ENVIRONMENTAL ASSESSMENT FOR THE DECOMMISSIONING OF THE DIAMOND ORDNANCE RADIATION FACILITY AT THE FOREST GLEN ANNEX OF FORT DETRICK IN SILVER SPRING, MARYLAND

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June 2011

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EXECUTIVE SUMMARY

This Environmental Assessment (EA) has been prepared in compliance with the *National Environmental Policy Act of 1969* (NEPA), as amended (Title 42, U.S. Code [USC], 4321-4347), and regulations of the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] 1500-1508) and the Army NEPA Regulation, 32 CFR 651, by the U.S. Army Garrison (USAG), Forest Glen Annex (FGA) of Fort Detrick in Silver Spring, Maryland, with technical assistance from BSA Environmental Services, Inc., under subcontract to PBS&J. This document has been printed on recycled paper.

The EA characterizes the potential environmental impacts that may result from implementation of the Proposed Action. The Proposed Action and subject of this EA is the Decommissioning of the Diamond Ordnance Radiation Facility (DORF) at the FGA of Fort Detrick in Silver Spring, Maryland. Five reasonable alternatives have been identified and were evaluated in this EA. These include: No Action (Alternative I), Release Using Site-Specific Derived Concentration Guideline Levels (DCGLs) (Alternative II), Focused Remediation by Encasement of Activated Material and Subsequent Release (Alternative III), Focused Remediation by Removal of Activated Material and Subsequent Release (Alternative IV), and Total Remediation, Complete Demolition, and Subsequent Release (Alternative V).

The DORF is currently regulated by two different entities. The Army Reactor Office (ARO) issued Permit No. DORF-1-97 to the Army Research Laboratory (ARL) in 1997 because of residual radioactivity resulting from reactor operations during the 1960's and 1970's. This permit remains in effect and ultimately must be terminated. After the termination of reactor operations by the ARL, ARL decommissioned the facility to the 1979-80 unrestricted levels then applicable, and the reactor permit was terminated. The Walter Reed Army Medical Center (WRAMC) then began to utilize the DORF for managing, packaging, shipping, and "hold for decay" of radioactive medical waste. This action is authorized by the U.S. Nuclear Regulatory Commission (USNRC) License No. 08-01738-2. Because of the 2005 Base Realignment and Closure decision, the WRAMC will cease operations no later than 15 September 2011, and will no longer need to conduct operations previously covered by USNRC License No. 08-01738-2. USNRC License No. 08-01738-2 must either be terminated, or alternatively, transferred to another holder.

The Walter Reed Army Institute for Research (WRAIR) is a medical research laboratory with facilities located on and off the FGA. Those facilities are all currently covered by USNRC 08-01738-2. The WRAIR will remain operational after the WRAMC ceases its operations in September 2011. In order to sustain current and future laboratory operations at the WRAIR, the WRAIR must obtain USNRC license coverage under a separate permit or license for its continued activities at the FGA and off-post leased locations. However, the DORF site is no longer required to sustain either current or future operations, and the 1) removal of the DORF site from USNRC license No. 08-01738-2, and 2) the termination of ARO Permit No. DORF-1-97, is the intended desired outcome of this Proposed Action.

It is possible that both actions, i.e., the termination of Permit No. DORF-1-97, and the removal of DORF site from USNRC license No. 08-01738-2, will have to be pursued as one coordinated action. Alternatively, it is possible that the two actions could be pursued separately. Regardless of the actual sequencing of the two actions, the two actions are referred to herein as the "Decommissioning of the DORF."

This EA evaluates four feasible Action Alternatives that could be utilized to achieve the desired outcome, and also the No Action alternative. Several potential environmental issues associated with implementation of the No Action or the Action Alternatives were identified, including impacts to historical and cultural resources, traffic, water resources, waste management, and human health and safety. The environmental impacts of the Action Alternatives (Decommissioning of the DORF) were evaluated in detail, and the potential adverse environmental, health, and socioeconomic impacts were found to be negligible to minor, and mitigable. Under the No Action Alternative, the potential impacts, both adverse and beneficial, of the Decommissioning of the DORF at the FGA would not occur. The principal conclusions of this EA are (1) Implementation of the Proposed Action, No Action (Alternative I), Release Using Site-Specific DCGLs (Alternative II), Focused Remediation by Encasement of Activated Material and Subsequent Release (Alternative III), Focused Remediation by Removal of Activated Material and Subsequent Release (Alternative IV), and Total Remediation, Complete Demolition, and Subsequent Release (Alternative V) would result in no significant, non-mitigable, adverse environmental, human health, or socioeconomic impacts. (2) Alternatives II, III, IV, and V would enable the release of the DORF for unrestricted use. (3) Alternative V would have positive impacts on land use from the removal of residual radioactivity and leaving the land unrestricted and available for future mission-enhancing projects. (4) Implementing the No Action Alternative would eliminate the negligible to minor environmental impacts of the four Action Alternatives, and would allow radiological decay to continue simply with the passage of time. However, the No Action Alternative would also eliminate the potential beneficial impacts of decommissioning, which is to make a presently-encumbered parcel of land available for beneficial reuse. Selection of an alternative is planned for the end of 2011, in full consultation with both the NRC and the ARO.

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1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

Fort Detrick proposes the Decommissioning of the Diamond Ordnance Radiation Facility (DORF) at the Forest Glen Annex (FGA). The Proposed Action would reduce residual radioactivity at the DORF to a level that allows for the release of the site for unrestricted use and removal of the DORF from U.S. Nuclear Regulatory Commission (USNRC) License No. 08-01738-02 and termination of Army Reactor Office (ARO) Permit No. DORF-1-97.

The National Environmental Policy Act (NEPA) of 1969 requires all Federal agencies to give appropriate consideration to potential environmental effects of proposed major actions in planning and decision-making. The Council on Environmental Quality (CEQ) is responsible for issuing regulations (40 Code of Federal Regulations [CFR] 1500 *et seq.*) and implementing the provisions of NEPA. CEQ regulations in turn are supplemented by procedures adopted on an agency-specific basis. For the Department of the Army (DA), the pertinent regulations are 32 CFR 650 *Environmental Protection and Enhancement*, and 32 CFR 651 *Environmental Analysis of Army Actions*. This Environmental Assessment (EA) was developed pursuant to these laws and regulations. Due to a potential for significant adverse environmental impacts, projects must be preceded by the preparation of appropriate NEPA documentation. The screening criteria applied to categorical exclusions indicate that an EA for Decommissioning of the DORF at the FGA of Fort Detrick in Silver Spring, Maryland must be prepared.

1.2 BACKGROUND

The FGA is a U.S. Army Installation in Montgomery County, Maryland. The FGA consists of approximately 132 acres and is located approximately 8 miles north of the center of Washington, DC and 35 miles southwest of Baltimore, Maryland (see Figure 2-1). The Installation was acquired by the Army during WWII for the convalescent care of military personnel wounded in combat. Post war, the FGA was under the command and control of the Walter Reed Army Medical Center (WRAMC). Beyond the support of the WRAMC, the FGA provided tenant support for non-medical research. On 1 October 2008, command and control of the FGA passed from the WRAMC to Fort Detrick via the 2005 Defense Base Realignment and Closure Act.

The DORF consists of two buildings, Building 516 and Building 513, located on a 4.2 acre site on the southwest corner of the annex. Building 516 housed the “Training, Research, Isotopes, General Atomics” (TRIGA) Mark F reactor and is 65 ft by 50 ft and 25 ft high with a basement. Building 513 is a 25 ft by 25 ft and 10 ft high instrumentation building. Both buildings are enclosed by an exclusion fence and access is controlled through a single gated entrance.

Building 516 is a rectangular building completed in 1960. Construction materials of Building 516 include reinforced concrete, concrete block, and a structural steel roof system. The exterior of the building is running bond brick with slight projections in the wall plane denoting main structural elements. The main entry to the building is located in the southeast corner of the structure. A full-light, double-leaf door with transom and sidelights allows access to a small, flat-roofed vestibule. The east wall of the vestibule is brick with small perforations along the entry stair, and the north wall is fixed glazed units. A single-leaf, flush panel door opens off the vestibule into the building. A second opening lies in the western portion of the south wall. This

opening is a concrete loading dock with a double-leaf, flush-panel door sheltered by a metal-clad canopy. A brick planter spans the area between the pedestrian entry and the loading dock. A single-leaf, flush-panel door lies in the northern portion of the east wall. The basement area has exterior access from the west. Concrete retaining walls form a long drive that leads to a large, double-leaf, flush panel door. The retaining walls are topped by metal safety rails. The remainder of the building contains few openings including louvered ventilators in the west and north walls. The addition has one-over-one metal windows, and a single leaf door. The flat roof of the building is trimmed with a metal-coped parapet wall, and a tall vent stack rises from the northeast corner of the building. A metal framed, metal clad, shed-roofed addition is located on the north wall. The addition has one-over-one, double-hung, metal sash windows and a single-leaf passage door (U.S. Army Garrison [USAG], 2010a). Many features of Building 516 have deteriorated or have been removed.

Building 516 is two-stories with approximately 6,896 square feet (sf) of floor space. It has a two-sided mezzanine level that is accessed from the main floor. The basement contains the former Exposure Room, and areas referred to as the "Warm Room", the “Connector Room,” and the outer walls of the former reactor pool. The main floor is primarily open space, with a ventilation room, two small offices and a restroom (U.S. Army Corps of Engineers [USACE], 2010a).

Building 516 was operated by the DA’s Harry Diamond Laboratories (HDL) at the FGA from September of 1961 to September of 1977 (USACE, 2010a). The DORF housed a TRIGA Mark F Reactor. Designed by General Atomics, the TRIGA Reactor was used as the principal research tool in the study of neutron and gamma radiation effects on electrical and electronic components. The reactor was immersed in a large pool that moderated the nuclear reaction and provided a high level of safety to operators.

Building 513 is a one story brick building with approximately 600 sf of floor space and was previously used to store non-radiological material. Although it was once designated as a “radiological instrument” area, its actual radiological history was unknown but there is no reason to believe there was a significant radiological history in the building (USACE, 2010a).

A small temporary building is located between Building 516 and Building 513 that had previously been used for hazardous waste storage, but most recently contained non-hazardous items of potential reuse from Building 516. On 28 October 2009, WRAMC personnel determined that these items were of no value and properly disposed the materials. (USACE, 2010a).

1.2.1 DECOMMISSIONING OF 1980

Upon the termination of reactor operations, a decommissioning plan was prepared and implemented from 1979 through 1980 by Rockwell International. This plan included the removal of all reactor fuel and enough residual radioactivity so that the site could be released for unrestricted use. Additionally, a concrete parapet inside Building 516 was removed, the parapet rubble was placed inside the reactor pool, and concrete was poured into the pool to fill in spaces to form a continuous surface for the first floor of Building 516. In 1980, the Army Reactor Systems Health and Safety Committee (currently referred to as the Army Reactor Council [ARC]) verified that the entire decommissioning plan was implemented and the stated release objectives were met. This certified that the decommissioning project was complete in accordance with the regulations in existence at that time and the reactor permit was terminated (USACE, 2010a).

The 1980 decommissioning of the DORF did not mention the three 5,000-gallon underground storage tanks (USTs) that held non-radioactive pool water during the operation of the reactor. The tanks were characterized, deemed free of residual radioactivity, and removed in October of 1999 (USACE, 2010a). A sanitary sewer line ran through the tanks. Therefore, when the tanks were removed, a section of pipe was installed to reconnect Building 516 to the sanitary sewer system.

1.2.2 ISSUANCE OF PERMIT AND LICENSE

The radiological status of the DORF was questioned during a 1996 review by the ARC due to the release of new decommissioning standards (10 CFR 20 Subpart E). A survey was subsequently requested by the ARC to verify that the exposure environment was consistent with the new decommissioning standards. The survey revealed low but detectable (i.e., above background) ambient exposure rates in the former Exposure Room. In June 1998, in response to the findings of this survey, the ARC issued Army Radiation Permit No. DORF-1-97 under Army Regulation (AR) 50-7 to the Army Research Laboratory (ARL) Director. Permit No. DORF-1-97 applies to residual radioactivity still present in Building 516 that was produced as a result of former reactor operations. According to the permit, it does not apply to materials that are or were licensed by the USNRC or the U.S. Atomic Energy Commission, radioactive materials not produced at the DORF, or radioactive materials removed from the DORF site as part of an authorized disposal or transfer. Permit No. DORF-1-97 established additional controls and monitoring procedures to prevent removal or disturbance of activated concrete until the implementation of follow-up actions (USACE, 2010a).

The WRAMC began using Building 516 for storage, “decay-in-storage,” processing, and packaging of short and long-lived radioactive waste from the FGA research and hospital operations under the provisions of the USNRC License No. 08-01738-02 and the DA Radiation Authorization No. ARA 08-01-97. At this time, the DORF came under the dual regulatory jurisdiction of the ARO (Permit No. DORF-1-97) and the USNRC (License No. 08-01738-02) and this dual jurisdiction currently remains (although all containerized waste has since been removed).

Other Walter Reed Army Institute for Research (WRAIR) medical research laboratory facilities located on and off the FGA are also under the regulatory encumbrance of the USNRC License No. 08-01738-2. Those facilities are all currently covered by USNRC License No. 08-01738-2 issued to WRAMC. The WRAIR will remain operational after the WRAMC ceases its operations in September 2011. In order to sustain current and future laboratory operations at the WRAIR, the WRAIR must obtain USNRC license coverage under a separate permit or license for its continued activities at the FGA and off-post leased locations.

1.2.3 CURRENT DECOMMISSIONING PLANNING

In 2008, the Baltimore District of the USACE was tasked by the DA to conduct decommissioning studies of the DORF to assess the status of Permit No. DORF-1-97. An investigation of the DORF was conducted and a project planning package was prepared. This information was used to evaluate and select decommissioning options. The investigation results will be used in the preparation of a site-wide decommissioning plan (USACE, 2010a).

Appropriate USNRC license termination guidance found mainly within the three volumes of *Consolidated Decommissioning Guidance* (NUREG-1757) and the *Multi-Agency Radiation Site Survey and Investigation Manual* (MARSSIM) (NUREG-1575) was followed to collect and analyze characterization data in order to determine the radiological conditions of the DORF. The use of USNRC guidance assured that the acquired data could be used to support the eventual release of the DORF from USNRC License No. 08-01738-02 (USACE, 2010a).

The USACE and applicable stakeholders reviewed and approved the implementation of a project planning package. The package included the results of previous DORF radiation surveys that were used to develop a preliminary conceptual site model (CSM). Following MARSSIM guidance, the CSM originally divided the DORF into 11 Operable Units (OUs) but one OU was later added during the investigation (USACE, 2010a). The following lists the 12 current DORF OUs:

- **OU 1** - Building 516, lower floor, the Exposure Room.
- **OU 2** - Building 516, lower floor, the “Warm Room.”
- **OU 3** - Building 516, lower floor, the “Connector Room.”
- **OU 4** - Building 516, Mezzanine, Rooms 1, 1/2, 3, and 5, the main floor, Rooms 101,104,105, and 106, and the truck dock.
- **OU 5** - Building 513, storage building.
- **OU 6** - Building 516, outdoor area in the location of the former USTs.
- **OU 7** - Outdoor Area within the boundary fence (4.2 acres), including the truck ramp and the generator room (storage shed).
- **OU 8** - Outdoor Area outside of the boundary fence.
- **OU 9** - Building 516, lower floor, the former reactor pool area.
- **OU 10** - Groundwater below the 4.2-acre DORF site.
- **OU 11** - Building 516, Mechanical Room and Ventilation Room (main floor).
- **OU 12** - Building 516, Roof, which was re-designated a special survey area.

After determination of the OUs, a master list of radionuclides associated with former reactor operations and former medical and research waste storage operations was prepared. From this master list, radionuclides of concern (ROCs) at the DORF were determined through the review of historical facility documents, previous measurement results, NUREG-1757, and other research (USACE, 2010a).

Release criterion, which are regulatory limits expressed in terms of radiation dose, were then determined for the DORF based on the total effective dose equivalent (TEDE). The radiation dose that the USNRC believes presents a negligible risk, as published in 10 CFR 20.1402, reads as follows:

> *"Decommissioning with license termination shall be limited to sites considered acceptable for unrestricted release where the residual radioactivity that is distinguishable from background radiation results in a total effective dose equivalent to an average member of the critical group that does not exceed twenty-five millirem per year (25 millirem [mrem]/yr), including that from groundwater sources of drinking water, and the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA)..."*

Subsequently, the ARC concurred with the USNRC's 25 mrem TEDE dose limit for the DORF. From this, dose limits specific to the DORF were developed for each of the ROCs within each of the OUs. These dose limits were MARSSIM-based site-specific derived criteria guideline levels (DCGLs) equivalent to USNRC's dose limit for the reuse of facilities (structures) and for the release of land areas (soil). They were based on exposure assessments that relied on highly conservative assumptions and parameters designed to maximize the resulting dose. The criteria used to develop the DCGLs can be found in Tables H.1 and H.2 of NUREG-1757, Vol. 2.

Data and measurements were collected to determine the level of residual radioactivity in each of the OUs in August and September of 2009. Additional site visits took place in October, November, and December of 2009, and again in March and July of 2010. In accordance with MARSSIM, Data Quality Objectives (DQOs) were set for the project and were also included in the project planning package. The DQO process established criteria for data quality and developing survey designs. According to NUREG-1757, final status surveys must be able to sufficiently describe radiological conditions at a site or facility in preparation for its release for unrestricted use. Data collection was completed in such a manner to meet the requirements for final status survey and DQOs (USACE, 2010a).

The levels of residual radioactivity within each of the OUs were compared to the previously determined site-specific DCGLs (release criteria). If the level of residual radioactivity within any of the OUs was below the DCGLs, that particular OU would become eligible for expedited release and no additional final status survey data would be needed. The comparison revealed that OUs 2, 3, 4, 5, 6, 7, 8, 10, 11 and 12 exhibited residual radioactivity levels that were below the DCGLs therefore no additional final status survey data would be required for those OUs (USACE, 2010a).

However, radiation surveys at OU 1 (the Exposure Room) revealed the presence of detectable residual activation within the concrete that exceeded the applicable DCGLs. OU 1 was deemed ineligible for expedited release. Additional final status survey data would be required before the release status of OU 1 would be considered again (USACE, 2010a).

Previous investigations indicated that no residual activation above the DCGLs is present in OU 9 (the former reactor pool area). However, the removal of 10 additional sampling cores is necessary to release OU 9 pursuant to MARSSIM guidance. Subsequently, OU 9 was designated as a Class 3 area. As defined in NUREG-1757 Vol. 2, Class 3 areas are impacted areas that have a low probability of containing residual radioactivity that is more than a fraction of the DCGL and future investigation is needed to determine its actual radiological status (USACE, 2010a).

1.3 PURPOSE AND NEED

The DORF site is no longer required to sustain either current or future operations, and the 1) removal of the DORF site from USNRC License No. 08-01738-2, and 2) the termination of ARO Permit No. DORF-1-97, is the purpose of this Proposed Action.

It is possible that both actions, i.e., the termination of Permit No. DORF-1-97, and the removal of DORF site from USNRC license No. 08-01738-2, will have to be pursued as one coordinated action. Alternatively, it is possible that the two actions could be pursued separately. Regardless

of the actual sequencing of the two actions, the two actions are referred to herein as the "Decommissioning of the DORF."

1.4 ASSESSMENT METHODOLOGY

This EA outlines and describes activities associated with the Proposed Action (Section 2.0), and systematically reviews five alternatives (Section 3.0). It characterizes the environmental aspects which may be impacted due to the implementation of any alternatives (Section 4.0), and describes potentially adverse environmental impacts, including human health impacts associated with the implementation of any alternatives (Section 5.0). This analysis considers impacts that are expected to result from the implementation of any alternatives and examines the potential for cumulative impacts among these activities to the affected environmental attributes.

This EA provides the best available information, as of April 2011, including guidance provided by Army personnel on the Proposed Action that may impact historical resources, human health and safety, traffic, and noise. Data presented in Sections 2.0 and 4.0 reflect the current conditions at the FGA using references to the most recent available data source. Additional information may be received and incorporated into the EA during the 30-day public comment period on this EA.

To reduce redundancy with previous relevant documents, CEQ regulations encourage agencies to eliminate repetitive discussions and to focus the decision process on the pertinent issues "ripe for decisions at each level of environmental review." This approach refers to the coverage of general matters in broad-scope documents, with subsequent narrower-scope documents incorporating by reference, the general discussions and concentrating primarily on the specific issues associated with the current proposal (40 CFR 1508.28).

This EA is based, in part, on earlier NEPA documentation. This approach entails referencing specific analyses, discussions, and conclusions of these documents without providing detailed discussion in the present EA. Consistent with CEQ guidance, the following NEPA study relevant to the FGA are incorporated by reference:

- *Final Environmental Assessment for the Base Realignment and Closure Recommendations and Master Planning Activities Walter Reed Army Medical Center Forest Glen Annex, Maryland, 2008*

1.5 PUBLIC PARTICIPATION

In accordance with NEPA, public comment is being solicited and encouraged. In accordance with 32 CFR 651, unless comments are received which necessitate a change to this EA; the present document will be considered final as of the end of the public comment period.

2.0 DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action and subject of this EA is the Decommissioning of the DORF at the FGA of Fort Detrick in Silver Spring, Maryland. Figure 2-1 shows the regional location of the FGA. Figure 2-2 provides the location of Buildings 516 and 513 of the DORF on the FGA and Figures 2-3 through 2-6 are pictures of the DORF. The Proposed Action includes five alternatives, ranging from No Action to Complete Demolition, with three intermediate alternatives.

According to NEPA, all agencies of the Federal Government shall "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources" (42 USC 4332). This EA analyzes four reasonable Action Alternatives and a No Action Alternative. Potential alternatives for the Proposed Action are No Action (Alternative I), Release Using Site-Specific DCGLs (Alternative II), Focused Remediation by Encasement of Activated Material and Subsequent Release (Alternative III), Focused Remediation by Removal of Activated Material and Subsequent Release (Alternative IV), and Total Remediation, Complete Demolition, and Subsequent Release (Alternative V). Selection of an alternative is planned for the end of 2011, in full consultation with both the NRC and the ARO. Any work that is in addition to work described herein will be subject to additional NEPA analysis.

Section 2.0 below describes the five alternatives in detail. Section 2.1 briefly summarizes the planned decommissioning and/or demolition activities for the Proposed Action, and Section 2.2 discusses regulatory and permitting requirements for mitigation of potential environmental impacts during decommissioning and/or demolition. Section 2.3 presents the routine operational activities for the Proposed Action, including utility requirements and regulatory and permitting requirements.

