NEPA Environmental Assessment
Construct Skills Training Facility
Davison Army Airfield
Fort Belvoir, VA

Record Document
July 16, 2014

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U.S. ARMY GARRISON FORT BELVOIR

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ENVIRONMENTAL ASSESSMENT
CONSTRUCT SKILLS TRAINING FACILITY
DAVISON ARMY AIRFIELD, FORT BELVOIR, VIRGINIA

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EXECUTIVE SUMMARY

The following Environmental Assessment (EA) has been prepared by the U.S. Army in accordance with the National Environmental Policy Act (NEPA) to document potential impacts to the physical, biological, and human environments associated with the development of a new Skills Training Facility (STF) at Fort Belvoir, Virginia (Proposed Action). The proponent of the Proposed Action is the U.S. Army Garrison, Fort Belvoir. Fort Belvoir is located in Fairfax County, Virginia approximately 18 miles south of Washington D.C.

The Proposed Action will develop a new STF within the Davison Army Airfield (DAAF) area of Fort Belvoir, an area of the garrison that has been owned and operated by the U.S. Army since the 1940's. The DAAF area is bounded on the south by U.S. Route 1, to the east by the Fairfax County Parkway and to the north by Telegraph Road. The ten acre parcel proposed for the STF development is located just east of John J. Kingman Drive, along the northern entry to the DAAF (Farrar Gate). The proposed STF site is located between Santjer Drive and Accotink Creek along the east-southeast perimeter of the DAAF, access to the site will be provided from Santjer Drive, the main internal DAAF roadway.

The purpose of the proposed STF is to consolidate existing training activities that occur around the main garrison area of Fort Belvoir, replacing existing facilities that lack amenities and technology for training modern warfighter teams. No additional federal property acquisitions will be required to support the Proposed Action, all development will occur within existing Army property on the DAAF. The proposed STF will relocate approximately 190 student and instructor personnel from the main garrison area of Fort Belvoir to the DAAF area. Existing facilities on Fort Belvoir used for the STF missions are dilapidated and inadequate for current training needs and will be vacated upon completion of the new facility. Vacated facilities will eventually be redeveloped consistent with Fort Belvoir's Master Plan. Currently there are no plans to redevelop existing training facilities and any reuse or development of these facilities will be considered as a separate project independent of the Proposed Action.

The conceptualized STF buildings are configured in a two-story arrangement including 96,000 square feet of interior space, including classrooms; readiness storage; physical training areas; indoor firearms training; instructor offices; administrative space; fitness assessment areas; and mission oriented medical clinic facilities. The concept site plan includes parking for 180 vehicles; internal access road improvements; pedestrian walkways; landscaping; and outdoor personal fitness training spaces. No mechanized training or firearms use is associated with the proposed outdoor training spaces. Total planned building and pavement footprint encompasses 176,000 square feet, or approximately four acres of the ten acre project site. It is anticipated that only nine acres of the ten acre parcel will be directly impacted by the proposed facilities; overall clearing limits may extend up to 9.5 acres with the remaining acreage used to provide perimeter buffers and transition areas to the adjacent Forest and Wildlife Corridor and Accotink Creek floodplain.

This Environmental Assessment (EA) has been prepared and executed pursuant to the Council on Environmental Quality (CEQ) regulations; Title 40, Code of Federal Regulations (CFR)

Section 1500-1508 regarding procedural implementation of the National Environmental Policy Act (NEPA) of 1969; and more specifically Title 32 CFR 651, Environmental Analysis of Army Actions and Army implementing regulation AR 200-2, Environmental Effects of Army Actions. Assessing the Proposed Action in accordance with these standards, it is expected that the proposed development can be accomplished without creating significant environmental impacts as defined in NEPA.

The U.S. Army followed appropriate public coordination and outreach principles associated with these governing regulations and all appropriate impact analysis requirements relative to development of the Proposed Action have been addressed. Public coordination and outreach on this initiative includes posting a digital copy of this document to Fort Belvoir's internet portal; announcing public availability of this document in the local newspapers of general circulation; posting printed copies of this analysis in local libraries for public review for a period not less than 30 days and direct coordination with area community leaders and regulatory officials.

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1.0 Introduction

The Army is planning to construct a new Skills Training Facility (STF) to support the needs of the Operational Security Evaluation Group at Fort Belvoir, Virginia. Fort Belvoir is a primary military logistics support center for the Mid-Atlantic region, housing over 140 tenant organizations and approximately 43,000 personnel. The Proposed Action will relocate approximately 190 personnel from the central area of Fort Belvoir to the Davison Army Airfield (DAAF) area of the installation. No additional land acquisitions or additional personnel assignments are planned as part of the STF development.

Proposed facilities include:

- Adjoining administrative/classroom and physical training facilities, encompassing approximately 96,000 square feet in a two story configuration
- New access drive, roadways, walkways and parking for 180 vehicles.
- Incidental utilities, landscaping, site security and stormwater management features.

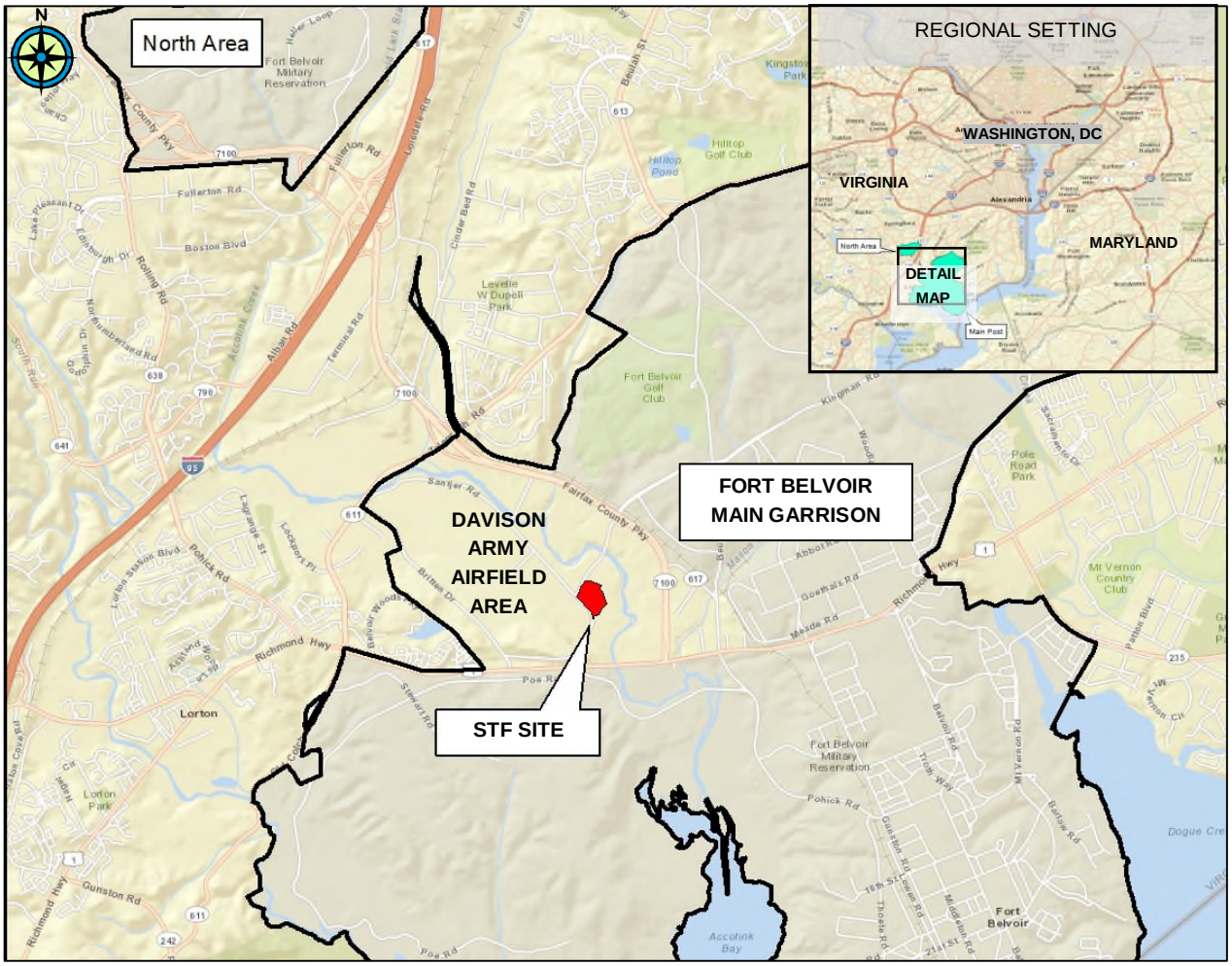

Figure 1-1: Vicinity Map, Proposed Skills Training Facility (STF); DAAF, Fort Belvoir
(Base image: 2013 Google Earth and OpenStreetMap.org© contributors)

2.0 Proposed Action Purpose and Need

The Proposed Action will develop a ten acre tract of existing woodland on the northeast perimeter of the DAAF for new administration and operations space for the Operational Security Evaluation Group. As currently planned, the development will include construction of a two-story 65,000 square foot classroom and administration building, a separate 29,000 square foot fitness training building (approximately 96,000 square feet total building footprint) along with associated parking and access roadways for a developed footprint of approximately 9 acres.

Regional access to the STF site will be via the Fairfax County Parkway and John J. Kingman Drive, entering the DAAF area via the Farrar Gate. The STF entrance will be configured with a secure automated entry gate on Santjer Drive. All access to the site will be from within the existing controlled perimeter of the DAAF.

Construction of the proposed STF development is planned to begin in Fiscal Year 2015 (FY15) subject to availability of appropriated funds and completion of design development. The proposed facilities will be designed in compliance with Army standards and in accordance with Leadership in Energy and Environmental Design (LEED®) - New Construction, Silver rating criteria. Buildings will be designed for optimal lifecycle energy efficiency, including evaluation of the potential for generating 30% of the hot water demand through the use of solar technology and use of net-zero energy systems based on most effective life-cycle cost analysis. Low Impact Development (LID) practices will also be incorporated in site planning to minimize stormwater runoff impacts consistent with EISA Section 438, the Virginia Stormwater Management Program (VSMP), and the Fort Belvoir MS-4 program.

Existing buildings housing the Operational Security Evaluation Group on the main post area of Fort Belvoir will be vacated upon completion of the new STF and will be returned to the Fort Belvoir DPW for reuse or redevelopment in accordance with the Fort Belvoir Master Plan.

Figure 2-1: Concept Site Rendering, Proposed STF; DAAF, Fort Belvoir
(Reference: 2012 Concept Planning Documents, Fort Belvoir, Directorate of Public Works)

The primary purpose of the proposed STF is to provide a secure, integrated skills development, training and evaluation complex for up to 190 personnel that currently work at four separate locations around Fort Belvoir. The primary need for the Proposed Action is to consolidate existing training facilities to improve mission effectiveness and replace antiquated facilities that no longer meet mission requirements.

The proposed STF is required as ongoing training requirements are adversely impacted by inadequate facilities that are geographically dispersed around Fort Belvoir. Existing facilities do not provide sufficient secure indoor and outdoor space for team training and operations; appropriate separation of spaces for student and instructor personnel; necessary division of training and operational spaces for training mission focus; and appropriate facilities for the increasing number of female recruits in the Army training programs.

The preferred STF site and proposed facilities at the DAAF will enable development of additional spaces needed for secure equipment storage; collocated classroom instruction; integrated instructor office and administration space; clinic and laboratory space for equipment calibration, testing and repair; fitness training and assessment spaces; indoor combat training and small arms training; and on-site medical examination and rehabilitation services. Outdoor spaces will be used for personal physical fitness regimens and will not include mechanized training or outdoor firearms use.

3.0 Alternatives Considered

In formulating the Proposed Action and conducting this EA, the following alternatives were considered:

- Constructing new STF facilities at DAAF on Fort Belvoir (Preferred Alternative)
- Renovating and expanding the existing STF facilities at Building 1809 on Fort Belvoir.
- Constructing new STF facilities near the Humphrey's Engineering Center on Fort Belvoir
- Constructing new STF facilities at the Belvoir North Area on Fort Belvoir
- Constructing new STF facilities at Training Area T8 on Fort Belvoir
- Continued use of existing STF facilities at Fort Belvoir (No Action Alternative)

In order for an alternative to be considered viable in comparison to the Proposed Action, it must meet the following screening criteria:

- Provide consolidated operations and training space for up to 190 personnel.
- Provide appropriate secure setting and isolation from adjacent development.
- Meet current facility Antiterrorism / Force Protection (ATFP) requirements.
- Be compatible with the Fort Belvoir Real Property Master Plan.
- Avoid impacts to known environmental constraints
- Provide a cost-effective design solution with minimal additional infrastructure required
- Be constructible within a defined 2-3 year timeframe between 2014-2017

Recognizing these needs the Army began an assessment of siting alternatives in 2012 to define facilities and areas that could potentially meet STF needs at Fort Belvoir. Key siting criteria included availability of a contiguous ten to twenty acre tract within Fort Belvoir that met force protection and security criteria and that would be compatible with the existing Fort Belvoir Master Plan. Initially, five areas were identified as possible locations for the STF during this siting analysis (as shown in Figure 3-1):

- The DAAF Site
- The Building 1809 Area - (Existing Training Location)
- The Humphreys Engineering Center (HEC)
- The Fort Belvoir North Area (BNA); and
- Training Area T8

Preliminary screening of these sites for existing utility services; known environmental constraints; and mission suitability was initiated in 2012, with follow on assessment work completed in 2013. This led to selection of the DAAF site as the preferred location for the STF as described herein.

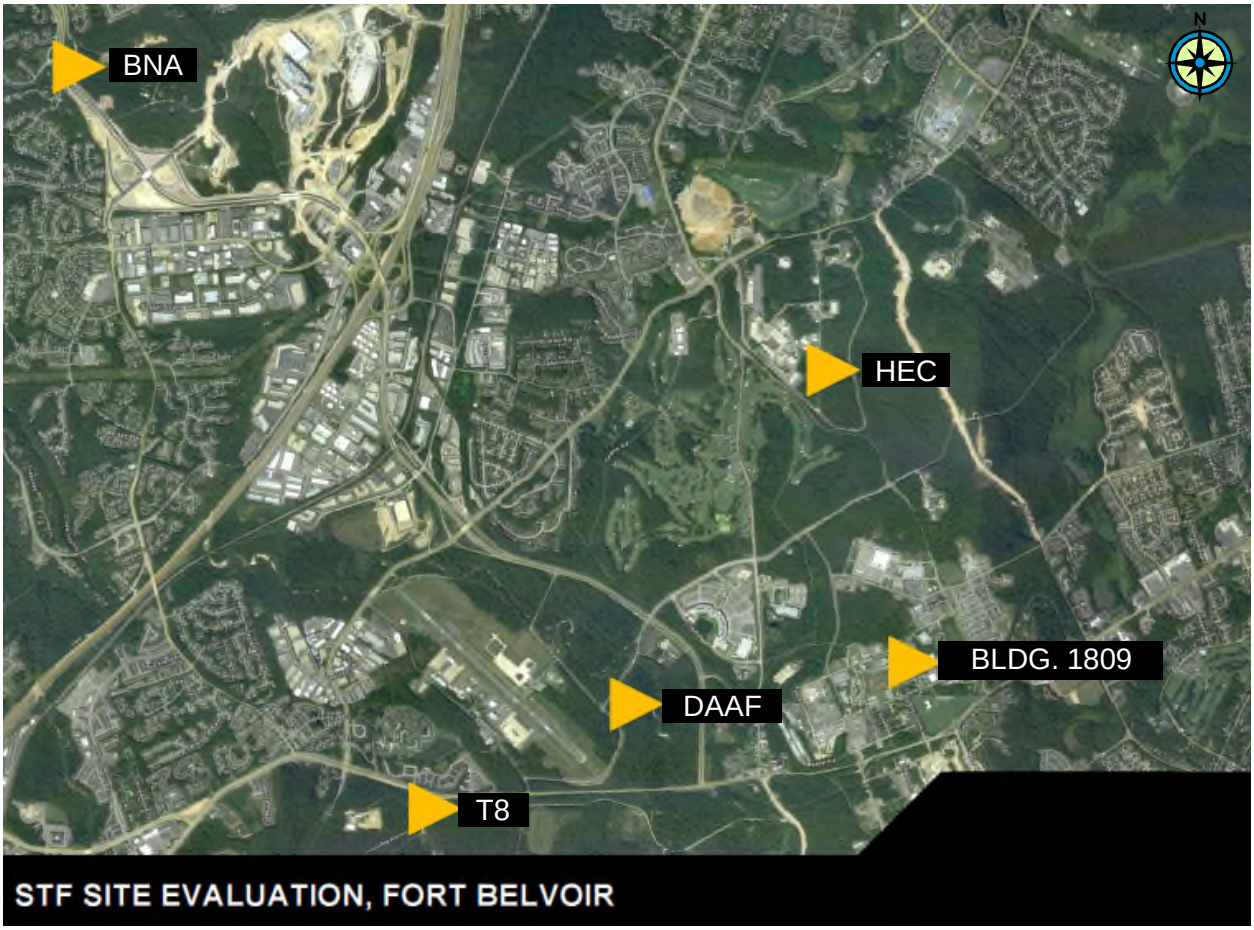

Figure 3-1: Alternative Siting Analysis Mapping, Proposed STF; DAAF, Fort Belvoir
(Base image: 2012 Concept Planning Documents, Fort Belvoir, Directorate of Public Works)

The DAAF site was determined to be most preferable due to STF mission suitability, lack of known site development constraints, consistency with the Fort Belvoir Master Plan and availability of existing infrastructure. Table 3-1 provides a comparison of expected site access and utility development needs generated during this preliminary siting analysis in 2012. This initial screening analysis documented that the DAAF site was most preferable from an existing infrastructure perspective.

Based on identification of the DAAF site as meeting all the preliminary screening criteria; including best infrastructure connectivity and lowest expected project cost, planners then conducted further detailed studies of the site to assess development feasibility as part of the NEPA Environmental Assessment process. This included a more detailed flood study of Accotink Creek and a geotechnical investigation to confirm suitability of the site for development as well as additional utility system assessments. This work was completed in early 2013 and confirmed that the site could be developed without impacting floodplain resources and site soils would be suitable for the proposed development.

During development of this EA a more detailed analysis of utilities at the DAAF site was conducted. This analysis provided in Appendix E confirmed that extension of up to 2,600 feet of four inch diameter gas main may be required on DAAF to support the proposed STF versus the

1,000 feet identified in the preliminary siting analysis. This more detailed utilities investigation also indicated that up to 1,300 feet of sanitary sewer pipe adjacent to the proposed STF may need to be replaced as part of the Proposed Action due to existing inflow and infiltration concerns within the DAAF sewer network. These elements have been factored into project planning and the scope of this EA. Even with these additional infrastructure requirements, the DAAF site location remains the Army's preferred alternative for development of the STF.

ESTIMATED SITEWORK REQUIREMENTS

	Bldg 1809		BNA		HEC		T8		DAAF	
Utility	Length (LF)		Length (LF)		Length (LF)		Length (LF)		Length (LF	
Water	500		3,000		5,000		1,360		250	
Sewer	520		2,800		5,000		730		250	
Natural Gas	1,520		2,500		5,000		1,450		1000	
Electric	1,635		2,500		6,000		1,450		350	
Telecom Data	2,000		6,000		7,000		6,000		350	
Road	0		1,816		572		950		0	

Table 3-1: Alternative Site Infrastructure Requirements Identified in 2012 Preliminary Siting Report, STF Fort Belvoir. *(Reference: 2012 Concept Planning Documents, Fort Belvoir, Directorate of Public Works)*

The NEPA environmental analysis was therefore scoped to define potential impacts of STF development on the DAAF site compared to the No Action Alternative. Further details on the Proposed Action and initial site screening of alternatives are provided in the following narratives.

3.1 Proposed Action - Preferred STF Site Background and Setting (STF at DAAF)

The proposed STF development will consolidate existing operations and training regimens occurring at Fort Belvoir into new purpose built facilities, improving the efficiency of training and providing a cellular environment conducive to team building and military skills development. Current skills training facilities supporting the STF mission are distributed around Fort Belvoir have been adapted for current uses and no longer meet training mission requirements. .

The proposed facilities will address these shortfalls by providing an integrated team training environment for up to 190 personnel in modern purpose built facilities as depicted in Figure 3-2. Proposed STF facilities include construction of a two-story, 65,000 square foot classroom and administration building and a separate 29,000 square foot fitness training building on the ten acre DAAF site.

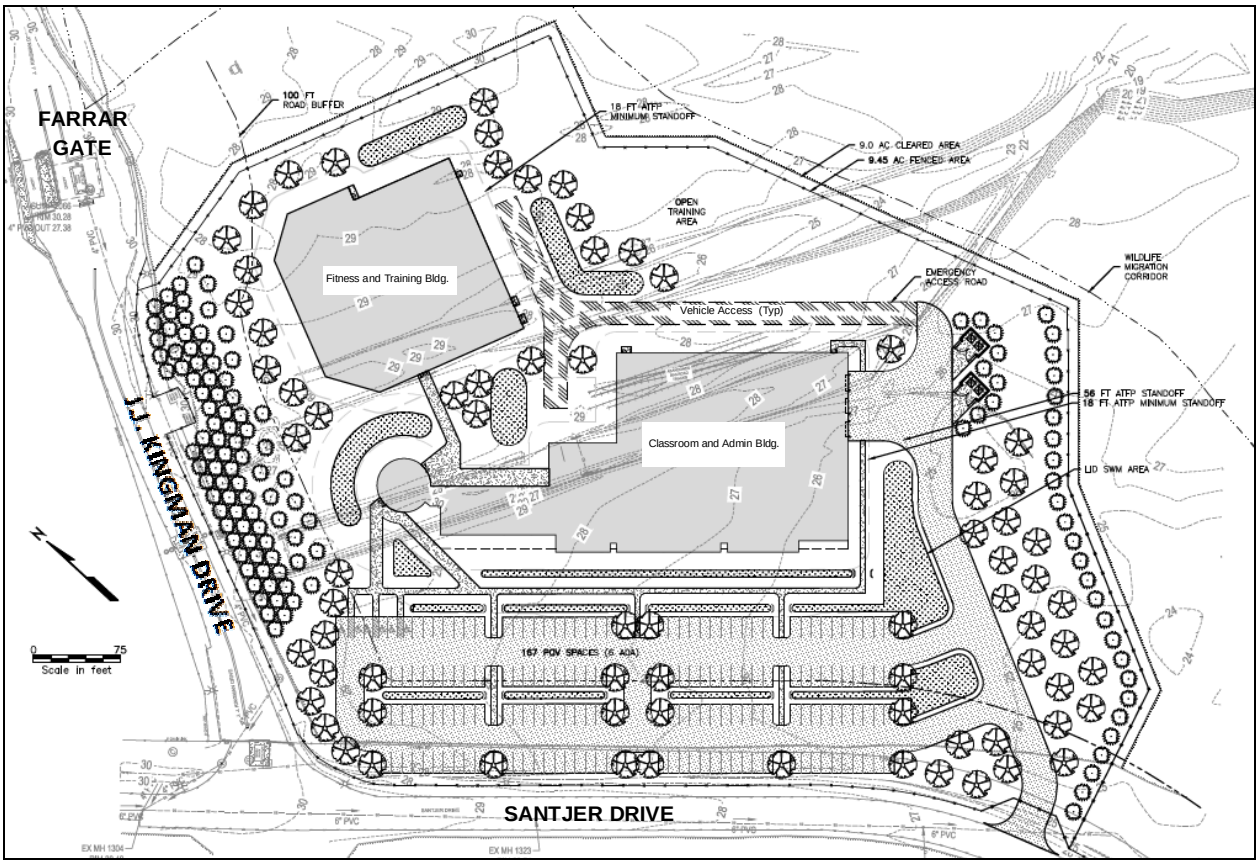

Figure 3-2: Concept Site Plan, Proposed STF; DAAF, Fort Belvoir
(Base image: 2013 Concept Planning Documents, Fort Belvoir, Directorate of Public Works)

The proposed STF site at the DAAF is currently a wooded tract composed primarily of emergent pine species varying between 20-30 years old. Existing tree age is supported by review of record aerial photography which indicates the STF site was an open grass field from the 1950's through the 1980's. Similar review of archival mapping indicates the DAAF was originally developed between 1951 and 1954, indicating the DAAF has been in continuous military use for approximately 60 years.

Land elevations on the proposed STF site range between twenty-four to twenty-nine feet above sea level and are fairly uniform across the site. There are several dry drainage channels, former access roads and field training features evident on site; including a small isolated rail segment evidently created for military demolition training. None of these features connect to existing roadways, rail corridors or access points and not in use at this time.

Accotink Creek runs along northern boundary of the proposed STF site and serves as a natural buffer to the adjacent Army Reserve Center located approximately 1,600 feet northeast of the site (near the intersection of J.J. Kingman Drive and the Fairfax County Parkway). The proposed STF is bordered to the south by Santjer Drive, which is the secure perimeter road around the DAAF. The single runway at the DAAF is buffered from the proposed STF site by Santjer Drive and a 300-foot expanse of pines that have grown up between the runway and Santjer Drive, reference Figure 3-3.

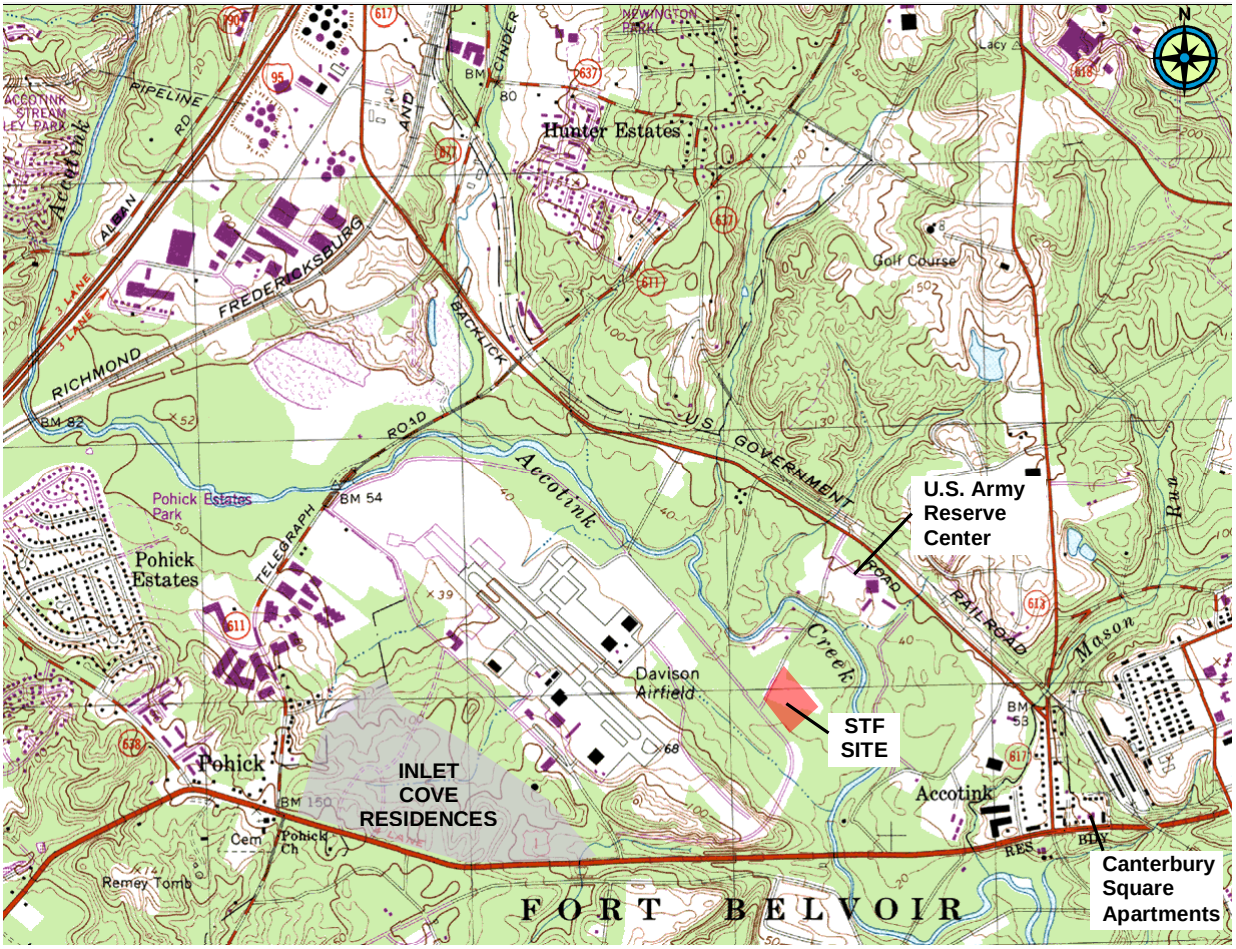

Figure 3-3: Regional Topographic Map, Proposed STF; DAAF; Fort Belvoir
(Base image: USGS Topographic Quadrangle Map (MapTech Terrain Navigator, 2012)

The off-garrison areas surrounding DAAF consists of mixed-use residential and commercial space typical of the northern Virginia region. The nearest residential area to the project site is the Canterbury Square Apartments located approximately 2,500 feet east of the site on the opposite side of the Fairfax County Parkway. The Inlet Cove community located approximately

1 mile southwest of the site along Route 1. Given the extent of existing buffers and proposed siting with the DAAF area, the proposed STF is not expected to impact any regional community resources or residential areas.

Development work will include extension of natural gas service to the site from the core area of DAAF following the existing road network (it is estimated that approximately 2,600 feet of 4-inch pipe will be required). Approximately 1,300 feet of existing sanitary sewer may also be replaced as part of the proposed development to address wet-weather flow concerns within the DAAF sewer network. Potable water and communications infrastructure services will be obtained from Santjer Drive frontage, with minimal service extensions in the STF site required. The conceptual route of these utility improvements is shown on Figure 3-4.

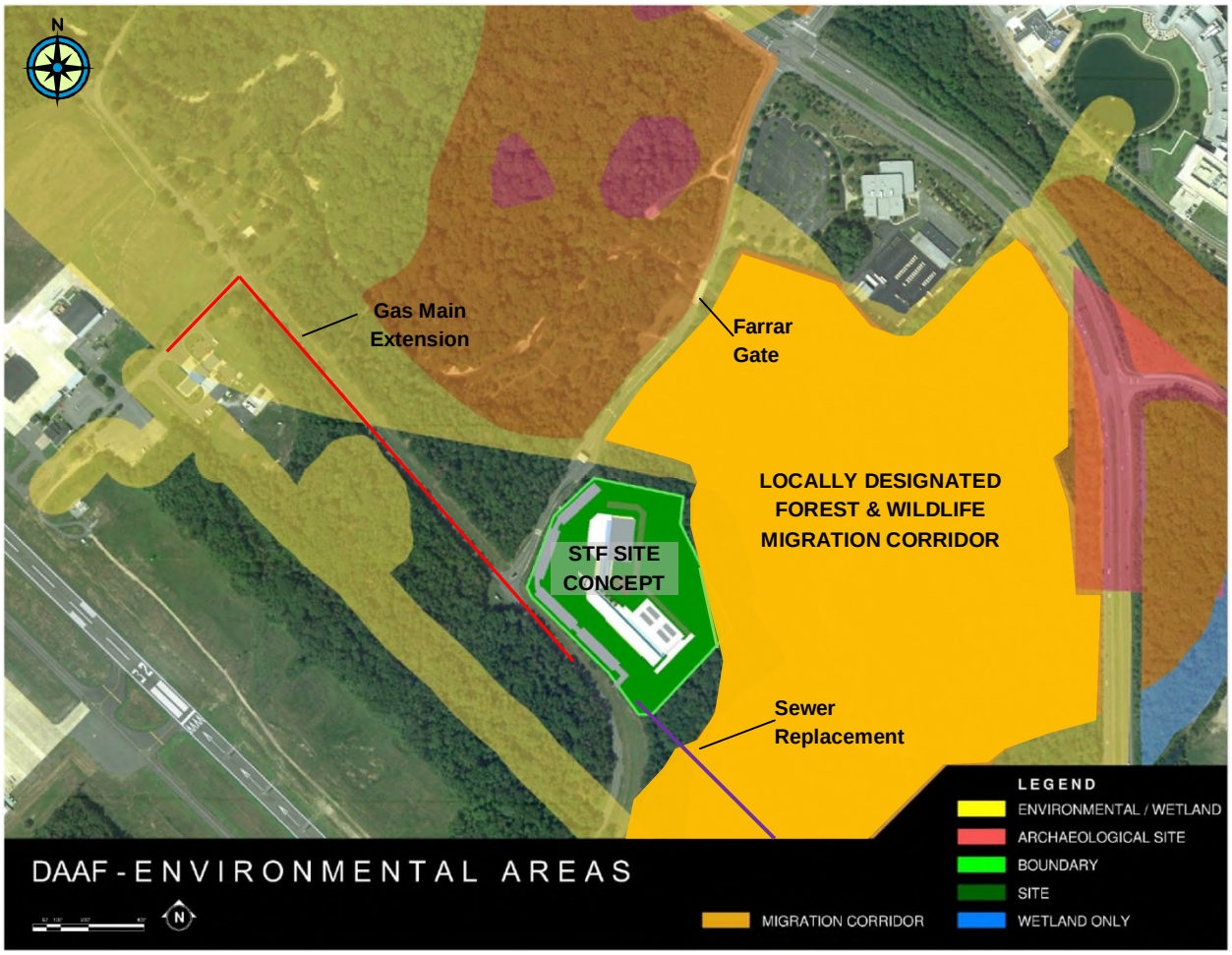

Figure 3-4: Known Environmental Constraints, Proposed STF; DAAF, Fort Belvoir
(Reference: 2012 Concept Planning Documents, Fort Belvoir, Directorate of Public Works)

3.2 Renovate and Expand the Current STF at Building 1809 (Option 1)

In planning the Proposed Action, the Army also considered redeveloping and expanding the current skills training site at Building 1809 on Fort Belvoir. Building 1809 is located along the 30th Engineer Road, between Franklin and Beauregard Roads within the core operational area of Fort Belvoir. This area is densely developed and expansion of the Building 1809 site for the proposed STF is constrained by existing facilities and other military operations. This limits capabilities for expansion and makes it impractical to provide suitable space required for the proposed STF mission.

Redevelopment and expansion of the Building 1809 site is also limited by two stream buffers located along the north side of the site as shown on Figure 3-5. These buffers would be adversely impacted during redevelopment and expansion of the Building 1809 site for the STF mission. Given these limitations, the Building 1809 site was not considered viable for further STF development analysis as it does not provide sufficient space for the existing program, would result in impacts to existing stream buffers and does not meet ATFP requirements of the training program.

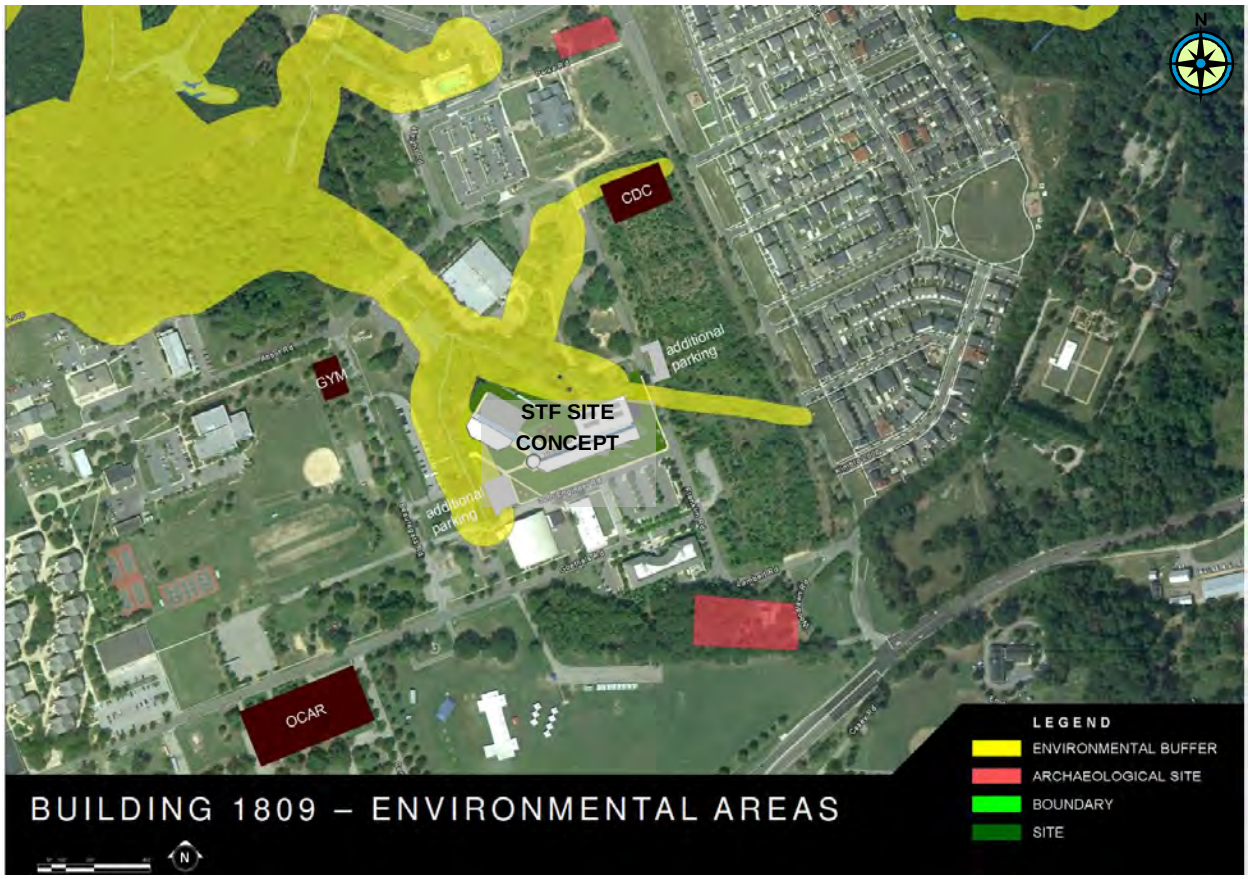

Figure 3-5: Known Environmental Constraints, Proposed STF; Building 1809 Site, Fort Belvoir
(Reference: 2012 Concept Planning Documents, Fort Belvoir, Directorate of Public Works)

3.3 Build a New Facility near Humphrey's Engineering Center - HEC (Option 2)

The third option considered for the Proposed Action was to build the STF adjacent to the Humphrey's Engineering Center (HEC) in an area just south of the Mulligan Road Bypass on Fort Belvoir. The HEC site is preferentially isolated from other garrison activities and meets ATFP requirements; however, the site is several thousand feet away from existing utility infrastructure and roadways. This would require extensive forest clearing and land impacts to provide a new access road and utility infrastructure to the site.

The proposed development area at the HEC would also require significant earthwork to level the site for the proposed buildings, significantly increasing the impact and cost of developing the STF on this site. There are also documented cultural resources within the concept STF footprint at the HEC site that further constrain development options as shown in Figure 3-6.

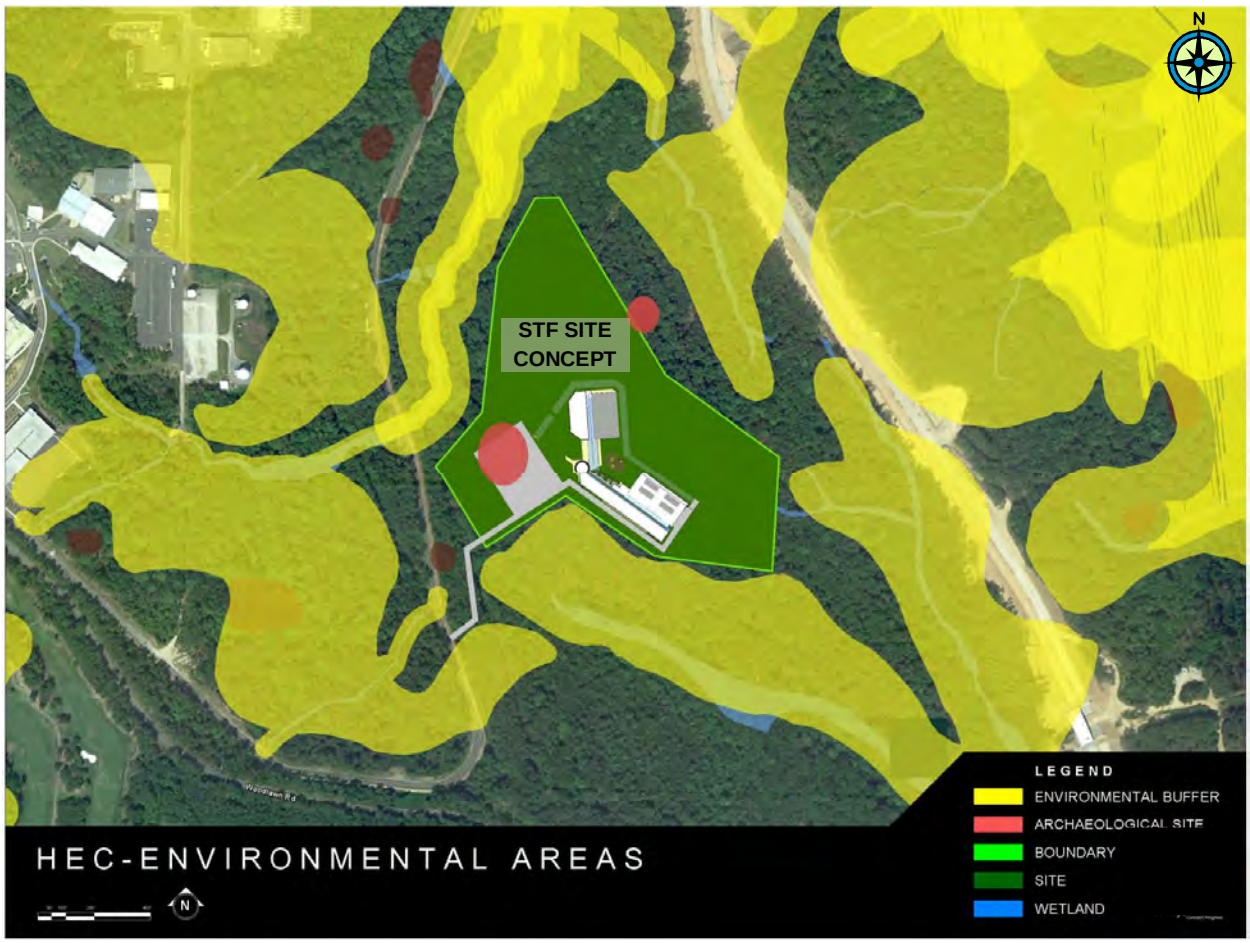

Figure 3-6: Known Environmental Constraints, Proposed STF; HEC Site, Fort Belvoir
(Reference: 2012 Concept Planning Documents, Fort Belvoir, Directorate of Public Works)

Preliminary estimates for development of the STF at the HEC were found to be cost prohibitive and development of this site could not be reasonably accomplished within the programmed execution schedule for the STF project, therefore the HEC site was excluded from further STF planning consideration and impact evaluation.

3.4 Build a New Facility in Fort Belvoir North Area - BNA (Option 3)

The third alternative considered during STF requirements planning was siting the facility within the former Engineering Proving Grounds area of Fort Belvoir, in an area referred to as the Fort Belvoir North Area (BNA). The BNA site is located north of the Fairfax County Parkway outside of the existing controlled perimeter of Fort Belvoir as shown in Figure 3-7.

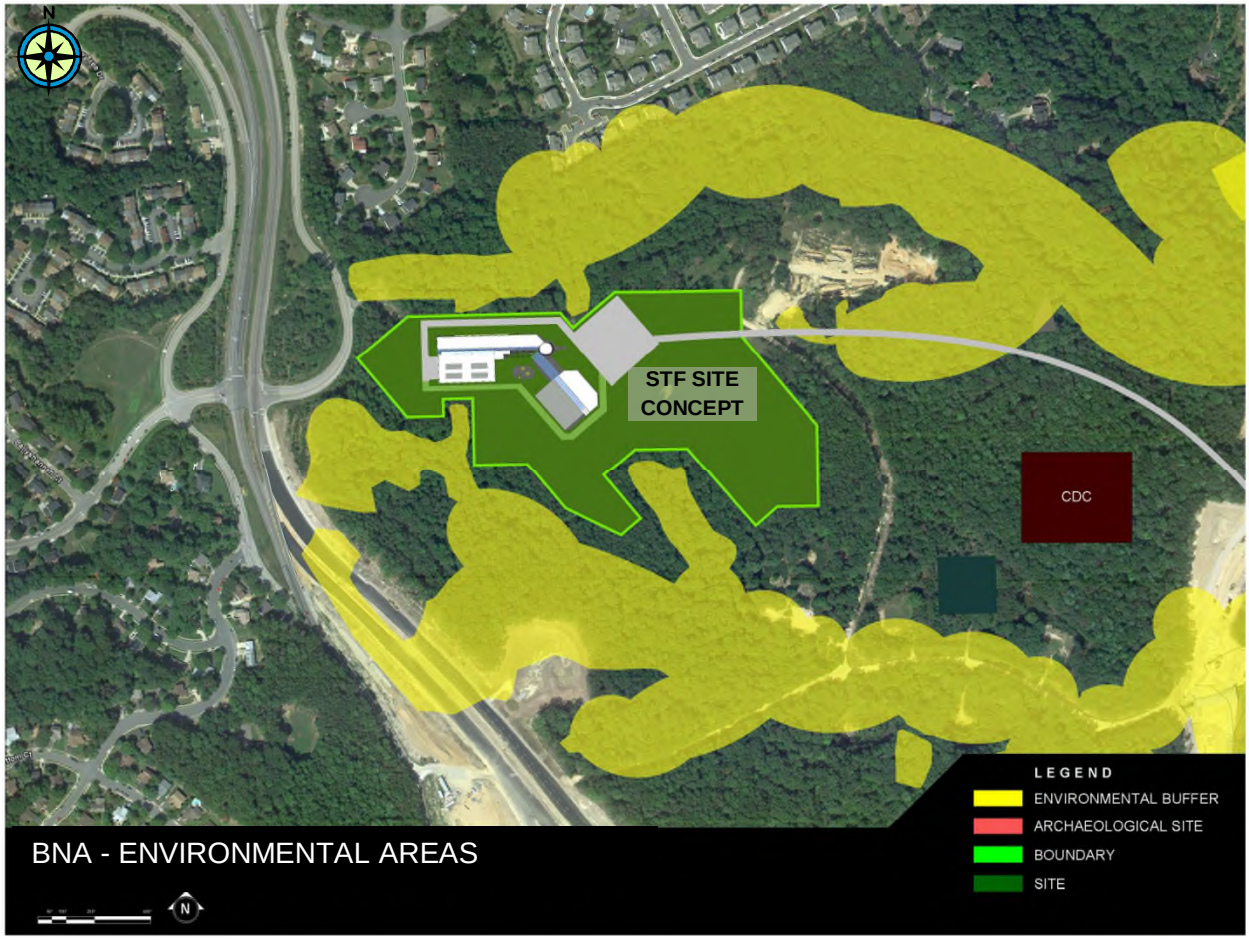

Figure 3-7: Known Environmental Constraints, Proposed STF; BNA Site, Fort Belvoir
(Reference: 2012 Concept Planning Documents, Fort Belvoir, Directorate of Public Works)

The BNA site provides sufficient area for the STF to be developed to meet ATFP requirements however; the site is not located within the controlled perimeter of Fort Belvoir. This will increase perimeter security development costs at this site and result in additional land clearing requirements. The BNA site can be served by existing utility infrastructure from the adjacent public road corridor however; direct road access to the site is not available. Development of the BNA site for the proposed STF would therefore need to include construction of several thousand feet of controlled access roadway out to Telegraph Road. Providing this access road and associated security features would require extensive forest clearing and result in additional land resource impacts. Based on these additional site development needs and potential resource and project cost impacts this site was dropped from further analysis and impact evaluation during the STF planning process.

3.5 Build a New Facility at Training Area T8 (Option 4)

The final site considered for the proposed STF during initial site planning was the former T-8 Army Training Area on Fort Belvoir. The T-8 area is located just south of U.S. Route 1, east of Telegraph Road on the main garrison area of Fort Belvoir as shown in Figure 3-8.

The proposed STF development site within the T-8 area is adequately served by regional utilities, has established connectivity to existing roadways and adequate land area for STF site security and development needs. Development of this site would require access road upgrades as the primary road serving this area is a limited use gravel road. Access improvements to the T-8 site would also need to include a new entry configuration and access gate at Poe Road, the main connector roadway adjacent to the T-8 site. These requirements increase the expected cost of developing the proposed STF on the T-8 site. The T8 area was also previously used as a live fire training area and as such must also be cleared of potential unexploded ordnance (UXO). This requires the site to undergo a formal range area decommissioning process which is time consuming and costly, limiting the viability of the T8 site for the targeted STF occupancy in 2017. The T8 site also has known cultural resource constraints that may limit site development potential as noted on Figure 3-8.

Figure 3-8: Known Environmental Constraints, Proposed STF; T8 Site, Fort Belvoir
(Reference: 2012 Concept Planning Documents, Fort Belvoir, Directorate of Public Works)

Given these potential impacts to required development schedule; expected cost of supporting road and security gate infrastructure; unknown range clearance challenges; and potential archeological site conflicts, the T8 site was eliminated from further STF planning consideration.

3.6 The No Action Alternative

The No Action Alternative represents the scenario in which the current training facilities used by the Operational Security Evaluation Group remain in their existing form. Under this alternative the Army would continue to operate the mission out of Building 1809 and associated satellite training locations around Fort Belvoir without renovation or redevelopment of the facilities.

This No Action Alternative does not meet the requirements for improved training and would not fulfill the purpose or need for the Proposed Action. It is explored herein as a baseline for comparison of alternatives and potential impacts and is not considered a viable option to the Proposed Action.

4.0 Affected Environment and Environmental Impact Analysis

The following resource narratives provide a more detailed description of the potentially affected environment associated with the Proposed Action and presents resource specific analysis and comparisons to the No Action Alternative. Potential resource issues at the preferred DAAF site have been quantified using resources referenced in Section 8 and further field investigations conducted at the DAAF site between January and October, 2013.

Field surveys used in this analysis included the forest stand delineation report (Appendix A); a site specific wetlands survey and delineation effort (Appendix B); a site traffic analysis (Appendix C); a threatened and endangered species survey (Appendix D); and a utilities study (Appendix E). These studies provide an accurate depiction of site resources and constraints, enabling a more thorough analysis of potential affects of the Proposed Action and provide a framework to plan the development to minimize potential impacts.

In describing potential resource affects, the terms minor, minimal and negligible are used interchangeably to describe potential impacts that can be appropriately addressed following routine procedures and established regulatory requirements and guidelines. These terms are not meant to trivialize the potential affect, but to categorize them as easily overcome using sound development planning and construction techniques; including standard land development sustainability practices in the region, (i.e. LEED® criteria).

4.1 General Site Setting and Physiographic Features

Fort Belvoir is situated in the Coastal Plain Physiographic Province, an area where soils are sedimentary in nature with pronounced stratification typical of alluvial deposits found around natural drainage features. Preliminary geotechnical assessment of the STF site indicates deep bedding soils consisting of unconsolidated layers of sand, gravel, silt, and clay. There is little topographic relief across the proposed STF site with the highest elevations approximately 30-feet above sea level; lower elevations occur near the southeast corner of the site dipping to approximately 25-feet above sea level.

The Natural Resource Conservation Service (NRCS) soil survey identifies two primary soil groups on the proposed site; a Gunston silt loam and a Woodstown sandy loam. The Gunston silt loam is a nearly-level, very deep, somewhat poorly drained soil. Gunston soils are not subject to ponding, nor are they considered flooded soil type or listed as hydric soils (hydric meaning indicative of wet or typical of wet areas). Gunston soils are classified as Hydrologic Soil Group D, indicating they are not very conducive to natural drainage, (i.e. they tend to absorb and hold water).

The second soil type noted on site is a Woodstown sandy loam. Woodstown loam soils are typically found on nearly-level to moderately-sloping sites and are considered very deep, moderately well drained soils. Woodstown soils are also not listed as being subject to ponding, considered a flooded soil type or listed as hydric soils. Woodstown soils are classified as Hydrologic Soil Group C indicating they less prone to absorb water are better suited to on-site infiltration practices.

The geotechnical and wetlands delineation reports prepared for the site are consistent with these general mapping classifications, with the preliminary geotechnical report noting hat infiltration rates would adequately support on-site stormwater infiltration practices, which will be favorable for the proposed STF development.

As the STF site is located near the FEMA 100-year flood boundary for Accotink Creek a detailed hydrologic analysis of the area was conducted to assess potential impacts of the proposed development. This study confirmed that the proposed STF development is located outside of the 100-year flood plain, but may be subject to inundation during larger storm events, (i.e. greater than the 100-year storm). Concept plans therefore include raising the base floor elevation three feet to provide appropriate flood protection during extreme storm events (over 100-year storms). This will include additional earthwork and grading to promote proper drainage away from the building foundations during site development. Potential impacts associated with earthwork will be minimized by appropriately designing fill containment areas and following approved erosion and sediment control and stormwater pollution prevention plans developed in conjunction with construction documents.

Siting the STF improvements outside of the 100-year flood boundary also enables the development to avoid the adjacent locally designated Forest and Wildlife Corridor that runs along Accotink Creek. This corridor has been preserved as part of Fort Belvoir's natural resource program and provides an important link between established natural areas of the garrison. There will be no encroachment into this area during development of the proposed STF facilities. In addition to maintaining physical separation from this Forest and Wildlife Corridor boundary, the proposed development will include edge plantings and screening of improvements to reduce light trespass, potential noise and aesthetic impacts related to future operations at the STF. This will be facilitated by the tree cover that will remain around the site perimeter as part of conservation planning.

Currently, the proposed STF site consists of a dense stand of emergent forest typical of fallow areas that are allowed to naturally progress to a forested state. The site consists of two predominant forest stand types; Loblolly-Shortleaf Pine and an Oak-Pine stands with predominant tree ages ranging from 30-60 years. The project timber inventory indicates the proposed STF development will result in removal of approximately 2,050 trees. Based on a 2:1 replacement ratio, this will require equivalent replacement for up to 4,100 trees following Fort Belvoir's current Tree Removal and Protection Policy. No "specimen trees" requiring individual tree specific conservation practices were observed on site. Nine specimen trees over 24-inches in diameter have been specifically located on site plans to facilitate integration with proposed development, however, due to the amount of earthwork proposed on the site it is unlikely these trees will remain viable after the development is complete. Site landscape planning will therefore incorporate replacement of these specimen trees as key elements within the STF site.

Redevelopment plans will also include appropriate edge planting around the perimeter of the site to promote site compatibility with the surrounding forest areas. Shade trees will be interspersed within the site to promote energy conservation; reduce heat-island effects of site development and promote nutrient uptake from the proposed on-site stormwater features.

Formal tree impact mitigation is expected to include a combination of on-site replacement, off-site replacement, and out-of-kind mitigation following Fort Belvoir's Tree Removal and Protection Policy. Assessing these needs, Fort Belvoir's natural resource managers have identified two potential stream restoration areas within the Accotink Creek watershed where the out-of-kind tree mitigation may be accomplished. These include restoration of a culvert on MR4, a tributary of Mason Run, and restoring a short length of stream above two recently constructed parking lots in Tompkins Basin. The full scope and planning of these mitigation efforts will be coordinated with Fort Belvoir staff during detailed design and construction sequencing of the project.

The No Action Alternative would result in continued use of the existing facilities that are currently geographically dispersed around Fort Belvoir and as there would be no construction activity, there would be no general physiographic affects of the No Action Alternative.

4.2 Air Quality Resources

Potential air emission sources associated with the proposed STF development include emissions during the construction phase (including those created from land disturbance, construction equipment, vehicular travel to and from the site, those emitted from architectural coatings, etc.) and emissions created during operation of the proposed facilities (including emissions from facility heating and emergency power systems, and emissions from vehicular traffic). No other specific industrial emission sources are planned as part of the proposed STF development.

Construction phase air quality and noise impacts are expected to be temporary and minor in nature and will be below applicable General Conformity thresholds as outlined in Virginia's State Implementation Plan and supporting regulations. Construction activities will be managed to limit fugitive dust generation during land disturbing activities in accordance with 9 VAC5-40-90. No portable asphalt batch plants or other construction units required to have specific portable equipment permits from the Virginia DEQ are planned to be utilized during construction of the proposed STF. If portable units are utilized on site, they will be required to be appropriately permitted with the state prior to use and proposed usage will be specifically reviewed and authorized by Fort Belvoir personnel. Proof of appropriate operating permits or permit-exempt equipment documentation including copies of state agency usage location notification letters will be submitted to Fort Belvoir air quality staff prior to any portable batch equipment mobilizing to the project site.

Heating for the buildings will be provided by natural gas fired boilers, the aggregate size of these heating systems is not planned to exceed 3.0 million BTU/hour of heat input. Due to the planned size and fuel type, these heating systems will not require New Source Performance Review under state and federal air permitting programs.

Emergency diesel generators at the proposed STF will be sized to support critical building systems with the aggregate electrical output of these units not to exceed 1,125 kilowatts; the aggregated diesel horsepower powering these units shall not exceed 1,675 horsepower. Furthermore, no individual generators of 645 brake horsepower or larger will be installed at the

STF. Design and installation of on site standby generators will be appropriately permitted and coordinated with Fort Belvoir's DPW-ENRD Air Compliance Program. DPW-ENRD will work with the Virginia DEQ to ensure all appropriate air quality program permits and registrations are obtained. The stationary emission sources proposed as part of the STF development are Title V insignificant in accordance with 9 VAC5-80-720C and New Source Performance Review permit-exempt under 9 VAC5-80-1105; therefore pre-construction permits will not be required.

Stationary sources of air emissions included in the project (facility heating systems and emergency generators) will be added to Fort Belvoir's existing air emissions inventory for air quality management purposes and the design and construction of these sources will be closely coordinated with Fort Belvoir's air quality program manager to appropriately integrate with these on-going air quality compliance programs.

As the proposed STF development is within a non-attainment area for the 8-hour ozone and fine particulate matter ($PM_{2.5}$) air quality standards, the proposed development was analyzed to confirm that it will conform to state and federal air quality plans to attain compliance with these standards. This conformity determination is specifically required by 9 VAC5-160, General Conformity Regulations and 40 CFR Part 93, Subpart B and is provided in Appendix F. The purpose of these rules is to ensure federal actions do not cause or contribute to new violations of National Ambient Air Quality Standards (NAAQS), ensure actions do not cause additional or worsen existing violations of standards, and to ensure the Proposed Actions do not delay attainment of NAAQS. Evaluating the conformance of the proposed STF development according to these standards, the highest total annual direct and indirect emissions associated with the development have been calculated to be in the range of 17.1 tons of nitrous oxides (NO_x); 17.8 tons of volatile organic compounds (VOCs); 23.5 tons of very fine particulate matter ($PM_{2.5}$); and 2.4 tons of sulfur dioxide (SO_2) per year. All of these levels are below the applicability thresholds of 50 tons of VOCs; 100 tons of SO_2, $PM_{2.5}$, and NO_x set forth in the general conformity analysis standards. This indicates the proposed STF project will not cause or contribute to new violations of NAAQS; cause additional violations of these standards; worsen existing violations of these standards, or delay attainment of NAAQS within the region.

The No Action Alternative would have no additional impacts on existing air quality as operations would remain unchanged and no new facilities would be constructed. The No Action Alternative would not achieve the consolidation of training activities associated with the Proposed Action which inherently reduces internal vehicle trips around Fort Belvoir to the geographically dispersed training locations currently in use. The No Action Alternative also does not enhance the potential for carpooling and mass transit commuting; commuting options which are enhanced with the development of integrated facilities under the Proposed Action.

4.3 Transportation Resources

Analysis of traffic impacts associated with the proposed STF development at the DAAF site indicate the proposed development will not significantly impact regional transportation networks or existing regional traffic conditions. Levels of Service (LOS) on the adjacent roadways and intersections will not be appreciably affected based on projected traffic loadings in the year 2017

based on highway capacity analysis models conducted as part of STF site traffic planning. A full copy of this analysis is included as Appendix C of this document.

This DAAF site traffic analysis included collection of additional traffic counts between May 7-9, 2013 at the intersection of J.J. Kingman Drive and Santjer Road (adjacent to the proposed facility). These counts were correlated with the most recent VDOT traffic counts (November 2011) conducted at the intersection of J.J. Kingman Drive and the Fairfax County Parkway (FCPY). This data was then analyzed using Synchro 8® software following the 2010 Highway Capacity Manual (HCM) to determine Levels of Service (LOS) at the primary regional intersection and at the proposed entrance to the STF on Santjer Drive.

