**DRAFT Finding of No Significant Impact (FONSI)**
Travel Camp Environmental Assessment
Fort Belvoir, Virginia

**Name of Action:** Travel Camp Environmental Assessment (EA)

**Description of Proposed Action and Need**: The Proposed Action involves the construction of a travel camp expansion with 30 recreational vehicle (RV) camp sites with full utility hookups; a camping support facility with laundry, restrooms, showers, open lounge space; and associated vehicle circulation roads and walkways. The Proposed Action would be implemented in accordance with the National Environmental Policy Act (NEPA), as amended (Title 42 U.S.C. §4321 et seq.), NEPA-implementing regulations of the Council of Environmental (CEQ) (40 Code of Federal Regulations [CFR] Parts 1500–1508), and the Army's NEPA-implementing regulations (32 CFR Part 651, *Environmental Analysis of Army Actions*).

The purpose of this project is to build and operate an approximately 20-acre travel camp expansion at Fort Belvoir to be managed by the Installation Management Command's Family and Morale, Welfare, and Recreation (MWR) Directorate. The Proposed Action would provide needed space for customers at Fort Belvoir in a highly desirable area along the Potomac River.

The need for the facility is to provide space for RVs and travelers to stay within the northern Virginia area. Currently, there is inadequate space for the level of patronage received from both customers assigned to or supported by Fort Belvoir and those visiting the area. Customers are forced to seek service from commercially operated facilities that are overcrowded during peak travel times, have higher cost, and are located an average of 45 minutes from Washington, DC.

**Alternatives:** The EA evaluates the Proposed Action, as described above, and the No Action Alternative. Two other alternatives just west of the Proposed Action site, along Warren Road, were considered but eliminated. Site 1 was eliminated from consideration because of expenses associated with the redevelopment of the site due to existing foundations. The area also contains limited developable space due to a resource protection area for a perennial stream to the south and east of the site. Site 2 was considered for the travel camp expansion but was eliminated from consideration due to environmental constraints. The area is surrounded by steep topography and slopes as well as a resource protection area, limiting the development area. Without extensive grading, the site would not be large enough to support the current design. The site also has potential for severe erosion and sediment control issues due to the steep topography.

**No Action Alternative:** Under the No Action Alternative, Fort Belvoir would not construct a travel camp expansion, resulting in a lack of adequate recreational space for customers and visitors to the northern Virginia area. Fort Belvoir customers and supporters would be forced to continue to use surrounding, more expensive facilities with longer commutes to Washington, DC. The morale of soldiers, family members, and DoD Civilians would remain stagnant at its current level.

**Environmental Consequences:** Environmental effects of the Proposed Action would include those related to construction and operation of the Proposed Action as well as impacts of increased personnel and traffic to Fort Belvoir. **Table 1** shows the resource areas analyzed in the EA and their expected effects for the Proposed Action and No Action Alternative.

Under the Proposed Action, minor adverse impacts would occur to soils; topography; surface waters; riparian protection areas (RPAs); stormwater; rare, threatened and endangered (RTE) species; electricity; potable water; sanitary sewers; telecommunications; noise; air quality; traffic and transportation; and cumulative impacts.

Moderate adverse impacts would occur to wildlife and vegetation.

No impacts would occur to land use; geology, groundwater; floodplains; wetlands; coastal zones; hazardous waste and toxic material; cultural and historic properties; environmental justice; and protection of children.

Minor, beneficial impacts would occur to socioeconomics.

**Summary of Environmental Impacts:** Based on the findings of the EA, it is anticipated that the Proposed Action would result in no significant adverse impact to any of the aforementioned resource areas. As summarized in Table 1, the Proposed Action could have minor adverse impacts on selected resources and an overall beneficial impact on socioeconomics. The adverse impacts would be maintained at a minor level by implementing BMPs, permit requirements, and performing other management measures throughout the construction and operational phases.

**Notice of Availability:** The EA and Draft FONSI have been made available for a 30-day review and comment period by the public, regulatory agencies, and stakeholder organizations. A Notice of Availability of the Draft EA and Draft FONSI announcing the 30-day review period was published in the *Springfield Connection* and the *Mount Vernon Gazette and Springfield.* Printed copies of the EA and Draft FONSI were made available for review at the Fort Belvoir Library; the Fairfax County Library - Kingstowne Branch and the Sherwood Branch; and on the installation's website: at:https://home.army.mil/belvoir/index.php/about/Garrison/directorate-publicworks/environmental-division.

**Response to Comments:** Comments from federal, state, and local agencies and the public received during the public review period will be considered by Fort Belvoir for incorporation into the Final EA.

**Conclusion:** Pursuant to the CEQ regulations; Title 40, CFR Section 1500-1508 regarding procedural implementation of the National Environmental Policy Act (NEPA) of 1969; and implemented for the Army by Title 32 CFR 651, *Environmental Analysis of Army Actions*, it is anticipated that the Proposed Action would not have significant adverse effects on the environment and that a FONSI is appropriate. An environmental impact statement (EIS) will not be prepared.

_____ _____

Jospeh V. Messina
Colonel, U.S. Army
Commanding

Date

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**DRAFT**

# Fort Belvoir
# Travel Camp Expansion
# Environmental Assessment

**Fort Belvoir, Virginia**
**July 2024**

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**Fort Belvoir Travel Camp**
**Fort Belvoir, Virginia**

**ENVIRONMENTAL ASSESSMENT**

Reviewed by:
U.S. Army Garrison Fort Belvoir

_____
Ashley McMahon
Acting Chief, Environmental Division

Recommended for Approval:
U.S. Army Garrison Fort Belvoir

_____
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Director, Public Works

Approved by:
U.S. Army Garrison Fort Belvoir

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Joseph V. Messina
Colonel, U.S. Army
Commanding

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# 1 INTRODUCTION

## 1.1 PROJECT BACKGROUND

Pursuant to the National Environmental Policy Act (NEPA) of 1969 (Title 42, U.S. Code [USC], 4321-4370f), as amended; regulations of the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] 1500-1508); and 32 CFR Part 651 (Army Analysis of Environmental Actions), Fort Belvoir has prepared an Environmental Assessment (EA) to evaluate potential environmental effects associated with construction of a new travel camp expansion at Fort Belvoir, Virginia.

Fort Belvoir is located approximately 18 miles southwest of Washington, DC, and 17 miles south of the Pentagon, on the Potomac River in Fairfax County, Virginia (**Figure 1-1**). Fort Belvoir contributes to the nation's defense primarily by providing a secure operating environment for regional and worldwide Department of Defense (DoD) missions and functions. The garrison also provides housing, medical services, recreational facilities, and other support services for active-duty military members and retirees in the National Capital Region.

The Army established Fort Belvoir during World War I as Camp A.A. Humphreys. In 1919, the Army Engineer School relocated to Camp Humphreys and remained on the installation until 1988. After World War II, Fort Belvoir's mission began to shift from training to research, development, test, and evaluation activities. In the 1950s, the installation's mission expanded to include hosting DoD organizations. With the departure of the Army Engineer School in 1988, Fort Belvoir's mission to support DoD organizations grew. In September 2005, the Defense Base Realignment and Closure (BRAC) Commission recommended numerous realignment and closure actions for military capabilities, which led to the establishment of the current configuration of facilities at Fort Belvoir.

The Proposed Action would be located on the Main Post of Fort Belvoir, south of Theote Road and east of Morrow Road, roughly bounded by McClellan Loop (**Figure 1-2**). The Proposed Action is approximately 20 acres and would consists of 30 recreational vehicle (RV) camp sites with full utility hookups; a camping support facility with laundry, restrooms, showers, and camper's lounge space for rustic camp sites; and associated vehicle circulation roads and walkways. The Proposed Action area is primarily forested with some surrounding recreational and operational buildings such as another travel camp, office buildings, and a baseball field.


**Figure 1-1: Fort Belvoir Location**


**Figure 1-2: Proposed Action Location**

## 1.2 PURPOSE AND NEED

The *purpose* of this project is to build and operate an approximately 20-acre travel camp expansion at Fort Belvoir to be managed by the Installation Management Command's Family and Morale, Welfare, and Recreation (MWR) Directorate. The Proposed Action would provide needed recreational space for Fort Belvoir.

The *need* for the Proposed Action is to provide recreational space for qualified personnel to temporarily stay within the northern Virginia area. Currently, there is inadequate space for the level of interest received from personnel assigned to or supported by Fort Belvoir. Personnel must currently seek service from commercially operated facilities that are overcrowded, have higher cost, and are located an average of 45 minutes from Washington, DC.

## 1.3 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

Under the guidance provided in NEPA and in 32 CFR Part 651, either an Environmental Impact Statement (EIS) or an EA must be prepared for any federal action. Actions that are determined to be exempt by law, emergencies, or categorically excluded do not require the preparation of an EA or EIS. If an action may significantly affect the environment, an EIS would be prepared. An EA provides sufficient evidence and analysis for determining whether to prepare an EIS. An evaluation of the environmental consequences of the Proposed Action and the No Action Alternative includes direct, indirect, and cumulative effects, as well as qualitative and quantitative (where possible) assessment of the level of significance of these effects. The EA results in either a Finding of No Significant Impact (FONSI) or a Notice of Intent (NOI) to prepare an EIS.

The purpose of this EA is to inform decision makers and the public of the likely environmental consequences of the Proposed Action and No Action Alternative. This EA identifies, documents, and evaluates environmental effects of the construction and operation of a travel camp expansion at Fort Belvoir, Virginia. Environmental effects would include those related to construction and operation of the Proposed Action. The Proposed Action, including the No Action Alternative and other alternatives eliminated from consideration, are described in **Section 2.0.**

The existing conditions at proposed action site are described in **Section 3.0** which, with information presented in the No Action Alternative, constitutes the baseline against other alternatives to be measured for the analysis of the effects of the construction of the travel camp expansion The following resources are evaluated in this EA: land use, air quality, water resources, biological resources, cultural resources, geological, topography, and soil resources, hazardous waste and toxic materials, utilities, socioeconomics, noise, traffic/transportation, and cumulative impacts.

## 1.4 PUBLIC INVOLVEMENT

Public participation opportunities with respect to this EA and decision making on the Proposed Action are guided by 32 CFR Part 651. Upon completion, the draft EA will be made available to the public for 30 days, along with a draft FONSI, if appropriate. A Notice of Availability (NOA) will be sent to agencies and organizations (including U.S. Fish and Wildlife Service [USFWS] and the Virginia State Historic Preservation Office [SHPO]) known to have an interest in the site at the beginning of the public comment period for official coordination and comment on the draft EA.

The NOA was published in the Washington Post and the Connection-Mount Vernon Gazette and Springfield. Electronic copies of the draft EA were made available for review on the Fort Belvoir Environmental webpage at https://home.army.mil/belvoir/index.php/about/Garrison/directorate-public-works/ environmental-division. The draft EA was also made available by request from Fort Belvoir, and hard copies were placed in the Fort Belvoir Library at 9800 Belvoir Rd, Fort Belvoir, VA 22060, and at the following Fairfax County Public Libraries:

- Kingstowne Library, 6500 Landsdowne Ctr, Alexandria, VA 22315
- Sherwood Regional Library, 2501 Sherwood Hall Lane, Alexandria, VA 22306

Comments received during the 30-day public review period will be addressed in the final EA, as appropriate. All coordination letters and responses received to date during the preparation of this EA are in **Appendix A**.

As appropriate, the Army may then execute the FONSI and proceed with implementation of the Proposed Action. If it is determined prior to issuance of a final FONSI that implementation of the Proposed Action would result in significant impacts, the Army will publish in the *Federal Register* an NOI to prepare an EIS, commit to mitigation actions sufficient to reduce impacts below significance levels, or not take the action.

## 1.5 ENVIRONMENTAL LAWS AND REGULATIONS

This EA has been prepared in accordance with the NEPA, as amended (Title 42 U.S.C. §4321 et seq.), NEPA-implementing regulations of the CEQ (40 CFR Parts 1500–1508), and the Army's NEPA-implementing regulations (32 CFR Part 651, *Environmental Analysis of Army Actions*).

Army decisions that affect environmental resources and conditions occur within the framework of numerous laws, regulations, and Executive Orders (EOs). Some of these authorities prescribe standards for compliance while others require specific planning and management actions to protect environmental values potentially affected by Army actions. Key provisions of appropriate statutes and EOs are described in more detail throughout the text of this EA and in **Table 1-1**.

**Table 1-1: Compliance with Federal Environmental Statutes and Executive Orders**

| Acts | Compliance |
|---|---|
| Archaeological Resources Protection Act (ARPA) of 1979 | FULL |
| Clean Air Act, as amended (42 U.S.C. ch. 85, subch. I §7401 et seq.) | FULL |
| Clean Water Act, as amended (33 U.S.C. ch. 23 §1151) | FULL |
| Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (42 U.S.C. §9601 et seq.) | FULL |
| Endangered Species Act of 1973, as amended (16 U.S.C. ch. 35 §1531 et seq.) | FULL |
| Energy Independence and Security Act of 2007, Section 438 | FULL |
| Farmland Protection Policy Act (7 U.S.C 4201) | FULL |
| Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e) | FULL |
| Migratory Bird Treaty Act (16 U.S.C §§703-712, et seq.) | FULL |
| National Defense Authorization Act of 2018 (Public Law 115-91) | |
| National Environmental Policy Act of 1969 (42 U.S.C. §4321 et seq.) | FULL |
| National Historic Preservation Act of 1966, as amended (16 U.S.C. ch. 1A, subch.II §470 et seq.) | FULL |
| Noise Control Act of 1972, as amended (42 U.S.C. §§4901-4918, et seq.) | FULL |
| North American Wetlands Conservation Act (16 U.S.C. 4401-4412) | FULL |
| Resource Conservation and Recovery Act (42 U.S.C. ch. 82 §6901 et seq.) | FULL |
| Safe Drinking Water Act, as amended (42 U.S.C. §300f) | FULL |
| Sikes Act, as amended (16 U.S.C. 670a-670o) | FULL |
| Solid Waste Disposal Act of 1965, as amended (42 U.S.C 6901 et seq.) | FULL |
| Toxic Substances Control Act of 1976 (15 U.S.C. ch.53, subch. I §§2601-2629) | FULL |
| Watershed Protection and Flood Prevention Act of 1954 (16 U.S.C. §1101, et | FULL |
| Wild and Scenic Rivers Act (16 U.S.C. 1271, et seq.) | FULL |
| **Executive Orders (EO)** | |
| Chesapeake Bay Protection and Restoration (EO 13508) | FULL |
| Consultation and Coordination with Indian Tribal Governments (EO 13175) | FULL |
| Efficient Federal Operations (EO 13834) | FULL |
| Environmental Justice in Minority Populations and Low-Income Populations (EO 12898) | FULL |
| Federal Compliance with Pollution Control Standards (EO 12088) | FULL |
| Floodplain Management (EO 11988) | FULL |
| Invasive Species (EO 13112) | FULL |

| | |
|---|---|
| Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis (EO 13990) | FULL |
| Protection and Enhancement of the Cultural Environment (EO 11593) | FULL |
| Protection of Children from Environmental Health Risks and Safety Risks (EO 13045) | FULL |
| Protection of Wetlands (EO 11990) | FULL |
| Revitalizing Our Nation's Commitment to Environmental Justice for All (EO 14096) | FULL |

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# 2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

Pursuant to the requirements of NEPA and the regulations for implementing NEPA promulgated by the CEQ (40 CFR 1500-1508) and 32 CFR 651, this section presents alternatives to the Proposed Action, including the No Action Alternative.

## 2.1 PROPOSED ACTION

The proposed travel camp expansion would include 20-acres of recreational space for campers and RV owners. The camp would include a camp support facility, and rustic tent camping. Thirty pull-through RV camp sites would be constructed, including concrete vehicle and picnic pads, water, sewer, electric, phone, and communication hook-ups. The camp support facility would include a laundry section, open lounge space, restrooms and showers, and vending machine space. The rustic tent camp sites would include tables and grills, water hook-ups, and vehicle parking spaces. Paved vehicle circulation roads, walking paths, landscaping, street and site lighting, sewage lift stations, storm water management, utility upgrades, and area directional signage would also be included.

Screening criteria for the Proposed Action require it be: economically viable in terms of project cost and resulting community impact; compatible with adjacent land uses and avoid potential encroachment; cognizant of the availability of buildable space and access to utilities, support services, and transportation infrastructure; compatible with the Fort Belvoir Area Development Plan (ADP); result in minimal to low environmental impacts; pose a minimal security risk to operations; and, consider human health and safety impacts.

### *2.1.1 Alternatives Considered but Eliminated from Further Analysis*

Two possible locations on Fort Belvoir were identified for the Proposed Action but were eliminated from consideration. These Alternatives are listed below.

*Alternative 1:* This site was considered for the travel camp expansion but was eliminated from consideration because of expenses associated with the redevelopment of the site due to prior usage for barracks and the potential for existing foundations and infrastructure on site. The Alternative 1 area also contains limited developable space due to a resource protection area for a perennial stream to the south and east of the site. In addition, Alternative 1 is near the Tompkins Basin Visitor which would cause negative impacts to aesthetics for the Visitor Center. This is Site 2A shown in **Figure 2-1** below.

*Alternative 2:* This site was considered for the travel camp expansion but was eliminated from consideration due to environmental constraints. The area is surrounded by steep topography and slopes as well as a resource protection area, limiting the development area. Without extensive grading, the site would not be large enough to support the current design. The site also has potential for severe erosion and sediment control issues due to the steep topography. Alternative 2 is shown as Site 2B in **Figure 2-1** below.

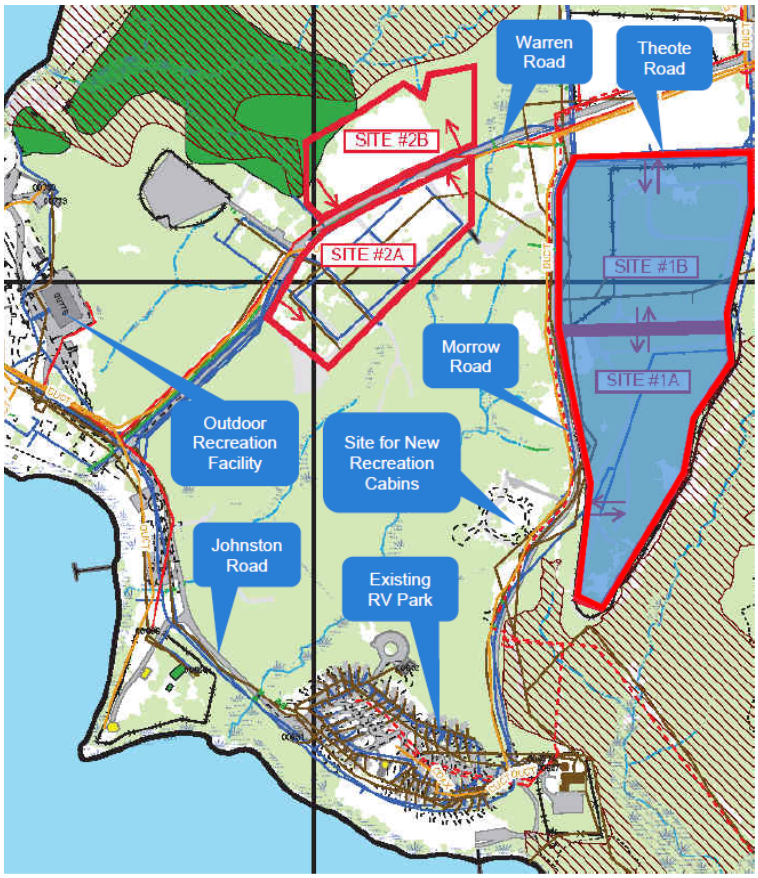


Image obtained from Fort Belvoir DPW

**Figure 2-1: Alternative Sites Considered For the Proposed Action**

## 2.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, Fort Belvoir would not construct a travel camp expansion resulting in a continued lack of adequate recreational space for customers and visitors to the northern Virginia area. Fort Belvoir authorized personnel would be forced to continue to use surrounding, more expensive facilities with longer commutes to Washington, DC.

# 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section presents the affected environment at the Proposed Action Site and analyzes the environmental consequences of implementing the Proposed Action and No Action Alternative. The impacts of an action can vary in duration. Two levels of impact duration could occur: short-term and long-term. Short-term impacts are temporary and generally occur during construction with the resource returning to preconstruction conditions almost immediately afterward or represent impacts that could last up to two years following construction. Impacts considered long-term would occur if the resource would require more than five years to recover or result in a permanent change from an activity that affects a resource for the life of the project or beyond.

## 3.1 LAND USE

### *3.1.1 Affected Environment*

Fort Belvoir is approximately 8,500 acres in size with approximately 65 percent of it undeveloped, mostly due to environmental and historical operational constraints. Fort Belvoir is divided into five areas. The Main Post is comprised of the North Post, South Post, the Southwest Area, and the Davison Army Airfield (DAAF). The Fort Belvoir North Area (FBNA) is non-contiguous with the Main Post and located northwest of Interstate (I)-95. The North and South Posts are separated by Richmond Highway, which is a major transportation corridor in this part of Virginia. The North and South Posts contain most of the development at Fort Belvoir (Fort Belvoir, 2017).

Current land use designations used at Fort Belvoir reflect the predominant use of a particular area, provide flexibility in siting facilities, and encourage mixed-use development. Existing land use at Fort Belvoir is a function of the Post's history, geography, needs, and responsibilities as an installation supporting more than 160 elements of the Army and DoD. Development at Fort Belvoir has been guided by the land use plan defined in the installation's Real Property Master Plan (U.S. Army, 2015). The majority of Fort Belvoir is classified as Community. Community land use permits usages such as childcare facilities. The next common category is Professional/Institutional, which typically permits usage such as municipal facilities, research buildings, office buildings, etc.

**Figure 3-1** shows the land use categories at Fort Belvoir and **Table 3-1** show the percentages of acres of land use categories for Fort Belvoir as designated in the 2014 Fort Belvoir Real Property Management Plan (U.S. Army, 2014).

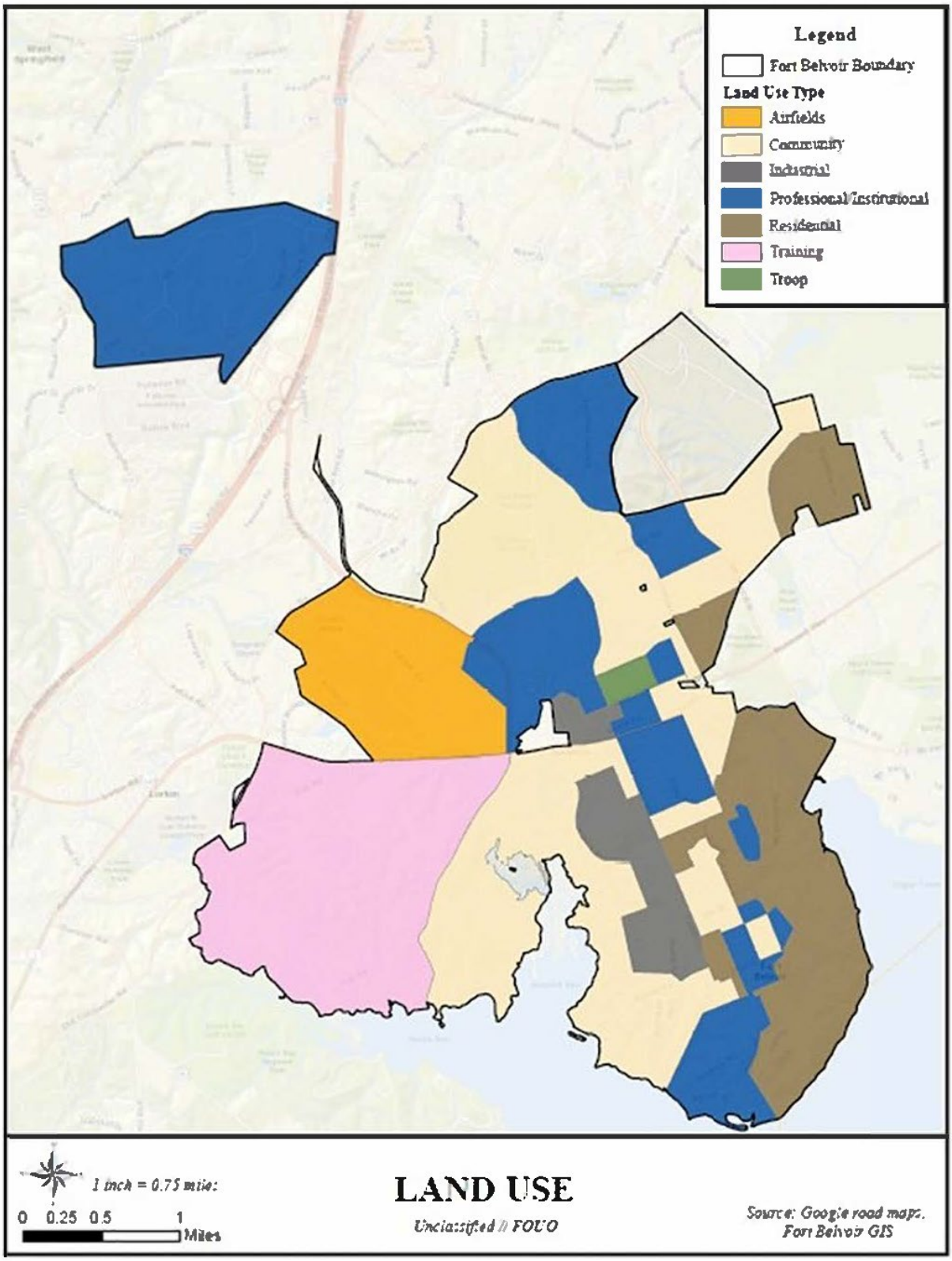


**Figure 3-1: Land Use Categories for the Fort Belvoir**

**Table 3-1: Existing Land Use Acreages**

| Land Use Category | Total (acres) | Constrained (acres) | Developed (acres) |
|---|---|---|---|
| Professional/Institutional | 2,113 | 863 | 1,250 |
| Residential | 1,240 | 655 | 585 |
| Troop | 46 | 0 | 46 |
| Community | 2,569 | 1,626 | 943 |
| Range/Training | 1,463 | 1,003 | 460 |
| Airfield | 690 | 472 | 218 |
| Industrial | 378 | 95 | 284 |
| **TOTAL** | **8,500** | **4,714** | **3,786** |
| **TOTAL PERCENTAGES** | **100** | **55** | **45** |

*Source: U.S. Army, 2014*

The Proposed Action site is located in the southwestern area of the Main Post and the land use classification for the site and surrounding area is Community. This designation encourages a mix of uses and includes religious, family support, personnel and professional services, medical, retail, commercial, and recreational facilities (U.S. Army, 2014). There are two additional travel camps located southwest of the Proposed Action area. Along with providing RV facility hook-ups and tent camping, there is boat access to the Potomac River and fishing and recreation piers.

### *3.1.2 Environmental Consequences*

#### *3.1.2.1 Threshold of Significance*

Impacts on land use could occur when the implementation of a project creates an inconsistency between the actual use of the land and the underlying land use designation, or when a project is incompatible with adjacent or surrounding land uses (i.e., siting an industrial facility in a residential area).

#### *3.1.2.2 Impacts of Proposed Action*

The Proposed Action site is situated within an area of the Fort Belvoir Main Post designated as a Community Land Use Zone. This classification generally includes recreational use and development; therefore, the construction and operation of a new travel camp expansion would be consistent with the current land use designation. There would be no beneficial or adverse impacts to this resource at Fort Belvoir because there would no changes in land use as a result of the Proposed Action.

#### *3.1.2.3 Impacts of No Action Alternative*

Under the No Action Alternative, the Proposed Action would not be constructed. There would be no impacts to land use on Fort Belvoir because the current land use would remain unchanged.

## 3.2 GEOLOGY, TOPOGRAPHY AND SOILS

### *3.2.1 Affected Environment*

#### *3.2.1.1 Geology*

Fort Belvoir spans the eastern part of the Piedmont province and the upper part of the Coastal Plain Physiographic province (from west to east) and exhibits characteristics of both provinces. The Fall Line, which runs north to south through Virginia, crossing Fairfax County at approximately the I-95 corridor, forms the transition zone between the resistant, igneous and metamorphic rock of the Piedmont and the softer, sedimentary rocks of the Coastal Plain.

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

#### *3.2.1.2 Topography*

The terrain at Fort Belvoir consists of wide, flat plateaus dissected by steep ravines. Elevation decreases from west to east, ranging from a high of 300 feet above mean sea level (MSL) in the northwestern corner of Fort Belvoir to 230 feet above MSL at the intersection of Beulah Street and Woodlawn Road near the northern edge of Main Post, to sea level at the eastern edge of Main Post along the Potomac River (Fort Belvoir, 2017).

Topography varies throughout the study area, with the highest elevation approximately 130 feet above MSL, located in the central area of the site, and the lowest elevation approximately 80 feet above MSL located in the southeastern corner of the site (**Figure 3-2**). The site slopes down to the east, west and north from this central area. The southeastern area of the site has steep slopes (greater than 25 percent grade) down into the ravine of a perennial stream outside and east of the Proposed Action area. The western and southwestern areas gently slope down and flatten at Morrow Road.

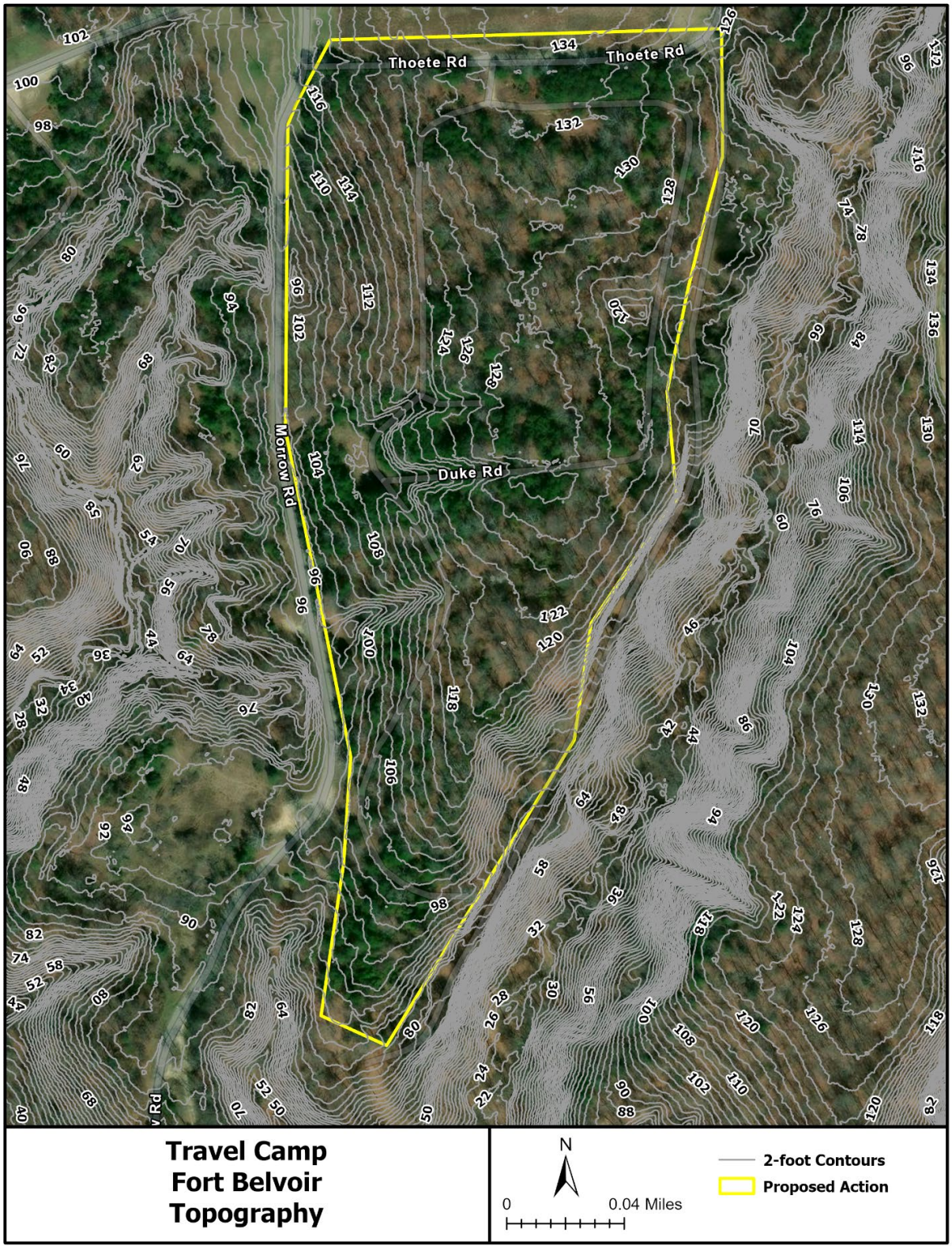


**Figure 3-2: Topography on the Proposed Action Site**

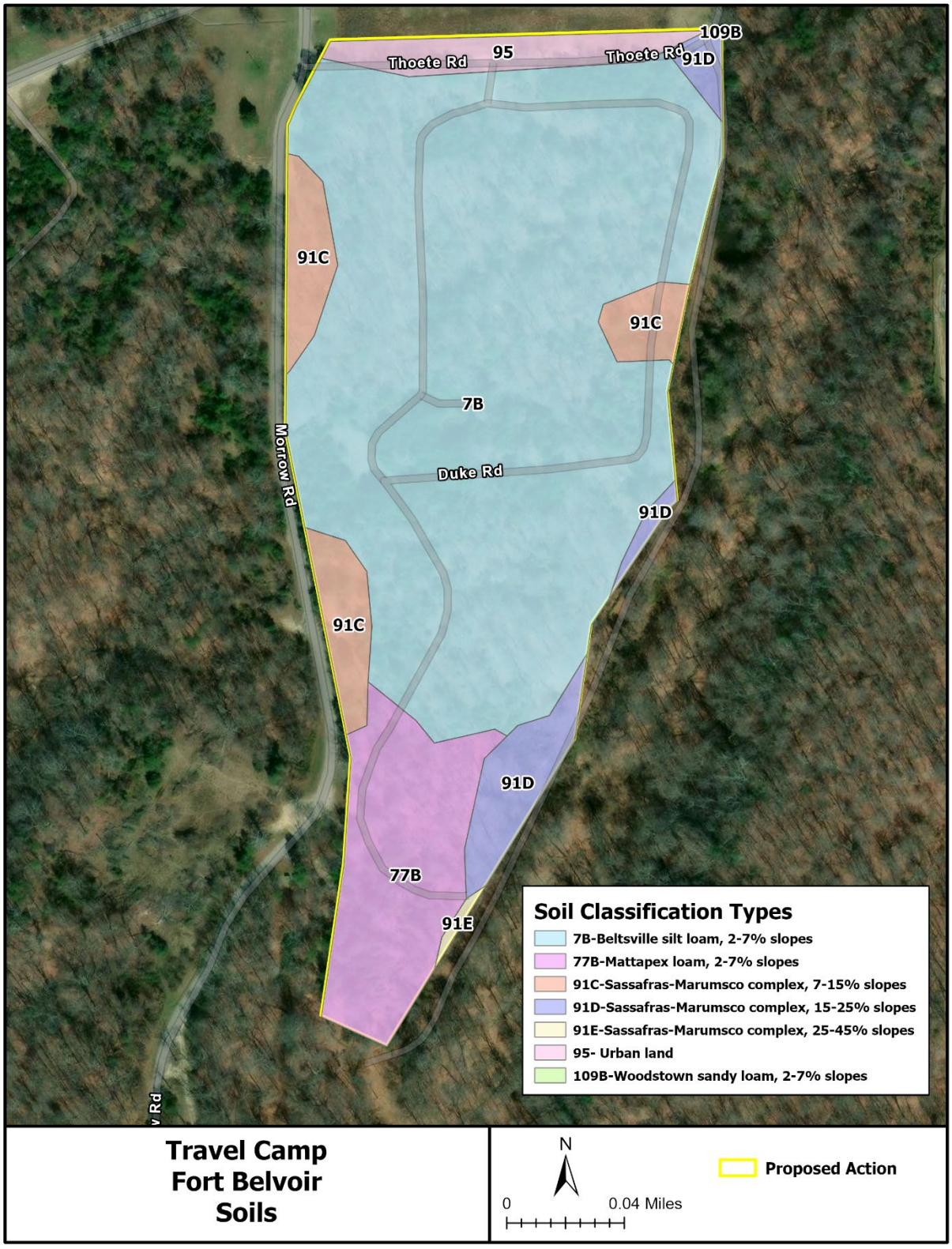


**Figure 3-3: Soils on The Proposed Action Site**

*3.2.1.3 Soils*

There are seven soil types within the Proposed Action area (**Figure 3-3, Table 3-2**). It is comprised primarily of Beltsville silt loam, 2 to 7 percent slopes, according to the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), soils map (USDA, 2024). The next most prevalent soil type is Mattapex loam, 2 to 7 percent slopes; followed by Sassafras-Marumsco complex, 7 to 15 percent slopes. All other soil types make up less than 5 percent of the Proposed Action area. Soil types are moderately to well drained and are non-hydric.

Previous site usage of Solid Waste Management Unit (SWMU) MP-13, property north of the Proposed Action site is associated with long term use of the site by the Army and civilian interests for vehicle and equipment storage (post WWII-mid 1990's), contractor activities (mid 1990's to 2018), and anecdotally as a former equipment wash yard. Polychlorinated biphenyl (PCBs) impacted soil was removed from the site in 2019. Further information about the status of the site can be found in **Section 3.5** and **Section 3.3.**

**Table 3-2: Soil Types within the Proposed Action Site**

| Map Unit Symbol | Soil | Approximate acreage within Proposed Action area (acres) | Drainage Class | Hydric |
|---|---|---|---|---|
| 7B | Beltsville silt loam, 2 to 7 percent slopes | 15.9 | Moderately well drained | No |
| 77B | Mattapex loam, 2 to 7 percent slopes | 2.7 | Moderately well drained | No |
| 91C | Sassafras-Marumsco complex, 7 to 15 percent slopes | 1.5 | Well drained | No |
| 91D | Sassafras-Marumsco complex, 15 to 25 percent slopes | 1.1 | Well drained | No |
| 91E | Sassafras-Marumsco complex, 25 to 45 percent slopes | 0.1 | Well drained | No |
| 95 | Urban land | 0.8 | NA | NA |
| 109B | Woodstown sand loam, 2-7 percent slopes | 0.0 | Moderately well drained | No |
| Notes: Hydric criteria refer to the potential of a soil to support vegetation and/or hydric conditions indicative of wetlands. NA=Not Applicable | | | | |

*Source: NRCS, 2024*

### *3.2.2 Environmental Consequences*

#### *3.2.2.1 Threshold of Significance*

Geology, topography, and soil impacts are evaluated separately in the following sections. The impacts on geology are analyzed based on potential changes caused by the Proposed Action to bedrock, unique sensitive landforms, or rock foundations. The impacts on topography are analyzed on potential changes to surface features, especially steep slopes. Impacts to soils are analyzed based on potential changes to soil type, erosion, and sedimentation due to the implementation of the Proposed Action.

#### *3.2.2.2 Impacts of Proposed Action*

##### 3.2.2.2.1 Geology

The construction and operation of the Proposed Action would have no adverse or beneficial impacts on the underlying geology of the area. There would be no bedrock blasting or impacts to bedrock outcrops during the construction of the proposed travel camp expansion that would impact the geology of Fort Belvoir.

##### 3.2.2.2.2 Topography

The construction of the Proposed Action would have short-term, minor, direct, adverse impacts on the topography of the site. Short-term impacts would be expected from the excavation and grading employed to prepare the site for construction. Areas impacted during construction would be re-graded to prior conditions. It would not result in the alteration or destruction of any unique or noteworthy topographic features within Fort Belvoir.

Long-term, minor, direct, adverse impacts from the operation of the Proposed Action would be expected as the elevations would be permanently altered to support the buildings, the cement pads, roads, and stormwater management system. Development would be located in the north-central area of the site to maximize the use of topographic highs to the extent possible. There would be no construction on the steep slopes of the southeastern area of the site.

##### 3.2.2.2.3 Soils

The construction of the Proposed Action would have short-term, minor, direct adverse impacts on soils from construction activities. Ground-disturbing activities would include vegetation and topsoil removal, the removal of mature landscape trees, and grading. Soils would be compacted, and soil layer structure would be disturbed and modified. Exposed soils would be susceptible to wind and surface runoff, which may lead to erosion and additional loss of soil. Any areas that were impacted during construction would be re-graded and native vegetation planted to restore soil stabilization on the site.

To minimize potential erosion impacts during the construction phase, a Stormwater Pollution Prevention Plan (SWPPP) would be prepared in accordance with Virginia Department of

Environmental Quality (VADEQ) Virginia Pollutant Discharge Elimination System (VPDES) regulations, 9 Virginia Administrative Code (VAC) 25-870-54 SWPPP Requirements, and the Virginia Stormwater Management Act. Additionally, a site-specific Erosion and Sediment Control (ESC) plan would be prepared prior to land disturbance in accordance with the Virginia Erosion and Sediment Control Regulations (9 VAC 25-840). The ESC plan would employ Best Management Practices (BMPs) and include strict measures consistent with the Virginia Erosion and Sediment Control Handbook to minimize erosional impacts.

In addition, stormwater management BMPs would be used to help minimize impacts to exposed soils during and following construction. These BMPs include revegetating soils as soon as possible with native, non-invasive vegetation, surrounding exposed soils with silt fence and synthetic hay bales, designating specified loading and unloading areas, covering exposed soils during anticipated storm events, and minimizing construction vehicle traffic on exposed soils to the maximum extent practicable.

Operation of the Proposed Action would have long-term, minor, direct, adverse impacts at the Proposed Action area due to the disturbance of the soil layer profile and loss of topsoil in the new impervious areas. The operation of the Proposed Action would add over 20 acres of impermeable surface to the area. However, the design would include stormwater management BMPs through the implementation of low impact development (LID) measures in compliance with Section 438 of the Energy Independence and Security Act (EISA). This would minimize long-term soil erosion by maintaining the pre-project hydrology of the site.

#### *3.2.2.3 Impacts of No Action Alternative*

Implementation of the No Action Alternative would have no impacts on topography, geology, or soils. The travel camp expansion would not be constructed, and there would be no activities that would change the topography, geology, or the existing soil quality of the site.

## 3.3 WATER RESOURCES

### *3.3.1 Affected Environment*

#### *3.3.1.1 Surface Water*

Surface waters at Fort Belvoir drain to the Potomac River or adjacent bays (Gunston Cove, Accotink Bay, and Pohick Bay), either directly or through one of the three tributaries that run through the installation: Accotink Creek, Pohick Creek, and Dogue Creek. A baseline watershed survey (Landgraf, 1999) identified seven main watersheds on Fort Belvoir. The Proposed Action area lies within the Accotink watershed and in the sub-watershed of Gunston Cove (Fort Belvoir, 2017). Gunstone Cove is sub watershed 11 of the Accotink Creek Watershed (**Figure 3-4**).

The Gunston Cove watershed consists of areas on Fort Belvoir that drain directly from Fort Belvoir into Gunston Cove, without first entering Accotink Bay or Pohick Bay. Gunston Cove then connects to the Potomac River. Of the seven Fort Belvoir watersheds, the Gunston Cove watershed contains the second highest percentage of both impervious surface and open area (16.49 percent

and 31.66 percent, respectively). The watershed also contains the lowest percentage of wetlands (2.98 percent). Within the watershed, steeply graded tributary streams coming down from the upper plateau area accelerate downstream gully and bank erosion. Sediment from the gully erosion is deposited in the wetland areas prior to Gunston Cove and continue to have impacts on water quality in the area.

Section 303(d) of the CWA and the United States Environmental Protection Agency's (USEPA's) Water Quality Planning and Management Regulations (40 CFR Part 30) states to identify and list water bodies in which current controls of a specified pollutant are inadequate to achieve water quality standards. Additionally, states are required to develop Total Maximum Daily Loads (TMDL) for water bodies that are not meeting water quality standards. TMDLs represent the total pollutant loading that a water body can receive without exceeding water quality standards.

Fort Belvoir discharges into several impaired receiving surface waters including the Potomac River (VADEQ, 2022). Impaired waters of Virginia are outlined in the biennial Virginia Water Quality Assessment 305(b)/303(d) Integrated Report. According to the 2022 report, the Potomac River is a Category 4A impaired water for PCBs found in fish tissues. Accordingly, a TMDL of 1,510 g/year has been developed for the Potomac River Basin for PCBs (ICPRB, 1007; VADEQ, 2022). Additionally, the Chesapeake Bay Basin has a TMDL for total nitrogen (185.9 million pounds), total phosphorous (12.5 million pounds), and sediment (6.45 billion pounds) which all contribute to impairments of the Chesapeake Bay (USEPA, 2010). Because waters of Fort Belvoir flow into the Potomac River and the Chesapeake Bay, the installation has developed action plans to address these TMDL requirements (Fort Belvoir, 2021, 2023b).

The Proposed Action area has a varied topography with a high, relatively flat area on the northern side, gentle slopes to the west and southwest, and steep slopes to the east and southeast. There are two unnamed stream systems to the east and west of the Proposed Action area (Fort Belvoir, 2017). They flow from north to south and into Gunston Cove, which then connects to the Potomac River. The main branch of both streams is perennial, and both have intermittent stream tributaries. Perennial streams typically have water flowing in them year-round. Most of the water comes from smaller upstream waters or groundwater while runoff from rainfall or other precipitation is supplemental.