Alternative I: No Action

The No Action Alternative was evaluated in accordance with CEQ regulations. Although it would not satisfy the purpose of and need for the project, the No Action Alternative does establish the baseline to which the Action Alternatives can be compared. Under the No Action Alternative, neither the removal of the DORF from USNRC License No. 08-01738-02 or termination of ARO Permit No. DORF-1-97 would occur. The radiological conditions of the DORF would remain as documented in the 2010 Investigation Report, although natural decay of residual radioactivity will continue to occur with the passage of time.

Alternative I, the No Action Alternative, is to not decommission the DORF at the FGA at this time. The DORF would remain under the regulatory jurisdiction of both the ARO and the USNRC. Unencumbered use of the DORF would not be permitted until an indefinite time in the future, when the decommissioning process is ultimately completed.

ACTION ALTERNATIVES

Under all of the Action Alternatives, a final status survey report demonstrating that all but OUs 1 and 9 at the DORF are eligible for release for unrestricted use could be submitted to the USNRC. If the USNRC concurs with the findings of the report and agrees that the activation products at the site should remain under the jurisdiction of the ARO, the DORF could be released from the listing of authorized use areas on License No. 08-01738-02. At that time,

regulatory jurisdiction over the site would remain with the ARO only. However, the discussion that follows presumes that a decommissioning plan would be required to discuss actions necessary to obtain relief from both USNRC license No. 08-01738-2 and ARO Permit No. DORF-1-97.

Alternative II: Release Using Site-Specific DCGLs

Site-specific DCGLs based on reasonably foreseeable future-use scenarios for OU 1, developed in accordance with applicable guidance, would be included in a Decommissioning Plan that would be submitted to the ARO and as necessary to the USNRC for approval. Additional final status survey data would only be needed for OUs 1 and 9 since the remaining OUs would retain their radiological status as described in the 2010 Investigation Report and Final Status Survey Report. OU 9 has been identified as a Class 3 area (see Section 1.2.3).

Final status surveys demonstrating adherence to the site-specific DCGLs would be submitted at a minimum to ARO, and as necessary to the USNRC. Once regulatory approval is obtained from both agencies, the site could then be released to Fort Detrick without regulatory encumbrance.

Alternative III: Focused Remediation by Encasement of Activated Material and Subsequent Release

Alternative III would involve submitting a decommissioning plan to the ARO and as necessary to the USNRC for the remediation (via encasement) of OU 1 using site-specific DCGLs and/or USNRC screening values, i.e., control of OU 1 residual radioactivity using “structurally long-lived substances such as concrete” to encase structures containing residual radioactivity. The addition of concrete to OU 1 would reduce the dose received by a future receptor.

Under Alternative III, it is possible that relief from the USNRC license could be obtained by the WRAMC in the near term. However, it is unlikely that the ARO would grant relief from Permit DORF-1-97 as long as elevated residual activity remains.

Following the completion of all necessary remedial activities, a decommissioning report (including final status surveys demonstrating compliance with chosen cleanup levels) would be submitted to the appropriate regulatory agencies. Once regulatory approval is obtained, the site could then be released to Fort Detrick without regulatory encumbrance.

Alternative IV: Focused Remediation by Removal of Activated Material and Subsequent Release

Alternative IV would involve submitting a decommissioning plan to the ARO and as necessary to the USNRC for the remediation of OU 1 using site-specific DCGLs and/or USNRC Screening values and remediation methods such as scabbling and shearing to remove a predetermined amount of residual radioactivity, consisting predominantly of activated concrete. The remediation of OU 1 under Alternative IV would involve the generation of radiological waste, composed of concrete debris and various other activated wastes. This waste would be transported from the DORF site and disposed of at a low level radioactive waste (LLRW) disposal facility. However, if radionuclide concentrations in the removed wastes are low enough to be eligible for exemptions from the ARO and approval is obtained, the waste could be

transported for disposal to a Subtitle C (Resource Conservation and Recovery Act [RCRA]) facility.

After the remediation of OU 1, additional final status survey data regarding OUs 1, 2, and 3 would be collected and submitted to the appropriate regulatory agencies for review and approval because of the proximity to the remediation activities in OU 1. Final status survey data may also be needed for OU 9; however it is anticipated that the remaining OUs would maintain their previous releasable status.

Following the completion of all necessary remedial activities, a decommissioning report (including final status surveys demonstrating compliance with chosen cleanup levels) would be submitted to the appropriate regulatory agencies. Once regulatory approval is obtained, the site could then be released to Fort Detrick without regulatory encumbrance.

Alternative V: Total Remediation, Complete Demolition, and Subsequent Release

Under this Alternative, a decommissioning plan would be prepared and submitted to the ARO and as necessary to the USNRC for approval. Once approved by both agencies, the DORF would be demolished in its entirety. Demolition waste from the DORF facility would be either recycled, or if non-recyclable, disposed of at a suitable disposal facility. If the waste being disposed is under USNRC license or ARO permit, it must be disposed of at either a LLRW facility or at a Subtitle C disposal facility if approved by the pertinent regulatory authority.

After review and approval of the decommissioning report including final status surveys and adherence to established DCGLs, the ARO would terminate Permit No. DORF-1-97 and if not already complete, the USNRC would allow for removal of the DORF from License No. 08-01738-2, thereby releasing the entirety of the DORF for unrestricted use.

It is important to note that there may be an option to submit a decommissioning plan to the ARO that would request approval for partial release of the DORF for unrestricted use from Permit No. DORF-1-97. If the ARO approves this plan, the demolition waste from the released OUs could then be disposed of at a municipal landfill. Unreleased OUs would remain under the ARO permit; therefore demolition waste from these OUs must be disposed of at a LLRW disposal facility or, if ARO approval is obtained, disposed of at a Subtitle C facility.

2.1 PLANNED DECOMMISSIONING

Selection of an alternative is planned for the end of 2011, in full consultation with both the NRC and the ARO. Implementation of an alternative is planned for the end of 2012, or as soon thereafter as possible (McClain, 2010c). Further improvements or modifications of the Proposed Action may occur subsequently when warranted. Any such modifications will be subject to NEPA analyses at that time.

2.2 REGULATORY AND PERMITTING REQUIREMENTS FOR DECOMMISSIONING AND DEMOLITION

2.2.1 Demolition Requirements

Decommissioning (and if selected, demolition) will be performed by a qualified contractor. Adherence to all applicable regulations will assure safety. Many of these parameters, which specify guidelines for features such as structural integrity and hazardous waste handling, are based on national codes and regulations, which are established to ensure safety (USAG, 2010b).

2.2.2 Sedimentation, Erosion, and Stormwater Management Requirements

Stormwater management measures are required for projects that disturb more than 5,000 sf (approximately 0.115 acres) of land area on Federal property according to the Code of Maryland Regulations (COMAR) 26.17.02 and the *Maryland Stormwater Management Guidelines for State and Federal Projects*, 15 April 2010. The stormwater management measures will be designed consistent with the with the *2000 Maryland Stormwater Design Manual Volumes I and II,* 2009 Model Standard Stormwater Management Plan and 2009 Model Stormwater Management Ordinance (Maryland Department of the Environment [MDE], 2009). Additionally, all projects will be in compliance with the new regulations of the MDE Stormwater Management Act of 2007.

An erosion and sediment control plan for land clearing, grading, or other earth disturbance must be approved by the MDE under COMAR 26.17.01 for construction activities that disturb more than 5,000 square feet or 100 cubic yards. During demolition, application of best management practices (BMPs) for demolition will minimize soil erosion and potential airborne particle matter, in compliance with COMAR 26.11.06.03D *(Particular Matter from Materials Handling and Construction)* and the *Final 2010 Effluent Guidelines* published by the U.S. Environmental Protection Agency (USEPA). Alternative V would disturb over 5,000 sf and would require stormwater management or erosion and sedimentation control plans if chosen. It would be the responsibility of the contractor to develop stormwater management and erosion and sedimentation control plans.

If the area disturbed is more than one acre, a general permit under the National Pollutant Discharge Elimination System (NPDES) is also required in accordance with 40 CFR 122.26. An Individual Permit (for discharge of stormwater during the construction period) application must be completed and submitted with applicable fees to the MDE. The preliminary estimate of disturbed area would exceed one acre if Alternative V is chosen.

2.2.3 Forestation Requirements

The FGA is under the command and control of Fort Detrick and utilizes the Maryland Forest Conservation Act. This act requires any project that disturbs over 40,000 sf (0.92 acres) of unforested land must afforest (convert open land by planting trees) 15 percent of the equivalent surface area. Additionally, any project that disturbs over 40,000 sf (0.92 acres) of forested land must reforest the equivalent surface area at a 2:1 ratio. These plantings would contribute to the growth and development of the designated forest areas. The Maryland Department of Natural Resources (MDNR) typically must approve forestation plans before the project can break

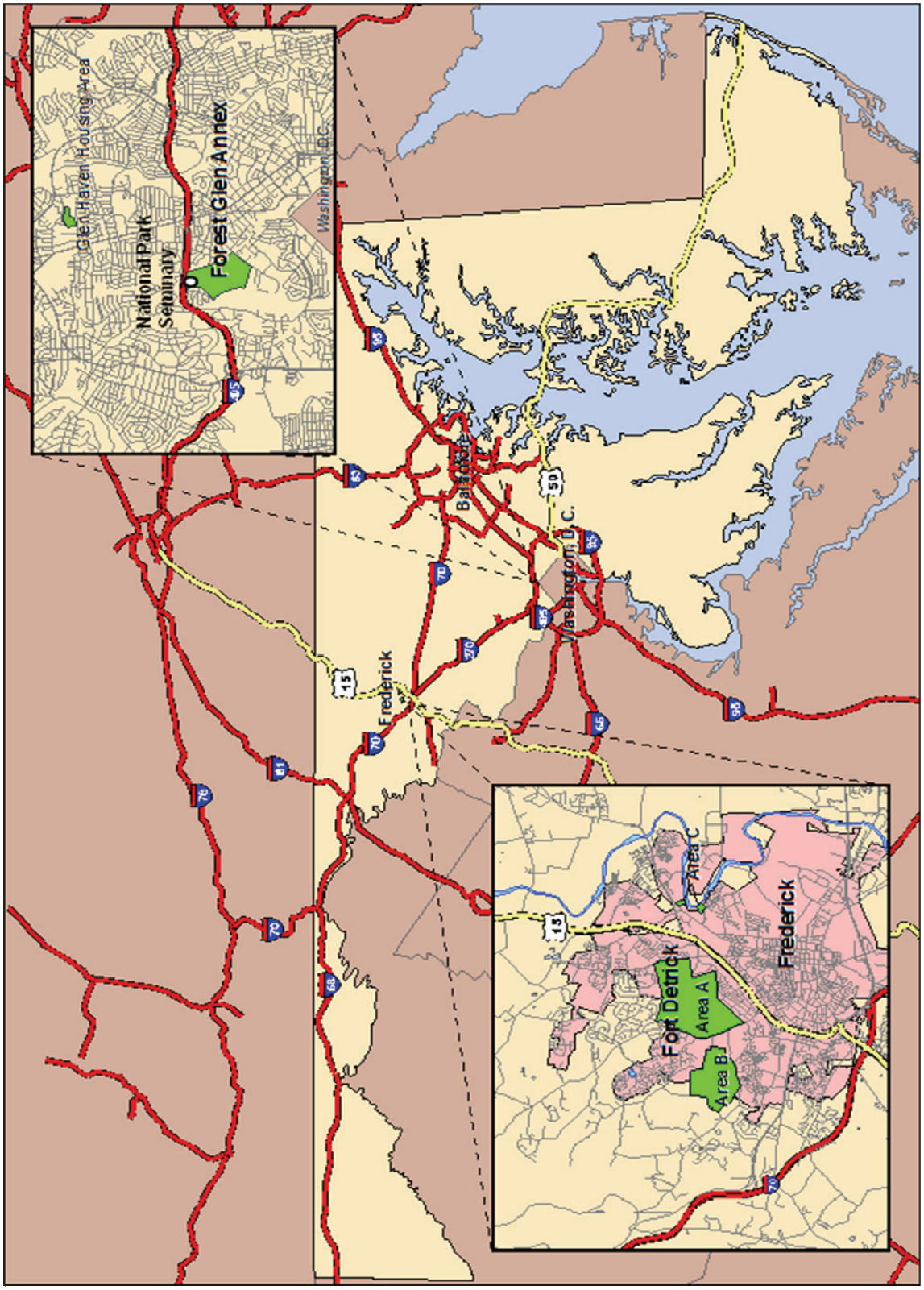

Figure 2-1. Regional Location Map.

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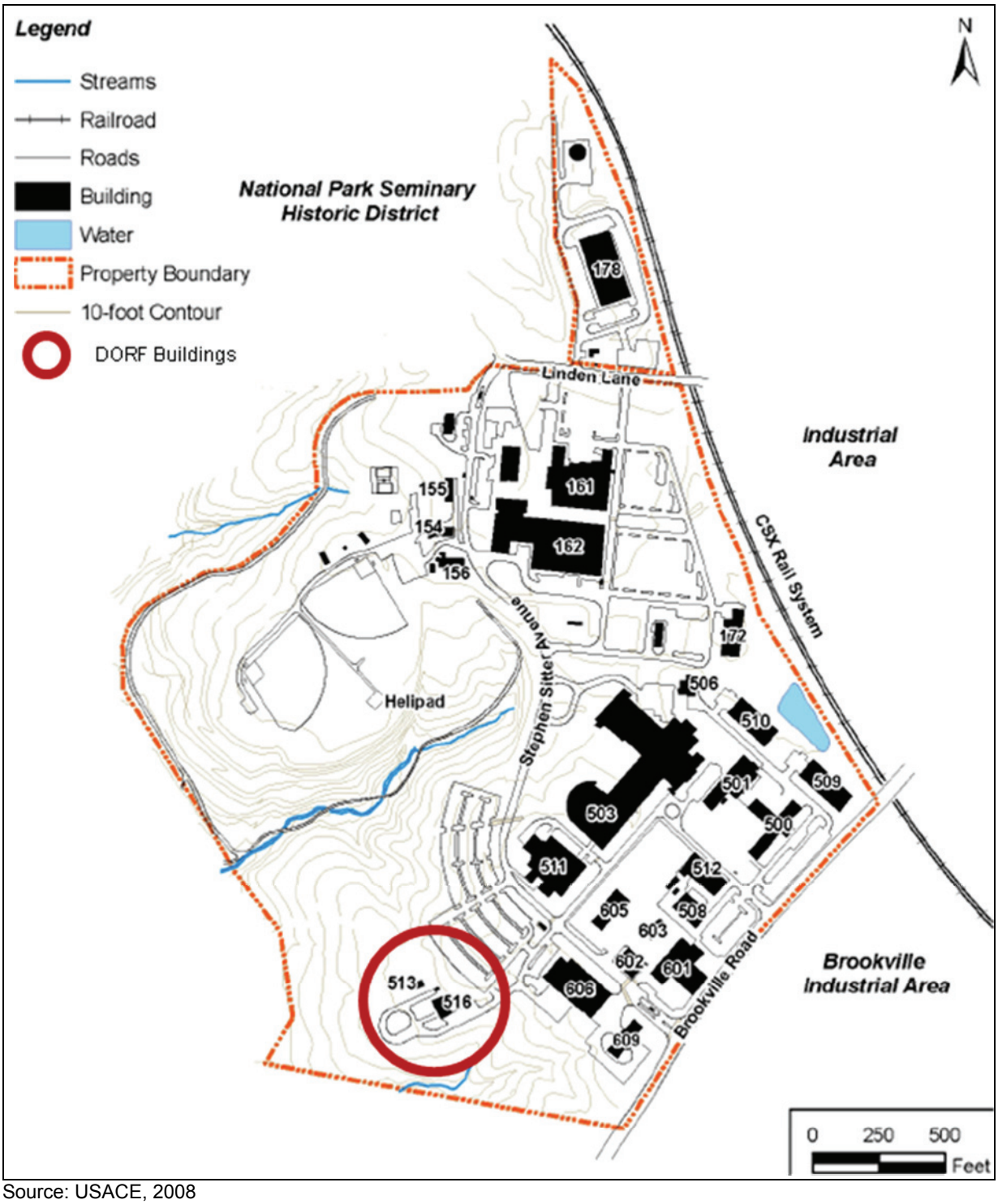

Source: USACE, 2008

Figure 2-2. Location of Buildings 516 and 513 on the Forest Glen Annex.

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Figure 2-3. Building 516 of the DORF.

Figure 2-4. Building 513 of the DORF.

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Figure 2-5. Lower Level of Building 516.

Figure 2-6. Upper Level of Building 516.

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ground (USAG, 2010b). Demolition activities related to Alternative V would result in disturbance of over 40,000 sf; therefore a forestation plan is necessary.

2.2.4 Air Permitting Requirements

Air quality permits to construct or modify are required for generators greater than 500 horsepower or 373 kilowatts and for fuel burning equipment greater than or equal to one Million British Thermal Units (MMBtu) per hour. Air quality permits to operate are required for fuel burning equipment with maximum rated capacities of 50 MMBtu per hour or more (COMAR 26.11.02).

The FGA is located in an air quality nonattainment area for ozone (see Section 4.8). MDE issued Fort Detrick an air quality permit to operate (Permit No. 031-00983 A) for the FGA on 1 January 2011 which expires on 31 December 2015. This operating permit recognizes the FGA as a synthetic minor source of emissions with respect to Title V of the Clean Air Act (CAA), and limits nitrogen oxide (NO_x) emissions from the facility to less than 25 tons in any rolling 12-month period. NO_x stack emissions from the FGA during calendar year (CY) 2010 totaled approximately 5.8 tons. The FGA is subject to all applicable Federal and state air pollution control requirements including, but not limited to: 40 CFR 60 Subpart Dc, MDE Regulation Numbers 5-1157, 5-1158, 5-1159, 5-1233, and 5-1234, and COMAR 26.11 (McClain, 2010b).

2.2.5 Historical and Cultural Resource Requirements

The National Historic Preservation Act of 1966 (NHPA), as amended (16 USC 470), mandates national policy for protection and restoration of significant historic, architectural, archeological, or cultural resources. The 1980 amendments to the NHPA provide for historic preservation costs to be included in project planning and budgeting. The State Historic Preservation Office (SHPO) has primary responsibility for ensuring adherence to the NHPA. The FGA maintains an Integrated Cultural Resources Management Plan (ICRMP) that serves as a guide to compliance with the NHPA of 1966 and other applicable Federal laws and regulations (USAG, 2010a). Under Section 106 of the NHPA, historic properties include buildings that are eligible for listing in the National Register of Historic Places (NRHP). Coordination with the Army's Cultural Resources Manager and MD SHPO will occur prior to implementation of an Action Alternative. See Sections 4.9 and 5.2.9 for details on historic resources and the Proposed Action.

2.2.6 Noise and Nuisance Lighting

The State of Maryland (COMAR 26.02.03.02 and 26.02.03.03) and Montgomery County (County Code: Chapter 31B) have established environmental noise standards that set maximum allowable noise levels for receivers located in industrial, commercial, and residential districts. The state regulatory limits for noise levels for receivers in residential areas are 55 decibels Type A (dBA), for receivers in commercial areas are 64 dBA, and for receivers in industrial areas are 70 dBA (Maryland Office of the Secretary of State, 2010). Montgomery County maximum allowable noise levels (31B-5) for receiving noise areas are 65 dBA for residential noise areas during daytime hours (7 a.m. to 9 p.m. on weekdays and 9 a.m. to 9 p.m. on weekends) and 55 dBA during nighttime hours (9 p.m. to 7 a.m. weekdays and 9 p.m. to 9 a.m. weekends). Maximum allowable noise levels for non-residential noise areas are 67 dBA during daytime hours and 62 dBA during nighttime hours (Montgomery County Department of Environmental Protection [DEP], 2010).

The State of Maryland [COMAR 26.02.03.03 A(2)(a)] states that noise levels from construction or demolition activities must not exceed 90 dBA at the boundaries of the construction/demolition site during daytime hours (7 a.m. to 10 p.m.) (Maryland Office of the Secretary of State, 2010). Montgomery County (Section 31B-6) set a maximum allowable noise level for construction (from 7 a.m. to 5 p.m. weekdays) of 75 dBA if the DEP has not approved a noise-suppression plan for the activity; or 85 dBA if the DEP has approved a noise-suppression plan for the activity. At all other times, noise levels specified in Section 31B-5 of the Montgomery County noise ordinance are applicable. Construction noise levels must be measured at the location at least 50 ft from the source on a receiving property where noise from the source is greatest (Montgomery County DEP, 2010).

Construction activities must not permit prominent discrete tones and periodic noises (e.g. dump truck tail gate banging) that exceed a level that is 5 dBA lower than the noise level standard established in Montgomery County (31B-5) (Montgomery County DEP, 2010). According to COMAR [26.02.03.03(B)(2)(d)], blasting operations associated with construction and demolition activities are exempt from noise restrictions during daytime hours (Maryland Office of the Secretary of State, 2010).

2.2.7 Demolition Waste Management Requirements

All solid waste from the demolition of Building 513, Building 516, and land clearing debris would be managed in accordance with Federal, DA, USAG, and state requirements and properly disposed of at permitted waste disposal facilities. Throughout the demolition phase, pollution prevention would be practiced through reduction or elimination of wastes and emissions of toxic materials to the environment, in accordance with the *Pollution Prevention Act of 1990* (42 USC 133); Executive Order (EO) 12856, *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements* (August 1993); EO 13423, and EO 13514. The demolition contractors would be responsible for the disposal of construction debris at permitted facilities off the FGA.

The 2006 Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding (MOU) Guiding Principles Section V: Reduce Environmental Impact of Materials states: “During a project’s planning stage, identify local recycling and salvage operations that could process site related waste. Program the design to recycle or salvage at least 50 percent construction, demolition and land clearing waste, excluding soil, where markets or on-site recycling opportunities exist”. This MOU would only apply to non-radioactive/non-hazardous material being demolished.

2.3 UTILITY REQUIREMENTS FOR ROUTINE OPERATIONS

2.3.1 Water

The Washington Suburban Sanitary Commission (WSSC) furnishes the FGA with potable water by way of two WSSC Patuxent River reservoirs. The Robert R. Morse Filtration Plant, which is supplied by the northwest branch of the Anacostia River and part of the Patuxent River, provides the FGA with a secondary source of potable water. The potable water supplied to the FGA is treated using sedimentation, filtration, disinfection, and potential hydrogen (pH) adjustment. During fiscal year (FY) 2009, the FGA consumed approximately 111 million gallons of potable water (McClain, 2010b). Currently the DORF does not consume water although it is

connected to the water distribution system. Implementation of any alternative will not substantially change annual water consumption.