Even with inflating regional traffic counts by 2% annually and incorporating the anticipated STF traffic in the model, the 2017 LOS at the FCPY intersection remain at LOS C and D during the morning and evening peak traffic conditions. This demonstrates the minimal impact of STF vehicle movements compared to daily traffic counts of 29,000 vehicles circulating through the FCPY intersection on a daily basis. This modeling also confirmed that general traffic movements into the DAAF site through the Farrar Gate are not impeded due to the proposed STF development. One of the reasons traffic impacts associated with the STF development are minimal is that the regional traffic pattern primarily circulates in the opposite direction through the FCPY intersection. The study also confirmed that with appropriate entrance design into the STF site from Santjer Drive, service levels at the existing un-signalized intersection at J.J. Kingman Drive and Santjer Drive within the DAAF area will remain unchanged and no additional turn lanes into the facility along Santjer Drive are warranted at this time.

Although site specific traffic impacts are expected to be minimal, the proposed STF development will be subject to Fort Belvoir transportation management planning requirements and the STF site traffic planning will be reflected in the Fort Belvoir's Transportation Management Plan and Real Property Master Plan. These plans address mass transit and alternative transportation opportunities consistent with federal facility transportation planning in the national capital region. As the Proposed Action will not add additional personnel to the installation or increase the regional population by more than 500 persons, development of a formal site specific traffic management plan for the STF is not required at this time.

A key element of these transportation management plans is coordination of on-site parking allowances and mass transportation links to increase vehicle occupancy ratios, reduce regional traffic and improve air quality. This includes regional policies for employee parking ratios which recommend one parking space is provided for every 1.5 employees in central metropolitan areas and a 1:2 ratio for developments which are accessible by regional high-occupancy-vehicle (HOV) lanes.

Currently there are no HOV lanes that connect to the DAAF site, so the parking ratio used for the STF planning analysis is based upon the 1:1.5 ratio. This led to development of the current conceptual parking plan for the STF which includes spaces for 167 privately owned vehicles (POV), including six spaces for mobility impaired persons, (ADA spaces). The concept also includes parking for 13 directly assigned government owned vehicles including several small

trucks, yielding a total of 180 spaces. Of the 167 parking spaces assigned for POVs, 20 of these spaces are aligned for guest instructors and 80 for transitory students, yielding a total of 100 spaces for transitory or "visitor" personnel. This leaves 67 POV spaces available for the 87 directly assigned employees, a ratio of 1 space per every 1.3 employees. Given the large number of transitory student assignments and lack of direct mass-transit connectivity within the DAAF this is seen as a sound planning figure for further rationalization as site plans are developed. Assigning 10 additional spaces as visitor or HOV spaces to promote regional transportation objectives will enable the Proposed Action to achieve the targeted 1:1.5 parking ratio. The final configuration of parking and number of spaces for privately owned vehicles will be evaluated further during design of the facility and subsequent discussions with Fort Belvoir planning officials. STF facility managers will work with Fort Belvoir to integrate facility operations with the garrison's overall Transportation Management Plan minimizing on-site parking needs accordingly.

Generally, the proposed STF will enable slightly improved traffic management at Fort Belvoir as the 190 personnel will no longer pass through the main Fort Belvoir entry gates, reducing the traffic load on this more populated area of the installation. Consolidation of STF operations will also enhance the feasibility of workplace ride sharing due to centralization of training which will be a positive benefit of the proposed development.

Comparing transportation impacts of the Proposed Action to the No Action Alternative, leaving the mission location unchanged would not specifically impact or facilitate any ongoing transportation initiatives. The No Action Alternative would not facilitate ride-sharing initiatives or reduce traffic loads on the main garrison, two positive affects of the Proposed Action.

4.4 Coastal Resources

Development of the preferred STF alternative at the DAAF site is governed by the Coastal Zone Management Act (CZMA) of 1972. The CZMA requires all federal activities that affect land use, water use, or coastal resources within the coastal zone to be consistent with the policies stipulated by Virginia's Coastal Resource Management Program (CRMP) to the maximum extent practicable. Virginia's CRMP includes guidance for protecting designated wetlands; fisheries; subaqueous lands; dunes and beaches; coastal air pollution; point source water pollution; reducing non-point source water pollution; shoreline sanitation; and enhancing coastal land management.

These requirements are administered through a variety of state and local programs and project consistency reviews are coordinated through the Virginia Department of Environmental Quality (DEQ); the lead agency responsible for administering consistency reviews and issuing consistency determinations for federal projects at Fort Belvoir. Appendix F contains a Coastal Zone Consistency Determination for the proposed development for further coordination with DEQ during the public consultation process for this project. This determination confirms that development of the proposed STF at the DAAF site will be accomplished in accordance with Virginia's CRMP to the maximum extent practicable and the development and subsequent facility operations will be consistent with the CZMA requirements.

The proposed STF site development will not encroach upon any Chesapeake Bay Program Resource Protection Areas limiting potential for direct impacts to these coastal resources. Any project related utility work in these areas will be appropriately permitted through the VMRC process. On-site stormwater BMPs will appropriately minimize potential indirect impacts to these resources. Therefore, there are no anticipated impacts to Coastal Zone Resources associated with the Proposed Action.

Comparing the Proposed Action with the No Action Alternative, the No Action Alternative would also be consistent with Virginia's CRMP as no new facilities would be constructed under this alternative and existing training operations at Building 1809 are currently consistent with the CRMP and the CZMA. The No Action Alternative would not promote coastal sustainability objectives associated with energy conservation, low-impact development and sustainability, elements incorporated into the Proposed Action.

4.5 Compatible Land Resources

The proposed ten acre STF site on the DAAF is entirely within the limits of Fort Belvoir and is located in an area designated for military airfield land use according to current Fort Belvoir master planning documents. The Army is currently in the process of preparing an update of the Fort Belvoir Master Plan to manage garrison development through 2030 and the proposed STF development is consistent with this plan. The proposed STF site is designated for Army airfield development under both the 2007 land use plan and the draft update of the Real Property Master Plan (2030 Master Plan). Development of the proposed STF at the DAAF site has been reviewed and authorized by garrison master planning officials and has been deemed consistent with future Fort Belvoir development plans.

Fort Belvoir will also be coordinating the proposed STF development with the National Capital Planning Commission (NCPC) to confirm consistency with regional planning and zoning guidelines in the National Capital Region. The NCPC is responsible for coordinating community input and consistency of proposed federal development actions including guidance for general development consistency, energy efficiency, working environment, physical security, traffic management, transportation planning and architectural context.

The proposed STF is within an area designated as a Building Height Restriction Zone due to the proximity of the DAAF airfield. This zoning incorporates a 7:1 horizontal to vertical transitional slope area around the airfield to determine maximum allowable height of ground obstructions to avoid potential flight conflicts. As the proposed STF site is located 1,200 feet (horizontally) from the center of the DAAF runway, the height restriction over the site is calculated to be 150 feet above the runway centerline elevation (based on maximum height limits). Current FAA records list the DAAF runway elevation as 73.4 feet above mean sea level (AMSL); indicating structures up to 223 feet AMSL would be permissible. Current STF concept planning does not include any structures above two stories high (approximately 32 feet above proposed grade or 63 feet AMSL). Therefore, the proposed STF development is beneath all airfield height zoning restrictions and compatible with current area zoning.

The No Action Alternative would result in continued use of the existing facilities that are consistent with surrounding land uses. Existing facilities do not provide sufficient space for integrated team training and therefore detract from mission efficiency; this space limitation is one of the primary needs identified for the Proposed Action.

4.6 Recreational and Wildlife Management Area Resources

Development of the STF at DAAF will not impact any Formerly Classified Lands or Federal Highway Administration Section 4(f) resources including publicly owned parks, recreation areas, and wildlife or waterfowl refuges. There is a locally managed Forest and Wildlife Corridor along the northeast boundary of the proposed site. This designated wildlife corridor links the Jackson Miles Abbott Wildlife Refuge in the northeast quadrant of Fort Belvoir to the Accotink Bay Wildlife Refuge to the southwest of the proposed STF site. Neither of these refuges is managed by the U.S. Fish and Wildlife Service, but are owned and operated as part of Fort Belvoir's internal natural resource programs. The designated migration corridor is a vital link between these refuges and Fort Belvoir does not permit any development within this corridor. Accotink Creek, the associated Chesapeake Bay Resource Protection Area (RPA) buffers and 100-year floodplain are all also located within this wildlife corridor ensuring that proposed development actions will remain outside these jurisdictional areas.

The concept STF site plan has been developed to specifically avoid and minimize potential impacts to this Forest and Wildlife Corridor. This will include relevant construction planning and phasing to avoid potential species of concern and provision of transition buffer plantings along the site boundary to integrate the development into the natural setting. The Fort Belvoir Real Property Master Plan notes this corridor is a natural constraint on development and it therefore provides a logical boundary and buffer for the proposed STF development.

Site lighting will also be designed to minimize light trespass into the wildlife corridor and will include directional controls to minimize general nighttime light pollution. The STF is not expected to alter light emissions from the area or affect the regional night lighting profile and will conform to LEED® criteria designed to limit these potential impacts. There are no specific aesthetic mitigation measures required for the development of the proposed STF site.

The No Action Alternative also will not affect any Section 4(f) resources, designated wildlife conservation areas, recreational sites or associated land uses. There would be no change in lighting profiles or aesthetics associated with the No Action Alternative. The No Action Alternative would not reduce lighting profile or result in improved lighting efficiencies that will be inherent with development of the proposed STF which will follow LEED® standards.

4.7 National Farmland, Rangeland and Forest Resources

The Proposed Action will not impact any land resources designated as Important Farmland, Prime Rangeland or Forestlands as designated by the U.S. Department of Agriculture. Development of the STF will not result in any secondary or induced impacts to farmland, prime rangeland, or forestland resources.

The No Action Alternative will not impact any of these designated land resources.

4.8 Biological Resources

The Fort Belvoir area is known to host a variety of resident state, federal, and internationally protected, threatened, and endangered plant and animal species. These include three resident species, the *Haliaeetus leucocephalus (bald eagle; internationally protected);* the *Clemmys insculpta (wood turtle; state listed*); and the *Stygobromus Phreaticus* (*Northern Virginia Well Amphipod; state species of concern*). In addition to these resident fauna, the peregrine falcon (*Falco peregrinus; state threatened, internationally protected*) is also known to migrate through Fort Belvoir during its seasonal fall migration. The sole endangered plant species currently documented on Fort Belvoir is the *Isotria medeoloides* (*small whorled pogonia, federally listed plant species*). Although all of these species have been documented to occur in the Fort Belvoir area, none have been found on the proposed STF site at the DAAF as documented in Appendix D. Assessing potential off-site or in-direct impacts to these species of concern is therefore the primary consideration of this NEPA analysis.

Reviewing potential direct and indirect impacts to the bald eagle, eagle habitat on Fort Belvoir primarily occurs along the Dogue and Accotink Creek shorelines located over a mile from the proposed STF site. The nearest known active eagle nesting site is approximately 2.2 miles to the southeast of the proposed STF development area, (Watts and Byrd, 2013). Given this degree of separation from the proposed STF project and lack of direct bald eagle habitat connectivity, the proposed STF development at DAAF is not expected to directly or indirectly impact the bald eagle species. Peregrine falcons also known to frequent the area in and around the Accotink Creek / Accotink Bay transition area approximately 0.75 miles southeast of the proposed STF development site. Given this degree of separation and lack of direct falcon habitat connectivity, the proposed STF development at the DAAF is not expected to present any direct or indirect impact to these protected avian species.

The proposed STF development is in close proximity to Accotink Creek, known habitat for the *Clemmys insculpta (wood turtle)*. These turtles are listed as threatened in Virginia and have been mapped within the Accotink Creek watershed. This species is also known to traverse connected deciduous woodlands within 300 feet of resident waterways. Due to this proximity, development of the proposed STF site will incorporate conservation planning to protect this species and avoid and minimize impacts. This began with an initial turtle population assessment of the STF site in July of 2013 during the terrestrial season for the wood turtle. This survey documented that no protected wood turtles were present on site or in the immediate vicinity. In order to ensure wood turtles don't enter the development area, exclusionary fencing will be installed during the winter months to limit potential for specimens to migrate into the proposed construction area. In addition to this fencing, site development contractors will also be briefed on turtle identification needs and procedures for reporting any turtles found during preliminary clearing and earthwork. The final turtle conservation practice will be a sweep of the project area by trained conservation staff to capture and relocate any turtle species that may have found their way into the development area immediately prior to initiating land clearing activity. These measures will follow regional conservation guidance for these species and will

be coordinated with Fort Belvoir environmental management staff to appropriately avoid and minimize any impacts to this turtle species.

The final animal species of potential concern noted on Fort Belvoir is the Northern Virginia Well Amphipod. This endangered crustacean inhabits groundwater seeps in steeply sloping areas of Fort Belvoir but has not been found on or near the STF site. As the project area does not include steep slopes and there are no groundwater seeps within or adjacent to the project site there are no anticipated direct or indirect impacts to this species.

The only endangered plant species of potential concern at the STF site is the small whorled pogonia, a federally endangered plant species that is known to occur on Fort Belvoir. Site surveys completed in July of 2013 confirmed that there are none of these plants within the proposed STF development area and the existing habitat is not conducive for these species.

As a general measure to protect bird and animal species, site tree cutting and land clearing will be planned to occur outside the primary nesting season of April 1 - July 31 to avoid potential impacts to indigenous bird and animal species. If tree removal and clearing is required within this timeframe the site will be surveyed for nesting species and relocation efforts employed in cooperation with Fort Belvoir staff to avoid and minimize impacts to the maximum extent practical and avoid potential conflicts with the intent of the Migratory Bird Treaty Act.

Based on these evaluations, development of the STF at the DAAF will not have any direct or indirect impacts to protected, threatened or endangered species, their habitat, or other natural heritage resources.

Continued training at the existing facilities under the No Action Alternative is not anticipated to impact any protected, threatened, or endangered species of concern.

4.9 Floodplain Resources

The proposed STF development site is located in the Accotink Creek watershed which encompasses approximately 52 square miles. The northeastern boundary of the proposed STF site is approximately 400 feet southwest of Accotink Creek and approximately 1.5 miles upstream of the confluence with the Potomac River. The regional watershed is heavily developed and Accotink Creek experiences a significant amount of runoff from urban infrastructure and impervious areas. This context makes the area around the STF site subject to frequent inundation and flooding, typically during high-intensity thunderstorm events.

Evaluating this potential in more detail, area Flood Insurance Rate Maps (FIRMs) note the proposed STF site is within the 100-year floodplain (Zone A). Recognizing this concern, STF planners completed a more intensive floodplain study and topographic survey for the proposed STF development in 2012, mapping the flood plain limit as shown in blue on Figure 4-1.

This study confirmed that project area is actually above the 100-year base flood elevation (BFE) and this finding will be appropriately documented with FEMA in a formal request for flood plain map revision as part of project design development to reflect the more accurate site elevation and hydrologic setting. Considering the proximity of Accotink Creek and the associated floodplain, design of the proposed facilities will include provisions to address potential regional

flood events, including; locating building floors at least 18 inches above the 100-year elevation and 15 feet laterally away from the recently mapped 100-year flood inundation area.

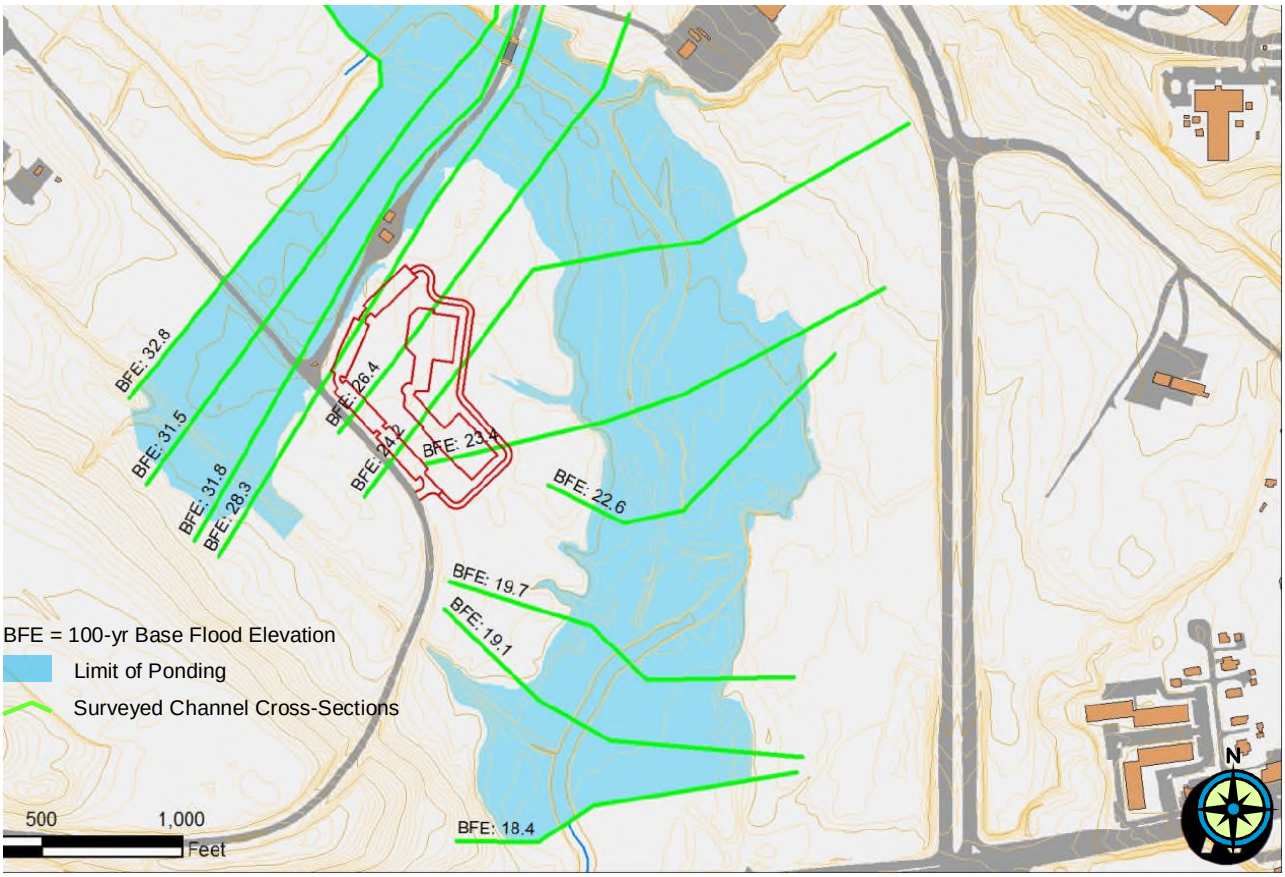

Figure 4-1: Flood Study Analysis Mapping, Proposed STF; DAAF, Fort Belvoir
(Reference: 2012 Accotink Creek Flood Study, Fort Belvoir, Directorate of Public Works)

Drainage from the existing STF site collects in several low areas which flow to the eastern boundary of the site and form an open drainage channel which leads to Accotink Creek. STF development plans will include low-impact development techniques to protect downstream channels and ensure stormwater discharges do not exceed existing channel capacities. This will include confirming adequate channel requirements in accordance with Virginia stormwater management program. Currently no additional off-site drainage improvements are planned due to the proposed development as existing channels appear adequate for the proposed development. If off-site improvements are required they will be appropriately coordinated, permitted and designed in accordance with applicable regulatory standards. Site landscaping and grading will divert stormwater away from the structures consistent with these floodplain planning requirements. All site drainage will be managed in accordance with the Virginia Stormwater Management Regulations, Chesapeake Bay Preservation Area regulations and EISA-Section 438 to replicate predevelopment hydrology and limit potential surface water impacts. Based on this information, the proposed STF development at the DAAF site is not expected to have any impacts on the 100-year floodplain or associated floodway resources.

The No Action Alternative also would not have any effect or impact on floodplain resources as existing facilities are located outside of the floodplain and no additional improvements are associated with the No Action Alternative.

4.10 Wetland Resources

Based on review of available site mapping and field surveys conducted in April 2013 the proposed STF development at the DAAF will not impact any Section 401 or 404 regulated wetland areas. No wetland areas, springs or seeps have been identified on site as documented in Appendix B.

Utility work may require crossing of Accotink Creek to connect site sanitary drainage to the regional sewer network. The extent of this work is dependent upon on-going regional sewer collection system evaluations underway at DAAF. If a utility creek crossing is required it will be appropriately permitted through the Virginia Marine Resources Commission, U.S. Army Corps of Engineers, and Virginia Department of Environmental Quality and conducted using trenchless techniques to minimize impacts. This may include a combination of directional drilling and jack and bore construction depending on the method of sewer renovation required. This construction can be conducted without impact to wetland areas but will be appropriately permitted through state and federal authorities. The requirement for this work will be defined further during design development as Fort Belvoir and American Water complete their independent evaluation of sewer system needs at the DAAF.

The proposed STF site geotechnical survey has documented that groundwater elevations vary across the site but are a minimum of 5-feet below the proposed finished grade indicating there will be no groundwater impacts anticipated due to the proposed development. The use of structured fill and on-site infiltration practices will enhance potential for localized groundwater recharge and will be a positive benefit of the proposed development.

The No Action Alternative would not have any impacts on wetlands as there are no land use impacts associated with maintaining current facility operations and training regimens.

4.11 Stormwater Management and Water Quality Resources

Development of the STF site at the DAAF is not expected to appreciably affect local or regional water quality. Redevelopment planning will include appropriate management of stormwater quality and quantity in accordance with federal, state, and local regulations, including Fort Belvoir's MS-4 permit program and EISA Section 438 requirements. Fort Belvoir's MS-4 program includes specific construction project stormwater management requirements including installation and maintenance of appropriate erosion and sediment controls to protect land quality and ensure adequate perimeter controls and buffers are used to protect off-site areas from sediment migration.

Potential localized watershed impacts at the DAAF site will be minimized by designing and permitting the STF following state and federal stormwater management and water quality protection requirements. This will include avoiding and protecting Chesapeake Bay

Preservation Areas (CBPAs) and associated Resource Protection Areas (RPAs) near the project.

Project design documents will be reviewed and approved by the Fort Belvoir MS-4 stormwater permit manager and routine inspections conducted throughout construction and operation of the STF to ensure compliance with these standards. These standards and associated guidelines address the full range of site planning and construction phase permitting; long term facility BMP operation and maintenance and regional planning coordination required at Fort Belvoir.

Under these criteria, any land disturbance in excess of 2,500 square feet requires a stormwater permit and coordination with the Chesapeake Program standards. Furthermore, EISA Section 438 requires projects disturbing over 5,000 square feet to incorporate site planning, design, construction, and maintenance strategies to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow. As the proposed STF development includes a building and pavement footprint of approximately 176,000 square feet, the proposed facilities will be designed to comply with these standards.

Stormwater management measures to be included in the STF development include bio-retention areas and bio-swales in parking lot islands, along the edges of the parking areas and along the north edge of the site. Permeable pavement is planned in sidewalks between STF buildings and within parking stall areas. Site earthwork design will include evaluation of the use of “structured soil” beneath the parking lot to promote further infiltration and enhanced root development of parking area plantings. Structured soil has the potential to enable use of larger tree species in parking lot islands, creating more canopy cover to intercept precipitation, improve infiltration of runoff and reduce localized heat island effect of the STF development; objectives consistent with water quality objectives at the STF site.

Regional water quality is a concern as the Accotink Creek is listed as an impaired waterway by the Virginia DEQ due to concerns about bacteria levels, impacts to benthic organisms and accumulations of polychlorinated biphenyls (PCBs) in fish tissue samples. These impairments are primarily related to existing urbanization within the watershed that has occurred prior to implementation of modern water quality practices and due to legacy use of chemical compounds within the watershed. The proposed STF will not appreciably affect these parameters and will be developed using on-site water management features to reduce runoff quantity, protect water quality and replicate and maintain existing hydrologic functions to the maximum extent practicable. The proposed STF site represents less than 0.03 percent of the total watershed area of Accotink Creek and therefore direct watershed impacts of the Proposed Action are expected be insignificant on a regional scale.

The No Action Alternative would result in continued use of the existing facilities currently managed in conformance with Fort Belvoir’s MS4 program. There would be no upgrades or improvements to existing stormwater infrastructure at Fort Belvoir under the No Action Alternative. The No Action Alternative would also not present a funding opportunity for the stream restoration projects associated with the Proposed Action.

4.12 Wild and Scenic River Resources

There are no federally listed wild and scenic rivers located with the area of potential effect of the Proposed Action as defined by Public Law 90-542; 16 U.S.C. 1271 et seq. Currently, no rivers in Virginia are federally designated as wild and scenic rivers. There are several state designated scenic rivers in Virginia; however, none are located in the vicinity of Fort Belvoir.

The nearest named river system to the project is the Potomac River which is approximately one mile southeast of the site. The named water bodies of Accotink Creek and Accotink Bay and Pohick Bay are located downstream of the project area, representing the tidal areas of Accotink Creek as it flows into the Potomac River. Redevelopment activity will be configured to avoid and minimize impacts to these water bodies following local, state, and federal guidelines including adherence to required preservation program setbacks and buffers.

The No Action Alternative will not impact any wild and scenic river resources.

4.13 Historical, Architectural, Archeological and Cultural Resources

Based on review of existing state and federal historic resource registers there are no documented historic, architectural, archeological, or cultural resources within the proposed STF site at DAAF or within the project's Area of Potential Effect (APE). Fort Belvoir staff will request Virginia State Historic Preservation Office (SHPO) concurrence with this finding during the regulatory review of this EA.

Although no eligible historic properties have been identified within the proposed STF development area, a small section of railroad track with a railcar wheel remnant was found within the STF site during site surveys. The Fort Belvoir Cultural Resources Manager (CRM) has evaluated this track segment and has determined that it is not eligible for listing on the National Register of Historic Places (NRHP). Additionally, this evaluation shows that the resource is not connected with the NRHP eligible Fort Belvoir Military Railroad and was instead associated with former training activity located at the STF site. Fort Belvoir is currently preparing documentation of its evaluation of the track segment and its determination that the resource is not eligible for the NRHP and will forward this documentation to the SHPO for concurrence, in accordance with Section 106 and 110 of the National Historic Preservation Act.

In the event that unanticipated cultural resources are encountered during site development, construction specifications will include the requirement that work will be stopped pending consultation with the Fort Belvoir CRM in accordance with the Fort Belvoir Integrated Cultural Resources Management Plan (ICRMP).

The No Action Alternative will not impact any known or documented historical, architectural, archeological or cultural resources.

4.14 Impacts on Hazardous Materials, Pollution Prevention and Solid Wastes

Development of the proposed STF facilities at the DAAF will generate land clearing and construction activity waste typical of site development and building construction activity. As this development will follow LEED® sustainability construction requirements, waste minimization and

recycling will be promoted throughout construction consistent with the Army Sustainable Design and Development Policy. The proposed STF facility will not increase the amount, or alter the types and quantities of materials and wastes currently used and produced by ongoing activities at Fort Belvoir.

Development of the STF at DAAF will not impact any existing hazardous material or hazardous waste treatment, storage, or disposal areas. Proposed construction activities are likely to include limited use of hazardous materials including miscellaneous adhesives, sealants, and coatings that may contain toxic or flammable constituents. Proper management of hazardous materials and petroleum products during construction and future operation of the STF will appropriately limit any potential environmental impacts associated with utilization of these materials in accordance with Fort Belvoir's existing hazardous material, hazardous waste and pollution prevention programs.

Training at the proposed STF will include an indoor firing range and armory which is expected to generate small quantities of lead and associated weapon cleaning residuals. The majority of these materials will be recycled in accordance with established Fort Belvoir waste minimization and recycling programs. Any incidental hazardous wastes generated will be managed through Fort Belvoir's existing hazardous waste management program. No new waste streams or industrial processes are associated with the proposed STF development.

There are no recorded Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or Resource Conservation and Recovery Act (RCRA) regulated sites located on or adjacent to the proposed STF development site. The proposed STF development site was previously utilized as a training area for base personnel and inert training ordnance has been previously found within the proposed development area. No live ammunition or unexploded ordnance (UXO) has been found on site or on the DAAF during general area wide surveys and investigations. The entire DAAF site is however located within a munitions response area which is currently under assessment in accordance with CERCLA following guidance of the Military Munitions Response Program. Due to this context, garrison officials have advised that appropriately credentialed on-call UXO safety personnel must be available during construction to appropriately address any suspect objects that are discovered during project excavation activity. This is a routine protocol for excavation work at the DAAF consistent with the CERCLA munitions assessment program at the airfield and does not indicate any particular concern about the proposed STF site.

The No Action Alternative will not result in any permanent change in solid waste generation volumes or character from the existing STF training activities. The No Action Alternative will not result in any change in hazardous material use, waste generation or require any further site investigative activity for potential UXO, CERCLA or RCRA sites. There are no documented hazardous material or waste sites directly associated with current training activities.

4.15 Energy Supply and Sustainable Design Impacts

The Proposed Action will not impact any known energy sources or supplies. Sustainable design practices will be utilized on all phases of the STF development to conserve resources and

minimize development demands on energy, promote water conservation, recycling and minimize waste production. Development of the STF will comply with current federal energy management and sustainability practices to promote building energy efficiency and long-term operational performance, including the Army's Sustainable Design and Development Policy. This policy sets forth requirements to achieve a LEED® Silver performance standard for construction of new facilities which will be a minimum standard for the project.

Development of the STF at the DAAF site will require clearing of up to nine and a half acres of trees, the majority of which are small pines between twenty and thirty years old. These trees currently have minimal timber value but will be harvested consistent with Fort Belvoir's timber management program. Non-saleable trees and residuals will be chipped on site and used for soil stabilization during construction as incorporated into site landscaping. This will reduce the amount of material that must be hauled off site and provide beneficial use of these resources consistent with LEED® program requirements.

The No Action Alternative would not alter current operations and will result in continued reliance on antiquated building systems that do not meet current energy codes for new construction. This would result in greater energy consumption over the long-term compared to the construction of the proposed STF. Neither alternative will require commitment of any irreversible or irretrievable natural resources or energy supplies.

4.16 Noise Impacts

Development of the proposed STF at the DAAF will not impact current or future operational noise levels. The proposed development will not alter current noise contours associated with the airfield. Temporary noise impacts due to construction activity would be limited to noise generated by construction equipment. These impacts will be minimized by using appropriately equipped and maintained construction equipment and limiting noise intensive work to normal working hours in accordance with standard construction practices at Fort Belvoir.

The No Action Alternative would not alter existing noise generating activities at Fort Belvoir.

4.17 Socioeconomic Impacts and Environmental Justice, Health and Safety Impacts

There are no socio-economic, environmental justice, environmental health or public safety concerns associated with the STF development or the No Action Alternative.

4.18 Environmental Permitting Requirements

Potential environmental permits, certifications and planning calculations that are expected to be required during development of the STF include:

- Virginia Stormwater Management Program (VSMP) Permits
- Virginia Pollutant Discharge Elimination System (VPDES) MS4 Stormwater Permits
- Project Stormwater Pollution Prevention Plan (SWPPP)
- Project Erosion and Sediment Control Plan

- Responsible Land Disturber (RLD) Certifications
- Energy Independence and Security Act (EISA) Calculations
- VMRC/DEQ/USACE permitting of wetland, water body and stream utility crossings

Additional regulatory coordination that will be required includes filing for map revisions of the confirmed 100-year base flood elevation around the DAAF site based on the updated floodplain mapping prepared for the site and registering the new stationary air emissions sources (heating system and generator) under Fort Belvoir's air quality compliance programs.

No other specific planning, construction, mission oriented, or operational permits are anticipated to be required due to the Proposed Action. If unanticipated permit needs are identified during redevelopment planning, they will be appropriately coordinated with Fort Belvoir staff and regulatory personnel.

The No Action Alternative would not require any additional environmental permitting or regulatory coordination as current activities and facilities are already integrated into Fort Belvoir's operating permits and environmental program.

4.19 Utility System Impacts

The proposed STF site at the DAAF was selected as it has established utility infrastructure that can support the proposed development, however some additional extensions, renovations and service connections within the DAAF will be required as described below. The following narratives provide a breakout of potential utility impacts associated with the Proposed Action:

Potable Water System Impacts

American Water (AW) owns, operates and maintains Fort Belvoir's water distribution system; potable water for this system is supplied by the Fairfax Water Authority the regional water purveyor. Potable water demand at Fort Belvoir averages around 2.0 MGD; the proposed site development is not expected to impact these demands as no new activities or additional personnel demands will be added to the system.

The existing 8-inch diameter waterline in Santjer Drive is adequate to support the proposed STF development; however AW is currently upgrading this line to a new 16-inch diameter line to provide improved fire flow capacity to the entire DAAF area. This effort is independent of the proposed STF development and is scheduled for completion in 2013. This new line will provide a looped water main around the DAAF site improving overall resiliency of the water system and water supply to the STF site.

New potable and fire main service connections from this new system in Santjer Drive to the STF facilities will be included in the project. These lines will be sized based on design codes but are expected to be two and six inches in diameter, respectively. Potable demands are projected to be on the order of 3,000 gallons per day, with fire demands peaking at 1,500-2,000 gallons per minute depending on final building design details. The

new looped water main currently being installed at the DAAF will be more than adequate to meet these demands.

The No Action Alternative would have no impact on existing potable water infrastructure and would not increase the demand for potable water at Fort Belvoir.

Sanitary Sewer System Impacts

The proposed STF development will not increase wastewater strength or overall flow volume from Fort Belvoir as no additional personnel or processes will be added to the garrison under the proposed initiative. Localized flows in the 8-inch sanitary sewer along Santjer Drive will see increases on the order of 3-3,500 gallons per day due to proposed STF development.

This flow rate is well within the rated capacity of the existing sewer, even with application of the 2.5x peaking factor required by DEQ standards. In discussing sewer service with AW representatives that are responsible for operation and maintenance of the Fort Belvoir sewer collection system, the DAAF site reportedly is experiencing wet weather flow challenges due to inflow and infiltration into older areas of the sewer network.

In order to address potential conjunctive wet weather impacts to the DAAF trunk sewer, Fort Belvoir is considering upgrade of 1,300 feet of the existing sewer along Santjer Drive out to U.S. Route 1 to a 15-inch diameter pipe. This may be incorporated as part of the proposed STF site development or alternatively a small diameter force-main may be utilized from the proposed STF to the regional 15-inch diameter sewer located along the south bank of Accotink Creek. Final selection of the preferred DAAF sewer upgrade option will be coordinated with Fort Belvoir and AW staff upon completion of their independent DAAF regional sewer assessment which is currently underway. This study is currently expected to be complete in 2014.

The No Action Alternative would not impose any additional impact to the sanitary sewer system at Fort Belvoir as personnel and equipment loadings and location would not change. The inflow and infiltration issues within the existing DAAF sewer network will still need to be addressed independent of the Proposed Action, i.e. DAAF sewer collection system repairs are still be required under the No Action Alternative.

Stormwater System Impacts

Site drainage flows to the regional drainage channel, Accotink Creek, via existing off-site surface drainage channels at DAAF. These drainage channels will remain in service during and after completion of the proposed STF development. No off-site stormwater drainage improvements are planned or are required as part of the proposed development. The project stormwater management plan will include confirmation that these channels are adequately sized to convey drainage from the site and peak runoff characteristics will be controlled to protect these channels from erosion due to increased runoff frequency, volume or intensity following state and federal regulatory requirements and Fort Belvoir's MS4 program.

The No Action Alternative would not impose any additional impact to the stormwater drainage system utility infrastructure at Fort Belvoir.

Natural Gas System Impacts

Washington Gas owns and operates Fort Belvoir's natural gas distribution system, including pipelines and service connections on DAAF. The nearest gas line to the proposed STF site is located approximately 2,600 feet northwest of the site along Gavin Road adjacent to the existing DAAF fire station. The proposed STF development will extend this gas main (four inch maximum diameter) up to the STF site to provide fuel for the planned natural gas fired heating system.

This gas line extension will be installed along the shoulder of the existing road network following Washington Gas installation standards. As these areas are currently cleared and routinely mowed as part of road maintenance practices, installation of the gas line will have minimal impacts to land and water resources. There is one low-lying area along the route that has been noted as a potential wetland area. This area will be surveyed during design of the gas main extension and impacts will be avoided by re-routing around the area or by utilizing directional drilling to avoid disturbing any sensitive areas. The additional gas demand at the proposed STF development will not require any upgrades to off-site utility infrastructure or increase regional gas utility demands.

The No Action Alternative would not require any changes to the natural gas infrastructure or increase the demand for natural gas at Fort Belvoir, the proposed gas main extension to the proposed STF project site could be eliminated or deferred under the No Action Alternative.

Electrical Distribution System Impacts

Dominion Virginia Power operates Fort Belvoir's electrical supply and distribution system, the proposed STF development will not require any upgrades or extensions to this system beyond installation of service entry conductors, transformers and meter sets to serve the new buildings from the regional grid along Santjer Drive. Electrical demands will not exceed available capacity or effect regional demand profile.

Similarly, the No Action Alternative would not require any changes to the electrical infrastructure or increase demand for electricity at Fort Belvoir.

Communications System Impacts

Fort Belvoir owns and operates the communications systems that will serve the proposed STF development. STF improvements will be limited to service connections to overhead and underground cables located near the intersection of Santjer Drive and J.J. Kingman Drives. Regional telephone service connections will be administered by Verizon Communications the private utility that currently provides telephone service on Fort Belvoir.

The No Action Alternative would not require any changes to regional communications infrastructure.

4.20 Secondary and Induced Impacts

Development of the proposed STF at the DAAF site will not promote or induce any additional development actions or sponsor any secondary or induced impacts. The Proposed Action will enable reuse of the existing training facility area (Building 1809); however no specific uses have been currently programmed for this area. Redevelopment of these existing facilities will be independently coordinated as future facility needs are identified consistent with the Fort Belvoir Master Plan.

Existing regional transportation, telecommunications, utilities and drainage systems are adequate for the proposed development of the STF. No secondary or induced impacts to these regional systems are anticipated due to the Proposed Action as the Proposed Action will not increase personnel loading in the Fort Belvoir area.

The No Action alternative would result in secondary impacts to mission readiness and training efficiency, as the existing facilities are inadequate for continued long-term use. This may result in eventual relocation of the training conducted at Fort Belvoir to another less advantageous geographical location that would result in increased training cost, sponsor a need for additional facilities, or limit training capabilities; all of which would be negative secondary or induced impacts of the No Action Alternative.

4.21 Cumulative Impacts

Although the proposed development of the STF facilities at the DAAF area of Fort Belvoir is a relatively minor development project in the regional context, it is important to analyze the potential cumulative effects of the Proposed Action in accordance with 40 CFR 1508.7.

Assessing the reasonably foreseeable impacts of the proposed STF development on personnel loading, the proposed relocation of 190 staff and students from existing facilities on Fort Belvoir is a small portion of the total garrison population of approximately 43,000 persons and even more insignificant compared to the regional population of over 5.8 million persons. Direct cumulative and foreseeable personnel impacts of the proposed loading are therefore expected to be very minor in nature.

The proposed STF will present opportunities for improved commuting to Fort Belvoir for off-site employees and students/trainees. Currently these opportunities are limited due to the geographically separated configuration of training facilities and this consolidated facility will reduce the need for internal garrison travel as well as enhance opportunities for car pooling and mass transit commuting for site personnel and students.

The development of the STF at the DAAF is not anticipated to significantly contribute to cumulative regional urbanization impacts. The existing area is heavily urbanized and the DAAF site has been previously cleared and used for military training for over 50 years. The STF development will result in limited improvement to the DAAF sewer system, either through replacement of the existing sewer, enhanced control of wet weather flows at DAAF or construction of a new on-site pump station at the STF site. The cumulative impact of these improvements will be less potential for sewer system overflows and release into the

environment, potential positive cumulative effects of the Proposed Action. No other additional projects or development initiatives are reasonably foreseeable as induced or secondary impacts due to the Proposed Action.

There are several unrelated development initiatives in the region that will be occurring in the same timeframe as the STF development. These include general road improvements along the Route 1 corridor that are under development by the VDOT (Route 1-Widening Project); development of the INSCOM SCIF facilities to the north of the site near the intersection of Beulah Road and Kingman Drive; and the private Belvoir Business Park office development underway west of the site near the intersection of Telegraph Road and the Fairfax County Parkway. It is not anticipated that these independent projects will directly affect the proposed STF development or present significant cumulative, induced or secondary impacts relative to the Proposed Action. There may be minor traffic disruptions due to road improvements and coincidental construction along the Route 1 corridor but these are not expected to impact the proposed STF development.

Cumulative impacts of the No Action Alternative would be limited to the reduction in mission readiness and training efficiency associated with continued reliance on sub-standard facilities for training military personnel. The No Action Alternative would not provide suitable facilities for female personnel and in the long-term this may impact personnel readiness.

Table 4-1 on the following pages presents a summary of potential impacts for comparison between the alternatives for further reference.

Table 4-1 Potential Environmental Impact Analysis Summary - Replace Skills Training Facility, Fort Belvoir							
EA Narrative Section	Environmental Resource	*No Action Alternative*	*Preferred Alternative*	*Option 1*	*Option 2*	*Option 3*	*Option 4*
		Continue Ops at Bldg 1809	*Develop STF at DAAF*	*Expand STF at Bldg 1809*	*Develop STF at HEC*	*Develop STF at BNA*	*Develop STF at T8*
4.1 & 4.5	**Land Use**	No Impact	Minor	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative
a.	Compatible with Zoning/Ordinances?	No Impact	Yes	-	-	-	-
b.	Total Land Area Required	No Impact	10 Acres	-	-	-	-
c.	Total Land to be Disturbed	No Impact	10 acres	-	-	-	-
d.	Affected Land Area Classification	Military Reservation	Military Reservation	-	-	-	-
e.	Directly Affected Population	190 personnel	190 personnel	-	-	-	-
4.2 & 4.3	**Air Quality &Transportation Issues**	No Impact	No Impact	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative
a.	Complies w/ State and Federal Air Quality?	Yes	Yes	-	-	-	-
b.	Fugitive Dust	No Impact	Dust Control Measures	-	-	-	-
4.4	**Coastal Resource Impacts**	No Impact	No Impact	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative
a.	Consistent with State or Federal Coastal Zone?	Yes	Yes	-	-	-	-
4.6	**Recreational Resources**	No Impact	No Impact	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative
a.	National parks and monuments	No Impact	No Impact	-	-	-	-
b.	National natural landmarks	No Impact	No Impact	-	-	-	-
c.	National battlefield park sites	No Impact	No Impact	-	-	-	-
d.	National historic sites and parks	No Impact	No Impact	-	-	-	-
e.	Wilderness areas	No Impact	No Impact	-	-	-	-
f	Wildlife refuges	No Impact	No Impact	-	-	-	-
g.	National seashores, lake shores, and trails	No Impact	No Impact	-	-	-	-
h.	State parks	No Impact	No Impact	-	-	-	-
i.	Bureau of Land Management (BLM) administered lands	No Impact	No Impact	-	-	-	-
j	National forests and grasslands	No Impact	No Impact	-	-	-	-
k	Native American owned lands and leases administered by the Bureau of Indian Affairs (BIA).	No Impact	No Impact	-	-	-	-
4.7	**Farmland, Rangeland and Forest Land**	No Impact	Minor	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative
a.	Prime Farmland	No Impact	No Impact	-	-	-	-
b.	Prime Rangeland	No Impact	No Impact	-	-	-	-
c.	Forest Land	No Impact	10 Acres of Trees	-	-	-	-
4.8	**Biological Resources**	No Impact	Minor	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative
a.	Threatened and Endangered Species	No Impact	No Impact	-	-	-	-
b.	Fish and Wildlife Resources	No Impact	Seasonal Considerations	-	-	-	-
c.	Habitat and Vegetation	No Impact	Native Re-Planting	-	-	-	-
d.	Light Emissions	No Impact	No Impact	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative
4.9	**Floodplains**	No Impact	No Impact	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative
a.	Located in 100 or 500 yr Floodplain?	No	No	-	-	-	-
b.	Complies with State Floodplain Program	Yes	Yes	-	-	-	-
c.	Floodplain Mitigation Required?	No	No	-	-	-	-
d.	Floodplain/Floodway Impact (Acres)	None	None	-	-	-	-
4.10	**Wetlands**	No Impact	No Impact	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative
a.	401 or 404 Wetland Areas on Site?	No Impact	No Impact	-	-	-	-
b.	Area of Wetland Impact	No Impact	No Impact	-	-	-	-
c.	Wetland Mitigation Area Required (Acres)	No	No	-	-	-	-
4.11	**Stormwater Management and Water Quality**	No Impact	Minor	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative
a.	Discharge Impacts	No Impact	No Impact	-	-	-	-
b.	Intake Impacts	No Impact	No Impact	-	-	-	-
c.	Aquifer Impacts	No Impact	No Impact	-	-	-	-
d.	Watershed Management Plan Impact	No Impact	No Impact	-	-	-	-
e.	Water Quality Construction Impacts	No Impact	SWPPP/VDPES	-	-	-	-
f.	Land Quality	No Impact	E&S Control	-	-	-	-
g.	Stormwater Compliance	No Impact	Positive EISA Compliant	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative
4.12	**Wild and Scenic and Recreational Rivers**	No Impact	No Impact	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative

Table 4-1 Potential Environmental Impact Analysis Summary - Replace Skills Training Facility, Fort Belvoir (continued)							
4.13	**Historic/Cultural Resources**	No Impact	No Impact	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative
a.	Impacts to National Historic Register Sites	No Impact	No Impact	-	-	-	-
b.	Tribal Land Impacts	No Impact	No Impact	-	-	-	-
c.	Mitigation Effort Required	No Impact	No Impact	-	-	-	-
d.	Visual Aesthetic Impacts/Sensitive Areas	No Impact	No Impact	-	-	-	-
4.14	**Hazardous Materials/P2/SW**	No Impact	Minor	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative
a.	Hazardous Materials	FAPH Compliant	Const. Materials	-	-	-	-
b.	Pollution Prevention	FAPH Compliant	Const. Waste	-	-	-	-
c.	Solid Waste	FAPH Compliant	Const. Waste	-	-	-	-
4.15	**Natural Resources, Energy, Sustainability**	Minor Energy Use	Positive Energy Conserv.	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative
4.16	**Noise**	No Impact	No Impact	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative
4.17	**Socio-Economic Issues/Environmental Justice**	No Impact	No Impact	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative
a.	Minority/Low-Income Impacts?	No Impact	No Impact	-	-	-	-
b.	Supports Economic Development Issues?	No Impact	No Impact	-	-	-	-
c.	Environmental Justice Requirements	No Impact	No Impact	-	-	-	-
4.18	**Environmental Permitting**	No Impact	Minor	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative
4.19	**Secondary Impacts**	Training Readiness	Positive Sewer Impr.	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative
4.20	**Cumulative Impacts**	Training Readiness	Positive Sewer Impr.	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative	Not Viable Alternative

Notes:

- Insignificant Impact of No Action
- Insignificant Impact of Preferred Alternative (Below regulatory levels or any foreseeable impact)
- Minor Impact , (Impacts manageable within existing regulatory framework, no specific mitigation required by local, state or federal law or regulation)
- Positive Impact to Environment
- Non-Viable Alternative
- Negative Impact to Mission

5.0 MITIGATIVE MEASURES

As currently proposed, the development of the STF at the DAAF will not require any specific mitigative measures due to regulatory requirements other than standard requirements to avoid and minimize disturbance of sensitive areas and limit potential for off-site impacts. None of these measures currently meet the threshold of actionable mitigation measures warranting further environmental analysis under NEPA but are enumerated herein as general observations to be carried through during site planning.

Construction of the STF at the DAAF site will result in minor and temporary impacts to local land, water and air quality resources. These impacts will be minimized by following established regulatory requirements. These requirements include utilizing appropriate stormwater and erosion and sediment control measures; applying appropriate dust control techniques during land disturbance; appropriately segregating and recycling of construction and demolition debris; and minimizing the duration and extend of land disturbance by appropriately sequencing and planning land development activity.

Although field surveys have not identified any federally-listed threatened or endangered plant or animal species within the proposed project area of potential effect, construction shall be coordinated in accordance with wood turtle management guidance to avoid impacts to this state protected species. This includes installation of silt fencing during the winter months prior to site clearing to exclude turtles from the development areas; relocation of any turtles found during pre-construction screening of the fenced in area; and briefing site personnel on turtle awareness and identification so any incidental turtles discovered during land clearing can be managed appropriately.

Site timber clearing will be conducted in conjunction with the Fort Belvoir forest management program with slash and unsalable timber mulched on site for reuse during site development activity for erosion control and stabilization. This will reduce waste and requirement for hauling slash and timber residuals off site. Timber clearing will also be timed to avoid disruption to bird nesting seasons as outlined in the Fort Belvoir INRMP.

Compensatory mitigation for trees removed from the site will follow Fort Belvoir's Tree Removal and Protection Policy #27 dated October 12, 2012 regarding tree removal and restoration. Due to limited on-site opportunities for tree mitigation, out-of-kind compensatory mitigation within the Accotink Creek watershed will be incorporated within the scope of the project. This may include funding of two stream restoration projects within the Accotink Creek watershed. Potential mitigative projects include the repair of a culvert on a tributary of Mason Run (MR4), and repairing a stream channel above two recently constructed parking lots within Tompkins Basin. Execution of these Fort Belvoir mitigation projects will be coordinated with garrison officials, regulatory authorities and appropriately designed and permitted as independent projects upon confirmation of Fort Belvoir's preferred out-of-kind mitigation strategy.

Specific minor and temporary impacts that may arise during earthwork activity include off-site sedimentation and dust deposition, and these will be closely monitored during land grading and

earthwork activities to avoid and minimize potential impacts. As the proposed redevelopment will follow Fort Belvoir's MS4 program standards, water quality impacts will be closely monitored and controlled to keep them within established water quality criteria, (both during construction and future operation of the new facility).

All construction will follow state and federal stormwater management and erosion control permitting requirements. Design of site stormwater practices shall conform to the EISA 438 standards regarding control of stormwater at federal facilities, matching predevelopment hydrologic conditions to the maximum extent practicable. Designated wetland areas will be be avoided during installation of any off-site utility system upgrades. This will include obtaining appropriate jurisdictional determinations and associated permits for crossing Accotink Creek and any other wetland areas associated with this work. Where utilities must cross these areas they shall be installed from outside the jurisdictional boundary of these areas using trenchless techniques as a mitigative practice.

Fort Belvoir staff will also monitor STF design development for adherence to sustainability principles in accordance with local, state and federal regulatory guidance to confirm redevelopment follows the practices described in this EA and the Fort Belvoir INRMP and associated implementing policies and guidance. This will include coordination of appropriate buffer plantings using native species to screen the adjacent wildlife corridor, compensatory tree mitigation for site timber clearing activity, and implementation of low-impact development practices to reduce runoff volumes and enhance water quality emanating from the site. STF construction activities will also accomplished in accordance with Fort Belvoir's waste minimization and pollution prevention plans. This will include segregation and recycling of construction materials to promote resource recovery to the maximum extent practicable, including recycling a minimum of 50% of construction and demolition debris.

6.0 CONCLUSIONS

Based upon the foregoing analysis, the Proposed Action is not expected to result in any significant impacts to the environment. Construction would be undertaken in compliance with all applicable Federal, State and local laws and regulations, and Fort Belvoir policies. Temporary and minor impacts would be reduced by implementing best management practices normally used in development at Fort Belvoir.

The Environmental Assessment and Draft Finding of No Significant Impact will be made available for public comment for a period of thirty (30) days. No decision will be made on the Proposed Action until the close of the public comment period.

7.0 LIST OF AGENCIES AND PERSONS CONSULTED

The following agencies and points of contact were consulted regarding preparation of this Environmental Assessment.

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In addition to these individual personal notifications, public notice of availability of the draft EA and FONSI was advertised in four local newspapers twice within a 30-day period and printed copies were made available to regulatory agencies for review for a period of 60-days.

Copies of all correspondence received during these reviews and a copy of the public notice advertisement will be included as part of the administrative record for this NEPA analysis.

8.0 LIST OF REFERENCES

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9.0 LIST OF ACRONYMS AND ABBREVIATIONS

The following is a list of acronyms and abbreviations that may appear in this EA and supporting documentation.

AMSL ..... Above Mean Sea Level
APE ..... Area of Potential Effect
ATFP ..... Antiterrorism / Force Protection
AW ..... American Water Operations and Maintenance, Inc.
BNA ..... Fort Belvoir North Area
BMP ..... Best Management Practice
CBP ..... Chesapeake Bay Program
CBPA ..... Chesapeake Bay Preservation Act
CEQ ..... Council on Environmental Quality
CERCLA ..... Comprehensive Environmental Response, Compensation, and Liability Act
CFR ..... Code of Federal Regulations
CRM ..... Cultural Resources Manager
CRMP ..... Coastal Resource Management Program
CZMA ..... Coastal Zone Management Act
DAAF ..... Davison Army Airfield
DCR ..... Department of Conservation and Recreation
DEQ ..... Department of Environmental Quality
DPW ..... Directorate of Public Works
EA ..... Environmental Assessment
EISA ..... Energy Independence and Security Act
ENRD ..... Environmental Natural Resources Division
FCPY ..... Fairfax County Parkway
FEMA ..... Federal Emergency Management Agency
FIRM ..... Flood Insurance Rate Map
FONSI ..... Finding of No Significant Impact
FY ..... Fiscal Year
INRMP ..... Integrated Natural Resource Management Plan
INSCOM ..... U.S. Army Intelligence and Security Command
HEC ..... Humphreys Engineering Center
HOV ..... High Occupancy Vehicle
JPA ..... Joint Permit Application
LEED® ..... Leadership in Energy and Environmental Design
LID ..... Low Impact Development
LOS ..... Level of Service
LWB ..... Local Wetlands Board
NAAQS ..... National Ambient Air Quality Standards
NCPC ..... National Capital Planning Commission

NEPA.....National Environmental Policy Act
NRCS……Natural Resource Conservation Service
NRHP……..... National Register of Historic Places
OSEG……...Operations Security Evaluation Group
RCRA……Resource Conservation and Recovery Act
RLD ..... Registered Land Disturber
RMA……Resource Management Area
RPA…….....Resource Protection Area
SCIF ..... Sensitive Compartmented Information Facility
SHPO .....State Historic Preservation Office
STF…….....…….Skills Training Facility
SWPPP..... Stormwater Pollution Prevention Plan
TMDL.....Total Maximum Daily Load
USACE ..... U.S. Army Corps of Engineers
USEPA……..US Environmental Protection Agency
USGS……United States Geologic Survey
UXO..... Unexploded Ordnance
VMRC .....Virginia Marine Resources Commission
VPDES..... Virginia Pollutant Discharge Elimination System
VSMP .....Virginia Stormwater Management Program

Appendix A

Forest Stand Delineation Report

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U.S. ARMY GARRISON FORT BELVOIR

Natural Resource Inventory
Forest Stand Delineation
24-inch Tree Survey
Prepared for OTC Project Development
Forest Conservation Plan

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1.0 INTRODUCTION

This natural resource inventory (NRI), forest stand delineation (FSD), and specimen tree survey has been prepared as part of forest conservation planning on a nine acre development site on the Davison Army Airfield just east of the Farrar Gate at Fort Belvoir, VA.

The project site is located along the northeast quadrant of the Davison Army Airfield property, and is bounded on the southwest by Santjer Drive, on the northwest by John J. Kingman Drive and the Farrar Gate, and by a 300-400 foot forested buffer which protects Accotink Creek on the north and eastern edges. The tract is approximately 1,600 feet south of Virginia Route 7100 also known as the Fairfax County Parkway which is the regional road connectivity to the site. U.S. Route 1 is located approximately 2,000 feet to the east of the site.

This inventory and forest delineation is required to assess potential forest mitigation needs related to a training center development on this site consistent with the Fort Belvoir Integrated Natural Resources Management Plan (INRMP), and will enable development of an effective Forest Conservation Plan (FCP) with base development authorities.

Forest conservation planning is required to support the proposed development of 95,000 square feet of two-story building space and associated walkways, vehicle access roads and parking on the site. Proposed site grading is expected to require between three to five feet of fill across the entire building site which will significantly impact most of existing trees. A forest stand delineation was therefore conducted following guidelines set forth in the Fort Belvoir INRMP and the Maryland Department of Natural Resources, *State Forest Conservation Technical Manual*, *3rd Edition*, (hereafter referred to as the Maryland State Manual).

The Maryland State Manual was utilized as it provides a highly detailed perspective on the forest stand types in the proposed development area and a thorough baseline for the preliminary impact review process. This detailed analysis will aid in addressing the Fort Belvoir INRMP requirements that specify a 2:1 equivalent mitigation ratio for each tree removed during construction that is 4-inch and larger in diameter. Coupling these impacts with the NRI, will enable development of an effective FCP.

2.0 METHODOLOGY

Due to the density of existing trees in the proposed development area a line-plot system of tally was used to quantify the number and species of trees located within the project area. The size and species trees within these plot areas were recorded to aid in the delineation of stand type and quantify the number of trees that may be impacted with the proposed development.

FSD efforts began with a desktop assessment of sequential aerial imagery and USGS topographic maps (quad sheets) dating back to 1890 to assess the age of the existing forest stands and development history of the 9-acre site. This data provided an indication of prior land use as well insight into any historical development of the proposed site. The earliest aerial imagery found for this area dating to 1960 indicates the area was primarily an open grassy area which gradually reverted to forestland over the past 50 years. A study of quad sheets from 1890 to present is consistent with aerial photography records, indicating the project area has remained undeveloped through recent history even though the adjacent airfield was developed between 1948 and 1951.

Field forest inventory began with line-plot cruising, systematically tallying timber on a series of plots arranged in a rectangular or square pattern. The lines are established using a compass and are spaced equally across the site to insure a good mix of samples from all stand types located within the site. Each plot is spaced equally along the plot lines to insure a good mix of inventory tallies that will give insight into stand type and tree volume located within the site.

The project FSD methodology used 1/10th acre plot sizes on a radius of 37.2' and a grid of 2 x 2 chains (132'x132') to define existing tree distributions. This density of plot sizes was primarily driven by the complex forest stand types reflective of emergent growth patterns within the site. A ten factor prism (10x) was used to survey basal areas within each plot to assess volume of existing tree stocking. This yields average plot volumes as well as per tree basal area distributions, which provides an indication of the timber value and maturity of tree growth within the stand for replacement valuation purposes.

Field protocol also included visual identification and delineation of predominant forest stand types within the site boundaries. Forest stands are further characterized based on species composition, density, size, condition, and stand age. Each stand is made of dominant, co-dominant and associative tree species. Each of these is tabulated to indicate their frequency and average diameter. This data is used to provide a stand description including the understory and herbaceous species present in each stand. Additional ecological stand data is also tallied to give a better understanding of stand composition, stand age, and stand condition. The additional ecological data included at each plot is:

- Percent canopy closure and tree species observed including relative dominance,
- Percent and species of shrubs observed,
- Percent and species of ground coverage by herbaceous species,
- Percent of the forest floor covered by woody debris,
- The presence or absence of rare, exotic or invasive species

As a final step in the FSD, specimen trees of 24-inch diameter and greater were specifically field located to assess impacts due to proposed development. Once the specimen trees were visually identified, land surveyors physically located the base coordinates of each specimen tree and recorded the species, size, observed health and status. Each specimen tree's data was then mapped on the proposed site plan to determine potential impacts and mitigation alternatives.

This FSD data is then used in parallel with the NRI as the basis for development of the Forest Conservation Plan (FCP). The NRI includes mapping of site soil types; steep slope areas; wetlands; buffer setback requirements; wildlife mitigation boundaries and other natural resource constraints as outlined in the Fort Belvoir INRMP. This NRI data along with the FSD details and field summaries are included as appendices to this narrative report and are summarized below.

3.0 FOREST STAND ANALYSIS AND NATURAL RESOURCE INVENTORIES

The following are summaries of the project FSD analysis and NRI; including a discussion of the terminology used in this report:

3.1 Forest Stand Summary Table

Reference the attached summary table located in the Appendices portion of this document.

3.2 Forest Association

A forest association is an assemblage of plants having ecologically similar requirements and includes one or more dominant species from which it derives a definite character. There were two primary forest associations identified on the project site, *Oak-Pine* and *Loblolly-Shortleaf Pine*. *Oak-Pine* are forests in which hardwoods (usually upland oaks) make up a plurality of the stocking but pines make up 25%-50% of the stocking. Common associated species include gum, hickory, and yellow poplar. *Loblolly-Shortleaf Pine* forests are forests in which loblolly pine, shortleaf pine, and other southern yellow pines except longleaf or slash pine, singly or in combination make up the plurality of the stocking. Common associates include oak, hickory, and gum.

3.3 Forest Stand Narratives

A forest stand is an assemblage of forest trees of sufficiently uniform species composition, age, and condition to be considered a homogeneous unit for management purposes. Two primary forest stand types were documented on the 9 acre study tract distinctive primarily by serial age of the respective stand, stocking size (average diameter of the trees within the stand), stand composition, and stand occurrence as it pertains to the topography of the study tract. A third area on the tract is considered disturbed and not included in the forest stand typography.