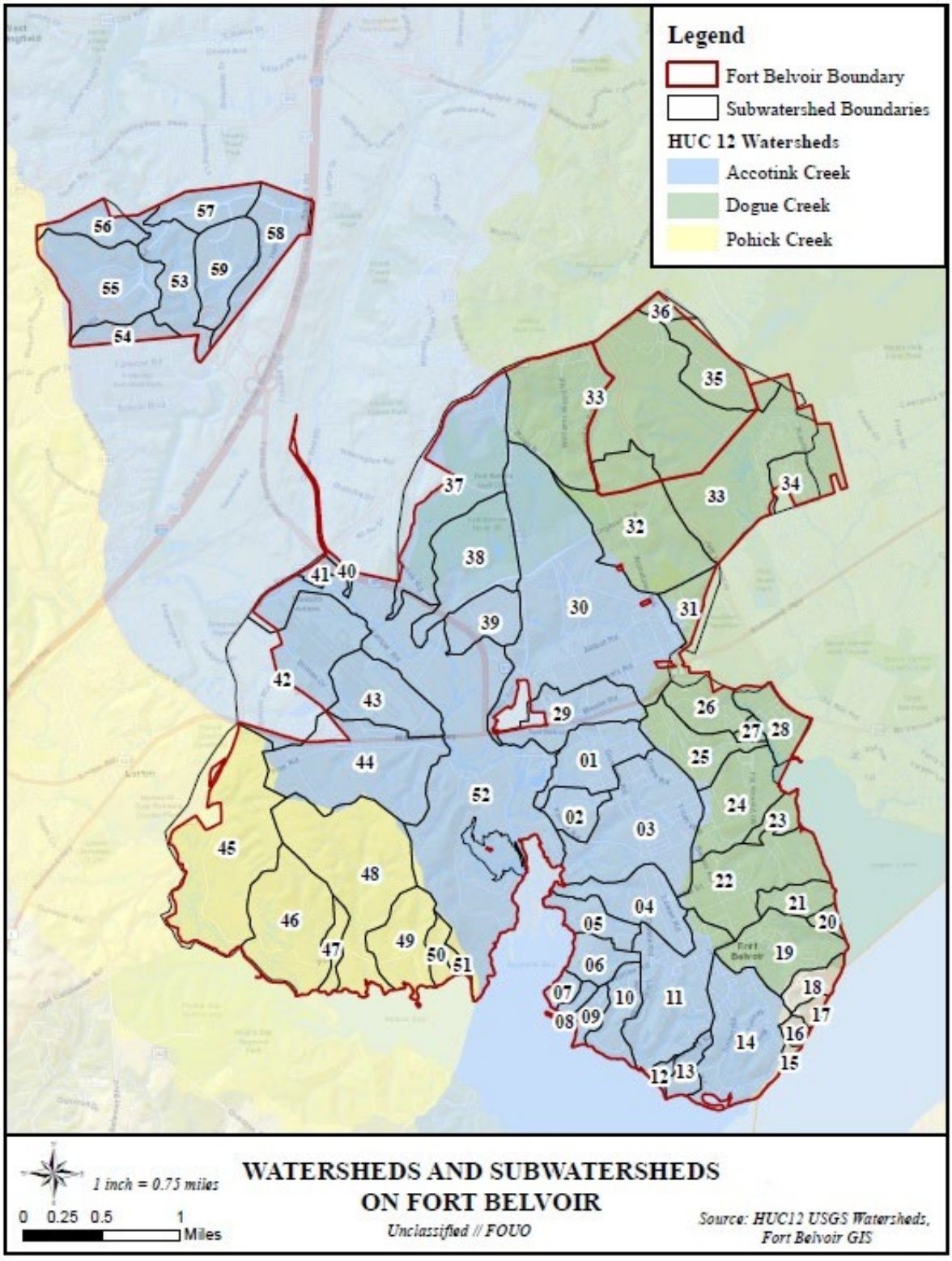


**Figure 3-4: Watershed of Fort Belvoir**

Intermittent streams have flow during certain times of the year when smaller upstream waters are flowing and when groundwater provides enough water for stream flow. Runoff from rainfall or

other precipitation supplements the flow of intermittent streams. During dry periods, intermittent streams may not have flowing surface water (USEPA, 2024).

On the eastern and southern side of the Proposed Action area, surface water flows from the central area to the east and southeast off-site and into the eastern unnamed tributary of Gunston Cove (Denton and Scott, 2017). Surface water on the western side flows from the central area to the west off-site and into the western unnamed tributary of Gunston Cove.

A water resources survey conducted by USACE Baltimore District 21-22 February 2024, determined that there were no Waters of the United States (WOUS) or isolated wetlands and streams within the Proposed Action area (**Appendix B**). Two intermittent streams were identified east and south of the site using the *North Carolina Division of Water Quality Methodology for Identification of Intermittent and Perennial Streams and Their Origin*. The streams drain into the Gunston Cove unnamed tributary east of the Proposed Action area (**Figure 3-5**).

#### *3.3.1.2 Groundwater*

Fort Belvoir is underlain by three main aquifers: Lower Potomac, Middle Potomac, and Bacons Castle Formation. The Lower Potomac aquifer is the primary aquifer on the installation and in eastern Fairfax County. This aquifer exists between a layer of crystalline bedrock and a thick wedge of clay that contains interbedded layers of sand. Water in the Lower Potomac Aquifer flows to the southeast and is recharged in the western section of Fort Belvoir and to the north and west of the installation. Depth to the water table on the installation fluctuates based on precipitation, leakage, and evapotranspiration, but is typically 10 to 35 feet below ground surface. However, the water table may be at or near the surface near streams in the form of shallow, unconfined aquifers or perched water tables.

#### *3.3.1.3 Floodplains*

One-hundred-year floodplains on Fort Belvoir are protected under EO 11988, *Floodplain Management* (May 24, 1977), which directs federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. The EO was issued in furtherance of NEPA, the National Flood Insurance Act of 1968, and the Flood Disaster Protection Act of 1973. Floodplains are defined in EO 11988 as the “lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year.” The term "100-year flood" is used to describe the recurrence interval of floods. The 100-year recurrence interval means that a flood of that magnitude has a one percent chance of occurring in any given year. In other words, the chances that a river will flow as high as the 100-year flood stage this year is 1 in 100 (USGS, 2018).

A review of the Federal Emergency Management Agency (FEMA) National Flood Hazard Layer, accessed on 7 March 2024, shows the Proposed Action area is within FEMA Flood Insurance Rate Map (FIRM) area 51059C0395E (FEMA, 2024). Floodplains in the vicinity of the Proposed Action area are shown on **Figure 3-6.** These maps indicate that the Proposed Action area is entirely

within Zone X, defined as an area determined to be outside the 100- and 500-year floodplain. The nearest 100-year floodplain is approximately 650 feet south of the Proposed Action area and there are no 500-year floodplains within the vicinity.

#### *3.3.1.4 Resource Protection Areas*

EO 13508, *Chesapeake Bay Protection and Restoration* establishes the protection and restoration of the Chesapeake Bay Watershed in terms of meeting the goals, outcomes and objectives set out in the Strategy for Protecting and Restoring the Chesapeake Bay Watershed. This document encourages coordination with state, local, and non-governmental partners to protect and restore the health of the Chesapeake Bay Watershed. The Army also adheres to the 2024 *U.S. Army Chesapeake Bay Strategy* which is a science-based action agenda that reflects adaptive management principles and contributes to the long-term recovery of the Chesapeake Bay.

Virginia's Chesapeake Bay Preservation Act (CBPA), Virginia Code 10.1-2100 et seq., and its implementing Chesapeake Bay Preservation Area Designation and Management Regulations, 9 VAC 10-20-120 et seq., protect certain lands, designated as Chesapeake Bay Preservation Areas, which, if improperly developed, could result in substantial damage to the water quality of the Chesapeake Bay and its tributaries. Projects that occur on lands that are protected under the CBPA must be consistent with the Act and may be subject to the performance criteria for Resource Protection Areas (RPAs) as specified in §9 VAC 10-20-130. Under the CBPA, Fairfax County adopted a Chesapeake Bay Preservation Ordinance that designates RPAs and Resource Management Areas within the county.

The purpose of the RPA is to maintain or restore a vegetated buffer between development and tributaries to the Chesapeake Bay, with the assumption that such a buffer traps nutrients and pollutants in runoff and groundwater before reaching the Chesapeake Bay. RPAs include tidal wetlands; tidal shores; nontidal wetlands connected by surface flow and contiguous to tidal wetlands; or waterbodies with perennial flow, and a minimum 100-foot buffer landward of the other RPA components. Development in these areas should be avoided and/or minimized.

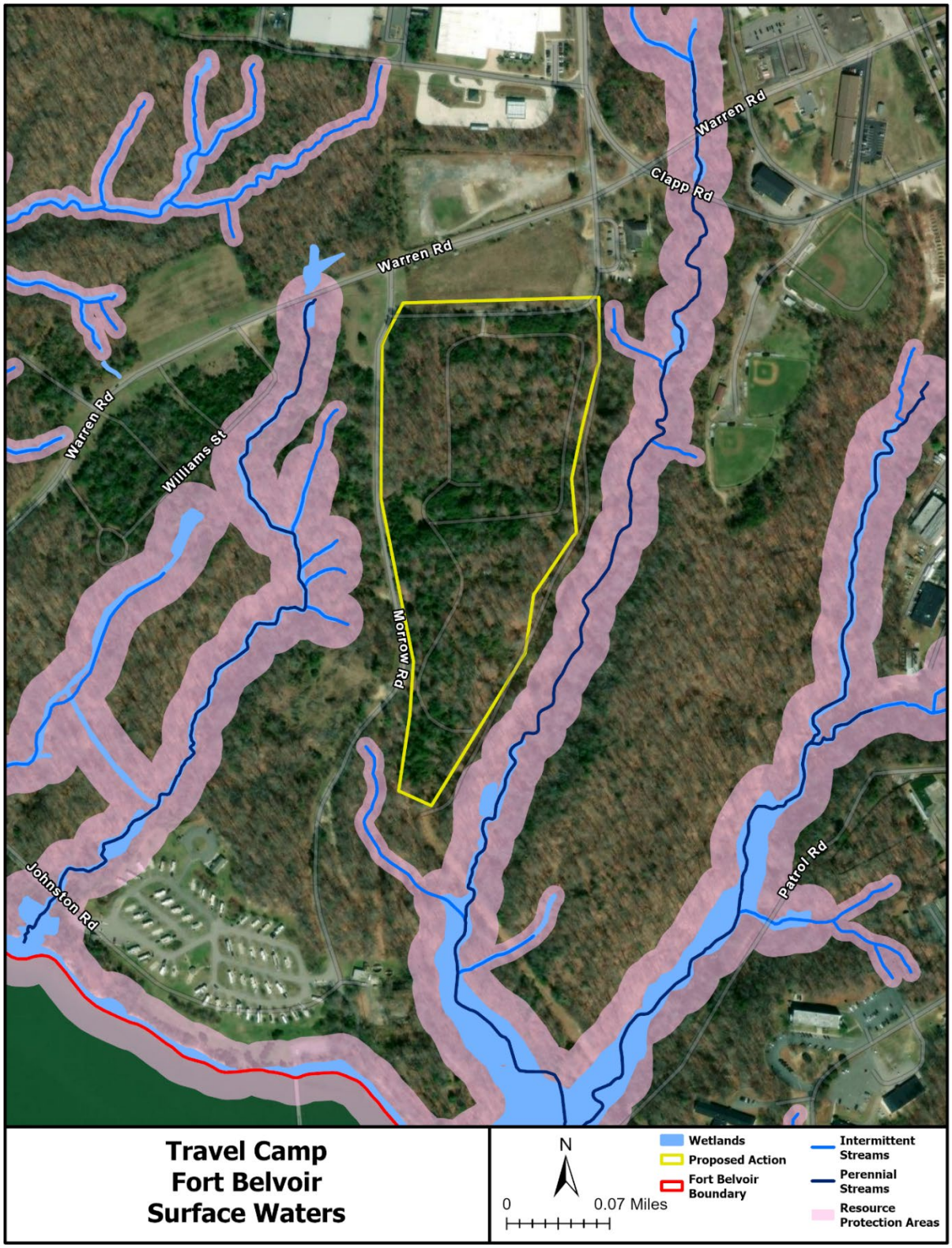


**Figure 3-5: Surface Waters and Resource Protection Areas**


**Figure 3-6: Floodplains Near Proposed Action Site**

When impacts occur, an additional review is conducted to determine the extent of impact, as well as mitigation for the RPA infringement. Mitigation for RPA impacts typically includes the replanting of trees and/or shrubs at a predetermined ratio or the enhancement of a degraded RPA elsewhere on Fort Belvoir. RPAs are typically addressed during the wetland permitting process or the Coastal Zone Management Act (CZMA) consistency determination process.

Fort Belvoir recognizes the RPA designation but being a federal entity, is not subject to the provisions of the Fairfax County ordinance. While Fort Belvoir does not use the RPA maps produced by Fairfax County, the Army does delineate RPAs on the installation, reflecting a spirit of compliance with the state and local requirements. Fort Belvoir designates a 100-foot RPA for perennial streams and associated wetlands and a 35-foot RPA buffer for intermittent streams and associated wetlands (Fort Belvoir, 2023a).

Within the vicinity of the Proposed Action area, there are RPAs associated with the intermittent and perennial streams and their adjacent wetlands to the east, west, and south of the site. These RPAs are all outside of the Proposed Action boundary (**Figure 3-5**).

#### *3.3.1.5 Wetlands*

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

EO 11990, *Protection of Wetlands* (May 24, 1977), requires federal agencies to take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. Construction in jurisdictional wetlands and WOUS is regulated by the USACE pursuant to Section 404 of the CWA as implemented in regulations contained in 33 CFR, Parts 320–330. Impacts to state waters, including wetlands, are regulated by the Virginia Water Protection Permit Program (9 VAC 25-210-10 et seq.), which serves as Virginia's 401 Water Quality Certification Program for federal Section 404 Permits.

The predominant wetland type on Fort Belvoir is palustrine forested (PFO), which tends to occur in association with the riparian areas of Accotink, Dogue, and Pohick Creeks. Wetlands generally occur along the perennial and intermittent streams that are drainages of these creeks (Fort Belvoir, 2017).

A February 2024 USACE water resources survey confirmed that there are no wetlands, either isolated or connected to any WOUS, located within the Proposed Action area (**Figure 3-5**). PFO wetlands associated with perennial streams and their intermittent tributaries are found east, west, and south of the site according to the Fort Belvoir Integrated Natural Resource Management Plan (INRMP) (Fort Belvoir, 2017).

### *3.3.1.6 Stormwater*

As described in the earlier section on Surface Water (**Section 3.3.1.1**), the Proposed Action area is located within the Accotink Creek watershed. Stormwater is directed by the topography of the site, through the western, eastern and southern downhill slopes that connect to the unnamed streams that flow into Gunston Creek. Existing stormwater management structures on the site include four storm discharges that convey surface water through open drainages to the east and the west of the site and into the unnamed tributaries of Gunston Cove**.** These structures were from the previous development of the site and are currently unmaintained.

Stormwater runoff in urban areas is one of the leading sources of water pollution in the United States. Recognizing the importance of controlling stormwater generated from development, federal, state and local governments have adopted requirements for stormwater management. Water quality impacts on the waterways of Fort Belvoir relate mostly to urbanization, including issues related to bacteria, changes in stream morphology from increased impervious surface, and sedimentation. Development that increases the imperviousness of watersheds generates more stormwater runoff, leading in turn to erosion of stream channels and transport of sediment, other particulates, and dissolved nutrients to downstream surface waters. Erosion of stream channels can severely damage the channel and those features of the channel that provide habitat for fish, amphibians, aquatic insects, and other invertebrates. An excess of sediment and particulates could also degrade water quality downstream. The following regulations for stormwater management at Fort Belvoir apply:

**Federal Requirements**

- National Pollutant Discharge Elimination System (NPDES) - Section 402 of the Federal CWA, known as the NPDES program, requires permits for the discharge of pollutants from point sources and is administered by VADEQ through its Virginia Stormwater Management Program. Fort Belvoir operates a municipal separate storm sewer system (MS4) for the entirety of the installation pursuant to the NPDES regulations, and discharges stormwater runoff under VPDES Stormwater Permit No. VAR040093. Stormwater runoff generated by development on Fort Belvoir, including the Proposed Action, would be included under the installation-wide permit, provided the proponent complies with its terms and conditions and coordinates with the appropriate personnel on Fort Belvoir.

- Energy Independence and Security Act (EISA), Section 438 – federal projects 5,000 square feet in size or greater are required to maintain or restore pre-development hydrology. Guidance provided by the USEPA promotes retaining rainfall on-site through infiltration, evaporation/transpiration, and re-use to the same extent as occurred prior to development. Section 438 requires that LID or green infrastructure, including reducing impervious surfaces and using vegetative practices, porous pavements, cisterns and green roofs be incorporated into development plans.

- LID is a stormwater management approach that emphasizes the retention of native vegetation and soils, reduces runoff, and seeks to approximate predevelopment hydrologic conditions. LID provides an effective alternative to more traditional stormwater management approaches that rely on engineered structures. When properly used, LID can

be cost effective by reducing the reliance on hard structures. It can make more efficient use of land resources by reducing the need for large, centralized stormwater basins, decreasing the total amount of runoff generated, and providing water-quality improvements.

**VADEQ Requirements**

- Stormwater Management Act (9 VAC 25-870)
    - General Permit for Discharges of Stormwater from Construction Activities
    - Virginia BMP Clearinghouse
    - Virginia Runoff Reduction Method
- Erosion and Sediment Control Law (9 VAC 25-840)
    - ESC
    - Virginia ESC Handbook
- Chesapeake Bay Preservation Area Designation and Management (9 VAC 25-830-130)
    - Construction activities disturbing one or more acres, requires:
        - General Permit for the Discharge of Stormwater from Construction Activities
        - SWPPP, developed by the project proponent, requiring stormwater management measures as included in the approved site plan, and demonstration of how these measures would be maintained, identifying the responsible entity throughout duration of construction.

**Installation Requirements**

- Fort Belvoir Department of Public Works (DPW) reviews all construction site plans involving 2,500 square feet or more of earth disturbance for compliance with the MS4 conditions, state requirements for stormwater management and erosion/sediment control, and the Fairfax County Public Facilities Manual.

#### *3.3.1.7 Coastal Zone*

The CZMA of 1972 (16 USC §1451 et seq., as amended) aids the states, in cooperation with federal and local agencies, for developing land and water use programs in coastal zones. Section 307 (c)(1) of the CZMA Reauthorization Amendment stipulates that federal projects that affect land uses, water uses, or coastal resources of a state's coastal zone must be consistent to the maximum extent practicable with the enforceable policies of that state's federally approved coastal management plan. Virginia has developed and implemented a federally approved Coastal Resources Management Program (CRMP) describing current coastal legislation and enforceable policies. Virginia's Coastal Zone includes all of Fairfax County, including Fort Belvoir. VADEQ regulates activities that are proposed within the CZMA Program through federal consistency requirements. Under these requirements, applicants for federal and state licenses or permits must certify their proposed activity will be conducted in a manner consistent with the State's CZMA Program. A Coastal Zone Consistency determination has been prepared for this project and is included in **Appendix C**.

### *3.3.2 Environmental Consequences*

#### *3.3.2.1 Threshold of Significance*

The threshold of significance for groundwater and surface water quality impacts would be exceeded if a proposed action would result in changes to regional groundwater patterns or depletion of groundwater, alteration of local surface water, or degradation of water quality such that water quality standards would be exceeded. The threshold of significance for wetlands, RPAs, and floodplains would be exceeded if a proposed action would result in degradation of wetlands without mitigation, or result in a permanent, adverse change to the movement of surface water such that noticeable increased flooding occurs. For stormwater resources, the threshold of significance, would be exceeded if a proposed action resulted in noncompliance in stormwater permitting, regulations, or resulted in the degradation of water quality from increased flow. For coastal zone resources, the threshold of significance would be exceeded if a proposed action would not be consistent with Virginia's Coastal Resources Management Policies.

#### *3.3.2.2 Impacts of Proposed Action*

##### 3.3.2.2.1 Surface Waters and RPAs

There are no streams or associated RPAs within the Proposed Action area. All RPAs in the vicinity of the area would be avoided. However, construction of the Proposed Action could result in short-term, minor, direct, adverse impacts to surface water from the destabilization of the soils as a result of vegetation clearing and excavation/grading to prepare the site. This stage of construction exposes soils and increases the potential for erosion and discharge of sediment-laden stormwater to downstream receiving waters. However, appropriate ESC and stormwater management measures pursuant to the construction SWPPP and the VPDES Construction General Permit would minimize any detrimental impacts.

Prior to construction, ESC and stormwater management plans would be developed that specify measures that would be put in place to avoid or minimize erosion and sedimentation. Such measures may include, but are not limited to, silt fencing, use of synthetic hay bales, temporary sediment traps, and other similar measures. The Proposed Action would be coordinated and approved through the Fort Belvoir DPW, and routine inspections would be conducted throughout construction to ensure compliance.

Fort Belvoir has developed the Chesapeake Bay TMDL Action Plan per the requirements of 9VAC25-880-70 Part II.B.5 (Fort Belvoir, 2023a). In compliance with this, permanent or temporary soil stabilization would be applied to denuded areas within seven days after final grade is reached on any portion of the site. In addition, nutrients for re-vegetated areas would be applied in accordance with manufacturer's recommendations or any approved Nutrient Management Plan (NMP) and not be applied during rainfall events.

Fort Belvoir has also developed the PCB TMDL Action Plan per the requirements of 9 VAC 25-880-70 Part II.B.6 which requires the continued surface water monitoring of the PCB Site M-13 to the north of the Proposed Action area, as additional restoration efforts are on-going (Fort

Belvoir, 2021). The Proposed Action would ensure that all construction activities would not impact this site or the surface water monitoring locations.

Operation of the Proposed Action would not result in any impacts to surface waters and RPAs on Fort Belvoir. Construction of permanent stormwater management features using BMPs and LID technologies would capture stormwater generated from the development and be designed to maintain pre-development levels of off-site discharge. These measures are further described under the Stormwater section below.

3.3.2.2.2 Groundwater

Under the Proposed Action, no impacts are expected to occur to groundwater. The construction of the Proposed Action would result in an increase of impervious surface area, reducing the infiltration of stormwater into the shallow, near-surface aquifer; however, LID measures would be employed to minimize this impact. The Proposed Action would be required to retain all stormwater volume on site and would not be allowed to infiltrate into subsurface groundwater. In addition, no withdrawal of groundwater would be necessary to construct or operate the proposed travel camp expansion .

3.3.2.2.3 Floodplains

There are no expected impacts to floodplains as a result of the Proposed Action. The Proposed Action is not located within a floodplain and there is no potential to impact flood levels or floodways at Fort Belvoir.

3.3.2.2.4 Wetlands

There would be no impacts to wetlands as a result of the construction or operation of the Proposed Action. There are no wetlands within the Proposed Action area. To prevent indirect impacts to wetlands in the vicinity of the Proposed Action area, previously described ESC and stormwater management plans to avoid or minimize adverse impacts to surface water would also avoid or minimize impacts to wetlands. In addition, permanent stormwater management features would be employed using LID measures to minimize impacts from the increase in impervious surfaces at the Proposed Action area.

3.3.2.2.5 Stormwater

Under the Proposed Action, there could be short-term, minor, direct, adverse impacts to stormwater from construction activities due to ground disturbance that may lead to an increase in sediment run-off. Those potential impacts would be minimized through compliance with the terms of Fort Belvoir's MS4 Permit VAR040093. Under the terms of the permit, projects that disturb more than one acre of land are required to prepare and implement an ESC Plan, a SWM Plan, and a Construction General Permit, to be reviewed and approved by Fort Belvoir's DPW and by VDEQ as previously described in the **Section 3.3.1.1.** (Fort Belvoir, 2022).
Because the project is located within a Chesapeake Bay Preservation Area and would disturb more than 2,500 square feet, the contractor would also be required to prepare an ESC Plan in compliance

with the Virginia Erosion and Sediment Control Law (9 VAC 25-840) and in conformance with the *Virginia Erosion and Sediment Control Handbook, Third Edition, 1992*. The plan would be submitted to Fort Belvoir's DPW for review and approved by VADEQ's Northern Regional Office (NRO) and routine inspections would be conducted throughout construction to ensure compliance with these permits. The contractor would also obtain a Construction General Permit and prepare and implement a construction SWPPP to minimize sedimentation to downstream receiving water bodies.

There could be long-term, minor, direct, adverse impacts as a result of the operation of the Proposed Action. The existing stormwater structures would be removed and the stormwater management system would be updated and reconfigured, which would alter the stormwater drainage pattern of the Proposed Action area. The Proposed Action would increase the amount of impervious surface by over 20 acres on the site, which could result in an increase in the volume of stormwater runoff. Permeable surfaces would be employed where feasible to reduce runoff and promote infiltration. The proposed travel camp expansion design is a combination of concrete pads, buildings, and vegetated areas. Use of the natural vegetation areas would help minimize the amount of impervious area constructed for the Proposed Action. In addition, compliance with EISA Section 438 through the incorporation of LID measures in the design of the proposed travel camp expansion would ensure that the Proposed Action would not result in an increase in the volume of stormwater runoff. Examples of potential LID measures include underground detention, multiple bioretention facilities, infiltration berms or beds, porous pavement or other innovative stormwater design options.

3.3.2.2.6 Coastal Zone

Both the construction and operation of the Proposed Action would be consistent with Virginia's CRMP enforceable policies. Non-point source pollution would be managed with temporary ESC measures defined in the approved ESC Plan or permanent stormwater management BMPs, as appropriate. The Coastal Zone Consistency Determination will be submitted to Virginia as **Appendix C** in the Draft Final EA/Draft FONSI. Complete results of this coordination, including recommendations from VADEQ, are included in **Appendix C**.

### *3.3.2.3 Impacts of No Action Alternative*

Under the No Action Alternative, no adverse impacts would occur to water resources. The current level of stormwater infiltration and runoff discharge would occur. In addition, no effects to coastal zones or wetlands would occur without any new development associated with the Proposed Action.

## 3.4 BIOLOGICAL RESOURCES

### *3.4.1 Affected Environment*

Located on the western shore of the Potomac River, within the larger metropolitan area of Washington, D.C., Fort Belvoir sustains its military mission while maintaining relatively large areas of native vegetation in terms of size, diversity and regional position. Fort Belvoir has recognized the ecological importance of its natural habitats by designating three refuges, two biological corridors, wetlands and steep-sloped areas as environmentally constrained areas (Fort Belvoir, 2017). These large areas of native vegetation afford a contiguous band of wildlife habitat within and extending outside of the Installation. Fort Belvoir's natural resources management strategy, outlined in its INRMP, prioritizes preserving the native diversity of communities and species within communities and implements an ecosystem-based natural resources management program based in part on DoD Instruction 4715.3, *Natural Resources Conservation Program* and Army Regulation 200-1, *Environmental Protection and Enhancement*, to guide development on Fort Belvoir.

The Jackson Miles Abbott Wetland Refuge, T-17 Refuge, Accotink Creek Conservation Corridor, and Forest and Wildlife Corridor are designated Special Natural Areas by Fort Belvoir (**Figure 3-7**). The Accotink Creek Conservation Corridor was designated as a Special Natural Area in 2005. This predominantly forested 191-acre area serves as a wildlife migratory corridor and supports potential habitat for federally listed small whorled pogonia (*Isotria medeoloides*) and several other species of management concern (Fort Belvoir, 2017). This lies over a mile to the west of the Proposed Action area. The T-17 Refuge is the closest special nature area to the Proposed Action, bordering it to the east, south, and west along the Gunston Cove shoreline.
The T-17 Refuge was designated as a Special Natural Area under the 2005 BRAC EIS Record of Decision (U.S. Army, 2007a) to protect the *Stygobromus phreaticus*, northern Virginia Well Amphipod. The boundaries of this Special Natural Area were delineated to include the groundwater seepage area where *Stygobromus phreaticus* and other rare *Stygobromus* species are encountered, along with an estimated area of influence for groundwater recharge to that seepage area. The boundary delineation considered Fort Belvoir's mission and included the steep-sloped riparian areas and down-slope wetlands, areas that are not suitable for development, and excluded the upper, previously disturbed plateau (now in use as ball fields). For ease of management, the boundary of this Special Natural Area was set at the 100-foot contour and below. The area encompasses approximately 70 acres.

Biological resources discussed in the following sections include vegetation, wildlife, rare, threatened and endangered species (RTE), and Partners in Flight (PIF) habitat. Relevant regulations and policies are also discussed when applicable. The area of analysis for biological resources focuses on the Proposed Action Site, taking into account a broader geographic range when appropriate.

#### *3.4.1.1 Vegetation*

The Fort Belvoir 2017 INRMP characterizes the Proposed Action area as hardwood forest. Some of the area was previously disturbed and developed but allowed to regrow and become small pieces of early successional species mainly comprised of Virginia pine (*Pinus virginiana*). However, these sections are small and insignificant as they are surrounded by mature overstory trees. No tree planting mitigations have been done at the Proposed Action Site, and no tree planting mitigation sites will be impacted by the Proposed Action.

A forest stand delineation was conducted by the USACE Baltimore staff in February of 2024 to inventory the vegetation and characterize the site. Nearly the entire Proposed Action site is forested. Forest stands were distinguished primarily by differences in species composition and successional stage and ranked as Priority 1, 2, or 3 following the guidelines of the *Maryland State Forest Conservation Technical Manual*. Although this method is not a regulatory requirement in Virginia, it provides an efficient and comprehensive approach for cataloging and prioritizing forest resources. Priority 1 stands have wetlands, specimen trees of 30-inch diameter at breast height (dbh) or greater, intermittent or perennial streams, steep slopes, and/or other sensitive areas. Priority 2 stands may contain some elements listed for Priority 1 and/or have a designation of priority in a local land use plan, local forest conservation program, or other criteria adopted by a local forest conservation program. Priority 3 areas have evidence of increasing levels of human disturbance compared to Priority 1 and 2 areas. The Proposed Action was characterized as a single stand of mature white oak (*Quercus alba*) with a tree canopy dominated by trees of size class 20 to 29.9 inches dbh. The forest stand is considered a Priority 1 stand because it contains 29 specimen trees, steep topography, and contains wetlands/streams. No wetlands or streams are within the Proposed Project area outline; however, the forest stand continues outside of the Proposed Action area. The areas adjacent to the Proposed Action area, but within the same forest stand contain wetlands/streams (**Figure 3-6).**

Within the forest stand, trees in the sub canopy include red maple (*Acer rubrum,*) tree-of-heaven (*Ailanthus altissima*), American beech (*Fagus grandifolia*), sweetgum (*Liquidambar styraciflua*), tulip poplar (*Liriodendron tulipifera*), black tupelo (*Nyssa sylvatica*), Virginia pine, loblolly pine (*Pinus taeda*), southern red oak (*Quercus falcata*), chestnut oak (*Quercus montana*), pin oak (*Quercus palustris*), and black locust (*Robinia pseudoacacia*). The understory from 3 feet to 20 feet tall averages 67 percent coverage and includes red maple, American beech, green ash (*Fraxinus pennsylvanica*), American holly (*Ilex opaca*), eastern red cedar (*Juniperus virginiana*), border privet (*Ligustrum obtusifolium*), sweetgum, tulip poplar, black tupelo, Virginia pine, bigtooth aspen (*Populus grandidentata*), black cherry (*Prunus serotina*), white oak, southern red oak, and chestnut oak. Common herbaceous and woody species 0 feet to 3 feet tall consist of red maple, oriental bittersweet (*Celastrus orbiculatus*), striped wintergreen (*Chimaphila maculate*) American beech, American holly, eastern red cedar, border privet, Japanese honeysuckle (*Lonicera japonica*), southern red oak, and black raspberry (*Rubus occidentalis*) with 47 percent coverage.

Fort Belvoir's *Tree Removal and Protection Policy* requires the protection of existing trees and, where tree loss is unavoidable, mitigation for the removal of trees must be performed unless expressly exempted. In-kind mitigation measures include replacing any trees four inches or greater dbh that are removed with the planting of two new trees. Out-of-kind compensatory mitigation,

such as environmentally beneficial restoration, enhancement, or preservation measures may be completed if in-kind mitigation is not a feasible option (Fort Belvoir, 2018). Pursuant to the *Tree Removal and Protection Policy*, a Tree Protection Plan must be prepared in accordance with Fort Belvoir DPW requirements and included as part of the 35 percent design submittal for construction projects. The Proposed Action would minimize tree clearing and maximize on-site tree plantings, including options such as evergreens to address viewshed impacts and provide additional seasonal noise buffers to residential communities. In addition, the Army would continue to work closely with Fairfax County on a Memorandum of Understanding that would include identifying additional tree replanting opportunities throughout the Accotink Watershed, and such areas may include Fairfax County Public School properties and outreach programs.

#### *3.4.1.2 Wildlife*

Installation-wide surveys have documented diverse wildlife species occurring on Fort Belvoir. It provides the potential habitat for 43 species of mammals, 263 species of birds, 32 species of reptiles, 27 species of amphibians, and 60 species of fish. More than 2,500 acres of land have been set aside on Fort Belvoir for wildlife including the special nature areas displayed in **Figure -3-7.** Species of concern within the Proposed Action area are shown in **Figure 3-8.**

A number of aquatic species and their habitat exist in the streams, creeks, and wetlands on Fort Belvoir. A full listing of species and habitat are found in the Fort Belvoir's INRMP. Most of the installation's smaller tributary streams tend to have a less diverse fish assemblage, most likely due to limitations. in habitat and possibly water quality problems from stormwater or other inputs. Also, the small size and intermittent flow conditions of most of the smaller tributaries preclude all but the smallest fish species from inhabiting the smaller streams (Fort Belvoir, 2001).

The Proposed Action area is primarily upland with adjacent wetlands. These types of habitats support a variety of species found on Fort Belvoir including the eastern chipmunk (*Tamias striatus*), southern flying squirrel (*Glaucomys Volans*), eastern cottontail (*Sylvilagus floridanus*), American beaver (*Castor canadensis*), and red fox (*Vulpes vulpes*) (Fort Belvoir, 2017). Accotink Creek, along with its tributaries and associated floodplain wetlands, support amphibian species including spring peepers (*Pseudacris crucifer*), American toads (*Bufo americanus*), Fowler's toads (*Bufo woodhousii fowleri*), and bullfrogs (*Rana catesbeiana*).

#### *3.4.1.3 Federally Listed Rare, Threatened and Endangered Species*

Under the ESA of 1973, plant and animal species in danger of extinction throughout all or a significant part of their range are listed as endangered. Species that are likely to become endangered within the foreseeable future are listed as threatened. The USFWS is responsible for administering the ESA for terrestrial and freshwater organisms, as may be found within the Proposed Action site and its vicinity. The ESA establishes the federal government's responsibility for protection and recovery of species considered to be in danger of extinction.

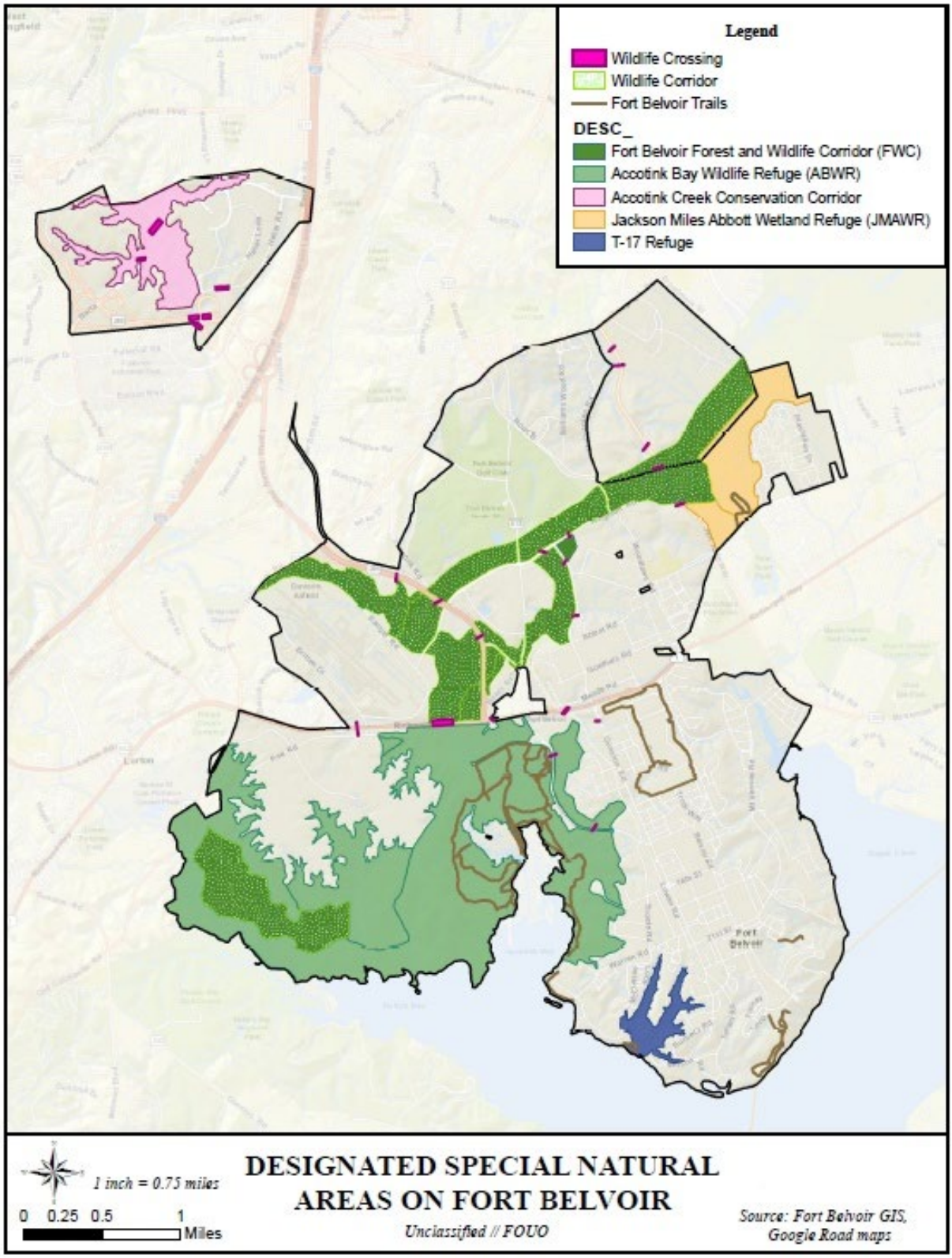


**Figure 3-7: Special Nature Areas of Fort Belvoir**

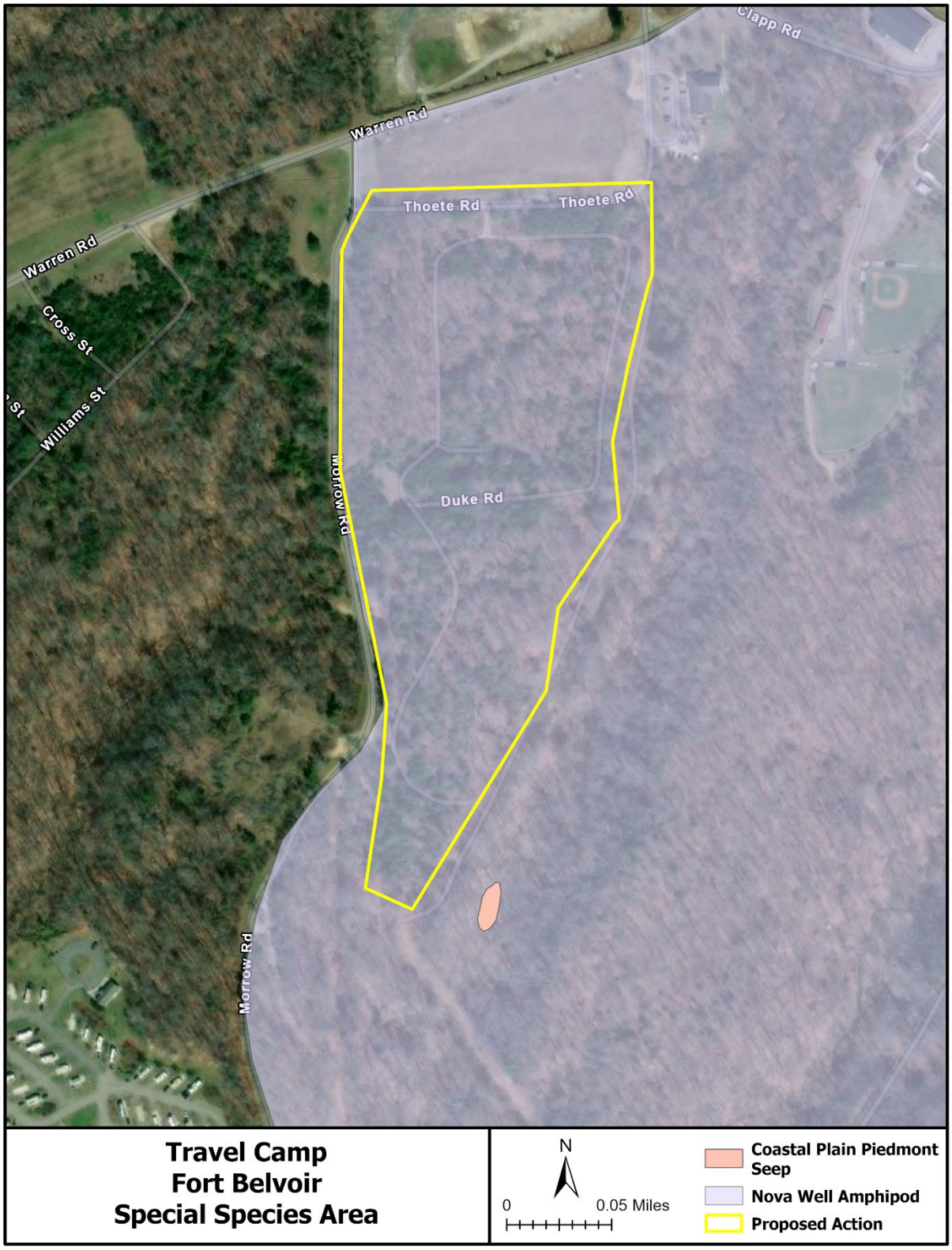


**Figure 3-8: Proposed Action Area Special Nature Areas/Species**

#### *3.4.1.4 Federally Listed Rare, Threatened and Endangered Species*

The ESA requires federal agencies, in consultation with the USFWS to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. Critical habitat can include areas not occupied by the species at the time of the listing but are essential to the conservation of the species. The Sikes Act provides for cooperation by the Department of the Interior and DoD with state agencies in planning, development, and maintenance of fish and wildlife resources on military reservations throughout the U.S.

Section 7 of the ESA requires federal agencies to request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action for any project that is conducted, permitted, funded, or licensed by any federal agency. The Information for Planning and Consultation (IPaC) resource list can be found in **Appendix G.** As reported through the USFWS Resource List, there are no critical habitats or wetlands within the project site. According to a screening of the Proposed Action site using the USFWS' IPaC online tool, the northern long-eared bat (NLEB [*Myotis septentrionalis*]), listed as an endangered species under the ESA, may occur in forested areas on or near the Proposed Action site (USFWS, 2024). In addition, the tricolored bat (*Perimyotis subflavus*) which is proposed to be listed as endangered is shown as potentially occurring within the Proposed Action area.

White-nose syndrome, a fungal disease known to affect bats, is the most severe and immediate threat to NLEB and tricolored bat survival and is the basis for the listing of the species' status. During the active season (April 1 to October 31), bats roost singly or in colonies in cavities, underneath bark, crevices, or hollows of both live and dead trees and snags. Fort Belvoir has identified tricolored and NLEB bats on their installation via acoustic surveys (Fort Belvoir, 2017). An acoustic bat monitoring presence/absence survey was conducted within the Proposed Action area in May of 2024. The following bats were detected during the surveys: big brown (*Eptesicus fuscus*) and eastern red (*Myotis lucifugus*). The acoustic bat survey report is in **Appendix E.**

The monarch butterfly is also listed in the IPaC screening as a candidate species and under consideration for official listing. Although there are generally no Section 7 requirements for candidate species, USFWS encourages agencies to take advantage of opportunities that may conserve the species. Primary threats include loss and degradation of habitat, use of herbicides and pesticides, urban development, and climate change. Conservation efforts include protection of the obligate milkweed plants (primarily *Asclepias* sp.) monarchs use for egg deposition and larvae feeding as well as other nectar resources for adults. Critical habitat has not been designated for the monarch.

Although not listed, the northern Virginia well amphipod does have a specially designated T-17 Refuge at Fort Belvoir, described in **Section 3.4.1** above. The amphipod was discovered at Fort Belvoir in 1996. This was the first known sighting of the amphipod since its collection from wells in Vienna, Virginia in 1941 and Alexandria, Virginia in 1948. Little is known about the amphipod; it is not state or federally listed but does have a DoD SAR designation and has been added to the National listing Workplan for evaluation to determine the species needs for federal protection. Potential threats to the northern Virginia well amphipod include a sensitivity to groundwater

contamination, pollution, impacts to the recharge zones of the water table as well as groundwater withdrawal, and disruption of slope stability.

### *3.4.1.5 State Listed Species*

Virginia has promulgated a state endangered species act that provides endangered and threatened listings for species vulnerable to extinctions at the state level. The Virginia statute (4 VAC 15-20-130) prohibits the taking, transportation, possession, sale, or offer for sale within the state of any species listed on the federally endangered species list or any other species designated by the state board. Virginia also provides protection for plant and insect species through Chapter 10 §3.2- 1000 of the Code of Virginia. It is the role of Virginia's Department of Conservation and Recreation, Division of Natural Heritage to maintain listings and rarity (i.e., conservation) rankings of rare plant and animal species and ecological communities. Unlike endangered and threatened listings, rare species listings and their rankings are not legal designations and do not provide any protective status, but, rather, are used to prioritize resources for conservation.

The Virginia Department of Wildlife Resources Fish and Wildlife Information Services search report showed the species in **Table 3-3** as potentially present within a three-mile radius of the Proposed Action area. Of these species, Fort Belvoir is known to have five state-listed species that occur on the Installation.

The little brown bat and the tricolored bat have an active season similar to that of the NLEB. The conservation measures outlined by Virginia include time of year restrictions that fall within the bounds of restrictions already established for the NLEB. Therefore, the conservation measures required for protection of the NLEB would be adequate for protection of the state-listed bat species.

**Table 3-3: Status of State-listed Species within Three Miles of the Proposed Action Site**

| Common Name | Scientific Name | Status | Known to Occur at Belvoir |
|---|---|---|---|
| NLEB | *Myotis septentrionalis* | FE, ST | X |
| Atlantic Sturgeon | *Acipenser oxyrinchus* | FE, SE | |
| Yellow Lance | *Elliptio lanceolata* | FT, ST | |
| Little Brown Bat | *Myotis lucifugus* | SE | X |
| Tricolored Bat | *Perimyotis subflavus* | FP, SE | X |
| Brook Floater | *Alasmidonta varicosa* | SE | |
| Wood Turtle | *Glyptemys insculpta* | ST | X |
| Peregrine Falcon | *Falco peregrinus* | ST | X |
| Shrike Loggerhead | *Lanius ludovicianus* | ST | |
| Henslow's Sparrow | *Centronyx henslowii* | ST | |
| Appalachian Grizzled Skipper | *Pyrgus wyandot* | ST | |
| Migrant Loggerhead Shrike | *Lanius ludovicianus migrans* | ST | |

**FE=Federally endangered; FT= Federally Threatened; FP= Federally Proposed; SE=State Endangered; ST=State Threatened*

#### *3.4.1.6 Partners in Flight (PIF)*

The DoD PIF program uses a cooperative network of natural resources personnel from military installations across the U.S. to sustain and enhance the military mission through proactive, habitat-based conservation and management strategies that maintain healthy landscapes and training lands (https://partnersinflight.org/). The DoD PIF uses voluntary partnerships at local, state, regional, national and international levels to share information and develop ecosystem-based, proactive management programs and programmatic priorities that aim to "keep common birds common" and help recover species at risk. The USFWS, as well as state wildlife agencies such the Virginia Department of Wildlife Resources, through the state nongame program, are also partners in this program.