2.3.2 Electrical

Potomac Electric Power Company (PEPCO) provides the FGA with electricity by way of three 13.2 kilovolt (kV), three-phase overhead circuits (numbers 14263, 14264, and 14265). These circuits traverse the FGA from north to south and serve four principal areas: Building 178; the Community Center Complex; the Research Area; and the industrial and motor pool area. The FGA also obtains electricity from the HESS Corporation. During FY 2009, electric consumption for the FGA totaled approximately 48 million kilowatt hours (kwh) (McClain, 2010b). Electrical consumption by the DORF is a small fraction of the overall the FGA consumption. Implementation of any alternative will not substantially change annual electric consumption.

2.3.3 Natural Gas

Washington Gas provides the FGA with natural gas and also owns the gas distribution system on the post. Two heating plants, located in the Research and Development Area (plant in Building 500) and the Community Center complex (plant in Building 163), are not interconnected and serve the FGA (USACE, 2008). During FY 2009, natural gas consumption for the FGA totaled approximately 3 million therms (McClain, 2010b). The DORF does not consume natural gas therefore implementation of any alternative will not change annual natural gas consumption.

2.3.4 Steam

Processes and activities that consume steam at the FGA include space heating, domestic hot water heating, cage washing, humidification, and sterilization. Buildings 163, 169, 178, 503, and 511 contain boilers that generate steam for use on the post (McClain, 2010a). The DORF does not consume steam therefore implementation of any alternative will not change annual steam consumption.

2.4 WASTE STREAM MANAGEMENT AND POLLUTION PREVENTION

The 4.2 acre site encompassing the DORF has been identified as an area of concern at the FGA. The building has diminished interior and process integrity due to the removal of equipment with residual radioactive contamination. This includes all of the reactor internals, filling of the reactor pool with concrete, removal of all associated piping, demolition of the water-cooled lead shield within the exposure room, the concrete shield plug, and electronic and operational devices in the control room. Other potential hazardous materials present on-site are lead-based paints and asbestos (USAG, 2010a).

2.4.1 Wastewater

WSSC provides sanitary sewage collection and treatment for the FGA. The WSSC has granted the FGA, an industrial user engaged in biomedical research and classified generally by North American Industry Classification System Code(s) 541710, a Discharge Authorization Permit (No. 08091) in accordance with provisions of the Commission's *Plumbing and Fuel Gas Code, Chapter 8: Industrial and Special Waste Regulations,* and applicable provisions of Federal and

state law, granting permission to discharge industrial wastewater into the WSSC sewer system. The Discharge Authorization Permit became effective 21 November 2008 and expires 21 September 2012 (McClain, 2010b).

The post discharges its sanitary sewage to the District of Columbia's sewage system by way of the WSSC Rock Creek sewer interceptor. The water discharged from the FGA is ultimately treated at the Blue Plains Wastewater Treatment Plant (WWTP) (USACE, 2008). During FY 2009, the FGA generated approximately 111 million gallons of wastewater (McClain, 2010b). Currently the DORF does not generate wastewater although it is connected to the sanitary sewer system. Implementation of any alternative will not substantially change annual wastewater generation.

2.4.2 Medical Waste

All medical waste generated at the FGA is managed in accordance with applicable Federal, DA, USAG, and state regulations for the protection of transporters and the public from potential hazards associated with potential contaminants. Special medical waste, as defined under COMAR 26.13.11.02 includes anatomical material, blood, blood-soiled articles, contaminated material (microbiological laboratory waste, feces of an individual diagnosed as having a disease that may be transmitted to another human being through the feces, articles soiled with feces of an individual diagnosed as having a disease that may be transmitted to another human being through the feces, or articles that have come into contact with a known infectious agent), microbiological laboratory waste (containing an infectious agent and including cultures or stocks of infectious agents and associated biological), and sharps (syringes, needles, surgical instruments, or other articles capable of cutting or puncturing human skin). Treatment (disinfection) of special medical waste and release to a licensed contractor, as discussed in Section 4.14.5, are in accordance with COMAR 10.06.06.04 and 10.06.06.06, respectively. The DORF does not generate medical waste therefore implementation of any alternative will not change annual generation. The DORF also has not stored medical waste since May 2009.

2.4.3 Hazardous Waste

The Fort Detrick Environmental Management Office (EMO) manages both the hazardous materials management program and the hazardous waste management program at the FGA. Fort Detrick's hazard communication program (HAZCOM) covers the storage and use issues, such as chemical compatibility in storage and handling, of hazardous materials. HAZCOM is overseen by the Fort Detrick Installation Safety Management Office and the individual tenants.

Hazardous materials typically utilized at the FGA include: solvents, paints, strong acids and bases, preservatives, heavy metals, and other materials associated with laboratory research and building maintenance. In addition to carrying out the use, storage, and disposal of hazardous materials and hazardous waste in accordance with Federal, state, local, and Army regulations, the Fort Detrick Hazardous Materials Management Plan (HMMP) and the Fort Detrick Hazardous Waste Management Plan (HWMP) are also followed.

The FGA adheres to hazardous waste accumulation rules set forth in COMAR 26.13.05.E(3), which allows for satellite accumulation areas (SAAs) (USACE, 2008). SAAs accumulate hazardous wastes or spent hazardous materials on the post, which are then transported to a 90 day collection site to await shipment off site. There are 126 SAAs located on the FGA as well as

one “less-than-90-day storage” area, also called a hazardous waste storage bunker (McClain, 2010a). The Defense Reutilization and Marketing Office (DRMO) arranges for the transport and proper disposal of the hazardous waste stored in the bunker for less than 90 days. The hazardous waste must be packaged in accordance with the U.S. Department of Transportation (DOT) regulations (49 CFR 171-179), and Federal, state, and treatment storage disposal facility requirements.

2.4.3.1 Asbestos-Containing Materials (ACMs)

On 20 July 2009 and 12-14 July 2010, an asbestos survey was completed at Building 516. Non-friable asbestos were identified within the thermal system insulation in Building 516 in various locations, therefore it is assumed that the entirety of the insulation contains ACMs. Currently, the physical condition of the thermal system insulation is good and does not present a personnel risk as long as it remains undisturbed. Various floor tiles and tile mastics in Building 516 contain asbestos. Although the tiles are loose, the asbestos is not considered friable. Because ACM can potentially be released by the demolition of buildings, asbestos must be removed by a qualified, licensed contractor, under applicable Federal and state regulations prior to demolition of the DORF (USACE, 2010a).

The MDE Air and Radiation Management Administration regulates the training of asbestos workers in Maryland (COMAR 26.11.21, *Control of Asbestos*). All workers conducting asbestos abatement activities at the DORF would be trained in safety, including respiratory protection (29 CFR 1926). Workers performing asbestos abatement activities would be protected from exposure and enrolled in a medical monitoring program (USAG, 2000).

If Alternative V is implemented, ACMs would be removed, packaged, and disposed of in accordance with Occupational Safety and Health Act (OSHA) (29 CFR 1926) and state laws, e.g., COMAR 26.11.21, *Control of Asbestos*. These materials would be transported by a contracted waste hauler to a landfill that is permitted to accept ACMs. The waste hauler and landfill would be determined after the contractor receives notice to proceed with the demolition of the DORF. The waste hauler and landfill would be licensed and permitted (USAG, 2000).

2.4.3.2 Lead-Based Paint (LBP)

On 20 July 2009 and 12-14 July 2010, a lead paint survey was completed at Building 516. Lead was confirmed to be present in most of the painted surfaces of Building 516 but concentrations were generally below the Maryland limit of 0.7 mg per square centimeter. Other than approximately 250 sf of painted surface, Building 516 is considered to be free of lead-based paint. Removal of LBP items during possible future demolition of the building would not constitute a LBP abatement provided the removal is not included in demolition plans for the purposes of reducing or eliminating a lead hazard. If a LBP removal is planned, it must be performed by a State of Maryland licensed lead abatement contractor. Representative demolition waste stream samples should be submitted for TCLP analysis for leachable lead content. If concentrations in excess of five parts per million (ppm) or higher are found, the waste stream should be handled and disposed of as hazardous waste (USACE, 2010a).

Adherence to the appropriate Federal and state regulations to protect human health and the environment are required (USACE, 2008). The OSHA Lead Standard regulates removal or encapsulation of lead and lead-containing materials (LCMs) where workers may be exposed

during demolition of structures containing such materials. LCMs would be packaged and disposed of in accordance with OSHA (29 CFR 1926) and state (COMAR Title 26) regulations (USAG, 2000; MDE, 2010d).

2.4.3.3 Polychlorinated Biphenyls (PCBs)

Due to the age of the electrical systems within the DORF, the presence of PCBs in transformers, light ballasts, and other older electrical equipment located within the buildings is possible. Units within the DORF would be managed as environmentally dangerous goods and considered to contain hazardous substances if PCB content is not stated on the unit(s). Unless documentation indicates otherwise, all oils associated with electrical devices (light ballasts, transformers, and capacitors) at the FGA should be considered to be contaminated with PCBs (USACE, 2008). Waste containing PCBs would be managed and disposed of in accordance with Federal (40 CFR 761.60) and state (COMAR 26.13) regulations (USAG, 2000; Maryland Office of the Secretary State, 2010).

2.4.4 Radiological Waste

The WRAMC Health Physics Office oversees the use, storage, and disposal of radioactive substances at the DORF, which are subject to conditions in the WRAMC license with the USNRC. Management of radiological waste is subject to USNRC regulations (10 CFR 20, *Standards for Radiation Protection*, Supart K, *Waste Disposal*). Packaging and shipment of all radiological waste material must also be in accordance with U.S. DOT regulations (49 CFR 172, *Hazardous Materials Table - Special Provisions* and 49 CFR 173, *Shippers – General Requirements for Shipments and Packaging*) and other applicable Federal, Department of Defense (DoD), and state regulations, as well as disposal facility requirements. Radiological wastes cannot be disposed of through the FGA trash or sanitary sewers.

The storage of radioactive waste in Building 516 was permitted through WRAMC's license with the USNRC (License No. 08-01738-02). Although the DORF no longer stores radioactive waste, the concrete walls within the building exhibit residual radioactivity due to the previous operation of the reactor. The ARL and WRAMC control access to the inactive, unoccupied, DORF. Access control, posting and monitoring are not necessary after completion of any of the Action Alternatives (McClain, 2010b).

2.4.5 Human Health and Safety Requirements

Adherence to all applicable Federal, state, and local regulations, as well as accepted work standards will ensure the health and safety of construction workers completing decommissioning activities at the DORF. Best management practices should be utilized at all times to minimize worker exposure and environmental contamination from radioactive waste and other hazards.

Under AR 50-7, decommissioning studies must include a discussion of how personnel and radiation safety will be managed. AR 50-7 requires the inclusion of radiological and non-radiological safety analyses within the decommissioning plan. All decommissioning activities at the DORF must comply with the established Reactor Safety Program and a Health Physics Plan, which includes a radiological safety program. Any radiological exposure to construction workers must be limited to ALARA.

2.4.5.1 Health and Safety Plan

NUREG-1757 states that a Health and Safety Plan (HASP) should be included in the decommissioning plan. According to the U.S. Department of Energy (DOE), a decommissioning HASP should include the following: documentation pertaining to potential radiological and non-radiological hazards that construction workers may encounter; appropriate training and certification of workers; descriptions of hazard controls (e.g., personal protective equipment), work procedures; and an emergency response plan (2000). A hazard refers to a source of danger (e.g., material, energy source, or operation) that can cause illness, injury, or death to personnel, harm to the general public, or damage to an operation or the environment. Guidance for preparing HASPs is found in DOE-EM-STD-5503-94 (*EM Health and Safety Plan Guidelines*). Since decommissioning activities at the DORF only involve the handling of low-level residual radioactivity, alternative requirements may be applied in lieu of the safety management guidelines contained within the DOE guidance.

2.4.5.2 OSHA Requirements

The decommissioning of a nuclear reactor must comply with all Federal and state OSHA regulations. Specific regulations impacting decommissioning operations are codified in 29 CFR 1926, *Safety and Health Regulations for Construction*. 29 CFR 1926.55 paragraph (b)(4) requires a site-specific safety and health plan for clean-up operations related to decommissioning. OSHA also requires a written emergency action plan. As mandated in 29 CFR 1926.35, this action plan should include emergency escape procedures and route assignments, as well as rescue and medical instructions for construction workers. Additional OSHA regulations codified in 29 CFR 1926 will apply to ensure the health and safety of construction workers completing decommissioning activities at the DORF.

2.4.5.3 Transportation Guidelines

According to NUREG-1757, compliance with current USNRC and U.S. DOT regulations and licenses is necessary to maintain human health and safety during the transportation of radioactive material from the DORF site. All packing and transportation of radioactive material must adhere to the procedures and standards set forth by the USNRC in 10 CFR 71, *Packaging and Transportation of Radioactive Materials*. The USNRC also requires compliance with U.S. DOT regulations when radioactive material is transported outside the DORF site, on public highways, or delivered to a carrier for transport. Appropriate U.S. DOT regulations include 49 CFR 107, 171 through 180, and 390 through 397, and may be specific to the mode of transport that is utilized.

Radioactive material being transported from the DORF site will be taken to a waste disposal facility as a “package.” The USNRC defines this package in 10 CFR 71 as “packaging together with its radioactive contents as presented for transport.” The USNRC mandates that the outside of this package must incorporate a feature, such as a seal, that is not readily breakable, and that, while intact, would be evidence that the package has not been opened by unauthorized persons. A package must be designed, constructed, and prepared for shipment so that under the tests specified in § 71.71 (“Normal conditions of transport") there would be no loss or dispersal of radioactive contents, no significant increase in external surface radiation levels, and no substantial reduction in the effectiveness of the packaging. A package must be made of materials and construction that assure that there would be no significant chemical, galvanic, or

other reaction among the packaging components, among package contents, or between the packaging components and package contents, including possible reaction resulting from inleakage of water, to the maximum credible extent. The package must be designed, constructed, and prepared for transport so that in still air at 38°C (100°F) and in the shade, no accessible surface of a package would have a temperature exceeding 50°C (122°F) in a nonexclusive use shipment, or 85°C (185°F) in an exclusive use shipment. A package may not incorporate a feature intended to allow continuous venting during transport.

3.0 ALTERNATIVES CONSIDERED

An EA must identify and explain the existing "range of alternatives" to the Proposed Action, which includes all reasonable alternatives to the Proposed Action that would avoid or minimize adverse impacts. Reasonable alternatives must be rigorously explored and objectively evaluated before being eliminated from detailed study with a brief discussion of the reasons for their elimination.

The Proposed Action and subject of this EA is the Decommissioning of the DORF at the FGA of Fort Detrick in Silver Spring, Maryland as described in Section 2.0. During the preparation of this EA, four feasible alternatives to the Proposed Action and the No Action Alternative were identified and evaluated. Selection of an alternative is planned for the end of 2011, in full consultation with both the NRC and the ARO.

These alternatives are briefly discussed in Sections 3.1, 3.2, 3.3., 3.4, and 3.5 below, details provided in Section 2.0. Environmental analyses of the alternatives are comprised of detailed discussion of the existing (baseline) environment in Sections 4.1-4.15, review of the environmental consequences of the Proposed Action in Section 5.2, and comparison of the alternatives in Section 5.3.

3.1 ALTERNATIVE I – NO ACTION

Alternative I, the No Action Alternative, is to not decommission the DORF at the FGA of Fort Detrick in Silver Spring, Maryland. The No Action Alternative was evaluated in accordance with CEQ regulations. Although it would not satisfy the purpose of and need for the project, the No Action Alternative does establish the baseline to which the Action Alternatives can be compared. The radiological conditions of the DORF would remain as documented in the 2010 Investigation Report, although natural decay of residual radioactivity will continue to occur with the passage of time. The DORF would remain under the regulatory jurisdiction of both the ARO and the USNRC.

3.2 ALTERNATIVE II – RELEASE USING SITE-SPECIFIC DCGLS

The site-specific DCGLs based on reasonably foreseeable future-use scenarios for OU 1 would be included in a decommissioning plan that would be submitted to the regulatory agencies for approval. Additional final status survey data would only be needed for OUs 1 and 9 since the remaining OUs would retain their radiological status as described in the 2010 Investigation Report.

3.3 ALTERNATIVE III – FOCUSED REMEDIATION BY ENCASEMENT OF ACTIVATED MATERIAL AND SUBSEQUENT RELEASE

Alternative III would involve the encasement of OU 1 using "structurally long-lived substances such as concrete" to encase radioactive structures (USNRC, 2010c). The addition of concrete to the surfaces of OU 1 would improve the shielding between a future receptor and the activation product remaining in OU 1. Alternative III would allow the activation products within the DORF to naturally decay within the encasing of additional concrete. The DORF would be continued to be monitored and surveyed, and it is likely that the ARO permit would need to remain in place.

Additional final status survey data would also be needed for OU 9. Under Alternative III, it is likely that the DORF site could be removed from USNRC License No. 08-01738-2, but it is also likely that ARO Permit No. DORF-1-97 would have to remain in place. In other words, the selection of Alternative III does not assure that decommissioning can be achieved within the reasonably foreseeable future.

3.4 ALTERNATIVE IV – FOCUSED REMEDIATION BY REMOVAL OF ACTIVATED MATERIAL AND SUBSEQUENT RELEASE

Alternative IV would involve the remediation of OU 1 using methods such as scabbling and shearing to remove a predetermined amount of activated concrete. The remediation of OU 1 under Alternative IV would involve the generation of radiological waste, composed of concrete debris and various other activated wastes. After the remediation of OU 1, additional final status survey data regarding OUs 1, 2, and 3 would be collected and submitted to the regulatory agencies for review and approval because of the proximity to the remediation activities in OU 1.

Additional final status survey data may also be needed for OU 9, however it is anticipated that the remaining OUs would maintain their previous releasable status.

3.5 ALTERNATIVE V – TOTAL REMEDIATION, COMPLETE DEMOLITION, AND SUBSEQUENT RELEASE

A decommissioning plan would be submitted to the regulatory agencies for approval. Once approved, the DORF would be demolished in its entirety under the regulatory jurisdiction of Permit No. DORF-1-97.

After review and approval of the decommissioning report including final status surveys and adherence to site-specific DCGLs, the ARO could terminate Permit No. DORF-1-97 and USNRC could remove the DORF site from License No. 08-01738-2. The entirety of the DORF could then be released for unrestricted use.

4.0 AFFECTED ENVIRONMENT

This section of the EA discusses aspects of the environment that potentially may be impacted by the implementation of the Proposed Action. The following description of the affected environment relies heavily on previous NEPA analyses. Relevant aspects of the affected environment (baseline conditions) are discussed below by environmental attribute area.

4.1 LOCATION AND LAND USE

Montgomery County has a land area of approximately 496 square miles. The FGA is a 132 acre facility located in the southeastern portion of Montgomery County, Maryland, approximately eight miles north of the center of Washington, DC. The property is bounded by Linden Lane on the north, the B&O railroad on the east, Brookville Road and a light industrial area to the south, and Rock Creek Park and the FGA suburb on the west. Adjacent areas consist primarily of dispersed subdivision development and light industrial buildings along Brookville Road surrounding the FGA. The National Park Seminary National Register District lies immediately north of the FGA on the opposite side of Linden Lane.

The FGA is zoned R-90, Residential Medium Density-9, by the Montgomery County Planning Department. This zoning district is defined as “medium-density housing with detached units on minimum 9,000 square foot lots.” The area surrounding the FGA to the south and east along Brookville Road and the B&O railroad is zoned I-1, Industrial Light. The I-1 zoning district’s purpose is to “protect and preserve areas for light industry, artisan, warehousing, and distribution.” Further to the east beyond the I-1 zoning district is R-60 zoning, Residential Medium Density-6. This zoning district is defined as “medium-density housing with detached units on minimum 6,000 square foot lots.” Located to the north of the annex is a Planned Development-15 zoning district. This district is designed “to allow a type of development integrating varied and compatible land uses with greater flexibility in site planning and building design.” To the west of the FGA is the Rock Creek watershed with R-60 zoning located beyond the watershed.

Approximately 75 percent of the boundary surrounding the DORF is a continuous wooded area. Further south lies Garfield Avenue which is zoned I-1 and contains multiple auto-repair shops, machine shops, and other like businesses. To the west of the DORF lies Rock Creek at approximately 600 ft away. A residential neighborhood is located further west more than 1,500 ft from the DORF. The area between the DORF and the residential neighborhood is densely wooded. Bordering the DORF to the north is a large parking lot located within the FGA. The parking lot is accessed via Stephen Sitter Avenue and is northwest of the Stephen Sitter/Brookville Road gate.

4.2 CLIMATE

Montgomery County has a temperate, continental climate with four distinct seasons. Summers range from mild to hot and occasionally humid. Winters are mostly mild with intermittent periods of cold and snow (Maryland State Archives, 2010). The Silver Spring area has an annual average temperature of 55.4 $^{\circ}$F, with average temperatures of 35.4°F in the winter and 74.7 $^{\circ}$F in the summer, and historical extreme temperatures of -26 $^{\circ}$F in the winter and 107°F in the summer. The average annual precipitation for the Silver Spring area is 41.77 inches (Southeast Regional Climate Center, 2010). During normal years, precipitation in the region is sufficient to

provide an adequate water supply. However, the Central Region of Maryland was in a drought emergency for the greater part of 2002. The resulting Level I and Level II mandatory water usage restrictions were lifted in February 2003. As of July 2010, the hydrologic indicators of rainfall, groundwater, and reservoirs in the central region of Maryland were classified as normal and the indicator for stream flow was classified as "watch" (MDE, 2010b).

The prevailing wind direction for the area is from the west-southwest with an annual average velocity of 7.4 miles per hour. Prevailing winds in the region influence seasonal climatic variations in the area. In the winter months (October - April), prevailing winds are from the northwest and bring clear, cool weather. During the summer (May - September), a large high-pressure system in the Atlantic Ocean, known as the Bermuda High, frequently influences the region. This system brings warm, moist air into the region from a southwesterly direction (Maryland Office of Environmental Programs, 1986).

The storm events database of the National Climatic Data Center (NCDC) lists the following extreme weather events for Montgomery County between 1 January 1950 and 30 April 2010: 14 droughts, 72 floods, 109 hail events, 30 heavy rain events, 109 heavy snow and ice events, 35 lightning events, 232 thunderstorms and high wind events, and 16 tornados (NCDC, 2010).

4.3 GEOLOGY

The FGA lies within the eastern part of the Piedmont Plateau Physiographic Province (Appalachian Highlands). Its landscape is characterized by mostly rolling hills with occasional steep slopes along streams and rivers and comprises nearly 29 percent of Maryland's land area (USACE, 2008; MDNR, 2005). The Piedmont Plateau is characterized by hard, crystalline metamorphic and igneous rocks. Its bedrock consists of metamorphosed igneous and sedimentary rocks such as gabbro, gneiss, and schist. Historically mined mineral resources include building stone, slate, non-metallic minerals, gold, and iron ore. Currently, mined crushed stone is used as an aggregate in the production of cement and lime (Maryland Geological Survey [MGS], 2009).