- The **Loblolly-Shortleaf Pine Stand (3.95 AC)** is located on the northwestern half of the study tract. This stand type is stocked singly or in combination of loblolly, shortleaf and other southern yellow pines (except long-leaf and slash pine). Common associates of this stand type include but are not limited to oak, hickory and gum. The dominant species representative of this stand type on this study tract was Virginia Pine. Associate species were very sparse, but included Sweet Gum and Scarlet Oak. Understory and shrub layer species included American Holly, American Beech, and Black Cherry. Ground cover was also, very sparse but did include Green Briar, Low Bush Blueberry, and various vines. Approximately 317 trees per acre occur in this tract with a mean size class of 7-inches in diameter. The basal area of 154 of this stand suggests that the stand is overstocked. The dominant over-story species in this stand is Virginia Pine and this stand appears to be approximately 35 years of age. Site visual observations indicate this area was previously developed for military support activities as evidenced by improved drainage features including ditch lines, remnants of drainage pipes and a small section of isolated railroad bed (evidently used for training purposes). Based on review of historic aerial imagery it appears tree colonization of the site began in the early 1980's as 1979 imagery shows the area as

open field; the predominant species and apparent age of Virginia Pine on site is consistent with this finding, indicative of natural reforestation of open areas that occurred approximately 35 years ago.

- The **Oak-Pine Stand (4.59 AC)** is located on the southwestern portion of the study tract, occupying approximately half of the parcel with frontage along Santjer Drive. This stand type dominance mainly consists of mature hardwood species. The mixture of species found in descending order of dominance include: Sweet Gum, Yellow Poplar, and Scarlet Oak. Common associates found with this stand type on the study tract included Red Maple, Green Ash, Black Cherry, American Beech, and American Holly. Approximately 25% of this stand type consisted of Virginia Pine. The understory and shrub layer mainly consisted of Red Maple, American Beech, American Holly, Sweet Gum, and Devils Walking Stick. Ground cover was also sparse in this stand, but what was present included Poison Ivy, Green Briar, Low Bush Blueberry, and various mosses and grasses. Approximately 141 trees per acre occurred in this stand with a mean size class of 8-inches in diameter. The basal area of 98.8 for this stand suggests that it is moderately stocked. The dominant over-story of this stand is Sweet Gum with approximately 41 Sweet Gums occurring per acre with an average diameter of 10-inches. From visual inspection and the wide range of size classes within this stand indicate this stand is an uneven aged stand. With the use of historical aerial imagery, it was observed that this stand is approximately 60 years old. Aerial imagery of this stand suggests that it was regenerated from natural reforestation along the edge lines of the open area that was maintained on the site until the early 1980's.

- **Disturbed Area (0.46 AC)** is located in the northern most corner of the study tract. This area was previously cleared to permit access for site geotechnical investigations and exhibited some further apparent wind and ice damage and thus is classed as disturbed area. This area was devoid of trees and no true stand type was readily apparent at the time of the tree survey. Upon further analysis it appeared that this area was predominately encompassed within the loblolly-shortleaf stand type discussed above.

3.4 Stand Age

A study of USGS topographic quadrangle maps from 1925 to present along with the aerial imagery from 1960 to present show that the area was vacant field/brush until around 1948 when it was developed and possibly used as a storage or training area for the airfield. The railroad remnants found on the site appear to have been concentrated to the small area which is now grown up with pine forest. Based on discovery of practice inert munitions on site during the geotechnical investigation, (2011 timeframe) it is theorized the area could have been used for training railroad demolition teams as part of site military activities. No other railroad resources were found leading to this site on any historical imagery or historical mapping dating back to 1890. Large, natural regenerated stands of Virginia Pine is often a indicator that the area was once open field or cleared land which use was abandoned and allowed to naturally regenerate. The aerial imagery clearly shows that around 1979 the open field area had been abandoned and the pines are taking over. The 1948 quad shows the entire area as being open and undeveloped whereas the 1953 quad clearly shows the oak-pine stand emerging and the

loblolly-shortleaf stand area is shown as open field. Based on this context the *Oak-Pine Stand* is thought to be approximately 60 years of age and th*e Loblolly-Shortleaf Pine Stand* is estimated to be approximately 35 years of age.

3.5 24" Tree Survey & Trees Associated with Historic Sites

A total of nine trees at or over 24-inches in diameter were documented in the study area. Six of these trees were tulip poplars (62.5%); and there was one each of Virginia Pine, Sweet Gum and Scarlet Oak on site (12.5% each). Exhibit 2 provides site mapping locating the specimen trees within the project site. Associated ecological data for the 24-inch specimen trees is given in the datasheets within Appendix F. No trees associated with historic sites were evident on site.

3.6 Site Soils

Exhibits 2 and 3 document two predominant USDA soil types on the 9-acre site; a *Gunston Silt Loam* and *Woodstown Sandy Loam.* On the Exhibits 2 and 3, *Gunston Silt Loam* is mapped as 48A, a silty and clayey soil that occurs on flat portions of the Coastal Plain in the Mason Neck formation. The topsoil is typically grey silt loam while the subsoil consists of deep moderately plastic clays. Bedrock is greater than 20 feet from the surface. *Gunston Silt Loam* is generally found on slopes of 0% - 2%. *Woodstown Sandy Loam* is mapped on Exhibits 2 and 3 as 109B, a soil that occurs in sandy sediments on nearly level landscapes in the lower Coastal Plain. Soil materials are primarily sandy loams to sandy clay loams. The seasonal high water table is 1.5 to 3.5 feet below the surface. Depth to hard bedrock ranges from 50 to more than 300 feet. *Woodstown Sandy Loam* is generally found on slopes of 2%-7%.

3.7 Rare, Threatened, and Endangered Species

Fort Belvoir natural resource inventories provided in the INRMP indicate that endangered plants including the *Small Whorled Pogonia and the Swamp Pink* may be present in the project area. The threatened *Wood Turtle* is also known to be present within the region. Development planning will include regulatory approved biological surveys to appropriately identify these plant species during the May/June timeframe to coincide with the bloom of ephemeral wildflowers. Wood Turtle surveys will be conducted prior to construction to exclude these species from the project area.

4.0 SUMMARY AND CONCLUSIONS

The proposed development is expected to result in removal of 100% of the trees within the 9-acre development area; this will include removal of all the specimen trees documented on the field survey. Although several of these specimen trees are not directly impacted by proposed building footprints, the critical root zones fall within expected fill limits leaving a great probability that the trees will eventually die from injury sustained during construction if they are not removed. For this reason the forest conservation plan should account for all of the specimen trees to be removed during construction. There are several trees of respectable size and species that fall along the edges of the limits of construction that were below the threshold for specimen tree designation and these should be evaluated during design on a per tree basis to determine if they can be left in place and incorporated into the final site plans.

Based on the current development plans a total of 1900 trees 4-inches or more in diameter are expected to be removed from the 9-acre study area, 1,252 of which fall within the Loblolly–Shortleaf Stand type (3.95 AC), 648 which fall within the Oak-Pine Stand type (4.59 AC). This does not account for the previous removal of trees in the Disturbed Area (0.46 AC) as part of site investigation work. Considering that this area was predominantly within the Loblolly–Shortleaf Stand type and assuming a similar stand density, the previously disturbed area (0.46 acres) likely removed 146 additional trees, for a total of approximately 2,050 trees lost due to the proposed development.

In order to meet the 2:1 equivalent mitigation ratio outlined in the Fort Belvoir INRMP, a significant amount of off-site replacement will be required (4100 trees) as the existing site will not provide adequate space for on-site mitigation. Current site landscaping plans only account for approximately 35 tree replacements due to development code limitations. Fort Belvoir has extensive experience with using off-site mitigation alternatives however, direct planting areas on the garrison are limited due to space constraints. Public Works staff have indicated that alternative in-kind mitigation to address area water quality concerns can be used as credits to offset actual tree planting requirements. Details on this program will need to be defined as the project moves forward and terms of mitigation particularly for the lower value tree species affected by the project will need to be worked out for the final FCP.

5.0 REFERENCES

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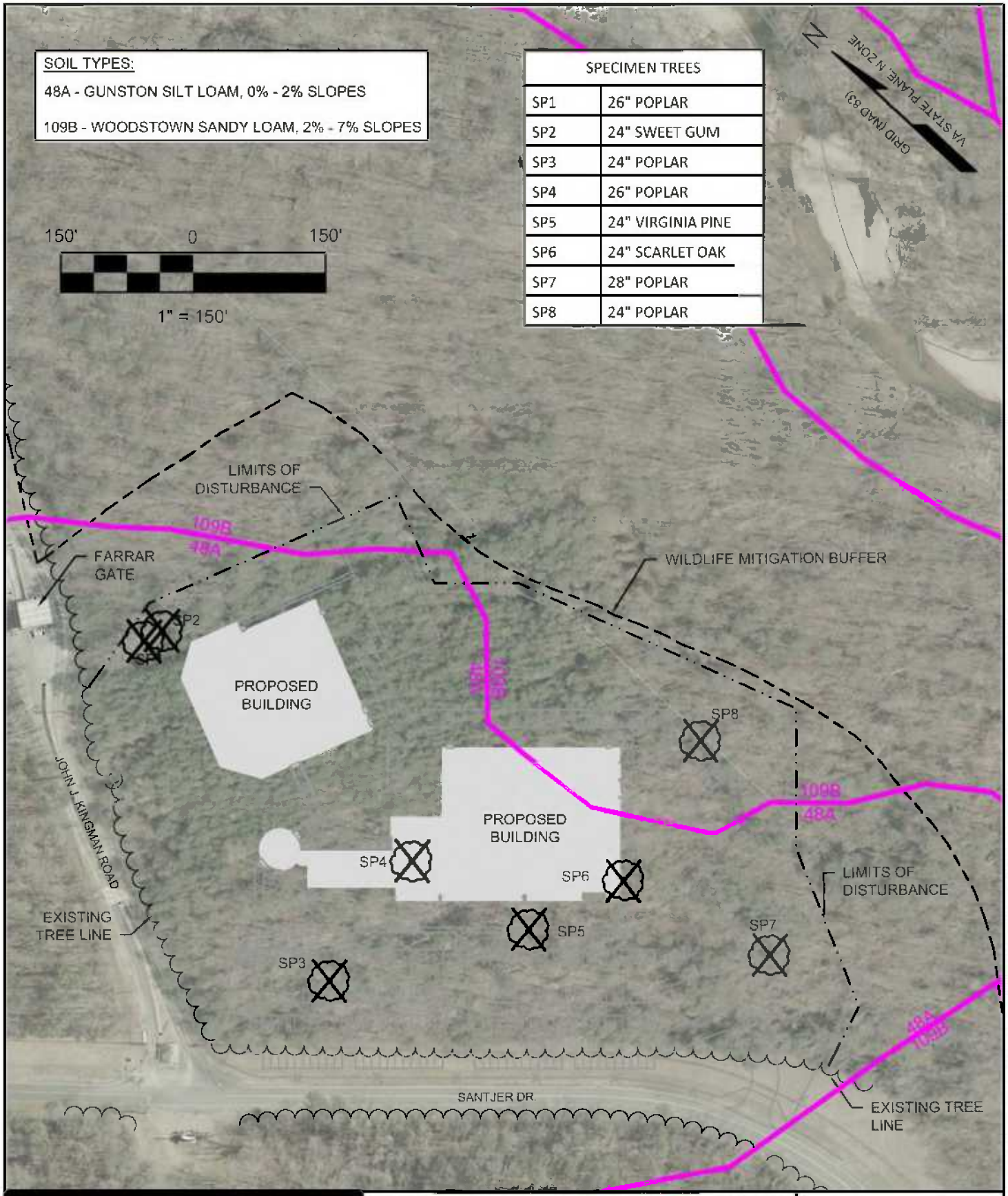
127 Nationwide Drive
Lynchburg, Virginia 24502-4272

FORT BELVOIR DAVISON AIRFIELD			EXHIBIT 1
SITE LOCATION			SCALE: 1" = 1500'
COMM NO: 212097	DRAWN: BSH	CHECK: TLF	DATE: 3/20/2013



SPECIMEN TREES	
SP1	26" POPLAR
SP2	24" SWEET GUM
SP3	24" POPLAR
SP4	26" POPLAR
SP5	24" VIRGINIA PINE
SP6	24" SCARLET OAK
SP7	28" POPLAR
SP8	24" POPLAR

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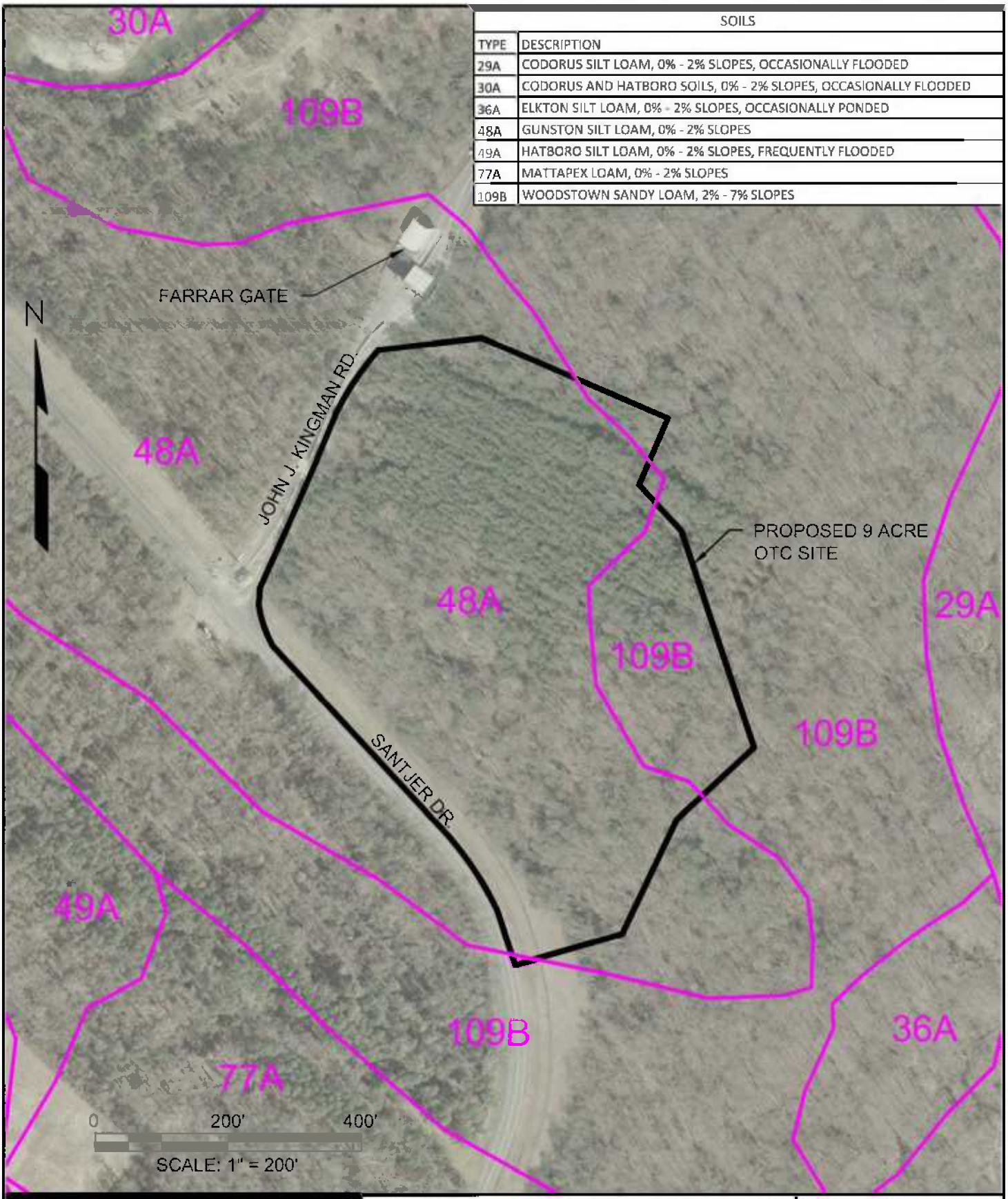
FORT BELVOIR
DAVISON AIRFIELD
ENVIRONMENTAL ASSESSMENT

PROPOSED IMPACTS TO SPECIMEN TREES

EXHIBIT 2

SCALE: 1" = 150'

COMM NO:	DRAWN:	CHECK:	DATE:
212097	BSH	TLF	3/20/2013



SOILS	
TYPE	DESCRIPTION
29A	CODORUS SILT LOAM, 0% - 2% SLOPES, OCCASIONALLY FLOODED
30A	CODORUS AND HATBORO SOILS, 0% - 2% SLOPES, OCCASIONALLY FLOODED
36A	ELKTON SILT LOAM, 0% - 2% SLOPES, OCCASIONALLY PONDED
48A	GUNSTON SILT LOAM, 0% - 2% SLOPES
49A	HATBORO SILT LOAM, 0% - 2% SLOPES, FREQUENTLY FLOODED
77A	MATTAPEX LOAM, 0% - 2% SLOPES
109B	WOODSTOWN SANDY LOAM, 2% - 7% SLOPES

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FORT BELVOIR
DAVISON AIRFIELD
ENVIRONMENTAL ASSESSMENT

SOIL TYPES

EXHIBIT 3

SCALE: 1" = 200'

COMM NO:	DRAWN:	CHECK:	DATE:
212097	BSH	TLF	3/20/2013

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Field Data Collection Sheet

Specimen Tree Data

Project: Davison Army Airfield EA

Date: 2-20-13

Field Crew: B. Harvey, C. Bryan, R. Massie

ID	SPECIES	DBH "	HEIGHT	CROWN	OBSERVATIONS
SP1	TULIP POPLAR	26"	60'	30'	Shares Crown with SP2
SP2	SWEET GUM	24"	65'	30'	Shares Crown with SP1
SP3	TULIP POPLAR	24"	70'	30'	Dying/Diseased 60% of Tree Dead
SP4	TULIP POPLAR	26"	65'-70'	30'	Hollow ≈ 22' From Ground
SP5	VIRGINIA PINE	24"	60'	30'	Healthy/ Good Condition
SP6	SCARLET OAK	24"	65'	40'	Largest of 3 Sharing Stump/Healthy
SP7	TULIP POPLAR	28"	70'	40'	70% of Tree Dead or Dying
SP8	TULIP POPLAR	24"	75'	45'	Healthy/ Good Condition

Davison Army Airfield
Forest Stand Summary Analysis

Stand ID	*Aerial Extent in Acres*	*Estimated Trees Per Acre*	*Average Diameter (d.b.h.)*	*Basal Area Per Acre* [1]	*Stand Formation Type*	*Dominant Species Indicator*	*Dominant Species Per Acre*	*Dominant Species Mean d.b.h.*	*Dominant % Frequency of Occurrence*	*Approximate Age of the Stand* [2]
Loblolly-Shortleaf Pine	3.95	317	6.9	154	Loblolly-Shortleaf Pine	Virginia Pine	317	6.9	100	34
Oak-Pine	4.59	141	8.8	98.8	Oak-Pine	Sweet Gum	41	8.2	46	60

1. Basal area is a measurement of the cross-section of a tree in square feet at breast height. Basal area (BA) of a forest stand is the sum of the basal areas of the individual trees and is reported as BA per acre. The BA value shown in this Forest Analysis equates to stocking which is a general description of the density of the forest stand as compared to the desirable density for best growth and management. Stands may be described as understocked; a stand of trees so widely spaced that, even with full growth potential realized, crown closure will not occur, well stocked; the situation in which a forest stand contains trees spaced widely enough to prevent competition, yet closely enough to utilize the entire site, and overstocked; the trees are so closely spaced that they are competing for resources, resulting in less than full growth potential for individual trees. Basal area per acre values are analyzed as non-stocked = 0 to 9, poorly stocked = 10 to 59, moderately stocked = 60 to 99, fully stocked = 100 to 129, and overstocked = 130 to 160. *Forestry Handbook, K.F. Wenger, 1984, pg. 318-321* . There is a correlation between stand density and canopy closure, typically recognized as understocked, under 40% crown closure, well stocked, 40-70% crown closure, overstocked, over 70% crown closure. *Essentials of Forestry Practice, C.H. Stoddard, 1968, page 53* .

2. Age Dating methodology-The ages of the two stand types were derived from examining historical aerial imagery of the stand area and examining when the natural regeneration took place. The website http://www.historicaerials.com/ was used to gain acces to the historical aerial imagery of the Davison Army Airfield site.

Wiley|Wilson **Forest Stand Delineation** **Field Data Sheet**

Forest Stand:	Mixed Mature Hardwood	**Point Sample #:**	H-1
Project Name:	Davison Airfield EA	**Date:**	2/20/2013
Field Crew:	B. Harvey, C. Bryan, R. Massie		

Point Sample Inventory (1/10th Acre Plot Size) Species and dbh:

Species:	**Diameter:**
Red Maple	(4) 8", (2) 4"
Sweet Gum	(1) 18", (2) 8"
Beech	(1) 4"
Red Cedar	(1) 6"
Black Cherry	(1) 4"

Total Trees: 12

Dominant Overstory:	**Co-dominant:**	**Associates:**	**Understory & Shrub Layer:**
Sweet Gum	Red Maple	Black Cherry, Red Cedar, Scarlet Oak	American Beech, American Holly, Sweet Gum, Greenbriar

% Woody Debris:	**% Canopy Closure:**	**# Snags:**	**Ground Cover:**
10%	50%	2	Blueberry, Moss

Stand Description: Stand consisted of a good mix of hardwoods and was on the fringe of the road. Large amounts of

Wiley|Wilson **Forest Stand Delineation** **Field Data Sheet**

Forest Stand:	Mixed Mature Hardwood	**Point Sample #:**	H-2
Project Name:	Davison Airfield EA	**Date:**	2/20/2013
Field Crew:	B. Harvey, C. Bryan, R. Massie		

Point Sample Inventory (1/10th Acre Plot Size) Species and dbh:

Species:	**Diameter:**
Sweet Gum	(1) 12", (1) 10", (4) 8", (1) 6",
Red Maple	(1) 4",
Virginia Pine	(1) 8"

Total Trees: 9

Dominant Overstory:	**Co-dominant:**	**Associates:**	**Understory & Shrub Layer:**
Sweet Gum	Red Maple	Red maple, American Beech	Red Maple, American Beech
% Woody Debris:	**% Canopy Closure:**	**# Snags:**	**Ground Cover:**
25%	40%	3	Green Briar, Vine

Stand Description: Stand consisted of a good mix of hardwoods. Area contained trees fallen from wind damage.

Wiley|Wilson **Forest Stand Delineation** **Field Data Sheet**

Forest Stand:	Mixed Mature Hardwood	**Point Sample #:**	H-3
Project Name:	Davison Airfield EA	**Date:**	2/20/2013
Field Crew:	B. Harvey, C. Bryan, R. Massie		

Point Sample Inventory (1/10th Acre Plot Size) Species and dbh:

Species:	**Diameter:**
Sweet Gum	(1) 14", (1) 10", (1) 8", (2) 6", (2) 4"
Red Maple	(1) 8", (2) 6"
Virginia Pine	(1) 14"
Yellow Poplar	(2) 24"

Total Trees: 13

Dominant Overstory:	**Co-dominant:**	**Associates:**	**Understory & Shrub Layer:**
Yellow Poplar	Sweet Gum	Red maple, American Beech, Virginia Pine	Red Maple, American Beech
% Woody Debris:	**% Canopy Closure:**	**# Snags:**	**Ground Cover:**
15%	40%	2	Green Briar, Moss

Stand Description: Stand consisted of a good mix of hardwoods with a slight influence of Virginia Pine.

Wiley|Wilson **Forest Stand Delineation** **Field Data Sheet**

Forest Stand:	Mixed Mature Hardwood/Pine	**Point Sample #:**	H-4
Project Name:	Davison Airfield EA	**Date:**	2/20/2013
Field Crew:	B. Harvey, C. Bryan, R. Massie		

Point Sample Inventory (1/10th Acre Plot Size) Species and dbh:

Species:	**Diameter:**
Sweet Gum	(1) 10", (1) 4"
Red Maple	(2) 6", (5) 4"
Virginia Pine	(1) 20", (1) 16"
Yellow Poplar	(1) 14"
Green Ash	(1) 6"

Total Trees: 13

Dominant Overstory:	**Co-dominant:**	**Associates:**	**Understory & Shrub Layer:**
Yellow Poplar	Sweet Gum, Virginia Pine	Red maple, American Beech, Green Ash	American Beech, Sweet Gum, American Holly

% Woody Debris:	**% Canopy Closure:**	**# Snags:**	**Ground Cover:**
20%	40%	4	Moss, Grass

Stand Description: Area fairly open with a good mix of hardwoods and a few Virginia Pine scattered through out

Wiley|Wilson **Forest Stand Delineation** **Field Data Sheet**

Forest Stand:	Mixed Mature Hardwood/Pine	**Point Sample #:**	H-5
Project Name:	Davison Airfield EA	**Date:**	2/20/2013
Field Crew:	B. Harvey, C. Bryan, R. Massie		

Point Sample Inventory (1/10th Acre Plot Size) Species and dbh:

Species:	**Diameter:**
Sweet Gum	(1) 18", (2) 16", (1) 14", (1) 12", (1)10", (2) 8", (2) 6", (4) 4"
Red Maple	(1) 6"
Virginia Pine	(1) 10"

Total Trees: 16

Dominant Overstory:	**Co-dominant:**	**Associates:**	**Understory & Shrub Layer:**
Sweet Gum	Virginia Pine	Red maple, American Beech, Black Cherry	American Beech, Red Maple, Black Cherry, Green Ash

% Woody Debris:	**% Canopy Closure:**	**# Snags:**	**Ground Cover:**
35%	40%	2	Moss, Grass

Stand Description: Area at corner of area delineated as limits of construction. Abundance of wind/ice damaged trees. Area located near intersection of road

Wiley|Wilson **Forest Stand Delineation** **Field Data Sheet**

Forest Stand:	Virginia Pine	**Point Sample #:**	H-6
Project Name:	Davison Airfield EA	**Date:**	2/20/2013
Field Crew:	B. Harvey, C. Bryan, R. Massie		

Point Sample Inventory (1/10th Acre Plot Size) Species and dbh:

Species:	**Diameter:**
Virginia Pine	(2)10", (7) 8", (6) 6", (3) 4"
Sweet Gum	(1) 6"
Yellow Poplar	(1) 6"

Total Trees: 20

Dominant Overstory:	**Co-dominant:**	**Associates:**	**Understory & Shrub Layer:**
Virginia Pine		American Beech, American Holly, Sweet Gum	American Beech, Sweet Gum, American Holly
% Woody Debris:	**% Canopy Closure:**	**# Snags:**	**Ground Cover:**
20%	50%	4	Moss, Grass, Poison Ivy

Stand Description: Fairly open. Noticeable change in stand type. Old storm drainage structures.

Wiley|Wilson Forest Stand Delineation Field Data Sheet

Forest Stand:	Hardwood/Pine	**Point Sample #:**	H-7
Project Name:	Davison Airfield EA	**Date:**	2/20/2013
Field Crew:	B. Harvey, C. Bryan, R. Massie		

Point Sample Inventory (1/10th Acre Plot Size) Species and dbh:

Species:	**Diameter:**
Virginia Pine	(1) 14", (3) 8", (1) 6"
Sweet Gum	(1)12", (1)8", (2) 6",(1) 4"
Yellow Poplar	(3) 12", (2) 10"
Green Ash	(1) 14"
Red Maple	(1) 6"

Total Trees: 17

Dominant Overstory:	**Co-dominant:**	**Associates:**	**Understory & Shrub Layer:**
Virginia Pine	Virgina Pine, Sweet Gum	American Beech, American Holly, Hornbeam	Sweet Gum, American Beech, Greenbriar
% Woody Debris:	**% Canopy Closure:**	**# Snags:**	**Ground Cover:**
40%	50%	1	Moss, Grass, American Holly

Stand Description: Reminants of old storm drainage structures and drainage swales

Wiley|Wilson **Forest Stand Delineation** **Field Data Sheet**

Forest Stand:	Virginia Pine	**Point Sample #:**	H-8
Project Name:	Davison Airfield EA	**Date:**	2/20/2013
Field Crew:	B. Harvey, C. Bryan, R. Massie		

Point Sample Inventory (1/10th Acre Plot Size) Species and dbh:

Species:	**Diameter:**
Virginia Pine	(4) 12", (5) 10", (4) 8"
Sweet Gum	(2)8"
Yellow Poplar	(1) 12", (1) 6"
Black Cherry	(1) 4"

Total Trees: 18

Dominant Overstory:	**Co-dominant:**	**Associates:**	**Understory & Shrub Layer:**
Virginia Pine	Sweet Gum	Hornbeam, Yellow Poplar	Scarlet Oak, Barberry, Greenbriar
% Woody Debris:	**% Canopy Closure:**	**# Snags:**	**Ground Cover:**
5%	60%	1	Vine, Poison Ivy, Blueberry

Stand Description: Area open. Fairly clean of debris

Wiley|Wilson **Forest Stand Delineation** **Field Data Sheet**

Forest Stand:	Mixed Mature Hardwoods	**Point Sample #:**	H-9
Project Name:	Davison Airfield EA	**Date:**	2/20/2013
Field Crew:	B. Harvey, C. Bryan, R. Massie		

Point Sample Inventory (1/10th Acre Plot Size) Species and dbh:

Species:	**Diameter:**
Virginia Pine	(2) 12", (1) 10"
Sweet Gum	(3) 10", (2)8", (2) 6", (1) 4"
Scarlet Oak	(2) 20", (1) 16"
American Beech	(1) 6", (1) 4"
Green Ash	(1) 4"

Total Trees: 17

Dominant Overstory:	**Co-dominant:**	**Associates:**	**Understory & Shrub Layer:**
Sweet Gum	Scarlet Oak	American Beech, Sweet Gum	American Beech

% Woody Debris:	**% Canopy Closure:**	**# Snags:**	**Ground Cover:**
10%	50%	2	Blueberry, Grass

Stand Description: Transition back to MMH.

Wiley|Wilson **Forest Stand Delineation** **Field Data Sheet**

Forest Stand:	Mixed Hardwood/Pine	**Point Sample #:**	H-10
Project Name:	Davison Airfield EA	**Date:**	2/20/2013
Field Crew:	B. Harvey, C. Bryan, R. Massie		

Point Sample Inventory (1/10th Acre Plot Size) Species and dbh:

Species:	**Diameter:**
Virginia Pine	(1) 14", (1) 12", (2) 10", (3)8", (2) 6"
Sweet Gum	(4) 6", (3) 4"
Black Gum	(1) 4"

Total Trees: 17

Dominant Overstory:	**Co-dominant:**	**Associates:**	**Understory & Shrub Layer:**
Virginia Pine	Sweet Gum	American Beech, Green Ash, Sourwood	Sweet Gum, American Beech

% Woody Debris:	**% Canopy Closure:**	**# Snags:**	**Ground Cover:**
20%	50%	0	Grass, Fern

Stand Description: This area is mainly open and start making transition into the Virginia Pine Stand type

Wiley|Wilson **Forest Stand Delineation** **Field Data Sheet**

Forest Stand:	Virginia Pine	**Point Sample #:**	H-11
Project Name:	Davison Airfield EA	**Date:**	2/20/2013
Field Crew:	B. Harvey, C. Bryan, R. Massie		

Point Sample Inventory (1/10th Acre Plot Size) Species and dbh:

Species:	**Diameter:**
Virginia Pine	(1) 12", (1) 10", (12)8", (8) 6", (8) 4"

Total Trees: 30

Dominant Overstory:	**Co-dominant:**	**Associates:**	**Understory & Shrub Layer:**
Virginia Pine		Sweet Gum	Sweet Gum, American Holly, American Beech,Vine, Scarlet Oak
% Woody Debris:	**% Canopy Closure:**	**# Snags:**	**Ground Cover:**
20%	60%	4	Moss, Grass

Stand Description: This area seems to be an old field/open area that has grown back with eubiquitous amounts of Virginia pine

Wiley|Wilson **Forest Stand Delineation** **Field Data Sheet**

Forest Stand:	Virginia Pine	**Point Sample #:**	H-12
Project Name:	Davison Airfield EA	**Date:**	2/20/2013
Field Crew:	B. Harvey, C. Bryan, R. Massie		

Point Sample Inventory (1/10th Acre Plot Size) Species and dbh:

Species:	**Diameter:**
Virginia Pine	(1) 10", (17)8", (15) 6", (14) 4"

Total Trees: 47

Dominant Overstory:	**Co-dominant:**	**Associates:**	**Understory & Shrub Layer:**
Virginia Pine		Sweet Gum	Sweet Gum, American Holly, American Beech, Scarlet Oak
% Woody Debris:	**% Canopy Closure:**	**# Snags:**	**Ground Cover:**
35%	60%-70%	6	Moss, Grass, Blueberry

Stand Description: This area seems to be an old field/open area that has grown back with eubiquitous amounts of Virginia pine. Area also heavily ridden with wind damage and damage from drillers doing bore testing.

Wiley|Wilson **Forest Stand Delineation** **Field Data Sheet**

Forest Stand:	Virginia Pine	**Point Sample #:**	H-13
Project Name:	Davison Airfield EA	**Date:**	2/20/2013
Field Crew:	B. Harvey, C. Bryan, R. Massie		

Point Sample Inventory (1/10th Acre Plot Size) Species and dbh:

Species:	**Diameter:**
Virginia Pine	(12)8", (20) 6", (15) 4"

Total Trees: 47

Dominant Overstory:	**Co-dominant:**	**Associates:**	**Understory & Shrub Layer:**
Virginia Pine		Sweet Gum	Sweet Gum, American Holly, American Beech, Black Cherry
% Woody Debris:	**% Canopy Closure:**	**# Snags:**	**Ground Cover:**
35%	70%	7	Moss, Grass, Greenbriar

Stand Description: This area seems to be an old field/open area that has grown back with eubiquitous amounts of Virginia pine. Area also heavily ridden with wind damage and damage from drillers doing bore testing.

Wiley|Wilson Forest Stand Delineation Field Data Sheet

Forest Stand:	Virginia Pine	**Point Sample #:**	H-14
Project Name:	Davison Airfield EA	**Date:**	2/20/2013
Field Crew:	B. Harvey, C. Bryan, R. Massie		

Point Sample Inventory (1/10th Acre Plot Size) Species and dbh:

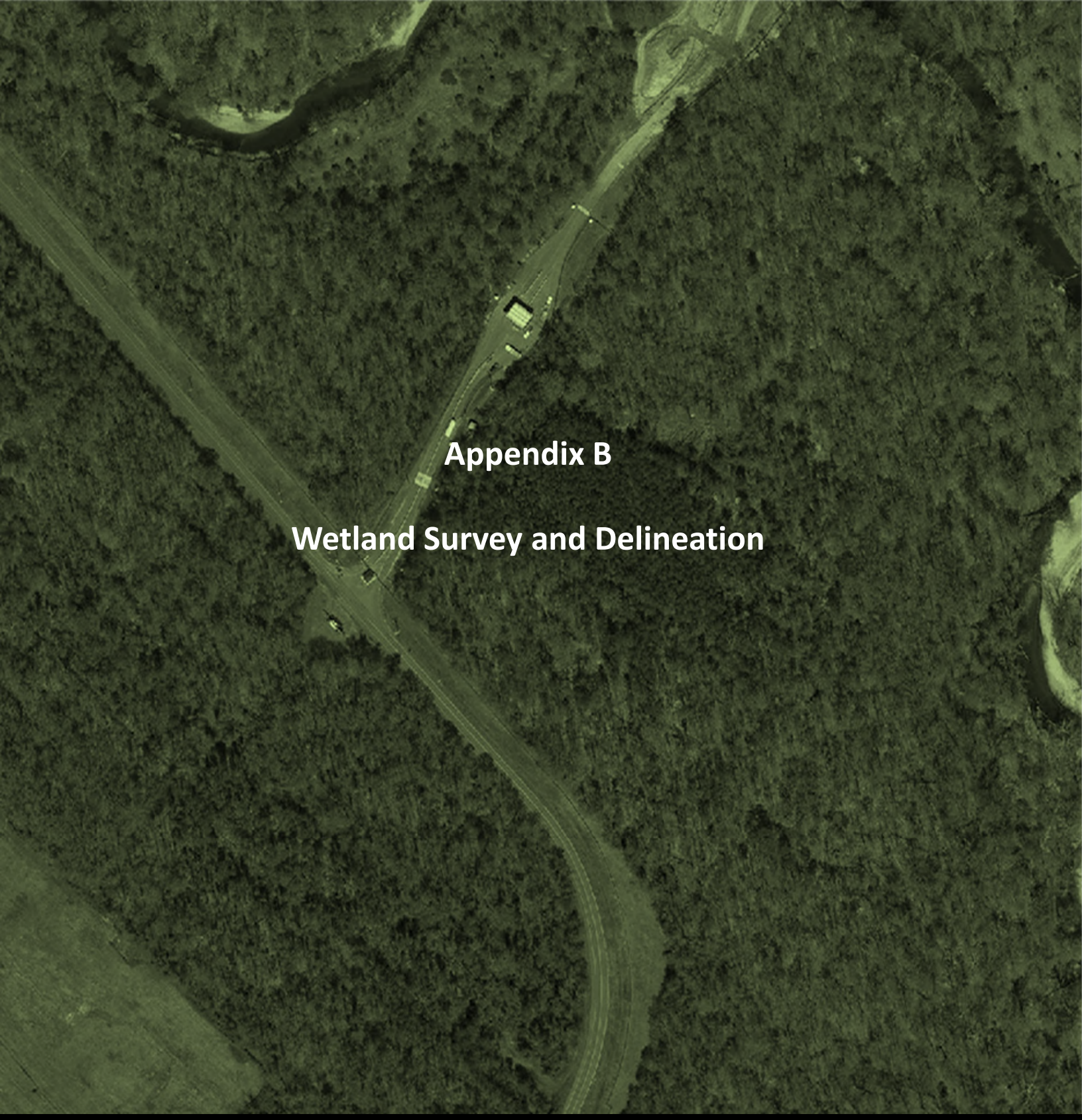
Species:	**Diameter:**
Virginia Pine	(1) 14", (1) 10", (11)8", (8) 6", (5) 4"
Pignut Hickory	(1) 4"
Black Cherry	(1)8"
Sweet Gum	(1) 4"

Total Trees: 29

Dominant Overstory:	**Co-dominant:**	**Associates:**	**Understory & Shrub Layer:**
Virginia Pine		Sweet Gum, Black Cherry, Black Gum	Sweet Gum, American Beech, Green Ash

% Woody Debris:	**% Canopy Closure:**	**# Snags:**	**Ground Cover:**
35%	70%	7	Moss, Grass

Stand Description: This area seems to be an old field/open area that has grown back with eubiquitous amounts of Virginia pine. Area also heavily ridden with wind damage and damage from drillers doing bore testing. This plot also lays near the edge of a drastic stand change back to Mixed Mature Hardwoods



Appendix B

Wetland Survey and Delineation

LEADERS IN EXCELLENCE!

U.S. ARMY GARRISON FORT BELVOIR

DOCUMENTATION FORM

Date:	April 30, 2013	**From:**	Brian S. Harvey, L.S.
Send to:	Tom Fitzgerald	**Office Location:**	Lynchburg
Subject:	Davison Airfield EA Wetlands Investigation	**Action:**	For Your Review
Commission No.:	212097.00	**cc:**	

☑ OFFICE CORRESPONDENCE ❑ TELEPHONE LOG ❑ CONFERENCE NOTES ❑ MEMORANDUM

Comments:

On April 9, 2013, Chris Bryan and I performed an on-site wetland investigation of the proposed OSEG Training Facility (OTC) at Davison Airfield, Fort Belvoir, VA. The project involves the development of a nine acre site for use as an OTC, which includes 2 proposed buildings to be used as classroom and training facilities and parking to accommodate the personnel while in training.

The investigation consisted of in-office review of existing mapping and an on-site delineation.

Prior to arriving on site, a review of available aerial mapping, NRCS soil mapping, and the National Wetlands Inventory Map for the area was performed. No Waters of the US or jurisdictional wetlands were apparent on the aerial survey or USGS topographic mapping. The NRCS soil mapping showed that a majority of the site contains soil type 48A which is Gunston silt loam. This soil type is considered a hydric soil type. A review of the National Wetland Inventory Map revealed no wetland areas within the area to be disturbed for the training facility.

After arriving at the site we started at the southeast corner and systematically traversed the nine acre site looking for visual indicators of possible wetland areas. There were no visual indicators that wetlands or Waters of the US were present on this site. Considering the soil on this site was classified as a hydric soil, we completed several test bores in some of the lower lying areas of the site and found that the hydrology and low chroma soils were not present and there did not seem to be any mottling to indicate prior inundation.

Based on these field observations of the soils, vegetation and hydrology, there are no jurisdictional wetlands or Waters of the US Present on this site. MWI mapping does indicate wetlands located to the North and Northeast of the project site, but these areas fall well outside the limits of proposed construction for the project.

Attachments:

1. Preliminary Drawing of Project Site
2. NRCS mapping
3. NWI mapping
4. USGS mapping

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Constant Progress

127 Nationwide Drive
Lynchburg, Virginia 24502-4272

FORT BELVOIR
DAVISON AIRFIELD
ENVIRONMENTAL ASSESSMENT

PRELIMINARY SITE LAYOUT

EXHIBIT1

SCALE: 1" = 150'

COMM NO:	DRAWN:	CHECK:	DATE:
212097	BSH	TLF	3/20/2013

Soil Map—Fairfax County, Virginia
(Davison Airfield Soils Data)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:1,720 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Fairfax County, Virginia
Survey Area Data: Version 10, Aug 19, 2010

Date(s) aerial images were photographed: 6/24/2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Fairfax County, Virginia (VA059)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
48A	Gunston silt loam, 0 to 2 percent slopes	7.6	84.5%
109B	Woodstown sandy loam, 2 to 7 percent slopes	1.4	15.5%
Totals for Area of Interest		**9.0**	**100.0%**

U.S. Fish and Wildlife Service

National Wetlands Inventory

Davison Airfield Wetlands

Apr 30, 2013

Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

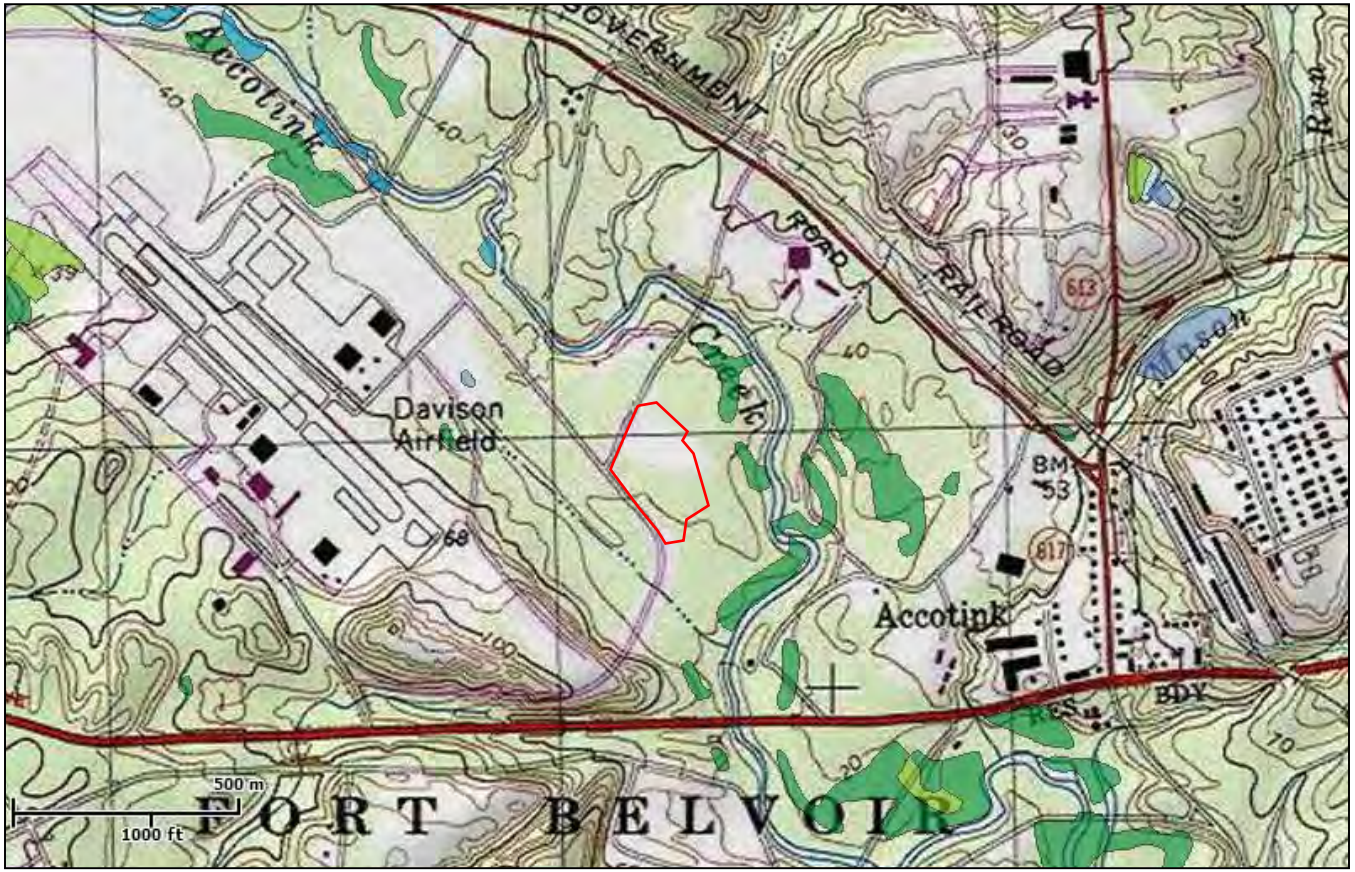
User Remarks:

U.S. Fish and Wildlife Service

National Wetlands Inventory

Davison Airfield Wetlands

Apr 30, 2013

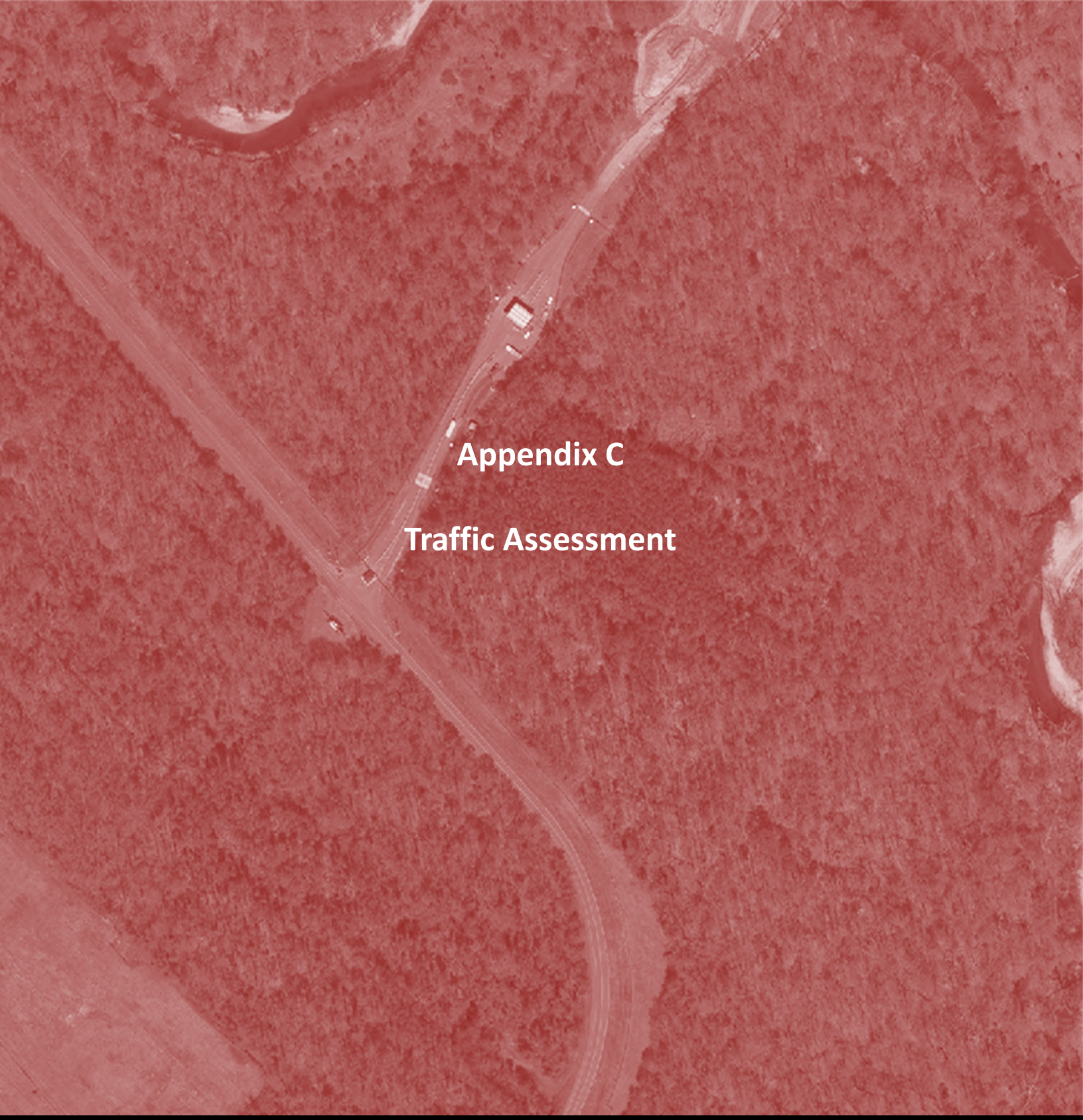


Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:



Appendix C

Traffic Assessment

LEADERS IN EXCELLENCE!

U.S. ARMY GARRISON FORT BELVOIR

RAMEY KEMP & ASSOCIATES
TRANSPORTATION ENGINEERS

RAMEY KEMP & ASSOCIATES, INC.
4343 Cox Road
Glen Allen, VA 23060
Phone: 804-217-8560 Fax: 804-217-8563
www.rameykemp.com

May 29, 2013

Mr. Tom Fitzgerald, P.E.
Vice President
Wiley|Wilson
127 Nationwide Drive
Lynchburg, Virginia 24502
Phone: (434) 947-1901

Subject: Operational Security Evaluation Group (OSEG) Training Facility – Traffic Impact Analysis
Fort Belvoir, Virginia

Dear Mr. Fitzgerald,

This letter report summarizes the Traffic Impact Analysis (TIA) prepared by Ramey Kemp & Associates, Inc. (RKA) for the proposed Operational Security Evaluation Group (OSEG) Training Facility located at Davison Airfield in Fort Belvoir, Virginia. The site is located in the east quadrant of the intersection of Santjer Drive at John J. Kingman Road inside the secure perimeter.

The proposed facility consists of one 65,000 s.f. building with space for offices and classrooms, and a 29,000 s.f. gym, and is expected to be complete in 2017. The proposed access plan consists of one full-movement driveway on Santjer Drive with two inbound lanes and one outbound lane. The purpose of this letter assessment is to determine if the traffic generated by this facility will warrant any off-site roadway improvements. Figure 1 shows the site location, and Figure 2 shows the proposed site plan.

Existing Traffic Volumes

The study limits include Fairfax County Parkway (Route 286), John J. Kingman Road, and Santjer Drive. Fairfax County Parkway is a four-lane divided urban principal arterial with a posted speed limit of 50 mph, and an average daily traffic (ADT) volume of approximately 29,000 vehicles per day (vpd) in the vicinity of the site. John J. Kingman Road is a two-lane roadway south of Fairfax County Parkway that provides access to Davison Airfield via the Farrar Gate. Santjer Drive is a two-lane roadway within the secure perimeter of Davison Airfield. Figure 3 shows the existing lane configuration.

A continuous turning movement count was conducted by Technical Traffic Services, Inc. at the following intersection beginning on May 6 and ending on May 10:

- Santjer Drive at John J. Kingman Road

The existing AM and PM peak hour traffic volumes were determined by averaging the peak hour volumes from May 7, 8, and 9. The turning volumes on these three days were fairly consistent without signification variation from one day to the next.

Existing traffic counts at the intersection of Fairfax County Parkway at John J. Kingman Road were obtained from traffic counts that were performed by others in November 2011. The traffic volumes turning on and off John J. Kingman Road were adjusted up to balance with the new traffic counts at Santjer Drive. The existing AM and PM peak hour traffic volumes are shown in Figure 4, and the count data are enclosed for reference.

Background Traffic Growth

According to the Virginia Department of Transportation (VDOT), the daily volumes on US 1 near Davison Airfield have remained consistent over the past five years with little to no growth. To be conservative in this analysis, the existing traffic volumes were grown by 2.0% per year for four years to estimate the background 2017 traffic volumes. Our understanding is that there are no approved developments within the vicinity of the site that will have a significant impact on the study intersections. Figure 5 shows the background 2017 peak hour traffic volumes.

Trip Generation

Average weekday daily and peak hour trips were calculated using the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9th Edition. Table 1 shows a summary of the trip generation calculations.

Table 1

Trip Generation – Average Weekday Traffic

Land Use (ITE Code)	Size	Daily (vpd)		AM Peak Hour (vph)		PM Peak Hour (vph)	
		Enter	Exit	Enter	Exit	Enter	Exit
General Office (710)	75,000 s.f.	527	527	134	18	28	135

Note that the gym is expected to be ancillary to the office / classroom building, but the trip generation potential of the 65,000 s.f. office / classroom building was based on 75,000 s.f. of space to account for a small number of trips that the gym might generate. No reductions for transit, ride sharing, pedestrian or bicycle trips were applied in this analysis.

Site Traffic Distribution and Assignment

The following site traffic distribution was developed based on existing land uses, traffic patterns in the area, and engineering judgment:

Inbound

- 70% from the northwest along Fairfax County Parkway
- 20% from the southeast along Fairfax County Parkway
- 10% from the northeast along John J. Kingman Road

Outbound

- 45% to the northwest along Fairfax County Parkway
- 45% to the southeast along Fairfax County Parkway
- 10% to the northeast along John J. Kingman Road

Figure 6 shows the site trip distribution, Figure 7 shows the site traffic assignment to the study intersections, and Figure 8 shows the projected AM and PM peak hour build-out traffic volumes.

Traffic Capacity Analysis

Traffic capacity analysis for the study intersections was performed using Synchro 8. Synchro is a comprehensive software package that allows the user to model signalized and unsignalized intersections to determine levels-of-service based on the thresholds specified in the 2010 Highway Capacity Manual (HCM) published by the Transportation Research Board.

Table 2 summarizes the capacity analysis results for the signalized intersection of Fairfax County Parkway at John J. Kingman Road, and all of the Synchro output is enclosed for reference.

Table 2
Level-of-Service Summary for Fairfax County Parkway at John J. Kingman Road

CONDITION	LANE GROUP	AM PEAK HOUR			PM PEAK HOUR		
		Lane LOS	Lane Queue (ft)	Overall LOS (Delay)	Lane LOS	Lane Queue (ft)	Overall LOS (Delay)
Existing 2013 Conditions	EBL	D	609	C (29.3)	E	170	D (39.0)
	EBT	A	253		C	556	
	EBR	A	2		A	0	
	WBL	E	48		E	17	
	WBT	D	507		D	413	
	WBR	B	246		A	0	
	NBL	E	27		E	83	
	NBT/R	D	30		C	78	
	SBL	E	75		E	725	
	SBL/T/R	C	75		C	456	
	SBR	A	0		C	411	
Background 2017 Conditions	EBL	D	732	C (32.2)	E	182	D (43.6)
	EBT	A	283		D	628	
	EBR	A	5		A	0	
	WBL	E	51		E	17	
	WBT	D	600		D	454	
	WBR	B	309		A	0	
	NBL	E	28		E	86	
	NBT/R	D	32		C	84	
	SBL	E	80		E	821	
	SBL/T/R	C	80		C	606	
	SBR	A	0		C	510	
Build 2017 Conditions	EBL	D	741	C (33.0)	E	182	D (49.2)
	EBT	B	297		D	665	
	EBR	A	29		A	0	
	WBL	E	94		E	31	
	WBT	D	608		D	454	
	WBR	C	317		A	0	
	NBL	E	43		F	208	
	NBT/R	D	41		E	196	
	SBL	E	81		E	821	
	SBL/T/R	D	108		D	681	
	SBR	A	7		D	622	

Capacity analysis indicates that the intersection currently operates at LOS C during the AM peak hour and at LOS D during the PM peak hour. The intersection is expected to continue to operate at LOS C during the AM peak hour and at LOS D during the PM peak hour under the background and build 2017 conditions.

Note that the southeastbound left-turn movement on Fairfax County Parkway experiences long delays and queues in the AM peak hour, and the southwestbound John J. Kingman Road approach experiences long delays and queues in the PM peak hour. However, the proposed site traffic is not expected to degrade these movements significantly because the projected traffic volumes can generally be served with minimum green times at the signal.

Table 3 summarizes the capacity analysis results for the unsignalized intersection of John J. Kingman Road at Santjer Drive, and all of the Synchro output is enclosed for reference.

Table 3
Level-of-Service Summary for John J. Kingman Road at Santjer Drive

CONDITION	LANE GROUP	AM PEAK HOUR			PM PEAK HOUR		
		Lane LOS	Lane Queue (ft)	Overall LOS (Delay)	Lane LOS	Lane Queue (ft)	Overall LOS (Delay)
Existing 2013 Conditions	EBL/T[2] WBT/R SBL/R[1]	A - A	1 - 9	N/A[3]	A - A	2 - 1	N/A[3]
Background 2017 Conditions	EBL/T[2] WBT/R SBL/R[1]	A - A	1 - 9	N/A[3]	A - A	2 - 1	N/A[3]
Build 2017 Conditions	EBL/T[2] WBT/R SBL/R[1]	A - B	1 - 27	N/A[3]	A - A	2 - 5	N/A[3]

1. Level of service for minor approach
2. Level of service for major street left turn movement
3. HCM methodology does not provide lane group or overall LOS, delay, and queue lengths for major street through movements or right turns at unsignalized intersections

Capacity analysis indicates that all lane groups currently operate at an acceptable LOS and are expected to continue to operate at an acceptable LOS with minimal queues under the background and build conditions during both the AM and PM peak hours.

Table 4 summarizes the capacity analysis results for the unsignalized intersection of Santjer Drive and the proposed site driveway, and all of the Synchro output is enclosed for reference.

Table 4
Level-of-Service Summary for Santjer Drive and Proposed Site Driveway

CONDITION	LANE GROUP	AM PEAK HOUR			PM PEAK HOUR		
		Lane LOS	Lane Queue (ft)	Overall LOS (Delay)	Lane LOS	Lane Queue (ft)	Overall LOS (Delay)
Build 2017 Conditions	EBL/T[2] WBT/R SBL/R[1]	A - A	8 - 2	N/A[3]	A - A	2 - 15	N/A[3]

1. Level of service for minor approach
2. Level of service for major street left turn movement
3. HCM methodology does not provide lane group or overall LOS, delay, and queue lengths for major street through movements or right turns at unsignalized intersections

Capacity analysis indicates that all lane groups are expected to operate at an acceptable LOS with minimal queues during both the AM and PM peak hours under build conditions. The projected traffic volumes on Santjer Drive at the proposed driveway do not warrant construction of a dedicated left-turn lane into the site.

Conclusions

Based on capacity analysis results, all of the study intersections are expected to operate at an acceptable LOS during both the AM and PM peak hours. The proposed OSEG Training Facility is not expected to have a significant impact on the existing transportation network. The projected traffic volumes on Santjer Drive at the proposed driveway do not warrant construction of a dedicated left-turn lane into the site. Figure 9 shows the proposed roadway configuration for the study intersections.

In the AM peak hour, ITE predicts 134 inbound vehicles, which is a rate of 2.23 vehicles per minute. It is reasonable to expect the actual flow rate could exceed 5.00 vehicles per minute during short periods within the peak hour. There is approximately 100 feet of storage on each entry lane between Santjer Drive and the entry gates, which is enough room to store four vehicles in each lane. To minimize the risk of entering traffic spilling back from the entry gates and blocking Santjer Drive, the gates should be designed to allow at least 2.50 vehicles per minute on each inbound lane.