As part of the PIF Program, DoD installations are encouraged to incorporate elements of the PIF Bird Conservation Strategy into their INRMPs. Such elements include habitat management practices such as prescribed burning and timber management programs. Designation of regional PIF priority bird species is the result of a cooperative/coordinated effort among various federal, state and private organizations. Fort Belvoir has designated approximately 4,200 acres of PIF habitat within its boundaries, most of it within Pohick Bays and the 234-acre Jackson Miles Abbott Wetland Refuge along Dogue Creek, both areas of high-quality habitat located within the Main Post. These large areas of habitat not only are valuable in and of themselves, but also provide for ecological connectivity through the Fort Belvoir to other regional habitats (USACE, 2015).

PIF Species of Concern status and applicable conservation guidelines are part of a broader designation identified by the INRMP as Fort Belvoir Breeding Birds of Management Concern, and includes USFWS Birds of Conservation Concern, DoD PIF Mission Sensitive Species and Fort Belvoir Habitat Indicator Species in addition to the PIF Species of Concern for Bird Conservation Region 30 (New England/Mid-Atlantic Coast). The six birds on the PIF Species of Concern Watch List that occur within the Bird Conservation Region 30 in which Fort Belvoir sits are: black billed cuckoo (*Coccyzus erythropthalmus*), Kentucky warbler (*Geothlypis formosa*), prairie warbler (*Setophaga discolor*), prothonotary warbler (*Protonotaria citrea*), wood thrush (*Hylocichla mustelina*), and eastern whip-poor-will (*Antrostomus vociferus*). Fort Belvoir is using three of the species – prairie warbler, prothonotary warbler, and wood thrush – as indicator species in the installation's wildlife management program. The Proposed Project area is adjacent to a wood thrush breeding buffer and a breeding buffer is slightly within the southern LOD for the Proposed Project area according to the 2017 Fort Belvoir INRMP.

### ***3.4.2 Environmental Consequences***

#### *3.4.2.1 Thresholds of Significance*

The threshold of significance for biological resources would be exceeded if a Proposed Action would jeopardize the continued existence of any federally listed, threatened, or endangered species or result in destruction of critical habitat; decrease the available habitat for commonly found species to the extent that the species could no longer exist in the area; eliminate a sensitive habitat, such as breeding areas, habitats of local significance, or rare or state-designated significant natural communities needed for the survival of a species.

Potential impacts to plants, wildlife, and fish are evaluated in accordance with applicable regulations including, but not limited to, the ESA, the Fish and Wildlife Conservation Act of 1980, the Migratory Bird Treaty Act, and EO 13112 on Invasive Species. The Sikes Act provides for cooperation by the Department of the Interior and DoD with state agencies in planning, development, and maintenance of fish and wildlife resources on military reservations throughout the U.S. The area of analysis for biological resources includes the Proposed Action site.

### *3.4.2.2 Impacts of Proposed Action*

#### 3.4.2.2.1 Vegetation

Under the Proposed Action, short-term, moderate adverse effects would occur to vegetation. Removal of approximately 22 acres of vegetation for construction of the facilities and infrastructure under the Proposed Action would result in long-term, moderate, adverse effects. The native, mature vegetation would be removed and replaced with primarily impervious surface for the RVs and camp sites. This would be offset by a combination of replanting within the Proposed Project site whenever possible through landscaping and offsite mitigation efforts in accordance with Fort Belvoir's Tree Removal and Protection Policy, requiring a 2:1 replacement ratio. The replacement ratio reflects the concept that trees planted in urban forest situations only survive for an average of seven years and trees being replaced are generally far larger than trees planted as in-kind, therefore the trees are replaced a 2:1 ratio. However, landscaped trees are not equivalent to forested habitat and therefore an adverse impact would still be incurred. If it is not possible to plant the required number of replacement trees, project-related alternatives such as environmentally beneficial restoration, enhancement, or preservation measures may be done. DPW approval of out-of-kind, compensatory mitigation is required, and funding must be equivalent to that required to plant the remaining trees. For example, the Army would continue to work closely with Fairfax County on a Memorandum of Understanding that would include identifying additional tree replanting opportunities throughout the Accotink watershed.

Following construction, the Proposed Action Site would be landscaped, per a DPW approved landscape plan, with native grass, shrubs and tree species coordinated with the Fort Belvoir Environmental Division staff to ensure that no invasive species would be introduced, and planting enhances wildlife habitat in a low-maintenance manner consistent with master planning objectives. Some tree stands surrounding the facility would be retained to provide a cover and shading for the travel camp expansion.

#### 3.4.2.2.2 Wildlife

Under the Proposed Action, long-term and short-term, minor adverse effects would occur to wildlife. During construction of the Proposed Action, equipment noise, ground disturbance, and vegetation removal would temporarily displace individuals of common wildlife species residing in the LOD. There may be limited mortality to individuals that are not able to relocate during construction. Population-level impacts would not reasonably occur due to the relatively small size of the construction area in relation to the overall size of Fort Belvoir. Additionally, most mobile species are able to safely avoid equipment. Therefore, construction activities associated with the

Proposed Action are expected to result in short-term, negligible, direct, adverse effects on terrestrial wildlife resources located within the immediate area.

Long-term, moderate, adverse effects would occur with the loss of habitat to local wildlife. Local forest dwellers would be displaced and lose a percentage of their habitat for nesting and for foraging foods in a prime habitat area for wildlife. Some species such as chipmunks would be less impacted as others as some mature trees may remain within the Proposed Project area for them to live and nest in.

To minimize impacts on birds, construction activities should avoid cutting and removal of vegetation from 1 April to 15 July. If cutting and removal occurs during this time frame, a survey for birds and active bird nests is recommended. No migratory bird, active nest, egg, or hatchling should be disturbed.

3.4.2.2.3 Rare, Threatened, & Endangered Species

Under the Proposed Action, short-term, less-than-significant adverse effects would occur to rare, threatened, and endangered (RTE) species. There are no known RTE species within the Proposed Action area.

The Proposed Action area includes habitat that is mapped as potentially housing NLEB and tricolored bats. Acoustic presence/absence surveys for bats were conducted on-site in May of 2024 and did not detect any RTE bats. To protect nesting bat species, no trees over three inches dbh would be removed within the Proposed Action site between 15 April and 15 September, in accordance with current USFWS guidelines and corresponding U.S. Army NLEB protection documents promulgated to protect the NLEB species. This would also avoid tree clearing during pup season, protecting bat species that are not RTE.

The northern Virginia well amphipod would not be affected under the Proposed Action as regulations that would affect the amphipod, specifically those that apply to water quality would be adhered to. For further information about the Proposed Action. All water quality impacts would be adhered to regarding the amphipod, see **Section 3.3.2.2.**

#### *3.4.2.3 Impacts of No Action Alternative*

Under the No Action Alternative, no impacts would occur to wildlife. The forested area would remain in its same state, causing no effects to wildlife or biological resources.

## 3.5 HAZARDOUS WASTE AND TOXIC MATERIALS

### *3.5.1 Affected Environment*

Hazardous and toxic materials or substances are generally defined as materials or substances that pose a risk (i.e., through either physical or chemical reactions) to human health or the environment. Regulated hazardous substances are identified through several federal laws and regulations. The most comprehensive list is contained in 40 CFR 302, *Designation, Reportable Quantities and Notification*, and provides quantities of these substances that, when released to the environment, require notification to a federal agency. Further, hazardous wastes, defined in 40 CFR 261.3, are considered hazardous substances. Generally, hazardous wastes are discarded materials (e.g., solids or liquids) not otherwise excluded by 40 CFR 261.4 that exhibit a hazardous characteristic (i.e., ignitable, corrosive, reactive, or toxic), or are specifically identified within 40 CFR 261. Petroleum products are specifically exempted from 40 CFR 302, but some are also generally considered hazardous substances due to their physical characteristics (i.e., especially fuel products), and their ability to impair natural resources.

Fort Belvoir conducts its hazardous waste management program in compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC. 9605, as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. 99-499 and the RCRA. Fort Belvoir has a Hazardous Waste Management/Waste Minimization Plan and a Master Spill Plan. Fort Belvoir also participates in the "Greening of Government" program (EO 13101, *"Greening" the Government through Waste Prevention*) that promotes the purchase of products to reduce solid and hazardous waste through implementation of a centralized system for tracking procurement, distribution, and management of toxic or hazardous materials. Fort Belvoir DPW also files annual hazardous material and toxic chemical reports in compliance with the Emergency Planning and Community Right-to-Know Act.

#### *3.5.1.1 Solid Waste Management*

The Corrective Action Program for the SWMUs on Fort Belvoir's Main Post is being performed in compliance with Fort Belvoir's Resource Conservation and Recovery Act (RCRA) Part B, Permit USEPA ID VA7213720082 Module IV, Site Wide Corrective Action. The RCRA Part B permit, issued in 2004, included the investigation and corrective actions for the 204 SWMUs located on Fort Belvoir's Main Post. According to the Fort Belvoir RCRA Permit, "This permit requires the Permittee (Fort Belvoir) to conduct RCRA Facility Investigations (RFIs) for potential releases of hazardous waste or hazardous constituents at the specified SWMUs and areas of concern identified at the Facility." The nearest SMWUs to the Proposed Action site are described below.

3.5.1.1.1 SWMU L-47

The 600 Area Transformer Storage Pad, also known as SWMU L-47 is located to the far east side of the LOD for the Proposed Action area (**Figure 3-9**). The unit is a 40-foot by 8-foot concrete pad with additional storage on wooden pallets to the south. The RFI concluded that the SWMU L-47 did not require further action due to the absence of PCBs in the soil. The absence of PCBs suggested the former activities at the site did not have an effect on soils in the vicinity (Tetra Tech, 2013). EPA concurred with the findings in December 2013.

3.5.1.1.2 SWMU MP-13

A 4.4-acre area north of the Proposed Action was investigated under RCRA as SWMU MP-13 (Theote Road/Warren Road Wash Yard Area). The area was previously used for vehicle and equipment storage from post WWII to the mid-1990's as a contractor multi-use area from early 2007 to 2018 including the stockpiling of construction debris and soil (**Figure 3-9**). Anecdotal information suggested that the area was used to wash down construction equipment during an early 1980s PCB removal action; however, a review of aerial photography indicates that the yard area was used for military and later civilian vehicle and equipment storage between 1972 and 1993 and would have been inaccessible as an equipment wash area. Investigations at the site in 2016 identified polynuclear aromatic hydrocarbons (PAHs) compounds and metals above USEPA Residential Regional Screening Levels (RSLs) in surface soil samples on the site. Inorganic (metals) concentrations were below background levels for Fort Belvoir. Soil was excavated to a depth of 24 inches over a 149,000 square foot area of the site in 2019 to address PAH concentrations. Following the removal action, there is negligible risk to ecological receptors from PAHs and metals at the site. Groundwater underlying the site contains concentrations of arsenic, chromium, cobalt, and thallium that are prohibitive for untreated consumption or use. Groundwater underlying all areas of Fort Belvoir is prohibited from use as a potable water source. No further action was recommended for SWMU MP-13 (Plexus, 2021).

3.5.1.1.3 SWMU A-28

SWMU A-28 is an unauthorized debris landfill located to the east of McLellan Loop Road and the Proposed Action area. The landfill initiated as an unauthorized accumulation in 1978 with usage terminated in 1980 (**Figure 3-9**). A 2009 RFI determined that arsenic concentrations were above EPA RSLs in soil samples but were below background concentrations at Fort Belvoir. Ground water samples also showed arsenic levels unacceptable for human consumption, but groundwater is not used for potable supply on Fort Belvoir and the reported levels were below the federally enforced levels (Tetra Tech, 2009). The RFI concluded that no further action was required at SWMU A-28, with EPA concurred in July 2010

*3.5.1.2 Installation Restoration Program*

The Fort Belvoir Installation Restoration Program (IRP) operates in coordination with the U.S. Army Environmental Command and USACE to restore former military training areas, waste sites, and petroleum areas through regulatory closure. The IRP is a comprehensive program designed to address contamination from past activities and restore Army lands to useable conditions. It is one

of two programs established under the Defense Environmental Restoration Program (DERP) to identify, investigate, and clean up hazardous substances, pollutants, and contaminants that pose environmental health and safety risks at active military installations and formerly used defense sites. The IRP was established in 1975 and is achieving successful restoration of more than 11,000 identified active Army environmental cleanup sites.

The IRP response actions (i.e., site identification, investigation, removal actions, remedial actions, or a combination of removal and remedial actions) correct other environmental damage (such as the detection and disposal of unexploded ordnance [UXO]) that poses an imminent and substantial endangerment to the public health or welfare or to the environment. IRP actions are conducted according to the provisions of CERCLA, EOs 12580 and 13016, and the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 300). The Proposed Action site has not been investigated under the RCRA or CERCLA and therefore is not covered under the IRP.

#### *3.5.1.3 Munitions*

The Proposed Action area was previously an ammunition supply point known as the 600 Area. A Munitions and Explosives of Concern (MEC) survey was performed over the entirety of the 21 acres of the 600 area in 2019, resulting in no detection of MECs or potentially explosive material (USACE, 2019). UXO safety literature will be provided to the construction contractors as part of the construction safety. No LUCs are known to occur within the Proposed Action area.

### ***3.5.2 Environmental Consequences***

#### *3.5.2.1 Thresholds of Significance*

Effects on hazardous materials and wastes are assessed by evaluating the degree to which the Proposed Action could cause worker, resident, or visitor exposure to hazardous materials; whether the Proposed Action would lead to noncompliance with applicable federal or state regulations or increase the amounts generated or procured beyond current waste management procedures and capacities; and whether the Proposed Action would disturb a hazardous waste site, create a hazardous waste site, or contribute to a hazardous waste site resulting in adverse effects on human health or the environment.

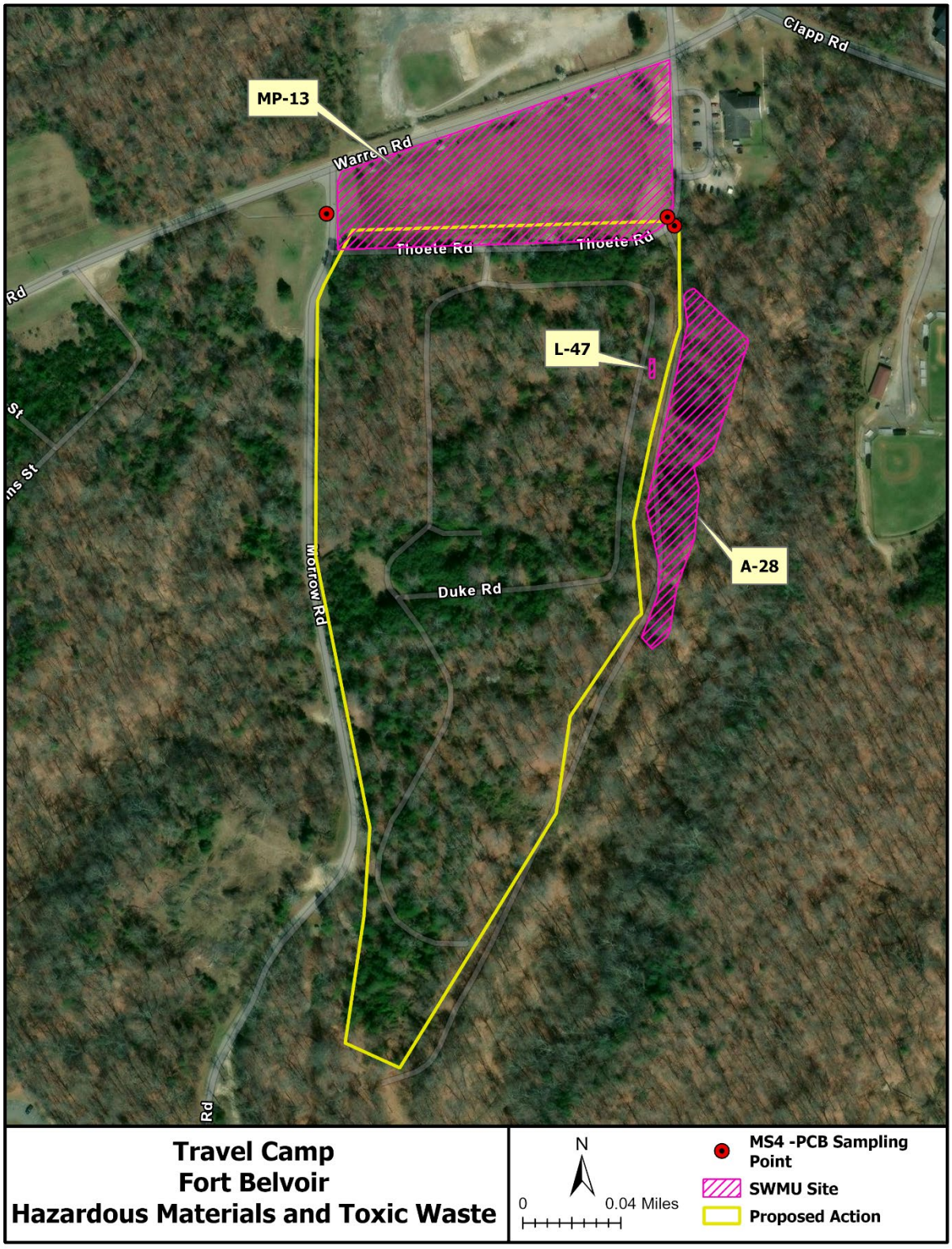


**Figure 3-9: SWMUs Surrounding the Proposed Action**

Effects from UXO would occur if military munitions are inadvertently encountered, causing an unintended detonation or the release of munition chemicals to the environment

### *3.5.2.2 Impacts of Proposed Action*

#### 3.5.2.2.1 Hazardous Waste

Under the Proposed Action, no significant impacts would occur on hazardous material and waste. The construction contractor would be required to prepare and adhere to a Spill Prevention, Control, and Countermeasures plan that identifies practices to minimize the potential for accidental spills of petroleum products or other hazardous substances and the procedures for containing and cleaning up any accidental spills that may occur.

Implementation of the Proposed Action would not result in a significant effect on hazardous materials and waste concerns within the Proposed Action Site. Soils excavated or otherwise disturbed during the project's construction phase would be tested in accordance with established Fort Belvoir policies and procedures. If concentrations of contaminants in soils are determined to exceed applicable regulatory thresholds for re-use on the site, any affected soils would be removed from the site and disposed of at a permitted facility off Fort Belvoir in accordance with Virginia Solid Waste Disposal Regulations as well as all other federal, state, and local laws and regulations. Additionally, all SWMUs near the Proposed Action site have been deemed as needing no further action. Fort Belvoir DPW has a BMP that prohibits the use of all groundwater underlying the installation therefore groundwater cannot be used as a potable source and any residual water contamination would not affect the Proposed Action.

#### 3.5.2.2.2 Munitions

Under the Proposed Action, no significant impacts would occur from munitions. The Proposed Site has undergone UXO sweeps, resulting in no munition discoveries. The area was determined to have a low probability of having munitions on site. The Proposed Action area was cleared for UXO in 2019. In addition, standard practice involves training of on-site personnel in the identification of potential munitions to prevent injury from unintentional detonations due to incorrect handling of discarded ordnance materials.

### *3.5.2.3 Impacts of No Action Alternative*

The No Action Alternative would have no effect on hazardous waste and toxic materials and waste on Fort Belvoir. The area is undeveloped and would remain undeveloped, with no potential for hazardous waste to harm those surrounding the area. In addition, the area has been searched for munitions and was determined to not have any on site.

## 3.6 UTILITIES

### *3.6.1 Affected Environment*

The proposed travel camp expansion would include electric, water, sanitary sewer, and communication hook-ups for each of the 30 RV camp sites and water hook-ups for the 10 tent camp sites. The facility would also include street lighting, a sewage-lift station, and a camp support facility that includes restrooms, showers, and laundry.

#### *3.6.1.1 Electricity*

Fort Belvoir purchases its electricity from Dominion Virginia Power (DVP) under a 50-year Utilities Privatization (UP) contract and provides electricity from a DVP-owned substation in the locality. There are no commercial power generating stations on Fort Belvoir that would be capable of powering the entire post. Since the contract was awarded in 2007, DVP has completed a number of projects to provide additional capacity, reliability, and resilience to the distribution system. These include undergrounding of existing overhead lines and installation of various equipment upgrades (Fort Belvoir, 2017).

There are existing electrical lines located along Warren, Theote, and Morrow Roads, and the unpaved road east of the Proposed Action area. There is a connection to the Morrow Road line on the west side of the site.

#### *3.6.1.2 Potable Water*

Fort Belvoir purchases its potable water from the Fairfax County Water Authority (Fairfax Water), which operates two water treatment facilities in Fairfax County. There are no water treatment facilities, or groundwater wells supplying potable water on Fort Belvoir. The majority of the water distribution system on post is owned and operated by American Water under a 50-year UP contract to provide water and wastewater infrastructure services. Since the award of the contract in 2009, American Water has completed a number of projects, including replacement of 39.3 miles of inadequate and leaking water lines, replacement of three water storage tanks, and stabilization of one stream crossing (Fort Belvoir, 2017).

There are existing water lines that run along Theote and Morrow Roads, adjacent to the Proposed Action area. An additional line runs along the unpaved road to the east of the area that connects to the Morrow Road line through the center of the site.

#### *3.6.1.3 Sanitary Sewer*

Fort Belvoir purchases sanitary sewer treatment services from Fairfax County's Noman M. Cole Jr. Pollution Control Plant. The Plant is adjacent to the southwestern boundary of Fort Belvoir and discharges to Pohick Creek. There are no sanitary sewer treatment facilities in operation on post. The majority of the sanitary sewer system is owned and operated by American Water under the UP contract to provide water and wastewater infrastructure services. Since the award of the UP contract in 2009, American Water has completed a number of system upgrades, including

replacement or relining of 12.7 miles of inadequate/failing sewer pipes, relocation/realignment of utility runs, upgrades of mechanical systems such as lift stations, installation of system monitoring devices, stabilization of three stream crossings, and elimination of cross-connections (Fort Belvoir, 2017).

There is an existing wastewater line that runs along Morrow Road adjacent to the Proposed Action area. There is an additional line that runs along the unpaved road east of the area that connects to the Morrow Road line through the center of the site.

#### *3.6.1.4 Telecommunications*

Telecommunications and information services on Fort Belvoir consist of a copper and fiber-optic data distribution network. The system includes overhead and buried transmission lines, duct banks, and other supporting facilities. Fort Belvoir owns the entire system, including copper and fiber-optic cable, utility poles, and computerized switchboard systems associated with inter-post and DoD applications (U.S. Army, 2015).

Telecommunication services on-post are provided by several contracted commercial vendors, including Verizon Federal, under privatized agreements. Maintenance, repair and upgrade of this system is done by the commercial vendors (Fort Belvoir, 2017).

### ***3.6.2 Environmental Consequences***

#### *3.6.2.1 Thresholds of Significance*

Impacts on utilities would be considered significant if an overload of the capacity of existing utilities were to occur to the extent that current levels of service are compromised, resulting in outages or shutdown of services.

#### *3.6.2.2 Impacts of Proposed Action*

##### 3.6.2.2.1 Electricity

There may be short-term, negligible, direct, adverse impacts to electric lines during the construction of the Proposed Action. Construction would require a minor amount of electricity in some instances. However, most construction equipment is battery-operated or powered by fossil fuel combustion. During construction, electric lines would need to be rerouted to meet the configuration of the proposed travel camp expansion, which may lead to a temporary disruption in service. However, this impact would be localized to the Proposed Action area and should not impact the other buildings and recreation areas within the vicinity.

There may be long-term, minor, direct adverse impacts to electricity during the operation of the proposed travel camp expansion from the RV electrical hook-ups, street lighting, and camp support facility. The existing electrical lines will be removed and reconfigured and the construction of the Proposed Action would include upgrades to the existing system. There is capacity for this increase in electrical demand at Fort Belvoir and it is not anticipated to decrease service levels to other

customers served by DVP (U.S. Army, 2015). In addition, lighting for the Proposed Action would be directional and pointed down when appropriate to avoid impacts to any receptors nearby.

#### 3.6.2.2.2 Potable Water

There may be short-term, negligible, direct adverse impacts to waterlines during the construction of the Proposed Action. During construction, these lines would need to be rerouted to meet the configuration of the proposed travel camp expansion, which may lead to a temporary disruption in service However, this impact would be localized to the Proposed Action area and should not impact the other buildings and recreation areas within the vicinity.

There may be long-term, minor, direct, adverse impacts on water usage during the operation of the Proposed Action due to the increase in water demand from the RV, tent hook-ups and camp support facility. However, Fort Belvoir is currently operating within capacity for its potable water demands and it is expected to be able to meet demands for future long-term development (U.S. Army, 2015).

#### 3.6.2.2.3 Sanitary Sewer

There may be short-term, negligible, direct, adverse impacts to wastewater during the construction period to ensure that the construction workers are provided restroom facilities while on the job site. Portable restroom facilities and disposal services to a permitted wastewater treatment facility would be the responsibility of the contracted construction company. During construction, wastewater lines would need to be rerouted to meet the configuration of the proposed travel camp expansion, which may lead to a temporary disruption in service. However, this impact would be localized to the Proposed Action area and should not impact the other buildings and recreation areas within the vicinity.

There may be long-term, minor, direct, adverse impacts on wastewater during the operation of the Proposed Action. In addition to the RV hook-ups and camp support facility, a new sewage-lift station would be installed and connected to the existing wastewater lines in the Proposed Action area. The anticipated amount of wastewater increases is within the acceptable quantity for future long-term development at Fort Belvoir (U.S. Army, 2015).

#### 3.6.2.2.4 Telecommunications

There may be short-term, negligible, direct adverse impacts to telecommunication lines during the construction of the Proposed Action. During construction, these lines would need to be rerouted to meet the configuration of the proposed travel camp expansion which may lead to a temporary disruption in service. However, this impact would be localized to the Proposed Action area and should not impact the other buildings and recreation areas within the vicinity.

There may be long-term, negligible, direct, adverse impacts on telecommunications during the operation of the Proposed Action due to the increase in usage by the guests of the proposed travel camp expansion. Utilization of these services would not be anticipated to decrease service levels to other customers served by Fort Belvoir.

#### *3.6.2.3 Impact of No Action Alternative*

Under the No Action Alternative, no impacts would be expected on any utilities. All operations on Fort Belvoir would remain the same, with no fluctuations in utility demands.

## 3.7 NOISE

### *3.7.1 Affected Environment*

Noise is generally defined as unwanted sound. It can be any sound that is undesirable because it interferes with communications or other human activities, affects hearing, or is otherwise annoying. Noise may be intermittent or continuous, steady, or impulsive. Human response to noise varies, depending on the type of noise, distance from the noise source, sensitivity, and time of day.

The decibel (dB) is a unit of measurement for noise levels and uses a logarithmic scale. To better match the sensitivity of the human ear, noise levels are typically A-weighted (dBA) to deemphasize low-frequency and very high-frequency sound. Sound levels, in dBA, for common activities and construction work are presented in **Table 3-4** below. Noise levels and durations from these activities would vary depending on the specific equipment used, and the impact on a receptor would depend on the distance between the receptor and the noise . Generally, noise levels decrease by approximately six dBA for every doubling of distance for point sources (such as a single piece of construction equipment) and approximately three dBA for every doubling of distance for line sources (such as a stream of motor vehicles on a busy road at a distance) (FHWA, 2006).

**Table 3-4: Common Sound Levels and Exposure Conditions**

| Source | Decibel Level (in dBA) | Exposure Concern |
|---|---|---|
| Silent Study Room | 20 | Normal safe level. |
| Library | 35 | |
| Soft Whisper (5 ft. away) | 40 | |
| Average Home in an urban area | 50 | |
| Dishwasher in next room | 55 | |
| Conversational speech (3 ft. away) | 65 | |
| Classroom Chatter | 70 | |
| Freight Train (100 ft. away) | 80 | May affect hearing in some individuals depending on sensitivity, exposure length, etc. |
| Heavy Traffic | 90 | |
| Construction Site | 100 | |
| Operating Heavy Equipment | 120 | |
| Live Rock Band | 130 | |
| Fighter Jet Launch | 150 | Above 140 dB may cause pain. |
| Shotgun Blast | 160 | |
| Rocket Launch | 180 | |

*Source: FAA, 2022; OSHA, 2022; Pulsar Instruments, 2024*

The National Institute for Occupational Safety and Health (NIOSH) recommends that individuals working in an environment of 85 dBA or louder for an eight-hour workday limit their exposure to this noise level and wear protective earwear to help manage and prevent hearing loss due to noise exposure. The Occupational Safety and Health Administration's (OSHA's) Noise standard (29

CFR 1910.95) requires employers to have a hearing conservation program in place if workers are exposed to a time-weighted average noise level of 85 dBA or higher over an eight-hour work shift. Neither NIOSH nor OSHA establish non-occupational noise safety levels.

The equivalent-average sound level (LEQ) represents an average sound level in decibels of a given event or period of time (typically one hour). The day-night average sound level (DNL) is also a useful descriptor for noise because it approximates the response characteristics of human hearing. It is the average noise level over a 24-hour period with nighttime hours adjusted with a 10-dB increase, thus, the higher the DNL, the louder the sound.

The *Noise Control Act* of 1972 (PL 92-574) directs federal agencies to comply with applicable federal, state, interstate, and local noise control regulations. The applicable local noise control regulation is the Fairfax County Noise Ordinance (29-15-108.1), which states "no person shall permit, operate, or cause any source of sound or sound generation to create a sound which exceeds the limits set forth in the following table titled 'Maximum Sound Levels' when measured at the property boundary of the sound source or at any point within any other property affected by the sound". As shown in **Table 3-5**, the maximum sound levels from continuous sounds sources (such as a jackhammer) in residential areas should not exceed 60 dBA during the day and 55 dBA at night. An impulse sound is generally characterized by a sound event that lasts for no more than one second, such as sounds from weapons, pile drivers, or blasting.

**Table 3-5: Fairfax County Noise Ordinance (§29-15-108.1)**

| Use and Zoning District Classification | Time of Day | MAXIMUM SOUND LEVELS | |
|---|---|---|---|
| | | Continuous Sound (dBA) | Impulse Sound (dB) |
| Residential Areas in Residential Districts | 7 a.m. to 10 p.m. | 60 | 100 |
| Residential Areas in Residential Districts | 10 p.m. to 7 a.m. | 55 | 80 |

*Source: Fairfax County, 2021*

The nearest potential noise-sensitive receptor (NSR) to the Proposed Action area are the other travel camps and recreational areas on Gunston Cove are located approximately 600 feet southeast of the site. Other facilities in the area include various administration and commercial buildings, the closest located approximately 1,000 feet to the north. The Proposed Action area is relatively isolated and buffered from these facilities and recreation areas by surrounding forests.

Existing sources of noise surrounding the Proposed Action area are from vehicular traffic on the Fort Belvoir roadways. The closest major thoroughfare is U.S. 1, located approximately 1.5 miles north of the Proposed Action area. In addition, Fort Belvoir's airfield is located approximately 2.5 miles to the northeast of the Proposed Action area and is a noise source from airplane and helicopter takeoffs and landings.

There are no daycare facilities, schools, libraries, or medical centers within a one-mile radius of the Proposed Action area. The nearest daycare and schools are the South Post Child Development Center and the Fort Belvoir Primary and Secondary Schools which are located approximately 1.1

miles and 2.5 miles, respectively, to the northeast of the site. The Fairfax County Kingstowne Branch Library is located approximately 4.8 miles north of the site. The nearest medical center is the Alexander T. Augusta Military Medical Center located approximately 1.3 miles northeast of the site. There is a residential area located approximately 0.64 miles southeast of the site.

The Proposed Action area is not located within the 65 dBA DNL areas for any nearby airports and airfields; therefore, aircraft-related noise is anticipated to be less than 65 dBA DNL. Noise elements in and around the Proposed Action area are consistent with that of any residential military post and its surrounding area that include administrative and recreational activities. The use of heavy equipment typically occurs sporadically throughout the daytime hours. Seasonal noise additions include the normal operation of HVAC systems, lawn maintenance, and increased pedestrian activities. None of these operations or activities produce excessive levels of noise.

### *3.7.2 Environmental Consequences*

#### *3.7.2.1 Threshold of Significance*

Noise impacts would be considered significant if the Proposed Action created appreciable long-term noise increases in areas of incompatible land use. Additionally, continuous construction noises above 60 dBA may be considered a nuisance if audible at residential properties during daytime hours (07:00 to 22:00) per the Fairfax County noise ordinance. Furthermore, noise levels exceeding NIOSH or OSHA guidance can be harmful to workers.

#### *3.7.2.2 Impacts of Proposed Action*

Construction

The Proposed Action construction activities would have short-term, direct, minor, adverse impacts on noise in the immediate area of the site, primarily due to site preparation and construction activities. Once brought to the site, construction equipment would remain within the Proposed Action area until the phase for which the equipment was needed is complete.

The noise levels generated at any given time would vary depending on the phase of construction, the specific activities occurring, the types of equipment used, and the quantities used. Construction activity would generally only occur between the hours of 7:00 and 15:30, Monday through Friday, which would comply with the construction schedule requirements of the Fairfax County noise ordinance.

**Table 3-6** summarizes calculated construction noise levels for representative activities that generate higher noise levels. The calculations assume those representative equipment types would all operate at the same location for each activity.

**Table 3-6: Estimated Noise Levels from Construction Activities**

| Distance from Noise Source in feet (meters) | Estimated Noise Level in dBA |
|---|---|
| 50 (15.2) | 90–94 |
| 100 (30.5) | 84–88 |

| | |
|---|---|
| 150 (45.7) | 81–85 |
| 200 (61.0) | 78–82 |
| 400 (121.9) | 72–76 |
| 800 (243.8) | 66–70 |
| 1,200 (365.8) | < 64 |

*Source: FHWA, 2006*

At 100 feet, the estimated noise level from construction activities would be below 90 dBA. The primary NSR features in the vicinity are more than 100 feet from the Proposed Action area. Residential housing areas in the vicinity are located more than 1,200 feet from the Proposed Action area, and the construction noise level at that distance would be below the Fairfax County Noise ordinance of 60 dBA. The surrounding administrative buildings and recreation areas are also buffered from the Proposed Action area by tree lines, which would greatly reduce noise from construction activities.

To minimize the potential adverse impact from these noises, vehicles would be equipped with noise-dampening equipment including mufflers which would be operated according to the manufacturers' instructions and limiting engine idling to less than five minutes. Additionally, construction would take place during daylight hours on weekdays, unless there is a specific action that would require working outside of this normal timeframe, such as mobilizing oversized materials or equipment to the site. OSHA regulations require that employers make hearing protectors available to those employees who are exposed to work conditions at or above 85 dBA (OSHA, 2002). Thus, potential impacts from construction equipment noise on workers would be minimized by following OSHA regulations and the USACE *Safety and Health Requirements Manual EM 385-1-1* (USACE, 2014).

Operations

The Proposed Action would result in long term, direct, minor, adverse impacts due to the operation of the proposed travel camp expansion. The noise levels generated by operational activities would be consistent with the existing travel camps in the area. The primary source of increased noise levels would be due to vehicular traffic and operation of the RVs. The greatest sources of noise from the operation of RVs are generators and air conditioners. However, the Proposed Action includes electrical hook-ups, so generators would not be used at the site. Standard RV air conditioners sound levels are typically between 65-75 dBA. Although this may impact the guests of the proposed travel camp expansion, the forested areas surrounding the site would provide a vegetative buffer and minimize noise levels outside of the Proposed Action area.

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#### *3.7.2.3 Impacts of No Action Alternative*

Under the No Action alternative, no new noise generating activities would occur and the current noise conditions at the Proposed Action area would remain unchanged. Therefore, there would be no impacts associated with noise.

## 3.8 AIR QUALITY

### *3.8.1 Affected Environment*

Air quality is defined by the ambient air concentration of specific pollutants of concern at a given location. Air pollution occurs when harmful substances, including solid particles and gases, are introduced into the earth's atmosphere. It can cause harm to the natural environment, including humans, animals, and plants. The following sections describe existing air quality conditions in the vicinity of the Proposed Action Site on Fort Belvoir, applicable laws and regulations, and potential impacts on air quality that could result from the implementation of the Proposed Action.

#### *3.8.1.1 National Ambient Air Quality Standards (NAAQS)*

The USEPA, under the requirements of the 1970 Clean Air Act (CAA) as amended in 1977 and 1990, established NAAQS for the following six criteria pollutants (40 CFR 50):

- Carbon monoxide (CO)
- Lead
- Nitrogen dioxide
- Ozone ($O_3$)
- Sulfur dioxide
- Particulate matter (PM), divided into two size classes:
    - Measured less than or equal to 10 micrometers in diameter ($PM_{10}$)
    - Measured less than or equal to 2.5 micrometers in diameter ($PM_{2.5}$)

Carbon monoxide, sulfur oxides ($SO_X$), and some particulates are emitted directly into the atmosphere from emissions sources. Nitrogen dioxide, $O_3$, and some particulates are formed through atmospheric and chemical reactions that are influenced by weather, ultraviolet light, and other atmospheric processes. Volatile organic compounds (VOCs) and nitrogen oxides ($NO_X$) emissions are precursors of $O_3$ and are used to represent $O_3$ generation. Lead emissions from

common air emissions sources that would be used under the Proposed Action have been negligible since leaded gasoline for on-road vehicles was phased out in the United States between 1973 and 1996. Therefore, lead is not included in the air quality analysis.

The NAAQS include primary and secondary standards. The primary standards were established at levels sufficient to protect public health with an adequate margin of safety. The secondary standards were established to protect the public welfare from the adverse effects associated with pollutants in the ambient air. Each state has the authority to adopt air quality standards stricter than those established under the federal NAAQS. Virginia accepts the federal standards (9 VAC Chapter 30). **Table 3-7** shows the federal primary and secondary air quality standards accepted by Virginia.

**Table 3-7: National Ambient Air Quality Standards**

| Criteria Pollutant | Primary/ Secondary | Averaging Time | Level | Form |
|---|---|---|---|---|
| CO | Primary | 8-hour | 9 ppm | Not to be exceeded more than once per year |
| | | 1-hour | 35 ppm | |
| $NO_X$ | Primary | 1-hour | 100 ppb | 98th percentile, averaged over 3 years |
| | Primary and secondary | Annual | 53 ppb | Annual Mean |
| $O_3$ | Primary and secondary | 8-hour | 0.070 ppm | Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years |
| $PM_{2.5}$ | Primary | Annual | 12 $\mu g/m^3$ | Annual mean, averaged over 3 years |
| | Secondary | Annual | 15 $\mu g/m^3$ | Annual mean, averaged over 3 years |
| | Primary and secondary | 24-hour | 35 $\mu g/m^3$ | 98th percentile, averaged over 3 years |
| $PM_{10}$ | Primary and secondary | 24-hour | 150 $\mu g/m^3$ | Not to be exceeded more than once per year on average over 3 years |
| Lead | Primary and secondary | Rolling 3-month average | 0.15 $\mu g/m^3$ | Not to be exceeded |
| $SO_X$ | Primary | 1-hour | 75 ppb | 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years |
| | Secondary | 3-hour | 0.5 ppm | Not to be exceeded more than once per year |

*Sources: 40 CFR 50, 9 VAC Chapter 30*
*Notes: ppm = parts per million; ppb = parts per billion; $\mu g/m^3$ = micrograms per cubic meter*

Areas that are and have historically been in compliance with the NAAQS or have not been evaluated for NAAQS compliance are designated as attainment areas. Areas that violate a federal air quality standard are designated as nonattainment areas. Areas that have transitioned from nonattainment to attainment are designated as maintenance areas and are required to adhere to maintenance plans to ensure continued attainment.

Fort Belvoir is in Fairfax County, which is within the National Capital Interstate Air Quality Control Region (40 CFR 81.12). The USEPA has designated Fairfax County as marginal nonattainment for the 2015 eight-hour $O_3$ NAAQS and as in maintenance for the 2008 eight-hour $O_3$ NAAQS. Fairfax County is designated as attainment or unclassified for all other criteria pollutants (USEPA, 2022b)

#### *3.8.1.2 Clean Air Act Conformity*

The CAA, as amended in 1990, requires state agencies to develop and adopt a State Implementation Plan to target the elimination or reduction of the severity and number of NAAQS violations in nonattainment areas. Federal agencies are required to ensure that their actions conform to the State Implementation Plan in a nonattainment area. Under Section 176(c) of the CAA, a project is in "conformity" if it corresponds to a State Implementation Plan's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving their expeditious attainment.

Conformity further requires that such activities would not:

- cause or contribute to any new violations of any standards in any area
- increase the frequency or severity of any existing violation of any standards in any area; or
- delay timely attainment of any standard or any required interim emission reductions or other milestones in any area

The USEPA published final rules on general conformity (40 CFR 51 and 93) in the Federal Register on November 30, 1993. The General Conformity Rules applies to federal actions in nonattainment or maintenance areas for any of the criteria pollutants. There are two main components to the overall process: a conformity applicability analysis to determine whether a conformity determination is required and, if it is, a conformity determination to demonstrate that the action conforms to the State Implementation Plan. A conformity applicability analysis is typically done by quantifying applicable direct and indirect emissions that are projected to result from implementation of a federal action. When the total emissions of nonattainment and maintenance pollutants (or their precursors) exceed specified thresholds, a general conformity determination is required. The emissions thresholds that trigger requirements for a general conformity determination are called *de minimis* levels. A federal action is exempt from a general conformity determination if the action's emissions for a particular criteria pollutant are below the pollutant's *de minimis* threshold.

Fairfax County is designated as nonattainment for the 2015 eight-hour $O_3$ NAAQS and as maintenance for the 2008 eight-hour $O_3$ NAAQS. Therefore, the General Conformity Rule is potentially applicable to emissions of VOCs and $NO_X$ because they are precursors for $O_3$. As outlined in 40 CFR 93.153(b), the applicable *de minimis* level thresholds for these pollutants is 50 tons per year (tpy) for VOCs and 100 tpy for $NO_X$.

#### *3.8.1.3 Hazardous Air Pollutants*

In addition to criteria pollutant standards, USEPA also regulates hazardous air pollutant (HAP) emissions for each state. HAPs differ from criteria pollutants for they are known or suspected to cause cancer and other diseases or have adverse environmental impacts. The National Emission Standards for Hazardous Air Pollutants regulate 188 HAPs based on available control technologies. Sources of HAP emission on Fort Belvoir include stationary, mobile, and fugitive emissions sources. Stationary sources include boilers, incinerators, fuel storage tanks, fuel-dispensing facilities, vehicle maintenance shops, laboratories, degreasing units, and similar testing units. Mobile sources of emissions include private and government-owned vehicles.

#### *3.8.1.4 Greenhouse Gas Emissions and Climate Change*

Greenhouse gases (GHGs) are compounds that contribute to the greenhouse effect. The greenhouse effect is a natural phenomenon where gases trap heat within the surface-troposphere (lowest portion of Earth's atmosphere) system, causing heating at the Earth's surface. The primary long-lived GHGs directly emitted by human activities are carbon dioxide ($CO_2$), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The heating effect from these gases is considered the probable cause of the global warming observed over the last 50 years. Global warming and climate change can affect many aspects of the environment. In the past, the USEPA has recognized potential risks to public health or welfare and signed an endangerment finding regarding GHGs under Section 202(a) of the CAA (74 Federal Register 66496, December 15, 2009), which found that the current and projected concentrations of the six key well-mixed GHGs in the atmosphere threaten the public health and welfare of current and future generations. To estimate global warming potential, all GHGs are expressed relative to a reference gas, $CO_2$, which is assigned a global warming potential equal to one (1). All six GHGs are multiplied by their global warming potential, and the results are added to calculate the total equivalent emissions of $CO_2$ ($CO_2e$). However, the dominant GHG emitted is $CO_2$, accounting for 80 percent of all GHG emissions as of 2019, the most recent year for which data are available (USEPA, 2022a). Current GHG emission sources on Fort Belvoir include combustion engines, boilers, chillers, and water heaters.

The Proposed Action would be constructed in accordance with EO 13123, *Greening the Government Through Efficient Energy Management*, and other applicable laws that pertain to sustainable construction including the 2018 International Green Construction Code, UFC 3-600-01, Energy Star Energy Efficiency Labeling System, and 40 CFR 247 Comprehensive Procurement Guideline for Products Containing Recovered Materials.

EO 13990, *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis,* signed January 20, 2021, reinstated the final guidance issued on August 5, 2016, by the CEQ that required federal agencies to consider GHG emissions and the effects of climate change in NEPA reviews. DoD has committed to reduce GHG emissions from non-combat activities 42 percent by 2025 (DoD, 2016). Per the Department of the Army Climate Strategy, goals also include archiving 50 percent reduction in Army net GHG pollution by 2030, compared to 2005 levels, and attaining net-zero Army GHG emissions by 2050. Accordingly, estimated $CO_2e$ emissions associated with the Proposed Action are provided in this EA for informative purposes.

Fort Belvoir is required to report to USEPA through the electronic GHG tool (e-GRRT) as the installation has exceeded 25,000 metric tpy for $CO_2e$ for the last five years. Current GHG emission sources at Fort Belvoir include combustion engines, boilers, chillers, and water heaters. The emission total is the amount reported annually under the requirements of 40 CFR 98 and does not include GHG emissions from mobile sources or emergency generators.

#### *3.8.1.5 Emissions Reporting*

Title V of the CAA requires states and local agencies to permit major stationary sources. As a major stationary source for emissions, Fort Belvoir (Main Post) operates under a Title V Permit (Registration Number 70550, issued on March 21, 2003). Fort Belvoir also operates under a minor New Source Review (mNSR) permit for Main Post (same Registration Number 70550).

Stationary emission sources on Fort Belvoir include large boilers, generators, heaters, above ground storage tanks and emergency generators. Emissions limits for stationary sources, as directed by the mNSR permit, are included in **Table 3-8**.

As a requirement of the permit, Fort Belvoir Air Quality Program maintains a rolling 12-month total for the criteria pollutant emissions from Fort Belvoir sources, as found in **Table 3-8**. There are no existing emissions sources within the Proposed Action Site. Any new equipment with the potential to produce emissions would be evaluated for permitting thresholds prior to purchase and installation. Should the final design require it, a new permit would be obtained to account for future stationary sources, as warranted.

**Table 3-8: 2023 Fort Belvoir Emissions from Stationary Sources (TPY) for CY**

| Year | SO2 | CO | $PM_{10}$ | $PM_{2.5}$ | NOx | VOCs |
|---|---|---|---|---|---|---|
| 2023 Emissions | 0.12 | 12.21 | 1.15 | 1.02 | 12.93 | 1.25 |

#### *3.8.1.6 Sensitive Receptors*

CEQ NEPA regulations require evaluation of the degree to which the Proposed Action affects public health (40 CFR 1508.27). Children, elderly people, and people with illnesses are especially sensitive to the effects of air pollutants; therefore, hospitals, schools, convalescent facilities, religious facilities, and residential areas are considered to be sensitive receptors for air quality impacts, particularly when located within one mile from the emissions source. There are several Fort Belvoir-based medical facilities, schools, residential areas, and religious institutions on the installation, most of which are located over a one-mile radius of the Proposed Action study area.