The Piedmont Plateau generally ranges in elevation from approximately 100 ft to 1,000 ft above sea level (MDNR, 1999). The elevation of Montgomery County ranges from 10 ft to more than 880 ft above sea level, whereas elevations at the FGA range from 190 ft near Rock Creek to 340 ft above sea level near the Service Building and Community Center Complex (MGS, 2008; USACE, 2008). The FGA topography is characterized as gently rolling with some steep slopes along Rock Creek and South Ireland Creek in the western and southern portions. Slopes vary from nearly flat to 25 percent or more (USACE, 2008).

Montgomery County is located within an area in which the Peak Ground Acceleration (PGA) ranges from 0.04 to 0.08 (U.S. Geological Survey [USGS], 2008). PGA is a measurement of the acceleration experienced by an object and is used to determine the amount of horizontal force a building can withstand during an earthquake (USGS, 2009). Montgomery County's low PGA value indicates that minimal building damage could be expected due to an earthquake. Nearly all of Maryland, including Montgomery County, is classified as a "region of negligible seismicity with very low probability of collapse of the structure" (MGS, 1999). Between 1758 and 2009, 64 earthquakes occurred in the State of Maryland (MGS, 2010).

4.4 SOILS

The FGA contains 9 soil series within its boundaries including: Galia silt loam (5-15 percent slopes), Glenelg silt loam (3-8 percent slopes), Brinklow-Blockton channery silt loam (15-25 percent slopes), Occoquan loam (3-8 percent slopes), Codorous silt loam (0-3 percent slopes), Wheaton silt loam (0-8 percent slopes), Urban land - Wheaton complex (0-8 percent slopes), Blocktown channery silt loam (25-45 percent slopes), and Urban land (0-45 percent slopes) (USACE, 2009). These soil series range in depth from about 10 inches to more than 60 inches (USACE, 2008). All series are listed as hydric soils except for Wheaton silt loam and Urban land. All are moderately well-drained to well-drained, although in flat areas it is likely that the soils could be hydric (USACE, 2009). All soil units have a low shrink/swell potential with the exception of the Brinklow-Blockton channery silt loam which has a moderate shrink/swell potential and would require further consideration in building foundations and roads. Most of the soil units that compose the FGA are highly erodible or potentially highly erodible (USACE, 2008).

Urban soils are mainly found on the FGA eastern boundary in the areas northwest of Brookville Road and south of Linden Lane. Urban soil units are a result of the removal and placement of original soil due to construction activities. These disturbed soils tend to lack structure and do not exhibit the features typically observed in undisturbed soils (USACE, 2008).

There are three soil types found on the DORF site. The majority of the DORF site is made up of Glenelg silt loam (3-8 percent slopes) and Glenelg silt loam (8-15 percent slopes). Brinklow-Blocktown channery silt loams (15- 25 percent slopes) can be found on a small percentage of the site (USACE, 2009).

4.5 WATER RESOURCES

4.5.1 Surface Water

The FGA is located completely within the Rock Creek drainage basin. Rock Creek is approximately 33 miles long and its watershed covers approximately 76 square miles (National Park Service, 2006). This stream originates from a spring near the city of Laytonsville in Montgomery County, Maryland, and flows south through Montgomery County and into Washington, DC, where it ends at its confluence with the Potomac River less than 10 miles south of the FGA, and eventually discharges into the Chesapeake Bay (USACE, 2008).

Eleven stream reaches have been identified within the FGA boundaries (USACE, 2009). Surface water runoff drains into these streams, which then flow in a western direction before emptying into Rock Creek. Precipitation drains into the stream beds or overland, directly into Rock Creek. The stream water depths vary from completely dry to approximately eight inches (USACE, 2008). Previous documents have identified the main FGA central streambed as South Ireland Creek (USACE, 2008), although there is no record of that stream name in the Federal Geographic Names Information System (USGS, 2010a).

There are no USGS gauging stations in the FGA area, however, Rock Creek streamflow is monitored by one USGS station, Rock Creek at Sherrill Drive, Washington, DC (#01648000) (USGS, 2010b), which is approximately 3 miles downstream of the FGA (USACE, 2008). This station's drainage area is approximately 62.2 square miles (USGS, 2010b). Based on the 80

years of complete data (1929 to 2009), the highest mean monthly streamflow occurs in March averaging 91 cubic feet per second (cfs) and the lowest mean monthly streamflow occurs in October averaging 42 cfs, with a mean daily streamflow of 64.1 cfs (USGS, 2010b).

In 2002, Montgomery County, as well as the State of Maryland experienced the worst drought conditions since the 1930s (NCDC, 2007). The highest mean monthly streamflow for Rock Creek in CY 2000, the last year before the drought, was 106 cfs in April, and the lowest mean monthly streamflow was 15 cfs in October. By contrast, the CY 2002 streamflow ranged from the highest mean monthly streamflow of 87 cfs in December to the lowest mean monthly streamflow of 17 cfs in February (USGS, 2010b). Level I Mandatory Water Use Restrictions were implemented after emergency drought conditions were declared by former Governor Parris N. Glendening. Restrictions included prohibitions on the use of water for residential landscaping, washing of paved surfaces, non-recycling water ornamental fountains, washing of vehicles, as well as unsolicited service of tap water in food service establishments. On 20 February 2003, the drought emergency in the central region of Maryland, including Montgomery County, was lifted and removed Level I Mandatory Water Use Restrictions (Maryland Office of the Governor, 2003).

Three stormwater management ponds are present within the FGA boundaries. Two ponds are located along the FGA's eastern boundary. The northern most pond on the eastern boundary is also considered to be Wetland 3. Another detention pond is located near the FGA's southwestern boundary (USACE, 2009). Water from all ponds eventually drains into Rock Creek, and eventually the Potomac River. No bodies of surface water or streams exist on the DORF site.

The water quality of Rock Creek has been impaired by nonpoint source pollution such as sedimentation as well as the discharge of limited point source pollutants due to its location in a highly urbanized watershed (USACE, 2008). According to the Montgomery County DEP watershed restoration action plan, the water quality of the section of Rock Creek nearest the FGA is fair to poor (USACE, 2008). Section 303(d) of the Clean Water Act (CWA) requires states to identify impaired waterbodies that are not in attainment of water quality standards even with the use of technology-based controls. Rock Creek was listed on Maryland's 303(d) list of waters impaired for aquatic life use, bacteria, nutrients, and sediment (USACE, 2008).

4.5.2 Groundwater

The Silver Spring area of the Piedmont Plateau Physiographic Province has the most productive hard rock aquifers within the State of Maryland. These aquifers are generally of good water quality, and approximately 20 percent of these formations have the potential to yield at least 50 gallons per minute of water (Maryland Office of Environmental Programs, 1986). These formations are composed of non-calcareous bedrock. Overall groundwater contamination potential is moderate because the fractures are generally not interconnected. Any contamination would likely be localized (USACE, 2008). The areas south and southeast of the FGA contain coastal aquifers that are considered to be more productive. These aquifers include the Magothy, Patapsco, and Patuxent aquifers. The FGA does not contain any aquifers that could provide drinking water. There is no indication of seeps or springs being located near the FGA (USACE, 2008). Groundwater is approximately 19-50 ft below the DORF (Gortva, 2011).

There are two wells in Montgomery County that are part of the Maryland Geological Survey's Observation-Well Network. The well nearest to the FGA is well number MO Eh 20 and is located approximately 7 miles northeast of the FGA in Fairland, Maryland. Based on the 55 years of complete data (1955-2010), the water in this well has ranged from 4.4 ft below land surface in CY 1972 to 18.0 ft below land surface in CY 2002, a severe drought year (USGS, 2010c).

4.5.3 Stormwater

The FGA is permitted to discharge stormwater runoff from land used for industrial operations in accordance with State Discharge Permit No. 02-SW-0694. This permit prohibits the discharge of non-stormwater into surface waters, requires annual site compliance evaluations, and mandates maintenance of a stormwater pollution prevention plan. Sampling of stormwater is not required; however, sampling may be conducted as a proactive measure.

In accordance with 40 CFR 122.26 and COMAR 26.17.01, *Water Management*, and 26.17.02, *Stormwater Management*, construction activities that disturb more than 5,000 sf (0.11 acre) of land area and/or more than 100 cubic yards of earth require a sedimentation and erosion control plan and a stormwater management plan consistent with the *2000 Maryland Storm Water Design Manual, Volumes I and II* (MDE, 2000). All projects will be in compliance with the post-development stormwater management regulations of the MDE Stormwater Management Act of 2007. If the area disturbed is more than one acre, a general permit under the NPDES is also required in accordance with 40 CFR 122.26. An Individual Permit (for discharge of stormwater during the construction period) application would be completed and submitted with applicable fees to the MDE.

All the FGA stormwater discharges to Rock Creek and eventually to the Potomac River. Some stormwater flows into three stormwater management ponds located within the FGA boundaries before it is discharged to Rock Creek (USACE, 2009). The FGA stormwater management ponds consist of two detention ponds located on the eastern boundary of the FGA (the northern pond on the east boundary is also consider Wetland 3) and a detention pond located north of Building 516 (see Figure 4-1) (USACE, 2008).

Stormwater on the DORF site is managed by a system of storm drains, underground piping, and drainage outfall points. There are two stormwater outfalls within the fenced perimeter of the DORF. These outfalls are located to the south and to the west of Building 516. Stormwater generally drains westward from the site in the direction of Rock Creek.

4.5.4 Drinking Water

The Safe Drinking Water Act (SDWA), 40 CFR 141, sets forth Federal water quality standards for drinking water. The National Primary Drinking Water Standards of the SDWA establish Maximum Contaminant Levels (MCLs) for various contaminants in drinking water. The Water Management Administration of the MDE monitors and enforces compliance with Federal drinking water standards.

The FGA is served by the WSSC. The WSSC serves approximately 460,000 customers in Montgomery and Prince George's counties over an area of about 1,000 square miles, and maintains over 5,500 miles of pipeline (WSSC, 2010). The FGA receives its water supply from two Patuxent River reservoirs that have a combined capacity of approximately 12.5 billion

gallons (USACE, 2003). Water from these reservoirs is purified using sedimentation, filtration, sterilization, and pH adjustment. The FGA contains no water storage facilities (USACE, 2003).

Two WSSC water mains supply water to the FGA which is then distributed across the annex. The northern portion of the FGA is fed by four connections to a 12-inch WSSC main running along Linden Lane. The southern portion is fed by three connections to a 16-inch WSSC main running along Brookville Road (USACE, 2003). Total water consumption for the FGA in FY 2009 was approximately 111 million gallons per year (McClain, 2010a). Currently the DORF does not consume water although it is connected to the water distribution system.

4.6 WETLANDS AND FLOODPLAINS

Wetlands are jointly defined by the USEPA and the USACE as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (40 CFR 230.3(t) and 33 CFR 328.3(b)). Federal activities within floodplains and wetlands are restricted under EO 11988, 33 CFR 1977, EO 11990, and AR 415-15. A 25 ft buffer around nontidal wetlands is required under the State of Maryland's Nontidal Wetlands Act. In 2010, the U.S. Army Corps of Engineers, Baltimore District was tasked to conduct a wetland delineation survey of the Forest Glen Annex property. The resulting Wetland Delineation document is currently being reviewed by the Environmental Management Office (Hoch, 2011).

An October 2009 study conducted by USACE, *Wetland Delineation Report, Fort Detrick, Forest Glen Annex, Silver Spring, Montgomery County, Maryland* (USACE, 2009) identified three jurisdictional wetlands located within the FGA boundaries. Wetland 1 is located along the southern boundary of the FGA and has an area of about 0.06 acres, and is classified as a palustrine emergent wetland. Wetland 2 is located along the southwest boundary of the FGA, has an area of about 0.12 acres, and is classified as a palustrine forested wetland. Wetland 3 is located along the eastern boundary of the FGA, has an area of 0.31 acres, and is classified as a palustrine forested wetland. Wetlands 1 and 3 adjoin jurisdictional waters. Wetland 2 is next to and drains into a jurisdictional water (USACE, 2009). There are no wetlands on the DORF site (see Figure 4-1).

A small section of Rock Creek's 100 year floodplain lies within the southwest boundary of the FGA (USACE, 2008). There are no floodplains on the DORF site.

4.7 PLANT AND ANIMAL ECOLOGY

Much of the ecosystems within the FGA have been highly altered due to urbanization and human activities. Much of the native vegetation has been destroyed or displaced by species that are more tolerant to disturbances. Dense forest cover is found along the slopes and subsequent streams of the western and southern regions of the FGA. Lawns and landscape plantings characterize much of the remainder of the facility (USACE, 2008). Vegetation around the DORF is limited exclusively to turf grass and a few ornamental shrubs (USACE, 2010b).

Native tree species known to dominate the FGA forests include black oak, smoothbark hickory, tulip tree, and white oak. Other less common tree species present include chestnut oak, pitch

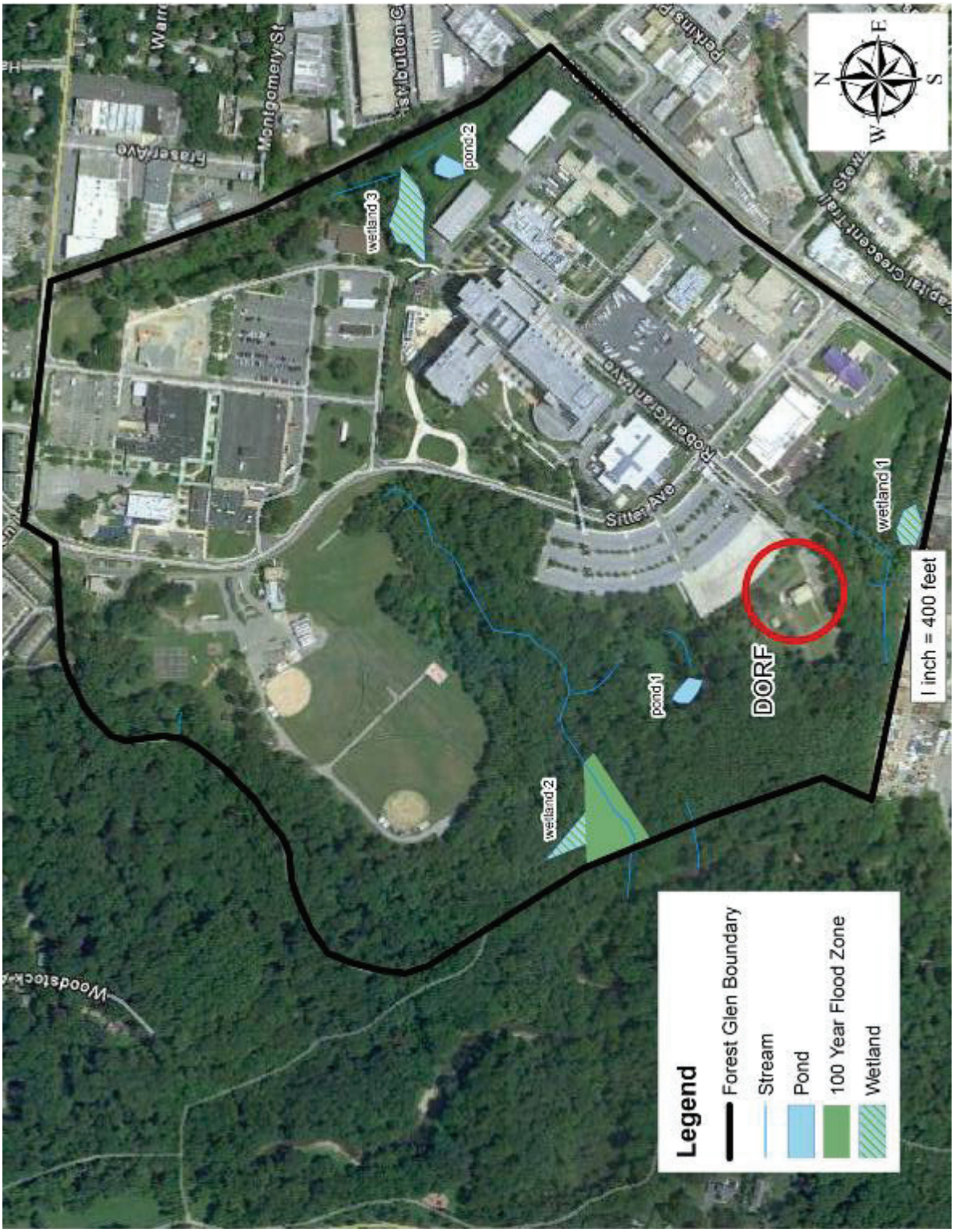

Figure 4-1. Wetlands and Floodplains on the Forest Glen Annex

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pine, scarlet oak, and scrub pine. Native species found in the forest understory include black snakeroot and hairy sweet cicely, although these species have become increasingly outcompeted by non-native species such as Amur honeysuckle, climbing euonymus, English ivy, Japanese honeysuckle, and oriental bittersweet (USACE, 2008). A narrow fringe of mature trees is found along the southern and western perimeter fence line of the DORF (USACE, 2010b).

Trapping surveys and observations have identified the presence of wildlife indicative of species adapted to living in urban habitats. Mammals typically found within the FGA borders include the eastern gray squirrel, raccoon, woodchuck, white footed mouse, and white-tailed deer (USACE, 2008). Common resident bird species include the American crow, blue jay, common house sparrow, European starling, northern cardinal, and rock dove. Neotropical migrant bird species include the American redstart, American robin, blackpoll warbler, and red-eyed vireo (USACE, 2008). Portions of the FGA provide habitat for two amphibian species, the gray tree frog, and the two-lined salamander, as well as one reptile species, the common box turtle (USACE, 2008). Transient birds and mammals (e.g. voles, mice, and deer) are known to be present within the boundaries of the DORF (USACE, 2010b)

According to the U.S. Fish and Wildlife Service, no proposed or listed Federal threatened or endangered species are present within the FGA or its vicinity, with the exception of infrequent transient individuals (USACE, 2008). The 2008 “Final Environmental Assessment for the Base Realignment and Closure Recommendations and Master Planning Activities Walter Reed Army Medical Center, Forest Glen Annex” documented the existence of three state rare plant species within the FGA, including an American Chestnut tree, a 10 foot patch of passionflower vine, and a 10–12 foot tall umbrella tree. Since the transfer of Command and Control in October 2008, only the presence of the umbrella tree has been positively confirmed, and this particular specimen was vandalized in 2009. However, it is currently recovering. Unfortunately, the location and continued presence of the American Chestnut tree and the small pocket of passionflower vines have not yet been confirmed by any post-transfer field surveys. It is possible that these two state rare plant species have been eliminated from the FGA forest flora by natural environmental causes (Hoch, 2011). Currently, the FGA has an active program to control invasive plant species.

4.8 AIR QUALITY

The FGA and the DORF lie within the EPA Mid-Atlantic Region 3, which is responsible for Federal environmental programs in Maryland, Delaware, Pennsylvania, Virginia, West Virginia, and the District of Columbia (USEPA, 2010d). The MDE Air and Radiation Management Administration administers Federal and state air quality regulations statewide. Maryland has adopted the USEPA National Ambient Air Quality Standards (NAAQS), as set forth under the CAA, to control a select group of widely occurring pollutants. These standards establish safe concentration levels for the six criteria pollutants: carbon monoxide (CO), lead, NO_x, ozone, particulate matter less than 10 microns in aerodynamic diameter (PM_{10}), and sulfur dioxide (SO_2). Particulate matter is divided into two classes, coarse particulate matter (PM_{10}), i.e., particles between 2.5 and 10 microns in diameter, and fine particulate matter ($PM_{2.5}$), i.e., particles less than 2.5 microns in diameter (MDE, 2010a).

Under the CAA, an “attainment area” is defined as a geographic area where the level of a criteria pollutant meets the primary or secondary NAAQS for the pollutant. A “nonattainment

area" is a geographic area that has (or that contributes to) levels of a criteria air pollutant that is higher than allowed by the primary or secondary NAAQS. One single location may be in attainment for one pollutant and simultaneously have unacceptably high levels of another criteria air pollutant. The CAA requires that attainment areas implement a Prevention of Significant Deterioration plan to prevent degradation and to maintain attainment status. The 1990 CAA established five classification categories based on the severity of nonattainment and set new deadlines for each category to achieve attainment. The five categories are extreme, severe, serious, moderated and marginal. One of the goals of the CAA is to set attainable goals/deadlines for air quality control regions to reach attainment status (MDE, 2010a).

As of 16 June 2010, all of Maryland, including the Silver Spring region, was in attainment for all NAAQS criteria pollutants except for ozone (USEPA, 2010a). On 5 April 2005, the USEPA officially designated Montgomery County as being a $PM_{2.5}$ nonattainment area; however, after review of the revised USEPA Area Designations for 2006 24-Hour $PM_{2.5}$ Standards, the entire state of Maryland is currently designated as an unclassifiable/attainment area for $PM_{2.5}$ (USEPA, 2010b).

On 12 March 2008, the USEPA significantly strengthened its NAAQS for ground-level ozone and revised the 8-hour "primary" ozone standard to a level of 0.075 ppm. The previous standard, set in 1997, was 0.08 ppm. Because ozone is measured out to three decimal places, the standard effectively became 0.084 ppm as a result of rounding. The USEPA also strengthened the secondary 8-hour ozone standard to the level of 0.075 ppm making it identical to the revised primary standard. The USEPA strengthened the secondary ozone standard after concluding that the 1997 secondary standard was not adequate to protect public welfare. In addition to changing the level of the standards from 0.08 ppm to 0.075 ppm, the USEPA now specifies the level of the standard to the third decimal; therefore, an area will meet the revised standards if the three-year average of the annual fourth-highest daily maximum 8-hour average at every ozone monitor is less than or equal to the level of the standard (i.e., 0.075 ppm). Based on monitored air quality from 2006-2008, Montgomery County is a nonattainment area that violates the NAAQS for ground level ozone with a concentration of 0.084 ppm (USEPA, 2010c).

On 6 January 2010, the USEPA proposed to strengthen the 8-hour primary standard for ground-level ozone to a level within the range of 0.060-0.070 ppm. The USEPA is also proposing to establish a distinct cumulative, seasonal "secondary" standard, designed to protect sensitive vegetation and ecosystems, including forests, parks, wildlife refuges, and wilderness areas. The USEPA is proposing to set the level of the secondary standard within the range of 7-15 ppm hours. The proposed secondary standard is a "cumulative peak-weighted index," called W126. The W126 index is calculated by:

- "Weighting" each hourly ozone measurement occurring during the twelve daylight hours (8:00 am to 8:00 pm) each day, with more weight given to higher concentrations. This "peak weighting" emphasizes higher concentrations more than lower concentrations, because higher concentrations are disproportionately more damaging to sensitive trees and plants;
- Adding these 12 weighted hourly ozone measurements for each day, to get a cumulative daily value;
- Summing the daily values for each month, to get a cumulative monthly value;
- Identifying the three consecutive months during the ozone season with the highest index value, to get the cumulative seasonal index value, and;

- Averaging these maximum seasonal index values over three years.