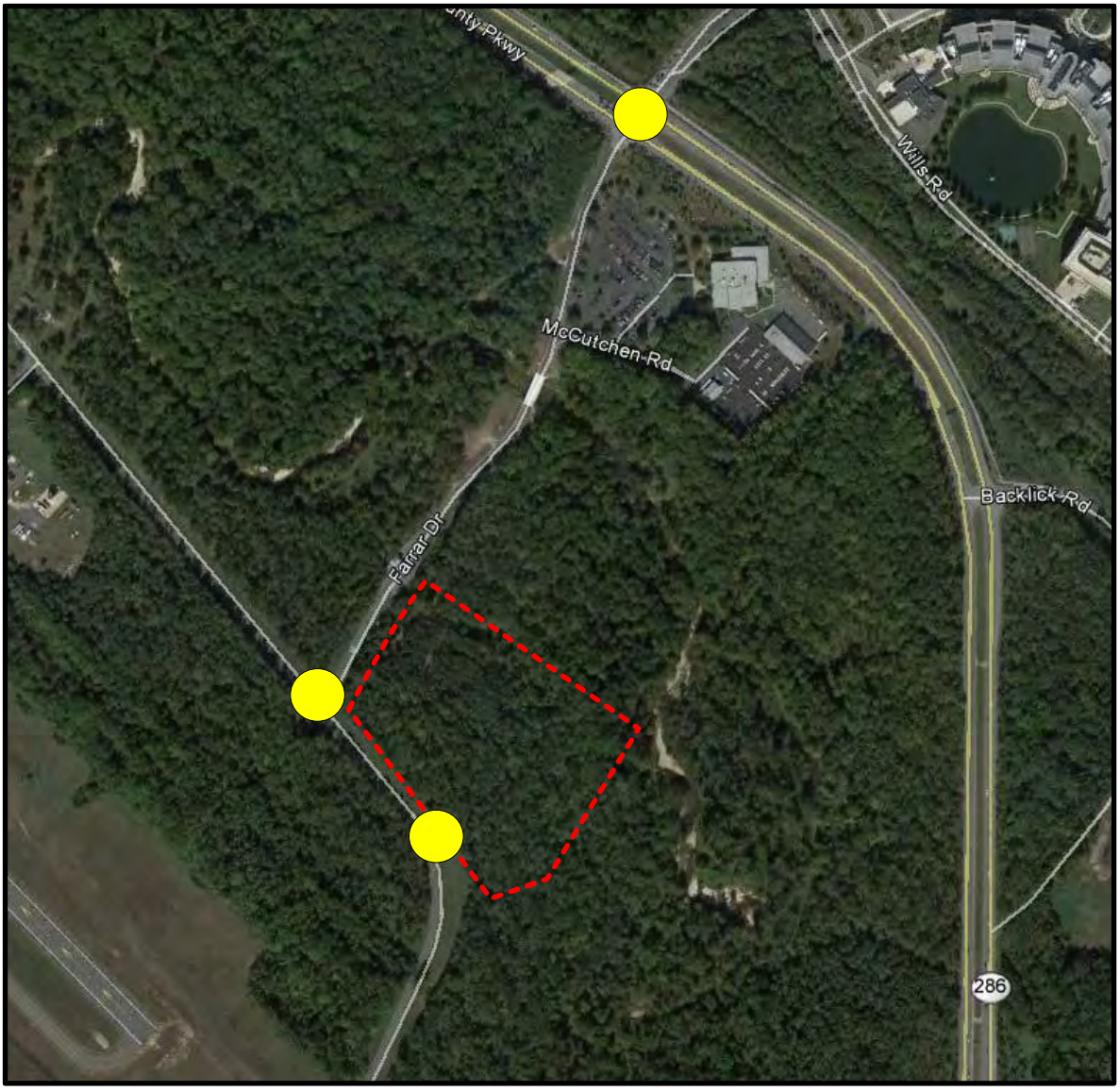
Please contact me at (804) 217-8560 if you have any questions about this report, or if you need any additional information.

Sincerely,
Ramey Kemp & Associates, Inc.

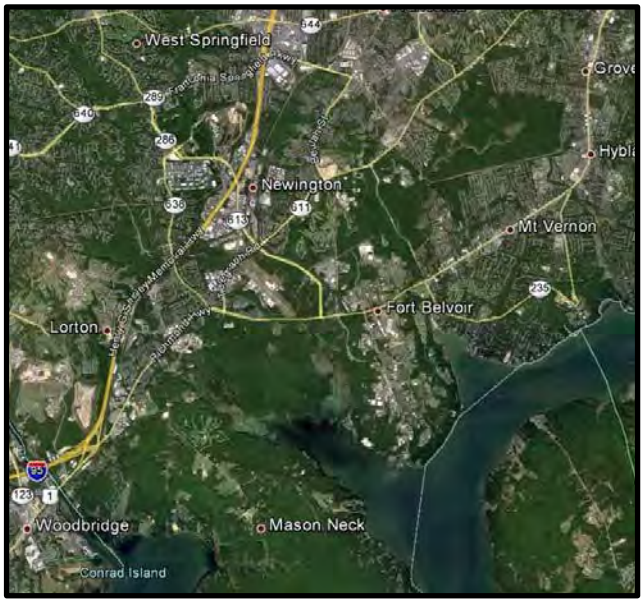
Carl Hultgren, P.E., PTOE
Regional Manager

Enclosures: Traffic figures, Traffic count data, Synchro output

Copy to: Mr. Christopher Landgraf
Mr. Duane Alston



INSET



Site Location

LEGEND

Proposed Site Location

Study Intersection

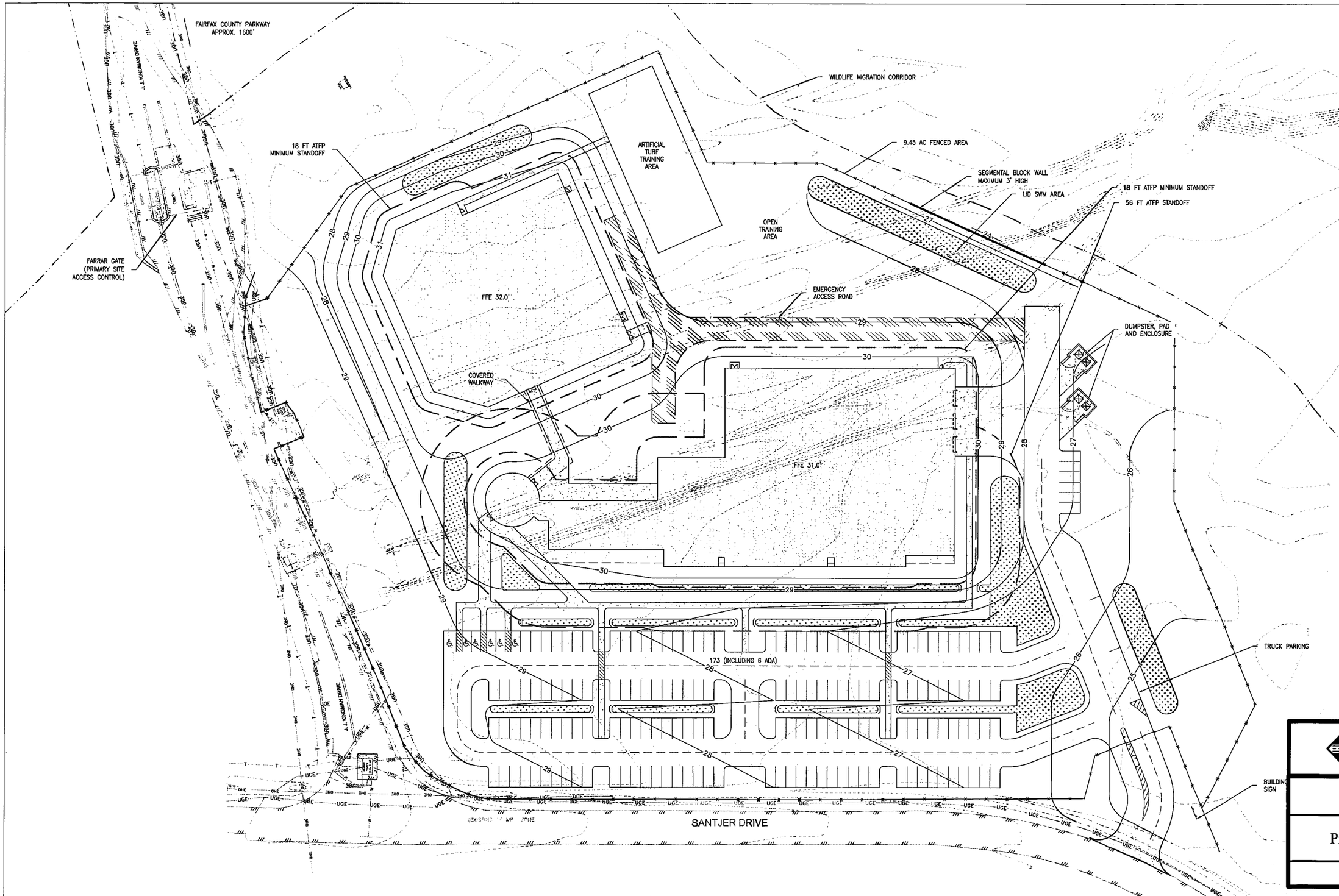
N

RAMEY KEMP & ASSOCIATES

OSEG Training Center
Fort Belvoir, Virginia

Site Location

Scale: Not to Scale | Figure 1



LEGEND

- PROPOSED CONTOUR
- EXISTING CONTOUR
- ATFP LIMITS
- FENCE LINE
- WILDLIFE MIGRATION CORRIDOR
- BUILDING
- SIDEWALK
- STORMWATER MANAGEMENT AREA
- PAVEMENT
- EMERGENCY ACCESS ROAD

NOTE
1. PARKING PLAN ACCOMMODATES UP TO 80 INSTRUCTORS, 100 STUDENTS AND GUESTS, AND 25 GOVERNMENT VEHICLES.

RAMEY KEMP & ASSOCIATES

OSEG Traning Facility
Fort Belvoir, Virginia

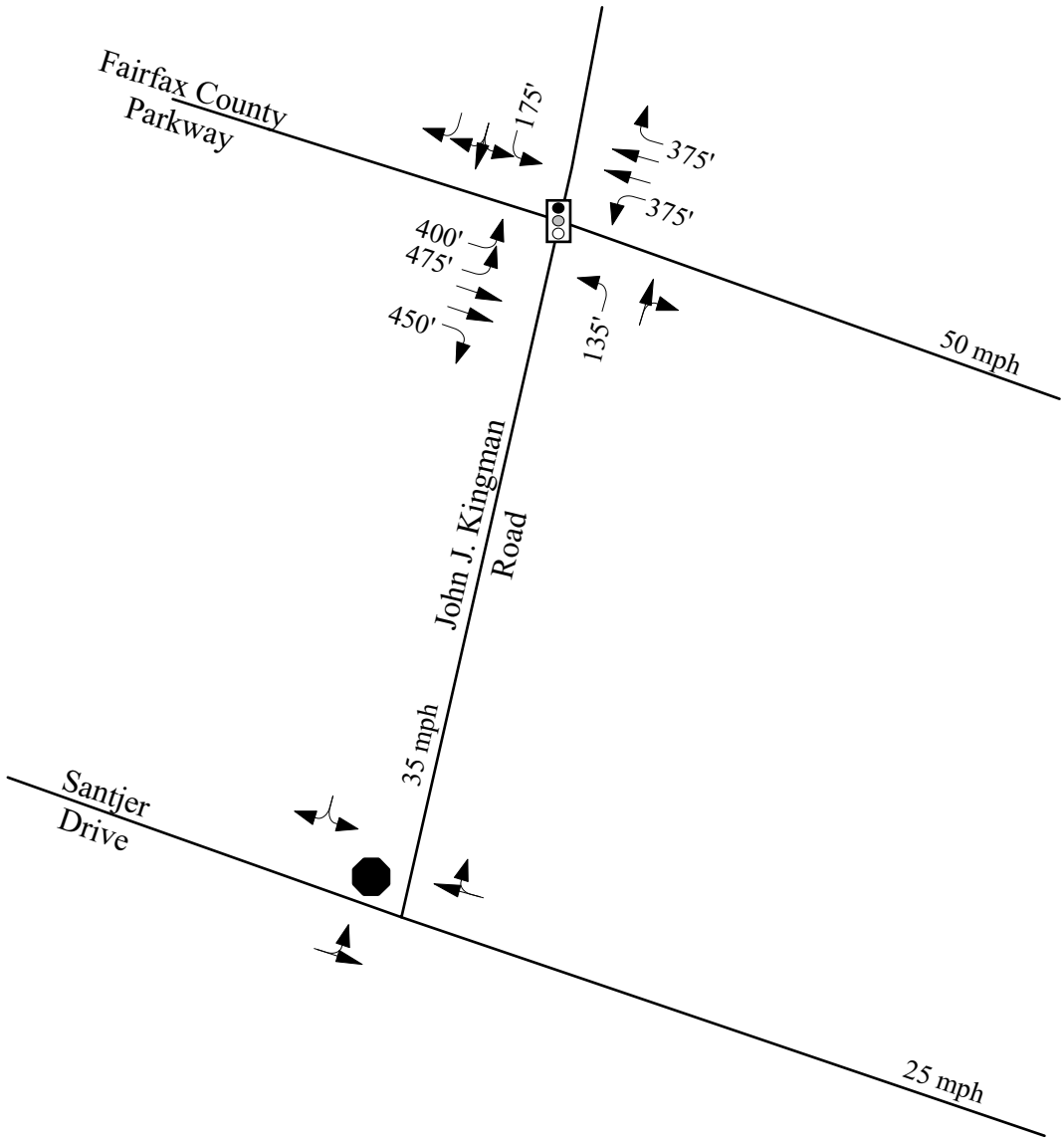
Preliminary Site Layout

Scale: Not to Scale | Figure 2

SCALE: 1" = 40'
40' 0 40'

Wiley|Wilson™ Constant Progress

OTC | Site Plan | C-2



LEGEND

- Existing Lane Configuration
- XX' Storage Length (feet)
- Signalized Intersection
- Stop Controlled Approach

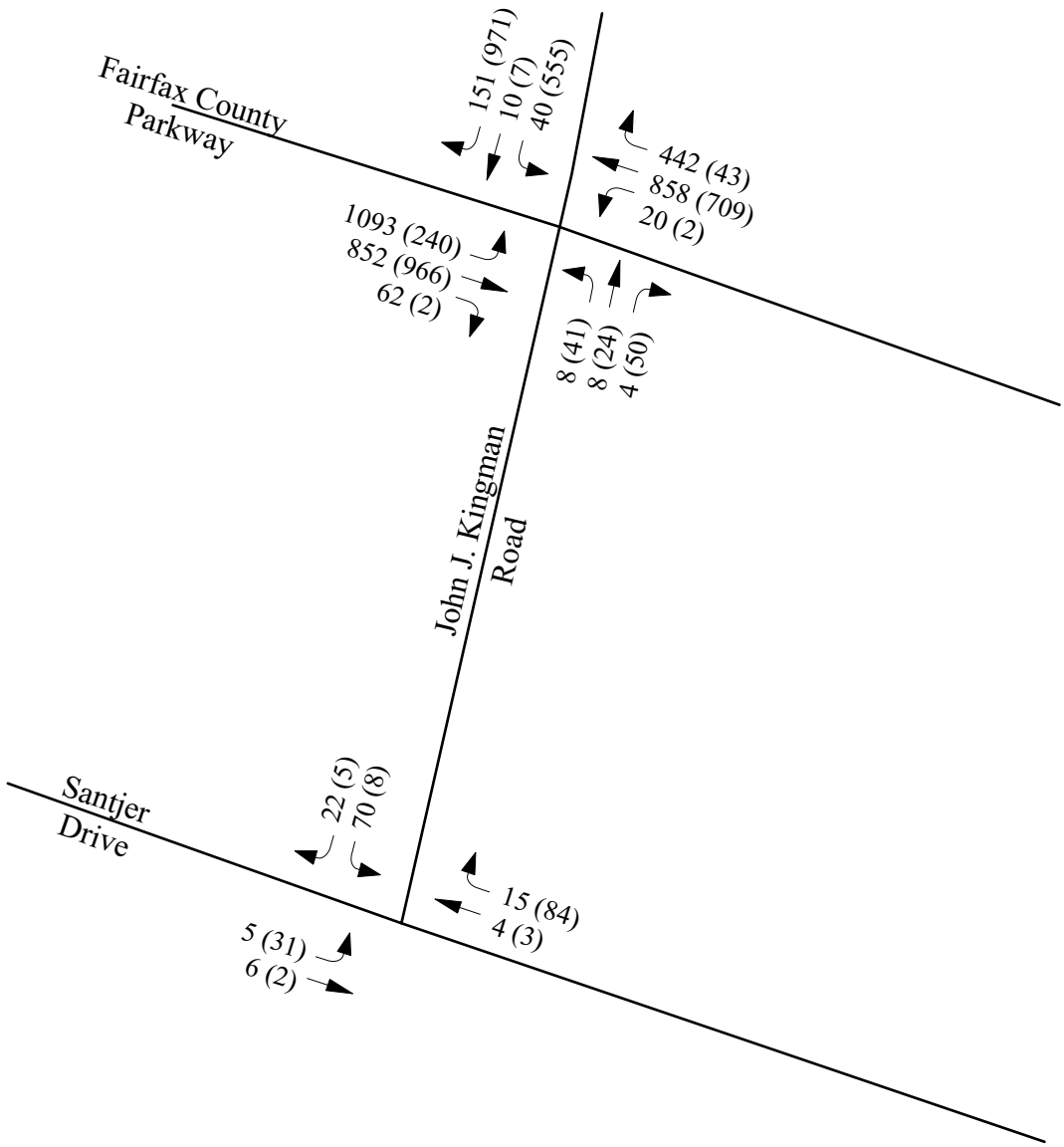
N

RAMEY KEMP & ASSOCIATES

OSEG Training Center
Fort Belvoir, Virginia

Existing Lane Configuration

Scale: Not to Scale | Figure 3



LEGEND

XX AM Peak Hour Volumes

(XX) PM Peak Hour Volumes

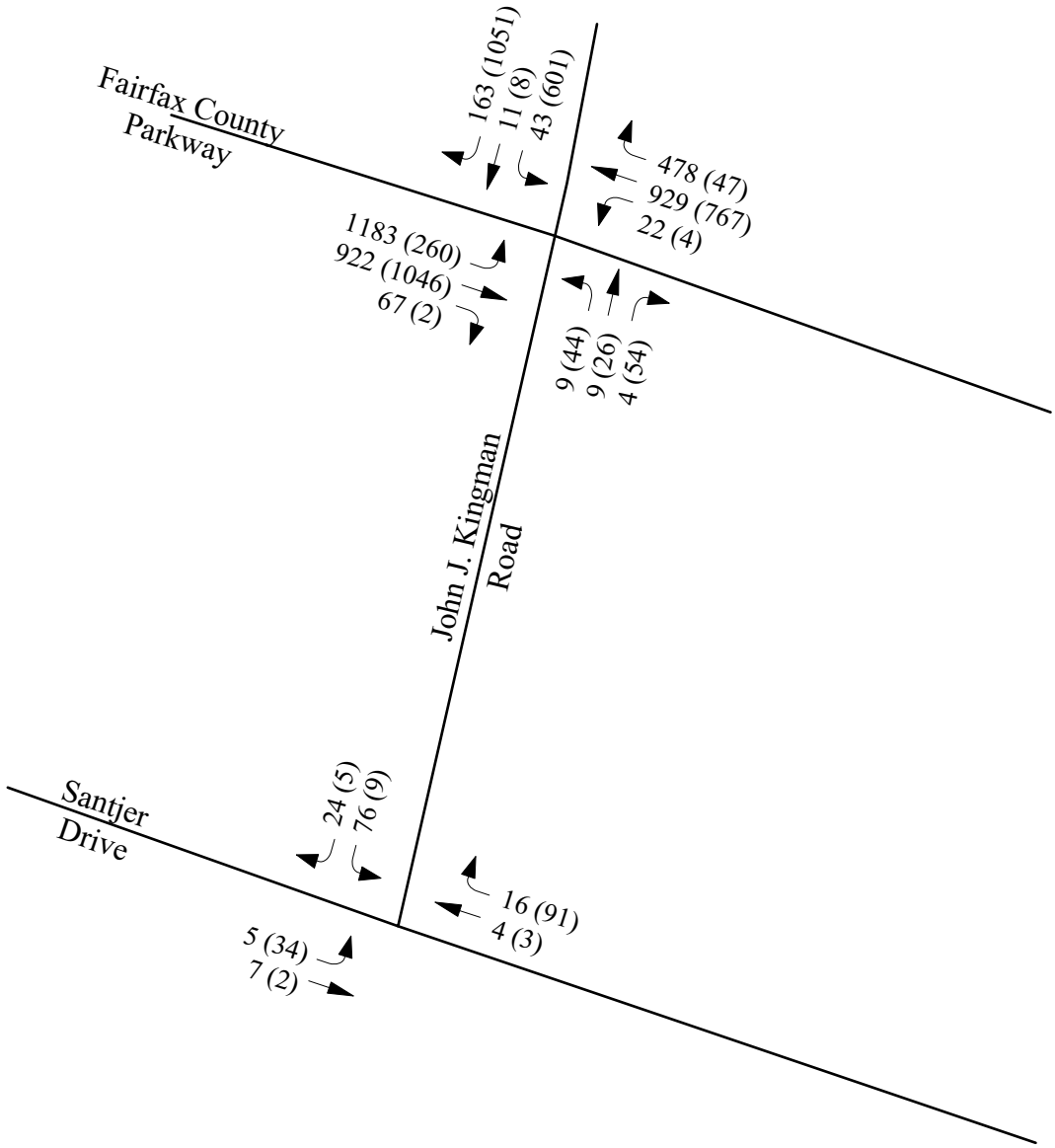
N

RAMEY KEMP & ASSOCIATES

OSEG Training Center
Fort Belvoir, Virginia

Existing 2013 Traffic Volumes

Scale: Not to Scale | Figure 4



LEGEND

XX AM Peak Hour Volumes

(XX) PM Peak Hour Volumes

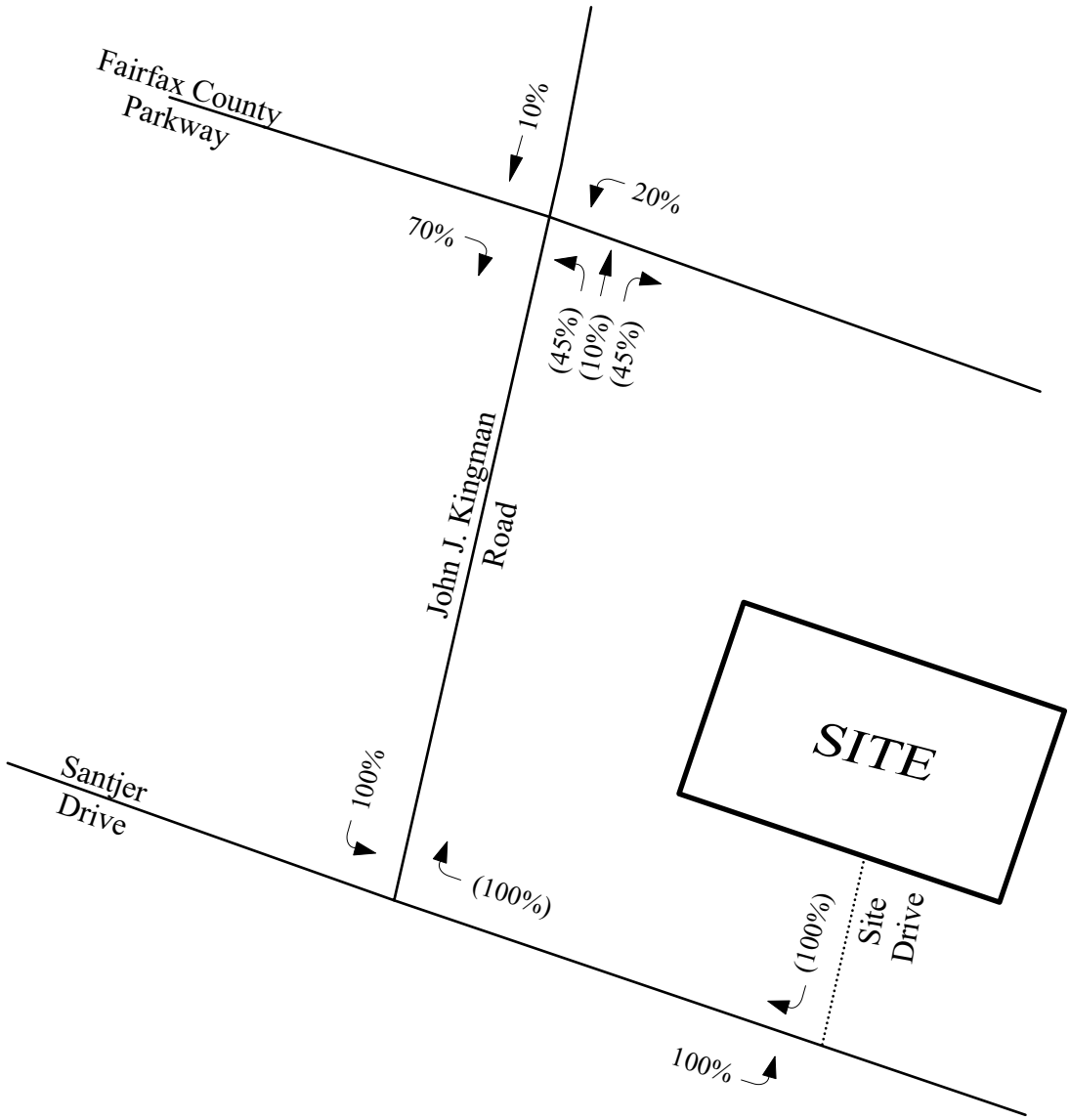
N

RAMEY KEMP & ASSOCIATES

OSEG Training Center
Fort Belvoir, Virginia

Background 2017 Traffic Volumes

Scale: Not to Scale | Figure 5



LEGEND

XX% Entering Site Trip Distribution

(XX%) Exiting Site Trip Distribution

N

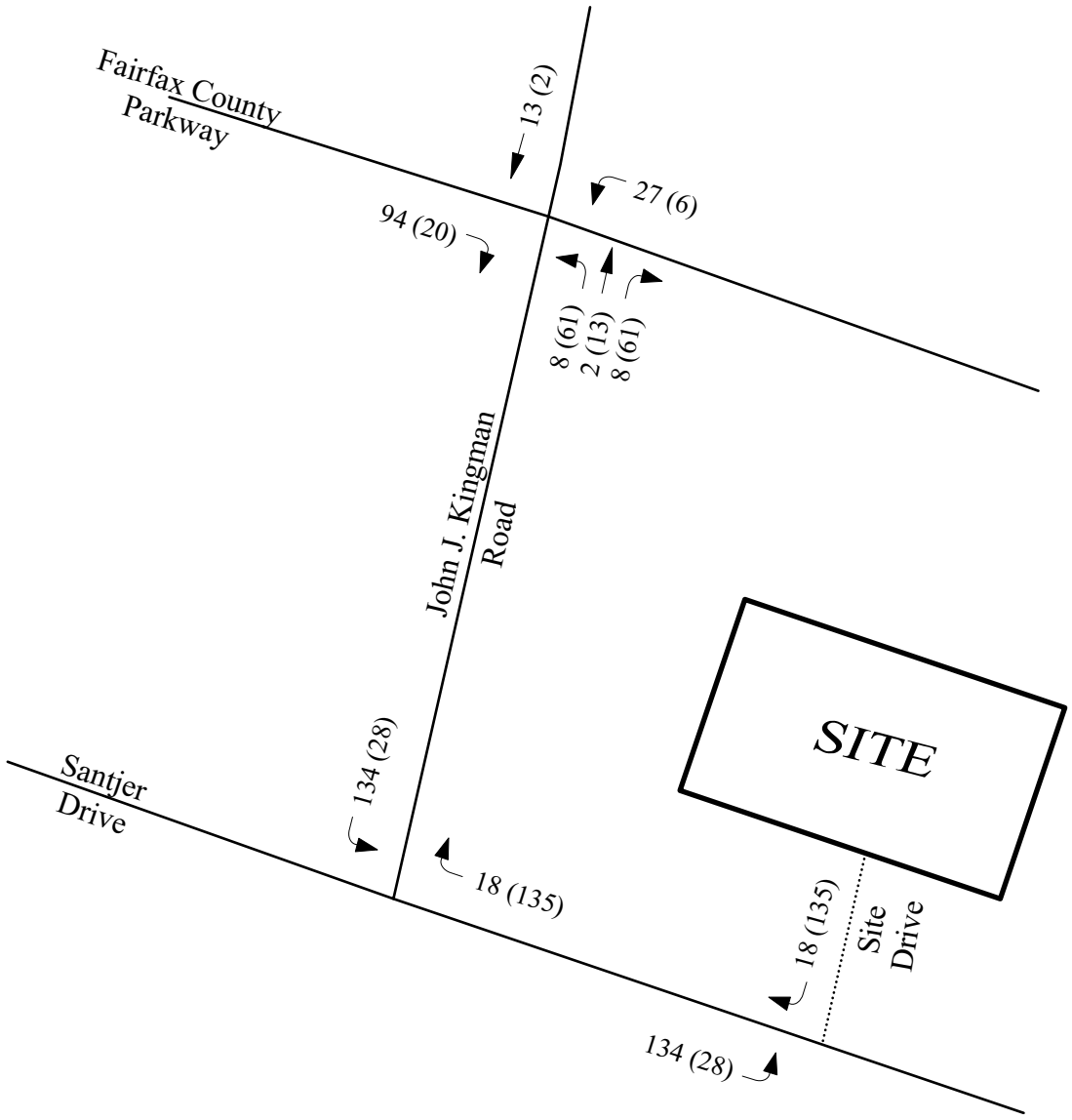
RAMEY KEMP & ASSOCIATES

OSEG Training Center
Fort Belvoir, Virginia

Site Trip Distribution

Scale: Not to Scale

Figure 6



LEGEND

XX AM Peak Hour Trips

(XX) PM Peak Hour Trips

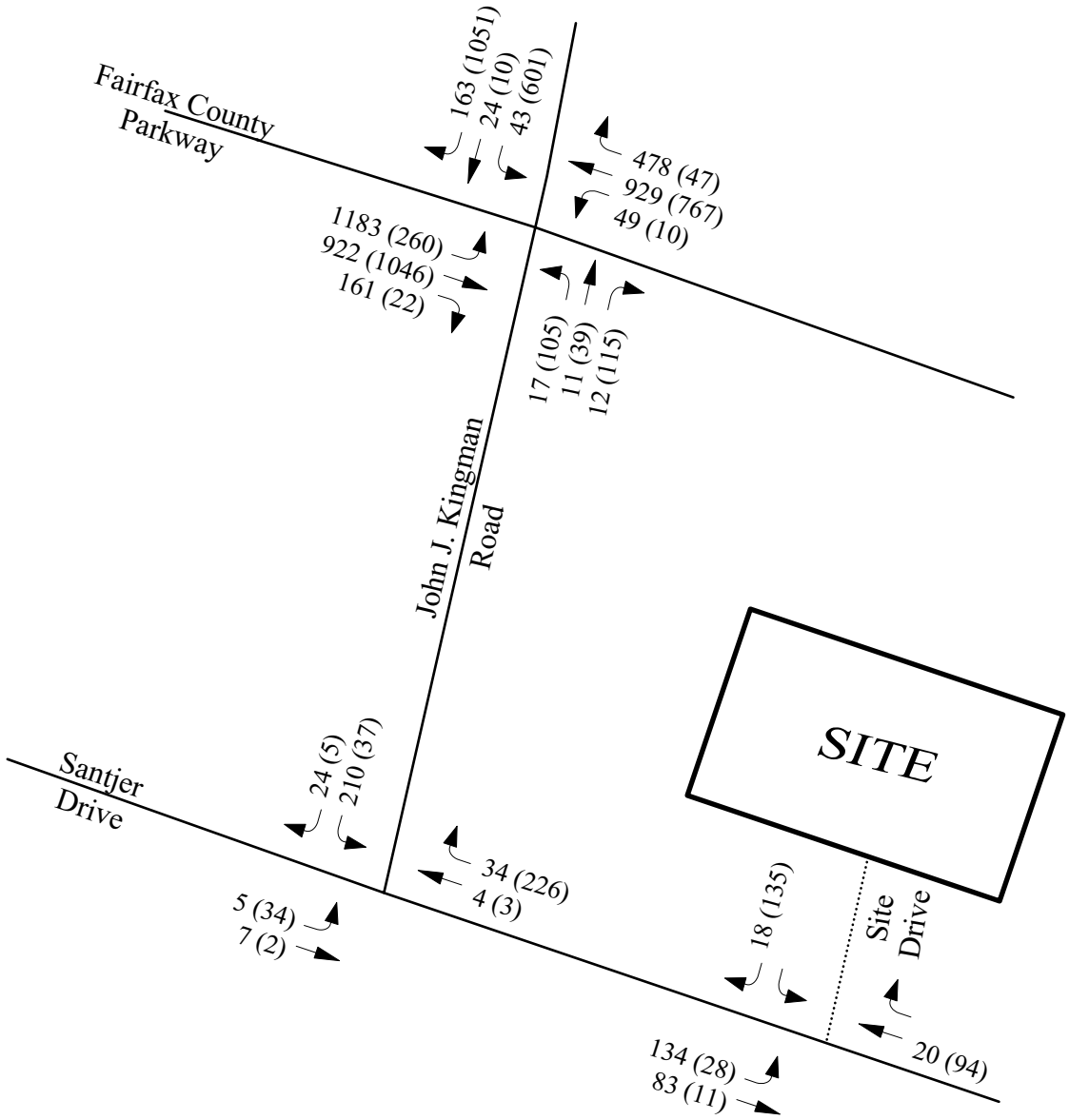
N

RAMEY KEMP & ASSOCIATES

OSEG Training Center
Fort Belvoir, Virginia

Site Trip Assignment

Scale: Not to Scale | Figure 7



LEGEND

XX AM Peak Hour Volumes

(XX) PM Peak Hour Volumes

N

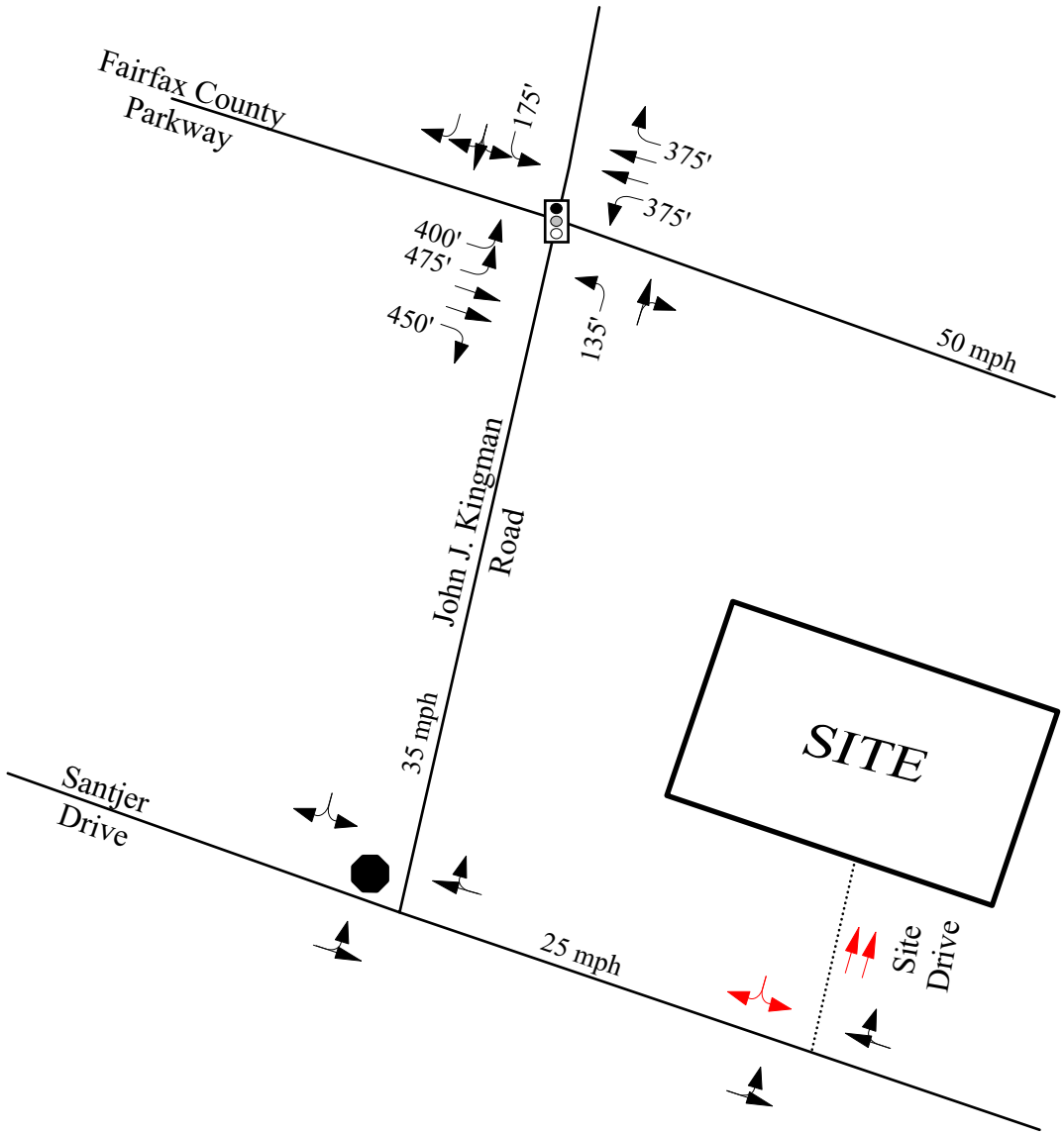
RAMEY KEMP & ASSOCIATES

OSEG Training Center
Fort Belvoir, Virginia

Build 2017 Traffic Volumes

Scale: Not to Scale

Figure 8



LEGEND

- Existing Lane Configuration
- XX' Storage Length (feet)
- Signalized Intersection
- Stop Controlled Approach
- Recommended Improvement

N

RAMEY KEMP & ASSOCIATES

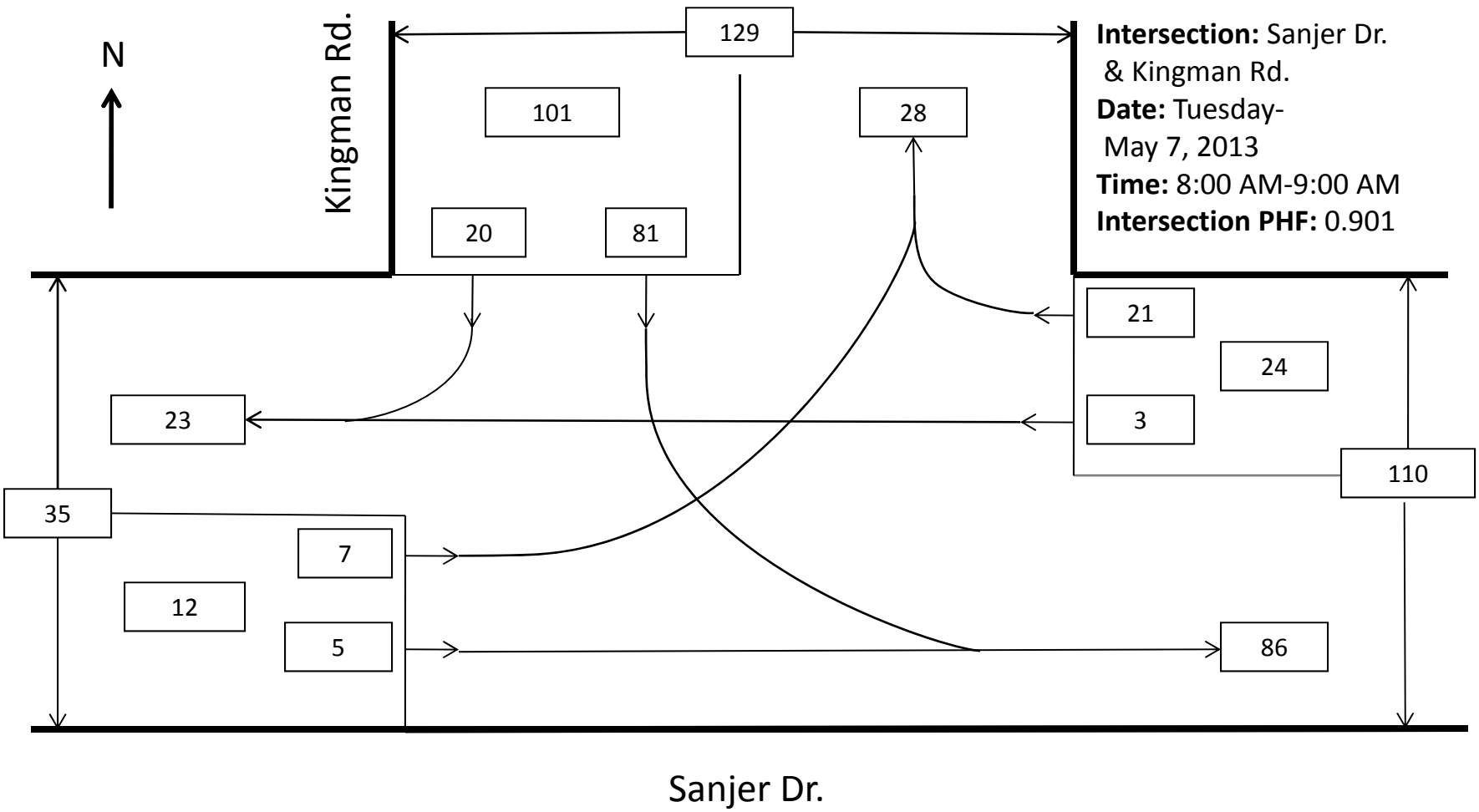
OSEG Training Center
Fort Belvoir, Virginia

Recommended Lane Configuration

Scale: Not to Scale | Figure 9

Technical Traffic services

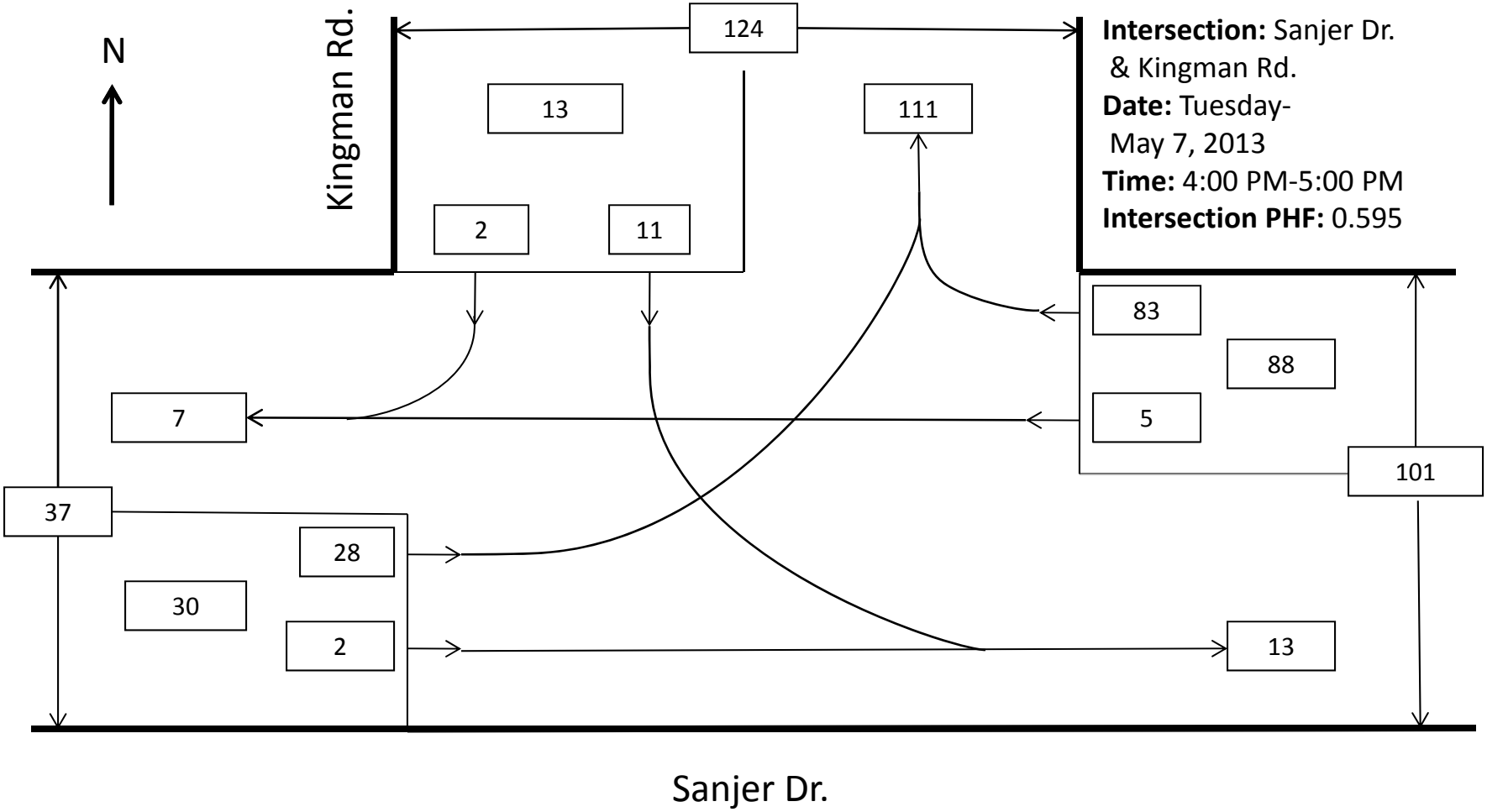
AM Peak Hour



Intersection: Sanjer Dr. & Kingman Rd.
Date: Tuesday- May 7, 2013
Time: 8:00 AM-9:00 AM
Intersection PHF: 0.901

Technical Traffic services

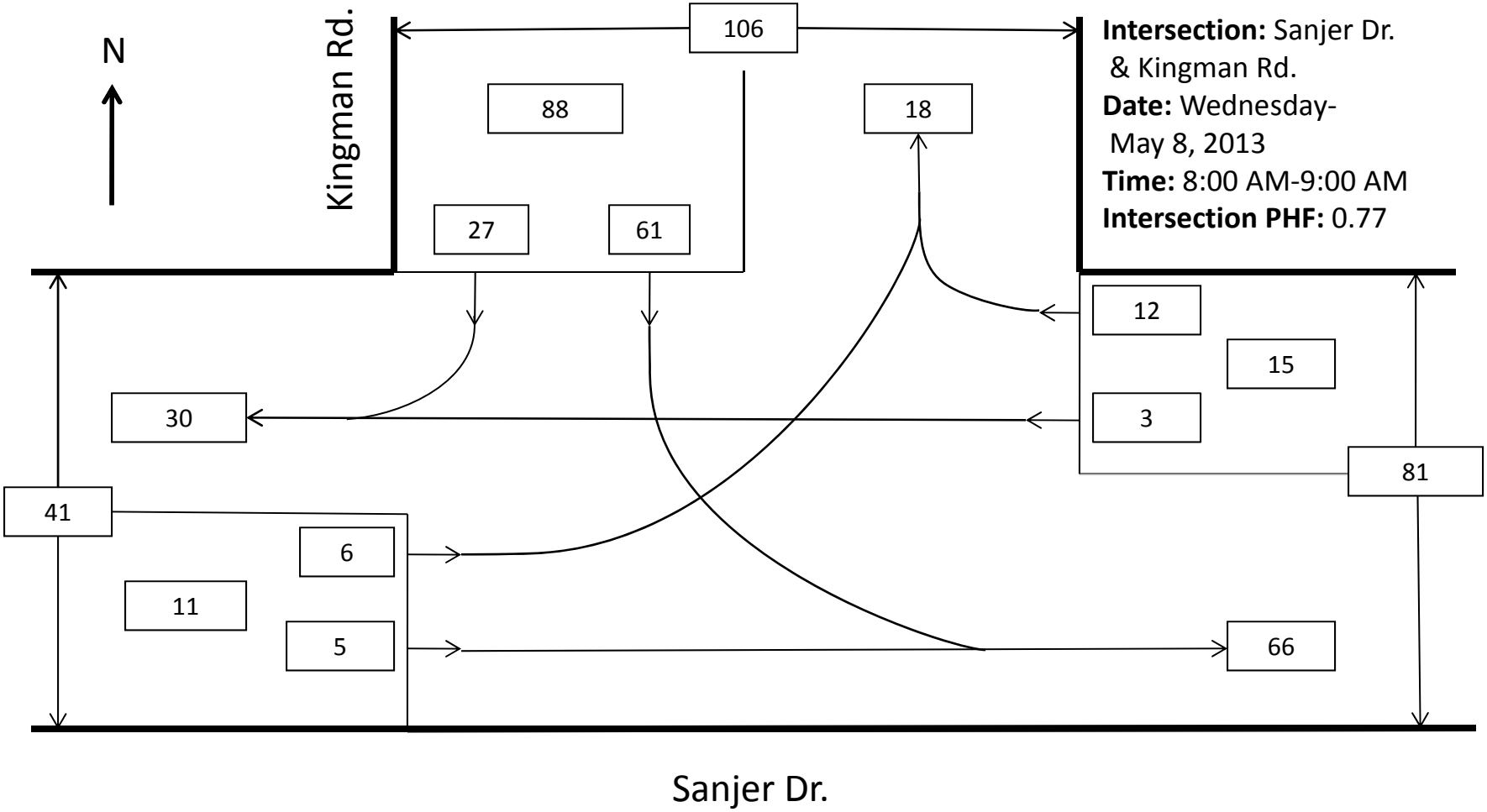
PM Peak Hour



Intersection: Sanjer Dr. & Kingman Rd.
Date: Tuesday- May 7, 2013
Time: 4:00 PM-5:00 PM
Intersection PHF: 0.595

Technical Traffic services

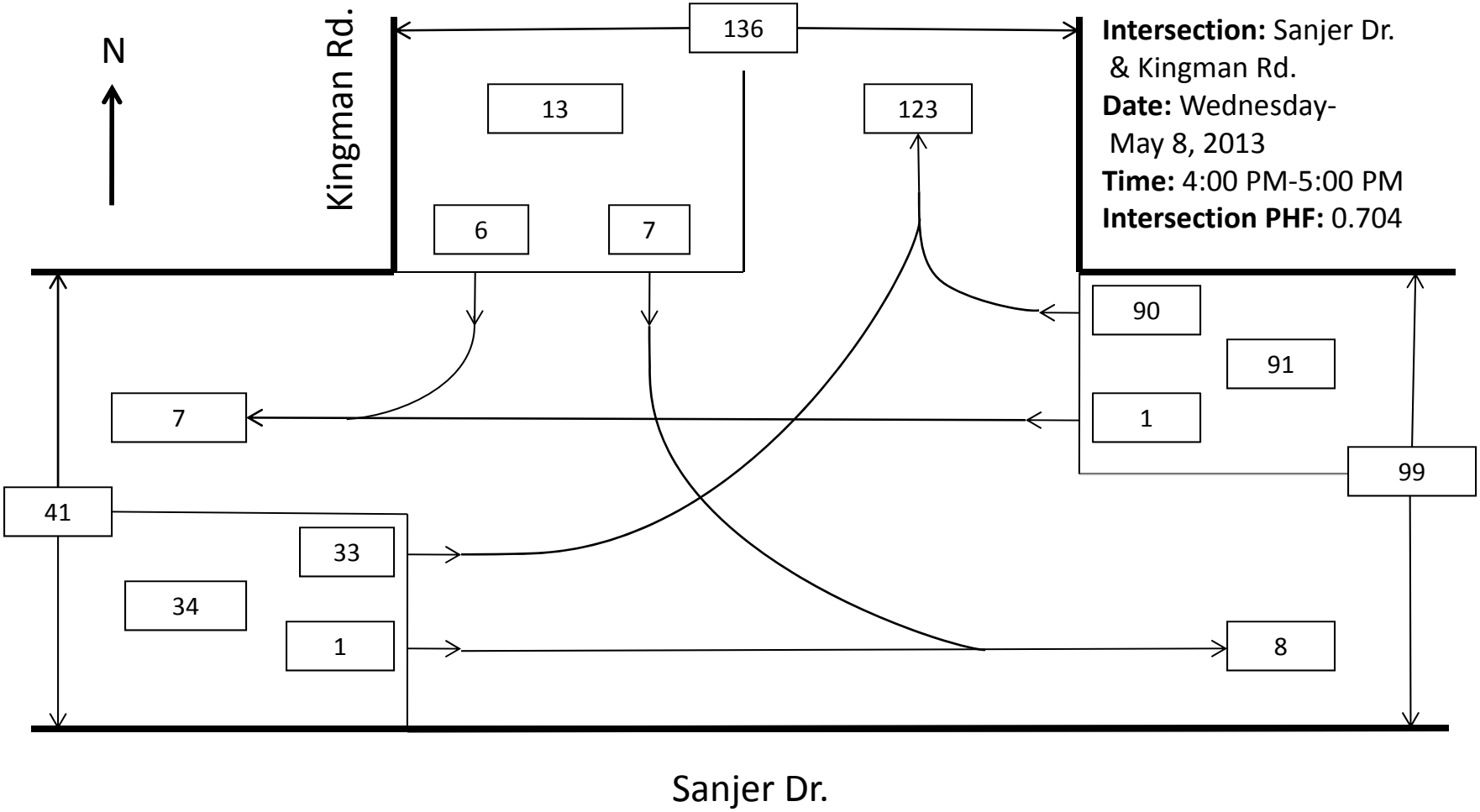
AM Peak Hour



Intersection: Sanjer Dr. & Kingman Rd.
Date: Wednesday- May 8, 2013
Time: 8:00 AM-9:00 AM
Intersection PHF: 0.77

Technical Traffic services

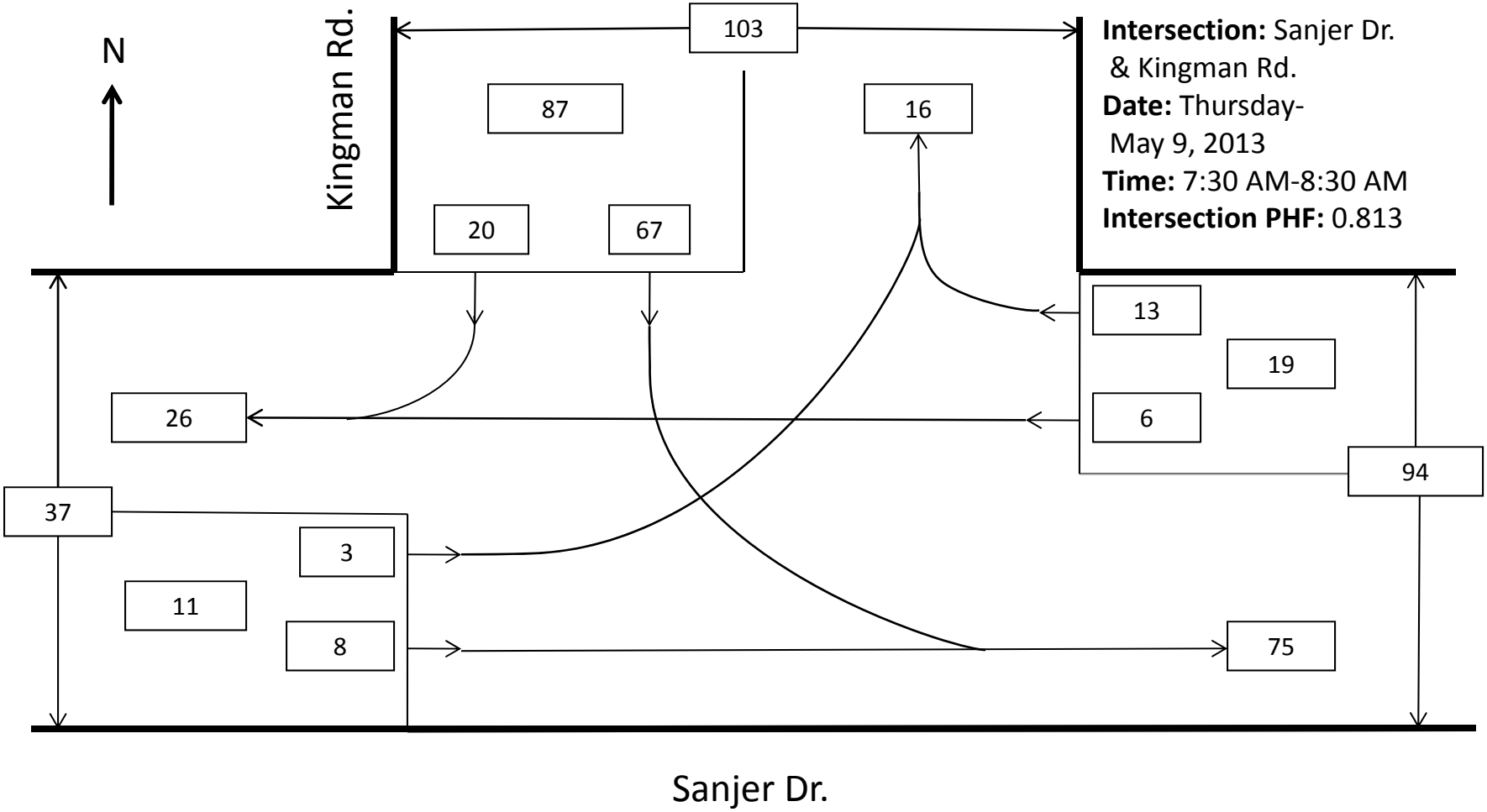
PM Peak Hour



Intersection: Sanjer Dr. & Kingman Rd.
Date: Wednesday- May 8, 2013
Time: 4:00 PM-5:00 PM
Intersection PHF: 0.704

Technical Traffic services

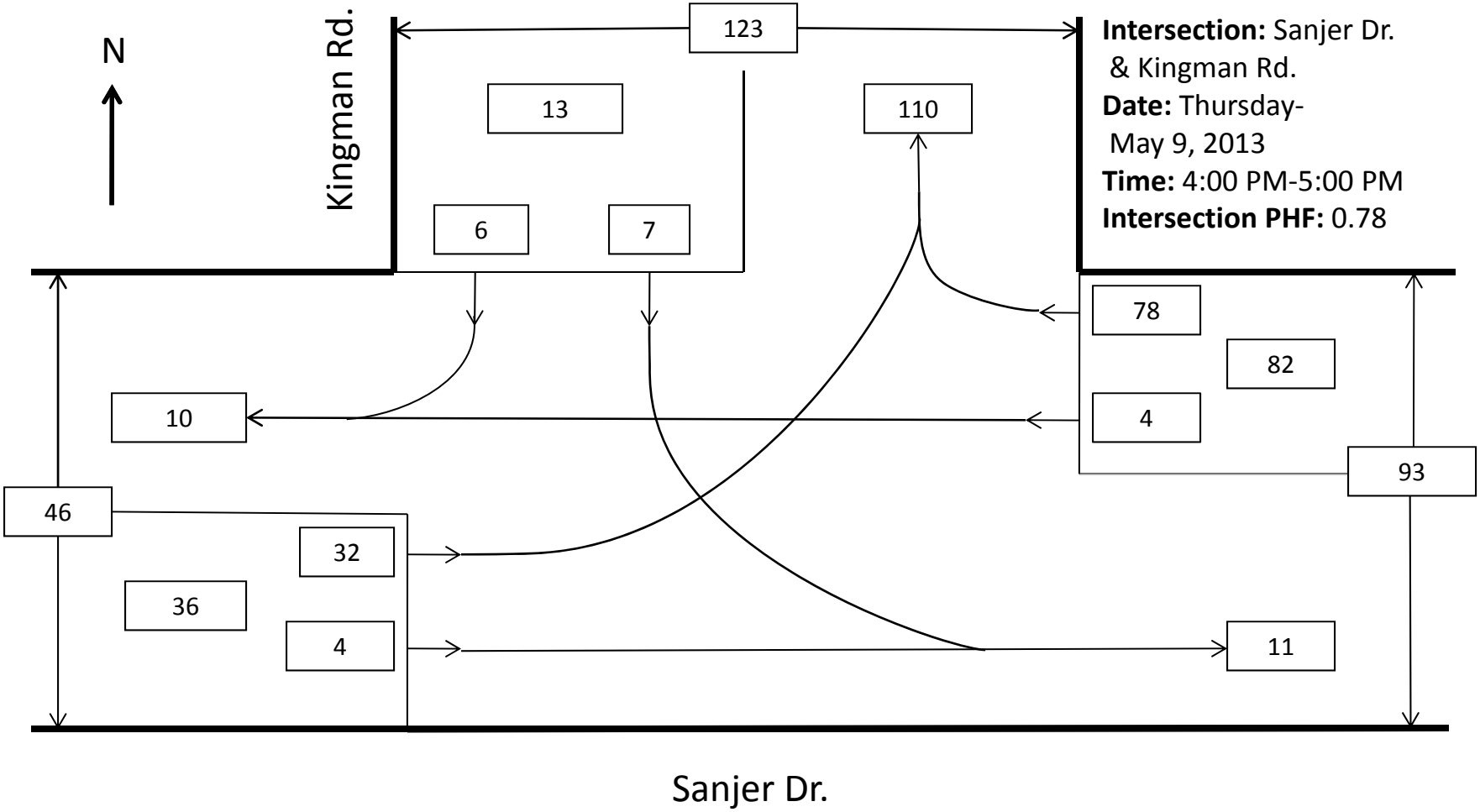
AM Peak Hour



Intersection: Sanjer Dr. & Kingman Rd.
Date: Thursday- May 9, 2013
Time: 7:30 AM-8:30 AM
Intersection PHF: 0.813

Technical Traffic services

PM Peak Hour



Intersection: Sanjer Dr. & Kingman Rd.
Date: Thursday- May 9, 2013
Time: 4:00 PM-5:00 PM
Intersection PHF: 0.78