### *3.8.2 Environmental Consequences*

#### *3.8.2.1 Threshold of Significance*

The threshold of significance for air quality impacts would be exceeded if the Proposed Action were to result in any of the following:

- Exceedance of the applicable General Conformity Rule *de minimis* level thresholds;
- Increase of criteria pollutant emissions to levels above permitted source thresholds; or
- Meaningful contributions to the potential effects of global climate change.

Based on compliance with the NAAQS, the General Conformity Rule is potentially applicable to emissions of VOCs and $NO_X$ in Fairfax County. The applicable *de minimis* thresholds for these pollutants is 50 tpy for VOCs and 100 tpy for $NO_X$ (40 CFR 93.153[b]). While the General Conformity Rule is not applicable to emissions of CO, $SO_X$, $PM_{2.5}$, and $PM_{10}$, an insignificance indicator of 250 tpy, defined as the USEPA Prevention of Significant Deterioration threshold, can be used to provide an indication of the significance of potential impacts to air quality. The 250 tpy threshold indicator does not denote a significant impact; however, it does provide a threshold to identify actions that have insignificant impacts to air quality.

#### *3.8.2.2 Impacts of Proposed Action*

Construction

Short-term, minor, adverse impacts on air quality would result from the construction of the Proposed Action. Emissions of criteria pollutants and GHGs would be directly produced from activities such as operation of heavy equipment; heavy duty diesel vehicles hauling construction materials and debris to and from the project site; workers commuting daily to and from the project site in their personal vehicles; and ground disturbance. All such emissions would be transitory in nature and would only occur when such activities are occurring. The estimated annual emissions for construction under the Proposed Action are summarized in **Table 3-9**.

**Table 3-9: Estimated Annual Air Emissions from the Proposed Action**

| Year | $CO_2$ | $CH_4$ | $N_2O$ | $CO_{2e}$ | Threshold | Exceedance |
|---|---|---|---|---|---|---|
| **2025** | 684 | 0.02775886 | 0.00630492 | 686 | 68,039 | No |
| **2026** | 26 | 0.00089255 | 0.00044531 | 26 | 68,039 | No |
| **2027** | 29 | 0.001034 | 0.00049731 | 29 | 68,039 | No |

The air pollutant of greatest concern is PM, such as fugitive dust, which is generated from ground-disturbing activities and combustion of fuels in construction equipment. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of activity. Fugitive dust emissions would be greatest during initial site preparation activities and site grading and would vary from day to day depending on the work phase, level of activity, and prevailing weather conditions. In accordance with 9 VAC 5-40-90, construction contractors would be required to take reasonable precautions to prevent particulate matter from becoming airborne. BMPs and environmental control measures (e.g., wetting the ground surface) would be incorporated at construction areas to minimize fugitive dust emissions. In addition, work vehicles would be well-maintained and use diesel particulate filters to reduce

emissions of criteria pollutants. These BMPs and environmental control measures could reduce uncontrolled PM emissions from a construction site by approximately 50 percent.

Construction and operation associated with the Proposed Action would produce a total of 684 metric tons of $CO_2e$. By comparison, 684 metric tons of $CO_2e$ is approximately the GHG footprint of 163 passenger vehicles driven for one year or 89.2 homes' energy use of one year (USEPA, 2024b). In 2021, Virginia produced 98 million metric tons of $CO_2$ emissions (USEIA 2021). Assuming all $CO_2e$ emissions from construction are from $CO_2$, emissions, the Proposed Action would represent less than percent 0.0006 of the total $CO_2$ emissions from the state. As such, air emissions produced during construction would not meaningfully contribute to the potential effects of global climate change and would not notably increase the total $CO_2$ emissions produced by the State.

Climate patterns and foreseeable climate trends in the northeast, such as increased average temperatures, increase in the frequency and intensity of flooding and drought events, and disruption of vegetative ecosystems, are unlikely to affect the U.S. Army's ability to implement the Proposed Action, and the Proposed Action would not appreciably contribute to the regional (i.e., northeastern United States) impacts from global climate change because of insignificant $CO_2e$ emissions compared to the total emissions produced by the state. Therefore, climate change would not likely affect the ability for the Proposed Action to be implemented.

Operations

Long-term, negligible, direct, adverse impacts on air quality would occur from operational air emissions associated with the Proposed Action. Operational air emissions would mainly be produced from the natural gas heating for the proposed buildings and the gas usage from the personnel supporting the buildings. Total estimated annual air emissions from operation of the proposed travel camp expansion are summarized in **Table 3-10.** Personnel emissions are based primarily on two personnel commuting to and from the site regularly.

**Table 3-10: Operational Emissions of the Proposed Action Tons Per Year**

| Pollutant | Personnel Emission TPY | Buildings Emissions TPY |
|---|---|---|
| $SO_x$ | 0.000109 | 0.0000054 |
| VOC | 0.015281 | 0.000497 |
| $NO_x$ | 0.008928 | 0.009038 |
| CO | 0.209110 | 0.007592 |
| $PM_{10}$ | 0.000295 | 0.000687 |
| $PM_{2.5}$ | 0.000261 | 0.000687 |
| Ammonia | 0.002569 | 0 |
| Pb | 0 | 0 |

Operation of the warehouse and administrative building would produce 21.204 tons (19.236 metric tons) of $CO_2e$, which is equivalent to the GHG footprint of 4.6 passenger vehicles driven for one year or 2.5 homes' energy use for one year (USEPA, 2024b). Assuming all $CO_2e$ operational emissions are from $CO_2$, operational emissions would represent less than 0.00006634 percent of the total $CO_2$ emissions from the state. As such, air emissions produced during operation of the

Proposed Action would not meaningfully contribute to the potential effects of climate change and would not noticeably increase the total $CO_2$ emissions produced by the state.

3.8.2.2.1 General Conformity

Emissions of VOCs and $NO_X$ during the construction phase would be less than their respective *de minimis* level thresholds of 50 tpy for VOCs and 100 tpy for $NO_X$. Emissions of CO, $SO_X$, $PM_{2.5}$, and $PM_{10}$ would be less than the insignificance threshold of 250 tpy. In addition, the annual emissions from operation of the proposed travel camp expansion would not exceed the *de minimis* level thresholds or insignificance thresholds of any criteria pollutant; therefore, a general conformity determination is not required and no significant impacts would occur. The U.S. Army has prepared a Record of Non-Applicability (RONA) for CAA conformity (see **Appendix F**).

### *3.8.2.3 Impacts of No Action Alternative*

There would be no impacts from the No Action Alternative. The Proposed Action would not be constructed; therefore, air quality would not change in any way.

## 3.9 TRAFFIC AND TRANSPORTATION

### *3.9.1 Affected Environment*

#### *3.9.1.1 Transportation*

Direct access to Fort Belvoir from I-95 is primarily via the Fairfax County Parkway (Route 7100 via Exit 166) with alternate access points at Lorton Road (Exit 163) and U.S. 1 (Exit 161). Rail transit does not directly connect to Fort Belvoir, but buses serve the post both directly and indirectly (Fort Belvoir, 2017).

Fort Belvoir's transportation system consists of roadways, multi-use trails, and a military airfield (Davison Army Airfield). Road access to Fort Belvoir is primarily through seven named Access Control Points (ACPs): Tulley Gate (entry to Pohick Road from U.S. 1), Lieber Gate (entry to Meade Road from U.S. 1), Pence Gate (entry to Belvoir Road from U.S. 1), J. J. Kingman Gate (entry from the Fairfax County Parkway), Walker Gate (entry from the Mount Vernon Memorial Highway), Telegraph Graph Gate (entry on Beulah Street), and Farrer Gate (access to DAAF only).

The Proposed Action area is located on the South Post, and accessible from Theote Road. Major roadways that connect to the site include the north-south Belvoir and Gunston Roads, and the east-west 12$^{th}$, 16$^{th}$, 18$^{th}$, 21$^{st}$, and 23$^{rd}$ Streets. Theote Road intersects with Pohick Road and Gunston Road that runs north to south through the Main Post and connects with U.S. 1. Morrow Road runs north to south adjacent to the western boundary of the Proposed Action area and provides a connection to the existing travel camps southeast of the site and access to Gunston Cove. Tulley Gate is the closest ACP to the Proposed Action area. There are two proposed entrances for the Proposed Action, one located on the north end of the site off Theote Road, and the other on the western side off Morrow Road. In addition to providing 30 RV hook-up pads, there will be parking for the 10 tent camp sites as well as parking for guests to the travel camp expansion.

*3.9.1.2 Traffic*

Fort Belvoir is located 18 miles southwest of Washington, D.C., in Fairfax County, which is the most populated jurisdiction in the National Capital Region and is expected to continue to grow according to Fairfax County and Metropolitan Washington Council of Governments forecasts (U.S. Army, 2015). Fort Belvoir is one of the largest employers in Fairfax County with a workforce of over 39,000 employees and is a major driver of traffic within the area. On post, workers are most heavily concentrated on the North and South Post. In addition to commuters, Fort Belvoir's services for active and retired military personnel and their dependents attract non-commuting trips during the day, including visitors to the PX, Commissary, the Fort Belvoir Community Hospital and recreational facilities. There are approximately 9,300 people living on Fort Belvoir.

The existing on-post roadway network provides mobility and connectivity to support the current use of the installation. Regional peak hour traffic where installation roads connect with public roadways creates inbound and outbound congestion during peak periods. However, once inside the security gates, there is no major congestion within the Fort Belvoir (U.S. Army, 2015).

A Transportation Impact Analysis conducted for 2015 RPMP EA analyzed the level of service (LOS) for major intersections at Fort Belvoir (U.S. Army, 2015). LOS is a qualitative measure describing operational traffic conditions, and the perception of these conditions by drivers or passengers. These conditions include factors such as speed, delay, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. Levels of service are given letter designations from A to F, with LOS A representing the best operating conditions (free flow, little delay) and LOS F, the worst (congestion, long delays). Generally, LOS A and B are considered high level of service, LOS C and D are considered moderate, and LOS E and F are considered low. In general, the standards are LOS D in urban areas and LOS C in rural areas.

**Table 3-11** shows the LOS for the major intersections in the vicinity of the Proposed Action Area. The intersections in the vicinity of the Proposed Action area are operating at an LOS D or higher which is the standard for the urban area surrounding Fort Belvoir.

**Table 3-11: Level of Service For Major Intersections in Vicinity of Proposed Action Area**

| Intersection | Signalized (Y/N) | am | pm | am | pm |
|---|---|---|---|---|---|
| | | Delay (seconds/vehicle) | | LOS | |
| Gunston Road and 12th Street/Pohick Road | N | 20.5 | 31.4 | C | C |
| Gunston Road and 16th Street | N | 8.3 | 8.8 | A | A |
| Gunston Road and 21st Street | Y | 10.9 | 12.5 | B | B |
| Gunston Road and 23rd Street | Y | 13.4 | 11.1 | B | B |
| Theote Road and Pohick Road | N | 4.1 | 10.6 | A | B |
| Theote Road and 16th Street | Y | 3.4 | 3.3 | A | A |
| Pohick Road and Route I | Y | 25.7 | 49 | C | D |

### *3.9.2 Environmental Consequences*

#### *3.9.2.1 Thresholds of Significance*

Traffic and transportation would be significantly impacted if there is a decrease in the LOS, an increase in the volume of traffic beyond the existing roadway capacity, parking availability falls below minimum local standards, or new or substantially improved roadways or traffic control systems are needed.

#### *3.9.2.2 Impacts of Proposed Action*

Construction

The Proposed Action would have a short-term, negligible, direct, adverse impact on traffic and roadways in the form of construction traffic within the boundaries of the Fort Belvoir Main Post. Construction of the Proposed Action would not impact any transportation infrastructure outside of Fort Belvoir and therefore have no impact on LOS.

The roadway network within Fort Belvoir provides sufficient access for any heavy equipment that may be required for the construction phase of the Proposed Action; therefore, none of the equipment used to construct the facility would require modifications to transportation infrastructure or traffic patterns.

To ensure that construction vehicles do not degrade the quality of the roadways within Fort Belvoir, gravel construction pads would be installed at the construction site exit to ensure dirt would be physically removed (including using brushes and/or water) from construction equipment before the equipment travels on the installation's roadways. Other mitigation measures to minimize traffic impacts during construction could include limiting which ACPs would be permitted to be used by construction vehicles and scheduling deliveries to avoid major intersections during peak times.

Operations

The Proposed Action would have long-term, minor, direct, adverse impacts on traffic and roadways from the operation of the Proposed Action within the boundaries of Fort Belvoir. There would be a slight increase in use of the roadways due to the increase in RVs and passenger vehicles when accessing the site. These types of vehicles are already common in the area due to the other travel camp facilities in the vicinity. The intersections within the vicinity of the Proposed Action area are predominantly operating at a LOS of B or better, indicating that there is capacity for this increase in traffic. In addition, users of the Proposed Action could be encouraged to access the site using nearby ACPs, limiting traffic impacts to other areas of Fort Belvoir.

All parking for the RVs and passenger vehicles would be located within the Proposed Action area. Therefore, there would be no impacts to existing parking availability within the vicinity of the site.

#### *3.9.2.3 Impacts of No Action Alternative*

Under the No Action alternative, there would be no changes made to current or future transportation or traffic conditions at or in the vicinity of the Proposed Action area. Therefore, there would be no impacts to transportation and traffic to Fort Belvoir and the surrounding areas.

## 3.10 CULTURAL AND HISTORIC RESOURCES

### *3.10.1 Affected Environment*

Several federal laws and regulations—including the NHPA of 1966, as amended, the Archaeological and Historic Preservation Act of 1974, the American Indian Religious Freedom Act (AIRFA) of 1978, the Archaeological Resource Protection Act of 1979 (ARPA), and the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990—have been established to manage cultural resources. Cultural resources include "historic properties" as defined by the NHPA, "cultural items" as defined by NAGPRA, "archaeological resources" as defined by ARPA, "sacred sites" as defined by EO 13007, *Indian Sacred Sites*, to which access is afforded under AIRFA, and collections and associated records as defined in 36 CFR 79.

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

The NHPA outlines federal policy to protect historic properties and promote historic preservation in cooperation with other nations, tribal governments, states, and local governments. Sections 106 and 110 of the NHPA require federal agencies to identify, evaluate, inventory, and protect historic properties (i.e., those listed or eligible for listing in the National Register of Historic Places [NRHP]) that are under their jurisdiction and control. Federal agencies must delineate the Area of Potential Effect (APE) within which impacts from a proposed action may occur, identify historic properties present within the APE, assess the potential effects of the undertaking on those historic properties and consider ways to avoid, minimize, or mitigate any adverse effects. The APE is the geographic area in which an undertaking may directly or indirectly cause changes in the use or character of a historic property. An undertaking is any federal action with the potential to affect historic properties. Federal agencies are further required to initiate consultation with the State Historic Preservation Officer (SHPO) for actions that may impact historic properties. Virginia Department of Historic Resources (VDHR) serves as the SHPO in Virginia.

The APE for the Proposed Action is defined as the Proposed Action area plus a half-mile buffer surrounding the Proposed Action Site to account for any potential effects on the viewshed of other resources in the vicinity.

#### *3.10.1.1 Fort Belvoir History*

The area that comprises Fort Belvoir has been used by military and government agencies since the early 20th Century. Originally, this area was named Camp AA Humphreys and was used as an engineering school/proving ground, ordnance range, and training camp for soldiers entering World War I (WWI). The population of Camp AA Humphreys reached over 22,000 troops during its most active period. After the end of WWI the population of the Installation decreased substantially in size and it became a permanent Army Installation in 1922, being renamed as Fort Humphreys. The Installation's main mission remained as a training/proving ground for military engineers. The Army Garrison was renamed in 1935 to Fort Belvoir in recognition of Belvoir Manor which had once occupied a land parcel of the area that the Installation was now situated upon.

After WWII the post fluctuated in personnel size due to times of conflict and peacetime. The mission of Fort Belvoir continued to be the research and development of engineering techniques and practices. Areas of emphasis ranged from cold weather temporary building designs to fungicides used in tropical climates. Fort Belvoir was considered the main engineering facility for the Army until 1988 when the US Army Engineer School was transferred to Fort Leonard Wood, Missouri. The current mission of Fort Belvoir is to provide administrative and basic operational support to its various tenant organizations.

Fort Belvoir used the Proposed Action site for the storage of military munitions from the 1930's through approximately the 1970's. During the 1980's the area was used for the storage of material other than military munitions.

*3.10.1.2 Archaeological Resources in the Area of Potential Effect*

The Proposed Action site has three archeological sites within a mile of the LOD.

Site 44FX1502 is within the LOD boundary, on the southern end. It is a terrestrial site with Native American cultural associations dated between 15000 Before Common Era (B.C.E.) and 1606 Common Era (C.E.) The site underwent surface level surveys in 1988 but has not undergone a Phase II Archeological Survey to determine its eligibility for the NRHP.

Sites 44FX1503 and 44FX1504 are terrestrial sites with Native American cultural associations dated between 15000 B.C.E.-1606 C.E. The sites underwent Phase I archeological testing in 1993 and were determined to not be eligible for NRHP. They are not located within the LOD boundary and will not be impacted by the Proposed Action.

### *3.10.2 Environmental Consequences*

#### *3.10.2.1 Thresholds of Significance*

Significant impacts on cultural resources would occur if potential resources that have not been previously documented are not properly identified, consultation pursuant to Section 106 is not completed, or impacts on viewsheds within the APE buffer are not appropriately considered and addressed.

#### *3.10.2.2 Impacts of Proposed Action*

No effects on cultural resources are anticipated from the Proposed Action. A 100-foot buffer around Site 44FX1502 would be implemented at the beginning of project construction to ensure the site was not disturbed during construction or operation of the Proposed Action.

The other four archeological and architectural sites mentioned above would not be disturbed during the construction or operation of the Proposed Action. These sites are outside of the LOD of the project and would incur no physical disturbance.
In terms of potential effects to viewsheds of resources in the project vicinity, the project is consistent with the campus-style environment found across Fort Belvoir and applicable installation design guidelines including the Fort Belvoir Master Plan. The Proposed Action site is surrounded by hardwood forest that provide a visual screen for all the known sites. Site 44FX1502 would maintain a barrier of trees to ensure its viewshed was not diminished.

In accordance with Section 106 of the NHPA, consultation was initiated with the VDHR and Fort Belvoir expects to receive concurrence from the VDHR on the determination of "no historic properties affected." A record of consultation and expected concurrence will be included in **Appendix A.**

Additionally, should cultural artifacts be inadvertently discovered during construction or operation of the Proposed Action, the inadvertent discovery plan described in Fort Belvoir's Integrated Cultural Resources Management Plan (ICRMP) would be implemented to ensure notifications are made to appropriate personnel and VDHR.

#### *3.10.2.3 Impacts of No Action Alternative*

No effects on cultural resources are anticipated from the No Action Alternative. No construction would occur that would alter the state of the sites with the Proposed Action's APE.

## 3.11 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, and PROTECTION OF CHILDREN

### *3.11.1 Affected Environment*

#### *3.11.1.1 Socioeconomics*

Socioeconomics is the relationship between economics and social elements, such as population levels and economic activity. Assessing socioeconomic conditions of a surrounding area is a reliable method in identifying adverse impacts on low-income populations and minorities. A multitude of factors can be used as indicators of economic conditions for a geographic area, such as demographics, median household income, unemployment rates, percentage of dependents living below the poverty level, employment, and housing data. Employment data identifies gross numbers of employees, employment by industry or trade, and unemployment trends. Data on industrial, commercial, and other sectors of the economy provide baseline information about the economic health of a region. Socioeconomic data are typically presented at county, state, and national levels to characterize baseline socioeconomic conditions in the context of regional, state, and national trends.

The region of influence (ROI) for this analysis is Fairfax County, Virginia. Fort Belvoir provides significant economic and social impact both directly and indirectly to this county. Fort Belvoir holds employment double that of the Pentagon with approximately 200,000 employees that represent the Army, Navy, Air Force, Marines, and Coast Guard. According to the Washington Business Journal, "...the Virginia Military Factbook, crafted by the Secretary of Veterans and Defense Affairs, the many pieces of Fort Belvoir have a $28.4 billion economic impact on Fairfax County in 2022 dollars, representing 23% of the jurisdiction's economy" (2024).

##### 3.11.1.1.1 Household Income and Property Value

Median household income in Fairfax County is $133,974. The median household income for the State of Virginia is $85,170 and for the United States is $74,580 (USCB 2022). Median household income in Fort Belvoir is $97,982.

The median property value for Fort Belvoir is $279,200, and the homeownership rate is 2.3 percent; most of the Fort Belvoir housing is managed by the Army through privatized housing agreements. The median property value in Fairfax County is $695,100, and the homeownership rate is 68 percent (USCB 2022).

#### *3.11.1.2 Environmental Justice*

EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, requires federal agencies to consider whether their actions will result in disproportionate adverse impacts to minority (People of Color) and low-income populations. EO 14096, *Revitalizing Our Nation's Commitment to Environmental Justice for All,* (April 26, 2023) expands and deepens the directives and concepts outlined in EO 12898. EO 14096 directs federal agencies to identify, analyze, and address disproportionate and adverse human health and

environmental effects and hazards of federal activities.

3.11.1.2.1 EJScreen and Climate and Economic Justice Screening Tool (CEJEST)

USEPA's EJScreen, based on nationally consistent data and an approach that combines environmental and demographic indicators in maps and reports, was used to evaluate potential EJ communities in the Proposed Action vicinity. A total of five census block groups were analyzed (**Appendix H).** Selection criteria were based off immediate proximity to the Proposed Action area. The EJScreen tool looks at 13 environmental indicators, combined with socioeconomic information such as that presented in **Table 3-12**.

**Table 3-12: Socioeconomic Indicators for Environmental Justice**

| Socioeconomic Indicator | Percentage in Census Tracts | State Average (Virginia) | Percentile in State | National Average | Percentile in Nation |
|---|---|---|---|---|---|
| People of Color | 73% | 38% | 87 | 39% | 79 |
| Low Income | 21% | 25% | 50 | 31% | 39 |
| Unemployment Rate | 7% | 5% | 78 | 65% | 72 |

*Source: EJ Screen Community Report (https://ejscreen.epa.gov/mapper/ejscreen)*

The CEJST has an interactive map and uses datasets that are indicators of burdens in eight categories: climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development. The tool uses this information to identify disadvantaged communities which exceed a certain threshold.

Neither the Proposed Action area itself nor the selected five block groups chosen for analysis, are classified as disadvantaged. There remained some criteria which exceeded the threshold for certain categories, such as the block group in Lorton exceeding the threshold of 10 percent by carrying a 14 percent value for people above the age of 25 who have less than a high school diploma.

It should be noted that CEJST identifies disadvantaged communities, which were outside of the selected block groups, alongside Richmond Highway. This is important to note as Richmond Highway runs through Fort Belvoir.

*3.11.1.3 Protection of Children*

On 21 April 1997, President Clinton issued EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, directing each federal agency to ensure that its policies, programs, activities, and standards address disproportionate environmental health or safety risks to children that may result from the agency's actions. EO 13045 recognizes that a growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health and safety risks due to still developing neurological, immunological, physiological, and behavioral systems. Examples of risks to children include increased traffic volumes and industrial- or production-oriented activities that would generate substances or pollutants that children could come into contact with and ingest.

There is one child development center located over a mile north of the Proposed Action. The Army has taken precautions for the safety of children by limiting access to certain areas, the use of fencing, and providing adult supervision.

### *3.11.2 Environmental Consequences*

#### *3.11.2.1 Thresholds of Significance*

##### 3.11.2.1.1 Socioeconomics

A proposed action is evaluated against the following significance criteria to determine if they would result in a significant impact on the socioeconomic environment:

- Substantially change to local population growth rates or employment opportunities
- Create a demand for housing, schools, public facilities, or recreational opportunities that exceeds existing supply

Socioeconomic considerations typically include construction costs and the local economic benefits related to increases in personnel. Economic impacts are defined to include direct effects, such as changes to employment and expenditures that affect the flow of dollars into the local economy, and indirect effects, which result from the "ripple effect" of spending and re-spending in response to the direct effects. Induced impacts are the result of spending of the wages and salaries of the direct and indirect employees on items such as food, housing, transportation, and medical services. This spending creates induced employment in nearly all sectors of the economy, especially service sectors, and can flow beyond the ROI.

##### 3.11.2.1.2 Environmental Justice

The concept of environmental justice is based on the premise that no segment of the population should bear a disproportionate share of adverse human health or environmental effects of a proposed federal action. Historically, low-income and minority communities have been disproportionately affected by negative environmental effects, receiving few of the benefits of economic growth and development while absorbing much of the societal cost.

A proposed action is evaluated against the following significance criteria to determine if they would result in a significant impact on environmental justice populations: it would cause socioeconomic impacts that disproportionately affect low-income or minority populations.

3.11.2.1.3 Protection of Children

Because children may suffer disproportionately from environmental health risks and safety risks, EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, was issued in 1997 to prioritize the identification and assessment of environmental health risks and safety risks that may affect children and to ensure federal agencies' policies, programs, activities, and standards address environmental and safety risks to children.

A proposed action is evaluated against the following significance criteria to determine if they would result in a significant impact on the protection of children: it would increase risks to the safety of children.

*3.11.2.2 Impacts of Proposed Action*

3.11.2.2.1 Socioeconomics

Short-term, negligible, direct and indirect, beneficial impacts to socioeconomics would be expected to occur during the construction period, as construction-related jobs would generally stimulate economic activity within the ROI.

An indirect benefit beyond the ROI would also occur due to wages and spending on building materials. While the economic benefits would be beneficial to the employees of the firms selected to implement the construction work, the overall impact on socioeconomic conditions at Fort Belvoir and within Fairfax County would be negligible. Temporary or permanent migration of workers and/or their families into the ROI would not be anticipated; therefore, no impact to community or protective services would be anticipated with implementation of the Proposed Action.

Operating the proposed travel camp expansion under Proposed Action would provide long-term, minor, direct, beneficial impacts to personnel to employed and non-employed alike. The construction of the travel camp expansion would foster increased tourism, revenue generation, opportunities of employment, and community development.

3.11.2.2.2 Environmental Justice

The Proposed Action would not have a potential disproportionate impact on communities with environmental justice concerns caused by the presence and accumulation of other environmental impacts within Fort Belvoir or Fairfax County.

3.11.2.2.3 Protection of Children

Under the Proposed Action, no effects would be anticipated to occur to children. The child development centers are to the east of the site and with proper precautions, would not allow children near the construction site. Post-construction, there would be no environmental risks for children near or in the Proposed Action site. Impacts would be negligible and would not exceed those to the general population; impacts would not occur in communities with environmental

justice concerns that have been impacted by cumulative or multiple adverse exposures. Further, this Proposed Action would take place on Fort Belvoir in an administrative area that does not have a socially vulnerable, low-income population. Therefore, the Proposed Action would have no mechanism for impact on communities with environmental justice concerns.

#### *3.11.2.3 Impacts of No Action Alternative*

Under the No Action Alternative, existing conditions would remain unchanged. There would be no impacts to environmental justice.

## 3.12 CUMULATIVE EFFECTS

This EA has been developed in accordance the 2020 CEQ NEPA regulations (40 CFR 1500) as amended on May 20, 2022, which require assessment of cumulative impacts (U.S. Army, 2022). A cumulative effect is defined as the following (40 CFR § 1508.1(g)(3)): An effect on the environment that results from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period.

### *3.12.1 Projects Considered for Potential Impacts*

The assessment of cumulative effects involves identifying and defining the scope of other actions and their interrelationship with a proposed action or alternatives. The scope must consider other projects that coincide with the location and timeline of a proposed action and other actions. Therefore, the cumulative effects analysis focuses on past, present, and reasonably foreseeable actions taking place within and immediately adjacent to Fort Belvoir.

Past actions are those actions, and their associated impacts, that occurred within the geographical extent of cumulative effects that have shaped the current environmental conditions of the Project area and, therefore, are now part of the existing environment, in addition to present actions and included in the affected environments for each resource area. Reasonably foreseeable actions that could have a causal relationship to the Proposed Action and Alternatives and contribute to additional impacts on the human environment are discussed in this section. Because the Proposed Action would be largely confined to Fort Belvoir, aside from commuter and operational traffic, only those actions occurring on Fort Belvoir or immediately adjacent to Fort Belvoir are included in this analysis. Brief descriptions of these actions, as available, follow.

***Fort Belvoir Dogue Creek Travel Camp***. This is a proposed project that involves the construction of a travel camp, similar to the travel camp in this Proposed Action. The travel camp would be located in the Dogue Creek Marina on Delaware Road and Hudson Road. This project is in a floodplain and will likely involve a Finding of No Practicable Alternative for impacts to floodplains. This project would be approximately two miles from the Proposed Action.

***Veterinary Clinic***. This proposed Veterinary Clinic would be a 21,950 square foot building in the northwest corner of the intersection of Theote Road and Warren Road. The facility would include a medical facility, parking, and associated infrastructure.

***911th Vehicle Engineering Company Complex.*** The project entails the consolidation of three separate facilitates into a single, new 911th Engineer Company Complex located on an approximately 10-acre site located north of Route 1 (Richmond Highway) between the Fairfax County Parkway and Accotink Village, on the North Post of Fort Belvoir. Under the Proposed Action, the project would include the demolition of two outdated structures at the site, followed by construction of a medium sized Tactical Equipment Maintenance Facility; an organizational equipment storage building; an organizational vehicle storage building; a petroleum, oil and lubricants storage building; a company operations facility; and an outdoor parking area.

***SM-1 Nuclear Reactor Dismantle and Decommission***. This project has begun at Fort Belvoir and involves the removal of all buildings, structures, and equipment from the SM-1 site to restore the site to a standard that allows for unrestricted future use. Because work in a floodplain is necessary, a Finding of No Practicable Alternative was completed. The site is just under a mile west of the Proposed Travel, sitting on Gunston Cove.

***Recreation Cabins***. Ten recreational cabins have been proposed on an approximately 5-acre area bounded to the north by wooded areas, to the east by Morrow Road, to the south by Johnston Road, and to the west by wooded areas. Each cabin would be approximately 900 square feet with a screened in and covered porches , resulting in 12,100 gross square feet for all ten 10 cabins.

### *3.12.2 Cumulative Effects on Resource Areas*

The Proposed Action, when combined with present and reasonably foreseeable future projects, would not result in cumulatively significant effects on any resource area. Four resource areas that would likely incur cumulative impacts are discussed below; the other resource areas identified earlier in Section 3 would not incur greater than negligible cumulative impacts.

#### *3.12.2.1 Water Resources*

All projects sited above, apart from the SM-1 Nuclear Reactor Decommissioning, would increase impervious surface of at minimum 15 acres. Fort Belvoir Project proponents would be expected to obtain coverage under applicable permits issued by USACE and VADEQ in accordance with the CWA and would adhere to avoidance, minimization and compensatory mitigation to ensure that impacts to regulated waters would remain minor, and the resulting cumulative impacts would not be significant.

Th SM-1 Nuclear Reactor Decommissioning would decrease impervious surface and provide beneficial impacts for the removal of hazardous waste associated with the reactor.

*3.12.2.2 Biological Resources*

Vegetation will incur a minor, indirect, adverse impacts due to the removal of 30 acres of forest for the combined projects. However, Fort Belvoir has in-kind mitigation measures to include replacing any trees four inches or greater dbh that are removed with the planting of two new trees. Out-of-kind compensatory mitigation, such as environmentally beneficial restoration, enhancement, or preservation measures may be completed if in-kind mitigation is not a feasible option (Fort Belvoir, 2018). Pursuant to the *Tree Removal and Protection Policy*, a Tree Protection Plan must be prepared in accordance with Fort Belvoir DPW requirements and included as part of the 35 percent design submittal for construction projects. Therefore, tree removal would be mitigated according to Fort Belvoir Policy.

*3.12.2.3 Air Quality*

If the Proposed Action were to occur at the same time as other construction efforts under the reasonably foreseeable actions, cumulative short-term, minor impacts on air quality would be expected from construction vehicle emissions. Implementation of BMPs and environmental control measures, such as wetting the ground surface and regular maintenance of work vehicles, would be incorporated at construction areas and during operations to minimize potential impacts. Cumulative, long-term, negligible to minor, adverse impacts on air quality would be expected as a result of daily operation of the Proposed Action, and Fairfax County traffic due to vehicle and equipment. Estimated air emissions generated by the Proposed Action would be *de minimis* and activities of this limited size and nature would not result in significant impacts on air quality.

*3.12.2.4 Noise*

If the Proposed Action were to occur at the same time as other construction efforts under the reasonably foreseeable actions, cumulative short-term, minor impacts on noise would be expected from construction. To minimize the potential adverse impact from these noises, vehicles would be equipped with noise-dampening equipment including mufflers which would be operated according to the manufacturers' instructions and limiting engine idling to less than five minutes. Additionally, construction would take place during daylight hours on weekdays, unless there is a specific action that would require working outside of this normal timeframe, such as mobilizing oversized materials or equipment to the site. The operation of the recreation cabins would have a minor, adverse impact on noise since they are within a quarter mile radius of the Proposed Action. However, these operational noises would be consistent with the noise produced from the Proposed Action as they are both recreational areas. Noise would be significantly lessened for the surrounding areas due to a forest bordering the sites.

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# 4 CONCLUSIONS

This draft EA has been prepared to analyze the potential environmental, cultural, and socioeconomic effects associated with the proposed construction and operation of a travel camp expansion at Fort Belvoir. It would include 30 RV camp sites with full utility hookups; a camping support facility with laundry, restrooms, showers, and open lounge space rustic camp sites; and associated vehicle circulation roads and walkways. The need for the facility is to provide space for RVs and travelers to stay within the northern Virginia area.

The analysis within this draft EA concluded that there would be no significant adverse impacts minor adverse impacts would occur to soils; topography; surface waters; riparian protection areas (RPAs); stormwater; RTE species; electricity; potable water; sanitary sewers; telecommunications; noise; air quality; traffic and transportation; and cumulative impacts.

Moderate adverse impacts would occur to wildlife and vegetation.

No impacts would occur to land use; geology, groundwater; floodplains; wetlands; coastal zones; hazardous waste and toxic material; cultural and historic properties; environmental justice; and protection of children.

**Table 4-1** summarizes the potential consequences the Proposed Action and No Action Alternative would have on the environmental resources.

Based on the evaluation of the environmental consequences in this draft EA, the Proposed Action would have no significant impacts on the environment, and the preparation of an EIS is not warranted. The preparation of a FONSI is appropriate.

**Table 4-1: Summary of Potential Environmental Consequences on Resources**

| Resource | Proposed Action | No Action Alternative | Permits, Best Management Practices, and Mitigation Measures |
|---|---|---|---|
| Land Use | No effects, land use of the Proposed Action is consistent with current land use. | No effects | |
| Geology, topography, and soils | Short-term and long-term, direct, minor adverse impacts on soils and topography. Soils would be compacted, and soil layer structure would be disturbed and modified. Exposed soils would be susceptible to wind and surface runoff. Topsoil and soil structure would be permanently lost. Topography would be permanently changed. | No effects | -Obtain ground disturbance permits from Fort Belvoir DPW<br>-Follow ESC Plan (to be included in the project civil design plan following review by Fort Belvoir DPW and approval by VDEQ)<br>-Follow SWPPP |

| Resource | Proposed Action | No Action Alternative | Permits, Best Management Practices, and Mitigation Measures |
|---|---|---|---|
| | No impacts to geology. | | -Obtain Construction General Permit from VDEQ<br>-Stormwater management BMPs would be used to help minimize impacts to exposed soils during and following construction |
| Water resources (surface water, RPAs, wetlands, floodplains, groundwater, stormwater, and coastal zones) | Minor, short-term adverse impacts on surface water, RPAs, and stormwater. Surface waters and RPAs could face impacts from soil destabilization from grading and vegetation clearing. Stormwater will have short- and long-term impacts form an increase in impervious surface area.<br><br>No impacts to groundwater, floodplains, or wetlands, or coastal zones. | No effects | -Obtain Construction General Permit<br>-Follow ESC and SWPPP, as referenced above<br>-Design and construction would be performed in accordance with Virginia CZMA policies<br>- All temporarily disturbed areas would be graded and revegetated upon completion of construction<br>-Employ erosion and sediment control measures during construction, to include silt fencing and sediment traps<br>-Implement LID measures to prevent increased runoff including infiltration berms and porous pavement |
| Biological resources (vegetation, wildlife, RTE species, and PIF) | Short-term, direct, moderate, impacts to vegetation due to the removal of approximately 22 acres of forested habitat.<br><br>Moderate, short- and long-term adverse effects to wildlife due to disturbance during construction and permanent loss of forested habitat.<br><br>Minor, direct, short-term impacts to RTE species due to loss of potential habitat. | No effects | -Replanting to offset removal of existing trees within the site would be performed in accordance with Fort Belvoir's Tree Removal and Protection Policy.<br>-Consultation regarding listed species would be conducted pursuant to Section 7 of the ESA.<br>-Acoustic bats surveys were conducted in May 2024 and no RTE bats were detected |

| Resource | Proposed Action | No Action Alternative | Permits, Best Management Practices, and Mitigation Measures |
|---|---|---|---|
| | | | - To minimize impacts to birds,construction activities would avoid cutting and removal of vegetation from April 1 to July 15.<br>- To protect nesting bat species, no trees over 3 inches in diameter would be removed within the project area between April 15 and September 15. |
| Hazardous Waste and Toxic Materials | No effects to hazardous waste or munitions. | No effects | -Soils excavated or otherwise disturbed during the project's construction phase would be tested in accordance with established Fort Belvoir policies and procedures.<br>-The construction contractor would be required to prepare and adhere to the Fort Belvoir Master Spill Plan |
| Utilities (Electricity, Potable Water, Sanitary Sewer, and Telecommunications) | Short-term and long-term, minor, direct adverse impacts to electricity during construction due to usage from construction equipment and rerouting of electric lines. Long-term effects would occur from increased electricity usage.<br><br>Short- and long-term, direct, minor, adverse effects to potable water, sanitary sewers , and telecommunications from line rerouting during construction and increased long-term usage. | No effects | -Any required ground disturbance associated with the extension of existing utilities for connection to the Proposed Action would adhere to the required sediment and erosion control permits.<br>-All short-term impacts would be limited of the immediate vicinity of the Proposed Action |

| Resource | Proposed Action | No Action Alternative | Permits, Best Management Practices, and Mitigation Measures |
|---|---|---|---|
| Noise | Short-term direct, minor impacts to noise during construction.<br><br>Long-term, minor, direct impacts to noise due to operational noises similar to the surrounding travel camps. | No effects | -The Fairfax County noise ordinance limits construction noise above 60 dBA for residential areas during weekdays.<br>-Noise levels must not exceed NIOSH or OSHA guidance for construction workers.<br>-To minimize the potential adverse impact from these noises, construction vehicles would be equipped with noise dampening equipment<br>-Construction vehicles and equipment would be turned off when not in use for more than five minutes.<br>-Construction would take place during daylight hours on weekdays, unless there is a specific action that would require working outside of this normal timeframe, such as mobilizing oversized materials or equipment to the site. |
| Air Quality | Short-term, direct, minor impacts to air quality from construction and heavy machinery usage.<br><br>Long-term, direct, negligible impacts to air quality from operations of the natural gas heating and personnel supporting the buildings. | No effects | -BMPs include: covering truck beds while in transit to reduce fugitive emissions; spraying water on any unpaved roads or stockpiles to limit fugitive emissions; using ultra-low sulfur diesel as a fuel source where appropriate to minimize oxides of sulfur emissions; using clean diesel in construction equipment and vehicles though the implementation |

| Resource | Proposed Action | No Action Alternative | Permits, Best Management Practices, and Mitigation Measures |
|---|---|---|---|
| | | | of add-on control technologies and using electric-powered equipment in lieu of diesel-powered equipment when feasible; and, implementing control measures for heavy construction equipment and vehicles (e.g. minimizing operating and idling time).<br>-Emissions would be less than *de minimis levels* |
| Traffic and Transportation | Short-term, direct, negligible, adverse impacts due to construction traffic within Fort Belvoir boundaries.<br><br>Long-term, direct, minor adverse impacts from a small increase in traffic from travelers at the travel camp expansion. | No effects | -Roads in Fort Belvoir are sufficient for heavy machinery, requiring no modifications to infrastructure or traffic patterns<br>-Gravel construction pads would be used to remove construction dirt before equipment leaves<br>-Limit the ACPs construction vehicles use |
| Cultural and Historic Resources | No effects. A 100-foot buffer would be implemented around the documented archaeological site and would ensure no inadvertent disturbance to that resource. | No effects | -Consultation in accordance with<br>Section 106 of the NHPA required<br>-Inadvertent discovery of cultural resources would be managed according to procedures documented in Fort Belvoir's ICRMP<br>-100-foot buffer would be implemented around Site 44FX1502 to ensure no disturbance |
| Socioeconomics, Environmental Justice, and Protection of Children | Short-term, direct and indirect, negligible beneficial impacts to socioeconomics from construction-related jobs stimulating the economy. | No effects | -The Proposed Action would be initiated only after this environmental review has been completed and the appropriate permits |

| Resource | Proposed Action | No Action Alternative | Permits, Best Management Practices, and Mitigation Measures |
|---|---|---|---|
| | No effects to environmental justice or protection of children. | | are acquired. It is anticipated that the permitting process would result in assurance of safety and protection of the public, including children.<br>-Proper precautions including the placement of fencing, signage, and other types of barriers would be used to prevent potential harm to all civilians, including children. |
| Cumulative Impacts | Minor, indirect, long-term impacts to water resources due to increases in impervious surfaces.<br><br>Minor, long-term, indirect, adverse impacts to biological resources due to loss of habitat.<br><br>Minor, long-term, indirect impacts, adverse impacts to air quality due to increased emissions.<br><br>Minor, long-term, indirect, adverse impacts to air quality due to increased noise level from construction of projects and operational noises. | No effects | -Fort Belvoir Master Plan accounts for cumulative impacts and has long-term plans for overall beneficial impacts to the Installation<br>-Adhere to CWA, VADEQ, and USACE permits and regulations for water quality for all projects<br>-Adhere to the tree replacement policy at Fort Belvoir and mitigate tree loss where needed<br>-Implement BMPs to reduce dust and emissions during construction<br>-Use noise dampening equipment for construction vehicles |

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# 5 ACRONYMS

| | |
|---|---|
| ACP | Access Control Point |
| AIRFA | American Indian Religious Freedom Act |
| APE | Area of Potential Effect |
| ARPA | Archaeological Resource Protection Act |
| BCE | Before Common Era |
| BMP | Best Management Practice |
| BRAC | Defense Base Realignment and Closure |
| CAA | Clean Air Act |
| CBPA | Chesapeake Bay Preservation Act |
| CE | Common Era |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFR | Code of Federal Regulations |
| CO | Carbon Monoxide |
| $CO_2$ | Carbon Dioxide |
| $CO_2e$ | Carbon Dioxide Equivalent |
| CRMP | Coastal Resources Management Program |
| CWA | Clean Water Act |
| CZMA | Coastal Zone Management Act |
| DAAF | Davison Army Airfield |
| dB | Decibel |
| dBA | A-weighted Decibel |
| dbh | Diameter at Breast Height |
| DERP | Defense Environmental Restoration Program |
| DMM | Discarded Military Munitions |
| DNL | Day-night Average Sound Level |
| DOD | Department of Defense |
| DPW | Department of Public Works |
| DVP | Dominion Virginia Power |
| EISA | Energy Independence and Security Act |
| EISA | Energy Independence and Security Act |
| EO | Executive Order |
| EPA | Environmental Protection Agency |
| ESA | Endangered Species Act |
| ESC | Erosion and Sediment Control |
| FAA | Federal Aviation Administration |
| FBNA | Fort Belvoir North Area |
| FEMA | Federal Emergency Management Agency |
| FHWA | Federal Highway Administration |
| FIRM | Flood Insurance Rate Map |
| GHG | Greenhouse Gas |
| HAP | Hazardous Air Pollutants |
| I | Interstate |
| ICPRB | Interstate Commission on the Potomac River Basin |
| ICRMP | Integrated National Resources Management Plan |

| | |
|---|---|
| INRMP | Integrated Natural Resource Management Plan |
| IRP | Installation Restoration Program |
| LEQ | Equivalent-Average Sound Level |
| LID | Low Impact Development |
| LOS | Level of Service |
| MC | Munitions Constituents |
| MEC | Munitions and Explosives of Concern |
| MMRP | Military Munitions and Response Program |
| MS4 | Municipal Separate Storm Sewer System |
| MSL | Mean Sea Level |
| NAAQS | National Ambient Air Quality Standards |
| NAGRPRA | Native American Graves Protection and Repatriation Act |
| NHPA | National Historic Preservation Act |
| NIOSH | National Institute for Occupational Safety and Health |
| NMP | Nutrient Management Plan |
| $NO_X$ | Nitrogen Oxides |
| NPDES | National Pollutant Discharge Elimination System |
| NRCS | Natural Resources Conservation Service |
| NRHP | National Register of Historic Places |
| NSR | Noise-sensitive Receptor |
| $O_3$ | Ozone |
| OSHA | Occupational Safety and Health Administration |
| PCB | Polychlorinated Biphenyls |
| PFO | Palustrine Forested |
| PIF | Partners in Flight |
| PM | Particulate Matter |
| $PM_{10}$ | Particulate Matter 10 Microns |
| $PM_{2.5}$ | Particulate Matter 2.5 Microns |
| RFI | Facility Investigation Report |
| ROI | Region of Influence |
| RPA | Resource Protection Areas |
| RPMP | Real Property Master Plan |
| SMP | Stormwater Management Program |
| $SO_X$ | Sulfur Oxides |
| SWMU | Solid Waste Management Unit |
| SWPPP | Stormwater Pollution Prevention Plan |
| TMDL | Total Maximum Daily Load |
| TPY | Tons Per Year |
| USACE | U.S. Army Corps of Engineers |
| USDA | U.S. Department of Agriculture |
| USEPA | U.S. Environmental Protection Agency |
| UXO | Unexploded Ordnance |
| VAC | Virginia Administrative Code |
| VADEQ | Virginia Department of Environmental Quality |
| VDHR | Virginia Department of Historic Resources |
| VOC | Volatile Organic Compounds |

VPDES Virginia Pollutant Discharge Elimination System

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# 6 LIST OF PREPARERS

| US Army Corps of Engineers, Baltimore District | | |
|---|---|---|
| Name | Project Responsibility | Organization |
| Marisa Wetmore | Section Chief | Planning Division |
| Connie Ramsey | Section Chief | Planning Division |
| Lauren Joyal | Project Manager | Planning Division |
| Christina Olson | Biologist | Planning Division |

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APPENDICES

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# APPENDIX A – AGENCY COORDINATION

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**DEPARTMENT OF THE ARMY**
**US ARMY INSTALLATION MANAGEMENT COMMAND**
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT BELVOIR**
**9820 FLAGLER ROAD, SUITE 213**
**FORT BELVOIR, VIRGINIA 22060-5928**

June 20, 2024

Directorate of Public Works

Mr. Troy Andersen
Field Supervisor
U.S. Fish and Wildlife Service
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061

Dear Mr. Andersen,

The purpose of this letter is to initiate consultation with your office under Section 7 of the Endangered Species Act (ESA) for a proposed undertaking by the US Army Garrison Fort Belvoir to construct 30 RV camp sites with full utility hookups, 15 rustic cabins, a camping support facility with laundry, restrooms, showers, and camper's lounge space, rustic camp sites, and associated vehicle circulation roads and walkways at Fort Belvoir, in Fairfax County, Virginia (Enclosure 1).