An area would meet the proposed secondary standard if the three-year average of the cumulative seasonal index values is less than or equal to the level of the standard (i.e. 7-15 ppm-hours). On 8 December 2010, the USEPA requested that the Clean Air Scientific Advisory Committee (CASAC) provide further interpretation of the epidemiological and clinical studies used to obtain the proposed stricter ozone standards. The USEPA will review the findings of the CASAC prior to selecting the new standards. In light of ongoing scientific review, the USEPA intends to set an ozone standard in the range recommended by the CASAC by the end of July 2011.

As mentioned above, Montgomery County is currently a nonattainment area for the current 8-hour primary standard for ground-level ozone with a concentration of 0.084 ppm. It will also be in nonattainment for the proposed 8-hour primary standard of 0.060-0.070 ppm. Additionally Montgomery County will be in nonattainment for the proposed secondary standard of 7-15 ppm-hours with a concentration of 19 ppm-hours. Furthermore, it is projected that Montgomery County will violate the proposed 8-hour primary standard in the year 2020 with a concentration over 0.060 ppm but will be in attainment for the proposed secondary standard (USEPA, 2010c).

The USEPA is proposing an accelerated schedule for designating areas for the primary ozone standard. Additionally, the USEPA is taking comment on whether to designate areas for a seasonal secondary standard on an accelerated schedule or a 2-year schedule. The accelerated schedule would be:

- By January 2011: States make recommendations for areas to be designated attainment, nonattainment or unclassifiable.
- By July 2011: USEPA makes final area designations.
- August 2011: Designations become effective.
- December 2013: State Implementation Plans, outlining how states will reduce pollution to meet the standards, are due to USEPA.
- 2014 to 2031: States are required to meet the primary standard, with deadlines depending on the severity of the problem (USEPA, 2010c).

4.8.1 FOREST GLEN ANNEX AIR POLLUTION SOURCES

The FGA conducts comprehensive annual air emission inventories and air pollution sources on the post primarily including boilers (12), generators (6), and gasoline storage tanks (4). As discussed in Section 2.2.4, the FGA maintains an air quality permit to operate (Permit No. 031-00983 A) which limits NO_x emissions from the post to less than 25 tons per year. The FGA criteria air pollutants and emissions totals for CY 2009 are listed below.

Table 4-1. FGA Criteria Air Pollutants CY 2010.

Pollutant	Actual Emissions (tons/year)
CO	1.3612
NO_x	5.8341
SO_2	0.5862
Volatile Organic Compounds	0.8114
$PM_{2.5}$	1.1144
PM_{10}	1.1484

Source: Wolf, 2011

Under Title V of the Clean Air Act, any source that emits or has the potential to emit 100 tons per year or more of any criteria air pollutant is considered a "major source"; therefore, the FGA is not considered "major source" for emissions of criteria air pollutants (USEPA, 2010f). Currently, the DORF does not produce any air emissions.

4.9 HISTORICAL RESOURCES

The FGA is located in Montgomery County Maryland and totals 132 acres. The acreage that now encompasses present day Montgomery, Prince George's and Frederick counties, as well as Washington, DC, was designated as Prince George's County in 1695. In 1748 Prince George's County was divided and the western portion, including what would later be Montgomery, became Frederick County. On 6 September 1776 a bill was passed in the Maryland Constitutional Convention to divide Frederick into three counties, Frederick, Montgomery, and Washington (Montgomery County Maryland, 1999). Montgomery County was important in many events throughout the history of the U.S., including the French and Indian War, Revolutionary War, and Civil War (USACE, 2000).

During the late-eighteenth and early-nineteenth centuries portions of the current the FGA acreage was divided into two properties. The northern portion of the property was referred to as the "Highlands" and owned by William Carroll. The southern portion of the property was referred to as "Edgewood" and was owned by Robert Brent who operated a tobacco plantation on the property (USAG, 2010a).

The property associated with the National Park Seminary was originally created as a retreat development by the Forest Glen Improvement Company. In 1887 a hotel was constructed on the property named the Forest Glen Inn (or Ye Forest Inn). A downturn in the economy resulted in the failure of the Forest Glen Improvement Company and the leasing of the Forest Glen Inn and property to John and Vesta Cassedy (USAG, 2010a).

In the spring of 1889, the Cassedys opened a girls' seminary on the property. "The Cassedys proceeded to create a campus complete with trails, formal gardens, bridges, walkways, statues, administrative buildings, and residence halls that represented architecture from across the globe" (USAG, 2010a). The National Park Seminary was incorporated in 1903. John Cassedy passed away in 1910 and the seminary was later purchased in 1916 by Joe Clifton Trees. A few years later, the seminary was sold again to Dr. James E. Ament (USAG, 2010a).

Dr. Ament purchased the Edgewood plantation on the southern portion of the modern day FGA for use as a dairy farm for the seminary. During the Great Depression the seminary experienced low enrollment and was sold in 1936 to Roy Tasco Davis. Davis transformed the seminary into a junior college that was subsequently closed for use by the U.S. Army as an annex to the WRAMC in 1942 (USAG, 2010a).

During World War II, the FGA was used for the convalescent care of military personnel wounded during combat. Post war, the FGA provided medical care and research, supporting WRAMC. Missions included the Army Prosthetics Research Laboratory, the Army Audiology and Speech Correction Center, and officer's housing, all established in 1947, which were housed in buildings of the former college (USAG, 2010a).

Major expansion of the FGA occurred in the 1950s during which numerous buildings were constructed on the southern end of the property, south of Linden Lane. In 1971, another expansion took place at the FGA that included the completion of the large community center consisting of the base exchange, commissary, arts and crafts center, veterinary offices, and an on-post banking location. "The buildings originally occupied at the FGA, including approximately 43 acres of land, were transferred to Montgomery County with the seminary buildings eventually deeded to a private developer for adaptive re-use" (USAG, 2010a). Beyond the support of the WRAMC, the FGA provided tenant support for non-medical research. This included the HDL that operated a TRIGA reactor located in the southern portion of the location. Both pulse and continuous radiation testing was done on small components to evaluate performance in the event of nuclear combat (USAG, 2010a, see Section 1.2 for details).

4.9.1 CULTURAL RESOURCES

The DA must protect prehistoric and historic cultural resources on DA property according to the NHPA and other Federal laws and regulations. The NHPA, as amended (16 USC 470), mandates national policy for protection and restoration of significant historic, architectural, archeological, or cultural resources. The 1980 amendments to the NHPA provide for historic preservation costs to be included in project planning and budgeting. The SHPO has primary responsibility for ensuring adherence to the NHPA (USACE, 2000).

In accordance with AR 200-1, *Environmental Protection and Enhancement*, the FGA maintains an ICRMP that serves as a guide for compliance with the NHPA and other applicable Federal laws and regulations (USAG, 2010a). An inventory and evaluation of potential historical resources from the early-twentieth century to the end of the Cold War Era (1946-1989) was completed for potentially eligible listings in the NRHP. The survey identified 63 resources dating to the Cold War Era that were ineligible for registration with the NRHP because they did not retain the integrity and significance necessary for individual National Register consideration.

According to 36 CFR 800, Protection of Historic Properties, Federal agencies must allow the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on any government "undertaking" which would have a negative adverse effect on property considered eligible for listing the National Register for Historic Places. The ACHP will decide if it would like to participate in the resolution of adverse effects within 15 days of receipt of the notification. Federal undertakings include construction, demolition, rehabilitation, repair, licensing, permitting, financing, and planning. Under Section 106 of the NHPA, historic properties include buildings that are eligible for listing in the NRHP (ACHP, 2007).

Consultation with SHPO has been initiated because of the eligibility of the Building 516 for listing in the NRHP. In order to complete the Section 106 consultation for the demolition of Building 516 (Alternative V) the USAG will need to prepare a Memorandum of Agreement (MOA).

4.9.1.1 Current NRHP-Listed Sites

There are no NRHP-listed sites on the FGA. Four resources pre-date the Army's acquisition of the property and were also evaluated for potentially eligible listings in the NRHP. The "Carpenter's House" (Building 136), two buildings that once supported the seminary's agricultural complex (Buildings 152 and 156), and components of the Ireland Trail predate the

Army acquiring the FGA. Buildings 136, 152, and 156 did not retain the integrity and significance necessary for National Register consideration. The Ireland Trail merits consideration for the National Register as contributing, yet separate, components of the National Park Seminary Historic District (USAG, 2010a).

4.9.1.2 NRHP-Eligible Sites

As noted in Section 4.9.1.1, the following properties have been determined eligible for listing in the NRHP:

Building 516

Building 516 is a rectangular building completed in 1960 as the DORF. The building is sited atop a full basement and is roughly two stories in height. Construction materials of Building 516 include reinforced concrete, concrete block, and a structural steel roof system. The exterior of the building is running bond brick with slight projections in the wall plane denoting main structural elements. The main entry to the building is located in the southeast corner of the structure. A full-light, double-leaf door with transom and sidelights allows access to a small, flat-roofed vestibule. The east wall of the vestibule is brick with small perforations along the entry stair, and the north wall is fixed glazed units. A single-leaf, flush panel door opens off the vestibule into the building. A second opening lies in the western portion of the south wall. This opening is a concrete loading dock with a double-leaf, flush-panel door sheltered by a metal-clad canopy. A brick planter spans the area between the pedestrian entry and the loading dock. A single-leaf, flush-panel door lies in the northern portion of the east wall. The basement area has exterior access from the west. Concrete retaining walls form a long drive that leads to a large, double-leaf, flush panel door. The retaining walls are topped by metal safety rails. The remainder of the building contains few openings including louvered ventilators in the west and north walls. The addition has one-over-one metal windows, and a single leaf door. The flat roof of the building is trimmed with a metal-coped parapet wall, and a tall vent stack rises from the northeast corner of the building. A metal framed, metal clad, shed-roofed addition is located on the north wall. The addition has one-over-one, double-hung, metal sash windows and a single-leaf passage door (USAG, 2010a).

DORF was operated by the HDL. Later, many years after the initial decommissioning, the HDL became a part of the Army Research Laboratory. Both pulse and continuous radiation testing was done on small components to evaluate performance in the event of nuclear combat (USAG, 2010a).

The Ireland Trail

The Ireland Trail and picnic pavilion were constructed by the National Park Seminary ca. 1930. The trail follows a meandering path beginning slightly south of Linden Lane, then follows a roughly southwestern path before turning to the southeast, and finally to the northeast where it ends at the picnic pavilion. The trail is approximately 0.75 miles in length, and parallels a narrow water course for about half of its length. Several water crossings are located along the trail. The trail is roughly 12 ft in width and constructed of pebble-finish concrete. There are five bridges constructed along the Ireland Trail. Four of the five are also constructed of concrete with a pebble-finish. The fifth bridge was partially reconstructed in 2008, and now has a smooth concrete finish to the bridge deck. The trail ends at a rubble stone picnic pavilion and associated

landscape elements. The pavilion measures about 12 ft square with a gable roof and a large stone chimney on the northeastern wall. The chimney serves a large fireplace and oven that orient to the exterior of the building. The building is divided into two, unconnected rooms each having an exterior doorway. The western room originally had casement windows that opened inward. The eastern room had windows on the northern and southern walls and a door to the east. The interior walls of the eastern room show evidence that clothing racks or narrow shelves lined both of the transverse walls. The building is in ruinous condition, but historic photographs depict a roof covered with pressed-metal shingles laid in a diamond pattern and vertical batten doors. A curving stone wall extended from the northeast corner of the building and contained a built-in seat. Although many details of the landscaping are obscured by silt varying in depth from 13 to 18 inches, preliminary examination aided in determining the original configuration of the area. A concrete dam originally formed a small pond to the south of the pavilion. Period photographs show that the pond was originally several ft deep with a stone retaining wall topped with concrete curbing. The retaining wall extended from the curved seat wall and a concrete pad. The wall continued in several arcs to the west before joining the original path of the trail. Field examination indicates that this entire area was paved with concrete. Although the trail leading to the pavilion is now silt-covered, research indicated that the concrete road of the main trail extended into this landscaped recreation area (USAG, 2010a).

4.9.2 Archeological Resources

Archeological surveys have been conducted on the FGA and no prehistoric or historic sites have been documented (USAG, 2010a).

4.10 SOCIOECONOMIC ENVIRONMENT

The FGA is located in Montgomery County, Maryland. The population of Montgomery County was estimated at 971,600 as of 1 July 2009, an 11.3 percent increase from 2000 (U.S. Census Bureau, 2010). Growth projections predict that the population will reach 1,075,000 by the year 2020 and 1,141,000 by the year 2030 (Maryland State Data Center, 2009).

As of April 2009, Montgomery County had a two percent increase in the total number of jobs from 2005. Growth projections predict that the number of Montgomery County jobs will increase to 590,000 by the year 2020 and 670,000 jobs by 2030 (Montgomery County Planning Department, Research and Technology Center, 2009).

The civil labor force for Montgomery County in June 2010 was 510,578 of which an average of 481,599 were employed (Maryland Department of Labor, Licensing and Regulation, 2010a). The private sector is the largest employment sector in Montgomery County, comprising approximately 81.5 percent of all the jobs in the county. Within the private sector professional and business services provide for 22.5 percent of jobs in the county, followed by education and health services (14.0 percent), trade transportation and utilities (12.8 percent), leisure and hospitality (8.4 percent), and financial activities (7.2 percent). The government sector provides for 18.5 percent of all jobs within the county, with 8.5 percent local government employees, 9.7 percent Federal employees, and 0.2 percent state employees (Maryland Department of Labor, Licensing and Regulation, 2010b).The June 2010 unemployment average for Montgomery County was 5.7 percent, which was less than the state of Maryland and the National averages of 7.1 percent and 9.5 percent respectively (Maryland Department of Labor, Licensing and Regulation, 2010a).

The FGA employed approximately 1,941 people during July 2010. The 132 enlisted military personnel accounted for 6.8 percent of the total number of people employed at the facility. There are 171 (8.8 percent) officers at the FGA, and 850 contractors accounted for 43.8 percent of the work force (LeClair, 2010).

The estimated 2008 median household income for Montgomery County was $93,895, which was $23,413 above the state average of $70,482. The number of persons living below the poverty level in Montgomery County was estimated at 5.8 percent in 2008, which was 2.4 percent lower than the state average of 8.2 percent (U.S. Census Bureau, 2010).

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low Income Populations,* requires that Federal agencies prepare NEPA documents to address any significant adverse impacts of Federal projects on minority or low-income populations. A poverty area is defined by the U.S. Census Bureau as an area in which at least 20 percent of the population lives below the poverty level. Within Montgomery County during the census year of 2008, 5.8 percent of all persons were living below the poverty level and the county was not considered a poverty area (U.S. Census Bureau, 2010).

4.11 NOISE AND ODORS

The State of Maryland (COMAR 26.02.03.02 and 26.02.03.03) and Montgomery County (County Code: Chapter 31B) have established environmental noise standards that set maximum allowable noise levels for receivers located in industrial, commercial, and residential districts. The state regulatory limits for noise levels for receivers in residential areas are 55 dBA, for receivers in commercial areas are 64 dBA, and for receivers in industrial areas are 70 dBA (Maryland Office of the Secretary of State, 2010). Montgomery County maximum allowable noise levels (31B-5) for receiving noise areas are 65 dBA for residential noise areas during daytime hours (7 a.m. to 9 p.m. on weekdays and 9 a.m. to 9 p.m. on weekends) and 55 dBA during nighttime hours (9 p.m. to 7 a.m. weekdays and 9 p.m. to 9 a.m. weekends). Maximum allowable noise levels for non-residential noise areas are 67 dBA during daytime hours and 62 dBA during nighttime hours (Montgomery County DEP, 2010). The DORF lies within a light industrial area.

Maximum noise level standards must be met for residential land use at the property boundary for all applicable activities within the FGA. If warranted, a noise level monitoring system using an approved sound level analyzer may be located at or within the property line of the receiving property. The State of Maryland [COMAR 26.02.03.03 A(2)(a)] states that noise levels from construction or demolition activities must not exceed 90 dBA at the boundaries of the construction/demolition site during daytime hours (7 a.m. to 10 p.m.) (Maryland Office of the Secretary of State, 2010). Montgomery County (Section 31B-6) set a maximum allowable noise level for construction (from 7 a.m. to 5 p.m. weekdays) of 75 dBA if the DEP has not approved a noise-suppression plan for the activity; or 85 dBA if the DEP has approved a noise-suppression plan for the activity. At all other times, noise levels specified in Section 31B-5 of the Montgomery County noise ordinance are applicable. Construction noise levels must be measured at the location at least 50 ft from the source on a receiving property where noise from the source is greatest (Montgomery County DEP, 2010).

Construction activities must not permit prominent discrete tones and periodic noises (e.g. dump truck tail gate banging) that exceed a level that is 5 dBA lower than the noise level standard

established in Montgomery County (31B-5) (Montgomery County DEP, 2010). Due to the thickness of the concrete walls of the DORF, blasting operations producing periodic noises will be necessary in order to demolish the structure. According to COMAR [26.02.03.03(B)(2)(d)], blasting operations associated with construction and demolition activities are exempt from noise restrictions during daytime hours (Maryland Office of the Secretary of State, 2010). Although the Montgomery County noise ordinance does not cover blasting operations, the director of the Department of Environmental Protection may waive any part of the noise ordinance if the director determines that compliance is not practical and would impose undue hardship [31B-11(b)(1)] (Montgomery County DEP, 2010). This is also relevant for noise resulting from loading concrete rubble into dump-trucks for offsite disposal.

There are no live-fire training and relatively limited helicopter operations, and no incompatible land uses at the FGA due to noise. Sources of noise are predominantly from car and truck traffic, lawn maintenance equipment, and human and bird vocalizations. Additionally, the CSX railroad along the eastern boundary and intermittent helicopter operations are infrequent sources of noise; 74 flights took place in 2009 (McClain, 2010a). Other intermittent noise at the FGA exists from the Building 503 rooftop heating, ventilation, and air conditioning (HVAC) units (USACE, 2008).

Noise from the HVAC units have a history of affecting the nearby community of Warren Court, and a noise abatement study was conducted over a 17-day period in July and August 2008 to resolve the issue. After the results were analyzed and compared to the requirements of the Montgomery County Noise Ordinance, it was determined that “the average sound levels at the Warren Court residential locations during the noise monitoring period complied with the Montgomery County regulations for residential noise areas, both during the daytime and nighttime.” Furthermore, the WRAIR equipment produced no prominent discrete tones, as specified in the Montgomery County Noise Ordinance, at the residential locations (Wyle Research and Consulting, 2008).

There are no sources of odor at the FGA, including the DORF and there have never been any community complaints linked to odor emanating from the post (McClain, 2010a).

4.12 TRANSPORTATION

4.12.1 ACCESS TO THE FOREST GLEN ANNEX

The FGA is located in the southern portion of Montgomery County, Maryland, approximately eight miles north of the center Washington, DC and 35 miles southwest of Baltimore, Maryland. the FGA can be reached via Interstate 495, also known as the Capital Beltway, and U.S. highway 29. The Capital Beltway is a 64 mile loop surrounding Washington DC providing access to I-295, U.S. highway 1, U.S. highway 15, U.S. highway 29, U.S. highway 50, U.S. highway 240, and U.S. highway 301. The Capital Beltway is located less than one mile north of the FGA, with access less than one mile away at Maryland Route 97. The FGA can also be reached via Interstate 270 which ends approximately 5 miles west of the FGA where it turns into I-495. Interstates, U.S. highways, and other roadways provide for convenient access to Washington, DC, Baltimore, and other employment centers in the region. Local access is achieved via the surrounding roadway network of county roads and state highways.

Two Access Control Points (ACP) serve the FGA. The main gate is located adjacent to the intersection of Brookville Road and Stephen Sitter Avenue which operates 24 hours a day. The second ACP is located at the intersection of Linden Lane and Stephen Sitter Avenue and is in operation from 0600 hours until 1800 hours. Stephen Sitter Avenue is a two lane road that extends between Brookville Road and Linden Lane. It connects the two distinct areas of the FGA: the Research and Development Area and the Community Center Area. Roads located in the Community Center Area include Forney Road, Holland Road, and Commissary Way. Roads located in the Research and Development Area consist of Robert Grant Avenue, Research Drive, and Road A. The average AM peak-hour volume entering the FGA is 336 vehicles and the average PM vehicle exiting the FGA is 457. These count data include all trips entering and exiting the FGA. These trips do not exceed the FGA traffic levels set by the National Capital Planning Commission (NCPC) and the Montgomery County Planning Board (MCPB) of 415 vehicles entering during AM peak hour and 506 vehicles exiting during PM peak hour. (USACE, 2008)

4.12.2 ACCESS TO THE DORF

Buildings 516 and 513 of the DORF are encircled by an exclusion fence that has a radius of about 240 ft. Access to the site is controlled through a single gated entrance. Included within the fence line are a small paved parking lot and the primary access road.

4.12.3 EXISTING TRAFFIC CONDITIONS

The FGA resides in an unincorporated region of Montgomery County, approximately two miles northwest of the urbanized unincorporated area known as Silver Spring, Maryland. Maryland Route 97 runs north and south connecting Silver Spring to I-495 and is located east of the FGA. Traffic volumes on Maryland Route 97 for northbound and southbound vehicles averaged 35,920 vehicles per day (vpd) south of I-495 and 80,840 vpd north of I-495 in CY 2009. Traffic counts on I-495 west of Maryland Route 97 were approximately 239,310 vpd for eastbound and westbound vehicles in 2009 and 232,010 vpd east of Maryland Route 97 (Maryland DOT, 2010).

The intersection of Maryland Route 97 and Seminary Road/Dale Drive received a Level of Service (LOS) of C for the AM peak period and C for the PM peak period. Maryland Route 97 and Seminary Place also operate at a LOS C for AM peak and PM peak periods. There are six LOS (A through F); LOS A represents the best operating conditions with no congestion, and LOS F is the worst with heavy congestion (USACE, 2008).

Brookville Lane, located on the southern boundary of the FGA, is a two lane road with a center turning lane and on street parking allowed on both sides of the street. The intersection of Steven Sitter Avenue and Brookville Lane operates at a LOS of A.

Linden Lane, located on the northern boundary of the FGA is a two lane road with a left turn lane for west bound traffic turning in to the FGA. On street parking can be found on Linden Lane west of the Linden Lane/Steven Sitter Avenue intersection. The Linden Lane and Steven Sitter Avenue intersection operates at a LOS A, which represent the best operating conditions with no congestion (USACE, 2008).