1: John J Kingman Road & Fairfax County Parkway

Timing Plan: AM Peak Hour

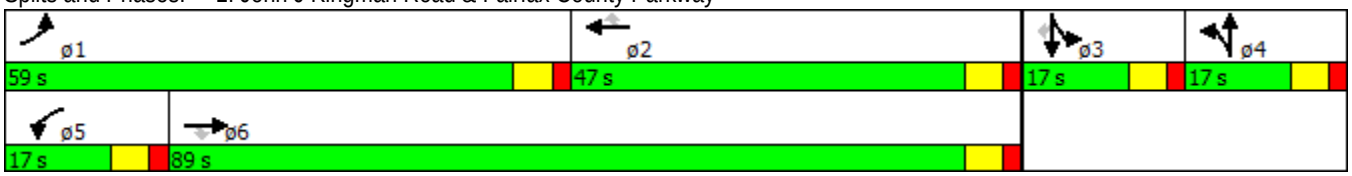
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1093	852	62	20	858	442	8	8	4	40	10	151
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt			0.850			0.850		0.954			0.874	0.850
Flt Protected	0.950			0.950			0.950			0.950	0.998	
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	1777	0	1681	1479	1504
Flt Permitted	0.950			0.950			0.950			0.950	0.998	
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	1770	1777	0	1681	1479	1504
Satd. Flow (RTOR)			117			339		4			77	164
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)										10%		46%
Lane Group Flow (vph)	1214	947	69	22	953	491	9	13	0	40	92	91
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases			6			2						3
Detector Phase	1	6	6	5	2	2	4	4		3	3	3
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	17.0	16.0	16.0	17.0	16.0	16.0	16.0	16.0		17.0	17.0	17.0
Total Split (s)	59.0	89.0	89.0	17.0	47.0	47.0	17.0	17.0		17.0	17.0	17.0
Total Split (%)	42.1%	63.6%	63.6%	12.1%	33.6%	33.6%	12.1%	12.1%		12.1%	12.1%	12.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	None
Act Effct Green (s)	49.3	89.4	89.4	9.2	43.7	43.7	8.4	8.4		10.3	10.3	10.3
Actuated g/C Ratio	0.40	0.73	0.73	0.08	0.36	0.36	0.07	0.07		0.08	0.08	0.08
v/c Ratio	0.88	0.37	0.06	0.17	0.76	0.63	0.07	0.10		0.28	0.47	0.33
Control Delay	43.0	8.8	0.3	60.8	41.8	15.2	60.8	50.2		62.0	25.6	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	43.0	8.8	0.3	60.8	41.8	15.2	60.8	50.2		62.0	25.6	3.2
LOS	D	A	A	E	D	B	E	D		E	C	A
Approach Delay		27.2			33.1			54.5			23.0	
Approach LOS		C			C			D			C	
Queue Length 50th (ft)	481	177	0	18	398	108	7	7		34	13	0
Queue Length 95th (ft)	609	253	2	48	507	246	27	30		75	75	0
Internal Link Dist (ft)		2339			1807			544			1799	
Turn Bay Length (ft)	400		450	300		300	150			200		
Base Capacity (vph)	1566	2580	1186	190	1262	782	190	195		181	228	308
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.78	0.37	0.06	0.12	0.76	0.63	0.05	0.07		0.22	0.40	0.30

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 122.6
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 29.3 Intersection LOS: C
Intersection Capacity Utilization 74.5% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: John J Kingman Road & Fairfax County Parkway



Intersection	
Intersection Delay, s/veh	7.1

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Vol, veh/h	5	6	4	15	70	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	7	4	17	78	24

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	21	0	-	0	31	13
Stage 1	-	-	-	-	13	-
Stage 2	-	-	-	-	18	-
Follow-up Headway	2	-	-	-	4	3
Pot Capacity-1 Maneuver	1595	-	-	-	983	1067
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	1005	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1595	-	-	-	979	1067
Mov Capacity-2 Maneuver	-	-	-	-	979	-
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	1001	-

Approach	EB	WB	SW
HCM Control Delay, s	3	0	9

Minor Lane / Major Mvmt	EBL	EBT	WBT	WBR	SWLn1
Capacity (veh/h)	1595	-	-	-	999
HCM Lane V/C Ratio	0.003	-	-	-	0.102
HCM Control Delay (s)	7.265	0	-	-	9
HCM Lane LOS	A	A			A
HCM 95th %tile Q(veh)	0.01	-	-	-	0.341

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

1: John J Kingman Road & Fairfax County Parkway

Timing Plan: PM Peak Hour

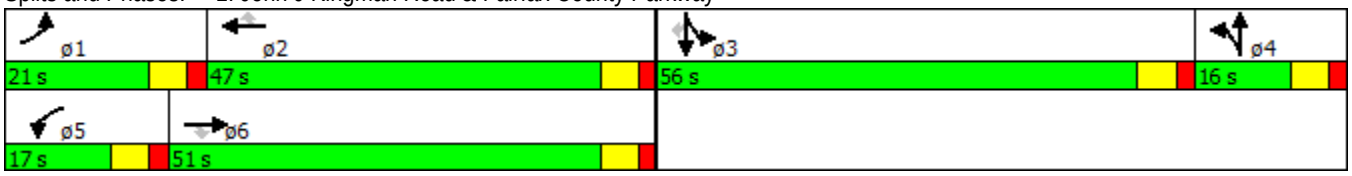
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	966	2	4	709	43	41	24	50	555	7	971
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt			0.850			0.850		0.899			0.868	0.850
Flt Protected	0.950			0.950			0.950			0.950	0.995	
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	1675	0	1681	1464	1504
Flt Permitted	0.950			0.950			0.950			0.950	0.995	
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	1770	1675	0	1681	1464	1504
Satd. Flow (RTOR)			117			117		56			296	304
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)										10%		47%
Lane Group Flow (vph)	267	1073	2	4	788	48	46	83	0	555	577	572
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases			6			2						3
Detector Phase	1	6	6	5	2	2	4	4		3	3	3
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	17.0	16.0	16.0	17.0	16.0	16.0	16.0	16.0		17.0	17.0	17.0
Total Split (s)	21.0	51.0	51.0	17.0	47.0	47.0	16.0	16.0		56.0	56.0	56.0
Total Split (%)	15.0%	36.4%	36.4%	12.1%	33.6%	33.6%	11.4%	11.4%		40.0%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	None
Act Effct Green (s)	15.9	56.8	56.8	8.0	39.2	39.2	10.4	10.4		49.3	49.3	49.3
Actuated g/C Ratio	0.12	0.43	0.43	0.06	0.30	0.30	0.08	0.08		0.38	0.38	0.38
v/c Ratio	0.64	0.70	0.00	0.04	0.74	0.09	0.33	0.45		0.88	0.79	0.76
Control Delay	64.1	34.4	0.0	62.8	46.9	0.3	66.9	32.9		55.4	26.2	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	64.1	34.4	0.0	62.8	46.9	0.3	66.9	32.9		55.4	26.2	23.9
LOS	E	C	A	E	D	A	E	C		E	C	C
Approach Delay		40.3			44.3			45.0			35.0	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)	120	388	0	4	333	0	40	23		490	264	234
Queue Length 95th (ft)	170	556	0	17	413	0	83	78		#725	456	411
Internal Link Dist (ft)		2339			1807			544			1799	
Turn Bay Length (ft)	400		450	300		300	150			200		
Base Capacity (vph)	451	1540	755	178	1176	604	164	206		676	765	786
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.59	0.70	0.00	0.02	0.67	0.08	0.28	0.40		0.82	0.75	0.73

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 131
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 39.0 Intersection LOS: D
Intersection Capacity Utilization 74.0% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: John J Kingman Road & Fairfax County Parkway



Intersection	
Intersection Delay, s/veh	2.6

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Vol, veh/h	31	2	3	84	8	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	2	3	93	9	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	97	0	-	0	121	50
Stage 1	-	-	-	-	50	-
Stage 2	-	-	-	-	71	-
Follow-up Headway	2	-	-	-	4	3
Pot Capacity-1 Maneuver	1496	-	-	-	874	1018
Stage 1	-	-	-	-	972	-
Stage 2	-	-	-	-	952	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1496	-	-	-	854	1018
Mov Capacity-2 Maneuver	-	-	-	-	854	-
Stage 1	-	-	-	-	972	-
Stage 2	-	-	-	-	930	-

Approach	EB	WB	SW
HCM Control Delay, s	7	0	9

Minor Lane / Major Mvmt	EBL	EBT	WBT	WBR	SWLn1
Capacity (veh/h)	1496	-	-	-	910
HCM Lane V/C Ratio	0.023	-	-	-	0.016
HCM Control Delay (s)	7.463	0	-	-	9
HCM Lane LOS	A	A			A
HCM 95th %tile Q(veh)	0.071	-	-	-	0.048

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

1: John J Kingman Road & Fairfax County Parkway

Timing Plan: AM Peak Hour

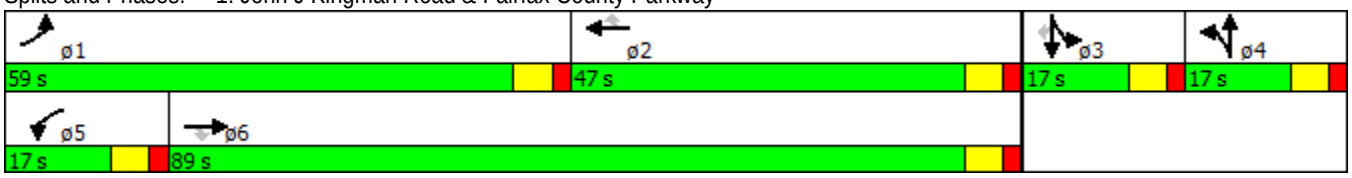
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1183	922	67	22	929	478	9	9	4	43	11	163
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt			0.850			0.850		0.957			0.875	0.850
Flt Protected	0.950			0.950			0.950			0.950	0.998	
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	1783	0	1681	1480	1504
Flt Permitted	0.950			0.950			0.950			0.950	0.998	
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	1770	1783	0	1681	1480	1504
Satd. Flow (RTOR)			117			333		4			83	164
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)										10%		46%
Lane Group Flow (vph)	1314	1024	74	24	1032	531	10	14	0	43	100	98
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases			6			2						3
Detector Phase	1	6	6	5	2	2	4	4		3	3	3
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	17.0	16.0	16.0	17.0	16.0	16.0	16.0	16.0		17.0	17.0	17.0
Total Split (s)	59.0	89.0	89.0	17.0	47.0	47.0	17.0	17.0		17.0	17.0	17.0
Total Split (%)	42.1%	63.6%	63.6%	12.1%	33.6%	33.6%	12.1%	12.1%		12.1%	12.1%	12.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	None
Act Effct Green (s)	53.6	92.9	92.9	9.3	43.3	43.3	8.4	8.4		10.5	10.5	10.5
Actuated g/C Ratio	0.42	0.73	0.73	0.07	0.34	0.34	0.07	0.07		0.08	0.08	0.08
v/c Ratio	0.91	0.40	0.06	0.18	0.85	0.70	0.09	0.11		0.31	0.51	0.36
Control Delay	45.2	9.2	0.5	61.5	48.2	19.4	60.9	50.5		63.4	26.2	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	45.2	9.2	0.5	61.5	48.2	19.4	60.9	50.5		63.4	26.2	3.6
LOS	D	A	A	E	D	B	E	D		E	C	A
Approach Delay		28.5			38.8			54.8			23.7	
Approach LOS		C			D			D			C	
Queue Length 50th (ft)	548	201	0	20	447	153	8	8		37	15	0
Queue Length 95th (ft)	#732	283	5	51	#600	309	28	32		80	80	0
Internal Link Dist (ft)		2339			1807			544			1799	
Turn Bay Length (ft)	400		450	300		300	150			200		
Base Capacity (vph)	1500	2591	1190	183	1209	760	183	187		173	227	302
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.88	0.40	0.06	0.13	0.85	0.70	0.05	0.07		0.25	0.44	0.32

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 126.8
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 32.2 Intersection LOS: C
Intersection Capacity Utilization 79.2% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: John J Kingman Road & Fairfax County Parkway



Intersection	
Intersection Delay, s/veh	7.2

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Vol, veh/h	5	7	4	16	76	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	8	4	18	84	27

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	22	0	-	0	32	13
Stage 1	-	-	-	-	13	-
Stage 2	-	-	-	-	19	-
Follow-up Headway	2.218	-	-	-	3.518	3.318
Pot Capacity-1 Maneuver	1593	-	-	-	982	1067
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	1004	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1593	-	-	-	978	1067
Mov Capacity-2 Maneuver	-	-	-	-	978	-
Stage 1	-	-	-	-	1010	-
Stage 2	-	-	-	-	1000	-

Approach	EB	WB	SW
HCM Control Delay, s	3	0	9

Minor Lane / Major Mvmt	EBL	EBT	WBT	WBR	SWLn1
Capacity (veh/h)	1593	-	-	-	998
HCM Lane V/C Ratio	0.003	-	-	-	0.111
HCM Control Delay (s)	7.268	0	-	-	9.1
HCM Lane LOS	A	A			A
HCM 95th %tile Q(veh)	0.01	-	-	-	0.375

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

1: John J Kingman Road & Fairfax County Parkway

Timing Plan: PM Peak Hour

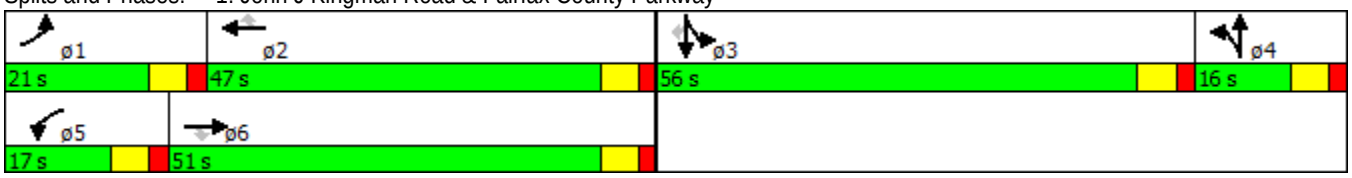
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	260	1046	2	4	767	47	44	26	54	601	8	1051
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt			0.850			0.850		0.899			0.868	0.850
Flt Protected	0.950			0.950			0.950			0.950	0.995	
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	1675	0	1681	1464	1504
Flt Permitted	0.950			0.950			0.950			0.950	0.995	
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	1770	1675	0	1681	1464	1504
Satd. Flow (RTOR)			117			117		58			294	294
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)										10%		47%
Lane Group Flow (vph)	289	1162	2	4	852	52	49	89	0	601	625	619
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases			6			2						3
Detector Phase	1	6	6	5	2	2	4	4		3	3	3
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	17.0	16.0	16.0	17.0	16.0	16.0	16.0	16.0		17.0	17.0	17.0
Total Split (s)	21.0	51.0	51.0	17.0	47.0	47.0	16.0	16.0		56.0	56.0	56.0
Total Split (%)	15.0%	36.4%	36.4%	12.1%	33.6%	33.6%	11.4%	11.4%		40.0%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	None
Act Effct Green (s)	16.3	59.0	59.0	8.0	41.2	41.2	10.5	10.5		51.8	51.8	51.8
Actuated g/C Ratio	0.12	0.43	0.43	0.06	0.30	0.30	0.08	0.08		0.38	0.38	0.38
v/c Ratio	0.70	0.76	0.00	0.04	0.79	0.09	0.36	0.49		0.94	0.85	0.82
Control Delay	67.9	36.9	0.0	62.8	50.0	0.3	68.4	34.8		64.9	32.3	30.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	67.9	36.9	0.0	62.8	50.0	0.3	68.4	34.8		64.9	32.3	30.0
LOS	E	D	A	E	D	A	E	C		E	C	C
Approach Delay		43.0			47.2			46.7			42.1	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	131	437	0	4	370	0	43	27		555	335	306
Queue Length 95th (ft)	182	#628	0	17	454	0	86	84		#821	#606	#510
Internal Link Dist (ft)		2339			1807			544			1799	
Turn Bay Length (ft)	400		450	300		300	150			200		
Base Capacity (vph)	430	1538	754	170	1124	582	156	201		645	743	758
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.67	0.76	0.00	0.02	0.76	0.09	0.31	0.44		0.93	0.84	0.82

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 135.8
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 43.6 Intersection LOS: D
Intersection Capacity Utilization 79.3% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: John J Kingman Road & Fairfax County Parkway



Intersection	
Intersection Delay, s/veh	2.7

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Vol, veh/h	34	2	3	91	9	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	2	3	101	10	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	104	0	-	0	132	54
Stage 1	-	-	-	-	54	-
Stage 2	-	-	-	-	78	-
Follow-up Headway	2	-	-	-	4	3
Pot Capacity-1 Maneuver	1488	-	-	-	862	1013
Stage 1	-	-	-	-	969	-
Stage 2	-	-	-	-	945	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1488	-	-	-	840	1013
Mov Capacity-2 Maneuver	-	-	-	-	840	-
Stage 1	-	-	-	-	969	-
Stage 2	-	-	-	-	920	-

Approach	EB	WB	SW
HCM Control Delay, s	7	0	9

Minor Lane / Major Mvmt	EBL	EBT	WBT	WBR	SWLn1
Capacity (veh/h)	1488	-	-	-	895
HCM Lane V/C Ratio	0.025	-	-	-	0.017
HCM Control Delay (s)	7.482	0	-	-	9.1
HCM Lane LOS	A	A			A
HCM 95th %tile Q(veh)	0.078	-	-	-	0.053

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

1: John J Kingman Road & Fairfax County Parkway

Timing Plan: AM Peak Hour

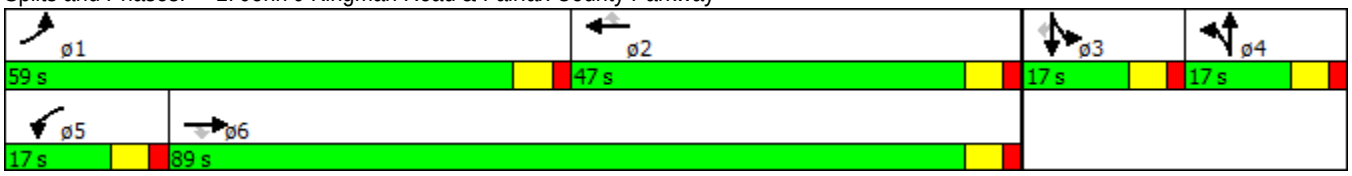
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1183	922	161	49	929	478	17	11	12	43	24	163
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt			0.850			0.850		0.922			0.894	0.850
Flt Protected	0.950			0.950			0.950			0.950	0.998	
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	1717	0	1681	1512	1504
Flt Permitted	0.950			0.950			0.950			0.950	0.998	
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	1770	1717	0	1681	1512	1504
Satd. Flow (RTOR)			179			329		13			67	164
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)										10%		42%
Lane Group Flow (vph)	1314	1024	179	54	1032	531	19	25	0	43	108	105
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases			6			2						3
Detector Phase	1	6	6	5	2	2	4	4		3	3	3
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	17.0	16.0	16.0	17.0	16.0	16.0	16.0	16.0		17.0	17.0	17.0
Total Split (s)	59.0	89.0	89.0	17.0	47.0	47.0	17.0	17.0		17.0	17.0	17.0
Total Split (%)	42.1%	63.6%	63.6%	12.1%	33.6%	33.6%	12.1%	12.1%		12.1%	12.1%	12.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	None
Act Effct Green (s)	53.6	88.8	88.8	10.9	43.4	43.4	9.0	9.0		10.7	10.7	10.7
Actuated g/C Ratio	0.42	0.70	0.70	0.09	0.34	0.34	0.07	0.07		0.08	0.08	0.08
v/c Ratio	0.91	0.42	0.15	0.36	0.86	0.70	0.15	0.19		0.31	0.58	0.38
Control Delay	46.1	11.0	1.8	64.6	49.0	20.1	62.0	40.3		63.5	38.1	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	46.1	11.0	1.8	64.6	49.0	20.1	62.0	40.3		63.5	38.1	4.9
LOS	D	B	A	E	D	C	E	D		E	D	A
Approach Delay		28.7			40.0			49.7			28.7	
Approach LOS		C			D			D			C	
Queue Length 50th (ft)	557	218	0	45	453	159	16	10		37	37	0
Queue Length 95th (ft)	#741	297	29	91	#608	317	43	41		81	108	7
Internal Link Dist (ft)		2339			1807			544			1799	
Turn Bay Length (ft)	400		450	300		300	150			200		
Base Capacity (vph)	1493	2464	1156	182	1203	755	182	188		172	215	301
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.88	0.42	0.15	0.30	0.86	0.70	0.10	0.13		0.25	0.50	0.35

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 127.5
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 33.0 Intersection LOS: C
Intersection Capacity Utilization 79.6% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: John J Kingman Road & Fairfax County Parkway



Intersection	
Intersection Delay, s/veh	8.4

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Vol, veh/h	5	7	4	34	210	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	8	4	38	233	27

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	42	0	-	0	42	23
Stage 1	-	-	-	-	23	-
Stage 2	-	-	-	-	19	-
Follow-up Headway	2.218	-	-	-	3.518	3.318
Pot Capacity-1 Maneuver	1567	-	-	-	969	1054
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	1004	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1567	-	-	-	965	1054
Mov Capacity-2 Maneuver	-	-	-	-	965	-
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	1000	-

Approach	EB	WB	SW
HCM Control Delay, s	3	0	10

Minor Lane / Major Mvmt	EBL	EBT	WBT	WBR	SWLn1
Capacity (veh/h)	1567	-	-	-	973
HCM Lane V/C Ratio	0.004	-	-	-	0.267
HCM Control Delay (s)	7.306	0	-	-	10
HCM Lane LOS	A	A			B
HCM 95th %tile Q(veh)	0.011	-	-	-	1.081

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	4.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	134	83	20	5	5	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	149	92	22	6	6	20

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	28	0	-	0	415	25
Stage 1	-	-	-	-	25	-
Stage 2	-	-	-	-	390	-
Follow-up Headway	2.218	-	-	-	3.518	3.318
Pot Capacity-1 Maneuver	1585	-	-	-	594	1051
Stage 1	-	-	-	-	998	-
Stage 2	-	-	-	-	684	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1585	-	-	-	535	1051
Mov Capacity-2 Maneuver	-	-	-	-	535	-
Stage 1	-	-	-	-	998	-
Stage 2	-	-	-	-	616	-

Approach	EB	WB	SB
HCM Control Delay, s	5	0	9

Minor Lane / Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1585	-	-	-	869
HCM Lane V/C Ratio	0.094	-	-	-	0.029
HCM Control Delay (s)	7.507	0	-	-	9.3
HCM Lane LOS	A	A			A
HCM 95th %tile Q(veh)	0.31	-	-	-	0.091

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

1: John J Kingman Road & Fairfax County Parkway

Timing Plan: PM Peak Hour

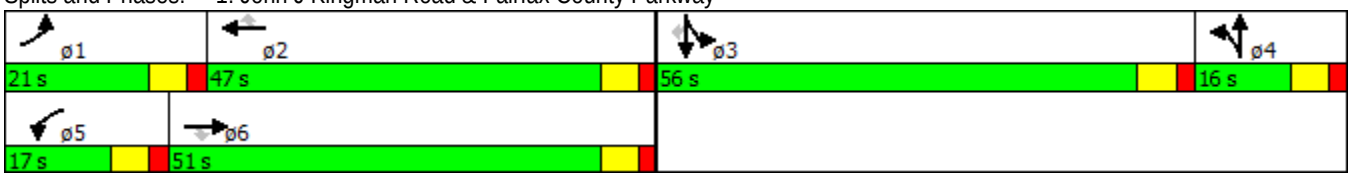
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	260	1046	22	10	767	47	105	39	115	601	10	1051
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt			0.850			0.850		0.888			0.869	0.850
Flt Protected	0.950			0.950			0.950			0.950	0.995	
Satd. Flow (prot)	3433	3539	1583	1770	3539	1583	1770	1654	0	1681	1466	1504
Flt Permitted	0.950			0.950			0.950			0.950	0.995	
Satd. Flow (perm)	3433	3539	1583	1770	3539	1583	1770	1654	0	1681	1466	1504
Satd. Flow (RTOR)			117			117		84			239	239
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Shared Lane Traffic (%)										10%		47%
Lane Group Flow (vph)	289	1162	24	11	852	52	117	171	0	601	627	619
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases			6			2						3
Detector Phase	1	6	6	5	2	2	4	4		3	3	3
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	17.0	16.0	16.0	17.0	16.0	16.0	16.0	16.0		17.0	17.0	17.0
Total Split (s)	21.0	51.0	51.0	17.0	47.0	47.0	16.0	16.0		56.0	56.0	56.0
Total Split (%)	15.0%	36.4%	36.4%	12.1%	33.6%	33.6%	11.4%	11.4%		40.0%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	Min	Min	None	Min	Min	None	None		None	None	None
Act Effct Green (s)	16.4	56.4	56.4	8.5	41.4	41.4	11.9	11.9		52.0	52.0	52.0
Actuated g/C Ratio	0.12	0.41	0.41	0.06	0.30	0.30	0.09	0.09		0.38	0.38	0.38
v/c Ratio	0.71	0.80	0.03	0.10	0.80	0.09	0.76	0.78		0.95	0.89	0.86
Control Delay	69.0	41.7	0.1	63.7	51.1	0.3	92.4	55.3		67.1	41.5	38.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	69.0	41.7	0.1	63.7	51.1	0.3	92.4	55.3		67.1	41.5	38.0
LOS	E	D	A	E	D	A	F	E		E	D	D
Approach Delay		46.3			48.4			70.4			48.7	
Approach LOS		D			D			E			D	
Queue Length 50th (ft)	132	442	0	10	373	0	106	78		561	405	369
Queue Length 95th (ft)	182	#665	0	31	454	0	#208	#196		#821	#681	#622
Internal Link Dist (ft)		2339			1807			544			1799	
Turn Bay Length (ft)	400		450	300		300	150			200		
Base Capacity (vph)	424	1450	718	167	1106	575	154	220		635	702	716
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.68	0.80	0.03	0.07	0.77	0.09	0.76	0.78		0.95	0.89	0.86

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 137.7
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 49.2 Intersection LOS: D
Intersection Capacity Utilization 83.7% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: John J Kingman Road & Fairfax County Parkway



Intersection	
Intersection Delay, s/veh	2.2

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Vol, veh/h	34	2	3	226	37	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	2	3	251	41	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	254	0	-	0	207	129
Stage 1	-	-	-	-	129	-
Stage 2	-	-	-	-	78	-
Follow-up Headway	2	-	-	-	4	3
Pot Capacity-1 Maneuver	1311	-	-	-	781	921
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	945	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1311	-	-	-	758	921
Mov Capacity-2 Maneuver	-	-	-	-	758	-
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	918	-

Approach	EB	WB	SW
HCM Control Delay, s	7	0	10

Minor Lane / Major Mvmt	EBL	EBT	WBT	WBR	SWLn1
Capacity (veh/h)	1311	-	-	-	774
HCM Lane V/C Ratio	0.029	-	-	-	0.06
HCM Control Delay (s)	7.827	0	-	-	9.9
HCM Lane LOS	A	A			A
HCM 95th %tile Q(veh)	0.089	-	-	-	0.192

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	5.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	28	11	94	5	5	135
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	31	12	104	6	6	150

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	110	0	-	0	181	107
Stage 1	-	-	-	-	107	-
Stage 2	-	-	-	-	74	-
Follow-up Headway	2	-	-	-	4	3
Pot Capacity-1 Maneuver	1480	-	-	-	808	947
Stage 1	-	-	-	-	917	-
Stage 2	-	-	-	-	949	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1480	-	-	-	791	947
Mov Capacity-2 Maneuver	-	-	-	-	791	-
Stage 1	-	-	-	-	917	-
Stage 2	-	-	-	-	929	-

Approach	EB	WB	SB
HCM Control Delay, s	5	0	10

Minor Lane / Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1480	-	-	-	940
HCM Lane V/C Ratio	0.021	-	-	-	0.165
HCM Control Delay (s)	7.485	0	-	-	9.6
HCM Lane LOS	A	A			A
HCM 95th %tile Q(veh)	0.064	-	-	-	0.591

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Appendix D

Threatened and Endangered Species Assessment

LEADERS IN EXCELLENCE!

U.S. ARMY GARRISON FORT BELVOIR

Threatened and Endangered Species Survey for small whorled pogonia (*Isotria medeoloides*) and wood turtle (*Glyptemys insculpta*)

FORT BELVOIR OTC

U.S. Army Garrison Fort Belvoir
Fort Belvoir, Virginia

Prepared by:

EEE Consulting, Inc.
Environmental, Engineering and Educational Solutions

September 13, 2013

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1.0 EXECUTIVE SUMMARY

EEE Consulting, Inc. (EEE) has conducted a survey for the Federally-threatened, State-endangered small whorled pogonia (*Isotria medeoloides*) and the state-threatened wood turtle (*Glyptemys insculpta*) within the Fort Belvoir OTC study area. A pedestrian survey of the site was conducted by EEE environmental scientists Taylor Sprenkle and Ben Williamson on July 9, 2013. Mr. Sprenkle is included on the U.S. Fish and Wildlife Service's list of approved surveyors for small whorled pogonia and is authorized to conduct surveys for wood turtle by Virginia Department of Game and Inland Fisheries Threatened and Endangered Species (TEND) permit 047159. No suitable small whorled pogonia habitat is present within the study area and no small whorled pogonias were found. No further survey work is recommended for small whorled pogonia. Suitable overwintering habitat for wood turtle is present within Accotink Creek and suitable summer foraging habitat is present within the floodplain wetlands associated with Accotink Creek. A thorough search of appropriate habitat was conducted; however, no wood turtles were found.

2.0 INTRODUCTION

After studying five alternative sites, the U.S. Army Corps of Engineers Real Property Services Field Office (USACE/RSFO) has selected a preferred site to develop an OSEG Training Center (OTC) at U.S. Army Garrison Fort Belvoir in Fairfax County, Virginia. In addition, it will also be necessary to replace an existing sanitary sewer line from Route 1 to the proposed OTC site. The location and overall topography of the study area are depicted in the Regional Location map (Exhibit 1) and the USGS Topographic Quadrangle map (Exhibit 2). Soil types and general vegetative cover can be seen in the NRCS Soils map (Exhibit 3) and the Threatened and Endangered Species Survey map (Exhibit 4). The purpose of this survey was to identify any occurrences of small whorled pogonia or wood turtle that could be affected by the proposed project.

3.0 SPECIES DESCRIPTIONS AND HABITAT ASSOCIATIONS

<u>Small whorled pogonia</u>

Small whorled pogonia was listed as Federally-endangered for protection under the Endangered Species Act on September 9, 1982 and was reclassified from endangered to threatened on October 6, 1994 (USFWS 1982, 1994). Small whorled pogonia is listed as State-endangered by the Commonwealth of Virginia (2VAC5-320-10).

Historically, small whorled pogonia has been documented in 21 states, Canada, and the District of Columbia; however, current estimates report that 93 extant sites representing fewer than 3,000 individuals occur across nine states (NatureServe 2009; USDA, NRCS 2011). In Virginia, most populations occur in the coastal plain and piedmont and, as of September 2007, small whorled pogonia had been documented in 18 counties, including Fairfax County, and two cities in Virginia (NatureServe 2011; USFWS 2011).

Small whorled pogonia is an herbaceous, perennial orchid (family Orchidaceae) that consists of a single stem (rarely two or more) with a whorl of five or six leaves at the summit of the stem. The stem is hollow and smooth with a glaucous light-green appearance similar to a seedless

green grape. Similar species include Indian cucumber root (*Medeola virginiana*), which has a solid, wiry, reddish-brown (sometimes green) stem with cobwebby pubescence and large whorled pogonia (*Isotria verticillata*), which has a reddish stem.

Small whorled pogonia is thought to remain dormant for extended periods (Correll 1950), but Mehrhoff (1989b) found that dormancy periods are typically less than three years. Size of an individual can be a good predictor of reproductive success the following year; with the largest individuals having the largest capsules and highest seed set (Vitt and Campbell 1997). Mehrhoff (1989b) found that the probability of flowering the following year is positively correlated with plant size and that flowering individuals are, on average, the largest plants. Small whorled pogonia is primarily self-pollinating and vegetative reproduction is infrequent (Mehrhoff 1983; Vitt and Campbell 1997). Flowering occurs from May to June when a greenish-yellow, odorless flower with green sepals less than 3 cm long emerges above the whorl of leaves (Radford et al. 1964; Gleason and Cronquist 1991).

Mehrhoff (1989a) found that the most consistent habitat features at sites occupied by small whorled pogonia are vegetation structure and disturbance history. Small whorled pogonia typically occurs on mesic sites in mixed-deciduous or mixed-deciduous coniferous forests that are generally in second- or third-growth successional stages (USFWS 1992). Most occupied sites have been cutover in the past and allowed to regenerate for at least several decades (Mehrhoff 1989a). Occupied sites typically have sparse to moderate ground cover, a relatively open understory, and proximity to long persisting canopy breaks associated with logging roads, streams, and large tree falls (Mehrhoff 1989a).

In Virginia, the ages of older canopy trees have been estimated to be 45 to 80 years old (Ware 1987). Virginia sites typically contain dry-mesic to wet-mesic soils that are low-nutrient, acidic loams (Mehrhoff 1989a). In Virginia, the soils at occupied sites are typically acidic sandy loams with pH values of 4.3 to 5.5; however, the soil from one site in Virginia was described as a silt loam (Ware 1991). The forest floor is typically flecked with sunlight and is covered with a light to thick layer of leaf litter with limited exposed rock and soil (USFWS 1992; Mehrhoff 1989a). Small whorled pogonia generally occurs on gentle to moderate slopes with eastern or northern exposures, although the plant has been documented on all slope aspects (Ware 1991). Decaying woody debris is also present at most occupied sites and, like many orchids, mycorhizzal associations likely play a prominent role in nutrient uptake (USFWS 1992).

Mehrhoff (1989a) did not identify unique indicator species, but red oak (*Quercus rubra*) and red maple (*Acer rubrum*) were present in the canopy of all occupied sites. In Virginia typical canopy species associated with small whorled pogonia are white oak (*Quercus alba*), black oak (*Q. velutina*), scarlet oak (*Q. coccinea*), sweetgum (*Liquidambar styraciflua*), tulip tree (*Liriodendron tulipifera*), and American beech (*Fagus grandifolia*). Typical understory and shrub species include flowering dogwood (*Cornus florida*), sourwood (*Oxydendrum arboreum*), mountain laurel (*Kalmia latifolia*), American chestnut (*Castanea dentata*), and witch hazel (*Hamamelis virginiana*). Typical ground cover species are partridge berry (*Mitchella repens*), Indian cucumber root, New York fern (*Thelypteris noveboracencis*), lowbush blueberry

(*Vaccinium pallidum*), rattlesnake plantain (*Goodyera pubescens*), red maple seedlings, oak species seedlings, Virginia creeper (*Parthenocissus quinquefolia*), naked tick-trefoil (*Desmodium nudiflorum*), catbrier (*Smilax glauca*), and Christmas fern (*Polystichum acrostichoides*). (USFWS 1992)

Two reference populations in Prince William County, Virginia have the following associates:

Prince William County Location #1:

The canopy was dominated by American beech, red maple, white oak, pignut hickory (*Carya glabra*), southern red oak (*Quercus falcata*), tulip tree, and sweetgum. The dominant saplings were blackgum (*Nyssa sylvatica*), American beech, red maple, American holly (*Ilex opaca*), and pignut hickory. The dominant herbs were southern ground cedar (*Lycopodium digitatum*), strawberry bush (*Euonymus americana*), lowbush blueberry, red maple, pignut hickory, beechdrops (*Epifagus virginiana*), mapleleaf viburnum (*Viburnum acerifolium*), black cherry (*Prunus serotina*), and Virginia creeper. No vine or shrubs were present at this location.

Prince William County Location #2:

The canopy was dominated by tulip tree, pignut hickory, white oak, and American beech. The sapling/shrub dominants were blackgum, American beech, ironwood (*Carpinus caroliniana*), and American holly. The herbaceous layer was dominated by southern ground cedar, American beech, naked-flowered tick-trefoil, sessile leaf bellwort (*Uvularia sessilifolia*), strawberry bush, New York fern, Christmas fern, partridgeberry, lowbush blueberry, and striped wintergreen (*Chimaphila maculata*).

<u>Wood turtle</u>

The wood turtle is a medium-sized, semi-aquatic turtle, having ornate "woodgrained" scutes on its brown carapace. There is a distinctive mid-rib keel along the apex of the shell. In older individuals, these features are obscured by smoothed wear. The plastron is yellow, with each segment blotched black along its side. The head is black, broad and flat-topped. The upper jaw is hinged at midline. The tail is distinctively long in relation to its size.

In winter, the wood turtle generally occurs along clear, fast-moving streams (often within deciduous forests) where it hibernates in undercut stream banks, under root masses, in leaf packs, in deep pools, under the mud or sand bottom of its waterway, or just sitting on the bottom. In summer, it is primarily terrestrial, and many individuals over-summer in the floodplains of their wintering streams, though some disperse further overland during the summer. The wood turtle occasionally occurs in forested wetlands and marshy fields along the stream systems it inhabits, and individuals may spend considerable time in upland areas (Ernst and McBreen, 1991). Although it is terrestrial, it requires moisture year-round. They are sometimes observed creeping along the bottom substrate of a water body. Surveys are often conducted by searching for over wintering individuals along the bottom in pools, under logs, in debris piles and cooler embankment crevices. The main threat to the turtle is rapid urbanization, direct loss of both aquatic and terrestrial habitat, water quality degradation, and in many places, collection for illegal pet trade.

The wood turtle has a northern range, extending from maritime Canada, west to E. Minnesota, south through Pennsylvania and Virginia. Shenandoah Valley populations represent the southern-most range for the species in North America. For this reason, the wood turtle is considered very rare in Virginia, and is a listed, threatened species. Northern Virginia is at the southern edge of the wood turtle's range, and according to Dr. Tom Akre (2002), this species occurs in Virginia almost exclusively in the upper Potomac River watershed. It is most common in mountain tributaries of the Shenandoah River from Rockingham County north, becoming less common and more sparsely dispersed downstream along the Potomac River into northern Loudoun and northern/eastern Fairfax Counties. Wood turtles have been documented from Fairfax, Loudoun, Clarke, Frederick, Warren, Shenandoah and Rockingham Counties. The only records of this species occurring in northern Virginia in a stream that is not a direct tributary to the Potomac River are 1997 and 2003 observations in upper Cub Run, in the Occoquan River watershed southwest of Chantilly (Fairfax County).

According to the Virginia Department of Game and Inland Fisheries Fish and Wildlife Information Service (VaFWIS), wood turtles have been documented within the vicinity of the project area within the Accotink Creek watershed. The most recent observation was recorded by Fort Belvoir biologists in May 2005.

4.0 SURVEY METHODOLOGY

Prior to conducting field work, relevant background information was reviewed, including wetlands information, site topography, soils data, and natural color and color infrared aerial imagery to identify potential suitable habitat within the study area.

A pedestrian survey of the site was conducted by EEE environmental scientists Taylor Sprenkle and Ben Williamson on July 9, 2013. Mr. Sprenkle is included on the U.S. Fish and Wildlife Service's list of approved surveyors for small whorled pogonia and is authorized to conduct surveys for wood turtle by Virginia Department of Game and Inland Fisheries Threatened and Endangered Species (TEND) permit 047159. The timing of this survey falls within the timeframe recommended by the USFWS for conducting small whorled pogonia surveys in Fairfax County (June 1 to July 20).

<u>Small whorled pogonia</u>

Prior to beginning field work, EEE environmental scientists visited a known small whorled pogonia colony in Prince William County to review habitat characteristics and to review visual distinctions between the small whorled pogonia and other similar plants.

Potential small whorled pogonia habitat was evaluated based on criteria developed from literature review, research conducted in Virginia, and the personal experience of EEE staff. Small whorled pogonia habitat was divided into three categories: low potential, medium potential, and high potential as follows:

High potential habitat areas possess almost all of the physical and biological characteristics of optimal habitat described for small whorled pogonia in Virginia (Ware 1991; USFWS 1992).

Medium potential habitat approaches optimal habitat but lacks one or more key habitat characteristics. Habitat that would otherwise be considered high potential, would be considered medium potential if:

- steep slopes are present;
- the slope aspect faces a direction other than north to southeast (i.e., west);
- scattered individuals of "dry" species such as Virginia pine (*Pinus virginiana*), chestnut oak (*Quercus prinus*) or black locust (*Robinia pseudoacacia*) are present; or
- the understory or ground cover is moderately dense.

Low potential habitat would have little to no potential to support the small whorled pogonia. Habitat is considered low potential if:

- the area is dominated primarily by chestnut oak or Virginia pine;
- the forest is relatively young;
- the area is heavily disturbed;
- the area is dominated by exotic species;
- the understory is extremely dense;
- the area is very dry or very wet; or
- very steep slopes are present with little leaf litter.

Any areas of high potential and medium potential habitat were thoroughly searched with transects spaced no greater than 20 feet apart while walking parallel to slope contours. Any plants that resembled small whorled pogonia such as Indian cucumber root and large whorled pogonia were examined closely and positively identified.

<u>Wood turtle</u>

Visual encounter surveys were conducted by walking through suitable habitat (e.g., in riparian or floodplain habitat along Accotink Creek) and searching for turtles basking or foraging in the water or on land. All potential overwintering habitat as well as summer foraging habitat was searched. Accotink Creek was searched using an Aquascope to view under root wads, undercut banks, and deeper pools where the bottom could not be clearly seen from the surface of the water. All adjacent upland areas were transected and searched with greater effort being expended within the floodplain wetlands adjacent to Accotink Creek. Any turtles resembling wood turtles (e.g., box turtles) were positively identified.

5.0 SURVEY FINDINGS

Soils

The soils within the study area consist of Woodstown sandy loam (109B), Codorus silt loam (29A), Codorus and Hatboro soils (30A), Elkton silt loam (36A), Gunston silt loam (48A), and Mattapex loam (77A) (See Table 1).

Table 1. Characteristics of mapped soils within the Fort Belvoir OTC study area.

Soils Series	**Texture**	**Soil reaction[1]**	**Organic content**	**Natural fertility**
Woodstown	sandy loam	vsa to exa	moderate	medium
Codorus	silt loam	sa	moderate	high
Hatboro	silt loam	vsa to n	low - moderate	medium
Elkton	silt loam	sa	low	low
Gunston	silt loam	sa to vsa	low	low
Mattapex	loam	sa to vsa	moderate	medium

1. ma = medium acid; sa = strongly acid; vsa = very strongly acid; exa = extremely acid; moda = moderately acid; n = neutral

The soils within the study area would not typically be considered highly suitable for small whorled pogonia in Virginia. None of the soils have all three characteristic of being a sandy loam, acidic, and low in nutrients. Woodstown sandy loam has a suitable texture and is acidic, but is not nutrient limited. It should be noted, however, that small whorled pogonia has been documented growing on a variety of soil types.

Small whorled pogonia

No suitable small whorled pogonia habitat was observed within the study area. The floodplain and floodplain wetlands adjacent to Accotink Creek are too wet to support small whorled pogonia and show evidence of periodic inundation. The non-wetland forests within the study area were either dominated by Virginia pine, had a dense understory, were dominated by exotics, or were disturbed. All areas of the study area were transected; however, no small whorled pogonias were found. No further small whorled pogonia survey work is recommended.

Wood turtle

Accotink Creek has habitat elements that could serve as suitable hibernacula for wood turtles. At the time of field work, Accotink Creek had clear, fast-running water that appeared to be well oxygenated. Accotink Creek has deep pools, overhanging banks, root wads, leaf packs, sand and cobble bottom, and submerged logs that could provide suitable overwintering habitat. The

floodplain wetlands associated with Accotink Creek could potentially provide summer foraging habitat for wood turtle. Several points along the banks of Accotink Creek were shallow enough to allow wood turtles to travel back and forth between Accotink Creek and adjacent foraging and basking habitat in the adjacent floodplain. All suitable habitat for wood turtle was thoroughly searched, however, no wood turtles were observed.

6.0 LIMITATIONS

This study is based on examination of habitat conditions at the time of this study and does not address conditions at a given time in the future as habitat conditions may change over time. In particular, the life history of the small whorled pogonia is such that it can remain dormant underground for several years and, thus, may go undetected in any given year depending upon the cycle of dormancy. Therefore, the conclusions of this study may differ from future observations.

EEE's survey has been conducted in accordance with generally accepted guidelines for the performance of surveys for rare, threatened, and endangered plants. EEE makes no warranties, either expressed or implied, and this report is not a recommendation to buy, sell, or develop the property.

EEE Consulting, Inc.

Taylor S.Sprenkle, PWD
Environmental Scientist

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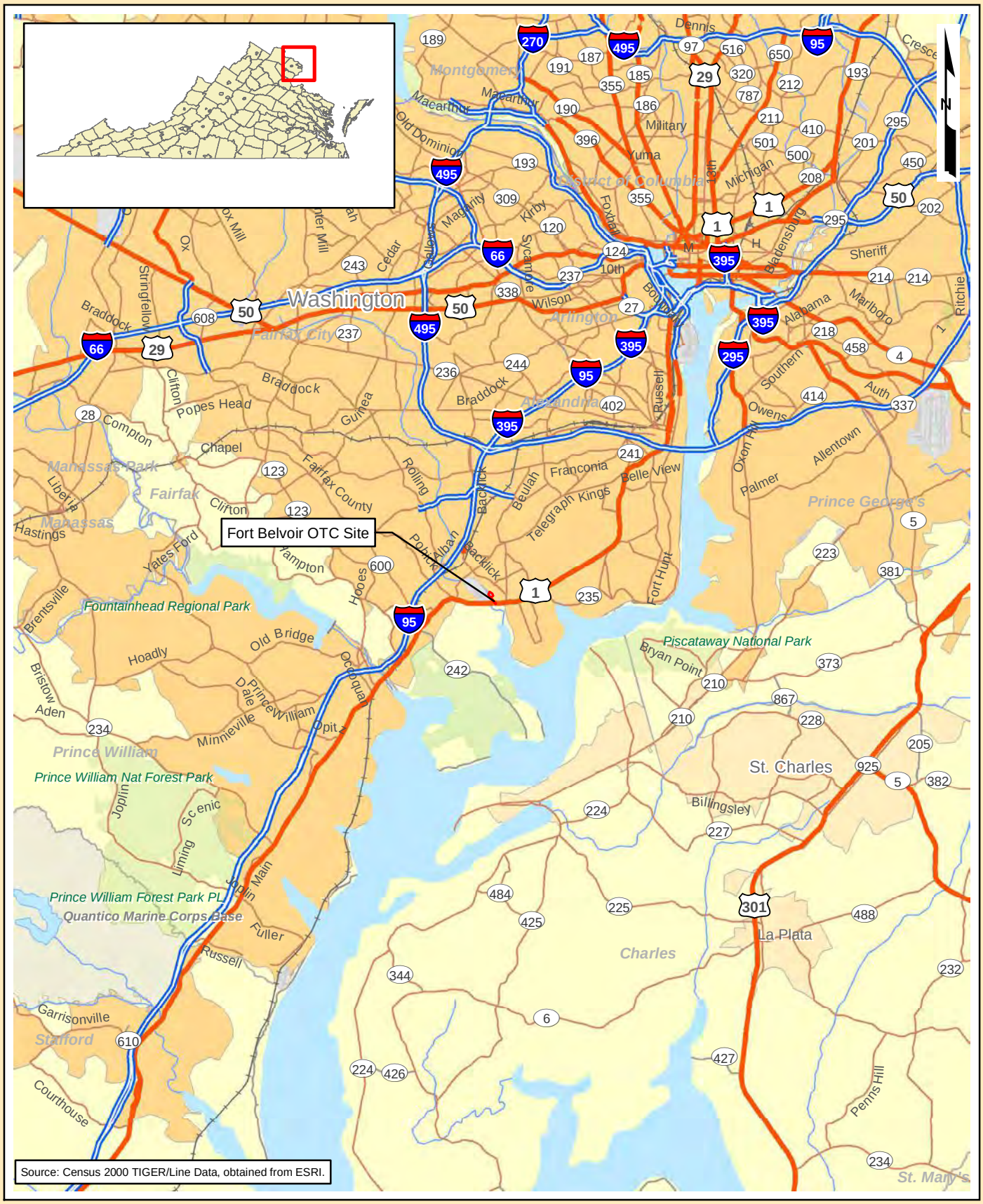
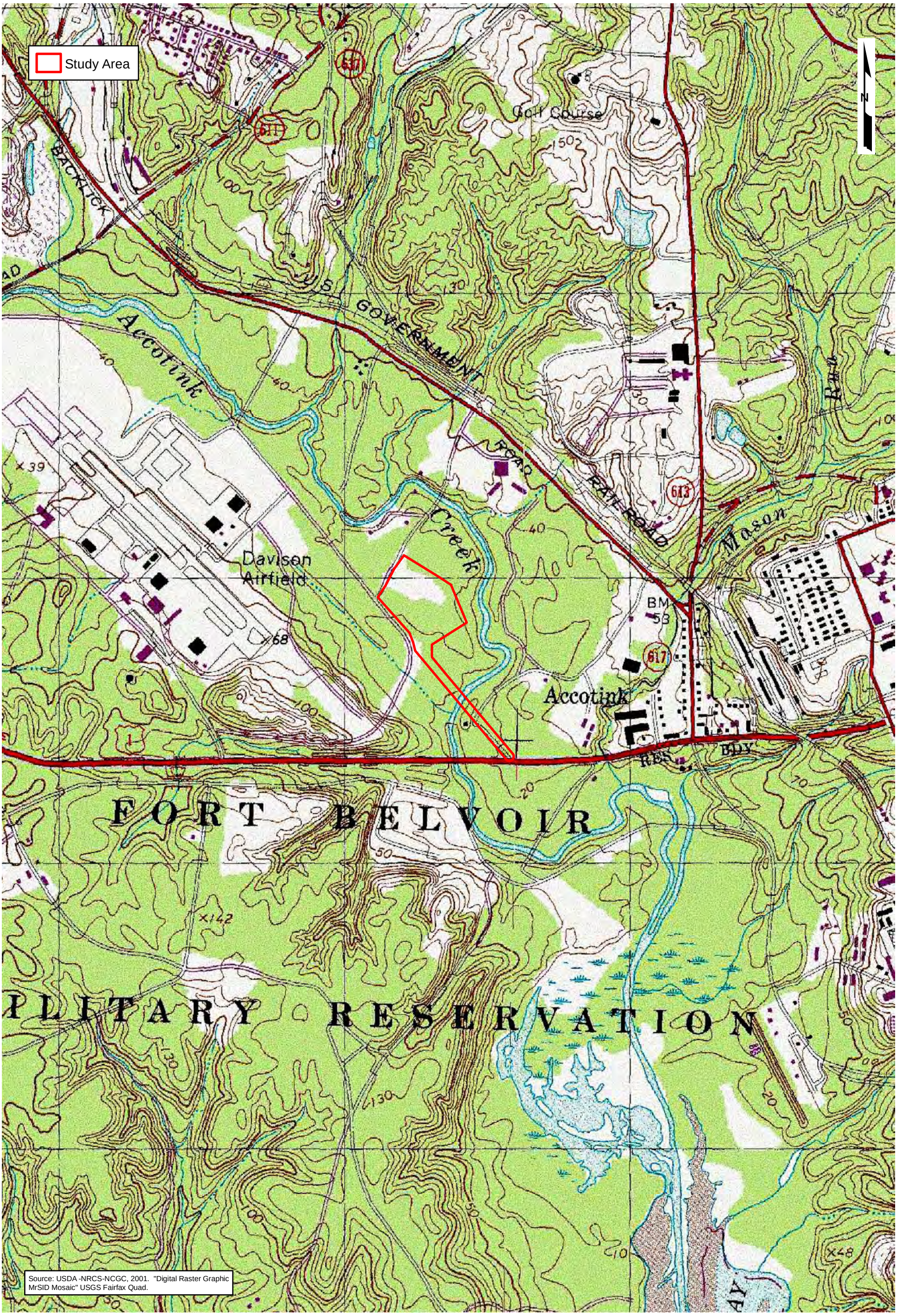


0 2.5 5 10
Miles
0 3.75 7.5 15
Kilometers

Regional Location

Fort Belvoir OTC Site
Fairfax, Virginia

Exhibit 1



Source: USDA -NRCS-NCGC, 2001. "Digital Raster Graphic MrSID Mosaic" USGS Fairfax Quad.

0 1,000 2,000 Feet

0 290 580 Meters

USGS Topo Quad

Fort Belvoir OTC Site
Fairfax, Virginia

Exhibit 2

0 500 1,000 Feet

0 140 280 Meters

NRCS Soils

Fort Belvoir OTC Site
Fairfax, Virginia

Exhibit 3

0 250 500 Feet

0 70 140 Meters

Threatened and Endangered Species Survey Map

Fort Belvoir OTC Site
Fairfax, Virginia

Exhibit 4

EXHIBIT 5
SITE PHOTOGRAPHS
FORT BELVOIR OTC

1. Looking northwest at unsuitable small whorled pogonia habitat. (Photo taken July 9, 2013)

2. Looking north-northeast (upstream) at suitable overwintering wood turtle habitat in Accotink Creek. (Photo taken July 9, 2013)

EXHIBIT 5
SITE PHOTOGRAPHS
FORT BELVOIR OTC

3. Looking southeast at a rood wad that could provide overwintering habitat for wood turtle in Accotink Creek. (Photo taken July 9, 2013)

4. Looking east at a gravel bar and shallow bank providing access to the adjacent floodplain for summer foraging of wood turtle. (Photo taken July 9, 2013

EXHIBIT 5
SITE PHOTOGRAPHS
FORT BELVOIR OTC

5. Looking northeast (upstream) at a riffle with cobble/gravel substrate and fast-flowing, clear water in Accotink Creek. (Photo taken July 9, 2013)

6. Looking southwest at a gravel bar and shallow bank providing access to the adjacent floodplain for summer foraging of wood turtle. (Photo taken July 9, 2013)

EXHIBIT 5
SITE PHOTOGRAPHS
FORT BELVOIR OTC

7. Looking northwest at unsuitable small whorled pogonia habitat. (Photo taken July 9, 2013)

8. Looking north at unsuitable small whorled pogonia habitat. (Photo taken July 9, 2013)

EXHIBIT 5
SITE PHOTOGRAPHS
FORT BELVOIR OTC

9. Looking southeast at unsuitable small whorled pogonia habitat and the edge of floodplain wetlands that would provide suitable summer foraging habitat for wood turtle. (Photo taken July 9, 2013)

10. Looking northwest at unsuitable small whorled pogonia habitat. (Photo taken July 9, 2013)

EXHIBIT 5
SITE PHOTOGRAPHS
FORT BELVOIR OTC

11. Looking south at unsuitable small whorled pogonia habitat. (Photo taken July 9, 2013)

12. Looking northwest at floodplain wetlands that would provide suitable summer foraging habitat for wood turtle, but would not be suitable habitat for small whorled pogonia due to the hydric water regime and evidence of frequent inundation. (Photo taken July 9, 2013)

WOOD TURTLE (*Glyptemys insculpta*)

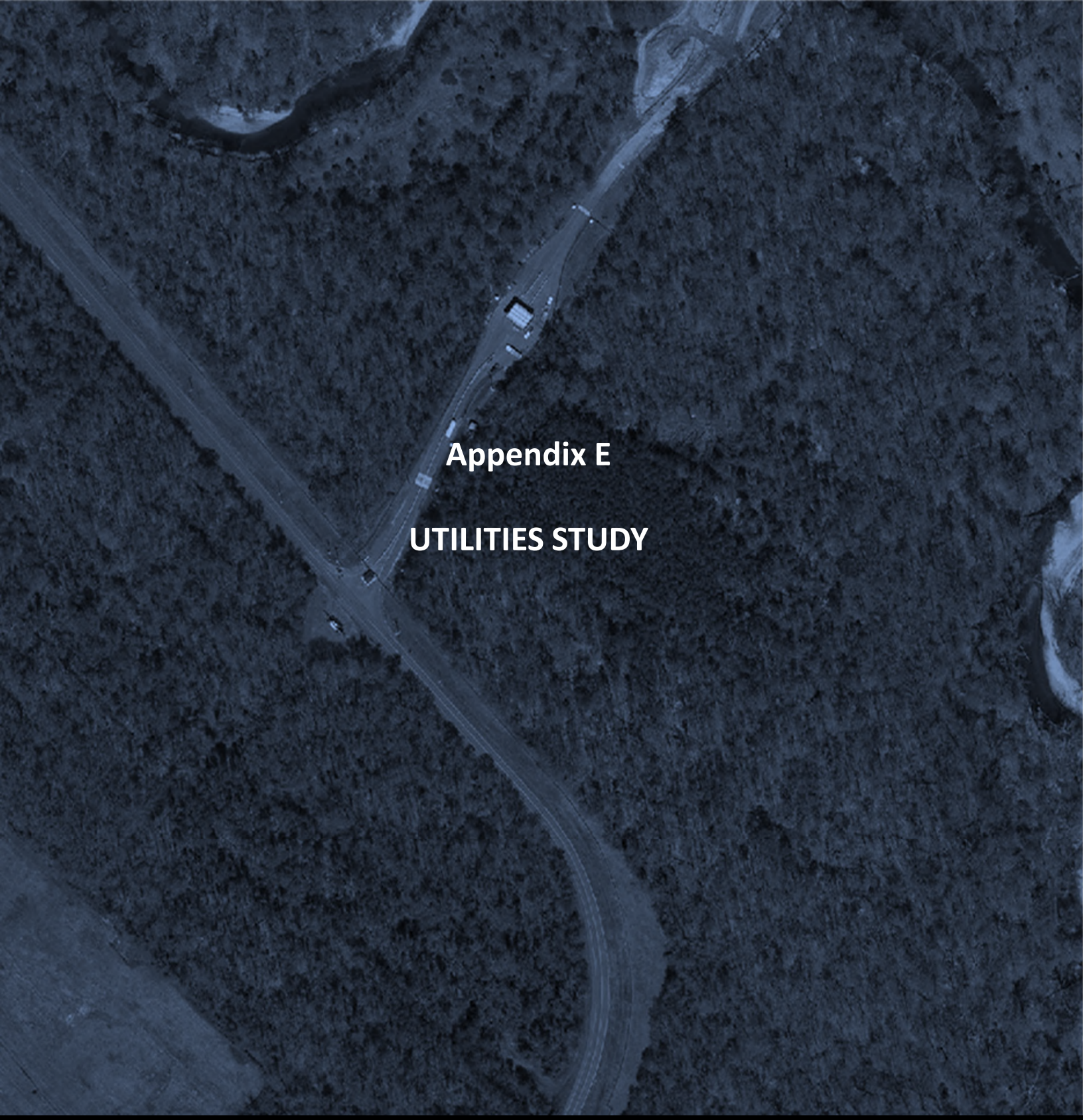
A Virginia *Threatened* Species

Note the sculptured scales of the top of shell (carapace).

Bottom view (plastron) of a male wood turtle. The concaved plastron is characteristic of a male. Note the distinct black markings and the brightly colored legs and tail.

Wood turtles, a state Threatened species, may be found in or near this project area. Wood turtles are medium-sized (6-9 inches adult shell length) semi-terrestrial turtles found in streams or in riparian uplands. The dull brown upper shell is very rough, and each section of the shell reflects growth rings that form an irregular pyramid. There is great variation in this trait, however, and the upper shell of older turtles may appear smooth. The bottom shell is yellow with black marginal blotches. Wood turtles have a black head, and dark brown extremities with characteristic yellow to burnt-orange skin patches on the neck and leg sockets. Wood turtles that are found in an instream construction area should be carefully relocated downstream to safety in suitable habitat (a run or deep pool with sandy or muddy bottom and submerged roots, branches, or logs). Wood turtles found within the project area uplands during construction should be relocated within the same watershed, approximately ¼ to ½ mile downstream of their original location. It is a violation of Virginia law to harm or to possess a wood turtle. If you have any questions concerning wood turtles, please contact John Kleopfer of the Virginia Department of Game and Inland Fisheries (804-829-6703; John.Kleopfer@dgif.virginia.gov).

THE WOOD TURTLE IS A PROTECTED SPECIES IN VIRGINIA: IT IS UNLAWFUL TO HARM, COLLECT, OR POSSESS THESE TURTLES.