The purpose of the project is to provide adequate outdoor camping opportunities for the Fort Belvoir/National Capital Region customers. This project will provide Fort Belvoir customers space for camp sites in the Northern Virginia region, with convenient access to Washington D.C. and affordable prices compared to commercialized campsites. The Proposed Action is located on previously disturbed land. The project will also require new electrical, water, gas, sanitary sewer lines; lighting; parking; curb and gutter; sidewalks; storm drainage; landscaping; and other site improvements.

Subsequent to the up-listing of the Northern Long-Eared Bat (*Myotis septentrionalis*) (NLEB) in 2023 from threatened to endangered, the Service suspended the traditionally used 4(d) rule applied to NLEB consultations and instituted the Interim Consultation Framework, to be used by federal projects completed by September 2024. Fort Belvoir completed the species-specific effect determination key for the NLEB using the IPaC platform and has submitted a determination of Not Likely to Adversely Affect.

There is also potential occurrence of the tricolored bat (*Perimyotis subflavus*), which is currently proposed for listing as endangered. While no official determination key is available for the tricolored bat, the time of year restrictions found in the NLEB determination key would be expected to aid in minimizing detrimental effects of the project to the tricolored bats. Therefore, Fort Belvoir has determined a similar Not Likely

to Adversely Affect determination for this species, which would be anticipated to use the same forest habitat as the NLEB in the project area.

To further understand the extent of potential bat presence in the project area, Fort Belvoir engage Engineer Research and Development Center (ERDC) to conduct a presence/absence survey for the NLEB and Indiana bat (*Myotis sodalis*), as well as the tricolored and little brown (*Myotis lucifugus*) bats. Based on the survey, two (2) species were detected within the project area during the May 2024 survey window. These findings are complementary to other findings in the region. EBAT did not detect any currently listed federally threatened or endangered species during the duration of this study. A copy of this report has been uploaded to the IPaC project page.

The species list also noted the potential presence of the candidate species, Monarch butterfly (*Danaus plexippus*). We request any additional information your office may have on the presence of federally protected animal and plant species listed by the Fish and Wildlife Coordination Act and Section 7 of the Endangered Species Act for the project areas shown on the enclosed site location maps.

Please provide written comments within 30 days from the date of this letter to Mrs. Ashley McMahon, Chief, Environmental Division, Directorate of Public Works, Building 1442, 9430 Jackson Loop, Fort Belvoir, Virginia 22060, or by email to ashley.c.mcmahon2.civ@army.mil. If you need further information, please contact Mr. John Pilcicki by phone at 703-805-3968, or by email at john.l.pilcicki.civ@army.mil .

Sincerely,

MESSINA.JOSEPH.VINCENT.1005845722
Digitally signed by MESSINA.JOSEPH.VINCENT.1005845722
Date: 2024.07.01 10:00:44 -04'00'

Joseph V. Messina
Colonel, U.S. Army
Commanding

Enclosures

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**DEPARTMENT OF THE ARMY**
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT BELVOIR
9820 FLAGLER ROAD, SUITE 213
FORT BELVOIR, VIRGINIA 22060-5928

June 20, 2024

Directorate of Public Works

Mr. Marc Holma
Office of Review and Compliance
Virginia Department of Historic Resources
2801 Kensington Avenue,
Richmond, VA 23221

Dear Mr. Marc Holma,

U.S. Army Garrison Fort Belvoir would like to initiate formal Section 106 consultation with your office in accordance with Section 36 CFR § 800.3 of the Advisory Council on Historic Preservation's regulations implementing Section 106.

US Army Garrison Fort Belvoir is proposing the construction of a 30 RV camp sites with full utility hookups, 15 rustic cabins, a camping support facility with laundry, restrooms, showers, and camper's lounge space, rustic camp sites, and associated vehicle circulation roads and walkways. The purpose of the Proposed Action is to provide adequate outdoor camping opportunities for the Fort Belvoir/National Capital Region customers. This project will provide Fort Belvoir customers space for camp sites in the Northern Virginia region, with convenient access to Washington D.C. and affordable prices compared to commercialized campsites. Figure 1 shows the expanded Limits of Disturbance (LOD) for proposed travel camp. The travel camp would be located on the southeast of the Fort Belvoir main post, southeast of the intersection of Theote and Morrow Roads and roughly bounded by McClellan Loop.

Fort Belvoir has determined that an Environmental Assessment (EA) is the most appropriate level of analysis and documentation to satisfy National Environmental Policy Act requirements. Enclosed is a draft of the EA; the final version will be available for public review in both digital and print format. The Area of Potential Effect (APE) is defined as the limits of disturbance (LOD) for the Proposed Action, and those areas from which the construction activities and new travel camp will be visible. The proposed undertaking will not impact any historic architectural resources, buildings, or structures. The entire LOD has been previously surveyed for archaeological resources. There are three known archeological sites within or in the vicinity of the APE (Figure 3)

Site 44FX1502 is within the LOD boundary. It is a terrestrial site with Native American cultural associations dated between 15000 B.C.E.-1606 C.E. The site underwent surface level surveys in 1988 but has not undergone a Phase II Archeological Survey to determine its eligibility for the National Register of Historic

Places (NRHP). Site 44FX1503 and 44FX1504 are terrestrial sites with Native American cultural associations dated between 15000 B.C.E.-1606
C.E. The sites underwent Phase I archeological testing in 1993 and were determined to not be eligible for NRHP. They are not located within the LOD boundary and will not be impacted by the proposed undertaking.

No known cultural or historic sites would be impacted by this undertaking. While site 44FX1502 is within the project LOD, Fort Belvoir will avoid the site and will enact a 100-foot buffer around the site for all construction activities. Should archaeological artifacts or features be encountered during construction, all construction activities in the immediate vicinity of the discovery would stop and VDHR would be contacted immediately to determine appropriate treatment.

Pursuant to Section 106 of the National Historic Preservation Act, 36 Code of Federal Regulations § 800, we request your participation and comments on the proposed undertaking. Please provide written comments within 30 days from the date of this letter to Mr. Brice Bartley, Acting Cultural Resource Manager, at brice.c.bartley.civ@army.mil, or Mrs. Ashley McMahon, Chief, Environmental Division, Directorate of Public Works, at ashley.c.mcmahon2.civ@army.mil or 703-806-0020.

Sincerely,

MESSINA.JOSEPH.VINCENT.1005845722 Digitally signed by MESSINA.JOSEPH.VINCENT.1005845722 Date: 2024.07.01 10:00:44 -0400'

Joseph V. Messina
Colonel, U.S. Army
Commanding

Enclosures

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**DEPARTMENT OF THE ARMY**
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT BELVOIR
9820 FLAGLER ROAD, SUITE 213
FORT BELVOIR, VIRGINIA 22060-5928

June 20, 2024

SUBJECT: Tribal Consultation Invitation with Chickahominy Indian Nation for the Proposed RV Travel Camp Expansion, Fort Belvoir, VA

Chief Stephen Adkins
Chickahominy Indian Tribe
8200 Lott Cary Road
Providence Forge, VA 23140

Dear Chief Adkins:

Respecting your tribal sovereignty and in recognition of our government-to-government relationship, U.S. Army Garrison Fort Belvoir invites you to consult on a new proposed action. Fort Belvoir has prepared an Environmental Assessment (EA) to evaluate potential environmental, cultural, and socioeconomic effects associated with the construction of new Recreational Vehicle (RV) travel camp. The project would provide adequate outdoor space and camping opportunities for Fort Belvoir/National Capital Region customers and meet the high demand for RV camp sites in Northern Virginia. The project site is located in Fort Belvoir, Virginia (Enclosure 1 and 2).

In accordance with Section 106 of the National Historic Preservation Act, 36 Code of Federal Regulations § 800, and Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, your participation and comments are requested. Your comments will aid to help further develop the scope of the environmental analysis. We invite you to be a consulting party in this review to help identify historic properties in the project area that may have religious and cultural significance to your tribe. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural places and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

While the construction of a new travel camp is expected to have minor adverse effects on the immediate area, Fort Belvoir has determined it will not be an adverse effect to cultural and historic resources, as much of the area has been disturbed previously. Three archeological sites are present within or adjacent to the project's limit of disturbance (Enclosure 3).

Site 44FX1502 is within the LOD boundary. It is a terrestrial site with Native American cultural associations dated between 15000 B.C.E.-1606 C.E. The site underwent surface level surveys in 1988 but has not undergone a Phase II Archeological Survey to determine its eligibility for the National Register of Historic Places. This site will be avoided with a 100-foot buffer. Sites 44FX1503 and 44FX1504 are terrestrial sites with Native American cultural associations dated between 15000 B.C.E.-1606 C.E. The sites underwent Phase I archeological testing in 1993 and were determined to not be eligible for NRHP. They are not located within the LOD boundary and will not be impacted by the proposed undertaking.

Please provide written comments within 30 days from the date of this letter to Mr. Brice Bartley, Acting Cultural Resource Manager, at brice.c.bartley.civ@army.mil 703-806-4142 or Mrs. Ashley McMahon, Chief, Environmental Division at ashley.c.mcmahon2.civ@army.mil 703-806-0020. We look forward to consulting with your tribe regarding the proposed project.

Sincerely,

MESSINA.JOSEPH.VINCENT.1005845722 Digitally signed by MESSINA.JOSEPH.VINCENT.1005845722 Date: 2024.07.01 10:00:44 -04'00'

Joseph V. Messina
Colonel, U.S. Army
Commanding

Enclosures

APPENDIX B – WETLAND DELINEATION REPORT

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, BALTIMORE DISTRICT
2 HOPKINS PLAZA
BALTIMORE, MARYLAND 21201-2930

CENAB-PL-I 2 May 2024

MEMORANDUM FOR: Felix Mariani, Chief, Environmental Division, Directorate of Public Works, Building 1442, 9430 Jackson Loop, Fort Belvoir, VA 22060

SUBJECT: Results of Water Resources Survey for the proposed Travel Camp Facility at Fort Belvoir, Fairfax County, Virginia

1. In support of National Environmental Policy Act (NEPA) documentation needed for a proposed travel camp facility at Fort Belvoir, biologists from the U.S. Army Corps of Engineers (USACE) Baltimore District Planning Division conducted a water resources survey on 21-22 February 2024. The water resources survey was needed to identify and delineate the extent of any potentially regulated wetlands and/or streams within the travel camp study area.

2. Fort Belvoir policy, as outlined in the *Fort Belvoir Directorate of Public Works Environmental and Natural Resources Division (DPW-ENRD) Guide for Project Sites with Waters of the U.S., Resource Protection Areas (RPAs) and Stream Buffers*, requires a water resource survey to identify Waters of the United States (WOUS) for all projects where natural resources may be impacted. All perennial streams and associated wetlands require a 100-foot RPA buffer while intermittent streams and associated wetlands require a 35-foot RPA buffer.

3. The travel camp study area lies within the southwestern corner of Fort Belvoir and is bordered by Theote Road to the north and Morrow Road to the west (Enclosure 1). The study area is approximately 22 acres. An additional 100-foot buffer surrounding the study area was also surveyed to ensure that there are no RPAs that would be impacted by the proposed project.

4. The southern and central portions of Fort Belvoir are situated on the Coastal Plain Physiographic Province. The Potomac Group, which makes up the majority of the Coastal Plain Physiographic Province under Fort Belvoir, is characterized by lens-shaped deposits of interbedded sand, silt, clay, and gravel, primarily of nonmarine origin. Topography varies throughout the travel camp study area, with the highest elevation approximately 130 feet above mean sea level (MSL), located in the center of the area, and the lowest elevation approximately 80 feet above MSL located in the southeastern corner of the area.

5. There were no WOUS and associated wetlands or isolated wetlands identified within the study area during the survey. The wetland delineation was conducted in accordance with U.S. Army Corps of Engineers Wetland Delineation Manual as well as the Regional Supplement to the U.S. Army Corps of Engineers Manual Atlantic and Gulf Coastal Plain Region. The Wetland Determination Data Sheets can be found in Enclosure 2. There were two features identified within a 100-foot buffer of the project area, identified as WOUS-1 and WOUS-2. Both features were determined to be stream channels as they exhibited a bed and bank morphology with an Ordinary High Water Mark (OHWM). Using the *North Carolina Division of Water Quality Methodology*

*for Identification of Intermittent and Perennial Streams and Their Origin*, it was determined that WOUS-1 and WOUS-2 are intermittent streams (Enclosure 2).

6. WOUS-1 has an average channel width of 3 feet and an average channel depth of 4 feet. Approximately 100 feet from the start of the stream, the width of the channel widens, and the banks become more developed, with an average of approximately 8 feet channel width and 6 feet channel depth. The previous rain event was more than 48 hours prior to the survey and there was no evidence of base flow within the channel.

7. WOUS-2 has an average channel width of 2 feet and an average channel depth of 2 feet until approximately 300 feet from the start of the stream where there is a head cut and the stream channel width widens to an average of approximately 10 feet and deepens to an average of approximately 6 feet. There was no evidence of base flow within the stream channel. Table 1 summarizes the WOUS information inventoried during the 2024 study area.

**Table 1: WOUS Delineated From 2024 Survey**

| WOUS | Type | Location | Length | Drainage |
|---|---|---|---|---|
| 1 | Intermittent | Northeast of the study area | 318 feet | From northwest to southeast into a perennial stream that outflows into Gunston Cove and then the Potomac River |
| 2 | Intermittent | Southwest of the study area | 820 feet | From northwest to southeast into a perennial stream that outflows into Gunston Cove and then the Potomac River |

8. The locations of the stream channels were recorded using a Trimble Model TDC650 GeoXH handheld Global Positioning System (GPS). The 35-foot RPA buffer for both streams are outside the travel camp study area as shown in the Water Resources Survey map (Enclosure 1). There were no other WOUS or associated wetlands nor isolated streams or wetlands identified within a 100-foot buffer of the travel camp study site.

9. Please provide any questions or comments to Ms. Christina Olson at (410) 962-3065 christina.a.olson@usace.army.mil.

AMY M. GUISE
Chief, Planning Division

Encls:
1. Water Resource Survey Map
2. Datasheets

Enclosure 1:

Water Resources Survey Map

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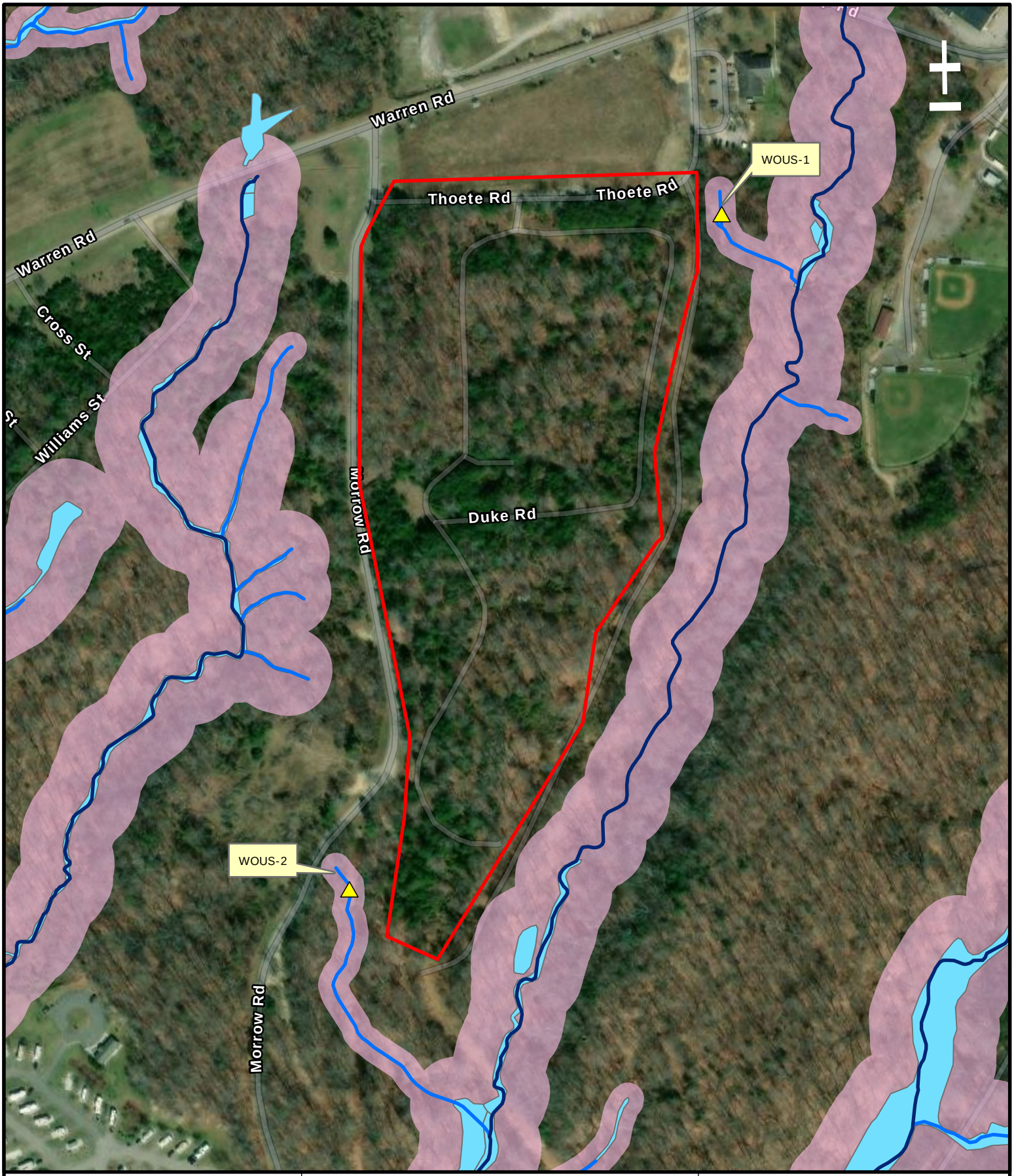


PLANNING DIVISION

1:3,500

Feet

0 75 150 300

# Fort Belvoir
# Travel Camp
# Water Resources Survey*

*Only WOUS-1 and WOUS-2 were delineated as part of this study.

- Data Points
- Intermittent Streams
- Perennial Streams
- Wetlands
- Resource Protection Areas
- Travel Camp Study Area

Enclosure 2:

Datasheets

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# STREAM DATA SHEET



**PERENNIAL FLOW DETERMINATION**

*(Adapted from North Carolina Division of Water Quality's Methodology for Identification of Intermittent and Perennial Streams and Their Origins, Version 4.11)*

## General Information

| | | | |
|---|---|---|---|
| Project/Site: | **Travel Camp EA/Fort Belvoir** | Date: | **2/22/2024** |
| Watershed: | **Accotink** | Time: | **13:22** |
| Field Investigator: | **Lauren Joyal, Christina** | State: | **Virginia** |
| | | County: | **Fort Belvoir** |

Reach Number: **WOUS-1**

## Stream Reach Summary

| | |
|---|---|
| **Approximate Reach Length:** | 318 |
| **Average Channel Width:** | 3 |
| **Average Channel Depth:** | 4 |
| **Average Water Depth: Riffles** | 0 |
| **Average Water Depth: Pools** | 0 |
| **Data Point Location:** | 18S 313455 4284021 |

**Drainage area to the reach:** N/A

**TOTAL SCORE: 25**

Stream is at least intermittent if ≥ 19 or perennial if ≥ 30

**THIS REACH IS: Intermittent**

## Recent Weather Data

| | |
|---|---|
| **Rain Gage:** | Davison Army Airfield (KDAA) |
| **Date of Last Rainfall:** | 2/17/2024 |
| **Rainfall Amount:** | 0.1" |

**Palmer Drought Index Value:** Near Normal (-1.9 to +1.9)

**Representative photographs**

**Upstream View of Channel**

**Downstream View of Channel**

**Field Indicators**

| A. Geomorphology | | Absent | | Weak | | Moderate | | Strong | Score |
|---|---|---|---|---|---|---|---|---|---|
| 1*. Continuity of channel bed and bank | | 0 | | 1 | | 2 | x | 3 | 3 |
| 2. Sinuosity of channel along thalweg | | 0 | x | 1 | | 2 | | 3 | 1 |
| 3. In-channel structure: e.g. riffle-pool, step-pool, riffle-pool sequence | | 0 | x | 1 | | 2 | | 3 | 1 |
| 4. Particle size of stream substrate | | 0 | | 1 | | 2 | x | 3 | 3 |
| 5. Active/relic floodplain | x | 0 | | 1 | | 2 | | 3 | 0 |
| 6. Depositional bars or benches | | 0 | x | 1 | | 2 | | 3 | 1 |
| 7. Recent alluvial deposits | x | 0 | x | 1 | | 2 | | 3 | 1 |
| 8. Headcuts | | 0 | | 1 | | 2 | x | 3 | 3 |
| 9. Grade control | | 0 | | 0.5 | x | 1 | | 1.5 | 1 |
| 10. Natural valley | | 0 | | 0.5 | | 1 | x | 1.5 | 1 |
| 11. Second or greater order channel | | x | No = 0 | | | | Yes = 3 | | 0 |

*artifical ditches are not rated; see discussions in manual

**Total Geomorphology Points:** 15



**Project/Site:** Travel Camp EA/Fort Belvoir
**Field Investigator:** Lauren Joyal, Christina
**Date:** 2/22/2024
**Time:** 13:22

**DATA POINT:** WOUS-1

| B. Hydrology | | Absent | | Weak | Moderate | Strong | Score |
|---|---|---|---|---|---|---|---|
| 12. Presence of Baseflow | x | 0 | | 1 | 2 | 3 | 0 |
| 13. Iron oxiding bacteria | x | 0 | | 1 | 2 | 3 | 0 |
| 14. Leaf litter | x | 1.5 | | 1 | 0.5 | 0 | 1.5 |
| 15. Sediment on plants or debris | x | 0 | | 0.5 | 1 | 1.5 | 0 |
| 16. Organic debris lines or piles | | 0 | x | 0.5 | 1 | 1.5 | 0.5 |
| 17. Soil-based evidence of high water table? | | No = 0 | | | x | Yes = 3 | 3 |
| | | | | | | **Total Hydrology Points:** | **5** |

| C. Biology | | Absent | | Weak | Moderate | Strong | Score |
|---|---|---|---|---|---|---|---|
| 18. Fibrous roots in streambed | | 3 | x | 2 | 1 | 0 | 2 |
| 19. Rooted upland plants in streambed | x | 3 | | 2 | 1 | 0 | 3 |
| 20. Macrobenthos (note diversity and abundance) | x | 0 | | 1 | 2 | 3 | 0 |
| 21. Aquatic Mollusks | x | 0 | | 1 | 2 | 3 | 0 |
| 22. Fish | x | 0 | | 0.5 | 1 | 1.5 | 0 |
| 23. Crayfish | x | 0 | | 0.5 | 1 | 1.5 | 0 |
| 24. Amphibians | x | 0 | | 0.5 | 1 | 1.5 | |
| 25. Algae | x | 0 | | 0.5 | 1 | 1.5 | |
| 26. Wetlands plants in streambed | x | FACW = 0.75 | | OBL = 1.5 | | Other = 0 | 0 |
| | | | | | | **Total Biology Points:** | **5** |

**Notes**

Stream channel contained debris as site was used as a dumping/waste area, steep slopes on both sides of the channel, no adjacent wetlands

**TOTAL SCORE:** 25

# STREAM DATA SHEET



**PERENNIAL FLOW DETERMINATION**

*(Adapted from North Carolina Division of Water Quality's Methodology for Identification of Intermittent and Perennial Streams and Their Origins, Version 4.11)*

## General Information

| | | | |
|---|---|---|---|
| Project/Site: | **Travel Camp EA/Fort Belvoir** | Date: | **2/22/2024** |
| Watershed: | **Accotink** | Time: | **14:01** |
| Field Investigator: | **Lauren Joyal, Christina** | State: | **Virginia** |
| | | County: | **Fort Belvoir** |

Reach Number: **WOUS-2**

## Stream Reach Summary

| | |
|---|---|
| **Approximate Reach Length:** | 820 |
| **Average Channel Width:** | 2 |
| **Average Channel Depth:** | 2 |
| **Average Water Depth: Riffles** | 0 |
| **Average Water Depth: Pools** | 0 |
| **Data Point Location:** | 18S 313173 4283554 |

**Drainage area to the reach:** N/A

**TOTAL SCORE: 22.5**

Stream is at least intermittent if ≥ 19 or perennial if ≥ 30

**THIS REACH IS: Intermittent**

## Recent Weather Data

| | |
|---|---|
| **Rain Gage:** | Davison Army Airfield (KDAA) |
| **Date of Last Rainfall:** | 2/17/2024 |
| **Rainfall Amount:** | 0.1" |

**Palmer Drought Index Value:** Near Normal (-1.9 to +1.9)

**Representative photographs**

**Upstream View of Channel**

**Downstream View of Channel**

**Field Indicators**

| A. Geomorphology | Absent | | Weak | | Moderate | | Strong | Score |
|---|---|---|---|---|---|---|---|---|
| 1*. Continuity of channel bed and bank | 0 | | 1 | | 2 | x | 3 | 3 |
| 2. Sinuosity of channel along thalweg | 0 | | 1 | x | 2 | | 3 | 2 |
| 3. In-channel structure: e.g. riffle-pool, step-pool, riffle-pool sequence | x 0 | | 1 | | 2 | | 3 | 0 |
| 4. Particle size of stream substrate | 0 | | 1 | | 2 | x | 3 | 3 |
| 5. Active/relic floodplain | x 0 | | 1 | | 2 | | 3 | 0 |
| 6. Depositional bars or benches | 0 | x | 1 | | 2 | | 3 | 1 |
| 7. Recent alluvial deposits | x 0 | | 1 | | 2 | | 3 | 0 |
| 8. Headcuts | 0 | | 1 | | 2 | x | 3 | 3 |
| 9. Grade control | 0 | | 0.5 | x | 1 | | 1.5 | 1 |
| 10. Natural valley | 0 | | 0.5 | x | 1 | | 1.5 | 1 |
| 11. Second or greater order channel | x No = 0 | | | | | Yes = 3 | | 0 |

*artifical ditches are not rated; see discussions in manual

**Total Geomorphology Points:** 14



**Project/Site:** Travel Camp EA/Fort Belvoir
**Field Investigator:** Lauren Joyal, Christina
**Date:** 2/22/2024
**Time:** 14:01

**DATA POINT:** WOUS-2

| B. Hydrology | | Absent | Weak | Moderate | Strong | Score |
|---|---|---|---|---|---|---|
| 12. Presence of Baseflow | x | 0 | 1 | 2 | 3 | 0 |
| 13. Iron oxiding bacteria | x | 0 | 1 | 2 | 3 | 0 |
| 14. Leaf litter | x | 1.5 | 1 | 0.5 | 0 | 1.5 |
| 15. Sediment on plants or debris | x | 0 | 0.5 | 1 | 1.5 | 0 |
| 16. Organic debris lines or piles | x | 0 | 0.5 | 1 | 1.5 | 0 |
| 17. Soil-based evidence of high water table? | | No = 0 | | x | Yes = 3 | 3 |
| | | | | | **Total Hydrology Points:** | **4.5** |

| C. Biology | | Absent | Weak | Moderate | Strong | Score |
|---|---|---|---|---|---|---|
| 18. Fibrous roots in streambed | | 3 | 2 x | 1 | 0 | 1 |
| 19. Rooted upland plants in streambed | x | 3 | 2 | 1 | 0 | 3 |
| 20. Macrobenthos (note diversity and abundance) | x | 0 | 1 | 2 | 3 | 0 |
| 21. Aquatic Mollusks | x | 0 | 1 | 2 | 3 | 0 |
| 22. Fish | x | 0 | 0.5 | 1 | 1.5 | 0 |
| 23. Crayfish | x | 0 | 0.5 | 1 | 1.5 | 0 |
| 24. Amphibians | x | 0 | 0.5 | 1 | 1.5 | |
| 25. Algae | x | 0 | 0.5 | 1 | 1.5 | |
| 26. Wetlands plants in streambed | x | FACW = 0.75 | OBL = 1.5 | | Other = 0 | 0 |
| | | | | | **Total Biology Points:** | **4** |

**Notes**

Moderate to steeps slopes on both sides of the channel, no adjacent wetlands

**TOTAL SCORE:** 22.5

# APPENDIX C – COASTAL ZONE FEDERAL CONSISTENCY DETERMINATION

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**Determination of Consistency with Virginia's**
**Coastal Resources Management Program**

This document provides the Commonwealth of Virginia with the Fort Belvoir Consistency Determination under the Coastal Zone Management Act Section 307(c)(1) and 15 Code of Federal Regulations (CFR) Part 930, Subpart C, for Fort Belvoir, Fairfax County, Virginia. The information in this Consistency Determination is provided pursuant to 15 CFR § 930.39.

This document represents an analysis of project activities in light of established Virginia Coastal Resources Management Program (CRMP) Enforceable Policies and Programs. Furthermore, submission of this consistency determination reflects the commitment of the U.S. Department of the Army (Army) to comply with those enforceable policies and programs. The Proposed Action would be implemented in a manner that is consistent with the Virginia CRMP. The Army has determined that the construction and operation of the Fort Belvoir Travel Camp would have a negligible impact on any land and water uses or natural resources of the Commonwealth of Virginia's coastal zone.

## C1 Description of Proposed Action

The Proposed Action involves the construction of a 20-acre travel camp recreational facility for campers and RV owners at Fort Belvoir in Fairfax County, Virginia (see Figure 1). The camp would include a camp support facility, and rustic tent camping. Thirty pull-through RV camp sites would be constructed, including concrete vehicle and picnic pads, water, sewer, electric, phone, and communication hook-ups. The camp support facility would include a laundry section, camper's lounge space, restrooms and showers, and vending machine space. The rustic tent camp sites would include tables and grills, water hook-ups, and vehicle parking spaces. Paved vehicle circulation roads, walking paths, landscaping, street and site lighting, sewage lift stations, storm water management, utility upgrades, and area directional signage would also be included.

## C2 Assessment of Probable Effects

The Army has prepared a draft Environmental Assessment (EA) to evaluate the potential environmental impacts from the travel camp facility in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S. Code 4321-4347), and 32 CFR Part 651, *Environmental Analysis of Army Actions*.

The Army intends to obtain all applicable permits required for implementation of the Proposed Action. A review of the permits and/or approvals required under the enforceable policies is being conducted. The Army has evaluated the construction of the Proposed Action for its foreseeable effects on the following enforceable policies:

**Fisheries –** The Proposed Action has no foreseeable impacts on fish or shellfish resources and would not affect the promotion of, or access to, commercial or recreational fisheries. The proposed site is located approximately one mile west of the Potomac River and just north of Gunston Cove which drains into the Potomac River. The closest water features near site are unnamed tributaries to Gunston Creek and associated riparian wetlands. Compliance with the installation's Municipal Separate Storm Sewer System (MS4) Permit and the Virginia Erosion and Sediment Control (ESC)

regulations would minimize the risk of sediment being transported off the site to the Potomac River Fishery. Best Management Practices (BMPs) recommended by the Virginia Departments of Conservation and Recreation and Forestry would be employed when necessary.

**Subaqueous Lands Management –** The Virginia Marine Resources Commission, pursuant to Virginia Administrative Code (VAC) Section 28.2-1204, has jurisdiction over encroachments in, on, or over any State-owned rivers, streams, and creeks. The Proposed Project would have no foreseeable impacts on subaqueous resources.

**Tidal and Non-tidal Wetlands Management –** The Proposed Action would not affect any tidal or non-tidal wetlands. There are no tidal or non-tidal wetlands located within the Proposed Action area. ESC regulations and Stormwater Management (SWM) plans would avoid and minimize impacts to wetlands outside of the Proposed Action area. Permanent SWM features would be employed using Low Impact Development (LID) measures to minimize impacts from the increase in impervious surfaces due to the Proposed Action and help protect wetlands outside of the area.

**Dunes Management –** The Proposed Action would not affect any coastal primary sand dunes.

**Non-Point Source Water Pollution Control –** Typically, a Proposed Action that is greater than 2,500 square feet would require an ESC plan and a SWM plan to be developed. The ESC plan would include temporary erosion and sediment control measures. The ESC plan and SWM plan would be prepared utilizing the requirements for water quality and quantity found in the Virginia Technical Criteria Part II B (9 VAC 25-870-62 through 9 VAC 25-870-92). The Proposed Action would disturb approximately 22 acres of soil; therefore, an ESC plan and SWM plan are required. A construction general permit in accordance with 9 VAC 25-830-130 would also be required. Short-term, minor, adverse impacts would occur from the Proposed Action on surface water with regard to water quality. Appropriate temporary erosion and sediment control measures and stormwater BMPs would be employed to minimize impacts to water quality from earth disturbance and potential erosion during construction.

**Point Source Water Pollution Control –** The Proposed Action would not result in point source water discharge.

**Shoreline Sanitation –** The Proposed Action is not located on or near a shoreline. The Proposed Action would therefore have no impact on shoreline sanitation.

**Air Pollution Control –** The Proposed Action area is located within an ozone non-attainment area, triggering the need to analyze emissions and determine the applicability of the General Conformity Rule under the Clean Air Act. A construction emissions estimate indicates that construction and operation activity would not generate sufficient emissions to trigger a need for a full General Conformity Analysis. The estimated emissions associated with the construction and operation of this Proposed Action are very low. The temporary impacts to air quality would be short-term, minor impacts that would not be regionally or locally significant.

**Coastal Lands Management –** Resource Protection Areas (RPAs) are associated with the Gunston Cove unnamed tributaries, and its associated non-tidal wetlands. There are no RPAs located in the Proposed Action area that would be impacted in the Proposed Action area (Figure 2). Appropriate

temporary ESC control measures and SWM BMPs would be employed at the construction site to minimize downstream impacts to the unnamed tributaries, Gunston Cove, and the Potomac River from earth disturbance associated with construction activities. SWM BMPs using LID would help minimize any long-term impacts to these surface waters from the increase in impervious area in the Proposed Action area.

**C3 Summary of Findings**

Based on the above analysis, which is elaborated on in the EA, Fort Belvoir personnel would: (1) ensure that the construction contractor uses and maintains appropriate temporary erosion and sediment controls; and (2) obtain the requisite permits and approvals. The Army finds that the proposed travel camp facility construction is fully consistent to the maximum extent practicable with the federally approved enforceable provisions of the Virginia CRMP, pursuant to the Coastal Zone Management Act of 1972, as amended and in accordance with 15 CFR 930.30.

Pursuant to 15 CFR Part 930.41, the Virginia CRMP has 60 days from receipt of this letter in which to concur with or object to this Consistency Determination, or to request an extension, in writing, under 15 CFR Part 930.41(b). Virginia's concurrence will be presumed if its response is not received by the Army on the 60th day from receipt of this determination. The state's response should be sent to U.S. Army Garrison Fort Belvoir, 9430 Jackson Loop, Suite 200, Fort Belvoir, VA 22060-5116.

_____

JOSEPH V. MESSINA
Colonel, U.S. Army
Commanding


**Figure 1: Proposed Project Location at Fort Belvoir**

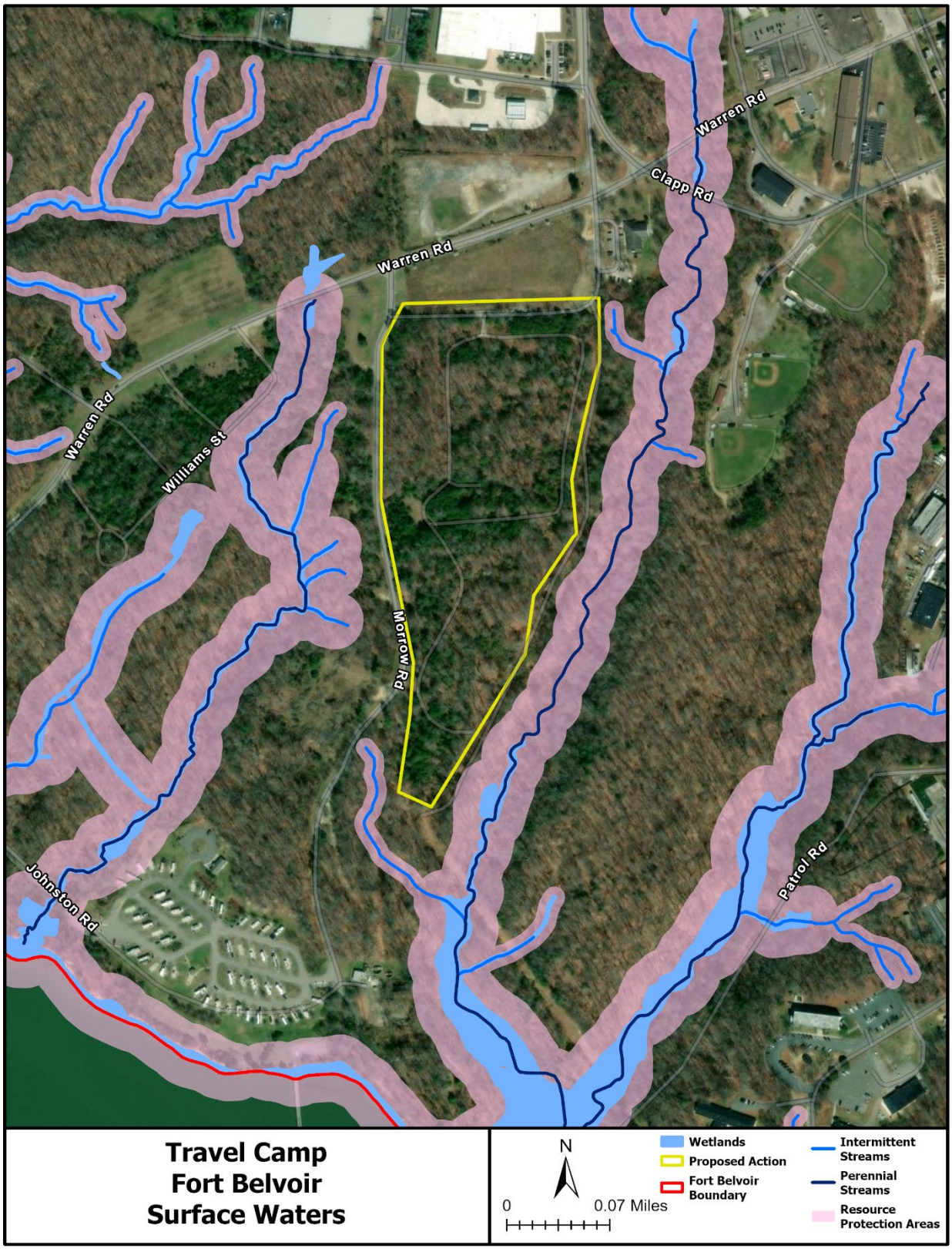


**Figure 2: Surface Waters at Proposed Location**

# APPENDIX D – FOREST STAND DELINEATION STUDY

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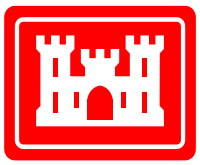
# FOREST STAND DELINEATION
# for the
# Proposed Travel Camp Facility
# At Fort Belvoir
# Fort Belvoir, Virginia



April 2024

Prepared For:

Department of Defense
Fort Belvoir

Prepared By:

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**FOREST STAND DELINEATION REPORT FOR**
**PROPOSED TRAVEL CAMP FACILITY**
**FORT BELVOIR, VIRGINIA**

## I. Introduction

The U.S. Army Corps of Engineers (USACE), Baltimore District, Planning Division prepared this report at the request of Fort Belvoir to inventory the proposed Travel Camp Facility site and assess its ecological value, estimate the number of trees located on the site, and document any specimen trees found within the site. Fort Belvoir proposes to build an approximately 22-acre travel camp on Fort Belvoir, Fairfax County, Virginia.

This report was created to inventory the plant species and their ecological value to identify potential environmental constraints, and possible mitigation efforts needed should it be developed.

## II. Site Description

The travel camp study site lies within the southwestern corner of Fort Belvoir and is bordered by Theote Road to the north and Morrow Road to the west. An unnamed stream that drains to Gunston Creek and into the Potomac River borders the site to the east and the south (Appendix A).

Fort Belvoir is located near the transition between the Eastern Piedmont and the Coastal Plain Physiographic Provinces and therefore exhibits characteristics of both. The southern and central portions of Fort Belvoir are situated on the Coastal Plain Physiographic Province, which is comprised of several geologic formations, including the Potomac Formation, Bacons Castle Formation, Shirley Formation, and Alluvium and Pliocene sand and gravel. These formations are characterized by unconsolidated sand, silt, and clay underlain by residual soil and weathered crystalline rocks. The Potomac Group, which makes up the majority of the Coastal Plain Physiographic Province under Fort Belvoir, is characterized by lens-shaped deposits of interbedded sand, silt, clay, and gravel, primarily of nonmarine origin (Fort Belvoir, 2017).

The terrain at Fort Belvoir consists of wide, flat plateaus dissected by steep ravines. Elevation decreases from west to east, ranging from a high of 230 feet above mean sea level (MSL) at the intersection of Beulah Street and Woodlawn Road near the northern edge of the main post, to sea level at the eastern edge of the main post along the Potomac River (Fort Belvoir, 2017).

Topography varies throughout the study area, with the highest elevation approximately 130 feet above MSL, located in the central area of the site, and the lowest elevation approximately 80 feet above MSL located in the southeastern corner of the site. The northern part of the study area was previously developed. It was a mature forest, and while some of this area was cleared, many of the large tree species were left in place. There is a chain link fence that surrounds the majority of the study area, and several unpaved roads transect the northern portion of the site.

## III. Methodology

Prior to field investigations, topographic maps, county soil surveys, and digital aerial orthophotographs were reviewed to identify probable forest stand boundaries. A full Forest Stand Delineation was conducted on 21-22 February 2024. Forest stands are considered forested areas at least an acre in size in accordance with the Maryland State Forest Technical Conservation Manual (Third Edition, 1997). Although this method is not a regulatory requirement in Virginia, it provides an efficient and comprehensive approach for cataloging and prioritizing forest resources. A 1/10 acre fixed plot sampling technique was used to assess forest stand conditions and forest structure. Sampling plots were chosen to be evenly distributed throughout the site. Forest stands were distinguished primarily by differences in species composition and successional stage. A stick flag was placed in the center of each plot and along the perimeter of the circular plot in each of the four cardinal directions. The plot center was marked in the field with pink tape flagging and the stand and plot number labeled with a black marker. All additional forest stand and forest structure procedures for data collection follow guidelines of the Maryland State Forest Conservation Technical Manual. The locations of specimen trees, defined as individuals with a diameter at breast height (dbh) of 30 inches or greater, or 75% of the state champion tree [(25 inches for Virginia pine (*Pinus virginiana*) and 28 inches for loblolly pine (*Pinus taeda*)], were recorded using a Trimble Model TDC650 GeoXH handheld Global Positioning System (GPS).

The priorities of the stands are given according to the guidelines in the Technical Manual. Priority 1 stands have wetlands, specimen trees, streams, steep slopes, and/or other sensitive areas. In some cases, a stand can have a sensitive area within its boundaries but be a low-quality stand based upon quality of vegetation, presence of invasive species or other values. These are noted in the stand descriptions. Priority 2 stands may contain some elements listed for Priority 1 and/or have a designation of priority in a local land use plan, local forest conservation program, or other criteria adopted by a local forest conservation program. Priority 3 areas have evidence of increasing levels of human disturbance compared to Priority 1 and 2 areas. Stand priority rankings help inform decisions on what areas should receive more consideration for on-site preservation and influence how an overall development site is designed.

The Fort Belvoir Tree Removal and Protection Policy requires the protection of existing trees and, where tree loss is unavoidable, mitigation for the removal of trees must be performed unless expressly exempted. In-kind mitigation measures include replacing any trees four inches or greater in dbh that are removed with the planting of two new trees (Fort Belvoir, 2018). Out-of-kind compensatory mitigation, such as environmentally beneficial restoration, enhancement, or preservation measures may be completed if in-kind mitigation is not a feasible option. To obtain an estimate of total trees at the site, the total number of trees of four inches or greater were counted in each fixed plot and then multiplied by the total acres of the site.

## IV. Results

The site contained one forest stand (Stand 1), which covered the full 22 acres of the site. Following the Maryland Forest Conservation Technical Manual guidance of a minimum of one plot per four acres per site, there were a total of six sample plots for the site. Stand 1 is ranked Priority 1 because

it contains specimen trees and steep topography (slopes greater than 20%). Stand variations result from changes in topographic position, degree of slope, and amount and type of historical human disturbance. The attached map (Figure 1, Appendix A) depicts the approximate location of the sampling plots, boundary of forest cover type within the study area, and specimen tree locations. Forested area conditions and forest structure were assessed at sample plots within the stand as detailed in the following stand description (see also Appendix B). Twenty-nine (29) specimen trees were found within the site, all located in Stand 1.

A total of 73 trees with a dbh of four inches or greater was counted in the six fixed plots (Appendix C). The combined area of the fixed plots was 0.6 acres. The total forested area in the study site is 22 acres; so it was estimated that there are 2,677 trees within the study site.

A brief description of the forest stand is as follows:

***Stand 1***

**Sample Plots:** **6**
**Successional Stage:** **Mature**
**Priority:** **1**
**Cover Type:** **White Oak**

Stand 1 is dominated by white oak (*Quercus alba*) in size class 20"-29.9" with approximately 86% canopy closure. Trees in the sub canopy include red maple (*Acer rubrum,*) tree-of-heaven (*Ailanthus altissima*), American beech (*Fagus grandifolia*), sweet gum (*Liquidambar styraciflua*), tulip poplar (*Liriodendron tulipifera*), black gum (*Nyssa sylvatica*), Virginia pine, loblolly pine, southern red oak (*Quercus falcata*), chestnut oak (*Quercus montana*), pin oak (*Quercus palustris*), and black locust (*Robinia pseudoacacia*). The understory from 3' to 20' tall averages 67% coverage and includes red maple, American beech, green ash (*Fraxinus pennsylvanica*), American holly (*Ilex opaca*), eastern red cedar (*Juniperus virginiana*), border privet (*Ligustrum obtusifolium*), sweet gum, tulip poplar, black gum, Virginia pine, bigtooth aspen (*Populus grandidentata*), black cherry (*Prunus serotina*), white oak, southern red oak, and chestnut oak. Common herbaceous and woody species 0' to 3' tall consist of red maple, oriental bittersweet (*Celastrus orbiculatus*), striped wintergreen (*Chimaphila maculate*) American beech, American holly, eastern red ceder, border privet, Japanese honeysuckle (*Lonicera japonica*), southern red oak, and black raspberry (*Rubus occidentalis*) with 47% coverage.