Seminary Road and Linden Lane/Forest Glen Road intersection operate at a LOS C for AM peak period and at a LOS A for PM peak period. The following intersections within the vicinity of

the FGA operate at a LOS A for AM peak period and at a LOS A for PM peak period: Brookville Road and Linden Lane, Linden Lane/Seminary Road and Second Avenue, Lyttonsville Place and Lyttonsville Road/Michigan Avenue, East-West Highway and Grubb Road, and Seminary Road and Linden Lane/Forest Glen Road (USACE, 2008).

The Montgomery County Department of Transportation (MCDOT) has announced a new Capital Improvement Program; "Rural and Residential Road Rehabilitation." The purpose of this program is to rehabilitate streets, curbs and sidewalks. This project began in August 2010 and is scheduled to be completed by summer/fall 2011. The scope of this project is the Forest Glen neighborhood which is located approximately one mile northeast of the FGA just north of the Capital Beltway. Roads included in this project are: Julep Avenue, Inwood Avenue, Woodman Avenue, Imperial Drive, Forest Grove Drive, Medical Park Drive, Woodland Drive, Alcan Drive, August Drive, Dublin Drive, Cody Drive, Brisbane Street, Brisbane Court, Belvedere Boulevard, Everest Street, Tilton Drive, Sanford Drive, Dameron Drive, Sherwood Drive, Myrtle Road, and Saxony Road (MCDOT Division of Highway Services, 2010).

4.12.4 PUBLIC TRANSPORTATION

Public Transportation at the FGA includes regional railroad services operated by the Maryland Department of Transportation; the regional Metrorail system operated by the Washington Metropolitan Area Transit Authority (WMATA); and fixed-route/fixed schedule bus service operated by the Maryland Transit Administration, WMATA, and the Montgomery County government (USACE, 2008).

4.12.5 AVIATION

The Baltimore/Washington International Thurgood Marshal Airport, Dulles International Airport, and Reagan National Airport provide commercial airline service and are located approximately 23 miles to the northeast, 22 miles to the west, and 11 miles to the south, respectively, from the FGA. International and domestic routes are served via major air carriers from these airports. Additionally, military air service is available at Andrews Air Force Base, Tipton Army Airfield, Fort Meade, Maryland and at Davison Army Airfield, Fort Belvoir, Virginia (USACE, 2008).

4.13 ENERGY RESOURCES

4.13.1 ELECTRICITY

Electricity is supplied to the FGA from the PEPCO and the HESS Corporation (McClain, 2010b). PEPCO supplies the FGA with electricity by way of three 13.2 kV, three-phase overhead circuits that traverse the FGA from north to south. According to the 2003 Master Plan update, the distribution network and electric supply equipment are in good condition (USACE, 2008). During FY 2009, electric consumption for the FGA totaled 47,670,302 kwh (McClain, 2010b). The distribution system at the FGA is owned by the post and government-owned emergency generating equipment is available for essential operation during a power failure (USACE, 2008). The DORF consumes negligible amounts of electricity.

4.13.2 NATURAL GAS

The FGA obtains its natural gas from Washington Gas, which also owns the gas distribution system at the post. All buildings at the FGA are individually metered for natural gas consumption. As of August 2008, the natural gas distribution system and capacity appeared to be adequate to support the needs of the population of the FGA at that time (USACE, 2008). During FY 2009, natural gas consumption for the FGA totaled 3,040,565 therms (McClain, 2010b). The DORF does not directly consume natural gas.

4.13.3 STEAM

Steam is generated on the post by way of the boilers in Buildings 163, 169, 178, 503, and 511. Processes and activities that consume steam on the FGA include space heating, domestic hot water heating, cage washing, humidification, and sterilization (McClain, 2010a). The DORF does not consume steam.

4.14 POLLUTION PREVENTION AND WASTE MANAGEMENT

4.14.1 WASTEWATER

The Rock Creek sewer interceptor of WSSC collects the sanitary sewage that is generated at the FGA. This interceptor, in turn, connects to Washington, DC's sewage system which ultimately flows to the Blue Plains WWTP. The Blue Plains WWTP provides primary, secondary, and tertiary treatment of wastewater (USACE, 2008). The FGA generated a total of 110,590,400 gallons of wastewater in FY 2009; therefore, approximately 303,000 gallons of wastewater was generated on the post daily (McClain, 2010b). The DORF generates minimal wastewater.

On the FGA, a force main pump-over into the southern sanitary sewer trunk main system is currently utilized by the sanitary sewer system for the Community Center complex. A pump system is also located at Building 156. The southern portion of the FGA contains six and nine-inch lateral lines that discharge into the nine-inch WSSC main that traverses the southern portion of the post and eventually connects to a ten-inch WSSC main (USACE, 2008).

An active sewer line passes between Buildings 516 and 513 and was used to dispose of sanitary wastewater generated in Building 516 as well as reactor "hold up" pool waters when research operations were still on-going. The pool water was discharged to this sewer via a tie-in discharge pipe at the location of the former USTs, approximately 200 ft west of the reactor building. The sewer line not only serviced Building 516, but also managed wastewater from other up-gradient portions of the FGA. It is anticipated that the use of this otherwise viable wastewater transport system by other facilities within the FGA will continue (USACE, 2010a).

4.14.2 INDUSTRIAL DISCHARGE

In accordance with Section 402 of the CWA, the FGA has a NPDES General Discharge Permit (permit number 02-SW) for stormwater associated with all industrial activities that take place at the FGA. The permit was issued effective 1 December 2002 and expired 30 November 2007; however, the permit remains active until MDE initiates the renewal process (USACE, 2008; McClain, 2010a). Furthermore, the FGA maintains a stormwater pollution prevention plan in order to mitigate potential contaminants in stormwater runoff (McClain, 2010a).

The FGA is also permitted to allow for the limited discharge of chlorinated potable water to the ground surface with the "General Permit (permit number 06HT9460) for Discharges from Tanks, Pipes, and other Liquid Containment Structures at Facilities other than Oil Terminals." The Permit was issued effective 15 October 2008 and expired 16 February 2011 (USACE, 2008; McClain, 2010a). The permit will remain active until the renewal process is completed.

4.14.3 MUNICIPAL SOLID WASTE AND RECYCLING

The FGA maintains an Integrated Solid Waste Management Plan (ISWMP) that outlines the FGA's solid waste management policies. Solid waste that is non-hazardous and not regulated medical waste is managed in accordance with the ISWMP and all Federal, local, state, and Army regulations. The FGA does not possess a solid waste permit; therefore, solid waste generated at the FGA is collected by a private contractor for off-post disposal in local landfill sites or incinerators. Municipal solid waste (MSW) is collected by a contractor and hauled off-post to the Montgomery County landfill in Laytonsville, Maryland. In FY 2010, approximately 1721 tons of MSW was generated at the FGA (Adkins, 2011).

Pollution prevention (P2) and recycling programs at the FGA are maintained by Fort Detrick in accordance with 40 CFR 246, AR 200-1, and AR 420-429. P2 and recycling efforts are constantly increasing on the post and the aim of the programs is to decrease the volume of solid waste generated by the activities and tenants at the FGA. The P2 and recycling programs consist of chemical substitution and the diversion of certain recyclable materials from the solid waste stream. White and colored office paper, newspaper, aluminum, cardboard, plastic and glass, construction and demolition waste are examples of materials that are recycled on the post (USACE, 2008). In FY 2010, approximately 271 tons of waste were recycled at the FGA. Additionally, the recycle diversion rate was nearly 16 percent (Adkins, 2011).

4.14.4 HAZARDOUS AND TOXIC SUBSTANCES

Hazardous material and hazardous waste management activities at the FGA are governed by specific environmental statutes and regulations. Those substances defined as hazardous by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the RCRA, or the Toxic Substances Control Act (TSCA), are termed as hazardous waste, hazardous materials, and toxic substances for the purpose of this analysis. Substantial danger to public health or welfare or the environment may result when these substances are released into the environment due to their quantity, concentration, or physical, chemical, or toxic characteristics. The use and storage of regulated and non-regulated hazardous materials are required by numerous laboratory activities and maintenance activities at the FGA, such as vehicle operation and maintenance and grounds maintenance. Examples of hazardous wastes generated at the FGA include radiological materials, solvents, paints, strong acids and bases, preservatives, heavy metals, sharps, and other materials associated with laboratory operations and building maintenance (USACE, 2008).

The FGA maintains a Hazardous Waste Management Plan and a Spill Prevention, Control, and Countermeasures Plan to address the storage and disposal of hazardous wastes on the post. The hazardous waste program on the FGA is overseen by and is the responsibility of the Garrison Commander and the Fort Detrick EMO (USACE, 2008). The Installation Spill Contingency Plan (ISCP) is in the process of being developed and will detail the regulatory notification and reporting procedures for all spill events.

The hazardous substances and hazardous materials or related issues evaluated in this EA include the following: petroleum constituents, ACMs, LBP, and polychlorinated biphenyls (PCBs). Fort Detrick has an active environmental program that maintains compliance specific to each of these hazardous substances and hazardous materials at the FGA. A summary of the regulatory requirements and the specifics of each program are discussed below (USACE, 2008).

4.14.4.1 Petroleum Constituents

Accidental discharges of petroleum, oils, and lubricants as well as hazardous materials and hazardous wastes are contained and cleaned up according to the Fort Detrick spill prevention, control, and counter measures (SPCC) and also in the future by the ISCP, which establishes responsibilities, duties, procedures, and resources in order to do so. It is the responsibility of the Fort Detrick EMO to coordinate and implement the SPCC and also in the future by the ISCP. The Fort Detrick Fire Department at the FGA is designated as the first responder to spill incidents.

The ISCP will be followed by the FGA for the handling of any spills or chemical emergencies on-post. The Fort Detrick Fire Department at the FGA responds to any reported spill, evaluates the situation, and when appropriate, calls the Montgomery County Hazardous Materials (HAZMAT) Team of Montgomery County Division of Emergency Management, Fire and Rescue Services. The HAZMAT Team then advises the FGA on how to correct the problem. Montgomery County personnel make required notifications after they take control of the spill scene (USACE, 2008).

The FGA contains a total of eight USTs and 16 aboveground storage tanks (McClain, 2010a). All USTs at the FGA have automatic tank gauging (ATG) systems to monitor petroleum product levels and notify the users if a release occurs. In accordance with Federal, state, and Army regulations, all USTs at the FGA undergo periodic leak detection testing. Releases do not go undetected due to a combination of the ATGs and leak detection testing along with inspections before and after the delivery of petroleum products (USACE, 2008).

4.14.4.2 Asbestos-Containing Materials (ACMs)

Federal laws were passed in the 1980s as a response to the dangers posed by materials containing asbestos. The Asbestos Hazard Emergency Reauthorization Act (AHERA) of 1987 set forth qualifications for inspection and analysis, analytical requirements, and acceptable response actions. AHERA was among the first Federal laws regarding asbestos which addressed the asbestos in public school facilities (USACE, 2008).

The USEPA, in accordance with Section 112 of the CAA of 1970 which established the National Emissions Standards for Hazardous Air Pollutants, regulates the emissions of asbestos fiber into the ambient air. The demolition or rehabilitation of buildings with ACM is regulated by these clean air standards, along with TSCA regulations concerning asbestos abatement (USACE, 2008). The FGA adheres to both the national emission standards for asbestos (40 CFR 61, Subpart M) and the State of Maryland's asbestos regulations (COMAR 26.11.21) (USEPA, 2010e; MDE, 2010c).

Abatement and disposal activities at the FGA are conducted by licensed asbestos abatement contractors. Furthermore, the FGA currently maintains an ACM management program and

conducts periodic surveys for the presence of ACM hazards. The post manages the material in place as long as there is no imminent health hazard or disturbance of the material planned. According to DoD policy, ACM is to be conveyed "as is" unless it poses a threat to human health at the time of transfer. In cases where the ACM poses a threat to human health at the time of transfer, the Army is responsible for removing, sealing, or otherwise rendering the ACM safe. Exceptions to this are if an agreement is reached that the transferee will take responsibility for such action or if the structure is to be demolished or renovated in compliance with applicable regulations. At the time of transfer, the transferee would be provided with information about the presence and condition of ACM (USACE, 2008).

4.14.4.3 Lead-Based Paint

Any hazards associated with LBP may be required to be abated by the Federal government for structures constructed before 1978. Although Fort Detrick has not conducted an Installation-wide survey at the FGA to identify the location of all LBP, the interior and exterior structural materials of buildings on the post may have been coated and protected by LBP. In accordance with AR 420-70, Fort Detrick's policy is to assume that buildings constructed prior to 1978 contain LBP and that it should be managed appropriately (USACE, 2008). Because buildings can disturb and potentially release LBP as dust or debris during demolition operations, adherence to the appropriate Federal and state regulations to protect human health and the environment are required (USACE, 2008). The OSHA Lead Standard regulates removal or encapsulation of lead and LCMs where workers may be exposed during demolition of structures containing such materials. LCMs will be packaged and disposed of in accordance with OSHA (29 CFR 1926) and state (COMAR Title 26) regulations (USAG, 2000; MDE, 2010d).

4.14.4.4 PCBs

The FGA implemented a total PCB transformer removal program. All out-of-service transformers were drained at a service site and the acquired fluid was disposed of by a licensed hazardous waste disposal contractor. Transformers and light ballasts have historically been the main sources of PCBs at the FGA and in the past. In 1995, all PCB-containing materials (including transformers) were removed from the FGA, except for PCB-containing fluorescent light ballasts, which are replaced with non-PCB containing ballasts when necessary. Disposal of the PCB-containing fluorescent light ballasts is carried out in accordance with all applicable Federal and state regulations (USACE, 2008). Unless documentation indicates otherwise, all oils associated with electrical devices (light ballasts, transformers, and capacitors) at the FGA should be considered to be contaminated with PCBs (USACE, 2008).

4.14.5 MEDICAL WASTE

Healthcare and medical research functions at the FGA generate medical waste, which may contain blood, plasma, pathological wastes, and other derivatives whether dried, dripping, or free flowing. Medical waste generated at the FGA is managed in accordance with all applicable Federal, state, Army Medical Command, and Army regulations. The HQ MEDCOM manages a contract with a licensed contractor that collects medical waste from the FGA generation points and transports it to an approved disposal facility. WRAIR is the primary generator of medical waste at the FGA (USACE, 2008). Radioactive materials/regulated medical waste has not been stored at the DORF since May 2009. In FY 2009, approximately 38 tons of medical solid waste was generated at the FGA (McClain, 2010a).

4.14.6 HAZARDOUS WASTE

The FGA generates hazardous wastes as a result of the utilization of hazardous materials for health care activities, medical research programs, and facilities/public works personnel taking place at the post. The Fort Detrick EMO manages both the hazardous materials management program and the hazardous waste management program at the FGA. Fort Detrick's HAZCOM program covers the storage and use issues, such as chemical compatibility in storage and handling, of hazardous materials. HAZCOM is overseen by the Fort Detrick Installation Safety Office and the individual tenant's Safety Officer.

Hazardous materials typically utilized at the FGA include: solvents, paints, strong acids and bases, preservatives, heavy metals, and other materials associated with laboratory research and building maintenance. In addition to carrying out the use, storage, and disposal of hazardous materials and hazardous waste in accordance with Federal, state, local, and Army regulations, the Fort Detrick HMMP and the Fort Detrick HWMP are also followed.

Hazardous waste, as defined in 40 CFR 261, may result from material on the FGA that is no longer needed for its intended purpose. The FGA adheres to hazardous waste accumulation rules set forth in COMAR 26.13.05.E(3), which allows for SAAs (USACE, 2008). There are 126 SAAs located on the FGA as well as one "less-than-90-day storage" area, also called a hazardous waste storage bunker (McClain, 2010a). The DRMO arranges for the transport and proper disposal of hazardous waste stored in the bunker for less than 90 days. The FGA is not a permitted "Treatment, Storage and Disposal Facility" and does not maintain a RCRA permit for hazardous waste (USACE, 2008).

4.14.7 RADIOACTIVE MATERIALS

Healthcare and medical research activities at the FGA utilize radioactive materials. The use, storage, and disposal of radioactive substances on the post are subject to conditions in WRAMC's license with the USNRC. The only generator of radioactive waste at the FGA is WRAIR. Radioactive waste stored at the FGA was disposed of in accordance with all applicable regulations and USNRC license requirements (USACE, 2008). Radioactive waste was formerly stored in Building 516 but was discontinued in May 2009; however, it is now stored in Building 503, the hazardous waste bunker (McClain, 2010a) (see Section 2.4.4 for details on radioactive material in the DORF).

4.15 ENVIRONMENTAL CONCERNS AND RESTORATION ON THE FGA

4.15.1 Waste Disposal Sites

The U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) preliminary assessments (PAs) dated 1990 and 2000 identified several waste disposal sites (USAG, 2010c). They are described below:

4.15.1.1 Ballfields/Helipad/Rubble Dump Site (FTGL-02)

The athletic fields in the western portion of the property are located on top of a former landfill (USACE, 2008). Construction debris, medical waste, incinerator ash, household and office waste were disposed of in the area of ballfields between 1942 and 1966. According to anecdotal

information, medical testing was done on large animals which were then buried in lead caskets in the landfill (USAG, 2010c). Iron precipitation is impacting streams located down-gradient from the ballfields and metal debris can be seen in the ground near the discharge points (USAG, 2010c).

No significant levels of radiological isotopes were detected in the soil or groundwater during a site investigation in 2004. However, the investigation indicated that several low level organic and metal analytes were detected in shallow groundwater above MDE remediation standards (USACE, 2008). An investigation completed between 2008 and 2009 of the rubble dump adjacent to the ball fields indicated that buried waste extended beyond the ball field site. Additional site delineation work will be needed to determine the nature and extent of landfill and its impacts (USAG, 2010c).

A contract was awarded in FY 2009 and fully funded in FY 2010 to complete the Remedial Investigation (RI) data collection effort and complete a data report. Activities include preparing a data report - delineate extent of the landfill, groundwater evaluation, and surface soil sample collection. The final data report is expected in July 2012. A RI and feasibility study (FS) is anticipated to be completed in FY 2012-2013. The results will be used to prepare a proposed plan (PP) and decision document (DD) to select the appropriate remedy. Remedy construction is anticipated to be implemented in FY 2014-2015. Potential remedies include capping, land use controls (LUCs) and long-term management (LTM) (Gortva, 2011).

4.15.1.2 Commissary Landfill (FTGL-03)

Another landfill site, identified by the USACHPPM PAs, is located in the area of the FGA commissary. Construction debris, medical waste, incinerator ash, and household and office waste was disposed of in the area of the commissary between 1942 and 1966. High levels of tetrachloroethylene concentrations (approximately 17 ppm) were found in a monitoring well located adjacent to this landfill. The USACHPPM site investigation indicated that groundwater is migrating from off-site. The MDE is conducting its own investigation of a potential off-site source because topography and groundwater contours are inconclusive; there is some uncertainty with the conclusion of the USACHPPM site investigation (USAG, 2010c).

A subsurface investigation for the design of the foundation of a new museum building indicated that fill material, consisting of mainly demolition materials such as brick, was found at depths to 21 ft (USAG, 2010c).

A contract was awarded in FY 2009 and fully funded in FY 2010 to complete the RI data collection effort and complete a data report. Activities include preparing a data report - delineate extent of the landfill, groundwater evaluation, and surface soil sample collection. The final data report is expected in July 2012. A RI and FS is anticipated to be completed in FY 2012-2013. The results will be used to prepare a PP and DD to select the appropriate remedy. Remedy construction is anticipated to be implemented in FY 2014-2015. Potential remedies include limited capping, LUCs and LTM (Gortva, 2011).

4.15.1.3 Building 511 Landfill (FTGL-04)

In 2001, the USACHPPM site inspection report identified a disposal site in the area of Building 503 and Building 511. Medical waste disposal on this site may have occurred between 1942

and 1966. Medical wastes were discovered during excavation for a parking lot southwest of Building 511. Approximately 1700 truckloads of waste were removed and transported to the landfill at Fort Meade during the construction of Building 503, which is located immediately north of Building 511. Some waste material was left on-site as it was determined that removal was unnecessary for the foundation construction (USAG, 2010c)

A contract was awarded in FY 2009 and fully funded in FY 2010 to complete the RI data collection effort and complete a data report. Activities include preparing a data report - delineate extent of the landfill, groundwater evaluation, and surface soil sample collection. The final data report is expected in July 2012. A RI and FS is anticipated to be completed in FY 2012-2013. The results will be used to prepare a PP and DD to select the appropriate remedy. Remedy construction is anticipated to be implemented in FY 2014-2015. Potential remedies include limited capping, LUCs and LTM (Gortva, 2011).

4.15.2 Building 500 (FTGL-01)

In May 1988, a thin film of oil in the groundwater was discovered during excavation 25 ft west of the north corner of Building 512. According to WRAMC staff notes from September 1988, a 50,000-gallon UST located near Building 500 failed a tightness test in June 1988. As a result, ten monitoring wells were installed in June 1989. Groundwater contamination was found to be minimal. Additionally, a 12,000 gallon UST located in the vicinity of Building 500 was removed in December 1992. Approximately 5,000 gallons of free product was pumped from the excavation and ten monitoring wells were installed in December 1992 and February 1993. Furthermore, two 50,000 USTs located near Building 500 were later removed in January 1993 and a bailing program was initiated in November 1993, and a pump and treat system was installed in March 1994. Two of the monitoring wells were converted to recovery wells in 1999 and in 2001 two more monitoring wells were installed across the street from the site to determine whether the fuel oil was migrating. One of the monitoring wells contained at least six inches of free product. Based on the Groundwater Extraction and Treatment Effectiveness Review the active pumping system was shut off in April 2002 because only limited quantities could be recovered from the saprolite. In order to further delineate the plume, three monitoring wells were installed (USAG, 2010c). Four wells are currently collecting free product by way of suspended absorbent material (McClain, 2010a). Additionally, the six wells that have regularly contained significant free product have utilized a detergent assisted vacuum Enhanced Fluid Recovery system (USAG, 2010c).

A contract was awarded in FY 2009 to complete the RI data collection effort and complete a data report. Planned activities include the installation of new monitoring wells, additional soil and groundwater sampling data and completion of a CAP per the MDE Oil Control Program requirements. It is anticipated that the CAP will recommend continuation of the current recovery approach including: passive free-product removal and waste handling, monitoring well gauging, groundwater sampling, enhanced fluid recovery, and LUCs (Gortva, 2011).

4.15.3 PCB Contamination North of Linden Lane (FTGL-06)

PCB contamination was detected on active Army and formerly owned Army property which includes the National Park Seminary. The National Park Seminary consists of 32 acres of land located north of Linden Lane. The Walter Reed Army Medical Annex occupied the land from the 1940s until recent times, when it was “excessed” to Montgomery County, Maryland. The land

was then sold to a private developer, National Park Seminary Venture, LLC, which is currently redeveloping the property for residential use (USAG, 2010c).