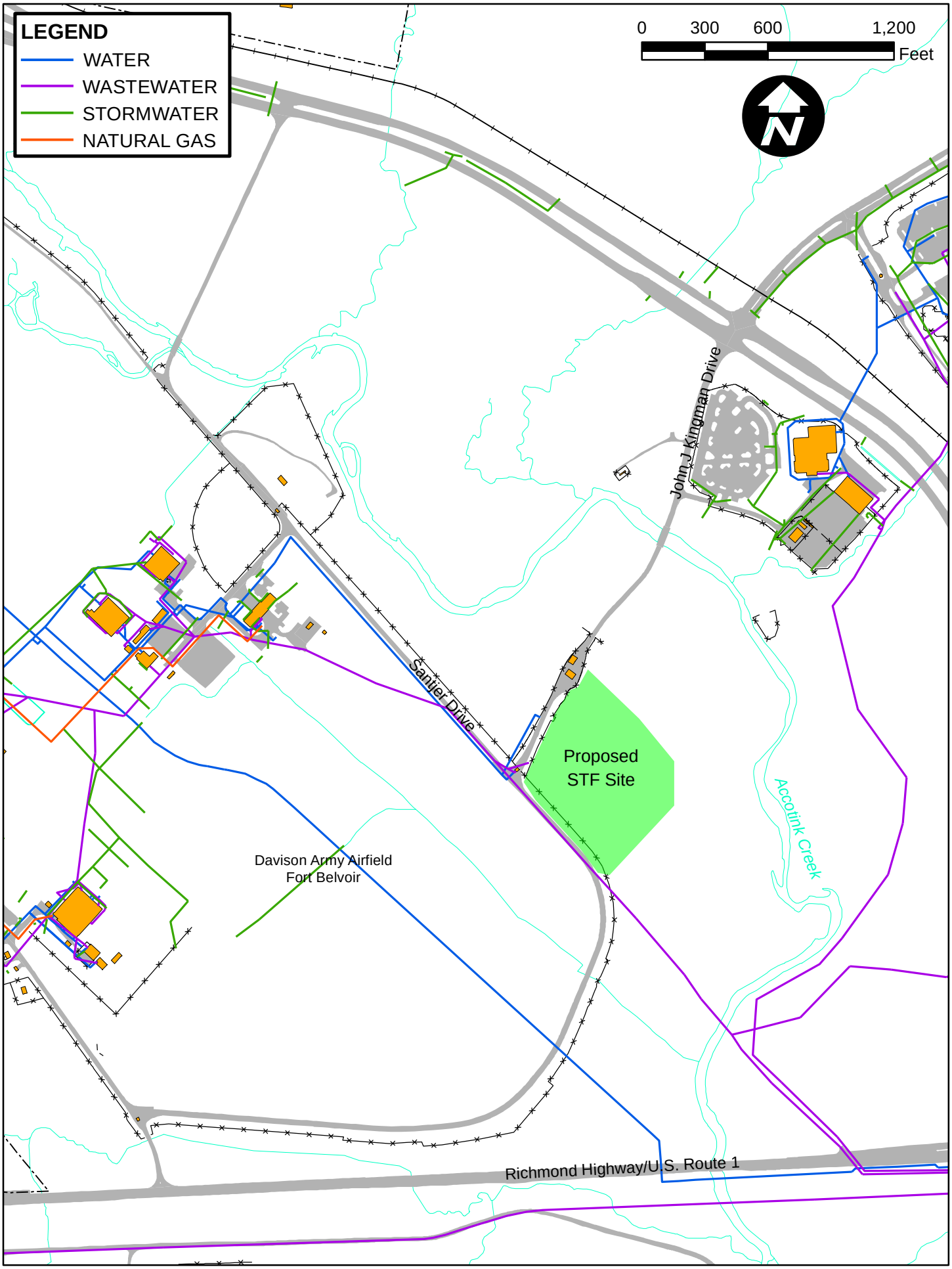


Appendix E

UTILITIES STUDY

LEADERS IN EXCELLENCE!

U.S. ARMY GARRISON FORT BELVOIR


LEGEND
WATER
WASTEWATER
STORMWATER
NATURAL GAS
0
300
600
1,200
Feet
N
John J Kingman Drive
Santjer Drive
Proposed
STF Site
Accotink Creek
Davison Army Airfield
Fort Belvoir
Richmond Highway/U.S. Route 1

DOCUMENTATION FORM

Date:	June 27, 2013	**From:**	T. Fitzgerald
Send to:	Project Team	**Office Location:**	Alexandria
Subject:	DAAF OTC Sewer Investigation	**Action:**	For Record
Commission No.:	212097.00	**cc:**	

❑ OFFICE CORRESPONDENCE ❑ TELEPHONE LOG ❑ CONFERENCE NOTES ☒ MEMORANDUM

Comments:

The following documents minutes of site meeting and field survey work to define limits of potential sewer replacement required on the subject project based on field inventory of site conducted on June 26, 2013 with Mr. Mark Pietras, P.E. (Senior Engineer - American Water) and Lenny White, (Capital Project Manager - American Water).

Tom Fitzgerald (Project Manager - WileyWilson), met with Lenny and Mark to discuss potential sewer upgrade needs to serve the proposed OSEG OTC development at DAAF on Fort Belvoir. The existing gravity sewer adjacent to the development site consists of an 8-inch terracotta sewer which has been slip lined with a HDPE pipe, resulting in a reduced interior diameter of 6-inches. American Water reports that there are wet weather flow concerns in this sewer segment that are currently under investigation.

This sewer segment conveys sewage from the entire developed area of DAAF and would not be considered adequate by modern design standards given the reduced interior diameter. Additional flow monitoring and smoke testing of sewers within the DAAF site is programmed for the summer of 2013 to identify sources of inflow and infiltration. After this office discussion, Mark Pietras and Tom Fitzgerald went out to the site to walk the sewer easement and inventory manholes for the upcoming TES survey.

Based on the results of these investigations the proposed OSEG development may be required to upgrade the sewer segment along Santjer Drive to accommodate the flow from the additional 180 OTC personnel during wet weather (dry weather flows are not a concern). For costing purposes, the proposed OTC development should program for replacement of 1,600 feet of the sewer, upgrading it to 12-inch diameter pipe. This will need to include a subaqueous crossing of Accotink Creek (approximately 35' wide at the crossing point). This will enable connection of the DAAF sewer to the recently installed 15-inch sewer that serves the Reserve Center and DLA facilities north of the project site per Figure 1. This will include programming for replacement of the sewer from Manhole 13-12 to Manhole 23-68. For the purposes of the environmental Assessment of the proposed action threatened and endangered species surveys will be completed from Manhole 13-11 to Manhole 23-44 out at Route 1, including a 100-foot wide corridor centered on the sewer alignment to document any endangered plant or animal species which may be present (red highlighted area on Figure 1). We have extended this TES survey out to Route 1 to provide flexibility in addressing elevation differences between the two parallel sewers, it appears the DLA north sewer is approximately 5-feet higher in elevation than the DAAF sewer so integrating the two sewers right at the creek may be problematic and require further downstream improvements or potentially a major pump station to serve the DAAF site.

Figure 1: DAAF sewer line in vicinity of OTC project. *(Base image: American Water GIS)*

Plate 1: Manhole 13-13; 9'-6" from MH rim to crown of 8" VCT; 8" VCT lined with HDPE - estimate new ID to be 6"; this is the primary sewer line from DAAF. Downstream MH 13-12 is just down Santjer Drive from this location, MH 13-12 was not accessed due to traffic concerns.

Note, MH is in good condition (9/10), small amount of infiltration noted by mineral stain around bench of manhole.

Dry day observation on June 26, 2013 at approx. 2 PM. Flow depth was approximately 1/4-1/3 of pipe diameter

Flow was consistent, and uniform flow profile. Water was clear and unfouled with sanitary items or human waste,

Plate 2: Manhole 23-66; 10'-6" from MH rim to crown of 8" VCT; no liner visible from surface; this is the second MH on the primary sewer line from DAAF after it crosses Accotink Creek. MH 13-01A at the creek crossing was buried under approximately 18" of soil and was not accessed.

Note, MH is in fair condition (6/10); consistent mineral stain indicative of infiltration from bench up 18" inside MH riser; rim is located below the flood level and is not of waterproof design; vent pipe near 5-o'clock position, vent is likely under the floodplain elevation.

Dry day observation on June 26, 2013 at approx. 2 PM. Flow depth was approximately 1/4-1/3 of pipe diameter

Flow was consistent, and uniform flow profile. Water was clear and unfouled with sanitary items or human waste, indicative of clear water source running at constant rate into sewer (i.e. groundwater or potable water discharge). Flow was consistent with upstream MH 13-13, indicative that infiltration between these locations (including subaqueous creek crossing) is minor.

Inflow into MH in this section around Accotink Creek is a significant concern as all of the manholes in this area are located at or below grade in an area subject to frequent flooding. Raising manholes in this area and installing waterproof frames and covers is strongly recommended. Vent pipes should also be extended above flood levels.

This sewer is significantly deeper than the parallel sewer from DLA north as it crosses under Accotink Creek.

Plate 3: Manhole 23-68; 5'-6" from MH rim to bench of MH of 15" PVC; this is the deflection MH on the sewer line from DLA North which parallels the DAAF line.

Note, MH is in good condition (8/10); no sign of infiltration; rim is located below the flood level and is not waterproof; vent is likely under the floodplain elevation.

Dry day observation on June 26, 2013 at approx. 2 PM. Flow was sanitary in consistency and character, approximately 2 inches of flow depth. Flow was consistent, and uniform flow profile.

Inflow into MH in this section around Accotink Creek is a significant concern as all of the manholes in this area are located at or below grade in an area subject to frequent flooding. Raising manholes in this area and installing waterproof frames and covers is strongly recommended. Vent pipes should also be extended above flood levels.

This manhole would be logical connection point for DAAF but there is not enough apparent depth, given the DAAF sewer is approximately 5 feet deeper than this sewer line.

Plate 4: Manhole 24-34; 5'-6" from MH rim to bench of MH of 15" PVC; this is the next MH on the sewer line from DLA North which parallels the DAAF line.

Note, MH is in good condition (8/10); no sign of infiltration; rim is located below the flood level and is not waterproof; vent is likely under the floodplain elevation.

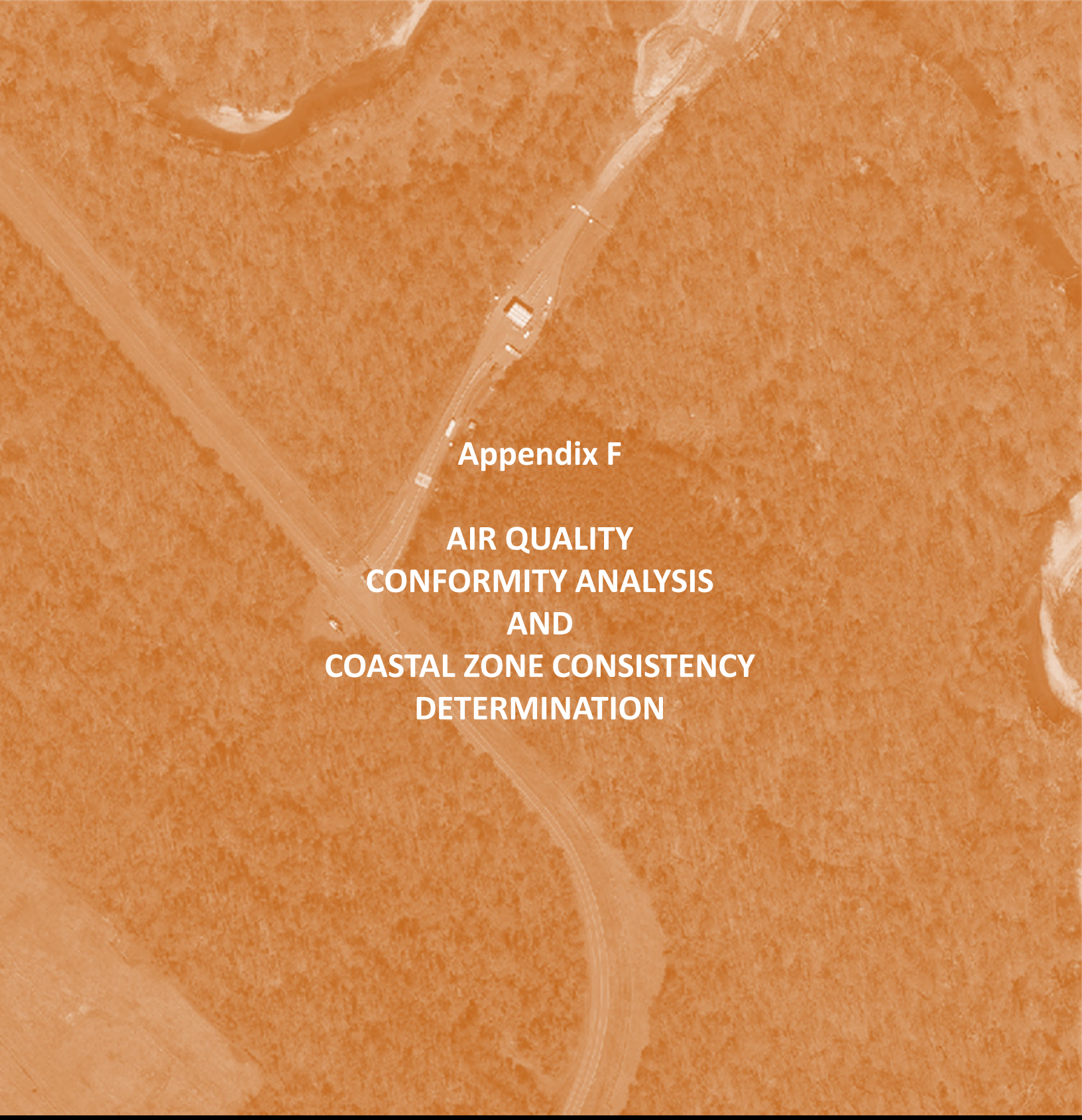
Dry day observation on June 26, 2013 at approx. 2 PM. Flow was sanitary in consistency and character, approximately 2 inches of flow depth. Flow was consistent, and uniform flow profile.

Inflow into MH in this section around Accotink Creek is a significant concern as all of the manholes in this area are located at or below grade in an area subject to frequent flooding. Raising manholes in this area and installing waterproof frames and covers is strongly recommended. Vent pipes should also be extended above flood levels.

Plate 5: Photo looking north up Accotink Creek where the DAAF sewer crosses, creek is 8 to 12-inches deep across this section. Note former water intake and headwall for antiquated raw water intake no longer in use just north of DAAF sewer crossing.

Plate 6: Photo looking across Accotink Creek where the DAAF sewer crosses, creek is 8 to 12-inches deep across this section. Note former water intake and headwall for antiquated raw water intake no longer in use just north of DAAF sewer crossing.

Plate 7: Photo up sewer line route to DAAF from eastern bank of Accotink Creek; sewer easement is heavily overgrown with emergent vegetation and small trees.



Appendix F

AIR QUALITY CONFORMITY ANALYSIS AND COASTAL ZONE CONSISTENCY DETERMINATION

LEADERS IN EXCELLENCE!

U.S. ARMY GARRISON FORT BELVOIR

RECORD OF NON-APPLICABILITY
In Accordance with the Clean Air Act - General Conformity Rule for:
The Proposed Skills Training Facility Development, Fort Belvoir, Virginia

Jan 14, 2014

The Army proposes to relocate the Skills Training Facility at Fort Belvoir to a new facility sited on the Davison Airfield area of the garrison, the Proposed Action includes:

- Construction of two adjoining training and evaluation buildings encompassing a total of 96,000 square feet including classrooms, readiness storage, physical training, indoor firearms training, instructor offices, administrative space, fitness assessment and medical clinic facilities.
- Site work will include at-grade parking for 180 student and instructor vehicles, internal road and pedestrian access corridors, landscaping and outdoor personal fitness training spaces.
- The total planned building and pavement footprint encompasses 176,000 square feet, or approximately 4 acres of the 10 acre site.
- Facilities will include natural gas fired heating systems and diesel fired emergency power generators.

The Proposed Action has been evaluated under the General Conformity provisions of the Clean Air Act, Section 176 as codified in Title 40 of the Code of Federal Regulations Part 93, Subpart B. The requirements of this rule have been found not to be applicable to the Proposed Action because:

The highest total annual direct and indirect emissions from this Proposed Action have been estimated at 17.1 tons of nitrous oxides (NO_x); 17.8 tons of volatile organic compounds (VOCs); 23.5 tons of very fine particulate matter ($PM_{2.5}$); and 2.4 tons of sulfur dioxide (SO_2) per year, which would be below the applicability threshold values of 50 tons of VOCs; 100 tons of SO_2, $PM_{2.5}$, and NO_x

Supporting documentation and emissions estimates:
(X) Are Attached (F-1)
( ) Appear in the National Environmental Policy Act documentation
( ) Other (not necessary)

For Gregory D. Gadson, Deputy
Gregory D. Gadson
Colonel, US Army
Garrison Commander

F-1 EMISSIONS ESTIMATION AND METHODOLOGY

The Army has considered all reasonably foreseeable net air emissions generated from all direct and indirect sources associated with the proposed development of the Skills Training Facility at Fort Belvoir. *Direct emissions* are defined as emissions directly caused or initiated by the proposed action and that will occur at the same time and place as the proposed action. *Indirect Emissions* are defined as reasonably foreseeable emissions that are caused by the action but may occur later in time and/or be further removed in distance from the action itself, and that the Federal agency can practically control. More specifically, project-related direct emissions would result from the following:

- *Construction Activities*: Including, the use of non-road equipment (e.g. backhoes and bulldozers), worker vehicles, the use of paints containing volatile organic compounds, off-gases from paving operations, and fugitive particles from land clearing and earth moving activities.
- *Operational Activities*: Including the use of building heating systems (boilers) and emergency generators not subject to major new source review, and the use of private motor vehicles.

All direct and indirect emissions with proposed action to develop the Skills Training Facility were estimated. Emissions related to Construction Activities were generated by estimating equipment uses required for installation of site utilities, site preparation work, facility construction, final grading, landscaping and paving, including:

- Construction of two adjoining training and evaluation buildings encompassing a total of 95,000 square feet including classrooms, readiness storage, physical training, indoor firearms training, instructor offices, administrative space, fitness assessment and medical clinic facilities.
- Site work will include at-grade parking for 180 student and instructor vehicles, internal road and pedestrian access corridors, landscaping and outdoor personal fitness training spaces.
- The total planned building and pavement footprint encompasses 176,000 square feet, or approximately 4 acres of the 10 acre site.
- Facilities will include natural gas fired heating systems and diesel fired emergency power generators.

F-1-1 ESTIMATED EMISSIONS FROM CONSTRUCTION EQUIPMENT

Emissions related to construction equipment include estimates of the off-road equipment required to construct the proposed facility as detailed in Table F-1. This table also includes an estimate of the emissions from this equipment and related facility construction efforts, (i.e. land clearing, painting, and paving). Emission categories are detailed based on anticipated construction phasing, which includes an estimate of the overall project construction schedule being 18-months with two primary phases, being 1 year of site preparation, utility installation and building construction (Phase I) and six months of final site completion and building commissioning (Phase II).

The following formula was used to estimate hourly emissions from non-road engine sources, including backhoes, excavators, cranes, lifts and other similar equipment using emission factors listed in EPA's NONROAD Emissions Model (2008a). Operating hours are based on projected construction schedule and operating hours typically required for projects of the scope of the Skills Training Facility. Hourly emissions from non-road equipment were estimated based on the following formula:

$M_i = (N \times EF_i) \times AI$

Where: M_i = mass of emissions of ith pollutant
N = number of pieces of equipment
EF_i = average emissions of ith pollutant/per hour
AI = anti-idling factor (0.98)

Table F-1

Annual Construction Equipment Emissions (tpy)						
Year	**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**
Year 1	4.6	9.0	0.7	0.7	1.4	1.4
Year 2	0.8	1.5	0.1	0.1	0.2	0.2
TOTAL	**5.4**	**10.5**	**0.8**	**0.8**	**1.6**	**1.6**

* Note project is projected to be complete in 18 months, Year 2 reflects 1/2 year of emissions and reduced amount of equipment (1/3 of first year loading).

F-1-2 ESTIMATED EMISSIONS FROM CONSTRUCTION WORKER VEHICLES

Emissions due to construction worker commuting to the project were estimated using emission factors provided in EPA's MOBILE6.2 source modeling program. The estimate assumes that workers commute a total of 30 miles per day to the project site at an average speed of 35 miles/hour.

Table F-2

Annual Const. Worker Vehicle Emissions (tpy)					
Year	**CO**	**NO_x**	**VOC**	**$PM_{2.5}$**	**SO_2**
Em. Factor (g/mile)	2.918	0.30	0.34	0.0113	0.0068
Year 1	1.1	0.1	0.1	LESS THAN 0.05	
Year 2	0.55	0.05	.06		
TOTAL	**1.65**	**0.15**	**0.16**		

* Projected Worker Population of 50 personnel, 230 work days/year, 30 miles roundtrip = 345,000 miles/year; (908,000 grams/ton). Year 2 reflects only 6-months of project work.

F-1-3 ESTIMATED EMISSIONS FROM ARCHITECTURAL COATINGS

Estimates of Volatile Organic Compound emissions associated with painting the proposed STF were generated based on coating the entire interior walls and ceiling spaces with 3 mm of paint, (primer and finish) is based on the following formula:

E= (F / G x H) / 2,000 Where: E = VOC emissions from Architectural finishes (tons)
F = total area to be coated (floor areas SFx 2)
G = paint coverage (SF/gal) (400 sf/gal)
H = pounds of VOC emissions per gallon (0.83 lb/gal)

Based on the projected floor area of 96,000 square feet, this yields:

E= (192,000 / 400) x 0.83 / 2,000 = **0.02 tons** of VOC's due to Architectural Finishes

F-1-4 ESTIMATED EMISSIONS FROM CURING ASPHALT PAVING

Estimates of Volatile Organic Compound emissions associated with curing of the pavements associated the proposed Skills Training Facility are independent of construction emissions associated with physically placing the asphalt paving (i.e trucks and pavers are accounted for in construction operations phase emissions summary, Table F-1). These curing emissions are calculated based on surface area to be paved using the following formula:

E= (F x G) / 2,000 Where: E = VOC emissions from Architectural finishes (tons)
F = total area to be paved (acres)
G = curing emission rate (lb VOC/acre) (2.62 lb/acre)

Based on the projected site paving area of 80,000 square feet, this yields:

E= (80,000 / 43,560 sf/acre) x 2.62 lb/acre / 2,000 = **0.0024 tons** of VOC's from Asphalt

F-1-5 ESTIMATED PARTICULATE EMISSIONS FROM SURFACE DISTURBANCE

Particulate emissions associated with land disturbance are estimated based on $PM_{2.5}$ emission ratios listed in EPA guidance document AP-42 for fugitive dust sources. These emissions associated with the Skills Training Facility site are based on the following formula:

E= A x TSP x R x C/2,000

Where: E = $PM_{2.5}$ (tons)
A = total area to be cleared (acres)
TSP = PM_{10} total suspended particulate (80 lb/acre)
R = Ratio of $PM_{2.5}$ to PM_{10} (0.15 lb/lb)
CF = Capture Fraction (0.5)

Based on the projected site clearing area of 4 acres, this yields:

E= 4 x 80 x 0.15 x 0.5/ 2,000 = **0.012 tons** of $PM_{2.5}$ from land disturbing activity

F-1-6 SUMMARY OF ESTIMATED CONSTRUCTION EMISSIONS

Table F-3 provides a summary of expected construction phase air emissions associated with the proposed Skills Training Facility:

Table F-3

Construction Activity Emissions Summary (tpy)						
Description	**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**
Const. Equipment	5.4	10.5	0.8	0.8	1.6	1.6
Const. Workers	1.65	0.15	-	-	-	0.16
Arch. Finishes	-	-	-	-	-	0.02
Asphalt Curing	-	-	-	-	-	.0024
Land Disturbance	-	-	0.012	0.012	-	-
Total	**7.05**	**10.65**	**0.81**	**0.81**	**1.60**	**1.78**
Conformity Threshold	NA	100	50	100	100	100

Table F-4 Facilities Construction Equipment Inventory

SCC	Equipment Description	HPavg	# of units in use	Avg Annual Hours	hp-hours
2265001060	4-Str Specialty Vehicle Carts	46	1	80	3680
2265002003	4-Str Pavers	62	1	40	2496
2265002006	4-Str Tampers/Rammers	8	1	120	902
2265002009	4-Str Plate Compactors	13	1	120	1520
2265002015	4-Str Rollers	83	1	120	9960
2265002021	4-Str Paving Equipment	37	1	40	1464
2265002024	4-Str Surfacing Equipment	9	1	40	357
2265002027	4-Str Signal Boards/Light Plants	5	1	80	403
2265002030	4-Str Trenchers	9	1	120	1066
2265002033	4-Str Bore/Drill Rigs	31	1	80	2511
2260002039	2-Str Concrete/Industrial Saws	5	1	80	363
2265002042	4-Str Cement & Mortar Mixers	8	1	120	1005
2265002045	4-Str Cranes	69	1	546	37696
2265002057	4-Str Rough Terrain Forklift	66	1	546	35981
2265002060	4-Str Rubber Tire Loaders	70	1	546	38438
2265002060	4-Str Rubber Tire Loaders	113	1	546	61698
2265002066	4-Str Tractors/Loaders/Backhoes	19	1	546	10418
2265002072	4-Str Skid Steer Loaders	18	1	546	10052
2265002078	4-Str Dumpers/Tenders	9	1	546	4652
2265003010	4-Str Aerial Lifts	21	1	546	11537
2265003030	4-Str Sweepers/Scrubbers	10	1	120	1183
2260004021	2-Str Chain Saws < 6 HP (com)	4	2	80	627
2265006010	4-Str Pumps	18	1	546	10019
2265006015	4-Str Air Compressors	10	1	546	5419
2270002003	Dsl - Pavers	135	1	40	5384
2270002015	Dsl - Rollers	85	1	40	3390
2270002018	Dsl - Scrapers	247	1	120	29628
2270002021	Dsl - Paving Equipment	131	1	40	5252
2270002030	Dsl - Trenchers	134	1	160	21488
2270002033	Dsl - Bore/Drill Rigs	132	1	80	10544
2270002036	Dsl - Excavators	138	1	546	75130
2270002045	Dsl - Cranes	238	1	40	9508
2270002048	Dsl - Graders	231	1	40	9248
2270002051	Dsl - Off-highway Trucks	161	1	546	87633
2270002057	Dsl - Rough Terrain Forklifts	61	1	546	33535
2270002060	Dsl - Rubber Tire Loaders	136	1	546	74420
2270002066	Dsl - Tractors/Loaders/Backhoes	87	1	546	47595
2270002069	Dsl - Crawler Tractor/Dozers	136	1	546	74311
2270002072	Dsl - Skid Steer Loaders	84	1	546	46055
2270002078	Dsl - Dumpers/Tenders	85	1	546	46628
2270003010	Dsl - Aerial Lifts	60	1	546	33011
2270003030	Dsl - Sweepers/Scrubbers	61	1	546	33202
2270004066	Dsl - Chippers/Stump Grinders (com)	242	1	120	29004
2270006005	Dsl - Generator Sets	419	1	120	50316
2270007015	Dsl - Forest Eqp - Feller/Bunch/Skidder	225	1	120	27024

F-1-7 ESTIMATED EMISSIONS FROM OPERATING FACILITY HEATING SYSTEMS

Emission estimates for the proposed facility heating systems are based on the U.S. Department of Energy's 1999 survey of *Consumption and Gross Energy Intensity by Census Region for Sum of Major Fuels, Commercial Buildings Energy Consumption Survey.* Heating system emission factors are based upon USEPA's *AP-42* VOC emission factors for natural gas fired boilers as outlined below:

Energy Intensity, Natural Gas Heating Systems	EI	= 31.4 ft^3 per gross square foot/yr
Total Building Square footage	SF	= 96,000 square feet
Total Natural Gas Input Required	HI	= 3,014,400 ft^3 (EI x SF)
AP-42 Emissions Factor NG Boiler	EF	= 5.5 $lb/10^6$ ft^3
Annual Emission Level	AE	= 3,014,400 x $5.5/10^6$ (HI x EF)
	AE	= 16.5 lb/year

Table F-5 provides a further breakdown of expected heating system emissions based upon USEPA's AP-42 guidance for natural gas fired boilers following the same calculation process outlined above.

Table F-5

Annual Facility Heating Equipment Emissions Estimate (tpy)							
Year	**CO**	**NO_x**	**VOC**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**
Emission Factors ($lb/10^6$ cf)	84	2.2	5.5	0.6	7.6	7.6	120,000
TOTAL	**253.2**	**6.6**	**16.5**	**1.8**	**22.9**	**22.9**	**362,000**

F-1-8 ESTIMATED EMISSIONS FROM FACILITY EMERGENCY POWER SYSTEMS

Emission estimates for use of the proposed facility emergency power generators is based upon the projection that incidental use and periodic maintenance testing will not exceed 500 hours maximum annual run-time and generator sets will not be equipped with selective catalytic reduction. Emission factors for the two maximum size units that could be installed at the Skills Training Facility are based on industrial diesel engine emission factors listed in Section 3.3 of USEPA's AP-42 emission's manual based upon power output (lb/hp-hr) as outlined in Tables F-6 and F-7 below:

Table F-6

AP-42 Industrial Diesel Emission Factors (lb/hp-hr)						
Year	**NO_x**	**VOC**	**$PM_{2.5}$**	**SO_2**	**CO_2**	**CO**
Emission Factors (lb/hp-hr)	0.031	0.00247	0.00220	0.00205	1.15	0.00668

Table F-7

Estimated Emergency Generator Emissions (tpy)							
Generator Rating	**Annual hp-hours**	**NO_x**	**VOC**	**$PM_{2.5}$**	**SO_2**	**CO_2**	**CO**
645 BHP	322,500	5.0	0.4	0.3	0.3	185	1.1
645 BHP	322,500	5.0	0.4	0.3	0.3	185	1.1
TOTAL	**645,000**	**10.0**	**0.8**	**0.6**	**0.6**	**370**	**2.2**

F-1-9 ESTIMATED EMISSIONS FROM FUTURE EMPLOYEE COMMUTING

Emission estimates for future employee and student commuting to and from the proposed Skills Training Facility site is based upon similar estimates provided for the construction phase workers, except there will be up to 190 personnel associated with the proposed action.

Emission estimates due to employee commuting to the project were estimated using emission factors provided in EPA's MOBILE6.2 source modeling program. The estimate assumes that workers commute a total of 30 miles per day to the project site at an average speed of 35 miles/hour as outlined in Table F-8 below.

Table F-8

Annual Employee Commuting Vehicle Emissions (tpy)					
Year	**CO**	**NO_x**	**VOC**	**$PM_{2.5}$**	**SO_2**
Em. Factor	2.918 (g/mile)	0.30 (g/mile)	0.34 (g/mile)	0.0113 (g/mile)	0.0068 (g/mile)
Annual	**4.21**	**0.43**	**0.49**	**LESS THAN 0.05**	

* Projected Employee Population of 190 personnel, 230 work days/year, 30 miles roundtrip = 1,311,000 miles/year; (908,000 grams/ton).

F-1-10 ESTIMATED EMISSIONS FROM FACILITIES MAINTENANCE

Emission estimates for future facilities operation are primarily associated with landscape maintenance and incidental material movement within the new Skills Training Facility which may include a small forklift which is documented in Table F-8 below

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Emission estimates due to employee commuting to the project were estimated using emission factors provided in EPA's MOBILE6.2 source modeling program. The estimate assumes that workers commute a total of 30 miles per day to the project site at an average speed of 35 miles/hour as outlined in Table F-9 and F-10 below.

Table F-9

Facilities Operation/Maintenance Equipment Emissions (tpy)						
Year	**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**
Year 1	0.02	0.10	-	-	-	.01
TOTAL	**0.02**	**0.10**	**-**	**-**	**-**	**.01**

Table F-10 Facilities Operation/Maintenance Equipment Inventory

SCC	Equipment Description	HPavg	# of units in use	Avg Annual Hours	hp-hours
2267003020	LPG - Forklifts	58	1	104	6051
2265004011	4-Str Lawn mowers (Com)	6	1	104	649
2260004026	2-Str Trimmers/Edgers/Brush Cutter (com)	1	1	52	73
2260004031	2-Str Leafblowers/Vacuums (com)	1	1	52	73
2265004031	4-Str Leafblowers/Vacuums (com)	8	1	52	432
2265004046	4-Str Front Mowers (com)	17	1	104	1768
2265004051	4-Str Shredders < 6 HP (com)	5	1	52	251
2265004056	4-Str Lawn & Garden Tractors (com)	18	1	104	1915

F-1-7 SUMMARY OF ESTIMATED OPERATIONS EMISSIONS

Table F-8 provides a summary of expected construction phase and operational phase air emissions associated with the proposed Skills Training Facility. This summary shows that all operational activity emissions will be below the applicability thresholds of the Clean Air Act conformity requirements.

Table F-8

Operational Activity Emissions Summary (tpy)							
Desc.	**CO**	**NO_x**	**VOC**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**
Facility Heating	253.2	6.6	16.5	1.8	22.9	22.9	362,000
Emergency Generators	2.2	10.0	0.8	0.6	0.6	0.6	370
Employee Commute	4.21	0.43	0.49	-	-	-	-
Annual Operations	0.02	0.10	.01	-	-	-	-
Total	**259.6**	**17.1**	**17.8**	**2.4**	**23.5**	**23.5**	**362,000**
Conformity Threshold	NA	100	50	100	100	100	NA

Determination of Consistency with
Virginia's Coastal Resources Management Program
Construct Skills Training Facility, Davison Army Airfield
U.S. Army Garrison, Fort Belvoir, Virginia

Pursuant to Section 307(c)(1) of the Coastal Zone Management Act of 1972 as amended, the U.S. Army has prepared this is a Federal Consistency Determination for the proposed development of a new Skills Training Facility and associated utility system improvements planned within the Davison Army Airfield (DAAF) at Fort Belvoir in Fairfax County, Virginia. This determination hereby documents and determines the consistency of its activities affecting Virginia's coastal resources of coastal uses as promulgated in the Virginia Coastal Resources Management Program (CRMP).

This document represents an analysis of project activities in light of established Virginia CRMP Enforceable Policies and Programs. Furthermore, submission of this Consistency Determination reflects the commitment of the Army to comply with those Enforceable Policies and Programs. The proposed project will be constructed and operated in a manner that is consistent with the Virginia CRMP. The Army has determined that the construction and operation of the proposed Skills Training Facilities would have a negligible impact on any land and water uses or natural resources of the Commonwealth of Virginia coastal zone.

Description of Proposed Activity

The proposed activity includes: Construction of a New Skills Training Facility, replacing existing facilities at Fort Belvoir that are dilapidated and no longer meet current training needs, including:

- Construction of new training buildings including unit training and planning areas, staff billeting, classrooms, an on-site medical clinic, gymnasium and fitness center, offices, storage rooms and equipment maintenance spaces; encompassing a total of approximately 96,000 square feet in two adjacent buildings within a 10-acre project area along Santjer Drive at the DAAF area of Fort Belvoir.
- Installation of utility services to the buildings from existing adjacent utilities serving site. Natural gas mains will be extended approximately 2,600 feet up to the development site from within the core service area of the DAAF following existing road alignments. Approximately 1,300 feet of sanitary sewer along Santjer Drive will be replaced as part of this project to improve wet-weather flow capability.

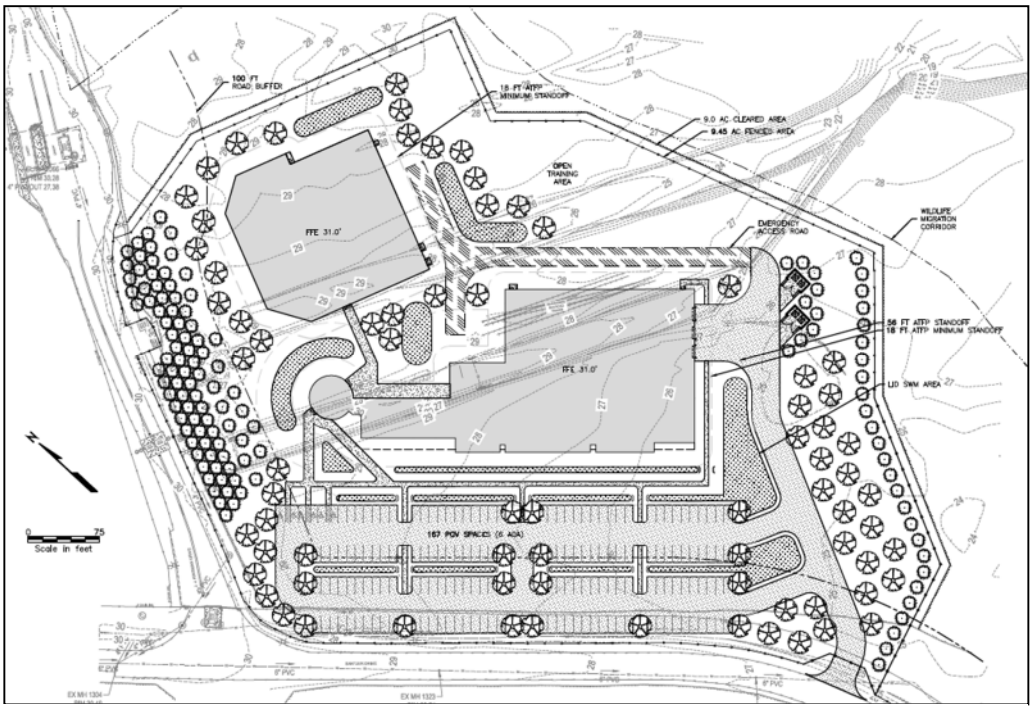

Figure 1: Concept site plan Skills Training Facility at Davison Army Airfield, Fort Belvoir, Virginia.

The U.S. Army has determined that development of the Skills Training Facility will not appreciably affect the land or water uses or natural resources of Virginia as documented within the NEPA Environmental Assessment of the proposed action. Based upon this information and the attached regulatory program summary, the U.S. Army finds that the proposed action is consistent to the maximum extent practicable with the enforceable policies of the Virginia CZMA.

Pursuant to 15 CFR Section 930.41, the Virginia Coastal Zone Management Program has 60 days from the receipt of this document in which to concur with or object to this Consistency Determination, or to request an extension under 15 CFR section 930.41 (b). Virginia's concurrence will be presumed if its response is not received by the Army on or before the 60th day from receipt of this determination. The Commonwealth of Virginia's response should be sent to Chief, Environmental Division, Bldg. 1442, 9430 Jackson Loop, Fort Belvoir, VA 22060-5116.

Assessment of Probable Effects

- **Fisheries Management**

  The program stresses the conservation and enhancement of finfish and shellfish resources and the promotion of commercial and recreational fisheries to maximize food production and recreational opportunities. This program is administered by the Marine Resources Commission (VMRC) (Virginia Code '28.2-200 to '28.2-713) and the Department of Game and Inland Fisheries (VDGIF) (Virginia Code '29.1-100 to '29.1-570). The state Tributyltin (TBT) Regulatory Program has been added to the Fisheries Management program. The General Assembly amended the Virginia Pesticide Use and Application Act as it related to the possession, sale, or use of marine antifoulant paints containing TBT. The use of TBT in boat paint constitutes a serious threat to important marine animal species. The TBT program monitors boating activities and boat painting activities to ensure compliance with TBT regulations promulgated pursuant to the amendment. The VMRC, VDGIF, and Virginia Department of Agriculture and Consumer Services (VDACS) share enforcement Responsibilities (Virginia Code '3.1-249.59 to '3.1-249.62).

  Statement of Affect on Fisheries Management:

  Development of the proposed Skills Training Facility at the DAAF will not involve building, dumping, or trespassing on or over, encroaching on, taking or using any material from the beds of the bays, ocean, rivers, streams, or creeks within Virginia. Where proposed utilities will cross streams, wetlands or waters of the state, crossings will be installed using trenchless techniques in accordance with Virginia Marine Resources Commission guidelines and associated specific construction permits. The proposed action would not have a reasonable foreseeable effect on fish spawning, nursery, or feeding grounds, and therefore none on fisheries management per the Virginia Marine Resources Commission and the Department of Game and Inland Fisheries. No paints containing Tributyltin will be used under this proposed action.

- **Subaqueous Lands Management**

  The Virginia management program for subaqueous lands establishes conditions for granting or denying permits to use state-owned bottomlands based on considerations of potential effects on marine and fisheries resources, wetlands, adjacent or nearby properties, anticipated public and private benefits, and water quality standards established by the Department of Environmental Quality (DEQ), Water Division. The program is administered by the Marine Resources Commission (Virginia Code '28.2-1200 to '28.2-1213).

  Statement of Affect on Subaqueous Lands Management:

  No subaqueous land use is proposed under this action. This project involves no encroachments in, on, or over state-owned submerged lands. Where proposed utilities will cross streams, wetlands or waters of the state, crossings will be installed using trenchless techniques in accordance with Virginia Marine Resources Commission guidelines and associated project specific construction permits. Figure 2 on the following page highlights the relationship of the proposed development to adjacent floodplain areas.

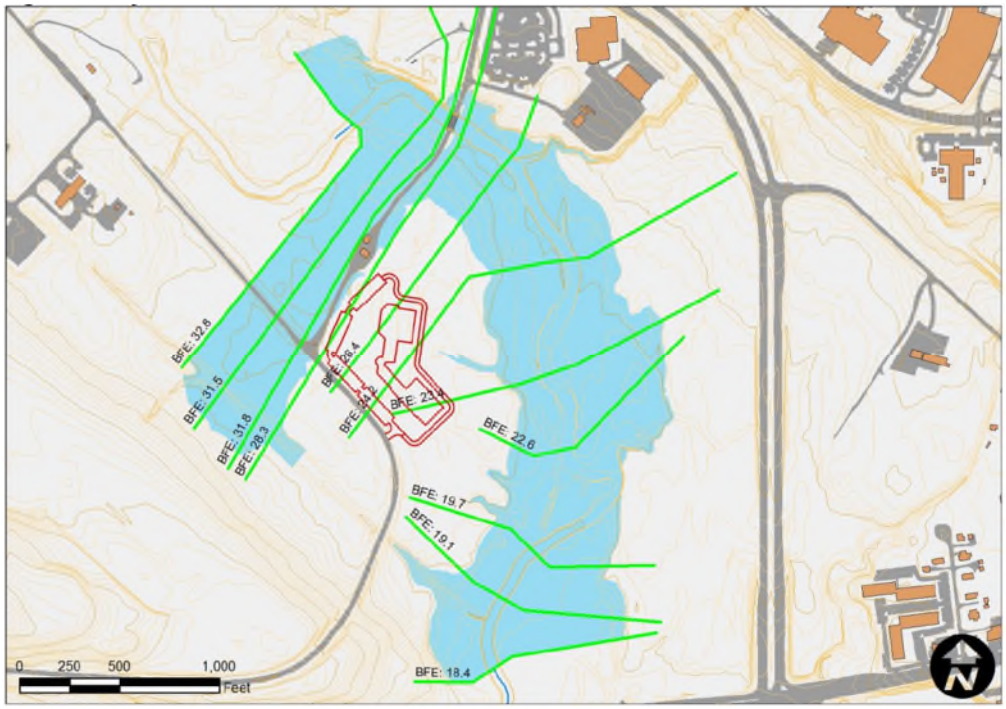

Figure 2: 100 Year floodplain (blue shaded area) in the vicinity of the proposed STF site. Proposed STF development is outside of floodplain boundary, (green cross sections note base flood elevations (BFE).

- **Non-Point Source Pollution**

  Virginia's Erosion and Sediment Control (ESC) Law requires soil-disturbing activities to be designed to reduce soil erosion and to decrease inputs of chemical nutrients and sediments to the Chesapeake Bay, its tributaries, and other rivers and waters of the Commonwealth. This program is administered by the Department of Conservation and Recreation (DCR) (Virginia Code '10.1-560 et seq.). Also, construction activity of less than 1 acre but part of a common plan of development disturbing 1 or more acres and having the potential to discharge stormwater requires coverage under the Virginia Stormwater Management Program (VSMP) General Permit for Discharges of Stormwater for Construction Activities.

  Statement of Affect on Non-Point Source Pollution:

  Development of the Skills Training Facility at the DAAF will include over an acre of land disturbance due to facility construction and demolition activity. Fort Belvoir has a developed integrated Storm Water Pollution Prevention Plan (SWPPP) to guide this activity and project specific ESC plans will be developed to avoid and minimize potential impacts per Virginia ESC law. These plans will become temporary additions to the SWPPP for the duration of the activity. Following these established ESC requirements will ensure conformance with the CZMA to the maximum extent practicable.

- **Wetlands Management**

  The purpose of the wetlands management program is to preserve tidal wetlands, prevent their despoliation and accommodate economic development in a manner consistent with wetlands preservation.

  The tidal wetlands program is Administered by the Marine Resources Commission (Virginia Code section 28.2-1301 through '28.2-1320). The Virginia Water Protection Permit Program administered by the Department of Environmental Quality Includes protection of wetlands – both

Tidal and non-tidal. This program is authorized by Virginia Code section 62.1-44.15.5 and the Water Quality Certification requirements of Section 401 of the Clean Water Act of 1972.

Statement of Affect on Wetlands Management:

As shown on Figure 3, the proposed action will not affect any wetlands at Fort Belvoir. It is unlikely that the proposed action would require an Individual Virginia Water Protection (VWP) Permit as it does not propose to conduct any of the following activities in a wetland:

- *New activities to cause draining that significantly alters or degrades existing wetland acreage or functions.*
- *Filling or dumping.*
- *Permanent flooding or impounding.*
- *New activities that cause significant alteration or degradation of existing wetland acreage or functions.*

If unexpected conditions arise during the proposed redevelopment that may impact wetlands, Fort Belvoir would apply for appropriate wetland protection permits prior to commencing the activity. Project ESC plans and practices will also be closely monitored to prevent potential sediment deposition in waterways or wetlands adjacent to construction areas.

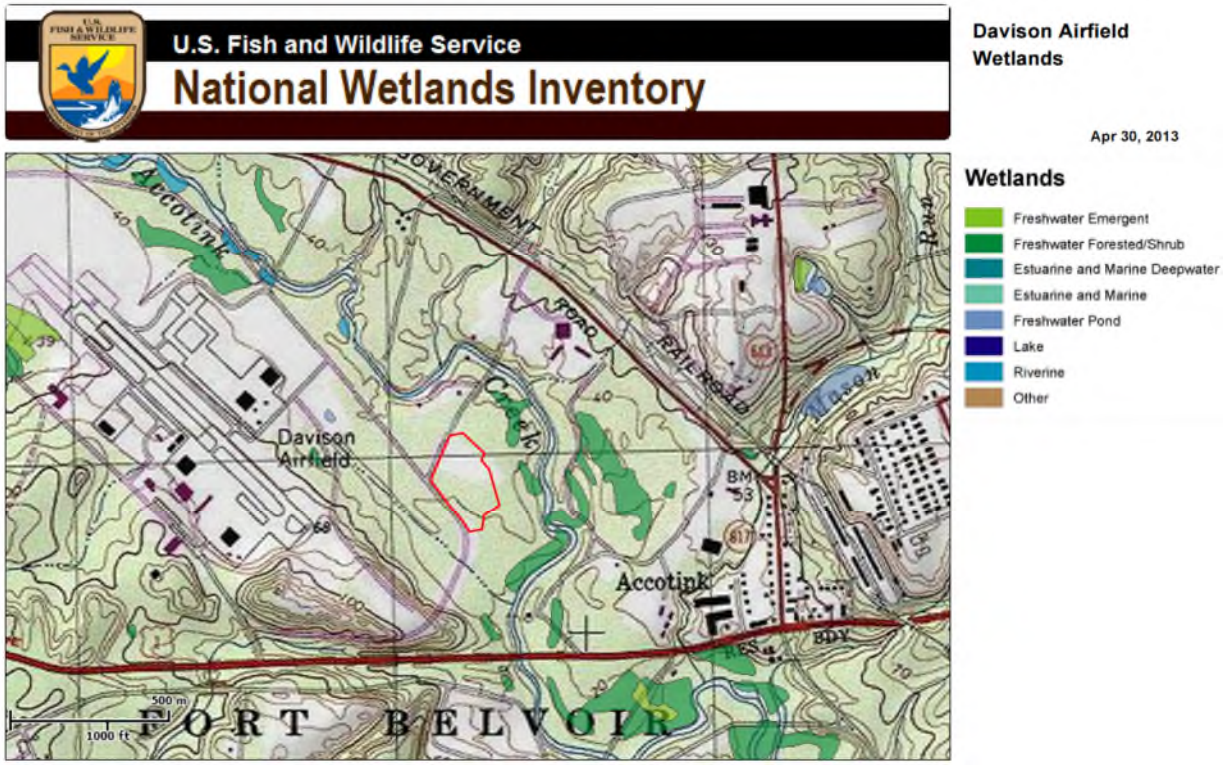

Figure 3: Regional National Wetland Inventory Mapping around STF project site (red outline). No wetlands were identified within the proposed limits of disturbance.

- **Sand Dune Management**

Dune protection is carried out pursuant to The Coastal Primary Sand Dune Protection Act and is intended to prevent destruction of alteration of primary dunes. This program is administered by the Marine Resources Commission (Virginia Code '28.2-1400 through '28.2-1420).

Statement of Affect on Sand Dune Areas: No permanent alteration of or construction upon any coastal primary sand dune will take place under the proposed action.

- **Point Source Pollution Control**

  The point source program is administered by the State Water Control Board pursuant to Virginia Code '62.1-44.15. Point source pollution control is accomplished through the implementation of the National Pollutant Discharge Elimination System (NPDES) permit program established pursuant to Section 402 of the federal Clean Water Act and administered in Virginia as the Virginia Pollutant Discharge Elimination System (VPDES) permit program.

  Statement of Affect on Point Source Pollution Control:

  Construction of the Skills Training Facility at the DAAF will not appreciably alter sanitary sewer characteristics at Fort Belvoir. All sewerage on this project will be managed through the existing collection system network, with some minor upgrades planned around the complex due to existing wet weather flow concerns. American Water O&M, Inc., is the current VPDES permittee for this facility and all sewer modifications will follow terms outlined in their existing operating permit. No new point source permits would be required under the proposed development action. As such the proposed redevelopment will have no impact to point sources of water pollution regulated by the VPDES program.

- **Coastal Lands Management**

  A state-local cooperative program administered by the Department of Conservation and Recreation's Division of Chesapeake Bay Local Assistance and 84 localities in Tidewater, Virginia, established pursuant to the Chesapeake Bay Preservation Act; Virginia Code section 10.1-2100 through 10.1-2114 and Chesapeake Bay Preservation Area Designation and Management Regulations; Virginia Administrative code 9 VAC 10-20-10 et seq.

  Statement of Affect on Coastal Lands Management:

  Development of the Skills Training Facility at the DAAF will include maintaining minimum buffer areas of not less than 100 feet adjacent to and landward of the components listed in 9 VAC 10-20-80, (including adherence to Resource Protection Areas). Construction activities will follow best management practices provided in the VSMP, including project specific SWPPP and the applicable provisions of the Chesapeake Bay Preservation Act. This will appropriately minimize potential affects to Coastal Lands in accordance with the CZMA.

- **Shoreline Sanitation**

  The purpose of this program is to regulate the installation of septic tanks, set standards concerning soil types suitable for septic tanks, and specify minimum distances that tanks must be placed away from streams, rivers, and other waters of the Commonwealth. This program is administered by the Department of Health (Virginia Code '32.1-164 through '32.1-165)

  Statement of Affect on Sanitation Facilities:

  The Skills Training Facility at the DAAF does not include installation or operation of any on-site septic tanks.

- **Air Pollution Control**

  The program implements the federal Clean Air Act to provide a legally enforceable State Implementation Plan for the attainment and maintenance of the National Ambient Air Quality Standards. This program is administered by the State Air Pollution Control Board (Virginia Code '10-1.1300).

  Statement of Affect on Air Pollution:

  The estimated emissions from implementation of the proposed action would not exceed the de minimis threshold values. No individual air pollution control permits will be required and a

conformity determination is not applicable to development of the proposed the Skills Training Facility at the DAAF.

Summary of Findings

The preceding analysis is further detailed in the NEPA Environmental Assessment prepared for the proposed action. Fort Belvoir will ensure that the Skills Training Facility will include appropriate water quality features and best management practices during both design and construction of the proposed facilities to protect coast resources. This shall include obtaining required permits and approvals for proposed site work, and completing all required mitigation referenced in these permits and approvals. Fort Belvoir finds that the proposed construction of the Skills Training Facility would be consistent to the maximum extent practicable with the federally-approved enforceable policies of the Virginia CRMP, pursuant to the Coastal Zone Management Act of 1982, as amended, and in accordance with 15 CFR Part 930.30.

By certification that the proposed action is consistent with the Virginia CRMP Enforceable Policies, the Commonwealth of Virginia is hereby notified that it has 60 days from receipt of this document to concur with, or object to, this Federal Consistency Determination. However, if the Commonwealth has not issued a decision within 60 days of receipt of this determination, it shall notify Fort Belvoir of the status of this matter and the basis for further delay. The point of contact for this matter is Mr. Patrick McLaughlin, Chief, Environmental and Natural Resources Division, Directorate of Public Works, telephone (703) 806-4007.

FOR Stephen Jr. Powers, Deputy

Gregory D. Gadson
Colonel, US Army
Commanding

Appendix G

RECORD AGENCY & PUBLIC REVIEW COMMENTS

LEADERS IN EXCELLENCE!

U.S. ARMY GARRISON FORT BELVOIR

ENVIRONMENTAL ASSESSMENT - SKILLS TRAINING FACILITY - AGENCY REVIEW COMMENTS
Fort Belvoir, Virginia

Comment Number	Division/Section/Page #/Sheet #	Sub-Section/Note	Commenter	Organization	Comment	Response
1	Surface Waters/subaqueuous Lands/Wetlands; Page 28	Sewer Improvements	DEQ NRO	SWCB/VMRC/ DEQ NRO	Obtain appropriate VMRC Permit for Accotink Creek crossing in conformance with Section 401/404; install utility improvements from outside wetland areas using trenchless techniques as mitigative measure.	Confirmed Project to be designed accordingly
2	SWM - SWP3	General Impact Mitigation	DEQ NRO	SWCB/VMRC/ DEQ NRO	Design of site stormwater practices shall conform to the EISA 438 standards regarding control of stormwater at federal facilities, matching predevelopment hydrologic conditions to the maximum extent practicable	Confirmed Project to be designed accordingly
3	Erosion Control and SWM Planning	General Impact Mitigation	DEQ NRO	SWCB/VMRC/ DEQ NRO	The Army must prepare and implement an erosion and sediment control (ESC) plan to ensure compliance with state law and regulations. The ESC plan is submitted to the DEQ Piedmont Regional Office that serves the area where the project is located for review for compliance. The Army is ultimately responsible for achieving project compliance through oversight of on-site contractors, regular field inspection, prompt action against non-compliant sites, and other mechanisms consistent with agency policy.	Confirmed Project to be designed accordingly
4	SWM - SWP3	General Impact Mitigation	DEQ NRO	SWCB/VMRC/ DEQ NRO	The operator or owner of a construction project involving land-disturbing activities equal to or greater than one acre (2,500 square feet or more in areas analogous to Chesapeake Bay Preservation Area) is required to register for coverage under the General Permit for Discharges of Stormwater from Construction Activities and develop a project specific stormwater pollution prevention plan (SWPPP). The SWPPP must be prepared prior to submission of the registration statement for coverage under the general permit and the SWPPP must address water quality and quantity in accordance with the VSMP Permit Regulations.	Confirmed Project to be designed accordingly
5	CBP Resource Protection Areas and Resource Management Areas	General Impact Mitigation	DEQ-OSWM	DEQ NRO	Development in areas analogous to RMA is subject to general performance criteria found in 9 VAC 25-830-130 of the Regulations, including requirements to: • minimize land disturbance (including access and staging areas); • retain indigenous vegetation; and • minimize post-development impervious surfaces. • Comply with the requirements of the Virginia Erosion & Sediment Control Handbook, Third Edition, 1992; and • Provide stormwater management criteria consistent with water quality protection provisions of the Virginia Stormwater Management Regulations (9 VAC 25-870-10).	Confirmed, Project to be designed in accordance with requirements.
6	Air Pollution, Page 17	Asphalt Paving	DEQ	Air Division	In accordance with 9 VAC 5-45-780, there are limitations on the use of "cut-back" (liquefied asphalt cement, blended with petroleum solvents) that may apply to paving activities associated with the project. Moreover, there are time-of-year restrictions on its use during the months of April through October in VOC emission control areas.	Confirmed Project to be designed accordingly
7	Air Pollution, Page 17	Fugitive Dust	DEQ NRO	Air Division	During construction, fugitive dust must be kept to a minimum by using control methods outlined in 9 VAC 5-50-60 et seq. of the Regulations for the Control and Abatement of Air Pollution. These precautions include, but are not limited to, the following: • Use, where possible, of water or chemicals for dust control; • Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials; • Covering of open equipment for conveying materials; and • Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.	Confirmed Project to be designed accordingly
8	Open Burning	Open Burning	DEQ NRO	Air Division	If project activities include the open burning of construction material or the use of special incineration devices, this activity must meet the requirements under 9 VAC 5¬130 et seq. of the Regulations for open burning, and may require a permit. The Regulations provide for, but do not require, the local adoption of a model ordinance concerning open burning. The applicant should contact Fairfax County fire officials to determine what local requirements, if any, exist.	No Open Burning permitted on project
9	Fuel Burning Equipment	Boilers/Generators	DEQ NRO	Air Division	The installation of fuel burning equipment (e.g. boilers and generators), may require permitting from DEQ prior to beginning construction of the facility (9 VAC 5-80, Article 6, Permits for New and Modified Sources). The applicant should contact DEQ-NRO for guidance on whether this provision applies.	Project will comply with requirements based on final equipment selection during design phase
10	Contaminated Soils	Waste Disposal	DEQ-DLPR	Solid Waste	Any soil that is suspected of contamination or wastes that are generated during construction-related activities must be tested and disposed of in accordance with applicable federal, state, and local laws and regulations	No contaminated soils aniticipated on project however, should contaminated soils be unexpectedlyencountered, Fort Belvoir will manage the material in compliance with applicable regulations
11	Demolition Materials	Asbestos/Lead Paint	DEQ-DLPR	Solid Waste	Any structures being demolished or removed should be checked for asbestos-containing materials (ACM) (such as insulation) and lead-based paint (LBP) prior to construction. If ACM or LBP are found, in addition to the federal waste-related regulations mentioned above, state regulations 9 VAC 20-80-640 for ACM and 9 VAC 20-60-261 for LBP must be followed.	No building demolition anticipated with project
12	Forest Resouces; Page 22	Forest/Land Conservation	DOF	SWCB/VMRC/ DEQ NRO	• Compensatory mitigation for trees removed from the site will follow Fort Belvoir's Tree Removal and Protection Policy #27 dated October 12, 2012 regarding tree removal and restoration. • The current development plans a total of 1900 trees 4-inches or more in diameter are expected to be removed from the 9-acre study area, 1,252 of which fall within the Loblolly—Shortleaf Stand type (3.95 AC), 648 which fall within the Oak-Pine Stand type (4.59 AC). This does not account for the previous removal of trees in the Disturbed Area (0.46 AC) as part of site investigation work. • Considering that this area was predominantly within the Loblolly—Shortleaf Stand type and assuming a similar stand density, the previously disturbed area (0.46 acres) likely removed 146 additional trees, for a total of approximately 2,050 trees lost due to the proposed development. • In order to meet the 2:1 equivalent mitigation ratio outlined in the Fort Belvoir INRMP, a significant amount of off-site replacement will be required (4100 trees) • Current site landscaping plans only account for approximately 35 tree replacements due to development code limitations. • Fort Belvoir has extensive experience with using off-site mitigation alternatives however, direct planting areas on the garrison are limited due to space constraints. • Due to limited on-site opportunities for tree mitigation, out-of-kind compensatory mitigation within the Accotink Creek watershed will be incorporated within the scope of the project. • Public Works staff has indicated that alternative in-kind mitigation to address area water quality concerns can be used as credits to offset actual tree planting requirements. Details on this program will need to be defined as the project moves forward and terms of mitigation particularly for the lower value tree species affected by the project will need to be worked out for the final FCP. • This may include funding of two stream restoration projects within the Accotink Creek watershed. Potential mitigative projects include the repair of a culvert on a tributary of Mason Run (MR4), and repairing a stream channel above two recently constructed parking lots within Tompkins Basin. • Execution of these Fort Belvoir mitigation projects will be coordinated with garrison officials, regulatory authorities and appropriately designed and permitted as independent projects upon confirmation of Fort Belvoir's preferred out-of-kind mitigation strategy.	Confirmed Project to be designed accordingl. Note, no potential upland forest mitigation sites exist to fulfill the mitigation requirement for this project. Therefore, the stream enhancement/restoration projects were selected.
13	Zoning, FAA; Page 21	FAA Coordination	DOAV	SWCB/VMRC/ DEQ NRO	The Army is required to submit a 7460-1 form to the Federal Aviation Administration (FAA) for review.	Form to be completed as part of building design

ENVIRONMENTAL ASSESSMENT - SKILLS TRAINING FACILITY - AGENCY REVIEW COMMENTS
Fort Belvoir, Virginia

Comment Number	Division/Section/Page #/Sheet #	Sub-Section/Note	Commenter	Organization	Comment	Response
14	Land Planning	General Impact Mitigation	FC	DPWES DP&Z	• Reduce the footprint of the structure by increasing the number of stories, if possible. This would have a potential benefit to reduce the limits of clearing and grading and the number of trees that must be cleared, given that this is an undeveloped site. • Consolidate parking into a single structure, if possible. • Although the document indicates that mature trees would not be cleared, more details and/or plans concerning the tree clearing would be useful to determine the expected impacts. • For any tree clearing mitigation that is proposed on-site, and for the landscaping of the site once construction is complete, native and non-invasive vegetation should be considered.	Taken under advisement, will be evaluated as design progresses
15	Land Planning	General Impact Mitigation	FC	DPWES DP&Z	• Table 3-1 indicates that 0 linear feet of road would be required to implement the STF at the preferred DAAF site. However, page 1 of the document indicates that new access drives and roadway would be required. Additionally, it is not clear why the table has not been updated with the information found in Appendix E regarding the additional linear feet of gas and sanitary sewer line required. • Appendix E also refers to a "For costing purposes, the proposed OTC development should program for replacement of 1,600 feet of the sewer, upgrading it to 12-inch diameter pipe. This will need to include a subaqueous crossing of Accotink Creek (approximately 35' wide at the crossing point)." There is no discussion of this crossing within the earlier documentation. DPWES shares the concern from DPZ regarding the height of the building and the footprint on the ground. Specifically, the layout of the site changes within Section 3 between the several different site options; specifically the location and layout of any parking lots as well as the boundary of the site. DPWES recommends the Army consider the use of a parking garage within the facility or as a separate structure to reduce the amount of impervious surface on the site. With regard to the stormwater management discussion (EA, Section 4.11), DPWES requests the infiltration study results as described in the EA (page 16) and a map to indicate the location of proposed pervious pavement on the site. • Section 4.1 indicates that the soil on the site of the preferred location is predominantly Gunston Silt Loam which is "somewhat poorly drained soil' and "tend to absorb and hold water" (pg. 16). It is also noted in Appendix A that the high water table is 1.5 to 3.5 feet below the surface (Appendix A, page 6). • The location of the LID SWM Area (EA, Fig. 3-2) has the lid structure within the area of Gunston Silt Loam. While the addition of "structured soil" as a soil amendment may allow for increased infiltration within the management facility, DPWES is concerned that the high ground water table may not promote infiltration. Therefore, bioretention facilities may not be appropriate in this location. • It is unclear if all of the areas within Fig. 3-2 with the similar hatch pattern as the one that is labeled as a LID STW Area is supposed to be additional management facilities or possibly pervious pavement. Please clarify. If so, please indicate the type of LID proposed.	1. Table 3-1 is a reference from an earlier site planning report and did not include the more detailed site evaluation conducted during preparation of the EA. The distances called out in the utility study portion of the EA have been identified as project requirements to ensure potential impacts are thoroughly quantified. The roadway distances listed in Table 3-1 were related to access road extensions required to connect to existing regional roadways; on-site driveways and circulation roadways around the building are not taken in the same context as they are required for every site evaluated (i.e. common requirement). 2. The replacement of the sewer line is being factored into the project design in conjunction with regional sewer needs. This need was not identified in the earlier planning documents as these documents simply looked at availability of adjacent sewer networks, not condition or capacity of those networks. The site investigation for the EA included this more detailed review. 3. The site footprint will be determined on the most economically feasible development option; currently, an elevated parking facility is not economically viable. The site layout will continue to be refined as the design progresses. DPWES will have the opportunity to review more advanced site designs during the NCPC submission process 4. The design of stormwater facilities will be done in accordance with EISA, replicating pre-development hydrology to the maximum extent practible. Drainage designs will be refined and presented during the NCPC process for further consideration. Figure 3-2 is a concept sketch of the site layout and will be refined during design. The areas hatched are indicative of areas suitable for integrated SWM practices, precise drainage areas contributing to each will be developed in accordance with allowable area calculations in the Virginia SWM regulations to keep thresholds below 2 acres (or as required by regulation).
16	Land Planning	General Impact Mitigation	FC	DPWES DP&Z	• There is a great deal of land with little to no change in contour on the site. It is unclear whether it is proposed that the excess stormwater will be sent to the proposed LID facility location. • There appears to be a great deal of contour change within the outline of the proposed buildings. It is unclear whether this is an existing stream channel or gully. It is unclear what the final contours for the site will look like. • While bioretention areas provide great water quality benefits, their use as the sole water quantity control may be exceeded by this design. As per for the Virginia BMP Clearinghouse, the maximum drainage area that can be sent to a bioretention area is 2 acres. It appears from the layout in Fig. 3-2, this will be exceeded. • In addition to the proposed LID bioretention facility, DPWES recommends that the site be designed to include a variety of stormwater management types to detain or retain as much was on site as possible. Other management opportunities include: • Green roofs • Rainwater harvesting (above or below ground) and reuse on site • Additional soil amendments • Sheetflow to vegetated areas • Planting with native vegetation • Swales to capture runoff from parking lots that are not directed to other LID features • Section 4.19, Utility System Impacts, describes that site drainage will flow to Accotink Creek via "existing off-site surface drainage channels at DAFF". It is unclear if these channels are man-made or natural. Please identify the channels on subsequent maps.	5. Existing contours reflect the pre-developed condition of the site and include several swales or fire plow breaksalongside an old road corridor that transects the site. This happens to be within the footprint of the existing building, these shallow drainage features drain off to the east and will be used on the eastern edge of the site as the primary drainage channel. Final contours for the site have not been confirmed at this time, these will be prepared for County review during the NCPC process. 6. Soil types will be thoroughly evaluated during design to ensure appropriate stormwater features are incorporated into the design, infiltration and bio-retention are the preferred practices. If these are infeasible, then alternative on-site measures as listed in the DPWES's comments may be used. On-site design infiltration rates listed in the October 16, 2012 geotechnical report ranged from 1.42 to 5.91 inches/hour indicating that on-site infiltration will be a feasible practice in most areas of the site, particularly given the intent to provide structured fill to enhance underground hydraulics as a part of site development planning. 7. Similarly, groundwater tables will be evaluated for suitability of infiltration practices; if unsuitable for infiltration, alternative SWM measures will be employed during design. The October 16, 2012 site geotechnical report lists groundwater elevations at the site as ranging from 4.7 to 33 feet below grade, so groundwater levels appear acceptable for design of proposed SWM practices; this will be confirmed as site design progresses.