Four invasive species were observed: tree-of-heaven, oriental bittersweet, border privet, and Japanese honeysuckle; with an approximate average of 11% coverage across the plots. The wildlife value of the stand is medium due to the presence of cover and forage, mostly in the form of hard mast. The stand is rated a Priority 1 because of its mature successional stage, steep topography, and specimen trees.

**Environmental Features**
Stand 1 is a mature forest with some areas of mixed successional stage due to previous development of the site. The stand covers almost the entire study area except for the roads that

border the site. It contains steep topography (Figure 2, Appendix A) in the southeast area of the stand and 29 specimen trees. It is contiguous with forested areas to the east and south that contain wetlands and streams.

## V. Conclusions

One forest stand of the white oak cover type was delineated and assessed on the site. The stand ranks as Priority 1. Stand 1 is mature with specimen trees and steep topography and provides local wildlife with shelter and food. It is estimated that there are 2,677 trees with a dbh of 4 inches or greater and there are 29 specimen trees within the site.

| Stand | Specimen Trees | Wetlands/ Stream | Steep Topography | Successional Stage | Priority Ranking |
|---|---|---|---|---|---|
| 1 | Y | N | Y | MATURE | 1 |

## VI. References


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# APPENDIX A

# Forest Stand Maps

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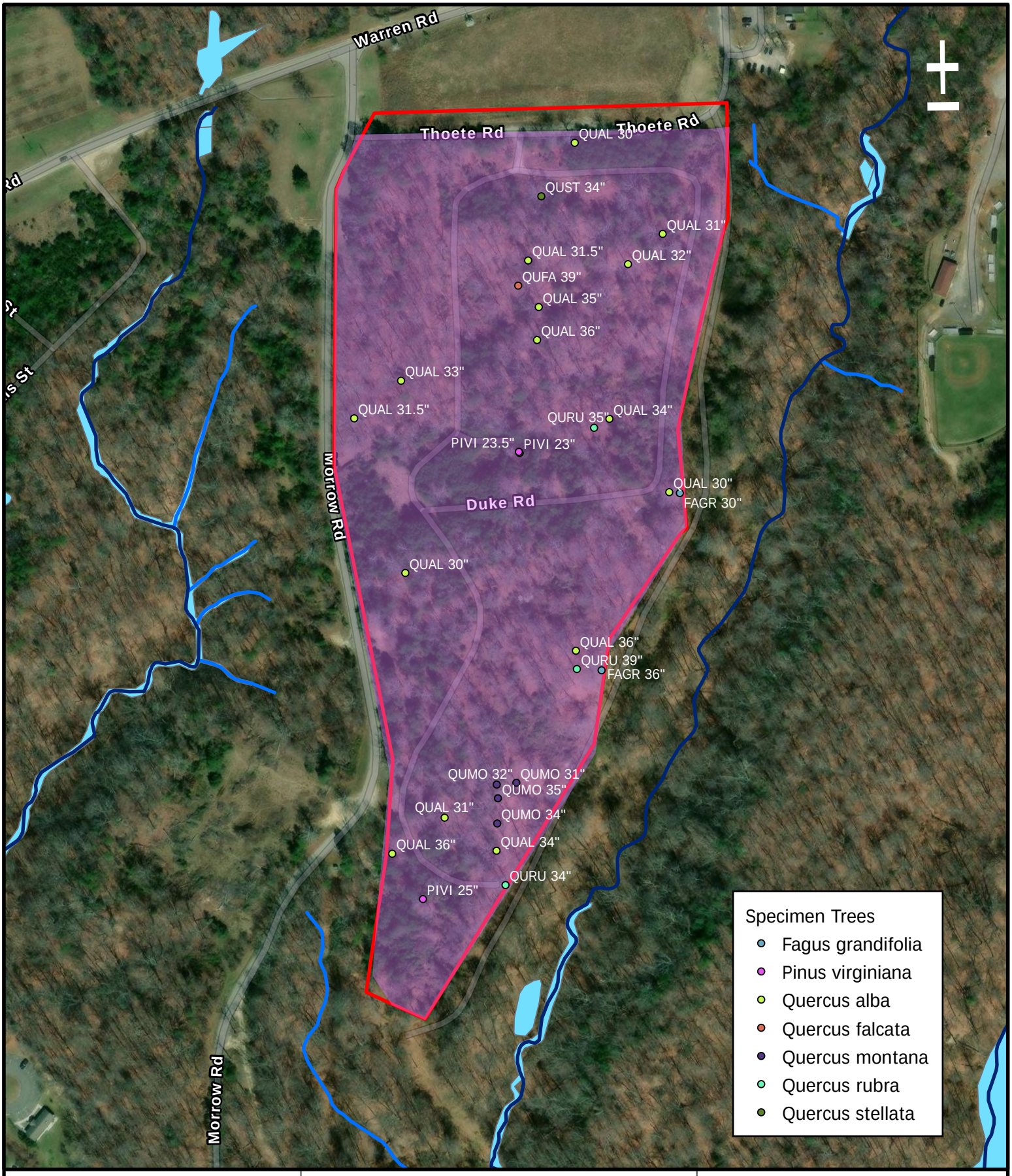


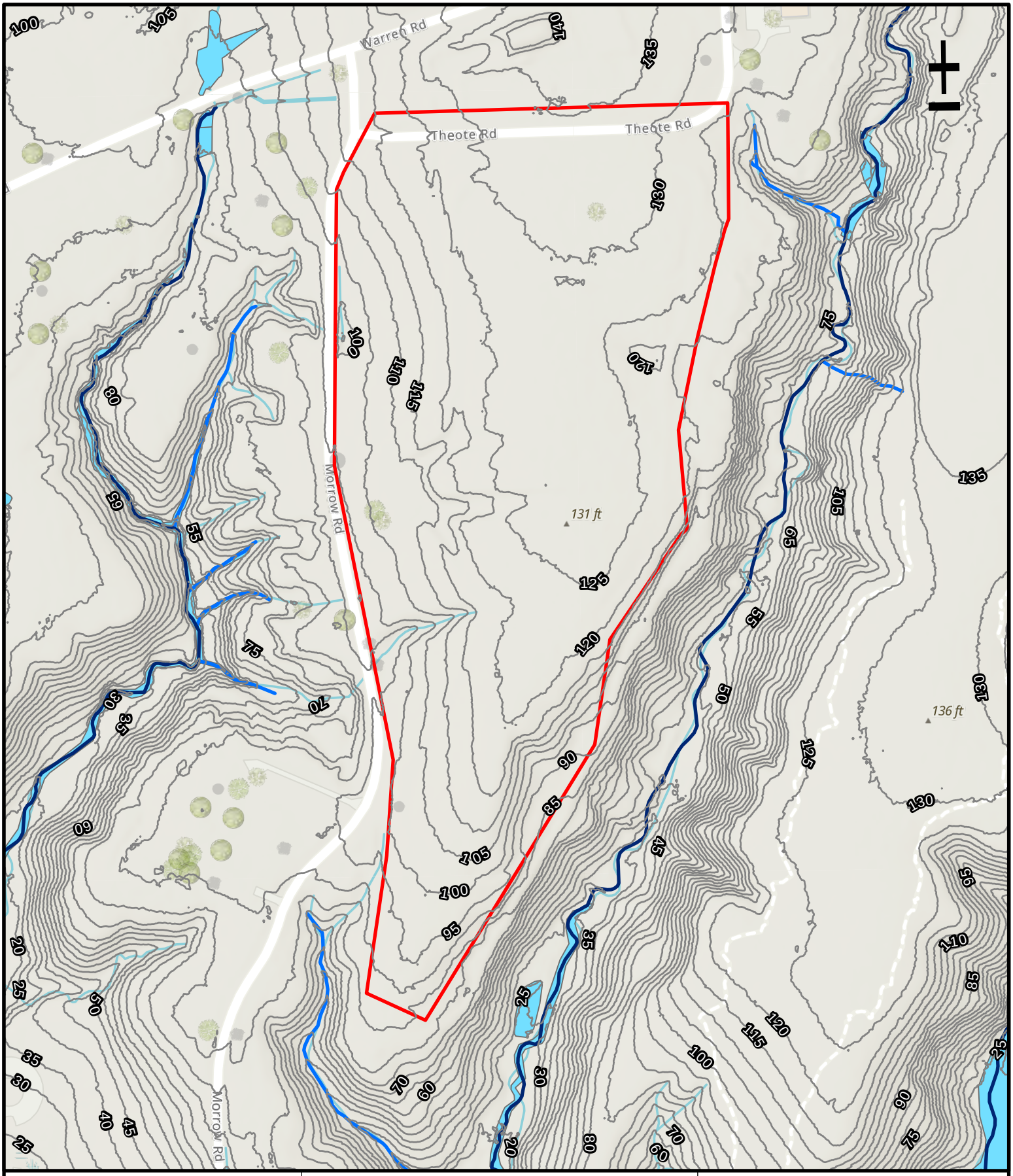

PLANNING DIVISION

1:3,000

0 50 100 200 300 Feet

# Fort Belvoir
# Travel Camp
# Figure 1: Tree Stands

Forest Stand 1
Wetlands
Intermittent Streams
Perennial Streams
Travel Camp Study Area




PLANNING DIVISION

1:3,000

0 50 100 200 300 Feet

# Fort Belvoir
# Travel Camp
# Figure 2: Topography

- 5-foot Contours
- Wetlands
- Intermittent Streams
- Perennial Streams
- Travel Camp Study Area

# APPENDIX B

# Field Sampling Data Sheets

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**FOREST STAND DELINEATION**
**Field Sampling Data Sheet**

| | |
|---|---|
| **Property: Travel Camp** | **Prepared By: Lauren Joyal /Christina Olson** |
| **Owner: Fort Belvoir** | **Stand #: 1** **Plot #: 1** |
| **Forest Cover Type: White Oak** | **Date: 21 Februrary 2024** |
| **Plot Size 1/10 Acre (37.5' radius)** | |

**Basal Area in Square Feet per Acre: 60**

**SIZE CLASS OF TREES >20' HEIGHT WITHIN SAMPLE PLOT**

| | TREE SPECIES | Number of Trees 2-5.9" dbh | | | Number of Trees 6-11.9" dbh | | | Number of Trees 12-19.9" dbh | | | Number of Trees 20-29.9" dbh | | | Number of Trees >30" dbh | | | Average Tree Height (ft) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Crown Position | Dom | CoD | Other | Dom | CoD | Other | Dom | CoD | Other | Dom | CoD | Other | Dom | CoD | Other | | Total |
| 1 | *Quercus alba* | | | | | | | | | | 2 | | | | | | | 2 |
| 2 | *Quercus montana* | | | | | | | | | 1 | | | | | | | | 1 |
| 3 | *Fagus grandifolia* | | | | | | | | | | | | 1 | | | | | 1 |
| 4 | *Nyssa sylvatica* | | | 2 | | | 3 | | | | | | | | | | | 5 |
| 5 | *Ailanthus altissima* | | | 1 | | | | | | | | | | | | | | 1 |
| 6 | | | | | | | | | | | | | | | | | | 0 |
| 7 | | | | | | | | | | | | | | | | | | 0 |
| 8 | | | | | | | | | | | | | | | | | | 0 |
| 9 | | | | | | | | | | | | | | | | | | 0 |
| | **Total Number of Trees per Size Class** | 3 | | | 3 | | | 1 | | | 3 | | | 0 | | | | 10 |
| | **Number & Size of Standing Dead Trees** | | | | | | | | | | | | | | | | | 0 |

**List of Woody Plant Species 3'-20':**

*Fagus grandifolia, Liquidambar styraciflua, Ailanthus altissima, Ligustrum obtusifolium, Quercus phellos, Fraxinus pennsylvanica, Prunus serotina*

**Canopy Closure:**

| C | N | E | S | W | % |
|---|---|---|---|---|---|
| N | Y | Y | Y | Y | 80 |

**Percent of Invasive Cover per Plot (all layers):** 20%

**Plot Successional Stage:** Mature

**List of Understory Species 0'-3':**

*Juniperus virginiana, Quercus falcata, Lonicera japonica, Fagus grandifolia, Rubus occidentalis, Smilax rotundifolia, Ilex opaca, Toxicodendron radicans*

**Understory Cover 3'-20':**

| C | N | E | S | W | % |
|---|---|---|---|---|---|
| Y | Y | Y | N | N | 60 |

**List of Major Invasive Species per Plot (All Layers):**

*Ailanthus altissima, Ligustrum obtusifolium, Lonicera japonica*

| | |
|---|---|
| **Rare or Endangered Species?** | No |
| **Specimen Trees?** | No |
| **Historic Sites?** | No |
| **Disease?** | No |
| **Insects/Infestation?** | No |
| **Exotic Plants?** | Yes |
| **Leaf Litter?** | Moderate |
| **Downed Woody Debris:** | Light |

**Herbaceous/ Woody Cover 0'-3':**

| C | N | E | S | W | % |
|---|---|---|---|---|---|
| Y | Y | Y | Y | N | 80 |

**Downed Woody Debris ( ≥ 2"):**

| C | N | E | S | W | % |
|---|---|---|---|---|---|
| N | N | N | N | N | 0 |

**HABITAT: What animal species present (if any noted)?**

common raccoon (*Procyon lotor* ) , white-tailed deer (*Odocoileus virginianus* ), eastern gray squirrel (*Sciurus carolinensis* )

**Wildlife cover/food/water?** Y/YY

**Stand corridor/patch?** Patch

**FUNCTION: Where is stand in relation to sensitive areas on site?** Wetlands, streams, and steep topography in abutting stand east of Stand 1

**Comments:**

Canopy Cover: 94.5%

Upland forest, plot is inside fenceline, stand of small *Pinus virginiana* saplings southwest of the plot, steep topography (>25%) southeast of the plot but within the stand. Stand 1 is contiguous with adjacent stand outside of the study site that contains steep topography, wetlands, and intermittent and perennial streams.

**FOREST STAND DELINEATION**
**Field Sampling Data Sheet**

| | | | |
|---|---|---|---|
| **Property: Travel Camp** | | **Prepared By: Lauren Joyal /Christina Olson** | |
| **Owner: Fort Belvoir** | | **Stand #: 1** | **Plot #: 2** |
| **Forest Cover Type: White Oak** | | **Date: 02 Februrary 2024** | |
| **Plot Size 1/10 Acre (37.5' radius)** | | | |

**Basal Area in Square Feet per Acre: 100**

**SIZE CLASS OF TREES >20' HEIGHT WITHIN SAMPLE PLOT**

| | TREE SPECIES | Number of Trees 2-5.9" dbh | | | Number of Trees 6-11.9" dbh | | | Number of Trees 12-19.9" dbh | | | Number of Trees 20-29.9" dbh | | | Number of Trees >30" dbh | | | Average Tree Height (ft) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Crown Position | Dom | CoD | Other | Dom | CoD | Other | Dom | CoD | Other | Dom | CoD | Other | Dom | CoD | Other | | Total |
| 1 | *Quercus alba* | 2 | | | 3 | | | | | | | | | | | | | 5 |
| 2 | *Quercus falcata* | | | 1 | | | 1 | | | 1 | | | | | | | | 3 |
| 3 | *Liriodendron tulipifera* | | | 1 | | | | | | | | | | | | | | 1 |
| 4 | *Robinia pseudoacacia* | | | | | | 1 | | | | | | | | | | | 1 |
| 5 | *Acer rubrum* | | | 2 | | | 5 | | | | | | | | | | | 7 |
| 6 | *Pinus virginiana* | | | | | | 1 | | | | | | | | | | | 1 |
| 7 | *Liquidambar styraciflua* | | | 7 | | | | 1 | | | | | | | | | | 8 |
| 8 | | | | | | | | | | | | | | | | | | 0 |
| 9 | | | | | | | | | | | | | | | | | | 0 |
| | **Total Number of Trees per Size Class** | 13 | | | 11 | | | 2 | | | 0 | | | 0 | | | | 26 |
| | **Number & Size of Standing Dead Trees** | | | | | | | | | | | | | | | | | 0 |

**List of Woody Plant Species 3'-20':**
*Juniperus virginiana, Quercus montana, Liquidambar styraciflua, Fagus grandifolia, Nyssa sylvatica, Acer rubrum*

**Canopy Closure:**

| C | N | E | S | W | % |
|---|---|---|---|---|---|
| Y | Y | Y | Y | Y | 100 |

**Percent of Invasive Cover per Plot (all layers):** 20%

**Plot Successional Stage:** Mature

**List of Understory Species 0'-3':**
*Ligustrum obtusifolium, Lonicera japonica, Smilax rotundifolia, Juniperus virginiana, Celastrus orbiculatus*

**Understory Cover 3'-20':**

| C | N | E | S | W | % |
|---|---|---|---|---|---|
| Y | Y | Y | Y | Y | 100 |

**List of Major Invasive Species per Plot (All Layers):**
*Ligustrum obtusifolium, Lonicera japonica, Celastrus orbiculatus*

**Rare or Endangered Species?** No
**Specimen Trees?** No
**Historic Sites?** No
**Disease?** No
**Insects/Infestation?** No
**Exotic Plants?** Yes
**Leaf Litter?** Moderate
**Downed Woody Debris:** Moderate

**Herbaceous/ Woody Cover 0'-3':**

| C | N | E | S | W | % |
|---|---|---|---|---|---|
| Y | Y | Y | N | N | 60 |

**Downed Woody Debris ( ≥ 2"):**

| C | N | E | S | W | % |
|---|---|---|---|---|---|
| N | N | N | Y | Y | 40 |

**HABITAT: What animal species present (if any noted)?**
common raccoon (*Procyon lotor* ) , white-tailed deer (*Odocoileus virginianus* ), eastern gray squirrel (*Sciurus carolinensis* )

**Wildlife cover/food/water?** Y/YY

**Stand corridor/patch?** Patch

**FUNCTION: Where is stand in relation to sensitive areas on site?** Wetlands, streams, and steep topography in abutting stand east of Stand 1

**Comments:**
Canopy Cover: 93%

Upland forest, plot is inside fenceline, along east side of the stand; culvert southeast to road that borders east side of the stand, thick understory, several downed mature *Pinus virginiana* oustide of plot, steep topography (>25%) southeast of the plot but within the stand. Stand 1 is contiguous with adjacent stand outside of the study site that contains steep topography, wetlands, and intermittent and perennial streams.

**FOREST STAND DELINEATION**
**Field Sampling Data Sheet**

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Property: Travel Camp** | | | | | | | | **Prepared By: Lauren Joyal /Christina Olson** | | | | | | | | | | | | |
| **Owner: Fort Belvoir** | | | | | | | | **Stand #: 1** | | | | | | | | **Plot #: 3** | | | | |
| **Forest Cover Type: White Oak** | | | | | | | | **Date: 21 Februrary 2024** | | | | | | | | | | | | |
| **Plot Size 1/10 Acre (37.5' radius)** | | | | | | | | | | | | | | | | | | | | |

| **Basal Area in Square Feet per Acre: 60** | | **SIZE CLASS OF TREES >20' HEIGHT WITHIN SAMPLE PLOT** | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TREE SPECIES** | | **Number of Trees 2-5.9" dbh** | | | **Number of Trees 6-11.9" dbh** | | | **Number of Trees 12-19.9" dbh** | | | **Number of Trees 20-29.9" dbh** | | | **Number of Trees >30" dbh** | | | **Average Tree Height (ft)** | |
| | **Crown Position** | **Dom** | **CoD** | **Other** | **Dom** | **CoD** | **Other** | **Dom** | **CoD** | **Other** | **Dom** | **CoD** | **Other** | **Dom** | **CoD** | **Other** | | **Total** |
| 1 | *Quercus alba* | 1 | | | | | | 1 | | | 1 | | | | | | | 3 |
| 2 | *Fagus grandifolia* | | | | | | | | | | | | 1 | | | | | 1 |
| 3 | | | | | | | | | | | | | | | | | | 0 |
| 4 | | | | | | | | | | | | | | | | | | 0 |
| 5 | | | | | | | | | | | | | | | | | | 0 |
| 6 | | | | | | | | | | | | | | | | | | 0 |
| 7 | | | | | | | | | | | | | | | | | | 0 |
| 8 | | | | | | | | | | | | | | | | | | 0 |
| 9 | | | | | | | | | | | | | | | | | | 0 |
| **Total Number of Trees per Size Class** | | 1 | | | 0 | | | 1 | | | 2 | | | 0 | | | | 4 |
| **Number & Size of Standing Dead Trees** | | | | | | | | | | | | | | | | | | 0 |

| **List of Woody Plant Species 3'-20':** | **Canopy Closure:** | | | | | | **Percent of Invasive Cover per Plot (all layers):** | **Plot Successional Stage:** |
|---|---|---|---|---|---|---|---|---|
| *Liquidambar styraciflua, Quercus alba, Juniperus virginiana, Fagus grandifolia, Ligustrum obtusifolium, Rhus glabra, Liriodendron tulipifera, Prunus serotina, Ailanthus altissima* | **C** | **N** | **E** | **S** | **W** | **%** | 10% | Mature |
| | Y | Y | Y | Y | Y | 100 | | |

| **List of Understory Species 0'-3':** | **Understory Cover 3'-20':** | | | | | | **List of Major Invasive Species per Plot (All Layers):** |
|---|---|---|---|---|---|---|---|
| *Lonicera japonica, Smilax rotundifolia, Juniperus virginiana, Celastrus orbiculatus, Ilex opaca, Pinus taeda* | **C** | **N** | **E** | **S** | **W** | **%** | *Ligustrum obtusifolium, Lonicera japonica, Celastrus orbiculatus, Ailanthus altissima* |
| | Y | Y | N | Y | Y | 80 | |

| | | **Herbaceous/ Woody Cover 0'-3':** | | | | | | **HABITAT: What animal species present (if any noted)?** |
|---|---|---|---|---|---|---|---|---|
| **Rare or Endangered Species?** | No | **C** | **N** | **E** | **S** | **W** | **%** | |
| **Specimen Trees?** | No | | | | | | | |
| **Historic Sites?** | No | Y | N | Y | Y | Y | 80 | common raccoon (*Procyon lotor*) , white-tailed deer (*Odocoileus virginianus*), eastern gray squirrel (*Sciurus carolinensis*) |
| **Disease?** | No | | | | | | | |
| **Insects/Infestation?** | No | **Downed Woody Debris ( ≥ 2"):** | | | | | | |
| **Exotic Plants?** | Yes | **C** | **N** | **E** | **S** | **W** | **%** | **Wildlife cover/food/water?** |
| **Leaf Litter?** | Moderate | | | | | | | Y/YY |
| **Downed Woody Debris:** | Light | N | N | N | Y | Y | 40 | **Stand corridor/patch?** Patch |

**FUNCTION: Where is stand in relation to sensitive areas on site?** Wetlands, streams, and steep topography in abutting stand east of Stand 1

**Comments:**
Canopy Cover: 87%

Upland forest, plot is inside fenceline, along east and central area of the stand, line of Pinus virginiana saplings south of plot, steep topography (>25%) southeast of the plot but within the stand. Dense understory with light herbacouse/woody cover. Stand 1 is contiguous with adjacent stand outside of the study site that contains steep topography, wetlands, and intermittent and perennial streams.

**FOREST STAND DELINEATION**
**Field Sampling Data Sheet**

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Property: Travel Camp** | | | | | | | | | **Prepared By: Lauren Joyal /Christina Olson** | | | | | | | | | | | | |
| **Owner: Fort Belvoir** | | | | | | | | | **Stand #: 1** | | | | | | | | | **Plot #: 4** | | | |
| **Forest Cover Type: White Oak** | | | | | | | | | **Date: 21 Februrary 2024** | | | | | | | | | | | | |
| **Plot Size 1/10 Acre (37.5' radius)** | | | | | | | | | | | | | | | | | | | | | |
| **Basal Area in Square Feet per Acre: 60** | **SIZE CLASS OF TREES >20' HEIGHT WITHIN SAMPLE PLOT** | | | | | | | | | | | | | | | | | | | | |
| **TREE SPECIES** | **Number of Trees 2-5.9" dbh** | | | **Number of Trees 6-11.9" dbh** | | | **Number of Trees 12-19.9" dbh** | | | **Number of Trees 20-29.9" dbh** | | | **Number of Trees >30" dbh** | | | **Average Tree Height (ft)** | | | | |
| **Crown Position** | **Dom** | **CoD** | **Other** | **Dom** | **CoD** | **Other** | **Dom** | **CoD** | **Other** | **Dom** | **CoD** | **Other** | **Dom** | **CoD** | **Other** | | | | | **Total** |
| 1 *Quercus alba* | | | | | | | 1 | | | | | | | | | | | | | 1 |
| 2 *Quercus montana* | | | | | | | | | 1 | | | | | | | | | | | 1 |
| 3 *Fagus grandifolia* | | | | | | | | | 2 | | | | | | | | | | | 2 |
| 4 *Liriodendron tulipifera* | | | | | | 1 | | | | | | | | | | | | | | 1 |
| 5 *Pinus virginiana* | | | 18 | | | | | | 1 | | | | | | | | | | | 19 |
| 6 *Pinus taeda* | | | | | | | | | 1 | | | | | | | | | | | 1 |
| 7 | | | | | | | | | | | | | | | | | | | | 0 |
| 8 | | | | | | | | | | | | | | | | | | | | 0 |
| 9 | | | | | | | | | | | | | | | | | | | | 0 |
| **Total Number of Trees per Size Class** | 18 | | | 1 | | | 6 | | | 0 | | | 0 | | | | | | | 25 |
| **Number & Size of Standing Dead Trees** | | | | | | | | | | 1 | | | | | | | | | | 1 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **List of Woody Plant Species 3'-20':** | **Canopy Closure:** | | | | | | **Percent of Invasive Cover per Plot (all layers):** | **Plot Successional Stage:** | | |
| *Liquidambar styraciflua, Quercus alba, Juniperus virginiana, Fagus grandifolia, Acer rubrum, Pinus virginiana, Ilex opaca* | **C** | **N** | **E** | **S** | **W** | **%** | 5% | Mature | | |
| | Y | Y | Y | Y | Y | 100 | | | | |
| **List of Understory Species 0'-3':** | **Understory Cover 3'-20':** | | | | | | **List of Major Invasive Species per Plot (All Layers):** | | | |
| *Lonicera japonica, Pinus taeda, Pinus virginiana, Potentilla sp., Chimaphila maculata* | **C** | **N** | **E** | **S** | **W** | **%** | *Lonicera japonica* | | | |
| | Y | Y | N | Y | Y | 80 | | | | |
| **Rare or Endangered Species?** No | **Herbaceous/ Woody Cover 0'-3':** | | | | | | **HABITAT: What animal species present (if any noted)?** | | | |
| **Specimen Trees?** No | **C** | **N** | **E** | **S** | **W** | **%** | | | | |
| **Historic Sites?** No | N | N | Y | N | N | 20 | common raccoon (*Procyon lotor* ) , white-tailed deer (*Odocoileus virginianus* ), eastern gray squirrel (*Sciurus carolinensis* ) | | | |
| **Disease?** No | | | | | | | | | | |
| **Insects/Infestation?** No | **Downed Woody Debris ( ≥ 2"):** | | | | | | | | | |
| **Exotic Plants?** Yes | **C** | **N** | **E** | **S** | **W** | **%** | **Wildlife cover/food/water?** | | | |
| **Leaf Litter?** Moderate | N | N | N | Y | N | 20 | Y/YY | | | |
| **Downed Woody Debris:** Moderate | | | | | | | **Stand corridor/patch?** Patch | | | |
| **FUNCTION: Where is stand in relation to sensitive areas on site?** Wetlands, streams, and steep topography in abutting stand east of Stand 1 | | | | | | | | | | |

**Comments:**
Canopy Cover: 97%

Upland forest, plot is just north of fenceline at the southern area of the stand, specimen tree adjacent to the plot; steep topography (>25%) northeast of the plot but within the stand. Dense understory with light herbacouse/woody cover. Stand 1 is contiguous with adjacent stand outside of the study site that contains steep topography, wetlands, and intermittent and perennial streams.

**FOREST STAND DELINEATION**
**Field Sampling Data Sheet**

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Property: Travel Camp** | | | | | | | | | **Prepared By: Lauren Joyal /Christina Olson** | | | | | | | | | | | | |
| **Owner: Fort Belvoir** | | | | | | | | | **Stand #: 1** | | | | | | | | | **Plot #: 5** | | | |
| **Forest Cover Type: White Oak** | | | | | | | | | **Date: 22 Februrary 2024** | | | | | | | | | | | | |
| **Plot Size 1/10 Acre (37.5' radius)** | | | | | | | | | | | | | | | | | | | | | |
| **Basal Area in Square Feet per Acre: 40** | **SIZE CLASS OF TREES >20' HEIGHT WITHIN SAMPLE PLOT** | | | | | | | | | | | | | | | | | | | | |
| **TREE SPECIES** | **Number of Trees 2-5.9" dbh** | | | **Number of Trees 6-11.9" dbh** | | | **Number of Trees 12-19.9" dbh** | | | **Number of Trees 20-29.9" dbh** | | | **Number of Trees >30" dbh** | | | **Average Tree Height (ft)** | | **Total** | | |
| **Crown Position** | **Dom** | **CoD** | **Other** | **Dom** | **CoD** | **Other** | **Dom** | **CoD** | **Other** | **Dom** | **CoD** | **Other** | **Dom** | **CoD** | **Other** | | | | | |
| 1 *Quercus alba* | | | | | | | 1 | | | 2 | | | | | | | | 3 | | | |
| 2 *Quercus palustris* | | | | | | | | | | | | 1 | | | | | | 1 | | | |
| 3 | | | | | | | | | | | | | | | | | | 0 | | | |
| 4 | | | | | | | | | | | | | | | | | | 0 | | | |
| 5 | | | | | | | | | | | | | | | | | | 0 | | | |
| 6 | | | | | | | | | | | | | | | | | | 0 | | | |
| 7 | | | | | | | | | | | | | | | | | | 0 | | | |
| 8 | | | | | | | | | | | | | | | | | | 0 | | | |
| 9 | | | | | | | | | | | | | | | | | | 0 | | | |
| **Total Number of Trees per Size Class** | 0 | | | 0 | | | 1 | | | 3 | | | 0 | | | | | 4 | | | |
| **Number & Size of Standing Dead Trees** | | | | | | | | | | | | | | | | | | 0 | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **List of Woody Plant Species 3'-20':** | **Canopy Closure:** | | | | | | **Percent of Invasive Cover per Plot (all layers):** | **Plot Successional Stage:** | | |
| *Quercus falcata, Quercus alba, Juniperus virginiana, Fagus grandifolia, Prunus serotina, Populus grandidentata* | **C** | **N** | **E** | **S** | **W** | **%** | | | | |
| | Y | N | Y | Y | Y | 80 | 5% | Mature | | |
| **List of Understory Species 0'-3':** | **Understory Cover 3'-20':** | | | | | | **List of Major Invasive Species per Plot (All Layers):** | | | |
| *Lonicera japonica, Juniperus virginiana, Smilax rotundifolia, Ilex opaca, Rubus occidentalis* | **C** | **N** | **E** | **S** | **W** | **%** | | | | |
| | N | N | N | N | Y | 20 | *Lonicera japonica* | | | |
| **Rare or Endangered Species?** No | **Herbaceous/ Woody Cover 0'-3':** | | | | | | **HABITAT: What animal species present (if any noted)?** | | | |
| **Specimen Trees?** No | **C** | **N** | **E** | **S** | **W** | **%** | | | | |
| **Historic Sites?** No | N | N | N | N | N | 0 | common raccoon (*Procyon lotor* ) , white-tailed deer (*Odocoileus virginianus* ), eastern gray squirrel (*Sciurus carolinensis* ) | | | |
| **Disease?** No | | | | | | | | | | |
| **Insects/Infestation?** No | **Downed Woody Debris ( ≥ 2"):** | | | | | | | | | |
| **Exotic Plants?** Yes | **C** | **N** | **E** | **S** | **W** | **%** | **Wildlife cover/food/water?** | | | |
| **Leaf Litter?** Moderate | Y | Y | Y | N | Y | 20 | Y/YY | | | |
| **Downed Woody Debris:** Moderate | | | | | | | **Stand corridor/patch?** Patch | | | |
| **FUNCTION: Where is stand in relation to sensitive areas on site?** Wetlands, streams, and steep topography in abutting stand east of Stand 1 | | | | | | | | | | |

**Comments:**
Canopy Cover: 62%

Upland forest, plot is in center of stand within the fenceline, steep topography (>25%) just south of the plot but within the stand. Light understory with light herbacouse/woody cover, fallen mature trees in plot. Stand 1 is contiguous with adjacent stand outside of the study site that contains steep topography, wetlands, and intermittent and perennial streams.

**FOREST STAND DELINEATION**
**Field Sampling Data Sheet**

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Property: Travel Camp** | | | | | | | | **Prepared By: Lauren Joyal /Christina Olson** | | | | | | | | | | | | |
| **Owner: Fort Belvoir** | | | | | | | | **Stand #: 1** | | | | | | | | **Plot #: 6** | | | | |
| **Forest Cover Type: White Oak** | | | | | | | | **Date: 22 Februrary 2024** | | | | | | | | | | | | |
| **Plot Size 1/10 Acre (37.5' radius)** | | | | | | | | | | | | | | | | | | | | |
| **Basal Area in Square Feet per Acre: 40** | **SIZE CLASS OF TREES >20' HEIGHT WITHIN SAMPLE PLOT** | | | | | | | | | | | | | | | | | | | |
| **TREE SPECIES** | **Number of Trees 2-5.9" dbh** | | | **Number of Trees 6-11.9" dbh** | | | **Number of Trees 12-19.9" dbh** | | | **Number of Trees 20-29.9" dbh** | | | **Number of Trees >30" dbh** | | | **Average Tree Height (ft)** | | | |
| **Crown Position** | **Dom** | **CoD** | **Other** | **Dom** | **CoD** | **Other** | **Dom** | **CoD** | **Other** | **Dom** | **CoD** | **Other** | **Dom** | **CoD** | **Other** | | | **Total** | | |
| 1 *Quercus alba* | | | | | | | | | | 3 | | | | | | | | 3 | | |
| 2 *Quercus falcata* | | | | | | 1 | | | | | | | | | | | | 1 | | |
| 3 *Acer rubrum* | | | 1 | | | 4 | | | 1 | | | | | | | | | 6 | | |
| 4 | | | | | | | | | | | | | | | | | | 0 | | |
| 5 | | | | | | | | | | | | | | | | | | 0 | | |
| 6 | | | | | | | | | | | | | | | | | | 0 | | |
| 7 | | | | | | | | | | | | | | | | | | 0 | | |
| 8 | | | | | | | | | | | | | | | | | | 0 | | |
| 9 | | | | | | | | | | | | | | | | | | 0 | | |
| **Total Number of Trees per Size Class** | 1 | | | 5 | | | 1 | | | 3 | | | 0 | | | | | 10 | | |
| **Number & Size of Standing Dead Trees** | | | | | | | | | | | | | | | | | | 0 | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **List of Woody Plant Species 3'-20':** | **Canopy Closure:** | | | | | | **Percent of Invasive Cover per Plot (all layers):** | **Plot Successional Stage:** | |
| *Acer rubrum, Juniperus virginiana, Fagus grandifolia, Prunus serotina, Pinus virginiana* | **C** | **N** | **E** | **S** | **W** | **%** | | | |
| | Y | Y | Y | N | Y | 80 | 5% | Mature | |
| **List of Understory Species 0'-3':** | **Understory Cover 3'-20':** | | | | | | **List of Major Invasive Species per Plot (All Layers):** | | |
| *Lonicera japonica, Juniperus virginiana, Ilex opaca, Acer rubrum, Fagus grandifolia* | **C** | **N** | **E** | **S** | **W** | **%** | | | |
| | Y | N | N | N | Y | 40 | *Lonicera japonica* | | |
| **Rare or Endangered Species?** No | **Herbaceous/ Woody Cover 0'-3':** | | | | | | **HABITAT: What animal species present (if any noted)?** | | |
| **Specimen Trees?** No | **C** | **N** | **E** | **S** | **W** | **%** | | | |
| **Historic Sites?** No | N | N | N | Y | Y | 40 | common raccoon (*Procyon lotor* ) , white-tailed deer (*Odocoileus virginianus* ), eastern gray squirrel (*Sciurus carolinensis* ) | | |
| **Disease?** No | | | | | | | | | |
| **Insects/Infestation?** No | **Downed Woody Debris ( ≥ 2"):** | | | | | | | | |
| **Exotic Plants?** Yes | **C** | **N** | **E** | **S** | **W** | **%** | **Wildlife cover/food/water?** | | |
| **Leaf Litter?** Moderate | N | N | N | N | Y | 20 | Y/YY | | |
| **Downed Woody Debris:** Light | | | | | | | **Stand corridor/patch?** Patch | | |
| **FUNCTION: Where is stand in relation to sensitive areas on site?** Wetlands, streams, and steep topography in abutting stand east of Stand 1 | | | | | | | | | |

**Comments:**
Canopy Cover: 82%

Upland forest, plot is on west side of stand outside of the fenceline, steep topography (>25%) southeast of plot but within the stand. Plot is just east of Morrow Road. Light understory with light herbacouse/woody cover. Stand 1 is contiguous with adjacent stand outside of the study site that contains steep topography, wetlands, and intermittent and perennial streams.

# FOREST STAND DELINEATION - FOREST STAND SUMMARY SHEET

**Project Name: Travel Camp EA** **Prepared By:** Christina Olson

**Owner: Fort Belvoir**

**Location: Fort Belvoir, Fairfax County, Virginia**

| **Stand Variable** | **Stand #1** | |
|---|---|---|
| **1. Dominant species/ Codominant species** | White Oak | |
| **2. Successional stage** | Mature | |
| **3. Basal area in s.f. per acre** | 56.7 | |
| **4. Size class of dominant species** | 2"-5.9" | |
| **5. Percent of canopy closure** | 86% | |
| **6. Average number of tree species per plot** | 4 | |
| **7. Common understory species 3' to 20' tall** | *Fagus grandifolia, Liquidambar styraciflua, Ligustrum obtusifolium, Prunus serotina, Quercus montana, Nyssa sylvatica, Acer rubrum, Quercus alba, Juniperus virginiana, Ilex opaca, Liriodendron tulipifera, Prunus serotina, Pinus virginiana, Quercus falcata, Fraxinus pennsylvanica, Populus grandidentata* | |
| **8. Percent of understory cover 3' to 20' tall** | 67% | |
| **9. Number of woody plant species 3' to 20' tall** | 20 | |
| **10. Common understory species 0' to 3' tall** | *Juniperus virginiana, Quercus falcata, Lonicera japonica, Fagus grandifolia, Rubus occidentalis, Smilax rotundifolia, Ilex opaca, Ligustrum obtusifolium, Celastrus orbiculatus, Pinus taeda, Acer rubrum, Chimaphila maculata* | |
| **11. Percent of herbaceous & woody plant cover 0' to 3' tall** | 47% | |
| **12. List of major invasive plant species & percent of cover** | *Ligustrum obtusifolium, Lonicera japonica, Celastrus orbiculatus Ailanthus altissima; 11%* | |
| **13. Number of standing dead trees ≥6" dbh per acre** | 1 | |
| **14. Comments** | Stand contains specimen trees and steep topography | |
| **15. Priority (1,2,3)** | 1 | |

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# APPENDIX C

## Tree Lists

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## Table C-1: Specimen Trees in Stand 1

| Specimen Tree # | Species Name | Common Name | DBH (Inches) | Condition | Comments |
|---|---|---|---|---|---|
| ST 1 | *Quercus alba* | White oak | 30 | Poor | Half dead |
| ST 2 | *Fagus grandifolia* | American beech | 30 | Good | |
| ST 3 | *Quercus rubra* | Northern red oak | 34 | Good | |
| ST 4 | *Quercus alba* | White Oak | 36 | Good | |
| ST 5 | *Quercus alba* | White oak | 36 | Fair | |
| ST 6 | *Quercus alba* | White oak | 35 | Good | |
| ST 7 | *Quercus alba* | White oak | 31.5 | Good | |
| ST 8 | *Quercus falcata* | Southern red oak | 39 | Good | |
| ST 9 | *Quercus stellata* | Post oak | 34 | Good | ID Tag |
| ST 10 | *Quercus alba* | White oak | 30 | Good | |
| ST 11 | *Quercus alba* | White oak | 32 | Good | |
| ST 12 | *Quercus alba* | White oak | 31 | Good | |
| ST 13 | *Quercus alba* | White oak | 34 | Good | |
| ST 14 | *Quercus rubra* | Northern red oak | 35 | Good | Double trunk |
| ST 15 | *Pinus virginiana* | Virginia pine | 23 | Fair | |
| ST 16 | *Quercus rubra* | Northern red oak | 39 | Good | |
| ST 17 | *Quercus alba* | White oak | 36 | Good | |
| ST 18 | *Fagus grandifolia* | American beech | 36 | Good | |
| ST 19 | *Quercus montana* | Chestnut oak | 32 | Good | |
| ST 20 | *Quercus montana* | Chestnut oak | 35 | Good | |
| ST 21 | *Quercus montana* | Chestnut oak | 31 | Good | |
| ST 22 | *Quercus montana* | Chestnut oak | 34 | Fair | |
| ST 23 | *Quercus alba* | White oak | 34 | Good | |
| ST 24 | *Pinus virginiana* | Virginia pine | 25 | Good | |
| ST 25 | *Quercus alba* | White oak | 31 | Fair | Double trunk |
| ST 26 | *Quercus alba* | White oak | 30 | Good | |
| ST 27 | *Pinus virginiana* | Virginia pine | 23.5 | Good | |
| ST 28 | *Quercus alba* | White oak | 33 | Fair | |
| ST 29 | *Quercus alba* | White oak | 31.5 | Fair | |

## Table C-2: Trees Equal to or Greater Than 4” dbh in Plots

| Tree # | Species Name | Common Name | DBH (Inches) | Total per Plot |
|---|---|---|---|---|
| **Plot 1** | | | | **9** |
| 1 | *Ailanthus altissima* | Tree-of-Heaven | 9 | |
| 2 | *Quercus alba* | White oak | 22 | |
| 3 | *Quercus alba* | White oak | 23 | |
| 4 | *Fagus grandifolia* | American beech | 20 | |
| 5 | *Quercus montana* | Chestnut oak | 19 | |
| 6 | *Nyssa sylvatica* | Black gum | 6 | |
| 7 | *Nyssa sylvatica* | Black gum | 6 | |
| 8 | *Nyssa sylvatica* | Black gum | 7 | |
| 9 | *Nyssa sylvatica* | Black gum | 4 | |
| **Plot 2** | | | | **25** |
| 1 | *Quercus alba* | White oak | 6 | |
| 2 | *Liquidambar styraciflua* | Sweet gum | 5 | |
| 3 | *Liquidambar styraciflua* | Sweet gum | 5 | |
| 4 | *Liquidambar styraciflua* | Sweet gum | 5 | |
| 5 | *Liquidambar styraciflua* | Sweet gum | 5 | |
| 6 | *Liquidambar styraciflua* | Sweet gum | 4 | |
| 7 | *Liriodendron tulipifera* | Tulip poplar | 4 | |
| 8 | *Liquidambar styraciflua* | Sweet gum | 5 | |
| 9 | *Liquidambar styraciflua* | Sweet gum | 6 | |
| 10 | *Acer rubrum* | Red maple | 5 | |
| 11 | *Acer rubrum* | Red maple | 7 | |
| 12 | *Robinia pseudoacacia* | Black locust | 11 | |
| 13 | *Acer rubrum* | Red maple | 7 | |
| 14 | *Quercus falcata* | Southern red oak | 5 | |
| 15 | *Pinus virginiana* | Virginia pine | 6 | |
| 16 | *Acer rubrum* | Red maple | 8.5 | |
| 17 | *Quercus alba* | White oak | 5 | |
| 18 | *Quercus alba* | White oak | 5 | |
| 19 | *Quercus falcata* | Southern red oak | 11 | |
| 20 | *Acer rubrum* | Red maple | 10 | |
| 21 | *Acer rubrum* | Red maple | 6 | |
| 22 | *Quercus alba* | White oak | 6 | |
| 23 | *Quercus alba* | White oak | 5 | |
| 24 | *Quercus falcata* | Southern red oak | 13 | |
| 25 | *Liquidambar styraciflua* | Sweet gum | 6 | |
| **Plot 3** | | | | **4** |
| 1 | *Fagus grandifolia* | American beech | 25 | |
| 2 | *Quercus alba* | White oak | 18 | |
| 3 | *Quercus alba* | White oak | 5 | |

| | | | | |
|---|---|---|---|---|
| 4 | *Quercus alba* | White oak | 4 | |
| **Plot 4** | | | | **22** |
| 1 | *Fagus grandifolia* | American beech | 19 | |
| 2 | *Quercus alba* | White oak | 18 | |
| 3 | *Fagus grandifolia* | American beech | 15 | |
| 4 | *Pinus virginiana* | Virginia pine | 5 | |
| 5 | *Pinus virginiana* | Virginia pine | 4 | |
| 6 | *Pinus virginiana* | Virginia pine | 7 | |
| 7 | *Pinus virginiana* | Virginia pine | 8 | |
| 8 | *Pinus virginiana* | Virginia pine | 7 | |
| 9 | *Pinus virginiana* | Virginia pine | 7 | |
| 10 | *Pinus virginiana* | Virginia pine | 5 | |
| 11 | *Quercus montana* | Chestnut oak | 15 | |
| 12 | *Pinus virginiana* | Virginia pine | 7 | |
| 13 | *Pinus virginiana* | Virginia pine | 4 | |
| 14 | *Pinus virginiana* | Virginia pine | 7 | |
| 15 | *Pinus virginiana* | Virginia pine | 4 | |
| 16 | *Pinus virginiana* | Virginia pine | 5 | |
| 17 | *Pinus virginiana* | Virginia pine | 4 | |
| 18 | *Pinus virginiana* | Virginia pine | 18 | |
| 19 | *Pinus virginiana* | Virginia pine | 8 | |
| 20 | *Pinus taeda* | Loblolly pine | 10 | |
| 21 | *Pinus virginiana* | Virginia pine | 4 | |
| 22 | *Liriodendron tulipifera* | Tulip poplar | 9 | |
| **Plot 5** | | | | **4** |
| 1 | *Quercus alba* | White oak | 22 | |
| 2 | *Quercus palustris* | Pin oak | 21 | |
| 3 | *Quercus alba* | White oak | 19 | |
| 4 | *Quercus alba* | White oak | 25 | |
| **Plot 6** | | | | **9** |
| 1 | *Quercus alba* | White oak | 26 | |
| 2 | *Acer rubrum* | Red maple | 8 | |
| 3 | *Acer rubrum* | Red maple | 6 | |
| 4 | *Quercus alba* | White oak | 23 | |
| 5 | *Acer rubrum* | Red maple | 7 | |
| 6 | *Quercus alba* | White oak | 22 | |
| 7 | *Acer rubrum* | Red maple | 6 | |
| 8 | *Acer rubrum* | Red maple | 12 | |
| 9 | *Quercus falcata* | Southern red oak | 6 | |

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# APPENDIX D

# Photographs

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Google Earth Historical Imagery from 2002 showing Stand 1


Stand 1 Plot 1: White Oak looking south


Stand 1 Plot 1: White Oak looking north

Stand 1 Plot 2: White Oak looking east

Stand 1 Plot 2: White Oak looking west

Stand 1 Plot 3: White Oak looking south

Stand 1 Plot 3: White Oak looking north

Stand 1 Plot 4: White Oak looking east

Stand 1 Plot 4: White Oak looking west

Stand 1 Plot 5: White Oak looking south

Stand 1 Plot 5: White Oak looking north

Stand 1 Plot 6: White Oak looking north

Stand 1 Plot 6: White Oak looking south

APPENDIX E – NORTHERN LONG-EARED BAT STUDY

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# APPENDIX F – AIR QUALITY RECORD OF NON-APPLICABILITY

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# FORT BELVOIR TRAVEL CAMP
# RECORD OF NON-APPLICABILITY (RONA)

**1. General Information:** The Air Force's Air Conformity Applicability Model (ACAM) was used to perform a net change in emissions analysis to assess the potential air quality impact/s associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, *Environmental Compliance and Pollution Prevention*; the *Environmental Impact Analysis Process* (EIAP, 32 CFR 989); the *General Conformity Rule* (GCR, 40 CFR 93 Subpart B); and the *USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide*. This report provides a summary of the ACAM analysis.