The MDE performed a brownfields site-specific assessment of the property in 2005. The assessment included sampling surface soil, subsurface soil, sediment and the stream. The presence of 1,2,4-trichlorobenzene at an estimated concentration of 15,000 ppm was determined in one subsurface soil sample that was collected north of Building 138. Confirmation of the presence of trichlorobenzene was determined during a follow-up sampling performed during a voluntary cleanup program study on the property. Additionally, the study revealed the presence of PCBs in the soil at each of the seven direct-push borings north of Building 138. PCBs were detected at depths extending to 12 ft below ground and at concentrations ranging up to 7,090 ppm (USAG, 2010c).

An intensive sampling program was performed to delineate the extent of contamination described above. Soil, groundwater, and stream sediments were sampled during the investigation. A report filed on 21 September 2006, “Notification of Intent to Perform Self-Implemented On-Site Clean-up and Disposal of PCB Remediation Waste,” described the soil sampling results to the USEPA Region III. Contaminated soils were removed and disposed off-site during 2006 and 2007 as a result of the 1.1 million dollar Environmental Services Cooperative Agreement, which was signed in 2006. Five out of six sediment samples taken in 2006 contained PCBs at concentrations ranging from 0.721 to 19.2 ppm. Furthermore, PCBs were discovered in down-gradient stream sediments above the regulatory limit of one ppm and potentially extend beyond the National Park Seminary property and onto Montgomery County property (USAG, 2010c).

Additional PCB contamination was discovered on the active Army land parcel north of Linden Lane near the salt dome in 2009. The National Park Seminary site was a formerly used defense site, but is being transferred back to the Forest Glen Installation Restoration Program. The extent of the PCB contamination is not known and additional characterization is needed for the entire site, active and former Army property, to determine the extent of contamination and source(s) (USAG, 2010c).

A contract was awarded in FY 2009 to complete the data collection effort and complete a data report. Soil, groundwater and sediment sampling will be conducted to determine the extent, distribution, and if potential additional sources of PCB contamination exist. This information will be used to develop a corrective measures study in FY 2013 and implement the appropriate remedy in FY 2014 (Gortva, 2011).

4.15.4 Building 607 Washdown Rack (FTGL-05)

The washrack is located in Building 607 in the cantonment area. From 1975 until 1979, it discharged directly to the stormwater sewer, which then discharged into the stream near the fabric care facility. In 1979, an oil water separator was connected to the washdown rack (USAG, 2010c).

In 2001, the USACHPPM conducted a preliminary site inspection. Stream sediment samples were analyzed for total metals, diesel range total petroleum hydrocarbons, PCBs, and semi-volatile organic compounds. One sediment sample in the stream below Building 600 contained lead concentrations elevated above background concentrations and above the action level of

400 milligrams per kilogram. Although the source of the lead is unknown, it was determined that it may be related to runoff from the motor pool. In order to accurately characterize the nature and extent of the contamination in the steam sediment, additional testing is required (USAG, 2010c).

A contract was awarded in FY 2009 and fully funded in FY 2010 to complete the RI data collection effort and complete a data report. Activities include preparing a data report - surface water and sediment sample collection. The final data report is expected in July 2012. A RI and FS is anticipated to be completed in FY 2012-2013. The results will be used to prepare a PP and DD to select the appropriate remedy. It is anticipated that the site may be closed out with no further action (Gortva, 2011).

5.0 ENVIRONMENTAL CONSEQUENCES

5.1 INTRODUCTION

This section will identify and analyze potential environmental impacts that may result from implementation of each of the Action Alternatives (Decommissioning of the DORF at the FGA of Fort Detrick in Silver Spring, Maryland) or the No Action Alternative. Such an analysis entails detailing the potential impacts associated with the implementation of each alternative that are reasonably foreseeable, but may not necessarily occur. The term “consequence” refers to the results of an event or events without consideration of probability. Where possible and appropriate, potential events will be characterized both in terms of their potential consequence and the probability that they will occur. Consequences of each of alternatives on the public, on the workforce, and the environment will be considered. Direct, indirect, and cumulative effects also will be considered.

Section 5.2 discusses potential impacts to the affected environment associated with the implementation of any alternative and the mitigation measures that would be applied. Section 5.3 presents a comparison of these potential environmental impacts to the potential environmental impacts of any alternative.

5.2 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

5.2.1 Land Use

Implementation of Alternative I or II would have no impacts to land use. Implementation of Alternative III, IV, and V would have a positive impact on land use or would have no impact to land use depending upon the outcome of the action. Positive impacts to land use would occur if the remediation of OU 1 of Building 516 removes or encases the radiological waste and the ARO terminates Permit No. DORF-1-97 upon review and approval of the final status surveys, the adherence to site-specific DCGLs, as well as the implementation of a decommissioning plan and report. This would constitute a positive impact on land use by removing the constraints placed upon the DORF by Permit No. DORF-1-97. No impact to land use would occur if the ARO does not terminate Permit No. DORF-1-97. Implementation of Alternative V would have a positive impact on land use. The demolition of Buildings 513 and 516 would result in the removal of residual radioactivity from the DORF and leaving the land unrestricted and available for future mission-enhancing projects.

5.2.2 Climate

Implementation of Alternative I, II, III, IV, or V would not impact the local climate. Potential impacts to air quality are discussed in Section 5.2.8.

5.2.3 Geology

Implementation of Alternative I, II, III, or IV would result in no impacts to geology. Implementation of Alternative V is unlikely to significantly impact the geology of the FGA site. Potential negative impacts to local geology could result during demolition and excavation activities related to Alternative V. Grading could change the slope of the land and therefore have a negative impact on stormwater drainage and erosion. However, BMPs for site excavation,

erosion control, and stormwater management would be utilized to mitigate the potential risks related to the demolition and excavation of the DORF. Since the FGA is located in an area of negligible seismicity, there is a negligible potential for the excavation of the DORF to cause earthquake activity.

5.2.4 Soils

Implementation of Alternative I or II would not result in impacts to soil resources. The impact on soil resources resulting from the remediation and disposal and transportation of wastes related to Alternative III, IV or V would be temporary and minor. In accordance with the *Maryland Standards and Specifications for Soil Erosion and Sediment Control*, application of all relevant BMPs for erosion control and stormwater management would minimize erosion and escape of fugitive dust during decommissioning activities due to wind or stormwater runoff, as noted in Section 2.2.2. Alternative IV and V involve the handling of hazardous and radiological materials that, although unlikely, could potentially impact soil resources. Contamination provisions would be applied to all decommissioning activities involving the handling of hazardous materials and activated concrete to mitigate the potential contamination of surrounding soil resources. Further information regarding waste management is found in Section 2.2.7.

5.2.5 Water Resources

5.2.5.1 Surface Water

There are no surface waters on the DORF site. Implementation of Alternative I or II would result in no impacts to nearby surface water. Implementation of Alternative III, IV, or V is unlikely to significantly impact surface water resources on the FGA. Temporary minor impacts to surface water could result during remediation and decommissioning activities related to Alternative III, IV, or V. The additional vehicles involved with the remediation of the DORF could result in operational spills of oil or fuel as well as other remediation related water contaminants that could potentially discharge to surface waters. Remediation contractors would enact cleanup and recovery plans regarding spills and adhere to BMPs during the remediation stage of Alternative III, IV, or V to mitigate potential impacts to surface water.

Implementation of Alternative IV or V would involve removing activated concrete. To prevent the release of fugitive dust, a water mist may be applied to areas in which dust is produced. Wastewater from this action could contain activated concrete debris that could potentially be released to nearby surface water. However, BMPs related to the screening and proper disposal of this water would be utilized to mitigate this potential risk. An alternative or in addition to using a water mist is a ventilation system to capture fugitive dust.

Potential negative impacts to surface water could also result during demolition activity regarding Alternatives IV and V if excessive runoff results in erosion from the site and sedimentation in nearby creeks, and subsequently to Rock Creek. Adherence to BMPs during the demolition phase would mitigate this potential impact. Relative BMPs include a sedimentation and erosion control plan and a stormwater management plan.

Alternative IV and V would involve the handling of hazardous and radiological materials that, although unlikely, could potentially impact surface water resources. Adherence to BMPs during the waste removal phase would mitigate these potential impacts. Additionally, contamination provisions would be applied to all decommissioning activities involving the handling of

hazardous and radiological materials to mitigate the potential risks to nearby surface water resources. Further information regarding waste management is found in Section 2.2.7.

5.2.5.2 Groundwater

Implementation of Alternative I or II would result in no impacts to groundwater. Potential temporary minor impacts to groundwater could result during remediation and decommissioning activities related to Alternatives III, IV, and V. Vehicles involved with the remediation of the DORF could result in operational spills of oil or fuel as well as other remediation related water contaminants that, although unlikely, could potentially be transported into the groundwater system. Remediation contractors would implement cleanup and recovery plans regarding spills and adhere to BMPs to mitigate potential impacts to groundwater.

Groundwater contamination directly related to removal of radioactive material is highly unlikely for the following reasons: (1) the primary contaminants (activation products) are fixed within a concrete matrix; (2) residual removable contamination is present in concentrations that are too low to be of any radiological impact; (3) decommissioning activities would include provisions for contamination control; (4) groundwater is estimated to be 19-50 ft below the ground surface at the DORF (Gortva, 2011).

Implementation of Alternative III, IV, or V would have potential negligible impacts on groundwater resources, mitigated by compliance with groundwater protection requirements mandated under RCRA (40 CFR 261-270), CERCLA (40 CFR 300-399), and SDWA (42 USC § 300(f) et seq. and 40 CFR 144). The SDWA requires state agencies to identify and protect critical aquifer areas.

5.2.5.3 Stormwater

Implementation of Alternative I or II would result in no impacts to stormwater. The potential stormwater impacts of the implementation of Alternative III, IV, or V would be minor and mitigable. Activities would not result in an increase in impervious surface area. Alternative V would decrease the amount of impervious surface area. BMPs as well as stormwater management practices and control measures would also be implemented to mitigate potential adverse impacts resulting from remediation and decommissioning activities associated with each Action Alternative. See Sections 5.2.4 and 5.2.5.1 for erosion and sediment control impacts.

5.2.5.4 Drinking Water Supplies

Implementation of any of the Action Alternatives or the No Action Alternative would not have an impact on drinking water supplies.

5.2.6 Wetlands and Floodplains

Federal activities within floodplains and wetlands are restricted under EO 11988, 33 CFR 1977, and EO 11990. Currently, the FGA uses the WRAMC Integrated Natural Resource Management Plan (INRMP) as a guide for the management and protection of wetlands at the FGA to be in accordance with Federal laws and regulations (USACE, 1999). An INRMP for the FGA is being completed concurrent with this EA (McClain, 2010a). The nearest wetland to the DORF is

identified as Wetland 1, according to the USACE's *Wetland Delineation Report, Fort Detrick, Forest Glen Annex, Silver Spring, Montgomery County, Maryland* (USACE, 2009). Wetland 1 is located approximately 200 ft from the DORF (USACE, 2009).

Implementation of Alternative I or II would result in no impacts to wetlands and floodplains. Remediation and decommissioning activities related to Alternative III, IV, or V would not take place within identified wetland or floodplain areas. There are potential negligible impacts to wetlands due to the proximity of Wetland 1. Adherence to BMPs, compliance with sedimentation and erosion control plans, and compliance with stormwater management plans would protect adjacent wetland and floodplain areas from potential negligible impacts related to Alternative III, IV, or V.

5.2.7 Plant and Animal Ecology

Implementation of Alternative I or II would result in no impacts to plant and animal ecology. Local plant and animal ecology in the immediate area of the DORF could be negatively impacted during the implementation of Alternative III, IV, or V through the destruction of habitat from fugitive dust, erosion control, and noise. The area surrounding the DORF consists of both developed and forested areas resulting in minor disturbance to plant and animal ecology from remediation and decommissioning activities. Although the area is not frequented by special status species, the implementation of Alternative III, IV, or V would discourage some species, particularly birds and deer, from the area through habitat disturbance. Utilization of BMPs relevant to fugitive dust, erosion control, and noise would mitigate negative impacts to the local plant and animal ecology during the implementation of Alternative III, IV, or V. The three rare plant species possible located within the FGA would remain undisturbed since remediation and decommissioning activities would not occur in areas in which they were last observed. Implementation of Alternative V would have positive impacts due to COMAR forestation requirements and creation of an open habitat.

5.2.8 Air Quality

Implementation of Alternative I or II would result in no impacts to air quality. Potential impacts to the air quality of the Silver Spring area resulting from implementation of Alternative III, IV, or V would be temporary and negligible due to fugitive dust emissions from demolition vehicle emissions, and by vehicular emissions from commuting activities of the workforce.

Potential negligible impacts on the air quality in the immediate vicinity of the site would result from demolition activities at the DORF from Alternative IV or V. All demolition activities at the DORF would be conducted in accordance with all applicable Federal, state, and local regulatory requirements. All air emissions from the focused remediation and release of the DORF would be within permit restrictions set forth by MDE, which are designed to be protective of human health (see Section 5.2.15 for human health impacts).

5.2.9 Historical and Cultural Resources

The NHPA of 1966, as amended (16 USC 470), mandates national policy for protection and restoration of significant historic, architectural, archeological, and cultural resources. The 1980 amendments to the NHPA provide for historic preservation costs to be included in project planning and budgeting. The SHPO has primary responsibility for ensuring adherence to the

NHPA. In accordance with 32 CFR 652 and AR 200-1, the FGA maintains an ICRMP that serves as a guide for compliance with the NEPA of 1966 and other applicable Federal Laws and regulations (USAG, 2010a). Under Section 106 of the NHPA, historic properties include buildings that are eligible for listing in the NRHP. Building 516 and the Ireland Trail are NRHP eligible, as detailed in Section 4.9.

Implementation of Alternative I or II would have no impacts to historical and cultural resources. Implementation of Alternative III, IV, or V would have adverse impacts to Building 516 of the DORF by changing the historical character of the structure. Consultation with SHPO for Building 516 has been initiated. In order to complete the Section 106 consultation, USAG would need to prepare a MOA. Impacts would be mitigated by following SHPO recommendations.

The Ireland Trail is located approximately 800 ft north of Building 516. Implementation of Alternative III, IV, or V may cause an increase in fugitive dust and vehicular air emissions which could cause damage to significant historical structures nearby. Utilization of BMPs relevant to fugitive dust, erosion, and noise (e.g., fugitive dust control, tree barriers) must be in effect to mitigate any adverse impacts to historical resources. Consultation with SHPO is occurring concurrently with this EA. Impacts would be mitigated by following SHPO recommendations.

5.2.10 Socioeconomic Environment

Implementation of Alternative I or II would result in no impacts to socioeconomic environment. Minor positive impacts would occur as a result of implementation of Alternative III, IV, or V. Local vendors and contractors would benefit from the work. Minority and/or low-income communities could be economically impacted if they are excluded from the economic benefits arising from the activities. All vendors and contractors participating in the implementation of an Action Alternative would be required to adhere to Equal Employment Opportunity and Affirmative Action considerations as identified in 29 CFR 1608.1. Implementation of the Alternative V would result in an overall positive impact on the FGA and the local community by the demolishing of a vacant building and removal of radiological building material from the site. The removal of a vacant building would have a positive impact on the FGA by creating open space and a potential future building site.

5.2.11 Noise and Lighting

The State of Maryland (COMAR 26.02.03.02 and 26.02.03.03) and Montgomery County (County Code: Chapter 31B) have established environmental noise standards that set maximum allowable noise levels for receivers located in industrial, commercial, and residential districts. As discussed in Section 4.11, noise impacts associated with blasting operations are exempt from noise restrictions during daytime hours according to COMAR [26.02.03.03(B)(2)(d)] (Maryland Office of the Secretary of State, 2010). Additionally, although the Montgomery County noise ordinance does not cover blasting operations, the Director of the DEP may waive any part of the noise ordinance if the Director determines that compliance is not practical and would impose undue hardship [31B-11(b)(1)] (Montgomery County DEP, 2010).

Implementation of Alternative I or II would have no impact on noise. Noise impacts from the Alternatives III, IV, or V would be temporary, minor, and mitigable. Excessive noise levels could impact the health of the workforce and/or the residents of neighboring communities near the DORF.

Implementation of Alternative III, IV, or V would require operation of power machinery and other activities that could result in a temporary increase in the noise level in the immediate vicinity of the site. Noise impacts on the health of demolition workers would be mitigated by adherence to OSHA standards for occupational noise exposure associated with construction (29 CFR 1926.52). Noise impacts on nearby residents would be mitigated by adherence to the regulatory limit [County Code (Section 31B-6)] for construction activities of 75 dBA if the DEP has not approved a noise-suppression plan for the activity; or 85 dBA if the DEP has approved a noise-suppression plan for the activity (Montgomery County DEP, 2010).

5.2.12 Transportation

Implementation of Alternative I or II would result in no impacts to transportation because there will be no additional vehicles. The potential impacts to transportation resulting from implementation of the Alternative III, IV, or V would be temporary, minor, and mitigable. The implementation of the Alternative III, IV, or V would result in increased traffic on the FGA and in areas adjacent to the FGA. Alternative III, IV, or V would not increase ingress and egress to the FGA above the predetermined acceptable levels of 415 vehicles entering during AM peak hour and 506 vehicles exiting during PM peak hour.

Implementation of Alternative III, IV, or V may include as many as 9 contract personnel on-site during an average day for the duration of the project, approximately 3 months. However the duration of the project may vary depending on the alternative. This translates to 9 additional automobiles entering and exiting one of the two FGA gates each morning and evening. Also, approximately 5 noon-time trips would be expected to enter and exit the site for lunch. Motorized equipment utilized for the project would be limited to a small number which would remain on site. Five such pieces of equipment could be transported on 3 heavy lift trucks at the beginning and completion of the project. This would translate to 6 heavy lift truck trips.

The most significant increase in traffic would arise from implementation of Alternative V due to the removal of demolition debris and the transport of backfill to the site. For traffic estimation purposes, it is assumed the demolition contractor would utilize large tandem axle dump trucks with Maryland load limits of 34,000 lbs, with a maximum weight load of 15 tons per vehicle for removal of “clean waste”. Radiological waste would be packaged in 55-gallon drums, super-sacks, or 100ft^3 steel boxes and loaded on an open trailer with load limits in excess of 50,000 pounds. This would equal approximately 415 truck loads for demolition debris at approximately 6,228 long tons. Some demolition waste could be removed as “clean waste” if the ARO releases OUs for unrestricted use and some or all demolition waste could be removed as radiological waste depending on whether the entire DORF is under jurisdiction of the ARO permit (see Section 2.0 for details).

An additional 31 truck loads would be required to transport the approximately 470 standard tons of backfill soil. Demolition waste would be removed over the course of two months (40 work days) at an average of 21 trips a day. Ingress and egress would occur through the Stephen Sitter/Brookville Road gate, located closest to the DORF. Back fill material would be transported to the site during the third month over the course of two days. Approximately 31 trips would be required via the Stephen Sitter/Brookville Road gate. All adjacent intersections to the FGA operate at a LOS of A during both the AM and PM peak hours and would be able to accommodate additional traffic volumes due to vehicles associated with the Alternative V (USACE, 2008).

5.2.13 Energy Resources

Implementation of Alternative I or II would result in no impacts to energy resources. Implementation of Alternative III, IV, or V would have negligible impacts on energy resources relative to energy consumption in the Silver Spring area. During implementation, the impact of diesel fuel demands for power equipment and movement of materials, and gasoline for workforce commuting, would be temporary and negligible relative to the consumption of these fuels in the Silver Spring area.

5.2.14 Waste Management and Pollution Prevention

Implementation of Alternative I, II, or IV would result in no impacts to waste stream management. Implementation of Alternative IV or V would have a negligible impact on the FGA waste management systems. Demolition waste resulting from demolition activities at the DORF would have a negligible impact on the waste stream at the FGA. The demolition contractor would have responsibility for adhering to regulatory requirements for the disposal of the concrete containing residual radioactivity outside the FGA in accordance with Federal, state, and local regulatory requirements, as noted in Section 2.4.4. Waste generated from demolition activities of the DORF would primarily consist of concrete/masonry structural materials (some of which would be contaminated with residual radioactivity).

As discussed in Section 4.14.6, ACM within the DORF could potentially be released into the air during demolition activities. These potentially minor impacts resulting from asbestos exposure to workers and the public would be mitigated by Federal (40 CFR 61; 29 CFR 1926) and state (COMAR 26.11.21) regulations (USEPA, 2010e; MDE, 2010b). In accordance with these regulations, the ACM would be removed by a qualified, licensed contractor prior to demolition.

Lead present in the DORF, as mentioned in Section 4.14.6, is stable and not an immediate threat to site personnel; however, disturbances typical of demolition activities may result in an airborne lead hazard and the inhalation of lead oxide and lead-tainted paint dust by demolition workers and the public is possible. These potentially minor impacts resulting from lead exposure to workers and the public would be mitigated by adherence to OSHA (29 CFR 1926) and state (COMAR 26.11.21) regulations.

Impacts from the PCBs that may be located in the ballasts of fluorescent lights in the DORF would be negligible. As discussed in Section 4.14.6, management and disposal of the PCB-containing fluorescent light ballasts would be carried out in accordance with all applicable Federal (40 CFR 761) and state (COMAR 26.13) regulations.

Potentially minor impacts to the health and safety of demolition workers would be minimized by adherence to accepted work standards and OSHA regulations (29 CFR 1926). The impact of radioactive waste associated with the demolition of the DORF would be minor. As mentioned in Section 4.14.7, Building 516 contains material that is contaminated with residual radioactivity. Assuming the USNRC releases the DORF for unrestricted use, demolition wastes can either be disposed of under the ARO permit at a LLRW or Subtitle C facility or off of the permit at a municipal landfill (see Section 2.0 for details). Demolition waste from the DORF facility would be either recycled, or if non-recyclable, disposed of at a suitable disposal facility.

Demolition waste resulting from implementation of Alternative V, the demolition of Buildings 516 and 513, would primarily consist of concrete/masonry structural materials (some of which would be contaminated with residual radioactivity), metallic debris, and road/sidewalk rubble. Approximately 2,600 cubic yards of non-metallic structural rubble from Buildings 516 and 513 would be generated by their complete removal, which includes a 20 percent "fluff-factor" that accounts for general voids and miscellaneous soil/debris that would attend the chipping/splitting/crushing of the intact structures. Based on a weight factor of 150 pounds per cubic foot for dense concrete rubble, the combined weight of these materials that would be removed from the site is approximately 4,700 long tons (McClain, 2010b).

Due to limited construction data, the tonnage of steel and other recoverable metals in Building 516 are difficult to estimate. The upper level floor is largely constructed of minimally partitioned spaces with masonry structural materials. Metal roof supports, decking, and a substantial overhead crane lift are present in this area. Heavy steel reinforcing rods are known to be present in most, and possibly all, of the lower level's poured concrete floors, walls, and ceilings. As a result, it is estimated that up to 500 long tons of metallic materials may be recoverable during a full demolition of Building 516. Insignificant amounts of metal are present in Building 513 (McClain, 2010b).