COMMONWEALTH of VIRGINIA

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June 18, 2014

Commander
U.S. Army Garrison Fort Belvoir
Attn: Directorate of Public Works
9430 Jackson Loop, Suite 100
Fort Belvoir, Virginia 22060-5116

RE: Environmental Assessment and Federal Consistency Determination for the Construct Skills Training Facility, Davison Army Airfield, Fort Belvoir, Fairfax County, (DEQ 14-067F).

Dear Commander:

The Commonwealth of Virginia has completed its review of the above-referenced document. The Department of Environmental Quality is responsible for coordinating Virginia's review of federal environmental documents submitted under the National Environmental Policy Act (NEPA) and responding to appropriate federal officials on behalf of the Commonwealth. DEQ is also responsible for coordinating Virginia's review of federal consistency documents submitted pursuant to the Coastal Zone Management Act (CZMA) and providing the state's response. This is in response to the April 16, 2014 Environmental Assessment (EA) (received April 24, 2014) for the above referenced project. In addition, the EA includes a Federal Consistency Determination (FCD) for the proposed action. The following agencies and locality participated in the review of this proposal:

Department of Environmental Quality
Department of Conservation and Recreation
Department of Game and Inland Fisheries
Marine Resources Commission
Department of Forestry
Department of Health
Department of Historic Resources
Department of Transportation
Department of Aviation
Fairfax County

In addition, the Department of Agriculture and Consumer Services, Department of

Mines, Minerals and Energy, and the Northern Virginia Regional Commission were invited to comment on the proposal.

PROJECT DESCRIPTION

The Department of the Army (Army) has submitted an Environmental Assessment for the proposed construction of a Skills Training Facility (STF) within the Davison Army Airfield (DAAF) area of Fort Belvoir in Fairfax County. The ten acre parcel proposed for the STF development is located east of John J. Kingman Drive, along the northern entry to the DAAF (Farrar Gate). Access to the site will be provided from Santjer Drive, the main internal DAAF roadway. The conceptualized STF buildings are configured in a two-story arrangement including 96,000 square feet of interior space, including:

- classrooms;
- readiness storage;
- physical training areas;
- indoor firearms training;
- instructor offices;
- administrative space;
- fitness assessment areas; and
- mission oriented medical clinic facilities.

The concept site plan includes:

- parking for 180 vehicles;
- internal access road improvements;
- pedestrian walkways;
- landscaping; and
- outdoor personal fitness training spaces.

No mechanized training or firearms use is associated with the proposed outdoor training spaces. Total planned building and pavement footprint encompasses 176,000 square feet, or approximately four acres of the ten acre project site.

CONCLUSION

Provided activities are performed in accordance with the recommendations which follow in the Impacts and Mitigation section of this report, this proposal is unlikely to have significant effects on ambient air quality, important farmland, forest resources, and wetlands. It is unlikely to adversely affect species of plants or insects listed by state agencies as rare, threatened, or endangered.

ENVIRONMENTAL IMPACTS AND MITIGATION

1. Surface Waters and Wetlands. According to the EA (page 26), development of the STF site at the DAAF is not expected to appreciably affect local or regional water quality. The document does not indicate that surface waters are located on site. In addition, the document (page 26) states that based on review of available site mapping and field surveys conducted in April 2013 the proposed STF development at the DAAF will not impact any Section 401 or 404 regulated wetland areas. In addition, designated wetland areas will be avoided during installation of any off-site utility system upgrades. This will include obtaining appropriate jurisdictional determinations and associated permits for crossing Accotink Creek and any other wetland areas associated with this work. Where utilities must cross these areas they shall be installed from outside the jurisdictional boundary of these areas using trenchless techniques as a mitigative practice.

1(a) Agency Jurisdiction. The State Water Control Board (SWCB) promulgates Virginia's water regulations, covering a variety of permits to include Virginia Pollutant Discharge Elimination System Permit, Virginia Pollution Abatement Permit, Surface and Groundwater Withdrawal Permit, and the Virginia Water Protection Permit (VWPP). The VWPP is a state permit which governs wetlands, surface water, and surface water withdrawals/impoundments. It also serves as § 401 certification of the federal *Clean Water Act* § 404 permits for dredge and fill activities in waters of the U.S. The VWPP Program is under the Office of Wetlands and Water Protection/Compliance, within the DEQ Division of Water Quality Programs. In addition to central office staff that review and issue VWP permits for transportation and water withdrawal projects, the six DEQ regional offices perform permit application reviews and issue permits for the covered activities. In addition, the Virginia Marine Resources Commission exerts jurisdiction over impacts to tidal wetlands in the commonwealth (Virginia Code 28.2-1301 through 28.2-1320)

1(b) Agency Findings.

(i) Virginia Marine Resources Commission

VMRC indicates that project activities may fall under the agency's jurisdiction where the proposed sewer line crosses Accotink Creek. Upgrading the line will require a permit for VMRC.

(ii) Virginia Department of Environmental Quality

The VWPP program at the DEQ Northern Regional Office (NRO) finds that it appears that impacts to surface waters, including wetlands, could occur as a result of development of the project.

1(c) Recommendations. In general, DEQ recommends that stream and wetland impacts be avoided to the maximum extent practicable. To minimize unavoidable impacts to wetlands and waterways, DEQ recommends the following practices:

- Operate machinery and construction vehicles outside of stream-beds and wetlands; use synthetic mats when in-stream work is unavoidable.
- Preserve the top 12 inches of trench material removed from wetlands for use as wetland seed and root-stock in the excavated area.
- Design erosion and sedimentation controls in accordance with the most current edition of the Virginia Erosion and Sediment Control Handbook. These controls should be in place prior to clearing and grading, and maintained in good working order to minimize impacts to State waters. The controls should remain in place until the area is stabilized.
- Place heavy equipment, located in temporarily impacted wetland areas, on mats, geotextile fabric, or use other suitable measures to minimize soil disturbance, to the maximum extent practicable.
- Restore all temporarily disturbed wetland areas to pre-construction conditions and plant or seed with appropriate wetlands vegetation in accordance with the cover type (emergent, scrub-shrub, or forested). The applicant should take all appropriate measures to promote revegetation of these areas. Stabilization and restoration efforts should occur immediately after the temporary disturbance of each wetland area instead of waiting until the entire project has been completed.
- Place all materials which are temporarily stockpiled in wetlands, designated for use for the immediate stabilization of wetlands, on mats, geotextile fabric in order to prevent entry in State waters. These materials should be managed in a manner that prevents leachates from entering state waters and must be entirely removed within thirty days following completion of that construction activity. The disturbed areas should be returned to their original contours, stabilized within thirty days following removal of the stockpile, and restored to the original vegetated state.
- Flag or clearly mark all non-impacted surface waters within the project or right-of-way limits that are within 50 feet of any clearing, grading, or filling activities for the life of the construction activity within that area. The project proponent should notify all contractors that these marked areas are surface waters where no activities are to occur.
- Employ measures to prevent spills of fuels or lubricants into state waters.

1(d) Requirements. A Joint Permit Application (JPA) must be submitted to VMRC for any potential impacts under the agency's jurisdiction. In addition, the initiation of the VWPP review process is accomplished through the submission of a JPA (form MRC 30-300) to VMRC. Upon receipt of a JPA for any proposed surface waters impacts, VWPP staff at DEQ-NRO will review the proposed project in accordance with the VWPP program regulations and guidance.

2. Subaqueous Lands Impacts. According to the Federal Consistency Determination (FCD) (EA, Appendix F), no subaqueous land use is proposed under this action. The project involves no encroachments in, on, or over state-owned submerged lands. Where proposed utilities will cross streams, wetlands or waters of the state, crossings will be installed using trenchless techniques in accordance with VMRC guidelines and associated project specific construction permits.

2(a) Agency Jurisdiction. The Virginia Marine Resources Commission, pursuant to Section 28.2-1200 *et seq.* of the *Code of Virginia*, has jurisdiction over any encroachments in, on, or over any state-owned rivers, streams, or creeks in the Commonwealth.

VMRC serves as the clearinghouse for the Joint Permit Application (JPA) used by the:

- U.S. Army Corps of Engineers (Corps) for issuing permits pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act;
- DEQ for issuance of a Virginia Water Protection Permit;
- VMRC for encroachments on or over state-owned subaqueous beds as well as tidal wetlands; and
- local wetlands board for impacts to wetlands.

2(b) Agency Findings. As previously stated, VMRC indicates that project activities may fall under the agency's jurisdiction where the proposed sewer line crosses Accotink Creek. Upgrading the line will require a permit for VMRC.

2(c) Requirements. A JPA must be submitted to VMRC for any potential impacts under the agency's jurisdiction. All jurisdictional impacts will be reviewed by VMRC during the JPA process.

3. Erosion and Sediment Control and Stormwater Management. According to the EA (page 39), all construction will follow state and federal stormwater management and erosion control permitting requirements. Design of site stormwater practices shall conform to the EISA 438 standards regarding control of stormwater at federal facilities, matching predevelopment hydrologic conditions to the maximum extent practicable.

3(a) Agency Jurisdiction. Effective July 1, 2013, the Department of Environmental Quality administers the nonpoint source pollution control enforceable policy of the VCP through *Virginia Erosion and Sediment Control Law and Regulations* (*VESCL&R*) and *Virginia Stormwater Management Law and Regulations* (*VSWML&R*). In addition, DEQ is responsible for the issuance, denial, revocation, termination and enforcement of the Virginia Stormwater Management Program (VSMP) General Permit for Stormwater Discharges from Construction Activities related to municipal separate storm sewer systems (MS4s) and construction activities for the control of stormwater discharges from MS4s and land disturbing activities under the Virginia Stormwater Management

Program. Note that these programs were previously administered by the Department of Conservation and Recreation.

3(b) Requirements.

(i) Erosion and Sediment Control and Stormwater Management Plans

The Army and its authorized agents conducting regulated land-disturbing activities on private and public lands in the state must comply with *VESCL&R* and *VSWML&R*, including coverage under the general permit for stormwater discharge from construction activities, and other applicable federal nonpoint source pollution mandates (e.g. Clean Water Act-Section 313, federal consistency under the Coastal Zone Management Act). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, borrow areas, soil stockpiles, and related land-disturbing activities that result in the total land disturbance of equal to or greater than 10,000 square feet (2,500 square feet in Chesapeake Bay Preservation Area) would be regulated by *VESCL&R*. Accordingly, the Army must prepare and implement an erosion and sediment control (ESC) plan to ensure compliance with state law and regulations. The ESC plan is submitted to the DEQ Piedmont Regional Office that serves the area where the project is located for review for compliance. The Army is ultimately responsible for achieving project compliance through oversight of on-site contractors, regular field inspection, prompt action against non-compliant sites, and other mechanisms consistent with agency policy. [Reference: VESCL 62.1-44.15 *et seq.*]

(ii) Virginia Stormwater Management Program General Permit for Stormwater Discharges from Construction Activities

The operator or owner of a construction project involving land-disturbing activities equal to or greater than one acre (2,500 square feet or more in areas analogous to Chesapeake Bay Preservation Area) is required to register for coverage under the General Permit for Discharges of Stormwater from Construction Activities and develop a project specific stormwater pollution prevention plan (SWPPP). The SWPPP must be prepared prior to submission of the registration statement for coverage under the general permit and the SWPPP must address water quality and quantity in accordance with the VSMP Permit Regulations. General information and registration forms for the General Permit are available on DEQ's website at http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/VSMPPermits/ConstructionGeneralPermit.aspx. [Reference: Virginia Stormwater Management *Act* 62.1-44.15 *et seq.*] *VSMP Permit Regulations* 9 VAC 25-870-10 *et seq.*].

4. Chesapeake Bay Preservation Areas. According to the document (page 21), the proposed STF site development will not encroach upon any Chesapeake Bay Program Resource Protection Areas limiting potential for direct impacts to these coastal resources. Furthermore, the EA (page 26) states that potential localized watershed impacts at the DAAF site will be minimized by designing and permitting the STF

following state and federal stormwater management and water quality protection requirements. This will include avoiding and protecting Chesapeake Bay Preservation Areas (CBPAs) and associated Resource Protection Areas (RPAs) near the project.

4(a) Agency Jurisdiction. Effective July 1, 2013, the DEQ Office of Stormwater Management (OSWM) administers the Chesapeake Bay Preservation Act (Bay Act) (Virginia Code §62.1-44.15 *et seq.*) and *Chesapeake Bay Preservation Area Designation and Management Regulations* (*Regulations*) (9 VAC 25-830-10 *et seq.*). Note that this enforceable policy was previously administered by the Department of Conservation and Recreation.

4(b) Agency Comments. In Fairfax County, the areas protected by the Chesapeake Bay Preservation Act, as locally implemented, require conformance with performance criteria. These areas include Resource Protection Areas and Resource Management Areas (RMAs) as designated by the local government. RPAs include:

- tidal wetlands;
- certain non-tidal wetlands;
- tidal shores; and
- a 100-foot vegetated buffer area located adjacent to and landward of these features and along both sides of any water body with perennial flow.

RMAs, which require less stringent performance criteria, include those areas of the county not included in the RPAs.

4(c) Agency Findings. DEQ-OSWM finds that the proposed project will result in land disturbance on lands analogous to locally designated RMA lands.

4(d) Requirements.

(i) Development in Resource Protection Areas

Pursuant to 9 VAC 25-830-140 of the *Regulations*, land development may be allowed in areas analogous to RPA only if it:

(i) is water dependent;
(ii) constitutes redevelopment;
(iii) constitutes development or redevelopment within a designated Intensely Developed Area;
(iv) is a new use established pursuant to subdivision 4a of this section;
(v) is a road or driveway crossing satisfying the conditions set forth in subdivision 1d of this section; or
(vi) is a flood control or stormwater management facility satisfying the conditions set forth in subdivision 1e of this section.

(ii) General Performance Criteria

Development in areas analogous to RMA is subject to general performance criteria found in 9 VAC 25-830-130 of the *Regulations*, including requirements to:

- minimize land disturbance (including access and staging areas);
- retain indigenous vegetation; and
- minimize post-development impervious surfaces.

For land disturbance over 2,500 square feet, the project must comply with:

- the requirements of the *Virginia Erosion & Sediment Control Handbook*, *Third Edition, 1992*; and
- stormwater management criteria consistent with water quality protection provisions of the *Virginia Stormwater Management Regulations* (9 VAC 25-870-10).

5. Air Pollution Control. According to the EA (page 17), potential air emission sources associated with the proposed STF development include emissions during the construction phase (including those created from land disturbance, construction equipment, vehicular travel to and from the site, those emitted from architectural coatings, etc.) and emissions created during operation of the proposed facilities (including emissions from facility heating and emergency power systems, and emissions from vehicular traffic). No other specific industrial emission sources are planned as part of the proposed STF development.

5(a) Agency Jurisdiction. DEQ's Air Quality Division, on behalf of the State Air Pollution Control Board, is responsible to develop regulations that become *Virginia's Air Pollution Control Law*. DEQ is charged to carry out mandates of the state law and related regulations as well as Virginia's federal obligations under the *Clean Air Act* as amended in 1990. The objective is to protect and enhance public health and quality of life through control and mitigation of air pollution. The division ensures the safety and quality of air in Virginia by monitoring and analyzing air quality data, regulating sources of air pollution, and working with local, state and federal agencies to plan and implement strategies to protect Virginia's air quality. The appropriate regional office is directly responsible for the issue of necessary permits to construct and operate all stationary sources in the region as well as to monitor emissions from these sources for compliance. As a part of this mandate, the environmental documents of new projects to be undertaken in the state are also reviewed. In the case of certain projects, additional evaluation and demonstration must be made under the general conformity provisions of state and federal law.

5(b) Agency Findings. According to the DEQ Air Division, the project site is located in a designated ozone nonattainment area and an emission control area for the control of oxides of nitrogen (NO_x) and volatile organic compounds (VOCs)

5(c) Recommendation. The Army should take all reasonable precautions to limit emissions of NO_x and VOCs, principally by controlling or limiting the burning of fossil fuels.

5(d) Requirements.

(i) Asphalt Paving

In accordance with 9 VAC 5-45-780, there are limitations on the use of "cut-back" (liquefied asphalt cement, blended with petroleum solvents) that may apply to paving activities associated with the project. Moreover, there are time-of-year restrictions on its use during the months of April through October in VOC emission control areas.

(ii) Fugitive Dust

During construction, fugitive dust must be kept to a minimum by using control methods outlined in 9 VAC 5-50-60 *et seq.* of the *Regulations for the Control and Abatement of Air Pollution*. These precautions include, but are not limited to, the following:

- Use, where possible, of water or chemicals for dust control;
- Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials;
- Covering of open equipment for conveying materials; and
- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.

(iii) Open Burning

If project activities include the open burning of construction material or the use of special incineration devices, this activity must meet the requirements under 9 VAC 5-130 *et seq.* of the *Regulations* for open burning, and may require a permit. The *Regulations* provide for, but do not require, the local adoption of a model ordinance concerning open burning. The applicant should contact Fairfax County fire officials to determine what local requirements, if any, exist.

(iv) Fuel Burning Equipment

The installation of fuel burning equipment (e.g. boilers and generators), may require permitting from DEQ prior to beginning construction of the facility (9 VAC 5-80, Article 6, Permits for New and Modified Sources). The applicant should contact DEQ-NRO for guidance on whether this provision applies.

6. Solid and Hazardous Wastes and Hazardous Materials. According to the EA (page 29), development of the STF at DAAF will not impact any existing hazardous

material or hazardous waste treatment, storage, or disposal areas. Proposed construction activities are likely to include limited use of hazardous materials including miscellaneous adhesives, sealants, and coatings that may contain toxic or flammable constituents. Proper management of hazardous materials and petroleum products during construction and future operation of the STF will appropriately limit any potential environmental impacts associated with utilization of these materials in accordance with Fort Belvoir's existing hazardous material, hazardous waste and pollution prevention programs.

6(a) Agency Jurisdiction. Solid and hazardous wastes in Virginia are regulated by the Virginia Department of Environmental Quality, the Virginia Waste Management Board (VWMB), and the U.S. Environmental Protection Agency. They administer programs created by the federal *Resource Conservation and Recovery Act*, *Comprehensive Environmental Response Compensation and Liability Act*, commonly called Superfund, and the *Virginia Waste Management Act.* DEQ administers regulations established by the VWMB and reviews permit applications for completeness and conformance with facility standards and financial assurance requirements. All Virginia localities are required, under the Solid Waste Management Planning Regulations, to identify the strategies they will follow on the management of their solid wastes to include items such as facility siting, long-term (20-year) use, and alternative programs such as materials recycling and composting.

6(b) Agency Findings. DEQ's Division of Land Protection and Revitalization (DLPR) (formerly the Waste Division) determined that both solid and hazardous waste issues and sites were generally addressed in the report. DLPR staff conducted a cursory database search for zip code 22060 (Fort Belvoir), and found one Resource Conservation and Recovery Act (RCRA) site, one Comprehensive Environmental Response Compensation and Liability Act (CERCLA) site, two Formerly Used Defense Sites (FUDS), and thirty-two petroleum release sites. A detailed list of these sites is included in DLPR comments attached to this response.

6(c) Recommendations.

(i) Petroleum Release Sites

DEQ's petroleum contamination (PC) case files may identify petroleum releases that should be evaluated by the project engineer or manager to establish the exact location of the release, the nature and extent of the petroleum release, and the potential to impact the proposed project. The facility representative should contact the Tank Program at DEQ-NRO at for further information and the administrative records of the PC cases which are determined to be in close proximity to the proposed project.

(ii) Comprehensive Environmental Response Compensation and Liability Act

The DEQ Federal Facilities Restoration Program recommends contacting the Environmental Compliance Branch Chief, Directorate of Public Works, Environmental and Natural Resource Division at Fort Belvoir for information concerning CERCLA obligations at the Main Post. The Environmental Compliance Branch Chief, or designee, should be advised prior to initiating any land-, sediment-, or groundwater-disturbing activities at or near Military Munitions Response Program (MMRP) range areas and Main Post Solid Waste Management Units (SWMUs).

6(d) Requirements.

(i) Generated Waste

Any soil that is suspected of contamination or wastes that are generated during construction-related activities must be tested and disposed of in accordance with applicable federal, state, and local laws and regulations.

(ii) Asbestos-containing Material and Lead-based Paint

Any structures being demolished or removed should be checked for asbestos-containing materials (ACM) (such as insulation) and lead-based paint (LBP) prior to construction. If ACM or LBP are found, in addition to the federal waste-related regulations mentioned above, state regulations 9 VAC 20-80-640 for ACM and 9 VAC 20-60-261 for LBP must be followed.

Questions or requests for further information regarding these comments may be directed to DEQ-DLPR, Steve Coe at (804) 698-4029.

7. Pesticides and Herbicides. DEQ recommends that the use of herbicides or pesticides for construction or landscape maintenance should be in accordance with the principles of integrated pest management. The least toxic pesticides that are effective in controlling the target species should be used to the extent feasible. Contact the Department of Agriculture and Consumer Services at (804) 786-3501 for more information.

8. Natural Heritage Resources. According to the EA (page 24), development of the STF at the DAAF will not have any direct or indirect impacts to natural heritage resources.

8(a) Agency Jurisdiction.

(i) Department of Conservation and Recreation

The mission of the Virginia Department of Conservation and Recreation is to conserve Virginia's natural and recreational resources. DCR supports a variety of environmental

programs organized within seven divisions including the Division of Natural Heritage. The Natural Heritage Program's (DCR-DNH) mission is conserving Virginia's biodiversity through inventory, protection, and stewardship. The *Virginia Natural Area Preserves Act*, 10.1-209 through 217 of the *Code of Virginia*, was passed in 1989 and codified DCR's powers and duties related to creating a statewide biological inventory, maintaining a statewide database for conservation planning and project review, land protection for the conservation of biodiversity, and the protection and ecological management of natural heritage resources (the habitats of rare, threatened, and endangered species, significant natural communities, geologic sites, and other natural features).

(ii) Department of Agriculture and Consumer Services

The *Endangered Plant and Insect Species Act* of 1979, Chapter 39 §3.1-1020 through 1030 of the *Code of Virginia*, as amended, authorizes the Virginia Department of Agriculture and Consumer Services (VDACS) to conserve, protect, and manage endangered and threatened species of plants and insects. The VDACS Virginia Endangered Plant and Insect Species Program personnel cooperates with the USFWS, DCR-DNH and other agencies and organizations on the recovery, protection or conservation of listed threatened or endangered species and designated plant and insect species that are rare throughout their worldwide ranges. In those instances where recovery plans, developed by USFWS, are available, adherence to the order and tasks outlined in the plans are followed to the extent possible.

8(b) Agency Findings.

(i) Accotink Bay-Gunston Cove Stream Conservation Unit

According to the information currently in DCR files, the Accotink Bay-Gunston Cove Stream Conservation Unit is located within the project site. Stream Conservation Units (SCUs) identify stream reaches that contain aquatic natural heritage resources, including 2 miles upstream and 1 mile downstream of documented occurrences, and all tributaries within this reach. SCUs are also given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain. The Accotink Bay-Gunston Cove SCU has been given a biodiversity ranking of B5, which represents a site of general significance. The natural heritage resources associated with this site are:

Lampsilis radiate	Eastern lampmussel	G5/S2S3/NL/NL
Glyptemys insculpta	Wood turtle	G3/S2/NL/LT

Eastern lampmussel is a freshwater mussel which inhabits river systems in areas with substrates composed of silt, sand, cobble, gravel and exposed bedrock (NatureServe, 2009). This species has a wide range, from eastern Canada west to Ontario and Quebec and south to South Carolina (NatureServe, 2009). In Virginia, there are records from the Chowan and York River drainages.

Considered good indicators of the health of aquatic ecosystems, freshwater mussels are dependent on good water quality, good physical habitat conditions, and an environment that will support populations of host fish species (Williams *et al.*, 1993). Because mussels are sedentary organisms, they are sensitive to water quality degradation related to increased sedimentation and pollution. They are also sensitive to habitat destruction through dam construction, channelization, and dredging, and the invasion of exotic mollusk species.

Wood turtle ranges from southeastern Canada, south to the Great Lake states and New England. In Virginia, it is known from northern counties within the Potomac River drainage (NatureServe, 2009). The Wood turtle inhabits areas with clear streams with adjacent forested floodplains and nearby fields, wet meadows, and farmlands (Buhlmann *et al.*, 2008; Mitchell, 1994). Since this species overwinters on the bottoms of creeks and streams, a primary habitat requirement is the presence of water (Mitchell, 1994).

Threats to the wood turtle include habitat fragmentation, urbanization, and automobile or farm machinery mortality (Buhlmann *et al.*, 2008). Please note that the Wood turtle is currently classified as threatened by the Virginia Department of Game and Inland Fisheries.

(ii) Accotink Wetlands Conservation Site

The Accotink Wetlands Conservation Site is also located downstream from the project site. Conservation sites are tools for representing key areas of the landscape that warrant further review for possible conservation action because of the natural heritage resources and habitat they support. Conservation sites are polygons built around one or more rare plant, animal, or natural community designed to include the element and, where possible, its associated habitat, and buffer or other adjacent land thought necessary for the element's conservation. Conservation sites are given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant. Accotink Wetlands Conservation Site has been given a biodiversity significance ranking of B3, which represents a site of high significance. The natural heritage resources of concern at this site are:

Bolboschoenus fluviatilis	River bulrush	G5/S2/NL/NL
Ranunculus ambigens	Water-plantain crowfoot	G4/S1/NL/NL
Tidal Freshwater Marsh	(Mixed High Marsh Type)	G3/S4?/NL/NL

River bulrush, a state-rare plant species, inhabits fresh tidal marshes of the coastal plain of Virginia. This species forms predominantly sterile colonies that spread by rhizomes. Water pollution and sedimentation, sea level rise, and invasive species such as *Phragmites* australis pose the greatest threats to populations of this sedge. Nine

populations of river bulrush are believed to be extant in Virginia.

Water-plantain crowfoot is a perennial wetland herb in the buttercup family (Ranunculaceae). The global distribution of water-plantain spearwort includes the eastern, midwestern, and southern U.S. and Ontario, Canada. Although apparently globally secure, water-plantain spearwort, also known as water-plantain crowfoot, is regionally rare to historical or extirpated, particularly in some eastern states (Kartesz 1999). In Virginia, it has been documented in scattered locations in the Coastal Plain, Piedmont, and Ridge and Valley. Many Virginia occurrences are historical, but more recent occurrences include those in Fairfax, Charlotte, and Lee counties. The lower stem of this relatively stout herb may recline, producing roots from the nodes, then become ascending to erect and extending sometimes to over 3 feet long. Leaves are lance-shaped, with margins smooth to finely-toothed. Yellow-petaled flowers bloom from April-July and can be solitary or in a branching inflorescence; the round to oval fruiting head is composed of numerous, small, 1-seeded, fruits (Godfrey and Wooten 1981). Habitat in Virginia occurrences includes a variety of wetlands: freshwater marshes, both tidal and non-tidal; a spring seep within a clearcut; wet soil within a floodplain; a muddy stream bottom; ditches; and very wet, mucky ground in a small pastured wetland. Threats include habitat degradation or destruction, and competition from invasive alien plant species.

Tidal Freshwater Marsh (Mixed High Marsh Type) (*Impatiens capensis-Peltandra virginica-Polygonum arifolium-Schoenoplectus fluviatilis-Typha angustifolia*-Tidal Herbaceous Vegetation) occupies the higher elevation zone of freshwater to slightly oligohaline marshes on the Atlantic Coast from Maine to Virginia. From Delaware to northern Virginia, this is the principal mixed freshwater tidal marsh community and forms extensive patches along many tidal rivers. This community is composed of mixed, dense, and often diverse marsh vegetation with highly variable species composition and patch dominance. The soils are highly variable, varying from silts and silty mucks to peats and sands across the range (NatureServe, 2010). In Virginia, this community occurs most extensively in estuarine reaches of the Potomac River drainage, but has also been documented along the Rappahannock, Pamunkey, Mattaponi, and James Rivers.

Freshwater tidal marshes are naturally dynamic systems that are best developed where there is a major input of freshwater, daily tidal range of at least 0.5 m, and a geomorphology that tends to constrict and magnify tidal influence in the upper reaches of the estuary. These marshes are subject to diurnal flooding by tides and river discharge (NatureServe, 2010). Principal threats include chronic sea-level rise leading to increasing upstream salinity, pollutants, and invasive exotic plants such as marsh dewflower (*Murdannia keissak*) (Fleming *et al.* 2011).

(iii) Parker's Pipewort

Parker's pipewort (*Eriocaulon parkeri*, G3/S2/NL/NL) has been historically documented

downstream from the project site. Parker's pipewort is classified as very rare to uncommon in Virginia. This diminutive pipewort species displays a greyish-white button flower and often occurs with other rare mudwort species in the intertidal zone of tidal regions from Maine to North Carolina. Potential threats include activities that alter natural river currents causing sedimentation, which could inhibit germination of seeds or smother seedlings, and/or erosion of the habitat. Other potential threats include activities that result in increased salinity levels, water pollution, and displacement by aggressive species (J. C. Ludwig, 1996). Parker's pipewort has been documented at 29 occurrences in Virginia with 11 of those historical or extirpated. Surveys for this species should be conducted during the flowering / fruiting period from July to October.

(iv) State-listed Plant and Insect Species

Under a Memorandum of Agreement established between VDACS and DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. DCR finds that the current activity will not affect any documented state-listed threatened or endangered plants or insects.

(v) State Natural Area Preserves

DCR files do not indicate the presence of any State Natural Area Preserves under the agency's jurisdiction in the project vicinity.

8(c) Recommendations.

(i) Erosion and Sediment Control, and Stormwater Management

DCR recommends the implementation of and strict adherence to applicable state and local erosion and sediment control and stormwater management laws and regulations to minimize adverse impacts to aquatic species.

(ii) Natural Heritage Resources

Contact DCR-DNH to secure updated information on natural heritage resources if the scope of the project changes and/or six months has passed before it is utilized. New and updated information is continually added to the Biotics Data System.

9. Wildlife Resources and Protected Species. According to the EA (page 23), the Fort Belvoir area is known to host a variety of resident state, federal, and internationally protected, threatened, and endangered plant and animal species. These include three resident species, the *Haliaeetus leucocephalus* (bald eagle; internationally protected); the *Clemmys insculpta* (wood turtle; state listed); and the *Stygobromus Phreaticus* (Northern Virginia Well Amphipod; state species of concern). In addition to these resident fauna, the peregrine falcon (*Falco peregrinus*; state threatened, internationally protected) is also known to migrate through Fort Belvoir during its seasonal fall

migration. The sole endangered plant species currently documented on Fort Belvoir is the *Isotria medeoloides* (small whorled pogonia, federally listed plant species). Although all of these species have been documented to occur in the Fort Belvoir area, none have been found on the proposed STF site at the DAAF.

9(a) Agency Jurisdiction. The Department of Game and Inland Fisheries (DGIF), as the Commonwealth's wildlife and freshwater fish management agency, exercises enforcement and regulatory jurisdiction over wildlife and freshwater fish, including state or federally listed endangered or threatened species, but excluding listed insects (*Virginia Code* Title 29.1). The DGIF is a consulting agency under the U.S. Fish and Wildlife Coordination Act (16 U.S.C. sections 661 *et seq.*), and provides environmental analysis of projects or permit applications coordinated through DEQ and several other state and federal agencies. DGIF determines likely impacts upon fish and wildlife resources and habitat, and recommends appropriate measures to avoid, reduce, or compensate for those impacts.

9(b) Agency Findings.

(i) Wood Turtle

According to DGIF records, the state-listed threatened Wood turtle has been documented from the project area. An unnamed tributary of Dogue Creek that has been designated a Threatened and Endangered Species Water due to the presence of the Wood turtle is located within the project area. However, based on the scope and location of the proposed work, DGIF does not anticipate it to result in adverse impacts upon this species.

(ii) Accotink Creek Confirmed Anadromous Fish Use Area

DGIF documents Accotink Creek and other nearby waters, designated Confirmed Anadromous Fish Use Areas, from the project area. However, based on the scope and location of the proposed work, DGIF does not anticipate it to result in adverse impacts upon these resources.

(iii) Potomac Winter and Summer Bald Eagle Concentration Zone

Bald eagle nests and the Potomac Winter and Summer Bald Eagle Concentration Zone have been documented from the project area. DGIF does not anticipate this project to result in adverse impacts upon bald eagles.

9(c) Recommendations.

(i) Bald Eagle

Although, DGIF does not anticipate this project to result in adverse impacts upon the

bald eagle, DGIF recommends coordination with the U.S. Fish and Wildlife Service (USFWS) regarding possible impacts upon this species.

(ii) General Protection of Wildlife Resources

DGIF offers the following recommendations to minimize overall impacts to wildlife and natural resources as a result of proposed development activities:

- Avoid and minimize impacts to undisturbed forest, wetlands, and streams to the fullest extent practicable.
- Maintain undisturbed naturally vegetated buffers of at least 100 feet in width around all on-site wetlands and on both sides of all perennial and intermittent streams.
- Maintaining wooded lots to the fullest extent possible.
- Adhere to a time-of-year restriction protective of resident and migratory songbird nesting from March 15 through August 15 of any year for all tree removal and ground clearing.
- Adhere to erosion and sediment controls during ground disturbance.
- Design stormwater controls to replicate and maintain the hydrographic condition of the site prior to the change in landscape. This should include, but not be limited to, utilizing bioretention areas, and minimizing the use of curb and gutter in favor of grassed swales. Bioretention areas (also called rain gardens) and grass swales are components of Low Impact Development (LID). They are designed to capture stormwater runoff as close to the source as possible and allow it to slowly infiltrate into the surrounding soil. They benefit natural resources by filtering pollutants and decreasing downstream runoff volumes.

DGIF does not generally support proposals to mitigate wetland impacts through the construction of stormwater management ponds, nor does it support the creation of in-stream stormwater management ponds.

10. Forest Resources. According to the EA (page 22), there is a locally managed Forest and Wildlife Corridor along the northeast boundary of the proposed site. The concept STF site plan has been developed to specifically avoid and minimize potential impacts to this Forest and Wildlife Corridor. Site timber clearing will be conducted in conjunction with the Fort Belvoir forest management program with slash and unsalable timber mulched on site for reuse during site development activity for erosion control and stabilization. Timber clearing will also be timed to avoid disruption to bird nesting seasons as outlined in the Fort Belvoir INRMP. Compensatory mitigation for trees removed from the site will follow Fort Belvoir's Tree Removal and Protection Policy #27 dated October 12, 2012 regarding tree removal and restoration. Due to limited on-site opportunities for tree mitigation, out-of-kind compensatory mitigation within the Accotink Creek watershed will be incorporated within the scope of the project.

10(a) Agency Jurisdiction. The mission of the Virginia Department of Forestry (DOF) is to protect and develop healthy, sustainable forest resources for Virginians. DOF was established in 1914 to prevent and suppress forest fires and reforest bare lands. Since the Department's inception, it has grown and evolved to encompass other protection and management duties including: protecting Virginia's forests from wildfire, protecting Virginia's waters, managing and conserving Virginia's forests, managing state-owned lands and nurseries, and managing regulated incentive programs for forest landowners.

10(b) Agency Findings. DOF notes that it has had previous opportunities to provide comments and recommendations on this project as a result of prior outreach efforts by Fort Belvoir through the Secretary of Agriculture's office and the DEQ Office of Environmental Impact Review. In earlier communications, DOF advised the Army of its interest in reducing the rate of forestland conversion in the commonwealth, much of which is the result of growing urbanization and associated municipal infrastructure development. DOF further explained that it was now working with sponsors of large projects, communities, and others to mitigate forestland loss by seeking voluntary actions to compensate for unavoidable disturbances or impacts to forests of the commonwealth. In implementing this program, DOF defined three categories of mitigation:

- Preservation,
- Restoration, and
- Creation.

DOF learned from the Army about the policy directives outlined in the Fort Belvoir Integrated Natural Resources Management Plan (INRMP) that required a 2:1 equivalent mitigation ratio and its openness to mitigating off-site if sufficient on-site opportunities were unavailable.

It is DOF's understanding that the project proposal includes the following:

- Compensatory mitigation for trees removed from the site will follow Fort Belvoir's Tree Removal and Protection Policy #27 dated October 12, 2012 regarding tree removal and restoration.
- The current development plans a total of 1900 trees 4-inches or more in diameter are expected to be removed from the 9-acre study area, 1,252 of which fall within the Loblolly–Shortleaf Stand type (3.95 AC), 648 which fall within the Oak-Pine Stand type (4.59 AC). This does not account for the previous removal of trees in the Disturbed Area (0.46 AC) as part of site investigation work.
- Considering that this area was predominantly within the Loblolly–Shortleaf Stand type and assuming a similar stand density, the previously disturbed area (0.46 acres) likely removed 146 additional trees, for a total of approximately 2,050 trees lost due to the proposed development.
- In order to meet the 2:1 equivalent mitigation ratio outlined in the Fort Belvoir INRMP, a significant amount of off-site replacement will be required (4100 trees)

as the existing site will not provide adequate space for on-site mitigation.

- Current site landscaping plans only account for approximately 35 tree replacements due to development code limitations.
- Fort Belvoir has extensive experience with using off-site mitigation alternatives however, direct planting areas on the garrison are limited due to space constraints.
- Due to limited on-site opportunities for tree mitigation, out-of-kind compensatory mitigation within the Accotink Creek watershed will be incorporated within the scope of the project.
- Public Works staff has indicated that alternative in-kind mitigation to address area water quality concerns can be used as credits to offset actual tree planting requirements. Details on this program will need to be defined as the project moves forward and terms of mitigation particularly for the lower value tree species affected by the project will need to be worked out for the final FCP.
- This may include funding of two stream restoration projects within the Accotink Creek watershed. Potential mitigative projects include the repair of a culvert on a tributary of Mason Run (MR4), and repairing a stream channel above two recently constructed parking lots within Tompkins Basin.
- Execution of these Fort Belvoir mitigation projects will be coordinated with garrison officials, regulatory authorities and appropriately designed and permitted as independent projects upon confirmation of Fort Belvoir's preferred out-of-kind mitigation strategy.

10(c) Recommendations. DOF recommends the following:

- Due to the loss of upland forests, preference should be given to upland forest candidate sites as off-site mitigation opportunities over the types of projects described in #9 above. The Davidson field site does not include any wetlands according to the project proposal. Stream restoration projects have alternative mitigation funding available to them through requirements associated with wetland mitigation regulations, upland forests do not. DOF could not support confirmation of Fort Belvoir's preferred out-of-kind mitigation strategy if upland forests mitigation opportunities are available and are not pursued.
- The Accotink Creek watershed in Fairfax County, if that is the Army's preferred area for funding off-site mitigation, affords numerous opportunities for upland forest mitigation that would address the types of specimen trees and species that will be lost as a result of the project and meet other community and environmental service needs. In addition to the Fairfax County Department of Public Works and Environment, the Army should consult with the Fairfax County Park Authority, and DOF's Area and Urban Foresters to identify upland forest mitigation sites.

10(d) Conclusion. DOF supports the Army's commitments in the EA to mitigate the upland forestland loss associated with the project. DOF concurs with Ft. Belvoir's

Finding of No Significant Impact (FONSI) for the proposal. DOF believes that the detailed mitigation plan described in the EA will compensate for the expected nine acres of unavoidable loss in forestland. The mitigation plan is also supported by the Army's Forest Stand Delineation Report (EA, Appendix A).

For additional information, contact DOF, Greg Evans at (434) 220-9020 and/or Buck Kline at (434) 220-9035.

11. Water Supply. According to the EA (page 31), American Water (AW) owns, operates and maintains Fort Belvoir's water distribution system; potable water for this system is supplied by the Fairfax Water Authority the regional water purveyor. Potable water demand at Fort Belvoir averages around 2.0 MGD; the proposed site development is not expected to impact these demands as no new activities or additional personnel demands will be added to the system.

11(a) Agency Jurisdiction. The Virginia Department of Health (VDH), Office of Drinking Water (ODW) reviews projects for the potential to impact public drinking water sources (groundwater wells and surface water intakes).

11(b) Agency Findings. VDH-ODW finds that there are no public groundwater wells within a 1-mile radius of the project site and no public surface water intakes located within a 5-mile radius of the project site. The project is not within Zone 1 (up to 5 miles into the watershed) or Zone 2 (greater than 5 miles into the watershed) of any public surface water sources.

11(c) Requirement. Potential impacts to public water distribution systems must be verified by the local utility.

11(d) Conclusion. VDH concludes the there are no apparent impacts on public drinking water sources as a result of this proposed project.

Contact VDH-ODW, Ezekiel Dufore at (804) 864-7201, for additional information regarding these comments.

12. Transportation Impacts. According to the EA (page 18), analysis of traffic impacts associated with the proposed STF development at the DAAF site indicate the proposed development will not significantly impact regional transportation networks or existing regional traffic conditions. Levels of Service (LOS) on the adjacent roadways and intersections will not be appreciably affected based on projected traffic loadings in the year 2017 based on highway capacity analysis models conducted as part of STF site traffic planning.

12(a) Agency Jurisdiction. The Virginia Department of Transportation (VDOT) provides comments pertaining to potential impacts to existing and future transportation systems.

12(b) Agency Findings. VDOT finds that it appears that appropriate due diligence associated with the relevant NEPA implementing regulations and all appropriate impact analysis requirements relative to development of the Proposed Action have been addressed. The VDOT NOVA District Special Project Development Section has no further comments on the Proposed Action.

For additional information regarding these comments, contact the VDOT NOVA District, Robert Iosco at (703) 259-2764.

13. Historic and Archeological Resources. According to the EA (page 28), no eligible historic properties have been identified within the proposed STF development area. However, a small section of railroad track with a railcar wheel remnant was found within the STF site during site surveys. The Fort Belvoir Cultural Resources Manager (CRM) has evaluated this track segment and has determined that it is not eligible for listing on the National Register of Historic Places (NRHP). Fort Belvoir is preparing documentation of its evaluation of the track segment and its determination that the resource is not eligible for the NRHP and will forward this documentation to the State Historic Preservation Officer (SHPO) for concurrence, in accordance with Section 106 and 110 of the National Historic Preservation Act. In the event that unanticipated cultural resources are encountered during site development, construction specifications will include the requirement that work will be stopped pending consultation with the Fort Belvoir CRM in accordance with the Fort Belvoir Integrated Cultural Resources Management Plan (ICRMP).

13(a) Agency Jurisdiction. DHR conducts reviews of projects to determine their effect on historic structures or cultural resources under its jurisdiction. DHR, as the designated State's Historic Preservation Office, ensures that federal actions comply with Section 106 of the National Historic Preservation Act of 1962 (NHPA), as amended, and its implementing regulation at 36 CFR Part 800. The NHPA requires federal agencies to consider the effects of federal projects on properties that are listed or eligible for listing on the National Register of Historic Places. Section 106 also applies if there are any federal involvements, such as licenses, permits, approvals or funding. DHR also provides comments to DEQ through the state environmental impact report review process.

13(b) Agency Findings. According to DHR, Fort Belvoir has consulted with DHR on this project pursuant to Section 106 of the National Historic Preservation Act. DHR concurs that no historic properties will be affected by this undertaking and that no further consultation between the Army and DHR is necessary.

For additional information, contact DHR, Marc Holma at (804) 482-6090.

14. Aviation Impacts. The EA (page 21) states that the proposed ten acre STF site on the DAAF is entirely within the limits of Fort Belvoir and is located in an area designated

for military airfield land use according to current Fort Belvoir master planning documents. The proposed STF is within an area designated as a Building Height Restriction Zone due to the proximity of the DAAF airfield. This zoning incorporates a 7:1 horizontal to vertical transitional slope area around the airfield to determine maximum allowable height of ground obstructions to avoid potential flight conflicts. As the proposed STF site is located 1,200 feet (horizontally) from the center of the DAAF runway, the height restriction over the site is calculated to be 150 feet above the runway centerline elevation (based on maximum height limits). Current FAA records list the DAAF runway elevation as 73.4 feet above mean sea level (AMSL); indicating structures up to 223 feet AMSL would be permissible. Current STF concept planning does not include any structures above two stories high (approximately 32 feet above proposed grade or 63 feet AMSL). Therefore, the proposed STF development is beneath all airfield height zoning restrictions and compatible with current area zoning.

14(a) Agency Jurisdiction. The Virginia Department of Aviation's Airport Services Division provides airport sponsors and managers with technical assistance on a wide range of projects and issues, including the planning, design, construction and maintenance of airport facilities. The division manages funding programs for capital improvements, facilities and equipment, airport maintenance projects, and airport security; the General Aviation Voluntary Security Certification Program; the licensing program for public-use airports; and the registration program for private-use airports. This division conducts statewide aviation system planning and maintains the Virginia Air Transportation System Plan.

14(b) Agency Findings. The Department of Aviation (DoAv) finds that it appears the proposed facility will have no impact on any public-use airport. However, the site will be within 20,000 linear feet of an airport operated by the Department of Defense.

14(c) Requirement. The Army is required to submit a 7460-1 form to the Federal Aviation Administration (FAA) for review.

For additional information, contact DoAv, Scott Denny at (804) 236-3624.

15. Local Comments.

15(a) Agency Jurisdiction. In accordance with CFR 930, Subpart A, § 930.6(b) of the *Federal Consistency Regulations*, DEQ, on behalf of the state, is responsible for securing necessary review and comment from other state agencies, the public, regional government agencies, and local government agencies, in determining the Commonwealth's concurrence or objection to a federal consistency certification.

15(b) Agency Comments. The Fairfax County Department of Planning and Zoning (DPZ) and the Department of Public Works and Environment Services (DPWES) have reviewed the Environmental Assessment for the Skills Training Facility (STF) at Davison Army Airfield (DAAF) at Fort Belvoir, and the associated Coastal Zone Management Act

Consistency Determination. Comments are listed by agency below.

(i) Department of Planning and Zoning

DPZ has the following comments:

- Reduce the footprint of the structure by increasing the number of stories, if possible. This would have a potential benefit to reduce the limits of clearing and grading and the number of trees that must be cleared, given that this is an undeveloped site.
- Consolidate parking into a single structure, if possible.
- Although the document indicates that mature trees would not be cleared, more details and/or plans concerning the tree clearing would be useful to determine the expected impacts.
- For any tree clearing mitigation that is proposed on-site, and for the landscaping of the site once construction is complete, native and non-invasive vegetation should be considered.

(ii) Department of Public Works and Environmental Services

DPWES has identified some inconsistencies with the numbers and specifics contained in tables and appendices of the document:

- Table 3-1 indicates that 0 linear feet of road would be required to implement the STF at the preferred DAAF site. However, page 1 of the document indicates that new access drives and roadway would be required. Additionally, it is not clear why the table has not been updated with the information found in Appendix E regarding the additional linear feet of gas and sanitary sewer line required.
- Appendix E states that "*For costing purposes, the proposed OTC development should program for replacement of 1,600 feet of the sewer, upgrading it to 12-inch diameter pipe. This will need to include a subaqueous crossing of Accotink Creek (approximately 35' wide at the crossing point).*" There is no discussion of this crossing within the earlier documentation.

DPWES shares the concern from DPZ regarding the height of the building and the footprint on the ground. Specifically, the layout of the site changes within Section 3 between the several different site options; specifically the location and layout of any parking lots as well as the boundary of the site. DPWES recommends the Army consider the use of a parking garage within the facility or as a separate structure to reduce the amount of impervious surface on the site.

With regard to the stormwater management discussion (EA, Section 4.11), DPWES requests the infiltration study results as described in the EA (page 16) and a map to indicate the location of proposed pervious pavement on the site.

Other comments for the report include:

- Section 4.1 indicates that the soil on the site of the preferred location is predominantly Gunston Silt Loam which is "*somewhat poorly drained soil*" and "*tend to absorb and hold water*" (pg. 16). It is also noted in Appendix A that the *high water table is 1.5 to 3.5 feet below the surface* (Appendix A, page 6).
- The location of the LID SWM Area (EA, Fig. 3-2) has the lid structure within the area of Gunston Silt Loam. While the addition of "structured soil" as a soil amendment may allow for increased infiltration within the management facility, DPWES is concerned that the high ground water table may not promote infiltration. Therefore, bioretention facilities may not be appropriate in this location.
- It is unclear if all of the areas within Fig. 3-2 with the similar hatch pattern as the one that is labeled as a LID STW Area is supposed to be additional management facilities or possibly pervious pavement. Please clarify. If so, please indicate the type of LID proposed.
- There is a great deal of land with little to no change in contour on the site. It is unclear whether it is proposed that the excess stormwater will be sent to the proposed LID facility location.
- There appears to be a great deal of contour change within the outline of the proposed buildings. It is unclear whether this is an existing stream channel or gully. It is unclear what the final contours for the site will look like.
- While bioretention areas provide great water quality benefits, their use as the sole water quantity control may be exceeded by this design. As per for the Virginia BMP Clearinghouse, the maximum drainage area that can be sent to a bioretention area is 2 acres. It appears from the layout in Fig. 3-2, this will be exceeded.
- In addition to the proposed LID bioretention facility, DPWES recommends that the site be designed to include a variety of stormwater management types to detain or retain as much was on site as possible. Other management opportunities include:
    - Green roofs
    - Rainwater harvesting (above or below ground) and reuse on site
    - Additional soil amendments
    - Sheetflow to vegetated areas
    - Planting with native vegetation
    - Swales to capture runoff from parking lots that are not directed to other LID features.
- Section 4.19, Utility System Impacts, describes that site drainage will flow to Accotink Creek via "*existing off-site surface drainage channels at DAFF*". It is unclear if these channels are man-made or natural. The channels should be identified on subsequent maps.

DPWES notes that the Potential Environmental Impact Analysis Summary (Table 4-1), presents a list of impacts related to specific actions. DPWES is concerned that without

detailed plans, it is unclear how the removal of 10 acres of trees on a 10 acre site will produce minor impacts. DPWES encourages designing the facility with an eye to environmental site design and maintain some of the existing vegetation in lieu of removing it and planting with new vegetation. If this is not possible, DPWES encourages the use of native vegetation throughout the site design.

For additional information and coordination, contact DPZ, Maya Dhavale at (703) 324-1380.

16. Pollution Prevention. DEQ advocates that principles of pollution prevention be used in all construction projects as well as in facility operations. Effective siting, planning, and on-site Best Management Practices (BMPs) will help to ensure that environmental impacts are minimized. However, pollution prevention techniques also include decisions related to construction materials, design, and operational procedures that will facilitate the reduction of wastes at the source.

16(a) Recommendations. We have several pollution prevention recommendations that may be helpful in the construction of this project and in the operation of the facility:

- Consider development of an effective Environmental Management System (EMS). An effective EMS will ensure that the Army is committed to minimizing its environmental impacts, setting environmental goals, and achieving improvements in its environmental performance. DEQ offers EMS development assistance and it recognizes facilities with effective Environmental Management Systems through its Virginia Environmental Excellence Program.
- Consider environmental attributes when purchasing materials. For example, the extent of recycled material content, toxicity level, and amount of packaging should be considered and can be specified in purchasing contracts.
- Consider contractors' commitment to the environment (such as an EMS) when choosing contractors. Specifications regarding raw materials and construction practices can be included in contract documents and requests for proposals.
- Choose sustainable materials and practices for infrastructure construction and design. These could include asphalt and concrete containing recycled materials, and integrated pest management in landscaping, among other things.
- Integrate pollution prevention techniques into utility maintenance and operation, to include the following: inventory control (record-keeping and centralized storage for hazardous materials), product substitution (use of non-toxic cleaners), and source reduction (fixing leaks, energy-efficient HVAC and equipment). Maintenance facilities should be designed with sufficient and suitable space to allow for effective inventory control and preventative maintenance.

DEQ's Office of Pollution Prevention provides information and technical assistance relating to pollution prevention techniques and EMS. For more information, contact DEQ's Office of Pollution Prevention, Sharon Baxter at (804) 698-4344.

17. Energy Conservation. The proposed facility should be planned and designed to comply with state and federal guidelines and industry standards for energy conservation and efficiency. The commonwealth encourages architectural and engineering designers to recognize and incorporate the energy, environmental, and sustainability concepts listed in the LEED Green Building Rating System into the development and procurement of their projects.

The energy efficiency of the facilities can be enhanced by maximizing the use of the following:

- thermally-efficient building shell components (roof, wall, floor, windows, and insulation);
- facility siting and orientation with consideration towards natural lighting and solar loads
- high efficiency heating, ventilation, air conditioning systems;
- high efficiency lighting systems and daylighting techniques; and
- energy-efficient appliances.

Contact the Department of Mines, Minerals and Energy, David Spears at (434) 951-6350, for assistance in meeting this challenge.

18. Water Conservation. The following recommendations will result in reduced water use associated with the operation of the facility.

- Grounds should be landscaped with hardy native plant species to conserve water as well as lessen the need to use fertilizers and pesticides.
- Convert turf to low water-use landscaping such as drought resistant grass, plants, shrubs and trees.
- Low-flow toilets should be installed with the rehabilitation.
- Consider installing low flow restrictors and aerators to faucets.
- Improve irrigation practices by:
    - upgrading sprinkler clock; water at night, if possible, to reduce evapotranspiration (lawns need only 1 inch of water per week, and do not need to be watered daily; overwatering causes 85% of turf problems);
    - installing a rain shutoff device; and
    - collecting rainwater with a rain bucket or cistern system with drip lines.
- Install new high-efficiency washers and dishwashers to reduce water useage by 30-50% per use over older models.
- Check for and repair leaks (toilets and faucets) during regular routine maintenance activities.

FEDERAL CONSISTENCY UNDER THE COASTAL ZONE MANAGEMENT ACT

Pursuant to the Coastal Zone Management Act of 1972 (§ 1456(c)), as amended, and the federal consistency regulations implementing the CZMA (15 CFR Part 930, Subpart C, § 930.30 *et seq.*) federal actions that can have reasonably foreseeable effects on Virginia's coastal uses or resources must be conducted in a manner which is consistent, to the maximum extent practicable, with the Virginia Coastal Zone Management Program. The VCP is comprised of a network of programs administered by several agencies. In order to be consistent with the VCP, the federal agency must obtain all the applicable permits and approvals listed under the enforceable policies of the VCP prior to commencing the project.

Federal Consistency Public Participation

In accordance with 15 CFR § 930.2, public notice of the proposed action was published on DEQ's web site from May 9, 2014 to May 23, 2014. No public comments were received in response to the notice.

Federal Consistency Concurrence

The EA included a Federal Consistency Determination (FCD) (Appendix F) that includes an analysis of the consistency of the project on the enforceable and advisory policies of the VCP. Based on our review of the FCD and the comments submitted by agencies administering the enforceable policies of the VCP, DEQ concurs that the proposal is consistent with the VCP provided all applicable permits and approvals are obtained as previously described.

In addition, DEQ recommends that the Army consider the Advisory Policies of the VCP (Attachment 2). Other state approvals which may apply to this project are not included in this concurrence. Therefore, the applicant must ensure that this project is constructed and operated in accordance with all applicable federal, state, and local laws and regulations.