Report generated with ACAM version: 5.0.23a

**a. Action Location:**

**Installation:** Fort Belvoir
**State:** Virginia
**County(s):** Fairfax
**Regulatory Area(s):** Washington, DC-MD-VA

**b. Action Title:** Fort Belvoir Travel Camp

**c. Project Number/s (if applicable):** 99479

**d. Projected Action Start Date:** 1 / 2025

**e. Action Description:**

The proposed travel camp would include 20-acres of recreational space for campers and RV owners. The camp would include a camp support facility and rustic tent camping. Thirty pull-through RV camp sites would be constructed, including concrete vehicle and picnic pads, water, sewer, electric, phone, and communication hook-ups. The camp support facility would include a laundry section, camper's lounge space, restrooms and showers, and vending machine space. The rustic tent camp sites would include tables and grills, water hook-ups, and vehicle parking spaces. Paved vehicle circulation roads, walking paths, landscaping, street and site lighting, sewage lift stations, storm water management, utility upgrades, and area directional signage would also be included.

Two possible locations on Fort Belvoir were identified for the Proposed Action but were eliminated from consideration. These Alternatives are listed below.

Alternative 1: This site was considered for the travel camp but was eliminated from consideration because of expenses associated with the redevelopment of the site due to existing foundations on-site. The Alternative 1 area also contains limited developable space due to a resource protection area for a perennial stream to the south and east of the site. In addition, Alternative 1 is near the Tompkins Basin Visitor which would cause negative impacts to aesthetics for the Visitor Center.

Alternative 2: This site was considered for the travel camp but was eliminated from consideration due to environmental constraints. The area is surrounded by steep topography and slopes as well as a resource protection area, limiting the development area. Without extensive grading, the site would not be large enough to the current design. The site also has potential for severe erosion and sediment control issues due to the steep topography.

Under the No Action Alternative, Fort Belvoir would not construct a travel camp, resulting in a lack of adequate recreational space for customers and visitors to the Northern Virginia area. Fort Belvoir customers and supporters would be forced to continue to use surrounding, more expensive facilities with longer commutes to Washington, DC. The morale of soldiers, family members, and DoD Civilians would remain stagnant at its current level.

# FORT BELVOIR TRAVEL CAMP
# RECORD OF NON-APPLICABILITY (RONA)

**2. Analysis:** Total reasonably foreseeable net change in direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" (highest annual emissions) and "steady state" (no net gain/loss in emission stabilized and the action is fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

All emissions estimates were derived from various sources using the methods, algorithms, and emission factors from the most current *Air Emissions Guide for Air Force Stationary Sources*, *Air Emissions Guide for Air Force Mobile Sources*, and/or *Air Emissions Guide for Air Force Transitory Sources*. For greater details of this analysis, refer to the Detail ACAM Report included in Attachment 1. Additionally, for informative purposes, greenhouse gas emissions (GHG) and the social cost of the GHG emissions estimated for this Proposed Action are included in Attachment 2.

____ applicable
__X__ not applicable

**Conformity Analysis Summary:**

**2025**

| Pollutant | Action Emissions (ton/yr) | GENERAL CONFORMITY | |
|---|---|---|---|
| | | Threshold (ton/yr) | Exceedance (Yes or No) |
| Washington, DC-MD-VA | | | |
| **VOC** | 0.381 | 50 | No |
| **NOx** | 3.156 | 100 | No |
| **CO** | 3.518 | | |
| **SOx** | 0.007 | | |
| **PM 10** | 52.489 | | |
| **PM 2.5** | 0.121 | | |

**2026**

| Pollutant | Action Emissions (ton/yr) | GENERAL CONFORMITY | |
|---|---|---|---|
| | | Threshold (ton/yr) | Exceedance (Yes or No) |
| Washington, DC-MD-VA | | | |
| **VOC** | 0.013 | 50 | No |
| **NOx** | 0.016 | 100 | No |
| **CO** | 0.182 | | |
| **SOx** | 0.000 | | |
| **PM 10** | 0.001 | | |
| **PM 2.5** | 0.001 | | |

**2027 - (Steady State)**

| Pollutant | Action Emissions (ton/yr) | GENERAL CONFORMITY | |
|---|---|---|---|
| | | Threshold (ton/yr) | Exceedance (Yes or No) |
| Washington, DC-MD-VA | | | |
| **VOC** | 0.016 | 50 | No |
| **NOx** | 0.018 | 100 | No |
| **CO** | 0.217 | | |
| **SOx** | 0.000 | | |
| **PM 10** | 0.001 | | |
| **PM 2.5** | 0.001 | | |

# FORT BELVOIR TRAVEL CAMP
# RECORD OF NON-APPLICABILITY (RONA)

The Criteria Pollutants (or their precursors) with a General Conformity threshold listed in the table above are pollutants within one or more designated nonattainment or maintenance area/s for the associated National Ambient Air Quality Standard (NAAQS). These pollutants are driving this GCR Applicability Analysis. Pollutants exceeding the GCR thresholds must be further evaluated potentially through a GCR Determination.

The pollutants without a General Conformity threshold are pollutants only within areas designated attainment for the associated NAAQS. These pollutants have an insignificance indicator for volatile organic compounds (VOC), nitrogen dioxides (NOx), carbon monoxide (CO), sulfur dioxides (SOx), particulate matter (PM) 10 microns, and PM 2.5 microns. Pollutants below their insignificance indicators are at rates so insignificant that they will not cause or contribute to an exceedance of one or more NAAQSs. These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant.

None of the annual net change in estimated emissions associated with this action are above the GCR threshold values established at 40 CFR 93.153 (b); therefore, the proposed Action has an insignificant impact on Air Quality and a General Conformity Determination is not applicable.

**Name, Title** **Date**

**Attachments**

Attachment 1 – Detail ACAM Report

Attachment 2 – Greenhouse Gas Emissions and Social Cost Report

# FORT BELVOIR TRAVEL CAMP
# RECORD OF NON-APPLICABILITY (RONA)

**Attachment 1 – Detail ACAM Report**

# FORT BELVOIR TRAVEL CAMP
# RECORD OF NON-APPLICABILITY (RONA)

## 1. General Information

**- Action Location**

**Installation:** Fort Belvoir
**State:** Virginia
**County(s):** Fairfax
**Regulatory Area(s):** Washington, DC-MD-VA

**- Action Title:** Fort Belvoir Travel Camp

**- Project Number/s (if applicable):** 99479

**- Projected Action Start Date:** 1 / 2025

**- Action Purpose and Need:**

The purpose of this project is to build and operate an approximately 20-acre travel camp at Fort Belvoir to be managed by the Installation Management Command G9's Family and Morale, Welfare, and Recreation (MWR) Directorate. The Proposed Action would provide needed space for customers at Fort Belvoir in a highly desirable area along the Potomac River.

The need for the facility is to provide space for RVs and travelers to stay within the northern Virginia area. Currently, there is inadequate space for the level of patronage received from both customers assigned to or supported by Fort Belvoir and those visiting the area. Customers are forced to seek service from commercially operated facilities that are overcrowded during peak travel times, have a higher cost, and are located an average 45 minutes from Washington, DC.

**- Action Description:**

The proposed travel camp would include 20-acres of recreational space for campers and RV owners. The camp would include a camp support facility, and rustic tent camping. Thirty pull-through RV camp sites would be constructed, including concrete vehicle and picnic pads, water, sewer, electric, phone, and communication hook-ups. The camp support facility would include a laundry section, camper's lounge space, restrooms and showers, and vending machine space. The rustic tent camp sites would include tables and grills, water hook-ups, and vehicle parking spaces. Paved vehicle circulation roads, walking paths, landscaping, street and site lighting, sewage lift stations, storm water management, utility upgrades, and area directional signage would also be included.

Two possible locations on Fort Belvoir were identified for the Proposed Action but were eliminated from consideration. These Alternatives are listed below.

Alternative 1: This site was considered for the travel camp but was eliminated from consideration because of expenses associated with the redevelopment of the site due to existing foundations on-site. The Alternative 1 area also contains limited developable space due to a resource protection area for a perennial stream to the south and east of the site. In addition, Alternative 1 is near the Tompkins Basin Visitor which would cause negative impacts to aesthetics for the Visitor Center.

Alternative 2: This site was considered for the travel camp but was eliminated from consideration due to environmental constraints. The area is surrounded by steep topography and slopes as well as a resource protection area, limiting the development area. Without extensive grading, the site would not be large enough to the current design. The site also has potential for severe erosion and sediment control issues due to the steep topography.

Under the No Action Alternative, Fort Belvoir would not construct a travel camp, resulting in a lack of adequate recreational space for customers and visitors to the Northern Virginia area. Fort Belvoir customers and supporters would be forced to continue to use surrounding, more expensive facilities with longer commutes to Washington, DC. The morale of soldiers, family members, and DoD Civilians would remain stagnant at its current level.

The following sections provide the detailed equations, emission factors, and calculations for the emissions associated with this project, which are summarized in the RONA. The emissions from the following activities have been accounted for in this analysis. Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

**- Activity List:**

| Activity Type | Activity Title |
|---|---|
| Construction / Demolition | Travel Camp Ft Belvoir |
| Heating | Heating for Bathhouse, Support Bldg |
| Personnel | Personnel supporting and using the Travel Camp |

## 2. Construction / Demolition

### 2.1 General Information & Timeline Assumptions

**- Activity Location**
**County:** Fairfax
**Regulatory Area(s):** Washington, DC-MD-VA

**- Activity Title:** Fort Belvoir Travel Camp

**- Activity Description:**
The Proposed Action would be located on the southeast of the Fort Belvoir main post, southeast of the intersection of Theote and Morrow Roads and roughly bounded by McClellan Loop. It would include 30 recreational vehicle (RV) camp sites with full utility hookups; a camping support facility with laundry, restrooms, showers, and camper's lounge space rustic camp sites; and associated paved vehicle circulation roads and walkways. The Proposed Action area is primarily forested with some surrounded recreational and operational buildings.

**- Activity Start Date**
**Start Month:** 1
**Start Month:** 2025

**- Activity End Date**
**Indefinite:** False
**End Month:** 12
**End Month:** 2025

**- Activity Emissions:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| VOC | 0.380845 |
| $SO_x$ | 0.006844 |
| $NO_x$ | 3.156379 |
| CO | 3.517714 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| PM 10 | 52.489272 |
| PM 2.5 | 0.120646 |
| Pb | 0.000000 |
| $NH_3$ | 0.003811 |

**- Activity Emissions of GHG:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CH_4$ | 0.030599 |
| $N_2O$ | 0.006950 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CO_2$ | 753.869581 |
| $CO_2e$ | 756.705438 |

**- Global Scale Activity Emissions for SCGHG:**

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CH_4$ | 0.030599 |
| $N_2O$ | 0.006950 |

| Pollutant | Total Emissions (TONs) |
|---|---|
| $CO_2$ | 753.869581 |
| $CO_2e$ | 756.705438 |

## 2.1 Site Grading Phase

### 2.1.1 Site Grading Phase Timeline Assumptions

**- Phase Start Date**

**Start Month:** 1
**Start Quarter:** 1
**Start Year:** 2025

**- Phase Duration**

**Number of Month:** 6
**Number of Days:** 0

### 2.1.2 Site Grading Phase Assumptions

**- General Site Grading Information**

**Area of Site to be Graded ($ft^2$):** 871,200
**Amount of Material to be Hauled On-Site ($yd^3$):** 500

The amount of material to be hauled on site is based on the assumption that grounds will need to be leveled and some tree stumps/trunks may need to be removed and filled. The assumption is that 500 $yd^3$ would be needed and a haul truck has a capacity of 20 $yd^3$.

**Amount of Material to be Hauled Off-Site ($yd^3$):** 1,000

The amount of material to be hauled off site is based on the amount of timber that a haul truck can transport off site. The amount of timber was based on the following assumption: Google Earths aerial map from April 2015 was used to approximate the number of trees per acre (50 trees per acre). The description of the proposed action and alternatives indicates that the site is approximately 20 acres, therefore there are 1,000 trees (50 trees * 20 acres = 1,000 trees). On average, a timber haul truck can hold 20 mature trees. Therefore, 50 logging trucks would be required. This is equivalent to 50 haul trucks, each having a capacity of 20 $yd^3$. 1000 $yd^3$ was used to ensure ACAM accounts for 50 logging trucks to remove all cut trees.

**- Site Grading Default Settings**

**Default Settings Used:** Yes
**Average Day(s) worked per week:** 5 (default)

**- Construction Exhaust (default)**

| Equipment Name | Number Of Equipment | Hours Per Day |
|---|---|---|
| Excavators Composite | 1 | 8 |
| Graders Composite | 1 | 8 |
| Other Construction Equipment Composite | 1 | 8 |
| Rubber Tired Dozers Composite | 1 | 8 |
| Scrapers Composite | 3 | 8 |
| Tractors/Loaders/Backhoes Composite | 3 | 8 |

**- Vehicle Exhaust**

**Average Hauling Truck Capacity ($yd^3$):** 20 (default)
**Average Hauling Truck Round Trip Commute (mile):** 20 (default)

**- Vehicle Exhaust Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 0 | 0 | 0 | 0 | 0 | 100.00 | 0 |

**- Worker Trips**

**Average Worker Round Trip Commute (mile):** 20 (default)

**- Worker Trips Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 50.00 | 50.00 | 0 | 0 | 0 | 0 | 0 |

### 2.1.3 Site Grading Phase Emission Factor(s)

**- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)**

| **Excavators Composite [HP: 36] [LF: 0.38]** | | | | | | |
|---|---|---|---|---|---|---|
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.40191 | 0.00542 | 3.44643 | 4.21104 | 0.10704 | 0.09848 |
| **Graders Composite [HP: 148] [LF: 0.41]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.33951 | 0.00490 | 2.85858 | 3.41896 | 0.15910 | 0.14637 |
| **Other Construction Equipment Composite [HP: 82] [LF: 0.42]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.29762 | 0.00487 | 2.89075 | 3.51214 | 0.17229 | 0.15851 |
| **Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.37086 | 0.00491 | 3.50629 | 2.90209 | 0.15396 | 0.14165 |
| **Scrapers Composite [HP: 423] [LF: 0.48]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.20447 | 0.00489 | 1.90932 | 1.57611 | 0.07394 | 0.06803 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.19600 | 0.00489 | 2.00960 | 3.48168 | 0.07738 | 0.07119 |

**- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)**

| **Excavators Composite [HP: 36] [LF: 0.38]** | | | | |
|---|---|---|---|---|
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02382 | 0.00476 | 587.13772 | 589.15263 |
| **Graders Composite [HP: 148] [LF: 0.41]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02155 | 0.00431 | 531.19419 | 533.01712 |
| **Other Construction Equipment Composite [HP: 82] [LF: 0.42]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02141 | 0.00428 | 527.74261 | 529.55369 |
| **Rubber Tired Dozers Composite [HP: 367] [LF: 0.4]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02159 | 0.00432 | 532.17175 | 533.99803 |
| **Scrapers Composite [HP: 423] [LF: 0.48]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02146 | 0.00429 | 528.94235 | 530.75755 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02149 | 0.00430 | 529.86270 | 531.68105 |

**- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)**

| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** | **$NH_3$** |
|---|---|---|---|---|---|---|---|
| LDGV | 0.29576 | 0.00175 | 0.20128 | 4.20030 | 0.00476 | 0.00421 | 0.05442 |
| LDGT | 0.26096 | 0.00219 | 0.26035 | 4.02283 | 0.00548 | 0.00485 | 0.04738 |
| HDGV | 0.85829 | 0.00466 | 0.79976 | 12.05606 | 0.02216 | 0.01960 | 0.09554 |
| LDDV | 0.10931 | 0.00126 | 0.15590 | 4.74159 | 0.00317 | 0.00292 | 0.01591 |
| LDDT | 0.38347 | 0.00151 | 0.86192 | 6.76545 | 0.00725 | 0.00667 | 0.01673 |
| HDDV | 0.15349 | 0.00445 | 2.81167 | 1.61168 | 0.06639 | 0.06108 | 0.06420 |
| MC | 2.60395 | 0.00200 | 0.67483 | 12.69559 | 0.02235 | 0.01977 | 0.05325 |

**- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)**

| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
|---|---|---|---|---|
| LDGV | 0.01888 | 0.00570 | 337.57289 | 339.74142 |
| LDGT | 0.01939 | 0.00811 | 421.53021 | 424.42905 |
| HDGV | 0.05931 | 0.02829 | 897.87847 | 907.78120 |
| LDDV | 0.05100 | 0.00067 | 374.11596 | 375.59033 |
| LDDT | 0.03866 | 0.00097 | 442.48956 | 443.74559 |
| HDDV | 0.02758 | 0.15872 | 1323.14510 | 1371.13329 |
| MC | 0.11579 | 0.00293 | 394.61333 | 398.38154 |

### 2.1.4 Site Grading Phase Formula(s)

**- Fugitive Dust Emissions per Phase**

$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

**- Construction Exhaust Emissions per Phase**

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

$CEE_{POL}$: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
$EF_{POL}$: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

**- Vehicle Exhaust Emissions per Phase**

$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
$HA_{OnSite}$: Amount of Material to be Hauled On-Site ($yd^3$)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site ($yd^3$)
HC: Average Hauling Truck Capacity ($yd^3$)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC $yd^3$)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

**- Worker Trips Emissions per Phase**

$VMT_{WT} = WD * WT * 1.25 * NE$

$VMT_{WT}$: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{WT}$: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

## 2.2 Trenching / Excavating Phase

### 2.2.1 Trenching / Excavating Phase Timeline Assumptions

**- Phase Start Date**
**Start Month:** 7
**Start Quarter:** 1
**Start Year:** 2025

**- Phase Duration**
**Number of Month:** 6
**Number of Days:** 0

### 2.2.2 Trenching / Excavating Phase Assumptions

**- General Trenching/Excavating Information**
**Area of Site to be Trenched/Excavated ($ft^2$):** 6,000
The area of site to be trenched/excavated is based on the following assumption: Google Earth measured distance from the main road (Warren Rd), south, to the end of the travel camp. This measurement assumes that trenching would connect from a main water line already established in the surrounding area. On average, the width of a trench is approximately 3 ft wide, therefore the area to be trenched/excavated would be 6,000 $ft^2$ (2,000 feet * 3 feet wide = 6,000 $ft^2$).

**Amount of Material to be Hauled On-Site ($yd^3$):** 1,000
The amount of material to be hauled on-site assumes that 50 trucks will be needed to transport all the necessary materials. The average hauling truck capacity is 20 $yd^3$ (20 $yd^3$ per truck * 50 trucks = 1,000 $yd^3$).
**Amount of Material to be Hauled Off-Site ($yd^3$):** 0

**- Trenching Default Settings**
**Default Settings Used:** Yes
**Average Day(s) worked per week:** 5 (default)

**- Construction Exhaust (default)**

| Equipment Name | Number Of Equipment | Hours Per Day |
|---|---|---|
| Excavators Composite | 2 | 8 |
| Other General Industrial Equipmen Composite | 1 | 8 |
| Tractors/Loaders/Backhoes Composite | 1 | 8 |

**- Vehicle Exhaust**
**Average Hauling Truck Capacity ($yd^3$):** 20 (default)
**Average Hauling Truck Round Trip Commute (mile):** 20 (default)

**- Vehicle Exhaust Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 0 | 0 | 0 | 0 | 0 | 100.00 | 0 |

**- Worker Trips**

**Average Worker Round Trip Commute (mile):** 20 (default)

**- Worker Trips Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 50.00 | 50.00 | 0 | 0 | 0 | 0 | 0 |

### 2.2.3 Trenching / Excavating Phase Emission Factor(s)

**- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)**

| **Excavators Composite [HP: 36] [LF: 0.38]** | | | | | | |
|---|---|---|---|---|---|---|
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.40191 | 0.00542 | 3.44643 | 4.21104 | 0.10704 | 0.09848 |
| **Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.49122 | 0.00542 | 3.71341 | 4.67487 | 0.13603 | 0.12515 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.19600 | 0.00489 | 2.00960 | 3.48168 | 0.07738 | 0.07119 |

**- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)**

| **Excavators Composite [HP: 36] [LF: 0.38]** | | | | |
|---|---|---|---|---|
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02382 | 0.00476 | 587.13772 | 589.15263 |
| **Other General Industrial Equipmen Composite [HP: 35] [LF: 0.34]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02385 | 0.00477 | 588.02637 | 590.04433 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02149 | 0.00430 | 529.86270 | 531.68105 |

**- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)**

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $NH_3$ |
|---|---|---|---|---|---|---|---|
| LDGV | 0.29576 | 0.00175 | 0.20128 | 4.20030 | 0.00476 | 0.00421 | 0.05442 |
| LDGT | 0.26096 | 0.00219 | 0.26035 | 4.02283 | 0.00548 | 0.00485 | 0.04738 |
| HDGV | 0.85829 | 0.00466 | 0.79976 | 12.05606 | 0.02216 | 0.01960 | 0.09554 |
| LDDV | 0.10931 | 0.00126 | 0.15590 | 4.74159 | 0.00317 | 0.00292 | 0.01591 |
| LDDT | 0.38347 | 0.00151 | 0.86192 | 6.76545 | 0.00725 | 0.00667 | 0.01673 |
| HDDV | 0.15349 | 0.00445 | 2.81167 | 1.61168 | 0.06639 | 0.06108 | 0.06420 |
| MC | 2.60395 | 0.00200 | 0.67483 | 12.69559 | 0.02235 | 0.01977 | 0.05325 |

**- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)**

| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
|---|---|---|---|---|
| LDGV | 0.01888 | 0.00570 | 337.57289 | 339.74142 |
| LDGT | 0.01939 | 0.00811 | 421.53021 | 424.42905 |
| HDGV | 0.05931 | 0.02829 | 897.87847 | 907.78120 |
| LDDV | 0.05100 | 0.00067 | 374.11596 | 375.59033 |
| LDDT | 0.03866 | 0.00097 | 442.48956 | 443.74559 |
| HDDV | 0.02758 | 0.15872 | 1323.14510 | 1371.13329 |
| MC | 0.11579 | 0.00293 | 394.61333 | 398.38154 |

# FORT BELVOIR TRAVEL CAMP
# RECORD OF NON-APPLICABILITY (RONA)

### 2.2.4 Trenching / Excavating Phase Formula(s)

**- Fugitive Dust Emissions per Phase**
$PM10_{FD} = (20 * ACRE * WD) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

**- Construction Exhaust Emissions per Phase**
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

$CEE_{POL}$: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
$EF_{POL}$: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

**- Vehicle Exhaust Emissions per Phase**
$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$

$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
$HA_{OnSite}$: Amount of Material to be Hauled On-Site ($yd^3$)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site ($yd^3$)
HC: Average Hauling Truck Capacity ($yd^3$)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC $yd^3$)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

**- Worker Trips Emissions per Phase**
$VMT_{WT} = WD * WT * 1.25 * NE$

$VMT_{WT}$: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

# FORT BELVOIR TRAVEL CAMP
# RECORD OF NON-APPLICABILITY (RONA)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{VE}$: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

## 2.3 Building Construction Phase

### 2.3.1 Building Construction Phase Timeline Assumptions

**- Phase Start Date**
**Start Month:** 7
**Start Quarter:** 1
**Start Year:** 2025

**- Phase Duration**
**Number of Month:** 6
**Number of Days:** 0

### 2.3.2 Building Construction Phase Assumptions

**- General Building Construction Information**
**Building Category:** Office or Industrial
**Area of Building ($ft^2$):** 2000
**Height of Building (ft):** 10
**Number of Units:** N/A

**- Building Construction Default Settings**
**Default Settings Used:** Yes
**Average Day(s) worked per week:** 5 (default)

**- Construction Exhaust (default)**

| Equipment Name | Number Of Equipment | Hours Per Day |
|---|---|---|
| Cranes Composite | 1 | 4 |
| Forklifts Composite | 2 | 6 |
| Tractors/Loaders/Backhoes Composite | 1 | 8 |

**- Vehicle Exhaust**
**Average Hauling Truck Round Trip Commute (mile):** 20 (default)

**- Vehicle Exhaust Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 0 | 0 | 0 | 0 | 0 | 100.00 | 0 |

**- Worker Trips**

**Average Worker Round Trip Commute (mile):** 20 (default)

**- Worker Trips Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 50.00 | 50.00 | 0 | 0 | 0 | 0 | 0 |

**- Vendor Trips**

**Average Vendor Round Trip Commute (mile):** 40 (default)

**- Vendor Trips Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 0 | 0 | 0 | 0 | 0 | 100.00 | 0 |

### 2.3.3 Building Construction Phase Emission Factor(s)

**- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)**

| **Cranes Composite [HP: 367] [LF: 0.29]** | | | | | | |
|---|---|---|---|---|---|---|
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.20113 | 0.00487 | 1.94968 | 1.66287 | 0.07909 | 0.07277 |
| **Forklifts Composite [HP: 82] [LF: 0.2]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.26944 | 0.00487 | 2.55142 | 3.59881 | 0.13498 | 0.12418 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.19600 | 0.00489 | 2.00960 | 3.48168 | 0.07738 | 0.07119 |

**- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)**

| **Cranes Composite [HP: 367] [LF: 0.29]** | | | | |
|---|---|---|---|---|
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02140 | 0.00428 | 527.58451 | 529.39505 |
| **Forklifts Composite [HP: 82] [LF: 0.2]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02138 | 0.00428 | 527.10822 | 528.91712 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02149 | 0.00430 | 529.86270 | 531.68105 |

**- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)**

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $NH_3$ |
|---|---|---|---|---|---|---|---|
| LDGV | 0.29576 | 0.00175 | 0.20128 | 4.20030 | 0.00476 | 0.00421 | 0.05442 |
| LDGT | 0.26096 | 0.00219 | 0.26035 | 4.02283 | 0.00548 | 0.00485 | 0.04738 |
| HDGV | 0.85829 | 0.00466 | 0.79976 | 12.05606 | 0.02216 | 0.01960 | 0.09554 |
| LDDV | 0.10931 | 0.00126 | 0.15590 | 4.74159 | 0.00317 | 0.00292 | 0.01591 |
| LDDT | 0.38347 | 0.00151 | 0.86192 | 6.76545 | 0.00725 | 0.00667 | 0.01673 |
| HDDV | 0.15349 | 0.00445 | 2.81167 | 1.61168 | 0.06639 | 0.06108 | 0.06420 |
| MC | 2.60395 | 0.00200 | 0.67483 | 12.69559 | 0.02235 | 0.01977 | 0.05325 |

**- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)**

| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
|---|---|---|---|---|
| LDGV | 0.01888 | 0.00570 | 337.57289 | 339.74142 |
| LDGT | 0.01939 | 0.00811 | 421.53021 | 424.42905 |
| HDGV | 0.05931 | 0.02829 | 897.87847 | 907.78120 |
| LDDV | 0.05100 | 0.00067 | 374.11596 | 375.59033 |
| LDDT | 0.03866 | 0.00097 | 442.48956 | 443.74559 |
| HDDV | 0.02758 | 0.15872 | 1323.14510 | 1371.13329 |
| MC | 0.11579 | 0.00293 | 394.61333 | 398.38154 |

### 2.3.4 Building Construction Phase Formula(s)

**- Construction Exhaust Emissions per Phase**
$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

$CEE_{POL}$: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
$EF_{POL}$: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

**- Vehicle Exhaust Emissions per Phase**
$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building ($ft^2$)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor $ft^3$ to trips (0.42 trip / 1000 $ft^3$)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

**- Worker Trips Emissions per Phase**
$VMT_{WT} = WD * WT * 1.25 * NE$

$VMT_{WT}$: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{WT}$: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

**- Vender Trips Emissions per Phase**
$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

$VMT_{VT}$: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building ($ft^2$)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor $ft^3$ to trips (0.38 trip / 1000 $ft^3$)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VT} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{VT}$: Vender Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

## 2.4 Architectural Coatings Phase

### 2.4.1 Architectural Coatings Phase Timeline Assumptions

**- Phase Start Date**
**Start Month:** 10
**Start Quarter:** 1
**Start Year:** 2025

**- Phase Duration**
**Number of Month:** 1
**Number of Days:** 0

### 2.4.2 Architectural Coatings Phase Assumptions

**- General Architectural Coatings Information**
**Building Category:** Non-Residential
**Total Square Footage ($ft^2$):** 2,000
**Number of Units:** N/A

**- Architectural Coatings Default Settings**
**Default Settings Used:** Yes
**Average Day(s) worked per week:** 5 (default)

**- Worker Trips**

**Average Worker Round Trip Commute (mile):** 20 (default)

**- Worker Trips Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 50.00 | 50.00 | 0 | 0 | 0 | 0 | 0 |

## 2.4.3 Architectural Coatings Phase Emission Factor(s)

**- Worker Trips Criteria Pollutant Emission Factors (grams/mile)**

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $NH_3$ |
|---|---|---|---|---|---|---|---|
| LDGV | 0.29576 | 0.00175 | 0.20128 | 4.20030 | 0.00476 | 0.00421 | 0.05442 |
| LDGT | 0.26096 | 0.00219 | 0.26035 | 4.02283 | 0.00548 | 0.00485 | 0.04738 |
| HDGV | 0.85829 | 0.00466 | 0.79976 | 12.05606 | 0.02216 | 0.01960 | 0.09554 |
| LDDV | 0.10931 | 0.00126 | 0.15590 | 4.74159 | 0.00317 | 0.00292 | 0.01591 |
| LDDT | 0.38347 | 0.00151 | 0.86192 | 6.76545 | 0.00725 | 0.00667 | 0.01673 |
| HDDV | 0.15349 | 0.00445 | 2.81167 | 1.61168 | 0.06639 | 0.06108 | 0.06420 |
| MC | 2.60395 | 0.00200 | 0.67483 | 12.69559 | 0.02235 | 0.01977 | 0.05325 |

**- Worker Trips Greenhouse Gasses Emission Factors (grams/mile)**

| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
|---|---|---|---|---|
| LDGV | 0.01888 | 0.00570 | 337.57289 | 339.74142 |
| LDGT | 0.01939 | 0.00811 | 421.53021 | 424.42905 |
| HDGV | 0.05931 | 0.02829 | 897.87847 | 907.78120 |
| LDDV | 0.05100 | 0.00067 | 374.11596 | 375.59033 |
| LDDT | 0.03866 | 0.00097 | 442.48956 | 443.74559 |
| HDDV | 0.02758 | 0.15872 | 1323.14510 | 1371.13329 |
| MC | 0.11579 | 0.00293 | 394.61333 | 398.38154 |

## 2.4.4 Architectural Coatings Phase Formula(s)

**- Worker Trips Emissions per Phase**

$VMT_{WT} = (1 * WT * PA) / 800$

$VMT_{WT}$: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips ( 1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area ($ft^2$)
800: Conversion Factor square feet to man days ( 1 $ft^2$ / 1 man * day)

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{WT}$: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

**- Off-Gassing Emissions per Phase**
$VOC_{AC}$ = (BA * 2.0 * 0.0116) / 2000.0

$VOC_{AC}$: Architectural Coating VOC Emissions (TONs)
BA: Area of Building ($ft^2$)
2.0: Conversion Factor total area to coated area (2.0 $ft^2$ coated area / total area)
0.0116: Emission Factor ($lb/ft^2$)
2000: Conversion Factor pounds to tons

## 2.5 Paving Phase

### 2.5.1 Paving Phase Timeline Assumptions

**- Phase Start Date**
**Start Month:** 10
**Start Quarter:** 1
**Start Year:** 2025

**- Phase Duration**
**Number of Month:** 2
**Number of Days:** 0

### 2.5.2 Paving Phase Assumptions

**- General Paving Information**
**Paving Area ($ft^2$):** 80000

**- Paving Default Settings**
**Default Settings Used:** Yes
**Average Day(s) worked per week:** 5 (default)

**- Construction Exhaust (default)**

| Equipment Name | Number Of Equipment | Hours Per Day |
|---|---|---|
| Cement and Mortar Mixers Composite | 4 | 6 |
| Pavers Composite | 1 | 7 |
| Paving Equipment Composite | 2 | 6 |
| Rollers Composite | 1 | 7 |
| Tractors/Loaders/Backhoes Composite | 1 | 7 |

**- Vehicle Exhaust**
**Average Hauling Truck Round Trip Commute (mile):** 20 (default)

**- Vehicle Exhaust Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 0 | 0 | 0 | 0 | 0 | 100.00 | 0 |

**- Worker Trips**

**Average Worker Round Trip Commute (mile):** 20 (default)

**- Worker Trips Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 50.00 | 50.00 | 0 | 0 | 0 | 0 | 0 |

### 2.5.3 Paving Phase Emission Factor(s)

**- Construction Exhaust Criteria Pollutant Emission Factors (g/hp-hour) (default)**

| **Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]** | | | | | | |
|---|---|---|---|---|---|---|
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.55317 | 0.00854 | 4.19957 | 3.25548 | 0.16367 | 0.15057 |
| **Pavers Composite [HP: 81] [LF: 0.42]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.24787 | 0.00486 | 2.64574 | 3.44523 | 0.13933 | 0.12819 |
| **Paving Equipment Composite [HP: 89] [LF: 0.36]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.20238 | 0.00487 | 2.21583 | 3.41771 | 0.08945 | 0.08229 |
| **Rollers Composite [HP: 36] [LF: 0.38]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.56682 | 0.00541 | 3.67816 | 4.11298 | 0.16639 | 0.15308 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | | | |
| | **VOC** | **$SO_x$** | **$NO_x$** | **CO** | **PM 10** | **PM 2.5** |
| Emission Factors | 0.19600 | 0.00489 | 2.00960 | 3.48168 | 0.07738 | 0.07119 |

**- Construction Exhaust Greenhouse Gasses Pollutant Emission Factors (g/hp-hour) (default)**

| **Cement and Mortar Mixers Composite [HP: 10] [LF: 0.56]** | | | | |
|---|---|---|---|---|
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02313 | 0.00463 | 570.17504 | 572.13174 |
| **Pavers Composite [HP: 81] [LF: 0.42]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02136 | 0.00427 | 526.53742 | 528.34436 |
| **Paving Equipment Composite [HP: 89] [LF: 0.36]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02141 | 0.00428 | 527.68636 | 529.49724 |
| **Rollers Composite [HP: 36] [LF: 0.38]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02381 | 0.00476 | 586.90234 | 588.91644 |
| **Tractors/Loaders/Backhoes Composite [HP: 84] [LF: 0.37]** | | | | |
| | **$CH_4$** | **$N_2O$** | **$CO_2$** | **$CO_2e$** |
| Emission Factors | 0.02149 | 0.00430 | 529.86270 | 531.68105 |

**- Vehicle Exhaust & Worker Trips Criteria Pollutant Emission Factors (grams/mile)**

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $NH_3$ |
|---|---|---|---|---|---|---|---|
| LDGV | 0.29576 | 0.00175 | 0.20128 | 4.20030 | 0.00476 | 0.00421 | 0.05442 |
| LDGT | 0.26096 | 0.00219 | 0.26035 | 4.02283 | 0.00548 | 0.00485 | 0.04738 |
| HDGV | 0.85829 | 0.00466 | 0.79976 | 12.05606 | 0.02216 | 0.01960 | 0.09554 |
| LDDV | 0.10931 | 0.00126 | 0.15590 | 4.74159 | 0.00317 | 0.00292 | 0.01591 |
| LDDT | 0.38347 | 0.00151 | 0.86192 | 6.76545 | 0.00725 | 0.00667 | 0.01673 |
| HDDV | 0.15349 | 0.00445 | 2.81167 | 1.61168 | 0.06639 | 0.06108 | 0.06420 |
| MC | 2.60395 | 0.00200 | 0.67483 | 12.69559 | 0.02235 | 0.01977 | 0.05325 |

**- Vehicle Exhaust & Worker Trips Greenhouse Gasses Emission Factors (grams/mile)**

| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
|---|---|---|---|---|
| LDGV | 0.01888 | 0.00570 | 337.57289 | 339.74142 |
| LDGT | 0.01939 | 0.00811 | 421.53021 | 424.42905 |
| HDGV | 0.05931 | 0.02829 | 897.87847 | 907.78120 |
| LDDV | 0.05100 | 0.00067 | 374.11596 | 375.59033 |
| LDDT | 0.03866 | 0.00097 | 442.48956 | 443.74559 |
| HDDV | 0.02758 | 0.15872 | 1323.14510 | 1371.13329 |
| MC | 0.11579 | 0.00293 | 394.61333 | 398.38154 |

### 2.5.4 Paving Phase Formula(s)

**- Construction Exhaust Emissions per Phase**

$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$

**- Construction Exhaust Emissions per Phase**

$CEE_{POL} = (NE * WD * H * HP * LF * EF_{POL} * 0.002205) / 2000$

$CEE_{POL}$: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
HP: Equipment Horsepower
LF: Equipment Load Factor
$EF_{POL}$: Emission Factor for Pollutant (g/hp-hour)
0.002205: Conversion Factor grams to pounds
2000: Conversion Factor pounds to tons

**- Vehicle Exhaust Emissions per Phase**

$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$

$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
PA: Paving Area ($ft^2$)
0.25: Thickness of Paving Area (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards ( 1 $yd^3$ / 27 $ft^3$)
HC: Average Hauling Truck Capacity ($yd^3$)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC $yd^3$)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{VE}$: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

**- Worker Trips Emissions per Phase**
$VMT_{WT} = WD * WT * 1.25 * NE$

$VMT_{WT}$: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{VE}$: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

**- Off-Gassing Emissions per Phase**
$VOC_P = (2.62 * PA) / 43560 / 2000$

$VOC_P$: Paving VOC Emissions (TONs)
2.62: Emission Factor (lb/acre)
PA: Paving Area ($ft^2$)
43560: Conversion Factor square feet to acre (43560 ft2 / acre)$^2$ / acre)
2000: Conversion Factor square pounds to TONs (2000 lb / TON)

## 3. Heating

### 3.1 General Information & Timeline Assumptions

**- Add or Remove Activity from Baseline?** Add

**- Activity Location**
**County:** Fairfax
**Regulatory Area(s):** Washington, DC-MD-VA

**- Activity Title:** Heating for Bathhouse, Support Bldg

**- Activity Description:**

We assume that the bathhouse and support building will use natural gas fired boilers to make hot water and hot air.

**- Activity Start Date**
**Start Month:** 1
**Start Year:** 2026

**- Activity End Date**
**Indefinite:** Yes
**End Month:** N/A
**End Year:** N/A

**- Activity Emissions of Criteria Pollutants:**

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| VOC | 0.000497 |
| $SO_x$ | 0.000054 |
| $NO_x$ | 0.009038 |
| CO | 0.007592 |

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| PM 10 | 0.000687 |
| PM 2.5 | 0.000687 |
| Pb | 0.000000 |
| $NH_3$ | 0.000000 |

**- Global Scale Activity Emissions of Greenhouse Gasses:**

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| $CH_4$ | 0.000204 |
| $N_2O$ | 0.000204 |

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| $CO_2$ | 10.847432 |
| $CO_2e$ | 10.858639 |

## 3.2 Heating Assumptions

**- Heating**
**Heating Calculation Type:** Heat Energy Requirement Method

**- Heat Energy Requirement Method**
**Area of floorspace to be heated ($ft^2$):** 2000
**Type of fuel:** Natural Gas
**Type of boiler/furnace:** Commercial/Institutional (0.3 - 9.9 MMBtu/hr)
**Heat Value (MMBtu/$ft^3$):** 0.00105
**Energy Intensity (MMBtu/$ft^2$):** 0.0949

**- Default Settings Used:** Yes

**- Boiler/Furnace Usage**
**Operating Time Per Year (hours):** 900 (default)

## 3.3 Heating Emission Factor(s)

**- Heating Criteria Pollutant Emission Factors (lb/1000000 scf)**

| VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | Pb | $NH_3$ |
|---|---|---|---|---|---|---|---|
| 5.5 | 0.6 | 100 | 84 | 7.6 | 7.6 | | |

**- Heating Greenhouse Gasses Pollutant Emission Factors (lb/1000000 scf)**

| $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
|---|---|---|---|
| 2.26 | 2.26 | 120019 | 120143 |

### 3.4 Heating Formula(s)

**- Heating Fuel Consumption $ft^3$ per Year**

$FC_{HER}$= HA * EI / HV / 1000000

$FC_{HER}$: Fuel Consumption for Heat Energy Requirement Method
HA: Area of floorspace to be heated ($ft^2$)
EI: Energy Intensity Requirement ($MMBtu/ft^2$)
HV: Heat Value ($MMBTU/ft^3$)
1000000: Conversion Factor

**- Heating Emissions per Year**

$HE_{POL}$= FC * $EF_{POL}$ / 2000
$HE_{POL}$: Heating Emission Emissions (TONs)
FC: Fuel Consumption
$EF_{POL}$: Emission Factor for Pollutant
2000: Conversion Factor pounds to tons

## 4. Personnel

### 4.1 General Information & Timeline Assumptions

**- Add or Remove Activity from Baseline?** Add

**- Activity Location**

**County:** Fairfax
**Regulatory Area(s):** Washington, DC-MD-VA

**- Activity Title:** Personnel supporting and using the RV Park

**- Activity Description:**

Two workers will support the RV Park. All 30 sites will be in use at least 8 months out of the year.

**- Activity Start Date**

**Start Month:** 3
**Start Year:** 2026

**- Activity End Date**

**Indefinite:** Yes
**End Month:** N/A
**End Year:** N/A

**- Activity Emissions of Criteria Pollutants:**

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| VOC | 0.015281 |
| $SO_x$ | 0.000109 |
| $NO_x$ | 0.008928 |
| CO | 0.209110 |

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| PM 10 | 0.000295 |
| PM 2.5 | 0.000261 |
| Pb | 0.000000 |
| $NH_3$ | 0.002569 |

**- Global Scale Activity Emissions of Greenhouse Gasses:**

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| $CH_4$ | 0.000936 |
| $N_2O$ | 0.000344 |

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| $CO_2$ | 21.077885 |
| $CO_2e$ | 21.203640 |

## 4.2 Personnel Assumptions

**- Number of Personnel**
**Civilian Personnel:** 40
**Support Contractor Personnel:** 2

**- Default Settings Used:** No

**- Average Personnel Round Trip Commute (mile):** 20

**- Personnel Work Schedule**
**Civilian Personnel:** 1 Days Per Week
**Support Contractor Personnel:** 5 Days Per Week

## 4.3 Personnel On Road Vehicle Mixture

**- On Road Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 37.55 | 60.32 | 0 | 0.03 | 0.2 | 0 | 1.9 |
| GOVs | 54.49 | 37.73 | 4.67 | 0 | 0 | 3.11 | 0 |

## 4.4 Personnel Emission Factor(s)

**- On Road Vehicle Criteria Pollutant Emission Factors (grams/mile)**

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $NH_3$ |
|---|---|---|---|---|---|---|---|
| LDGV | 0.24693 | 0.00166 | 0.12605 | 3.79468 | 0.00443 | 0.00392 | 0.04942 |
| LDGT | 0.20609 | 0.00206 | 0.15718 | 3.28057 | 0.00506 | 0.00447 | 0.04174 |
| HDGV | 0.73588 | 0.00470 | 0.59291 | 10.11613 | 0.01994 | 0.01764 | 0.09079 |
| LDDV | 0.10663 | 0.00124 | 0.14984 | 5.40767 | 0.00364 | 0.00334 | 0.01643 |
| LDDT | 0.16311 | 0.00141 | 0.42108 | 4.71893 | 0.00569 | 0.00523 | 0.01698 |
| HDDV | 0.11141 | 0.00422 | 2.31293 | 1.45606 | 0.04257 | 0.03916 | 0.06665 |
| MC | 2.58645 | 0.00200 | 0.66857 | 12.24584 | 0.02234 | 0.01976 | 0.05452 |

**- On Road Vehicle Greenhouse Gasses Emission Factors (grams/mile)**

| | $CH_4$ | $N_2O$ | $CO_2$ | $CO_2e$ |
|---|---|---|---|---|
| LDGV | 0.01491 | 0.00490 | 320.12657 | 321.95651 |
| LDGT | 0.01412 | 0.00680 | 396.22932 | 398.60697 |
| HDGV | 0.05128 | 0.02600 | 904.79960 | 913.82064 |
| LDDV | 0.05404 | 0.00067 | 367.38031 | 368.93032 |
| LDDT | 0.04024 | 0.00098 | 415.42062 | 416.71812 |
| HDDV | 0.02667 | 0.16412 | 1256.68964 | 1306.26349 |
| MC | 0.11083 | 0.00291 | 394.98905 | 398.62781 |

## 4.5 Personnel Formula(s)

**- Personnel Vehicle Miles Travel for Work Days per Year**
$VMT_P = NP * WD * AC$

$VMT_P$: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

**- Total Vehicle Miles Travel per Year**
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

$VMT_{Total}$: Total Vehicle Miles Travel (miles)
$VMT_{AD}$: Active Duty Personnel Vehicle Miles Travel (miles)
$VMT_C$: Civilian Personnel Vehicle Miles Travel (miles)
$VMT_{SC}$: Support Contractor Personnel Vehicle Miles Travel (miles)
$VMT_{ANG}$: Air National Guard Personnel Vehicle Miles Travel (miles)
$VMT_{AFRC}$: Reserve Personnel Vehicle Miles Travel (miles)

**- Vehicle Emissions per Year**
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{Total}$: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

# FORT BELVOIR TRAVEL CAMP
# RECORD OF NON-APPLICABILITY (RONA)

**Attachment 2 – Greenhouse Gas Emissions and Social Cost Report**

# FORT BELVOIR TRAVEL CAMP
# SOCIAL COST OF GREENHOUSE GASES

**1. General Information:** The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to estimate GHG emissions and assess the theoretical Social Cost of Greenhouse Gases (SC GHG) associated with the action. The analysis was performed in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the USAF Air Quality Environmental Impact Analysis Process (EIAP) Guide. This report provides a summary of GHG emissions and SC GHG analysis.