Removal of all exterior paved surfaces (paved roadways and walkways) within the confines of the DORF perimeter fence line is roughly estimated at 815 cubic yards. The combined tonnage of paved roadways and walkways to be removed was estimated to be approximately 1,028 tons (McClain, 2010b).

5.2.15 Human Health and Safety

Implementation of Alternative I or II would have no impacts to human health and safety. Potential minor impacts to human health and safety may occur with the implementation of Alternative III, IV, or V. The health and safety of construction workers would be protected by adherence to accepted work standards and regulations set forth by OSHA 29 CFR 1926, *Safety and Health Regulations for Construction.* The remediation of OU 1 may cause an increase in fugitive dust, which will be controlled through the use of a ventilation system or other methods of dust control. Respirators (as described in 29 CFR 1926.103) may be utilized in addition to the ventilation system. Adherence to MDE air quality regulations will also mitigate potential negative human health impacts related to air quality.

Implementation of Alternative V would involve the generation of hazardous wastes. Adherence to 29 CFR 1926.65 (*Hazardous Waste Operations and Emergency Response*) and applicable BMPs would mitigate potential negative human health impacts to construction workers related to hazardous wastes.

Implementation of Alternative IV or V would involve the generation of radiological waste composed of concrete debris and various other activated waste. Adherence to the HASP, including limiting radiological exposures to ALARA, as well as adherence to applicable OSHA Standards (29 CFR 1926) and BMPs will mitigate potential negative human health impacts to construction workers. Adherence to USNRC and U.S. DOT regulations during the transportation of radiological packages will mitigate potential negative human health and safety impacts to constructions workers and the public.

5.2.16 Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low Income Populations*, requires Federal agencies to consider whether their projects would result in disproportionate adverse impacts on minority or low-income populations. The U.S. Census considers a poverty area as one where at least 20 percent of the population lives below the poverty level, which it defines as the income level (based on family size, age of householder, and the number of children under 18 years of age) that is considered too low to meet essential living requirements, without regard to the local cost of living. Montgomery County is not considered a poverty area.

Implementation of Alternative I or II would have no impacts to Environmental Justice. The potential impacts due to implementation of the Alternative III, IV, or V would be negligible and mitigable. During the construction phase of the Proposed Action, minority and/or low-income communities could be economically impacted if they are excluded from the economic benefits arising implementing an Action Alternative. Such adverse Environmental Justice impacts are mitigated by the requirement that all vendors and contractors participating in the operations of Alternative III, IV, or V must adhere to Equal Employment Opportunity and Affirmative Action considerations as identified in 29 CFR 1608.

5.2.17 Public Opinion

Public opinion towards a Proposed Action must be considered to the maximum extent practicable in accordance with NEPA and 32 CFR 651. Evaluation of public opinion includes an assessment of national and/or local perception of issues. As part of the NEPA process, public comments are being solicited and encouraged.

5.2.18 Cumulative Impacts

The CEQ regulations implementing NEPA define cumulative impacts to the environment as those effects resulting from the impact of implementation of either of the four Action Alternatives or the No Action Alternative when combined with past, present, and future actions (40 CFR 1508.7). Thus, cumulative impacts are the sum of all direct and indirect impacts, both adverse and positive, that result from the incremental impacts due to implementation of either of the four Action Alternatives or the No Action Alternative when added to other past, present, and reasonably foreseeable future actions regardless of source. Cumulative impacts may be accrued over time and/or in conjunction with impacts from other activities in the area (40 CFR 1508.25).

Alternative I and Alternative II would result in no impacts. It is unlikely that significant cumulative impacts would result from implementation of Alternative III, IV, or V. The potential cumulative impacts resulting from implementation of Alternative III, IV, or V would be minor and mitigable.

Potential cumulative impacts on demolition workforce safety for Alternatives III, IV, or V would be minor and mitigable by adhering to OSHA Standards. Potential cumulative impacts on traffic due to implementation of either Alternatives III, IV, or V would be minor and mitigable by coordination among construction managers to ensure access to the sites for construction vehicles. Temporary minor cumulative impacts to the FGA waste management systems from implementation of Alternatives III, IV, or V may occur. Materials removed would be disposed of

at another location following U.S. DOT requirements and all Federal, state and local disposal requirements. Minor cumulative impacts to human health and safety during remediation, disposal and transportation of wastes may occur. These potential impacts would be minor and mitigable by the use of BMPs adhering to OSHA Standards and U.S. DOT requirements. Implementation of Alternative III, IV, or V is unlikely to adversely impact air quality in the Silver Spring region. All activities which would be conducted at the DORF would adhere to MDE air quality regulations, which are designed to be protective of human health.

Cumulative environmental impacts of the Proposed Action in conjunction with potential expansion of the Proposed Action or other future development on the DORF site would be assessed in a NEPA context for each specific project.

5.3 COMPARISON THE ALTERNATIVES

Table 5.1 provides a comparison of the potential environmental impacts related to each of the alternatives. With applicable mitigation measures, potential adverse impacts were deemed to be minor. Mitigation measures related to each of the alternatives are provided in Table 5.3. The contractor would be responsible for all mitigation measures within their control.

Table 5-1. Summary of Potential Environmental Impacts.

Environmental Attribute	Alternative I No Action	Alternative II Release Using Site-Specific DCGLs	Alternative III Focused Remediation by Encasement of Activated Material and Subsequent Release	Alternative IV Focused Remediation by Removal of Activated Material and Subsequent Release	Alternative V Total Remediation, Complete Demolition, and Subsequent Release
Land Use	No impact.	No impact.	Positive impacts to land use would occur if the remediation of OU 1 of Building 516 is successful and activated material was encased. No impact to land use would occur if the remediation of OU 1 of Building 516 was unsuccessful and the ARO does not terminate Permit No. DORF-1-97.	Positive impacts to land use would occur if the remediation of OU 1 of Building 516 is successful and activated material was removed. No impact to land use would occur if the remediation of OU 1 of Building 516 was unsuccessful and the ARO does not terminate Permit No. DORF-1-97.	Positive impact on land use. The demolition of Buildings 513 and 516 would result the removal of activated material and creation of usable space.
Climate	No impact.	No impact.	No impact.	No impact.	No impact.
Geology	No impact.	No impact.	No impact.	No impact.	Minor impacts to local geology due to demolition and excavation activities.
Soils	No impact.	No impact.	Temporary minor impact on soil resources resulting from the transportation of additional concrete to the DORF site.	Temporary minor impacts to soil from remediation, disposal, and transportation of wastes.	Temporary minor impacts on soil resources during the demolition phase. Some soils would be disturbed during excavation and other demolition related activities.
Water Resources	No impact.	No impact.	Temporary negligible impacts to surface water, groundwater, and stormwater from remediation and encasement. No impact to drinking water.	Temporary minor impacts to surface water, groundwater, and stormwater from remediation, disposal and transportation of wastes. No impact to drinking water.	Temporary minor impacts to surface water, groundwater and stormwater from remediation, disposal and transportation of wastes. No impact to drinking water.
Wetlands and Floodplains	No impact.	No impact.	Negligible impacts to wetlands located approximately 200 ft from the site.	Negligible impacts to wetlands located approximately 200 ft from the site.	Negligible impacts to wetlands located approximately 200 ft from the site.
Plant and Animal Ecology	No impact.	No impact.	Temporary minor impacts to plant and animal resources including displacement of species through disruption of habitat.	Temporary minor impacts to plant and animal resources including displacement of species through disruption of habitat.	Temporary minor impacts to plant and animal resources including displacement of species through disruption of habitat. Positive impacts due to COMAR forestation requirements.
Air Quality	No impact.	No impact.	Negligible impacts to the air quality of Silver Spring resulting due to fugitive dust emissions from demolition vehicle emissions, and by vehicular emissions from commuting activities of the workforce.	Negligible impact on the air quality in the vicinity of the DORF due to scabbling. Negligible impacts to the air quality of Silver Spring due to fugitive dust emissions from demolition vehicle emissions, and by vehicular emissions from commuting activities of the workforce.	Negligible impact on the air quality in the vicinity of the DORF due to demolition. Negligible impacts to the air quality of Silver Spring due to fugitive dust emissions from demolition vehicle emissions, and by vehicular emissions from commuting activities of the workforce.
Historical and Cultural Resources	No impact.	No impact.	Potential minor impacts to Ireland Trail due to proximity of the trail to the DORF. Adverse impacts to NRHP-eligible Building 516.	Potential minor impacts to Ireland Trail due to proximity of the trail to the DORF. Adverse impacts to NRHP-eligible Building 516.	Potential minor impacts to Ireland Trail due to proximity of the trail to the DORF. Adverse impacts to NRHP-eligible Building 516.
Socioeconomic Environment	No impact.	No impact.	Minor positive impacts would occur as a result of Alternative IV. Local vendors and contractors would benefit from the work.	Minor positive impacts would occur as a result of Alternative III. Local vendors and contractors would benefit from the work.	Minor positive impacts would occur as a result of Alternative V. Local vendors and contractors would benefit from the work.
Noise	No impact.	No impact.	Minor and mitigable noise impact to the health of the workforce and/or the residents of neighboring communities near the DORF.	Minor and mitigable noise impact to the health of the workforce and/or the residents of neighboring communities near the DORF.	Minor and mitigable noise impact to the health of the workforce and/or the residents of neighboring communities near the DORF.
Transportation	No impact.	No impact.	Temporary minor impacts to traffic due to increased workforce vehicles during implementation.	Temporary minor impacts to traffic due to increased workforce vehicles during implementation and transporting activated concrete during partial demolition.	Temporary minor impacts to traffic due to increased workforce vehicles during implementation and transporting activated concrete during demolition.
Energy Resources	No impact.	No impact.	Negligible impacts on energy resources relative to energy consumption in the Silver Spring area.	Negligible impacts on energy resources relative to energy consumption in the Silver Spring area.	Negligible impacts on energy resources relative to energy consumption in the Silver Spring area.
Waste Management	No impact.	No impact.	No impact.	Temporary negligible impact on the FGA waste management systems. Materials removed would be disposed of at another location.	Temporary negligible impact on the FGA waste management systems. Materials removed would be disposed of at another location.
Human Health and Safety	No impact.	No impact.	Potential negligible impacts to human health and safety may occur during remediation, disposal, and transportation of wastes.	Potential temporary minor impacts to human health and safety during remediation, disposal, and transportation of wastes.	Potential temporary minor impacts to human health and safety may occur during remediation, disposal, and transportation of wastes.
Environmental Justice	No impact.	No impact.	No disproportionate adverse impacts to minority or low-income populations are anticipated.	No disproportionate adverse impacts to minority or low-income populations are anticipated.	No disproportionate adverse impacts to minority or low-income populations are anticipated.
Cumulative Impacts	No impact.	No impact.	Significant adverse impacts are not anticipated.	Significant adverse impacts are not anticipated.	Significant adverse impacts are not anticipated.

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Table 5-2. Summary of Mitigation Measures Related to Each Alternative.

Environmental Attribute	Alternative I	Alternative II	Alternative III	Alternative IV	Alternative V
	No Action	**Release Using Site-Specific DCGLs**	**Focused Remediation by Encasement of Activated Material and Subsequent Release**	**Focused Remediation by Removal of Activated Material and Subsequent Release**	**Total Remediation, Complete Demolition, and Subsequent Release**
Land Use	No impact.	No impact.	Positive to no impact.	Positive to no impact.	Positive impact.
Climate	No impact.	No impact.	No impact.	No impact.	No impact.
Geology	No impact.	No impact.	No impact.	No impact.	Impacts mitigated by use of BMPs for site excavation, erosion control, and stormwater management.
Soils	No impact.	No impact.	Mitigated by following *Maryland Standards and Specifications for Soil Erosion and Sediment Control* and application of all relevant BMPs for erosion control and stormwater management would minimize erosion.	Mitigated by following *Maryland Standards and Specifications for Soil Erosion and Sediment Control* and application of all relevant BMPs for erosion control and stormwater management would minimize erosion.	Mitigated by following *Maryland Standards and Specifications for Soil Erosion and Sediment Control* and application of all relevant BMPs for erosion control and stormwater management would minimize erosion.
Water Resources	No impact.	No impact.	Mitigated by adherence to BMPs during remediation, disposal, and transportation of wastes and compliance with groundwater protection requirements mandated under RCRA (40 CFR 261-270), CERCLA (40 CFR 300-399), and SDWA (42 USC § 300(f) et seq. and 40 CFR 144). BMPs for stormwater control.	Mitigated by adherence to BMPs during remediation, disposal, and transportation of wastes and compliance with groundwater protection requirements mandated under RCRA (40 CFR 261-270), CERCLA (40 CFR 300-399), and SDWA (42 USC § 300(f) et seq. and 40 CFR 144). BMPs for stormwater control.	Mitigated by adherence to BMPs during remediation, disposal, and transportation of wastes and compliance with groundwater protection requirements mandated under RCRA (40 CFR 261-270), CERCLA (40 CFR 300-399), and SDWA (42 USC § 300(f) et seq. and 40 CFR 144). BMPs for stormwater control.
Wetlands and Floodplains	No impact.	No impact.	Adherence to BMPs, compliance with sedimentation and erosion control plans, and compliance with stormwater management plans would protect adjacent wetland and floodplain areas from potential negligible impacts.	Adherence to BMPs, compliance with sedimentation and erosion control plans, and compliance with stormwater management plans would protect adjacent wetland and floodplain areas from potential negligible impacts.	Adherence to BMPs, compliance with sedimentation and erosion control plans, and compliance with stormwater management plans would protect adjacent wetland and floodplain areas from potential negligible impacts.
Plant and Animal Ecology	No impact.	No impact.	Utilization of BMPs relevant to fugitive dust, erosion control, and noise would mitigate negative impacts to the local plant and animal ecology during the implementation.	Utilization of BMPs relevant to fugitive dust, erosion control, and noise would mitigate negative impacts to the local plant and animal ecology during the implementation.	Utilization of BMPs relevant to fugitive dust, erosion control, and noise would mitigate negative impacts to the local plant and animal ecology during the implementation.
Air Quality	No impact.	No impact.	The vehicular emissions would be a negligible portion of the total transportation emissions in the Silver Spring area during the encasement phase of the DORF.	All scabbling activities at the DORF would be conducted in accordance with all applicable Federal, state, and local regulatory requirements. Adherence to BMPs would mitigate fugitive dust emissions.	All demolition activities at the DORF would be conducted in accordance with all applicable Federal, state, and local regulatory requirements. Adherence to BMPs would mitigate fugitive dust emissions.
Historical and Cultural Resources	No impact.	No impact.	Impacts to the Ireland Trail would be mitigated by utilization of BMPs relevant to fugitive dust, erosion, and noise (e.g., fugitive dust control, tree barriers). Adherence to SHPO recommendations for Building 516 and Ireland Trail.	Impacts to the Ireland Trail would be mitigated by utilization of BMPs relevant to fugitive dust, erosion, and noise (e.g., fugitive dust control, tree barriers). Adherence to SHPO recommendations for Building 516 and Ireland Trail.	Impacts to the Ireland Trail would be mitigated by utilization of BMPs relevant to fugitive dust, erosion, and noise (e.g., fugitive dust control, tree barriers). Adherence to SHPO recommendations for Building 516 and Ireland Trail.
Socioeconomic Environment	No impact.	No impact.	Minor positive impact.	Minor positive impact.	Minor positive impact.
Noise	No impact.	No impact.	Noise impacts on the health of demolition workers would be mitigated by adherence to OSHA standards. Noise impacts on nearby residents would be mitigated by adherence to the regulatory limits.	Noise impacts on the health of demolition workers would be mitigated by adherence to OSHA standards. Noise impacts on nearby residents would be mitigated by adherence to the regulatory limits.	Noise impacts on the health of demolition workers would be mitigated by adherence to OSHA standards. Noise impacts on nearby residents would be mitigated by adherence to the regulatory limits.
Transportation	No impact.	No impact.	Implementation would not increase ingress and egress to the FGA above the predetermined acceptable levels.	Implementation would not increase ingress and egress to the FGA above the predetermined acceptable levels. All Federal, state, and local regulations on transporting activated material would be followed.	All adjacent intersections to the FGA would be able to accommodate additional traffic volumes due to vehicles associated with Alternative V. The minor increase to vehicle traffic would not exceed the mandated the FGA traffic counts set by the NCPC and the MCPB.
Energy Resources	No impact.	No impact.	Impacts would be temporary and negligible relative to the consumption of fuels in the Silver Spring area.	Impacts would be temporary and negligible relative to the consumption of fuels in the Silver Spring area.	Impacts would be temporary and negligible relative to the consumption of fuels in the Silver Spring area.
Waste Management	No impact.	No impact.	No impact.	Mitigated by adhering to regulatory requirements for the disposal of the activated material outside the FGA in accordance with Federal, state, and local regulatory requirements.	Mitigated by adhering to regulatory requirements for the disposal of the activated material outside the FGA in accordance with Federal, state, and local regulatory requirements.
Human Health and Safety	No impact.	No impact.	Mitigated by adherence to OSHA 29 CFR 1926, *Safety and Health Regulations for Construction,* MDE air quality requirements, U.S. DOT requirements, and all BMPs.	Mitigated by adherence to OSHA 29 CFR 1926, *Safety and Health Regulations for Construction,* MDE air quality requirements, U.S. DOT requirements, and all BMPs.	Mitigated by adherence to OSHA 29 CFR 1926, *Safety and Health Regulations for Construction,* MDE air quality requirements, U.S. DOT requirements, and all BMPs.
Environmental Justice	No impact.	No impact.	No mitigation required.	No mitigation required.	No mitigation required.

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6.0 CONCLUSIONS

The Proposed Action and subject of this EA is the Decommissioning of the DORF at the FGA of Fort Detrick in Silver Spring, Maryland. Five reasonable alternatives have been identified and were evaluated in this EA. These include: No Action (Alternative I), Release Using Site-Specific DCGLs (Alternative II), Focused Remediation by Encasement of Activated Material and Subsequent Release (Alternative III), Focused Remediation by Removal of Activated Material and Subsequent Release (Alternative IV), and Total Remediation, Complete Demolition, and Subsequent Release (Alternative V). Selection of an alternative is planned for the end of 2011, in full consultation with both the NRC and the ARO.

During the preparation of this EA several potential environmental issues associated with implementation of the No Action or the Action Alternatives were identified, including impacts to historical and cultural resources, impacts to traffic and impacts to water resources, waste management, and human health and safety. The environmental impacts of the Action Alternatives (Decommissioning of the DORF) were evaluated in detail, and the potential adverse environmental, health, and socioeconomic impacts were found to be negligible to minor, and mitigable. Under the No Action Alternative, the potential impacts, both adverse and beneficial, of the Decommissioning of the DORF at the FGA would not occur.

The principal conclusions of this EA are (1) Implementation of Alternative I (No Action), Alternative II (Release Using Site-Specific DCGLs), Alternative III (Focused Remediation by Encasement of Activated Material and Subsequent Release), Alternative IV (Focused Remediation by Removal of Activated Material and Subsequent Release), or Alternative V (Total Remediation, Complete Demolition, and Subsequent Release) would result in no significant, non-mitigable, adverse environmental, human health, or socioeconomic impacts. (2) Alternatives II, III, IV, and V would enable the release of the DORF for unrestricted use. (3) Alternative V would have positive impacts on land use from the removal of radioactive material and leaving the land unrestricted and available for future mission-enhancing projects. (4) Implementing the No Action Alternative would eliminate the negligible to minor environmental impacts but would also eliminate the beneficial impacts of decommissioning.

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10.0 ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
ACM	Asbestos Containing Material
ACP	Access Control Point
AHERA	Asbestos Hazard Emergency Reauthorization Act
ALARA	As Low as Reasonably Achievable
AR	Army Regulation
ARC	Army Reactor Council
ARL	Army Research Laboratory
ARO	Army Reactor Office
ATG	automatic tank gauging
BMPs	best management practices
CAA	Clean Air Act
CAP	corrective action plan
CASAC	Clean Air Scientific Advisory Committee
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CO	carbon monoxide
COMAR	Code of Maryland Regulations
CSM	conceptual site model
CWA	Clean Water Act
CY	calendar year
DA	Department of the Army
dBA	decibels type A
DCGL	Derived Concentration Guideline Level
DD	decision document
DEP	Department of Environmental Protection
DoD	Department of Defense
DORF	Diamond Ordinance Radiation Facility
DOT	Department of Transportation
DQO	Data Quality Objectives
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
EMO	Environmental Management Office
EO	Executive Order
FGA	Forest Glen Annex
FS	feasibility study
FY	fiscal year
HASP	Health and Safety Plan
HAZCOM	Hazard Communication
HAZMAT	Hazardous Materials
HDL	Harry Diamond Laboratories
HMMP	Hazardous Materials Management Plan
HVAC	heating, ventilation, and air conditioning
HWMP	Hazardous Waste Management Plan

ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resource Management Plan
ISCP	Integrated Spill Contingency Plan
ISWMP	Integrated Solid Waste Management Plan
kV	kilovolt
kWh	kilowatt hours
LBP	Lead Based Paint
LCMs	lead-containing materials
LLRW	low level radioactive waste
LOS	Level of Service
LTM	long-term management
LUCs	land use controls
MARSSIM	Multi-Agency Radiation Site Survey and Investigation Manual
MCDOT	Montgomery County Department of Transportation
MCPB	Montgomery County Planning Board
MDE	Maryland Department of the Environment
MDNR	Maryland Department of Natural Resources
MGS	Maryland Geologic Survey
mmBtu	Million British Thermal Units
MREM	millirem
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MSW	Municipal Solid Waste
NAAQS	National Ambient Air Quality Standards
NCDC	National Climate Data Center
NCPC	National Capital Planning Commission
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OSHA	Occupational Safety and Health Administration
OU	operable unit
P2	pollution prevention
PAs	preliminary assessments
PCB	Polychlorinated Biphenyls
PEPCO	Potomac Electric Power Company
pH	potential hydrogen
PGA	Peak Ground Acceleration
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PP	proposed plan
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
SDWA	Safe Drinking Water Act
SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
SPCC	spill prevention, control, and counter measures
TEDE	total effective dose equivalent

TRIGA	Training, Research, Isotopes, General Atomics
TSCA	Toxic Substance Control Act
USC	U.S. Code
USACE	U.S. Army Corps of Engineers
USAG	U.S. Army Garrison
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
USNRC	U.S. Nuclear Regulatory Commission
UST	underground storage tank
vpd	vehicles per day
WMATA	Washington Metropolitan Area Transit Authority
WRAIR	Walter Reed Army Institute of Research
WRAMC	Walter Reed Army Medical Center
WSSC	Washington Suburban Sanitary Commission
WWTP	Waste Water Treatment Plant

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