Report generated with ACAM version: 5.0.23a

**a. Action Location:**

**Installation:** Fort Belvoir
**State:** Virginia
**County(s):** Fairfax
**Regulatory Area(s):** Washington, DC-MD-VA

**b. Action Title:** Fort Belvoir Travel Camp

**c. Project Number/s (if applicable):** 99479

**d. Projected Action Start Date:** 1 / 2025

**e. Action Description:**

The proposed travel camp would include 20-acres of recreational space for campers and RV owners. The camp would include a camp support facility and rustic tent camping. Thirty pull-through RV camp sites would be constructed, including concrete vehicle and picnic pads, water, sewer, electric, phone, and communication hook-ups. The camp support facility would include a laundry section, camper's lounge space, restrooms and showers, and vending machine space. The rustic tent camp sites would include tables and grills, water hook-ups, and vehicle parking spaces. Paved vehicle circulation roads, walking paths, landscaping, street and site lighting, sewage lift stations, storm water management, utility upgrades, and area directional signage would also be included.

Two possible locations on Fort Belvoir were identified for the Proposed Action but were eliminated from consideration. These Alternatives are listed below.

Alternative 1: This site was considered for the travel camp but was eliminated from consideration because of expenses associated with the redevelopment of the site due to existing foundations on-site. The Alternative 1 area also contains limited developable space due to a resource protection area for a perennial stream to the south and east of the site. In addition, Alternative 1 is near the Tompkins Basin Visitor which would cause negative impacts to aesthetics for the Visitor Center.

Alternative 2: This site was considered for the travel camp but was eliminated from consideration due to environmental constraints. The area is surrounded by steep topography and slopes as well as a resource protection area, limiting the development area. Without extensive grading, the site would not be large enough to the current design. The site also has potential for severe erosion and sediment control issues due to the steep topography.

Under the No Action Alternative, Fort Belvoir would not construct a travel camp, resulting in a lack of adequate recreational space for customers and visitors to the Northern Virginia area. Fort Belvoir customers and supporters would be forced to continue to use surrounding, more expensive facilities with longer commutes to Washington, DC. The morale of soldiers, family members, and DoD Civilians would remain stagnant at its current level.

# FORT BELVOIR TRAVEL CAMP
# SOCIAL COST OF GREENHOUSE GASES

**2. Analysis:** Total combined direct and indirect GHG emissions associated with the action were estimated through ACAM on a calendar-year basis from the action start through the expected life cycle of the action. The life cycle for this action with "steady state" emissions (SS, net gain/loss in emission stabilized and the action is fully implemented) is assumed to be 10 years beyond the SS emissions year. For the purposes of this report, the emissions for this 10-year period are provided. However, the lifespan of the travel camp is anticipated to extend more than 10 years beyond the SS emissions year.

**GHG Emissions Analysis Summary:**

GHGs produced by fossil-fuel combustion are primarily carbon dioxide ($CO_2$), methane ($CH_4$), and nitrous oxide ($NO_2$). These three GHGs represent more than 97 percent of all U.S. GHG emissions. Emissions of GHGs are typically quantified and regulated in units of $CO_2$ equivalents ($CO_2e$). The $CO_2e$ considers the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to $CO_2$. All GHG emissions estimates were derived from various emission sources using the methods, algorithms, emission factors, and GWPs from the most current Air Emission Guidelines.

The Air Force has adopted the Prevention of Significant Deterioration (PSD) threshold for GHG of 75,000 ton per year (ton/yr) of $CO_2e$ (or 68,039 metric ton per year, mton/yr) as an indicator or "threshold of insignificance" for NEPA air quality impacts in all areas. This indicator does not define a significant impact; however, it provides a threshold to identify actions that are insignificant (de minimis, too trivial or minor to merit consideration). Actions with a net change in GHG ($CO_2e$) emissions below the insignificance indicator (threshold) are considered too insignificant on a global scale to warrant any further analysis. Note that actions with a net change in GHG ($CO_2e$) emissions above the insignificance indicator (threshold) are only considered potentially significant and require further assessment to determine if the action poses a significant impact. For further detail on insignificance indicators see Level II, Air Quality Quantitative Assessment, Insignificance Indicators (April 2023).

The following table summarizes the action-related GHG emissions on a calendar-year basis through the projected life cycle of the action.

| Action-Related Annual GHG Emissions (mton/yr) | | | | | | |
|---|---|---|---|---|---|---|
| **YEAR** | **$CO_2$** | **$CH_4$** | **$N_2O$** | **$CO_2e$** | **Threshold** | **Exceedance** |
| 2025 | 684 | 0.02775886 | 0.00630492 | 686 | 68,039 | No |
| 2026 | 26 | 0.00089255 | 0.00044531 | 26 | 68,039 | No |
| 2027 [SS Year] | 29 | 0.001034 | 0.00049731 | 29 | 68,039 | No |

The following U.S. and State's GHG emissions estimates (next two tables) are based on a five-year average (2016 through 2020) of individual state-reported GHG emissions (Reference: State Climate Summaries 2022, NOAA National Centers for Environmental Information, National Oceanic and Atmospheric Administration. https://statesummaries.ncics.org/downloads/).

# FORT BELVOIR TRAVEL CAMP
# SOCIAL COST OF GREENHOUSE GASES

| State's Annual GHG Emissions (mton/yr) | | | | |
|---|---|---|---|---|
| YEAR | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| 2025 | 103,326,696 | 508,919 | 17,006 | 103,852,622 |
| 2026 | 103,326,696 | 508,919 | 17,006 | 103,852,622 |
| 2027 [SS Year] | 103,326,696 | 508,919 | 17,006 | 103,852,622 |

| U.S. Annual GHG Emissions (mton/yr) | | | | |
|---|---|---|---|---|
| YEAR | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| 2025 | 5,136,454,179 | 25,626,912 | 1,500,708 | 5,163,581,798 |
| 2026 | 5,136,454,179 | 25,626,912 | 1,500,708 | 5,163,581,798 |
| 2027 [SS Year] | 5,136,454,179 | 25,626,912 | 1,500,708 | 5,163,581,798 |

**GHG Relative Significance Assessment:**

A Relative Significance Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (global, national, and regional) and the degree (intensity) of the proposed action's effects. The Relative Significance Assessment provides real-world context and allows for a reasoned choice against alternatives through a relative comparison analysis. The analysis weighs each alternative's annual net change in GHG emissions proportionally against (or relative to) global, national, and regional emissions.

The action's surroundings, circumstances, environment, and background (context associated with an action) provide the setting for evaluating the GHG intensity (impact significance). From an air quality perspective, context of an action is the local area's ambient air quality relative to meeting the National Ambient Air Quality Standards, expressed as attainment, nonattainment, or maintenance areas (this designation is considered the attainment status). GHGs are non-hazardous to health at normal ambient concentrations and, at a cumulative global scale, action-related GHG emissions can only potentially cause warming of the climatic system. Therefore, the action-related GHGs generally have an insignificant impact to local air quality.

However, the affected area (context) of GHG/climate change is global. Therefore, the intensity or degree of the proposed action's GHG/climate change effects are gauged through the quantity of GHG associated with the action as compared to a baseline of the state, U.S., and global GHG inventories. Each action (or alternative) has significance, based on their annual net change in GHG emissions, in relation to or proportionally to the global, national, and regional annual GHG emissions.

To provide real-world context to the GHG and climate change effects on a global scale, an action's net change in GHG emissions is compared relative to the state (where action will occur) and U.S. annual emissions. The following table provides a relative comparison of an action's net change in GHG emissions vs. state and U.S. projected GHG emissions for the same time period.

| Total GHG Relative Significance (mton) | | | | | |
|---|---|---|---|---|---|
| | | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
| 2023-2037 | State Total | 1,549,900,441 | 7,633,790 | 255,094 | 1,557,789,325 |
| 2023-2037 | U.S. Total | 77,046,812,685 | 384,403,675 | 22,510,615 | 77,453,726,975 |
| 2023-2037 | Action | 1,028 | 0.040025 | 0.012221 | 1,032 |
| | | | | | |
| Percent of State Totals | | 0.00006634% | 0.00000052% | 0.00000479% | 0.00006627% |
| Percent of U.S. Totals | | 0.00000133% | 0.00000001% | 0.00000005% | 0.00000133% |

From a global context, the action's total GHG percentage of total global GHG for the same time period is: 0.00000018%.*

* Global value based on the U.S. emits 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

# FORT BELVOIR TRAVEL CAMP
# SOCIAL COST OF GREENHOUSE GASES

**Climate Change Assessment (as SC GHG):**

On a global scale, the potential climate change effects of an action are indirectly addressed and put into context through providing the theoretical SC GHG associated with an action. The SC GHG is an administrative and theoretical tool intended to provide additional context to a GHG's potential impacts through approximating the long-term monetary damage that may result from GHG emissions affect on climate change. It is important to note that the SC GHG is a monetary quantification, in 2020 U.S. dollars, of the theoretical economic damages that could result from emitting GHGs into the atmosphere.

The SC GHG estimates are derived using the methodology and discount factors in the "Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990," released by the Interagency Working Group on Social Cost of Greenhouse Gases (IWG SC GHGs) in February 2021.

The speciated IWG Annual SC GHG Emission associated with an action (or alternative) are first estimated as annual unit cost (cost per metric ton, $/mton). Results of the annual IWG Annual SC GHG Emission Assessments are tabulated in the IWG Annual SC GHG Cost per Metric Ton Table below:

IWG SC GHG Discount Factor: 2.5%

| IWG Annual SC GHG Cost per Metric Ton ($/mton [In 2020 $]) | | | |
|---|---|---|---|
| **YEAR** | **$CO_2$** | **$CH_4$** | **$N_2O$** |
| 2025 | $83.00 | $2,200.00 | $30,000.00 |
| 2026 | $84.00 | $2,300.00 | $30,000.00 |
| 2027 [SS Year] | $86.00 | $2,300.00 | $31,000.00 |

Action-related SC GHG were estimated by calendar-year for the projected action's lifecycle. Annual estimates were found by multiplying the annual emission for a given year by the corresponding IWG Annual SC GHG Emission value (see table above).

| Action-Related Annual SC GHG ($K/yr [In 2020 $]) | | | | |
|---|---|---|---|---|
| **YEAR** | **$CO_2$** | **$CH_4$** | **$N_2O$** | **GHG** |
| 2025 | $56.76 | $0.06 | $0.19 | $57.01 |
| 2026 | $2.17 | $0.00 | $0.01 | $2.18 |
| 2027 [SS Year] | $2.49 | $0.00 | $0.02 | $2.51 |
| 2028 | $2.52 | $0.00 | $0.02 | $2.54 |
| 2029 | $2.55 | $0.00 | $0.02 | $2.57 |
| 2030 | $2.58 | $0.00 | $0.02 | $2.60 |
| 2031 | $2.64 | $0.00 | $0.02 | $2.65 |
| 2032 | $2.66 | $0.00 | $0.02 | $2.68 |
| 2033 | $2.72 | $0.00 | $0.02 | $2.74 |
| 2034 | $2.75 | $0.00 | $0.02 | $2.77 |
| 2035 | $2.78 | $0.00 | $0.02 | $2.80 |
| 2036 | $2.84 | $0.00 | $0.02 | $2.86 |
| 2037 | $2.87 | $0.00 | $0.02 | $2.89 |

# FORT BELVOIR TRAVEL CAMP
# SOCIAL COST OF GREENHOUSE GASES

The following two tables summarize the U.S. and State's Annual SC GHG by calendar-year. The U.S. and State's Annual SC GHG are in 2020 dollars and were estimated by each year for the projected action lifecycle. Annual SC GHG estimates were found by multiplying the U.S. and State's annual five-year average GHG emissions for a given year by the corresponding IWG Annual SC GHG Cost per Metric Ton value.

| State's Annual SC GHG ($K/yr [In 2020 $]) | | | | |
|---|---|---|---|---|
| **YEAR** | **$CO_2$** | **$CH_4$** | **$N_2O$** | **GHG** |
| 2025 | $8,576,115.77 | $1,119,622.48 | $510,188.89 | $10,205,927.14 |
| 2026 | $8,679,442.47 | $1,170,514.41 | $510,188.89 | $10,360,145.77 |
| 2027 [SS Year] | $8,886,095.86 | $1,170,514.41 | $527,195.19 | $10,583,805.46 |
| 2028 | $8,989,422.56 | $1,221,406.34 | $544,201.49 | $10,755,030.38 |
| 2029 | $9,092,749.25 | $1,272,298.27 | $544,201.49 | $10,909,249.01 |
| 2030 | $9,196,075.95 | $1,272,298.27 | $561,207.78 | $11,029,582.00 |
| 2031 | $9,402,729.34 | $1,323,190.20 | $561,207.78 | $11,287,127.32 |
| 2032 | $9,506,056.04 | $1,323,190.20 | $578,214.08 | $11,407,460.32 |
| 2033 | $9,712,709.43 | $1,374,082.13 | $595,220.37 | $11,682,011.93 |
| 2034 | $9,816,036.13 | $1,424,974.06 | $595,220.37 | $11,836,230.56 |
| 2035 | $9,919,362.82 | $1,424,974.06 | $612,226.67 | $11,956,563.55 |
| 2036 | $10,126,016.21 | $1,475,865.99 | $612,226.67 | $12,214,108.88 |
| 2037 | $10,229,342.91 | $1,526,757.92 | $629,232.97 | $12,385,333.80 |

| U.S. Annual SC GHG ($K/yr [In 2020 $]) | | | | |
|---|---|---|---|---|
| **YEAR** | **$CO_2$** | **$CH_4$** | **$N_2O$** | **GHG** |
| 2025 | $426,325,696.86 | $56,379,205.70 | $45,021,229.08 | $527,726,131.63 |
| 2026 | $431,462,151.04 | $58,941,896.86 | $45,021,229.08 | $535,425,276.98 |
| 2027 [SS Year] | $441,735,059.39 | $58,941,896.86 | $46,521,936.72 | $547,198,892.97 |
| 2028 | $446,871,513.57 | $61,504,588.03 | $48,022,644.35 | $556,398,745.96 |
| 2029 | $452,007,967.75 | $64,067,279.20 | $48,022,644.35 | $564,097,891.30 |
| 2030 | $457,144,421.93 | $64,067,279.20 | $49,523,351.99 | $570,735,053.12 |
| 2031 | $467,417,330.29 | $66,629,970.37 | $49,523,351.99 | $583,570,652.65 |
| 2032 | $472,553,784.47 | $66,629,970.37 | $51,024,059.62 | $590,207,814.46 |
| 2033 | $482,826,692.83 | $69,192,661.54 | $52,524,767.26 | $604,544,121.62 |
| 2034 | $487,963,147.01 | $71,755,352.70 | $52,524,767.26 | $612,243,266.97 |
| 2035 | $493,099,601.18 | $71,755,352.70 | $54,025,474.90 | $618,880,428.78 |
| 2036 | $503,372,509.54 | $74,318,043.87 | $54,025,474.90 | $631,716,028.31 |
| 2037 | $508,508,963.72 | $76,880,735.04 | $55,526,182.53 | $640,915,881.29 |

# FORT BELVOIR TRAVEL CAMP
# SOCIAL COST OF GREENHOUSE GASES

**Relative Comparison of SC GHG:**

To provide additional real-world context to the potential climate change impact associate with an action, a Relative Comparison of SC GHG Assessment is also performed. While the SC GHG estimates capture an indirect approximation of global climate damages, the Relative Comparison of SC GHG Assessment provides a better perspective from a regional and global scale.

The Relative Comparison of SC GHG Assessment uses the rule of reason and the concept of proportionality along with the consideration of the affected area (global, national, and regional) and the SC GHG as the degree (intensity) of the proposed action's effects. The Relative Comparison Assessment provides real-world context and allows for a reasoned choice among alternatives through a relative contrast analysis which weighs each alternative's SC GHG proportionally against (or relative to) existing global, national, and regional SC GHG. The below table provides a relative comparison between an action's SC GHG vs. state and U.S. projected SC GHG for the same time period:

| Total SC-GHG ($K [In 2020 $]) | | | | | |
|---|---|---|---|---|---|
| | | $CO_2$ | $CH_4$ | $N_2O$ | GHG |
| 2023-2037 | State Total | $138,871,079.50 | $19,288,041.76 | $8,367,097.84 | $166,526,219.10 |
| 2023-2037 | U.S. Total | $6,903,394,416.58 | $971,259,952.67 | $738,348,156.91 | $8,613,002,526.16 |
| 2023-2037 | Action | $88.33 | $0.09 | $0.39 | $88.81 |
| | | | | | |
| Percent of State Totals | | 0.00006360% | 0.00000048% | 0.00000464% | 0.00005333% |
| Percent of U.S. Totals | | 0.00000128% | 0.00000001% | 0.00000005% | 0.00000103% |

From a global context, the action's total SC GHG percentage of total global SC GHG for the same time period is: 0.00000014%.*

* Global value based on the U.S. emits 13.4% of all global GHG annual emissions (2018 Emissions Data, Center for Climate and Energy Solutions, accessed 7-6-2023, https://www.c2es.org/content/international-emissions).

APPENDIX G- INFORMATION FOR PLANNING AND CONSULTATION (IPaC) REPORT

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694

In Reply Refer To: 04/25/2024 16:19:42 UTC
Project code: 2024-0048165
Project Name: Travel Camp EA Fort Belvoir

Federal Nexus: yes
Federal Action Agency (if applicable): Army

**Subject:** Federal agency coordination under the Endangered Species Act, Section 7 for 'Travel Camp EA Fort Belvoir'

Dear Lauren Joyal:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on April 25, 2024, for 'Travel Camp EA Fort Belvoir' (here forward, Project). This project has been assigned Project Code 2024-0048165 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements may not be complete.**

**Ensuring Accurate Determinations When Using IPaC**

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat Rangewide Determination Key (DKey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid.***

**Determination for the Northern Long-Eared Bat**

Based upon your IPaC submission and a standing analysis completed by the Service, your project has reached the determination of "May Affect, Not Likely to Adversely Affect" the northern long-eared bat. Unless the Service advises you within 15 days of the date of this letter that your

IPaC-assisted determination was incorrect, this letter verifies that consultation on the Action is complete and no further action is necessary unless either of the following occurs:

- new information reveals effects of the action that may affect the northern long-eared bat in a manner or to an extent not previously considered; or,
- the identified action is subsequently modified in a manner that causes an effect to the northern long-eared bat that was not considered when completing the determination key.

**15-Day Review Period**

As indicated above, the Service will notify you within 15 calendar days if we determine that this proposed Action does not meet the criteria for a “may affect, not likely to adversely affect” (NLAA) determination for the northern long-eared bat. If we do not notify you within that timeframe, you may proceed with the Action under the terms of the NLAA concurrence provided here. This verification period allows the identified Ecological Services Field Office to apply local knowledge to evaluation of the Action, as we may identify a small subset of actions having impacts that we did not anticipate when developing the key. In such cases, the identified Ecological Services Field Office may request additional information to verify the effects determination reached through the Northern Long-eared Bat DKey.

**Other Species and Critical Habitat that May be Present in the Action Area**

The IPaC-assisted determination for the northern long-eared bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Monarch Butterfly *Danaus plexippus* Candidate
- Tricolored Bat *Perimyotis subflavus* Proposed Endangered

You may coordinate with our Office to determine whether the Action may affect the species and/or critical habitat listed above. Note that reinitiation of consultation would be necessary if a new species is listed or critical habitat designated that may be affected by the identified action before it is complete.

If you have any questions regarding this letter or need further assistance, please contact the Virginia Ecological Services Field Office and reference Project Code 2024-0048165 associated with this Project.

**Action Description**
You provided to IPaC the following name and description for the subject Action.

**1. Name**

Travel Camp EA Fort Belvoir

**2. Description**

The following description was provided for the project 'Travel Camp EA Fort Belvoir':

> The foot travel camp would be located on the southeast of the Fort Belvoir main post, southeast of the intersection of Theote and Morrow Roads and roughly bounded by McClellan Loop. It would include 30 RV camp sites with full utility hookups, a camping support facility with laundry, restrooms, showers, and camper’s lounge space rustic camp site, and associated vehicle circulation roads and walkways. The Proposed Action area is primarily forested with some surrounded recreational and operational buildings. The LOD for the project is approximately 22 acres.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@38.68287695,-77.1465154918692,14z

# DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of “may affect, but not likely to adversely affect” for the Endangered northern long-eared bat (*Myotis septentrionalis*).

## QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of the northern long-eared bat or any other listed species?

   **Note:** Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

   *No*

2. The action area does not overlap with an area for which U.S. Fish and Wildlife Service currently has data to support the presumption that the northern long-eared bat is present. Are you aware of other data that indicates that northern long-eared bats (NLEB) are likely to be present in the action area?

   Bat occurrence data may include identification of NLEBs in hibernacula, capture of NLEBs, tracking of NLEBs to roost trees, or confirmed NLEB acoustic detections. Data on captures, roost tree use, and acoustic detections should post-date the year when white-nose syndrome was detected in the relevant state. With this question, we are looking for data that, for some reason, may have not yet been made available to U.S. Fish and Wildlife Service.

   *No*

3. Does any component of the action involve construction or operation of wind turbines?

   **Note:** For federal actions, answer ‘yes’ if the construction or operation of wind power facilities is either (1) part of the federal action or (2) would not occur but for a federal agency action (federal permit, funding, etc.).

   *No*

4. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

   *Yes*

5. Is the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), or Federal Transit Administration (FTA) funding or authorizing the proposed action, in whole or in part?

   *No*

6. Are you an employee of the federal action agency or have you been officially designated in writing by the agency as its designated non-federal representative for the purposes of Endangered Species Act Section 7 informal consultation per 50 CFR § 402.08?

   **Note:** This key may be used for federal actions and for non-federal actions to facilitate section 7 consultation and to help determine whether an incidental take permit may be needed, respectively. This question is for information purposes only.

   *Yes*

7. Is the lead federal action agency the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC)? Is the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC) funding or authorizing the proposed action, in whole or in part?

   *No*

8. Is the lead federal action agency the Federal Energy Regulatory Commission (FERC)?

   *No*

9. Have you determined that your proposed action will have no effect on the northern long-eared bat? Remember to consider the effects of any activities that would not occur but for the proposed action.

   If you think that the northern long-eared bat may be affected by your project or if you would like assistance in deciding, answer “No” below and continue through the key. If you have determined that the northern long-eared bat does not occur in your project’s action area and/or that your project will have no effects whatsoever on the species despite the potential for it to occur in the action area, you may make a “no effect” determination for the northern long-eared bat.

   **Note:** Federal agencies (or their designated non-federal representatives) must consult with USFWS on federal agency actions that may affect listed species [50 CFR 402.14(a)]. Consultation is not required for actions that will not affect listed species or critical habitat. Therefore, this determination key will not provide a consistency or verification letter for actions that will not affect listed species. If you believe that the northern long-eared bat may be affected by your project or if you would like assistance in deciding, please answer “No” and continue through the key. Remember that this key addresses only effects to the northern long-eared bat. Consultation with USFWS would be required if your action may affect another listed species or critical habitat. The definition of Effects of the Action can be found here: https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions

   *No*

10. [Semantic] Is the action area located within 0.5 miles of a known northern long-eared bat hibernaculum?

    **Note:** The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    **Automatically answered**
    *No*

11. Does the action area contain any caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, or tunnels that could provide habitat for hibernating northern long-eared bats?

    *No*

12. Is suitable summer habitat for the northern long-eared bat present within 1000 feet of project activities?
    (If unsure, answer "Yes.")

    **Note:** If there are trees within the action area that are of a sufficient size to be potential roosts for bats (i.e., live trees and/or snags ≥3 inches (12.7 centimeter) dbh), answer "Yes". If unsure, additional information defining suitable summer habitat for the northern long-eared bat can be found at: https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions

    *Yes*

13. Will the action cause effects to a bridge?

    *No*

14. Will the action result in effects to a culvert or tunnel?

    *No*

15. Does the action include the intentional exclusion of northern long-eared bats from a building or structure?

    **Note:** Exclusion is conducted to deny bats' entry or reentry into a building. To be effective and to avoid harming bats, it should be done according to established standards. If your action includes bat exclusion and you are unsure whether northern long-eared bats are present, answer "Yes." Answer "No" if there are no signs of bat use in the building/structure. If unsure, contact your local U.S. Fish and Wildlife Services Ecological Services Field Office to help assess whether northern long-eared bats may be present. Contact a Nuisance Wildlife Control Operator (NWCO) for help in how to exclude bats from a structure safely without causing harm to the bats (to find a NWCO certified in bat standards, search the Internet using the search term "National Wildlife Control Operators Association bats"). Also see the White-Nose Syndrome Response Team's guide for bat control in structures

    *No*

16. Does the action involve removal, modification, or maintenance of a human-made structure (barn, house, or other building) **known or suspected to contain roosting bats?**

    *No*

17. Will the action directly or indirectly cause construction of one or more new roads that are open to the public?

    **Note:** The answer may be yes when a publicly accessible road either (1) is constructed as part of the proposed action or (2) would not occur but for the proposed action (i.e., the road construction is facilitated by the proposed action but is not an explicit component of the project).

    *No*

18. Will the action include or cause any construction or other activity that is reasonably certain to increase average daily traffic on one or more existing roads?

    **Note:** For federal actions, answer ‘yes’ when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.). .

    *Yes*

19. Will the increased vehicle traffic occur on any road that lies between any two areas of contiguous forest that are each greater than or equal to 10 acres in extent and are separated by less than 1,000 feet? Northern long-eared bats may cross a road by flying between forest patches that are up to 1,000 feet apart.

    **Note:** "Contiguous forest" of 10 acres or more may includes areas where multiple forest patches are separated by less than 1,000 feet of non-forested area if the forested patches, added together, comprise at least 10 acres.

    *Yes*

20. For every 1,000 feet of road where increased traffic is expected, will there be at least one place where bats could cross the road corridor by flying less than 33 feet (10 meters) between trees whose tops are at least 66 feet (20 meters) higher than the road surface?

    *Yes*

21. Will the proposed action involve the creation of a new water-borne contaminant source (e.g., leachate pond pits containing chemicals that are not NSF/ANSI 60 compliant)?

    *No*

22. Will the proposed action involve the creation of a new point source discharge from a facility other than a water treatment plant or storm water system?

    *No*

23. Will the action include drilling or blasting?

    *No*

24. Will the action involve military training (e.g., smoke operations, obscurant operations, exploding munitions, artillery fire, range use, helicopter or fixed wing aircraft use)?

    *No*

25. Will the proposed action involve the use of pesticides other than herbicides (e.g., fungicides, insecticides, or rodenticides)?

    *No*

26. Will the action include or cause activities that are reasonably certain to cause chronic nighttime noise in suitable summer habitat for the northern long-eared bat? Chronic noise is noise that is continuous or occurs repeatedly again and again for a long time.

    **Note:** Additional information defining suitable summer habitat for the northern long-eared bat can be found at: https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions

    *No*

27. Does the action include, or is it reasonably certain to cause, the use of artificial lighting within 1000 feet of suitable northern long-eared bat roosting habitat?

    **Note:** Additional information defining suitable roosting habitat for the northern long-eared bat can be found at: https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions

    *Yes*

28. Will the action use only downward-facing, full cut-off lens lights (with same intensity or less for replacement lighting)
    when installing new or replacing existing permanent lights? Or for those transportation agencies using the Backlight, Uplight, Glare (BUG) system developed by the Illuminating Engineering Society, will all three ratings (backlight, uplight, and glare) be as close to zero as is possible, with a priority of "uplight" of 0?

    *Yes*

29. Will the action direct any temporary lighting away from suitable northern long-eared bat roosting habitat during the active season?

    **Note:** Active season dates for northern long-eared bat can be found here: https://www.fws.gov/media/inactive-season-dates-swarming-and-staging-areas.

    *Yes*

30. Will the action include tree cutting or other means of knocking down or bringing down trees, tree topping, or tree trimming?

    *Yes*

31. Has a presence/probable absence summer bat survey targeting the northern long-eared bat following the Service's Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines been conducted within the project area? If unsure, answer "No."

    *No*

32. Does the action include emergency cutting or trimming of hazard trees in order to remove an imminent threat to human safety or property? See hazard tree note at the bottom of the key for text that will be added to response letters

    **Note:** A "hazard tree" is a tree that is an immediate threat to lives, public health and safety, or improved property and has a diameter breast height of six inches or greater.

    *No*

33. Are any of the trees proposed for cutting or other means of knocking down, bringing down, topping, or trimming suitable for northern long-eared bat roosting (i.e., live trees and/or snags ≥3 inches dbh that have exfoliating bark, cracks, crevices, and/or cavities)?

    *Yes*

34. [Semantic] Does your project intersect a known sensitive area for the northern long-eared bat?

    **Note:** The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your state agency or USFWS field office

    **Automatically answered**
    *No*

35. Will all tree cutting/trimming or other knocking or bringing down of trees be restricted to the inactive season for the northern long-eared bat?

    **Note:** Inactive Season dates for summer habitat outside of staging and swarming areas can be found here: https://www.fws.gov/media/inactive-season-dates-swarming-and-staging-areas.

    *Yes*

36. Will the action cause trees to be cut, knocked down, or otherwise brought down across an area greater than 10 acres?

    *Yes*

# PROJECT QUESTIONNAIRE

Enter the extent of the action area (in acres) from which trees will be removed - round up to the nearest tenth of an acre. For this question, include the entire area where tree removal will take place, even if some live or dead trees will be left standing.

*22*

In what extent of the area (in acres) will trees be cut, knocked down, or trimmed during the inactive (hibernation) season for northern long-eared bat? **Note:** Inactive Season dates for spring staging/fall swarming areas can be found here: https://www.fws.gov/media/inactive-season-dates-swarming-and-staging-areas

*0*

In what extent of the area (in acres) will trees be cut, knocked down, or trimmed during the active (non-hibernation) season for northern long-eared bat? **Note:** Inactive Season dates for spring staging/fall swarming areas can be found here: https://www.fws.gov/media/inactive-season-dates-swarming-and-staging-areas

*22*

Will all potential northern long-eared bat (NLEB) roost trees (trees ≥3 inches diameter at breast height, dbh) be cut, knocked, or brought down from any portion of the action area greater than or equal to 0.1 acre? If all NLEB roost trees will be removed from multiple areas, select 'Yes' if the cumulative extent of those areas meets or exceeds 0.1 acre.

*Yes*

Enter the extent of the action area (in acres) from which all potential NLEB roost trees will be removed. If all NLEB roost trees will be removed from multiple areas, entire the total extent of those areas. Round up to the nearest tenth of an acre.

*22*

For the area from which all potential northern long-eared bat (NLEB) roost trees will be removed, on how many acres (round to the nearest tenth of an acre) will trees be allowed to regrow? Enter '0' if the entire area from which all potential NLEB roost trees are removed will be developed or otherwise converted to non-forest for the foreseeable future.

*2*

Will any snags (standing dead trees) ≥3 inches dbh be left standing in the area(s) in which all northern long-eared bat roost trees will be cut, knocked down, or otherwise brought down?

*No*

Will all project activities by completed by April 1, 2024?

*No*

# IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Lauren Joyal
Address: 2 Hopkins Plaza
City: Baltimore
State: MD
Zip: 21201
Email joyall@umich.edu
Phone: 8128782281

# LEAD AGENCY CONTACT INFORMATION

Lead Agency: Army

APPENDIX H- ENVIRONMENTAL JUSTICE (EJ) SCREEN COMMUNITY REPORT

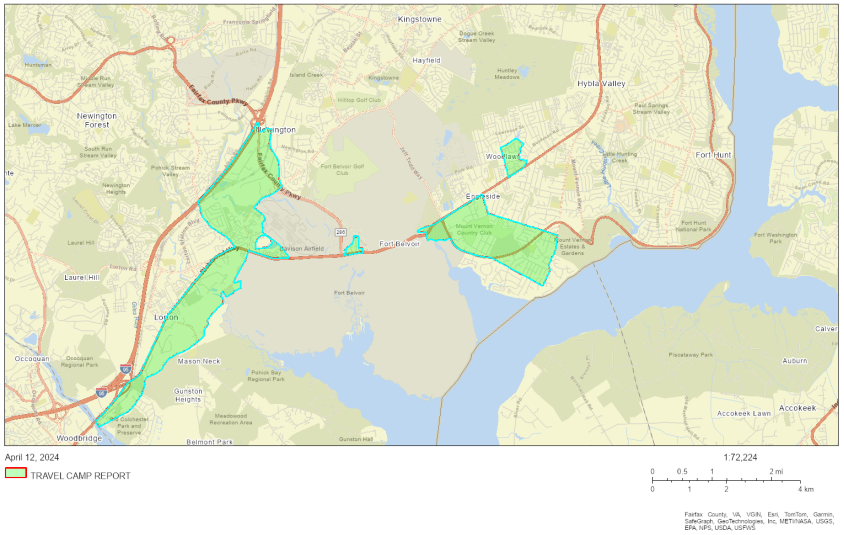
# EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

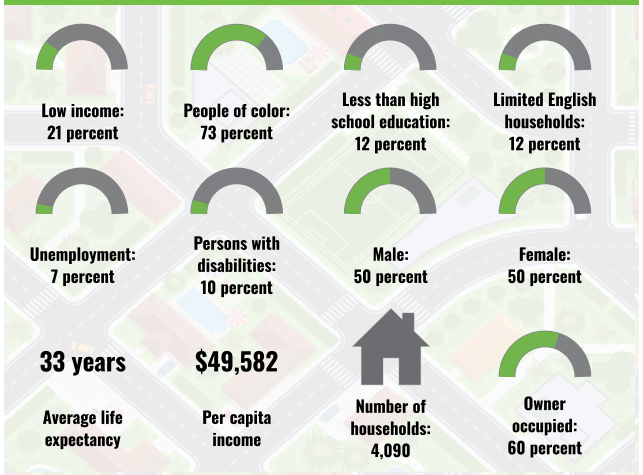
## Woodlawn, VA

**Blockgroup:**
510594221021,510594220002,510594219003,510594161001,510594217011
**Population: 12,345**
**Area in square miles: 4.99**

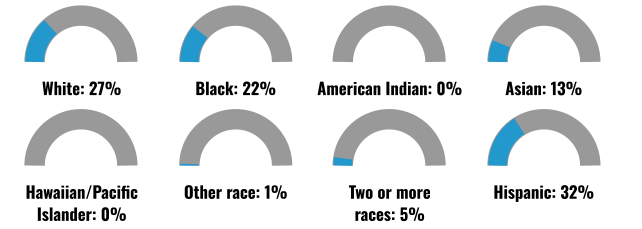
A3 Landscape




## COMMUNITY INFORMATION




## BREAKDOWN BY RACE




## BREAKDOWN BY AGE

### LANGUAGES SPOKEN AT HOME

| LANGUAGE | PERCENT |
|---|---|
| English | 61% |
| Spanish | 19% |
| Other Indo-European | 3% |
| Korean | 1% |

| | |
|---|---|
| Chinese (including Mandarin, Cantonese) | 2% |
| Vietnamese | 1% |
| Tagalog (including Filipino) | 1% |
| Other Asian and Pacific Island | 1% |
| Arabic | 2% |
| Other and Unspecified | 8% |
| Total Non-English | 39% |

| | |
|---|---|
| From Ages 1 to 4 | 5% |
| From Ages 1 to 18 | 25% |
| From Ages 18 and up | 75% |
| From Ages 65 and up | 11% |

## LIMITED ENGLISH SPEAKING BREAKDOWN

| | |
|---|---|
| Speak Spanish | 77% |
| Speak Other Indo-European Languages | 4% |
| Speak Asian-Pacific Island Languages | 12% |
| Speak Other Languages | 6% |

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

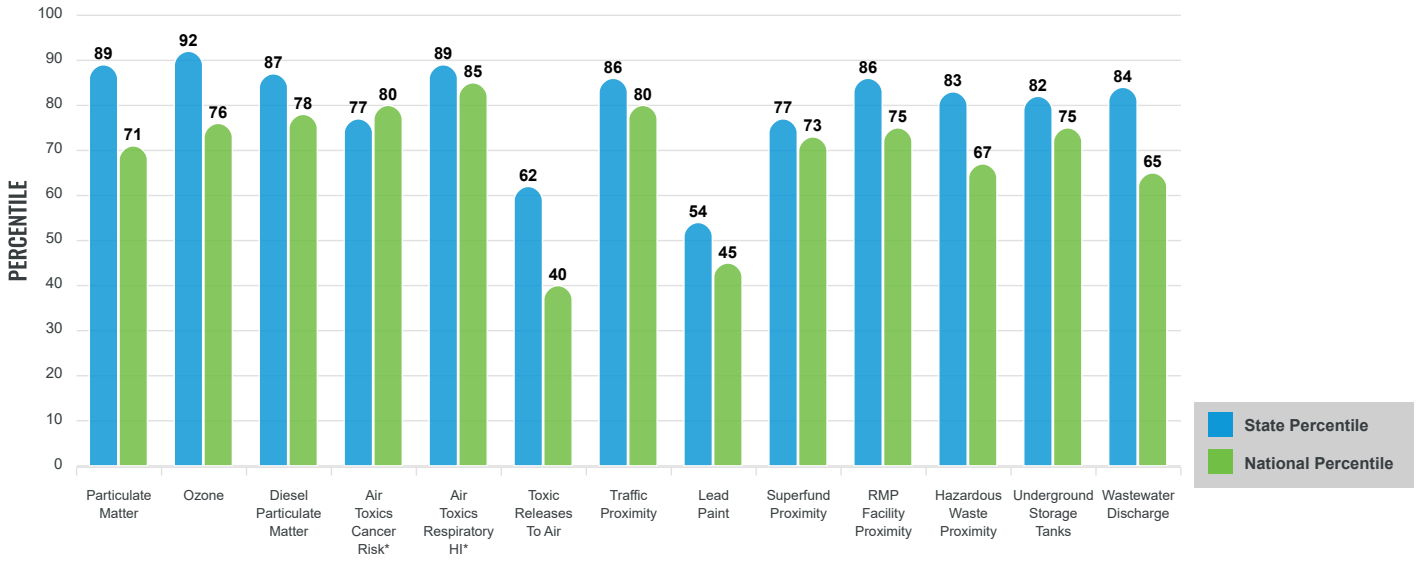
# Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

## EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

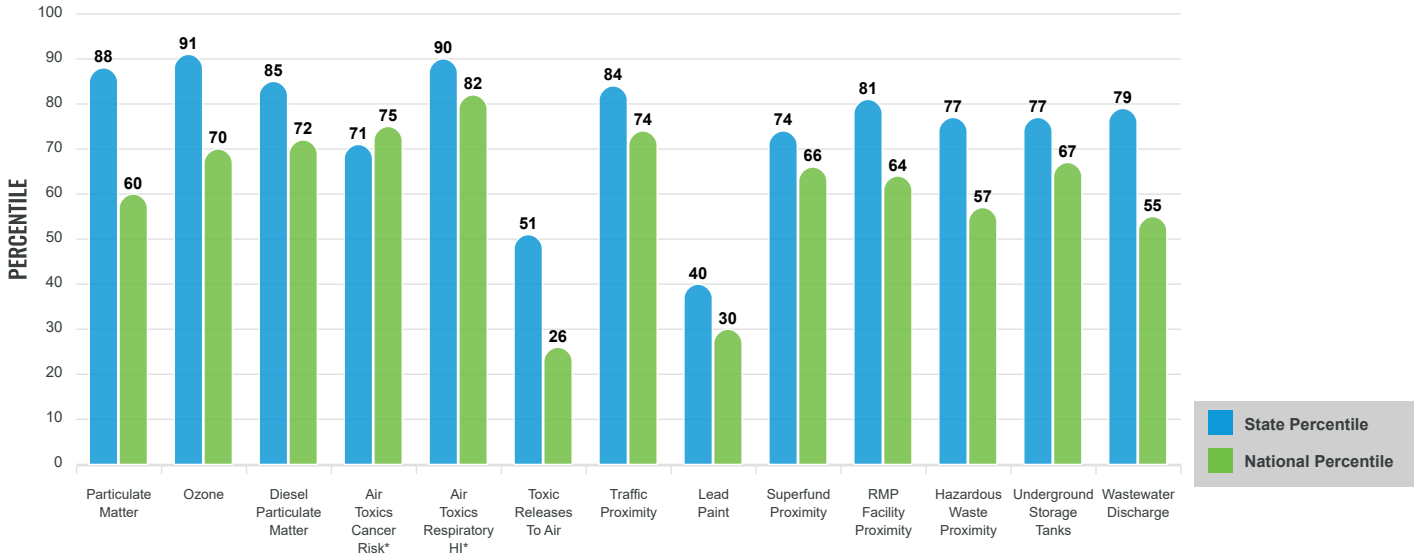
### EJ INDEXES FOR THE SELECTED LOCATION




## SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

## SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION




These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Blockgroup: 510594221021,510594220002,510594219003,510594161001,510594217011

# EJScreen Environmental and Socioeconomic Indicators Data

| SELECTED VARIABLES | VALUE | STATE AVERAGE | PERCENTILE IN STATE | USA AVERAGE | PERCENTILE IN USA |
|---|---|---|---|---|---|
| **POLLUTION AND SOURCES** | | | | | |
| Particulate Matter ($\mu g/m^3$) | 8.18 | 7.53 | 78 | 8.08 | 49 |
| Ozone (ppb) | 62.3 | 59.1 | 87 | 61.6 | 58 |
| Diesel Particulate Matter ($\mu g/m^3$) | 0.298 | 0.209 | 79 | 0.261 | 68 |
| Air Toxics Cancer Risk* (lifetime risk per million) | 30 | 29 | 26 | 25 | 52 |
| Air Toxics Respiratory HI* | 0.4 | 0.33 | 62 | 0.31 | 70 |
| Toxic Releases to Air | 58 | 4,300 | 35 | 4,600 | 19 |
| Traffic Proximity (daily traffic count/distance to road) | 200 | 150 | 79 | 210 | 74 |
| Lead Paint (% Pre-1960 Housing) | 0.086 | 0.22 | 41 | 0.3 | 33 |
| Superfund Proximity (site count/km distance) | 0.07 | 0.11 | 55 | 0.13 | 55 |
| RMP Facility Proximity (facility count/km distance) | 0.37 | 0.21 | 86 | 0.43 | 71 |
| Hazardous Waste Proximity (facility count/km distance) | 0.57 | 0.61 | 73 | 1.9 | 51 |
| Underground Storage Tanks (count/$km^2$) | 2.4 | 1.9 | 70 | 3.9 | 62 |
| Wastewater Discharge (toxicity-weighted concentration/m distance) | 0.0017 | 7.2 | 77 | 22 | 53 |
| **SOCIOECONOMIC INDICATORS** | | | | | |
| Demographic Index | 47% | 31% | 80 | 35% | 71 |
| Supplemental Demographic Index | 14% | 12% | 67 | 14% | 58 |
| People of Color | 73% | 38% | 87 | 39% | 79 |
| Low Income | 21% | 25% | 50 | 31% | 39 |
| Unemployment Rate | 7% | 5% | 78 | 6% | 72 |
| Limited English Speaking Households | 12% | 2% | 94 | 5% | 87 |
| Less Than High School Education | 12% | 10% | 70 | 12% | 65 |
| Under Age 5 | 5% | 6% | 53 | 6% | 53 |
| Over Age 64 | 11% | 17% | 32 | 17% | 30 |
| Low Life Expectancy | 8% | 20% | 0 | 20% | 0 |

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

### Sites reporting to EPA within defined area:

Superfund ..... 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities ..... 0

### Other community features within defined area:

Schools ..... 1
Hospitals ..... 0

| | |
|---|---|
| Water Dischargers | 15 |
| Air Pollution | 19 |
| Brownfields | 0 |
| Toxic Release Inventory | 7 |
| Places of Worship | 8 |

## Other environmental data:

| | |
|---|---|
| Air Non-attainment | Yes |
| Impaired Waters | Yes |

| | |
|---|---|
| Selected location contains American Indian Reservation Lands* | No |
| Selected location contains a "Justice40 (CEJST)" disadvantaged community | Yes |
| Selected location contains an EPA IRA disadvantaged community | Yes |

*Report for Blockgroup: 510594221021,510594220002,510594219003,510594161001,510594217011*

# EJScreen Environmental and Socioeconomic Indicators Data

## HEALTH INDICATORS

| INDICATOR | VALUE | STATE AVERAGE | STATE PERCENTILE | US AVERAGE | US PERCENTILE |
|---|---|---|---|---|---|
| Low Life Expectancy | 8% | 20% | 0 | 20% | 0 |
| Heart Disease | 4.9 | 5.5 | 39 | 6.1 | 24 |
| Asthma | 9 | 9.6 | 28 | 10 | 22 |
| Cancer | 5.9 | 6.1 | 42 | 6.1 | 41 |
| Persons with Disabilities | 10.6% | 12.6% | 43 | 13.4% | 36 |

## CLIMATE INDICATORS

| INDICATOR | VALUE | STATE AVERAGE | STATE PERCENTILE | US AVERAGE | US PERCENTILE |
|---|---|---|---|---|---|
| Flood Risk | 6% | 9% | 55 | 12% | 47 |
| Wildfire Risk | 0% | 2% | 0 | 14% | 0 |

## CRITICAL SERVICE GAPS

| INDICATOR | VALUE | STATE AVERAGE | STATE PERCENTILE | US AVERAGE | US PERCENTILE |
|---|---|---|---|---|---|
| Broadband Internet | 2% | 13% | 23 | 14% | 17 |
| Lack of Health Insurance | 11% | 8% | 75 | 9% | 71 |
| Housing Burden | Yes | N/A | N/A | N/A | N/A |
| Transportation Access | Yes | N/A | N/A | N/A | N/A |
| Food Desert | No | N/A | N/A | N/A | N/A |

*Report for Blockgroup: 510594221021,510594220002,510594219003,510594161001,510594217011*

www.epa.gov/ejscreen