REGULATORY AND COORDINATION NEEDS

1. Surface Waters and Wetlands. Should it be determined that surface water and/or wetland impacts associated with this proposal would occur, a Virginia Water Protection Permit issued by the DEQ Northern Regional Office may be required pursuant to Virginia Code §62.1-44.15:5. If necessary, a Joint Permit Application may be obtained from and submitted to the VMRC which serves as a clearinghouse for the joint permitting process involving the VMRC, DEQ, Corps, and local wetlands boards. For additional information and coordination, contact DEQ-NRO, Trisha Beasley at (703) 583-3940 and/or VMRC, Juliette Giordano at (757) 247-8028.

2. Subaqueous Lands. In accordance with §28.2-1203 of the Code of Virginia, a permit may be required from VMRC for anticipated that impacts to state-owned subaqueous lands. A Joint Permit Application may be obtained from and submitted to the VMRC which serves as a clearinghouse for the joint permitting process involving the VMRC, DEQ, Corps, and local wetlands boards. For additional information and coordination, contact VMRC, Juliette Giordano at (757) 247-8028.

3. Erosion and Sediment Control and Stormwater Management.

3(a) Erosion and Sediment Control and Stormwater Management. This project must comply with Virginia's *Erosion and Sediment Control Law* (Virginia Code § 62.1-44.15:61) and *Regulations* (9 VAC 25-840-30 *et seq.*) and *Stormwater Management Law* (Virginia Code § 62.1-44.15:31) and *Regulations* (9 VAC 25-870-210 *et seq.*) as administered by DEQ. Activities that disturb 10,000 square feet or more (2,500 square feet or more in CBPAs) would be regulated by *VESCL&R* and *VSWML&R*. Erosion and sediment control, and stormwater management requirements should be coordinated with the DEQ Northern Regional Office, Kelly Vanover at (804) 837-1073.

3(b) Virginia Stormwater Management Program General Permit for Stormwater Discharges from Construction Activities. For projects involving land-disturbing activities of equal to or greater than one acre (2,500 square feet or more in CBPAs), the applicant is required to apply for registration coverage under the Virginia Stormwater Management Program General Permit for Discharges of Stormwater from Construction Activities (9 VAC 25-870-1 *et seq.*). Specific questions regarding the Stormwater Management Program requirements should be directed to DEQ, Holly Sepety at (804) 698-4039 or Shantelle Nicholson at (804) 698-4085.

4. Chesapeake Bay Preservation Areas. The project must be conducted in a manner which is consistent with the coastal lands management enforceable policy of the VCP which is governed by the requirements of the *Chesapeake Bay Preservation Act* (Virginia Code §§ 10.1-2100 through 10.1-2114) and *Chesapeake Bay Preservation Area Designation and Management Regulations* (Virginia Code 9 VAC 25-830-10 *et seq.*). The proposed project is subject to 9 VAC 25-830-140 for construction in lands analogous to RPA and the general performance criteria of 9 VAC 25-830-130 for construction in lands analogous to RMA. For additional information and coordination, contact DEQ-OSWM, Daniel Moore at (804) 698-4520.

5. Air Quality Regulations. This project is subject to air regulations administered by the Department of Environmental Quality. The following sections of the Code of Virginia and Virginia Administrative Code are applicable:

- asphalt paving operations (9 VAC 5-45-780 *et seq.*)
- fugitive dust and emissions control (9 VAC 5-50-60 *et seq.*); and
- open burning restrictions (9 VAC 5-130).

The installation of fuel burning equipment (e.g. boilers and generators), may require a permit (9 VAC 5-50-10 *et seq.* and 9 VAC 5-80-10 *et seq.*) prior to construction. Also, contact Fairfax County fire officials for information on any local requirements pertaining to open burning. For more information and coordination contact DEQ-NRO, James LaFratta at (703) 583-3928.

6. Solid and Hazardous Wastes. All solid waste, hazardous waste, and hazardous materials must be managed in accordance with all applicable federal, state, and local environmental regulations. Some of the applicable state laws and regulations are:

- *Virginia Waste Management Act* (Code of Virginia Section 10.1-1400 *et seq.*);
- *Virginia Hazardous Waste Management Regulations* (VHWMR) (9VAC 20-60);
- *Virginia Solid Waste Management Regulations* (VSWMR) (9VAC 20-80); and
- *Virginia Regulations for the Transportation of Hazardous Materials* (9VAC 20-110).

Some of the applicable federal laws and regulations are:

- *Resource Conservation and Recovery Act* (*RCRA*) (42 U.S.C. Section 6901 *et seq.*);
- Title 40 of the Code of Federal Regulations; and
- U.S. Department of Transportation Rules for Transportation of Hazardous materials (49 CFR Part 107).

For additional information concerning location and availability of suitable waste management facilities in the project area or if free product, discolored soils, or other evidence of contaminated soils are encountered, contact DEQ-NRO, Richard Doucette at (703) 583-3813.

6(a) Asbestos Containing Material. It is the responsibility of the owner or operator to thoroughly inspect any existing structures for the presence of asbestos, including Category I and Category II nonfriable asbestos containing material (ACM). Upon classification as friable or non-friable, all waste ACM shall be disposed of in accordance with the Virginia Solid Waste Management Regulations (9 VAC 20-80-640), and transported in accordance with the Virginia regulations governing Transportation of Hazardous Materials (9 VAC 20-110-10 *et seq.*). Contact the DEQ-NRO, Kathryn Persqzk at (703) 583-3856 and the Department of Labor and Industry, Ronald L. Graham at (804) 371-0444, for additional information.

6(b) Lead-Based Paint. If applicable, this project must comply with the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) regulations, and with the Virginia Lead-Based Paint Activities Rules and Regulations. For additional information regarding these requirements contact the Department of Professional and Occupational Regulation, David Dick at (804) 367-8588.

7. Natural Heritage Resources. Contact DCR-DNH, Rene Hypes at (804) 371-2708, to secure updated information on natural heritage resources if the scope of the project changes and/or six months passes before the project is implemented, since new and updated information is continually added to the Biotics Data System.

8. Wildlife Resources and Protected Species.

(i) Bald Eagle

Potential project impacts to the Bald eagle may be coordinated with the U.S. Fish and Wildlife Service, Cindy Schulz at (804) 824-2426.

(ii) General Protection of Wildlife

Contact DGIF, Amy Ewing at (804) 367-2211 for the development of project-specific measures to minimize project impacts upon wildlife resources.

9. Waterworks Regulations. Contact VDH-CFO, Robert Edelman, District Engineer at (540) 829-7340, to obtain a Construction Permit in accordance with the Virginia *Waterworks Regulations* and to discuss the project scope and details regarding the various phases of construction.

10. Sewage Regulations. Contact DEQ-NRO, Bryant Thomas at (703) 583-3843 or Bryant.Thomas@deq.virginia.gov to ensure compliance with the Sewage Collection and Treatment (SCAT) Regulations, as applicable.

11. Aviation Impacts. The submission of a 7460-1 form to the FAA for a "Determination of No Hazard" may be coordinated with the FAA, Marcus Brundage at (703) 661-1365 or marcus.brundage@faa.gov.

Thank you for the opportunity to review the Environmental Assessment and Federal Consistency Determination for the Construct Skills Training Facility at Davison Army Airfield, Fort Belvoir in Fairfax County. Detailed comments of reviewing agencies are attached for your review. Please contact me at (804) 698-4325 or John Fisher at (804) 698-4339 for clarification of these comments.

Sincerely,

Ellie Irons, Program Manager
Environmental Impact Review

Enclosures

Ec: Daniel Burstein, DEQ-NRO
Steve Coe, DEQ-DLPR
Kotur Narasimhan, DEQ-Air
Larry Gavan, DEQ-OSWM
Shantelle Nicholson, DEQ-OSWM
Daniel Moore, DEQ-OSWM
Tony Watkinson, VMRC
Amy Ewing, DGIF
Robbie Rhur, DCR
Keith Tignor, VDACS
Greg Evans. DOF
Buck Kline, DOF
Barry Matthews, VDH
Roger Kirchen, DHR
Chip Ray, VDOT
Scott Denny, DoAv
David Spears, DMME
Pam Nee, Fairfax County
G. Mark Gibb, Northern Virginia Regional Commission

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
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Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4020
1-800-592-5482

Attachment 2

Advisory Policies for Geographic Areas of Particular Concern

a. Coastal Natural Resource Areas - These areas are vital to estuarine and marine ecosystems and/or are of great importance to areas immediately inland of the shoreline. Such areas receive special attention from the Commonwealth because of their conservation, recreational, ecological, and aesthetic values. These areas are worthy of special consideration in any planning or resources management process and include the following resources:

   a) Wetlands
   b) Aquatic Spawning, Nursery, and Feeding Grounds
   c) Coastal Primary Sand Dunes
   d) Barrier Islands
   e) Significant Wildlife Habitat Areas
   f) Public Recreation Areas
   g) Sand and Gravel Resources
   h) Underwater Historic Sites.

b. Coastal Natural Hazard Areas - This policy covers areas vulnerable to continuing and severe erosion and areas susceptible to potential damage from wind, tidal, and storm related events including flooding. New buildings and other structures should be designed and sited to minimize the potential for property damage due to storms or shoreline erosion. The areas of concern are as follows:

   i) Highly Erodible Areas
   ii) Coastal High Hazard Areas, including flood plains.

c. Waterfront Development Areas - These areas are vital to the Commonwealth because of the limited number of areas suitable for waterfront activities. The areas of concern are as follows:

   i) Commercial Ports
   ii) Commercial Fishing Piers
   iii) Community Waterfronts

   Although the management of such areas is the responsibility of local government and some regional authorities, designation of these areas as Waterfront Development Areas of Particular Concern (APC) under the VCP is encouraged.

Designation will allow the use of federal CZMA funds to be used to assist planning for such areas and the implementation of such plans. The VCP recognizes two broad classes of priority uses for waterfront development APC:

i) water access dependent activities;
ii) activities significantly enhanced by the waterfront location and complementary to other existing and/or planned activities in a given waterfront area.

Advisory Policies for Shorefront Access Planning and Protection

a. Virginia Public Beaches - Approximately 25 miles of public beaches are located in the cities, counties, and towns of Virginia exclusive of public beaches on state and federal land. These public shoreline areas will be maintained to allow public access to recreational resources.

b. Virginia Outdoors Plan - Planning for coastal access is provided by the Department of Conservation and Recreation in cooperation with other state and local government agencies. The Virginia Outdoors Plan (VOP), which is published by the Department, identifies recreational facilities in the Commonwealth that provide recreational access. The VOP also serves to identify future needs of the Commonwealth in relation to the provision of recreational opportunities and shoreline access. Prior to initiating any project, consideration should be given to the proximity of the project site to recreational resources identified in the VOP.

c. Parks, Natural Areas, and Wildlife Management Areas - Parks, Wildlife Management Areas, and Natural Areas are provided for the recreational pleasure of the citizens of the Commonwealth and the nation by local, state, and federal agencies. The recreational values of these areas should be protected and maintained.

d. Waterfront Recreational Land Acquisition - It is the policy of the Commonwealth to protect areas, properties, lands, or any estate or interest therein, of scenic beauty, recreational utility, historical interest, or unusual features which may be acquired, preserved, and maintained for the citizens of the Commonwealth.

e. Waterfront Recreational Facilities - This policy applies to the provision of boat ramps, public landings, and bridges which provide water access to the citizens of the Commonwealth. These facilities shall be designed, constructed, and maintained to provide points of water access when and where practicable.

f. Waterfront Historic Properties - The Commonwealth has a long history of settlement and development, and much of that history has involved both shorelines and near-shore areas. The protection and preservation of historic shorefront properties is primarily the responsibility of the Department of Historic Resources. Buildings, structures, and sites of historical, architectural, and/or archaeological interest are significant resources for the citizens of the Commonwealth. It is the policy of the Commonwealth and the VCP to enhance the protection of buildings, structures, and sites of historical, architectural, and archaeological significance from damage or destruction when practicable.

Fisher, John (DEQ)

From: Burstein, Daniel (DEQ)
Sent: Wednesday, April 30, 2014 4:23 PM
To: Fisher, John (DEQ)
Subject: Re: DOD/Department of the Army, Construct Skills Training Facility, Davison Army Airfield at Fort Belvoir, Fairfax County - DEQ #14-067F - Review

NRO comments regarding the Consistency Determination and Environmental Assessment for DOD/Army: Construct Skills Training Facility, Davison Army Airfield at Fort Belvoir, located in Fairfax County are as follows:

Land Protection Division - The project manager is reminded that if any solid or hazardous waste is generated/encountered during construction, the facility would follow applicable federal, state, and county regulations for their disposal.

Air Compliance/Permitting - The project manager is reminded that during the construction phases that occur with this project; the project is subject to the Fugitive Dust/Fugitive Emissions Rule 9 VAC 5-50-60 through 9 VAC 5-50-120. In addition, should the project install fuel burning equipment (Boilers, Generators, Compressors, etc...), or any other air pollution emitting equipment, the project may be subject to 9 VAC 5-80, Article 6, Permits for New and Modified sources and as such the project manager should contact the Air Permit Manager DEQ-NRO prior to installation or construction, and operation, of fuel burning or other air pollution emitting equipment for a permitting determination. Lastly, should any open burning or use of special incineration devices be employed in the disposal of land clearing debris during demolition and construction, the operation would be subject to the Open Burning Regulation 9 VAC 5-130-10 through 9 VAC 5-130-60 and 9 VAC 5-130-100.

Virginia Water Protection Permit (VWPP) Program – It appears that wetlands could be impacted during the development of this project. The project manager is reminded that a VWP permit from DEQ may be required should impacts to surface waters be necessary during land disturbance and/or construction. DEQ VWP staff recommends that the avoidance and minimization of surface water impacts to the maximum extent practicable as well as coordination with the US Army Corps of Engineers. Upon receipt of a Joint Permit Application for the proposed surface water impacts, DEQ VWP Permit staff will review the proposed project in accordance with the VWP permit program regulations and current VWP permit program guidance.

Water Permitting/VPDES Program/Stormwater: The project manager is reminded to follow all applicable regulations.

Daniel Burstein
Regional Enforcement Specialist, Senior II
Virginia Department of Environmental Quality
Northern Virginia Regional Office
13901 Crown Court
Woodbridge, VA 22193
Phone: (703) 583-3904
Fax: (703) 583-3821
daniel.burstein@deq.virginia.gov

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COMMONWEALTH of VIRGINIA

Marine Resources Commission
2600 Washington Avenue
Third Floor
Newport News, Virginia 23607

Molly Joseph Ward
Secretary of Natural Resources

John M.R. Bull
Commissioner

May 21, 2014

Mr. John Fisher
Department of Environmental Quality
Office of Environmental Impact Review
629 East Main Street, 6th Floor
Richmond, VA 23219

Re: #14-067F Skills Training Facility,
Davison Army Airfield, Fort Belvoir

Dear Mr. Fisher:

We have reviewed the environmental assessment and consistency determination for the proposed construction of a skills training facility to include buildings, parking areas and roadway infrastructure, a fitness training area, and potential upgrades to an existing sanitary sewer line at the Davison Army Airfield on Fort Belvoir in Fairfax County.

The Marine Resources Commission, pursuant to Chapter 12 of Title 28.2 of the Code of Virginia, is responsible for issuing permits for encroachments in, on, or over State-owned submerged lands throughout the Commonwealth. Accordingly, authorization may be required from the Marine Resources Commission for projects that involve encroachments channelward of ordinary high water along natural rivers and streams above the fall line or below mean low water below the fall line. We generally require permits for encroachments in, on, or over non-tidal streams with a contributing drainage area greater than five (5) square miles or with an average instream flow of at least five (5) cubic feet per second.

Based upon the information provided, this proposed project *may* fall within the jurisdiction of the Marine Resources Commission. The existing sanitary sewer line crosses Accotink Creek. Upgrading this line will require a permit from our agency. All jurisdictional impacts will be reviewed during the Joint Permit Application (JPA) process.

Thank you for the opportunity to comment on this project. If we may be of further assistance, please do not hesitate to contact us.

Sincerely,

Juliette Giordano
Environmental Engineer

Fisher, John (DEQ)

From: Gavan, Larry (DEQ)
Sent: Thursday, May 15, 2014 8:52 AM
To: Fisher, John (DEQ)
Subject: RE: NEW PROJECT Army 14-067F

Pls. see the comments below.
Thx
L

(a) Agency Jurisdiction. The Department of Environmental Quality (DEQ) administers the *Virginia Erosion and Sediment Control Law and Regulations* (*VESCL&R*) and *Virginia Stormwater Management Law and Regulations* (*VSWML&R*).

(b) Erosion and Sediment Control and Stormwater Management Plans. The Applicant and its authorized agents conducting regulated land-disturbing activities on private and public lands in the state must comply with *VESCL&R* and *VSWML&R*, including coverage under the general permit for stormwater discharge from construction activities, and other applicable federal nonpoint source pollution mandates (e.g. Clean Water Act-Section 313, federal consistency under the Coastal Zone Management Act). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, borrow areas, soil stockpiles, and related land-disturbing activities that result in the total land disturbance of equal to or greater than 10,000 square feet (2,500 square feet in Chesapeake Bay Preservation Area) would be regulated by *VESCL&R*. Accordingly, the Applicant must prepare and implement an erosion and sediment control (ESC) plan to ensure compliance with state law and regulations. The ESC plan is submitted to the DEQ Regional Office that serves the area where the project is located for review for compliance. The Applicant is ultimately responsible for achieving project compliance through oversight of on-site contractors, regular field inspection, prompt action against non-compliant sites, and other mechanisms consistent with agency policy. [Reference: VESCL 62.1-44.15 et seq.]

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DEPARTMENT OF ENVIRONMENTAL QUALITY
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Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

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MEMORANDUM

TO: John Fisher, DEQ Environmental Program Planner

FROM: Daniel Moore, DEQ Principal Environmental Planner

DATE: May 20, 2014

SUBJECT: DEQ #14-067F: Army: Construct Skills Training Center at Davidson Army Airfield, Ft. Belvoir

We have reviewed the Consistency Determination application for the proposed Skills Training Center at Fort Belvoir in Fairfax County and offer the following comments regarding consistency with the provisions of the *Chesapeake Bay Preservation Area Designation and Management Regulations* (Regulations):

In Fairfax County, the areas protected by the Chesapeake Bay Preservation Act, as locally implemented, require conformance with performance criteria. These areas include Resource Protection Areas (RPAs) and Resource Management Areas (RMAs) as designated by the local government. RPAs include tidal wetlands, certain non-tidal wetlands and tidal shores. RPAs also include a 100-foot vegetated buffer area located adjacent to and landward of these features and along both sides of any water body with perennial flow. RMAs, which require less stringent performance criteria, include those areas of the County not included in the RPAs.

Under the Federal Consistency Regulations of the *Coastal Zone Management Act of 1972*, federal actions in Virginia must be conducted in a manner "consistent to the maximum extent practicable" with the enforceable policies of the Virginia Coastal Zone Management Program. Those enforceable policies are administered through the Chesapeake Bay Preservation Act and Regulations.

Federal actions on installations located within Tidewater Virginia are required to be consistent with the performance criteria of the Regulations on lands analogous to locally designated RPAs and RMAs, as provided in §9VAC25-830-130 and 140 of the Regulations, including the requirement to minimize land disturbance (including access and staging areas), retain existing vegetation and minimize impervious cover as well as including compliance with the

requirements of the *Virginia Erosion and Sediment Control Handbook*, and stormwater management criteria consistent with water quality protection provisions of the *Virginia Stormwater Management Regulations*." For land disturbance over 2,500 square feet, the project must comply with the requirements of the *Virginia Erosion and Sediment Control Handbook.*

The proposed project will result in land disturbance on lands analogous to locally designated RMA lands.

Fairfax County CBPA Map #108-2 (http://www.fairfaxcounty.gov/gis/DMV/cbpa/2005/108-2) shows the boundaries of the locally-designated RPA buffer associated with Accotink Creek. Based on that map, and owing to the fact that the proponent agency did not submit a site plan map showing the location of the locally designated RPA boundary relative to the proposed project, it cannot be determined whether the proposed project will impact lands analogous to locally designated RPA lands. Please note that, pursuant to §9VAC25-830-140 of the Regulations, land development may be allowed in a RPA only if is water dependent; constitutes redevelopment; constitutes development or redevelopment within a designated Intensely Developed Area; is a new use pursuant to §9VAC25-830-140 4 a of the Regulations; is a road or driveway crossing satisfying the conditions set forth in §9VAC25-830-140 1 d of the Regulations; or is a flood control or stormwater management facility satisfying the conditions set forth in §9VAC25-830-140 1 e of the Regulations.

Pending verification that the project will not impact lands analogous to locally designated RPA lands, and provided adherence to all of the above requirements, the proposed activity would be consistent with the Regulations and the *Chesapeake Bay Preservation Act.*

Fisher, John (DEQ)

From: Moore, Daniel (DEQ)
Sent: Tuesday, May 27, 2014 10:44 AM
To: Fisher, John (DEQ)
Subject: FW: DEQ 14-067F Ft. Belvoir Skills Training Center.docx
Attachments: DEQ 14-067F Ft Belvoir STF RPA Map.pdf

John;

The map provided is helpful. Here is new text to replace the second to last paragraph (page 2) of the memo:

A revised Fairfax County CBPA Map #108-2 submitted by the applicant to DEQ staff on May 23, 2014 shows the proposed development relative to the boundaries of the locally-designated RPA buffer associated with Accotink Creek. Based on that map, it appears that the proposed project will not encroach upon or impact lands analogous to locally designated RPA lands. Please note that, pursuant to §9VAC25-830-140 of the Regulations, land development may be allowed in a RPA only if is water dependent; constitutes redevelopment; constitutes development or redevelopment within a designated Intensely Developed Area; is a new use pursuant to §9VAC25-830-140 4 a of the Regulations; is a road or driveway crossing satisfying the conditions set forth in §9VAC25-830-140 1 d of the Regulations; or is a flood control or stormwater management facility satisfying the conditions set forth in §9VAC25-830-140 1 e of the Regulations.

From: Tom Fitzgerald [mailto:tfitzgerald@wileywilson.com]
Sent: Friday, May 23, 2014 11:55 AM
To: Fisher, John (DEQ); Moore, Daniel (DEQ)
Subject: RE: DEQ 14-067F Ft. Belvoir Skills Training Center.docx

Good Morning,

Attached is an updated figure referencing in the base site plan for the proposed facility onto the Fairfax County RPA map. This highlights that the proposed development is outside the limits of this coastal resource area. I will try and reach Mr. Moore directly this afternoon to confirm that this additional information clarifies the context of the proposed development correctly or if any supplemental information is required.

All the Best,
Tom

Thomas L. Fitzgerald, PE
Vice President, Project Manager
Wiley|Wilson
127 Nationwide Drive
Lynchburg, VA 24502-4272
434.455.3209 Direct
434.665.2187 Mobile
tfitzgerald@wileywilson.com
www.wileywilson.com

From: Fisher, John (DEQ) [mailto:John.Fisher@deq.virginia.gov]
Sent: Wednesday, May 21, 2014 2:38 PM
To: Tom Fitzgerald
Cc: Moore, Daniel (DEQ)
Subject: FW: DEQ 14-067F Ft. Belvoir Skills Training Center.docx

Mr. Fitzgerald:

Attached are comments from the DEQ Office of Stormwater Management (OSWM) which administers the coastal lands management enforceable policy of the Virginia Coastal Zone Management Program (VCP) through the Chesapeake Bay Act and Regulations. With regard to the review of the Federal Consistency Determination (FCD) included in the EA (Appendix F), DEQ-OSWM finds that there is insufficient information in the document to determine whether the proposed training center would impact lands analogous to Chesapeake Bay Resource Protection Areas (RPAs).

I have copied Mr. Daniel Moore (DEQ-OSWM) and ask that you coordinate with him on the information necessary to make a determination. As it stands now, the Commonwealth would have to object to the Army's finding of project consistency with the VCP due to insufficient information. Please coordinate with Mr. Moore as soon as possible to resolve this matter. Let me know if you have any questions.

John

John E. Fisher
Virginia Department of Environmental Quality
Division of Environmental Enhancement
Office of Environmental Impact Review
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Richmond, Virginia 23219
(804) 698-4339
(804) 698-4319 fax
john.fisher@deq.virginia.gov
www.deq.virginia.gov

From: Moore, Daniel (DEQ)
Sent: Tuesday, May 20, 2014 4:35 PM
To: Fisher, John (DEQ)
Subject: DEQ 14-067F Ft. Belvoir Skills Training Center.docx

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DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR PROGRAM COORDINATION

ENVIRONMENTAL REVIEW COMMENTS APPLICABLE TO AIR QUALITY

TO: John E. Fisher **DEQ - OEIA PROJECT NUMBER: 14 – 067F**

PROJECT TYPE: ☐ STATE EA / EIR **X FEDERAL EA / EIS** ☐ SCC

X CONSISTENCY DETERMINATION

PROJECT TITLE: CONSTRUCT SKILLS TRAINING FACILITY, DAVISON ARMY AIRFIELD, FORT-BELVOIR

PROJECT SPONSOR: DOD / DEPT. OF THE ARMY

PROJECT LOCATION: **X OZONE NONATTAINMENT AND EMISSION CONTROL AREA FOR NOX & VOC**

REGULATORY REQUIREMENTSMAY BE APPLICABLE TO: **X CONSTRUCTION**
☐ OPERATION

STATE AIR POLLUTION CONTROL BOARD REGULATIONS THAT MAY APPLY:

1. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 E – STAGE I
2. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 F – STAGE II Vapor Recovery
3. ☐ 9 VAC 5-45-780 et seq. – Asphalt Paving operations
4. **X 9 VAC 5-130 et seq. – Open Burning**
5. **X 9 VAC 5-50-60 et seq. Fugitive Dust Emissions**
6. ☐ 9 VAC 5-50-130 et seq. - Odorous Emissions; Applicable to_____
7. ☐ 9 VAC 5-50-160 et seq. – Standards of Performance for Toxic Pollutants
8. ☐ 9 VAC 5-50-400 Subpart_____, Standards of Performance for New Stationary Sources, designates standards of performance for the_____
9. ☐ 9 VAC 5-80-1100 et seq. of the regulations – Permits for Stationary Sources
10. ☐ 9 VAC 5-80-1700 et seq. Of the regulations – Major or Modified Sources located in PSD areas. This rule may be applicable to the _____
11. ☐ 9 VAC 5-80-2000 et seq. of the regulations – New and modified sources located in non-attainment areas
12. ☐ 9 VAC 5-80-800 et seq. Of the regulations – Operating Permits and exemptions. This rule may be applicable to _____

COMMENTS SPECIFIC TO THE PROJECT:

All precautions are necessary to restrict the emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO_X).

K. S. Narasimhan

(Kotur S. Narasimhan)
Office of Air Data Analysis **DATE: May 2, 2014**

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VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

MEMORANDUM

TO: John Fisher, Environmental Program Planner

FROM: Steve Coe, Division of Land Protection & Revitalization Review Coordinator

DATE: May 21, 2014

COPIES: Sanjay Thirunagari, Division of Land Protection & Revitalization Review Manager; file

SUBJECT: Environmental Impact Statement: Project #14-067F Skills Training Center, Davison Army Airfield, Fort Belvoir

The Division of Land Protection & Revitalization (DLPR) has completed its review of the Environmental Review Request for the construction of a Skills Training Center, Davison Army Airfield, Fort Belvoir. The Department has these comments concerning potential waste issues associated with this project review request.

Solid and hazardous waste issues were generally addressed in the submittal, and the submittal indicated a search of solid and hazardous waste databases. The DEQ DLPR staff has reviewed the submittal, conducted a cursory database search for zip code 22060 (Fort Belvoir), and has the following comments concerning possible waste issues associated with the project:

RCRA sites: one

ID# VAR000512715 - Fort Belvoir Residential Communities LLC, Tracy Loop, Bldg 766, Fort Belvoir, VA 22060. Contact: Mark J. Leo at 703-787-2050.

CERLCLA sites: one

ID# VA5210020082 - Fort Belvoir, Belvoir Research & Development Center, Fort Belvoir, VA 22060. NPL Status: Not on the NPL.

Solid Waste sites: none

VRP sites: none

FUDS: two

1) Fort Belvoir. FUDS# C03VA0518. Fed ID# VA9799F1717.
2) Fort Belvoir Engineer Training. FUDS# C03VA0099. Fed ID# VA9799F1579.

Petroleum Release sites: 32 identified in cursory search. The following buildings on the base were identified as having possible petroleum releases/contamination incidents: (Note: Building # and date of event) - all incidents reported are CLOSED)

#00099 (4/2/2007), #00181 (4/2/2007), #00182 (4/2/2007), #00184 (4/2/2007), #00193 (4/2/2007), #00200 (6/5/2007), #00201 (3/6/2007), #00201-00203-00213-00211-00212 (4/2/2007), #00204-00205-00206-00207-00208-00209 (4/2/2007), #00210 (5/11/2007), #01803 (4/5/2007), 28 tanks in various buildings (6/20/2007), #00219 (4/2/2007), #00226 (4/2/2007), #00231 (4/5/2007), #00753 (6/20/2007), #00952 (6/20/2007), #01200 (6/20/2007), #01201 (6/20/2007), #01403 (5/15/2007), #01421 (5/15/2007), #01422 (4/5/2007), #01726 (4/2/2007), #01736 (4/2/2007), #01741 (4/5/2007), #01802 (4/30/2007), #02170 (6/20/2007), #02417 (4/2/2007), #02421 (4/2/2007), #02427 (4/2/2007), #02444 (4/2/2007), #02444 (5/31/2007), #02454 (3/27/2007)

Please note that the DEQ's petroleum contamination (PC) case files may identify petroleum releases that should be evaluated by the project engineer or manager to establish the exact location of the release and the nature and extent of the petroleum release and the potential to impact the proposed project. The facility representative should contact the DEQ's Northern Virginia Regional Office at 703-527-5020 (Tank Program) for further information and the administrative records of the PC cases which are determined to be in close proximity to the proposed project.

DEQ's Federal Facilities Restoration Program comments:

The DEQ's Federal Facilities Restoration Program recommends contacting Ms. Kelly Lease, Environmental Compliance Branch Chief, Directorate of Public Works, Environmental & Natural Resource Division, Fort Belvoir, Virginia at (703) 806-0020 for information concerning Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) obligations at Fort Belvoir's Main Post. Ms. Lease, or her designee, should be advised prior to initiating any land, sediment, or groundwater disturbing activities at or near MMRP range areas and Main Post Solid Waste Management Units (SWMUs).

Please contact Wade Smith at (804) 698-4125 or wade.smith@deq.virginia.gov with any additional questions.

GENERAL COMMENTS

Soil, Sediment, and Waste Management

Any soil that is suspected of contamination or wastes that are generated must be tested and disposed of in accordance with applicable Federal, State, and local laws and regulations. Some of the applicable state laws and regulations are: Virginia Waste Management Act, Code of Virginia Section 10.1-1400 *et seq.*; Virginia Hazardous Waste Management Regulations (VHWMR) (9VAC 20-60); Virginia Solid Waste Management Regulations (VSWMR) (9VAC 20-81); Virginia Regulations for the Transportation of Hazardous Materials (9VAC 20-110). Some of the applicable Federal laws and regulations are: the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 *et seq.*, and the applicable

regulations contained in Title 40 of the Code of Federal Regulations; and the U.S. Department of Transportation Rules for Transportation of Hazardous Materials, 49 CFR Part 107.

Asbestos and/or Lead-based Paint

All structures being demolished/renovated/removed should be checked for asbestos-containing materials (ACM) and lead-based paint (LBP) prior to demolition. If ACM or LBP are found, in addition to the federal waste-related regulations mentioned above, State regulations 9VAC 20-81-620 for ACM and 9VAC 20-60-261 for LBP must be followed. For questions contact DEQ's Northern Virginia Regional Office, Kathryn Persyzk, at 703-583-3856.

Pollution Prevention – Reuse - Recycling

Please note that DEQ encourages all construction projects and facilities to implement pollution prevention principles, including the reduction, reuse, and recycling of all solid wastes generated. All generation of hazardous wastes should be minimized and handled appropriately.

If you have any questions or need further information, please contact Steve Coe at (804) 698-4029.

Environmental Impact Review – General Guidance for database searches

When the environmental impact report is written or compiled for specific sites, it should include an environmental investigation on and near the properties selected in order to identify any solid or hazardous waste sites or issues related to the (project area). The report author should analyze the data in the web-based Waste Division databases to determine if the project would affect or be affected by any sites identified in the databases. The databases include the Permitted Solid Waste Management Facilities, Virginia Environmental Geographic Information Systems (Solid Waste, Voluntary Remediation Program, and Petroleum Release sites), CERCLA Facilities, and Hazardous Waste Facilities databases.

The Permitted Solid Waste Management Facilities Database
A list of active solid waste facilities in Virginia.

CERCLA Facilities Database
A list of active and archived CERCLA (EPA Superfund Program) sites.

Hazardous Waste Facilities Database
A list of hazardous waste generators, hazardous waste transporters, and hazardous waste storage and disposal facilities. Data for the CERCLA Facilities and Hazardous Waste Facilities databases are periodically downloaded by the Waste Division from U.S. EPA's website.

Virginia Environmental Geographic Information Systems (VEGIS)
The "What's in My Backyard" application displays cross-media geographical features in proximity to a selected site/address for different facility search parameters.

Accessing the DEQ Databases:

The report author should access this information on the DEQ website at

http://www.deq.virginia.gov/Programs/LandProtectionRevitalization/ReportsPublications/OriginalReports.aspx.

Scroll down to the databases which are listed under **Real Estate Search Information** heading.

Initially, the ***solid waste information*** can be accessed by clicking on the Permitted Solid Waste Management Facilities link and opening the file. You can search by city/county or region (zip code) for active permitted waste facilities. (Note: A targeted solid waste facility search can be accomplished through the **VEGIS** link - see information below re: VRP search).

The ***Superfund information*** will be listed by clicking on the Search EPA's CERCLIS database tab and clicking on the **Search Superfund Site Information** button (blue box). On this form, enter either 1) the zip code for the project site, or, 2) the name of the city or county and select Virginia in the State drop down box. Click "Search" at the bottom of the form. A facilities list will be appear.

The ***hazardous waste*** information can be accessed by clicking on the Hazardous Waste Facilities link. Go to the Geography Search section and fill in the 1) zip code of the project, or 2) the name of the city or county and VA in the state block, and click on "Search". The hazardous waste facilities in the locality will be listed.

The ***Voluntary Remediation Program*** (VRP), **Solid Waste Facilities**, and **Petroleum Release Sites** GPS databases can be accessed from the www.deq.virginia.gov website by clicking on **VEGIS** link under the **Resources & Tools** category. Then click on the "What's in my backyard" in the **Mapping Applications** block to the left. On the web map page, click on the "Pick a Quick Search Here" drop down arrow, and select "Address Search". In the adjacent block enter the zip code or address for the project site. Click on "Search". On the map you will see a green "balloon" indicating the site.

> On the map area click on the "Tools" drop down arrow, and the select "Identify". A normal search looks like this: In the "Radius" block, type in [.5], and in the adjacent block select [miles] from the drop down options. Click on the "Layer" drop down arrow, select "VRP Sites", and then click on the green balloon. All VRP sites within the indicated range will appear in the Map/Results block to the left. Clicking on the block by the identified site will result in a second green balloon on the map. With multiple sites identified by the search, you can select/unselect each site to visualize its location, or change the radius of the search as needed.
>
> At this time you can also search for "Solid Waste" sites and "Petroleum Releases" information for the project area by selecting these topics from the "Layer" options and then clicking on the green balloon on the map after each selection.

These database searches will include most waste-related site information for each locality based upon the radius of the address selected (such as .5 miles, .25 miles, or .1 mile). In many cases, especially when the project is located in an urban area, the database output for that locality will be extensive. This information is important to identify possible environmental concerns that may impact a new project.

Molly Joseph Ward
Secretary of Natural Resources

Clyde E. Cristman
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

600 East Main Street, 24th Floor
Richmond, Virginia 23219
(804) 786-6124

RECEIVED
MAY 21 2014
DEQ-Office of Environmental Impact Review

MEMORANDUM

DATE: May 21, 2014

TO: John Fisher, DEQ

FROM: Roberta Rhur, Environmental Impact Review Coordinator

SUBJECT: DEQ 14-067F, Construct Skill Training Facility, Davison Army Airfield, Fort Belvoir

Division of Natural Heritage

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, the Accotink Bay – Gunston Cove Stream Conservation Unit is located within the project site. Stream Conservation Units (SCUs) identify stream reaches that contain aquatic natural heritage resources, including 2 miles upstream and 1 mile downstream of documented occurrences, and all tributaries within this reach. SCUs are also given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain. The Accotink Bay – Gunston Cove SCU has been given a biodiversity ranking of B5, which represents a site of general significance. The natural heritage resources associated with this site are:

Lampsilis radiate	Eastern lampmussel	G5/S2S3/NL/NL
Glyptemys insculpta	Wood turtle	G3/S2/NL/LT

The Eastern lampmussel is a freshwater mussel which inhabits river systems in areas with substrates composed of silt, sand, cobble, gravel and exposed bedrock (NatureServe, 2009). This species has a wide range, from eastern Canada west to Ontario and Quebec and south to South Carolina (NatureServe, 2009). In Virginia, there are records from the Chowan and York River drainages.

Considered good indicators of the health of aquatic ecosystems, freshwater mussels are dependent on good water quality, good physical habitat conditions, and an environment that will support populations of host fish species (Williams et al., 1993). Because mussels are sedentary organisms, they are sensitive to water quality degradation related to increased sedimentation and pollution. They are also sensitive to habitat

destruction through dam construction, channelization, and dredging, and the invasion of exotic mollusk species.

The Wood turtle ranges from southeastern Canada, south to the Great Lake states and New England. In Virginia, it is known from northern counties within the Potomac River drainage (NatureServe, 2009). The Wood turtle inhabits areas with clear streams with adjacent forested floodplains and nearby fields, wet meadows, and farmlands (Buhlmann et al., 2008; Mitchell, 1994). Since this species overwinters on the bottoms of creeks and streams, a primary habitat requirement is the presence of water (Mitchell, 1994).

Threats to the wood turtle include habitat fragmentation, urbanization, and automobile or farm machinery mortality (Buhlmann et al., 2008). Please note that the Wood turtle is currently classified as threatened by the Virginia Department of Game and Inland Fisheries (VDGIF).

In addition, the Accotink Wetlands Conservation Site is also located downstream from the project site. Conservation sites are tools for representing key areas of the landscape that warrant further review for possible conservation action because of the natural heritage resources and habitat they support. Conservation sites are polygons built around one or more rare plant, animal, or natural community designed to include the element and, where possible, its associated habitat, and buffer or other adjacent land thought necessary for the element's conservation. Conservation sites are given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant. Accotink Wetlands Conservation Site has been given a biodiversity significance ranking of B3, which represents a site of high significance. The natural heritage resources of concern at this site are:

Bolboschoenus fluviatilis	River bulrush	G5/S2/NL/NL
Ranunculus ambigens	Water-plantain crowfoot	G4/S1/NL/NL
Tidal Freshwater Marsh	(Mixed High Marsh Type)	G3/S4?/NL/NL

River bulrush, a state-rare plant species, inhabits fresh tidal marshes of the coastal plain of Virginia. This species forms predominantly sterile colonies that spread by rhizomes. Water pollution and sedimentation, sea level rise, and invasive species such as *Phragmites* australis pose the greatest threats to populations of this sedge. Nine populations of river bulrush are believed to be extant in Virginia.

Water-plantain crowfoot is a perennial wetland herb in the buttercup family (Ranunculaceae). The global distribution of water-plantain spearwort includes the eastern, midwestern, and southern U.S. and Ontario, Canada. Although apparently globally secure, water-plantain spearwort, also known as water-plantain crowfoot, is regionally rare to historical or extirpated, particularly in some eastern states (Kartesz 1999). In Virginia, it has been documented in scattered locations in the Coastal Plain, Piedmont, and Ridge and Valley. Many Virginia occurrences are historical, but more recent occurrences include those in Fairfax, Charlotte, and Lee counties. The lower stem of this relatively stout herb may recline, producing roots from the nodes, then become ascending to erect and extending sometimes to over 3 feet long. Leaves are lance-shaped, with margins smooth to finely-toothed. Yellow-petaled flowers bloom from April-July and can be solitary or in a branching inflorescence; the round to oval fruiting head is composed of numerous, small, 1-seeded, fruits (Godfrey and Wooten 1981). Habitat in Virginia occurrences includes a variety of wetlands: freshwater marshes, both tidal and non-tidal; a spring seep within a clearcut; wet soil within a floodplain; a muddy stream bottom; ditches; and very wet, mucky ground in a small pastured wetland. Threats include habitat degradation or destruction, and competition from invasive alien plant species.

Tidal Freshwater Marsh (Mixed High Marsh Type) (*Impatiens capensis-Peltandra virginica-Polygonum arifolium-Schoenoplectus fluviatilis-Typha angustifolia* Tidal Herbaceous Vegetation) occupies the higher

elevation zone of freshwater to slightly oligohaline marshes on the Atlantic Coast from Maine to Virginia. From Delaware to northern Virginia, this is the principal mixed freshwater tidal marsh community and forms extensive patches along many tidal rivers. This community is composed of mixed, dense, and often diverse marsh vegetation with highly variable species composition and patch dominance. The soils are highly variable, varying from silts and silty mucks to peats and sands across the range (NatureServe, 2010). In Virginia, this community occurs most extensively in estuarine reaches of the Potomac River drainage, but has also been documented along the Rappahanock, Pamunkey, Mattoponi, and James Rivers.

Freshwater tidal marshes are naturally dynamic systems that are best developed where there is a major input of freshwater, daily tidal range of at least 0.5 m, and a geomorphology that tends to constrict and magnify tidal influence in the upper reaches of the estuary. These marshes are subject to diurnal flooding by tides and river discharge (NatureServe, 2010). Principal threats include chronic sea-level rise leading to increasing upstream salinity, pollutants, and invasive exotic plants such as marsh dewflower (*Murdannia keissak*) (Fleming et al. 2011).

Furthermore, Parker's pipewort (*Eriocaulon parkeri*, G3/S2/NL/NL) has been historically documented downstream from the project site. Parker's pipewort is classified as very rare to uncommon in Virginia. This diminutive pipewort species displays a greyish-white button flower and often occurs with other rare mudwort species in the intertidal zone of tidal regions from Maine to North Carolina. Potential threats include activities that alter natural river currents causing sedimentation, which could inhibit germination of seeds or smother seedlings, and/or erosion of the habitat. Other potential threats include activities that result in increased salinity levels, water pollution, and displacement by aggressive species (J. C. Ludwig, 1996). Parker's pipewort has been documented at 29 occurrences in Virginia with 11 of those historical or extirpated. Surveys for this species should be conducted during the flowering / fruiting period from July to October.

To minimize adverse impacts to the aquatic ecosystem as a result of the proposed activities, DCR recommends the implementation of and strict adherence to applicable state and local erosion and sediment control/storm water management laws and regulations. Due to the legal status of Wood turtle, DCR also recommends coordination with Virginia's regulatory authority for the management and protection of this species, the VDGIF, to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please re-submit project information and map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Gladys Cason (804-367-0909 or Gladys.Cason@dgif.virginia.gov). According to the information currently in our files, the Unnamed Tributary of Dogue Creek, which has been designated by the Virginia Department of Game and Inland Fisheries (VDGIF) as a "Threatened and Endangered Species Water" for the Wood turtle is within 2 miles of the project area. Therefore, DCR recommends coordination with Virginia's

regulatory authority for the management and protection of these species, the VDGIF, to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

The remaining DCR divisions have no comments regarding the scope of this project. Thank you for the opportunity to comment.

Cc: Amy Ewing, VDGIF

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Fisher, John (DEQ)

From: Ewing, Amy (DGIF)
Sent: Thursday, May 29, 2014 11:04 AM
To: Fisher, John (DEQ)
Cc: Cason, Gladys (DGIF); nhreview (DCR)
Subject: ESSLog# 34746_14-067F_Army Skills Training Facility Ft. Belvoir

We have reviewed the subject project that proposes to construct a new training facility a on the DAAF site on Ft. Belvoir in Fairfax County.

According to our records, state Threatened wood turtles have been documented from the project area. An unnamed tributary of Dogue Creek that has been designated a Threatened and Endangered Species Water due to the presence of wood turtles is located within the project area. However, based on the scope and location of the proposed work, we do not anticipate it to result in adverse impacts upon this species.

We also document Accotink Creek and other nearby waters, designated Confirmed Anadromous Fish Use Areas, from the project area. However, based on the scope and location of the proposed work, we do not anticipate it to result in adverse impacts upon these resources.

Bald eagle nests and the Potomac Winter and Summer Bald Eagle Concentration Zone have been documented from the project area. Although we do not anticipate this project to result in adverse impacts upon bald eagles, we recommend coordination with the USFWS regarding possible impacts upon them.

This project is located within 2 miles of a documented occurrence of a state or federal threatened or endangered plant or insect species and/or other Natural Heritage coordination species. Therefore, we recommend coordination with VDCR-DNH regarding the protection of these resources.

To minimize overall impacts to wildlife and our natural resources, we offer the following comments about development activities: We recommend that the applicant avoid and minimize impacts to undisturbed forest, wetlands, and streams to the fullest extent practicable. We recommend maintaining undisturbed naturally vegetated buffers of at least 100 feet in width around all on-site wetlands and on both sides of all perennial and intermittent streams. We recommend maintaining wooded lots to the fullest extent possible. We generally do not support proposals to mitigate wetland impacts through the construction of stormwater management ponds, nor do we support the creation of in-stream stormwater management ponds.

We recommend that the stormwater controls for this project be designed to replicate and maintain the hydrographic condition of the site prior to the change in landscape. This should include, but not be limited to, utilizing bioretention areas, and minimizing the use of curb and gutter in favor of grassed swales. Bioretention areas (also called rain gardens) and grass swales are components of Low Impact Development (LID). They are designed to capture stormwater runoff as close to the source as possible and allow it to slowly infiltrate into the surrounding soil. They benefit natural resources by filtering pollutants and decreasing downstream runoff volumes.

We recommend that all tree removal and ground clearing adhere to a time of year restriction protective of resident and migratory songbird nesting from March 15 through August 15 of any year.

We recommend adherence to erosion and sediment controls during ground disturbance.

Assuming adherence to erosion and sediment controls, we find this project consistent with the Fisheries Management Section of the CZMA.

Thanks, Amy

Amy Ewing ☯ **Environmental Services Biologist/FWIS Manager** ☯ **VA Dept. of Game and Inland Fisheries** ☯
4010 West Broad St. Richmond, VA 23230 ☯ **804-367-2211** ☯ **www.dgif.virginia.gov**

Think before you print

Bettina Ring
State Forester

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MAY 22 2014
DEQ-Office of Environmental Impact Review

COMMONWEALTH of VIRGINIA

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May 22, 2014

TO: John Fisher, DEQ
FROM: Greg Evans, DOF
SUBJECT: DEQ #14-067F: Ft. Belvoir FONSI determination request for construction of Army Skills Training Facility, Davison Army Airfield

I have completed a desk review of the above subject project request on behalf of the Department of Forestry and have the following comments:

DOF notes that it has had previous opportunities to provide comments and recommendations on this project as a result of prior outreach efforts by Fort Belvoir through Secretary Haymore's office and the DEQ Office of Environmental Impact Review. The Department complements the Army on the commitments it makes in the April 16, 2014 NEPA Environmental Assessment to mitigate the upland forestland loss associated with the project.

In earlier communications, DOF advised the Army of its interest in reducing the rate of forestland conversion in the Commonwealth, much of which is the result of growing urbanization and associated municipal infrastructure development. DOF further explained that it was now working with sponsors of large projects, communities and others to mitigate forestland loss by seeking voluntary actions to compensate for unavoidable disturbances or impacts to forests of the Commonwealth. In implementing this program, DOF had defined three categories of mitigation: Preservation, Restoration, and Creation. DOF learned from the Army about the policy directives outlined in the Fort Belvoir INRMP that required a 2:1 equivalent mitigation ratio and its openness to mitigating off-site if sufficient on-site opportunities were unavailable.

DOF concurs with Ft. Belvoir's request for a FONSI determination because a very detailed mitigation plan has been described in the Environmental Assessment to compensate for the expected nine acres of unavoidable loss in forestland that will result from the project. That mitigation plan is in turn, supported by a Forest Stand Delineation Report included in Appendix A of the EA.

DOF understands the following from the project proposal.

1. Compensatory mitigation for trees removed from the site will follow Fort Belvoir's Tree Removal and Protection Policy #27 dated October 12, 2012 regarding tree removal and restoration.
2. The current development plans a total of 1900 trees 4-inches or more in diameter are expected to be removed from the 9-acre study area, 1,252 of which fall within the Loblolly–Shortleaf Stand type (3.95 AC), 648 which fall within the Oak-Pine Stand type (4.59 AC). This does not account for the previous removal of trees in the Disturbed Area (0.46 AC) as part of site investigation work.
3. Considering that this area was predominantly within the Loblolly–Shortleaf Stand type and assuming a similar stand density, the previously disturbed area (0.46 acres) likely removed 146 additional trees, for a total of approximately 2,050 trees lost due to the proposed development.
4. In order to meet the 2:1 equivalent mitigation ratio outlined in the Fort Belvoir INRMP, a significant amount of off-site replacement will be required (4100 trees) as the existing site will not provide adequate space for on-site mitigation.
5. Current site landscaping plans only account for approximately 35 tree replacements due to development code limitations.
6. Fort Belvoir has extensive experience with using off-site mitigation alternatives however, direct planting areas on the garrison are limited due to space constraints.
7. Due to limited on-site opportunities for tree mitigation, out-of-kind compensatory mitigation within the Accotink Creek watershed will be incorporated within the scope of the project.
8. Public Works staff have indicated that alternative in-kind mitigation to address area water quality concerns can be used as credits to offset actual tree planting requirements. Details on this program will need to be defined as the project moves forward and terms of mitigation particularly for the lower value tree species affected by the project will need to be worked out for the final FCP.
9. This may include funding of two stream restoration projects within the Accotink Creek watershed. Potential mitigative projects include the repair of a culvert on a tributary of Mason Run (MR4), and repairing a stream channel above two recently constructed parking lots within Tompkins Basin.
10. Execution of these Fort Belvoir mitigation projects will be coordinated with garrison officials, regulatory authorities and appropriately designed and permitted as independent projects upon confirmation of Fort Belvoir's preferred out-of-kind mitigation strategy.

DOF recommendations pertaining to:

1. Because it is upland forests that are being lost, preference should be given to upland forest candidate sites as off-site mitigation opportunities over the types of projects described in #9 above. The Davidson field site does not include any wetlands according to the project proposal. Stream restoration projects have alternative mitigation funding available to them through requirements associated with wetland mitigation regulations, upland forests do not. DOF could not support confirmation of Fort Belvoir's preferred out-of-kind mitigation strategy if upland forests mitigation opportunities are available and are not pursued.

2. The Accotink Creek watershed in Fairfax County, if that is the Army's preferred area for funding off-site mitigation, affords numerous opportunities for upland forest mitigation that would address the types of specimen trees and species that will be lost as a result of the project and meet other community and environmental service needs. In addition to the Fairfax County Department of Public Works and Environment, the Army should consult with, the Fairfax County Park Authority and The Virginia Department of Forestry's Area and Urban Foresters to identify upland forest mitigation sites.

This concludes our comments.

Greg Evans
Voluntary Mitigation Program Manager
Virginia Department of Forestry
900 Natural Resources Drive, Suite 800
Charlottesville, VA 22903
434-220-9020

Cc: B. Kline

Fisher, John (DEQ)

From: Dufore, Ezekiel (VDH)
Sent: Monday, May 19, 2014 1:47 PM
To: Fisher, John (DEQ)
Cc: Soto, Roy (VDH)
Subject: 14-067F | Army: Construct Skills Training Facility, Davison Army Airfield, Fort Belvoir

Army: Construct Skills Training Facility, Davison Army Airfield, Fort Belvoir
Project #: 14-067F
Location: Fairfax County

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

No public groundwater wells are within a 1 mile radius of the project site.

No public surface water intakes are located within a 5 mile radius of the project site.

The project is not within Zone 1 (up to 5 miles into the watershed) or Zone 2 (greater than 5 miles into the watershed) of any public surface water sources.

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

The provided documentation indicates that the project does not involve the installation of any septic systems. Therefore, the project appears consistent with the *Shoreline Sanitation* policy of the *Virginia Coastal Zone Management Program.*

Ezekiel Dufore
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Fisher, John (DEQ)

From: Iosco, Robert C. (VDOT)
Sent: Friday, May 16, 2014 2:15 PM
To: Fisher, John (DEQ)
Cc: Ray, Alfred C. (VDOT); Jordan, Elizabeth (VDOT); Cromwell, James R. (VDOT); Fahrney, Tom W. (VDOT)
Subject: VDOT Review Comments - Draft EA/FONSI - Construct Skills Training Facility, Davison Army Airfield, Fort Belvoir, Fairfax County

Mr. John Fisher
Office of Environmental Impact Review
Department of Environmental Quality
Richmond, VA

Dear Mr. Fisher:

As you requested, I reviewed the draft Environmental Assessment (EA) that has been prepared by the U.S. Army in compliance with the National Environmental Policy Act (NEPA) to document potential impacts to the physical, biological, and human environments associated with the development of a new
Skills Training Facility (STF) at Fort Belvoir, Virginia (Proposed Action). Based on my cursory review, it appears that appropriate due diligence associated with the relevant NEPA implementing regulations and all appropriate impact analysis requirements relative to development of the Proposed Action have been addressed.

The VDOT NOVA District Special Project Development Section has no further comments on the Proposed Action. Thank you for providing us with the opportunity to review and comment on the draft EA/FONSI.

Robert

Robert Iosco | Senior Project Development Specialist | Special Project Development Section | Virginia Department of Transportation | **4975 Alliance Drive, Fairfax, VA 22030** Robert.Iosco@VDOT.Virginia.gov | 703.259.2764 (office)

Fisher, John (DEQ)

From: Holma, Marc (DHR)
Sent: Tuesday, April 29, 2014 8:59 AM
To: Fisher, John (DEQ)
Subject: construction of Skills Training Facility, Davison Army Airfield, Fort Belvoir (DHR #2014-0151; DEQ #14-067F)

John,

Fort Belvoir has already consulted with DHR on this project pursuant to Section 106 of the National Historic Preservation Act. We concurred that No Historic Properties will be Affected by this undertaking. No further consultation between the Army and DHR is necessary.

Marc Holma

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Impact Review

COMMONWEALTH of VIRGINIA

Randall P Burdette
Director

Department of Aviation
5702 Gulfstream Road
Richmond, Virginia 23250-2422

V/TDD • (804) 236-3624
FAX • (804) 236-3635

May 5, 2014

Mr. John Fisher
Virginia department of Environmental Quality
Office of Environmental Impact Review
629 East Main Street, 6th Floor
Richmond, Virginia 23219

RE: Fort Belvoir Skills Training Facility, **DEQ Project # 14-067F**

Dear Mr. Fisher:

The Virginia Department of Aviation has reviewed the information package provided on April 28, 2014 for the Fort Belvoir Skills Training Facility also known as DEQ Project # 14-067F. Following our review, it appears the proposed facility will have no impact on any public-use airport. However, the site will be within 20,000 linear feet of an airport operated by the Department of Defense. Therefore, the project applicant is required to submit a 7460-1 form to the Federal Aviation Administration for review.

If you have any other questions regarding this matter, please contact me at (804) 236-3632.

Sincerely,

S. Scott Denny
Senior Aviation Planner
Virginia Department of Aviation

County of Fairfax, Virginia

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

June 2, 2014

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DEQ-Office of Environmental Impact Review

John E. Fisher
Department of Environmental Quality
Office of Environmental Impact Review
629 East Main Street, Sixth Floor
Richmond, Virginia, 23219

Dear Mr. Fisher:

The Fairfax County Department of Planning and Zoning (DPZ) and the Department of Public Works and Environment Services (DPWES) have reviewed the Environmental Assessment for the Skills Training Facility (STF) at Davison Army Airfield (DAAF) at Fort Belvoir, and the associated Coastal Zone Management Act Consistency Determination. This project consists of the construction of a new 96,000 square foot, two story facility with access drive, roadways, walkways and parking for 180 vehicles. Additionally, the construction will necessitate utility work, landscaping, and stormwater management to support the new facility. Comments are listed by agency below.

Department of Planning and Zoning

Staff notes the environmental and construction information detailed in the Environment Assessment and has the following comments:

- Is it possible to have a smaller footprint of the structure by increasing the number of stories? This would have a potential benefit to reduce the limits of clearing and grading and the number of trees that must be cleared, given that this is an undeveloped site. Likewise, the parking could be consolidated into a parking structure. Staff also has concerns about the trees being cleared. Although it is noted that these are not mature trees, more details and/or plans concerning the tree clearing would be useful to determine the expected impacts.
- For any tree clearing mitigation that is proposed on-site, and for the landscaping of the site once construction is complete, native and non-invasive vegetation should be considered.

Staff concurs that the proposed Management Plan will not result in any adverse effects on Virginia's coastal resources or uses.

Department of Planning and Zoning
Planning Division
12055 Government Center Parkway, Suite 730
Fairfax, Virginia 22035
Phone 703-324-1325 FAX 703-324-1485
www.fairfaxcounty.gov/dpz/

Department of Public Works and Environmental Services

Staff from DPWES has a number of concerns regarding the project. There are some questions about the numbers and specifics in the tables and appendices:

- Table 3-1 indicates that 0 linear feet of road would be required to implement the STF at the preferred DAAF site. However, page 1 of the document indicates that new access drives and roadway would be required. Additionally, it is not clear why the table has not been updated with the information found in Appendix E regarding the additional linear feet of gas and sanitary sewer line required.
- Appendix E also refers to a "*For costing purposes, the proposed OTC development should program for replacement of 1,600 feet of the sewer, upgrading it to 12-inch diameter pipe. This will need to include a subaqueous crossing of Accotink Creek (approximately 35' wide at the crossing point).*" There is no discussion of this crossing within the earlier documentation.

DPWES Staff shares the concern from DPZ regarding the height of the building and the footprint on the ground, adding that the layout of the site changes within section 3 between the several different site options– specifically the location and layout of any parking lots as well as the boundary of the site. Please consider the use of a parking garage within the facility or as a separate structure to reduce the amount of impervious surface on the site.

In regards to the proposed stormwater management discussed in section 4.11, staff wishes to request the infiltration study results as described on page 16, and for a map to indicate the location of proposed pervious pavement on the site.

Other comments for the report include:

- Section 4.1 indicates that the soil on the site of the preferred location is predominantly Gunston Silt Loam which is "*somewhat poorly drained soil*" and "*tend to absorb and hold water*" (pg. 16) It is also noted in Appendix A that the *high water table is 1.5 to 3.5 feet below the surface* (pg. 6 of App A).
- The location of the LID SWM Area as pictured in Fig. 3-2 has the lid structure within the area of Gunston Silt Loam. While the addition of "structured soil" as a soil amendment may allow for increased infiltration within the management facility, we are concerned that the high ground water table may not promote infiltration. Therefore, bioretention facilities may not be appropriate in this location.
- It is unclear if all of the areas within Fig. 3-2 with the similar hatch pattern as the one that is labeled as a LID STW Area is supposed to be additional management facilities or possibly pervious pavement. Please clarify. If so, please indicate the type of LID proposed.

- There is a great deal of land with little to no change in contour on the site. How is it proposed that the excess stormwater will be sent to the proposed LID facility location?
- There looks to be a great deal of contour change within the outline of the proposed buildings (see highlighted areas in image to the right). Is this an existing stream channel or gully? How will the final contours look for the site?
- While bioretention areas provide great water quality benefits, their use as the sole water quantity control may be exceeded by this design. As per for the VA BMP Clearinghouse, the maximum drainage area that can be sent to a bioretention area is 2 acres. Judging from the layout in Fig. 3-2, this will be exceeded.
- In addition to the proposed LID bioretention facility, staff recommends that the site be designed to include a variety of stormwater management types to detain or retain as much was on site as possible. Other management opportunities include:
    - § Green roofs
    - § Rainwater harvesting (above or below ground) and reuse on site
    - § Additional soil amendments
    - § Sheetflow to vegetated areas
    - § Planting with native vegetation
    - § Swales to capture runoff from parking lots that are not directed to other LID features
- Section 4.19, Utility System Impacts, describes that site drainage will flow to Accotink Creek via "*existing off-site surface drainage channels at DAFF*". It is unclear if these channels are man-made or natural. Please identify the channels on subsequent maps.

Finally, staff notes that Table 4-1, Potential Environmental Impact Analysis Summary, presents a list of impacts related to specific actions. Staff shares the DPZ staff concern that without detailed plans, it is unclear how the removal of 10 acres of trees on a 10 acre site will produce minor impacts. Staff encourages designing the facility with an eye to environmental site design and maintain some of the existing vegetation in lieu of removing it and planting with new vegetation. If this is not possible, staff concurs with the DPZ assessment to encourage the use of native vegetation throughout the site design.

Thank you for the opportunity to comment on this Environmental Assessment and Consistency Determination. If you have any questions about our comments, please do not hesitate to contact Maya Dhavale of my staff at 703-324-1380.

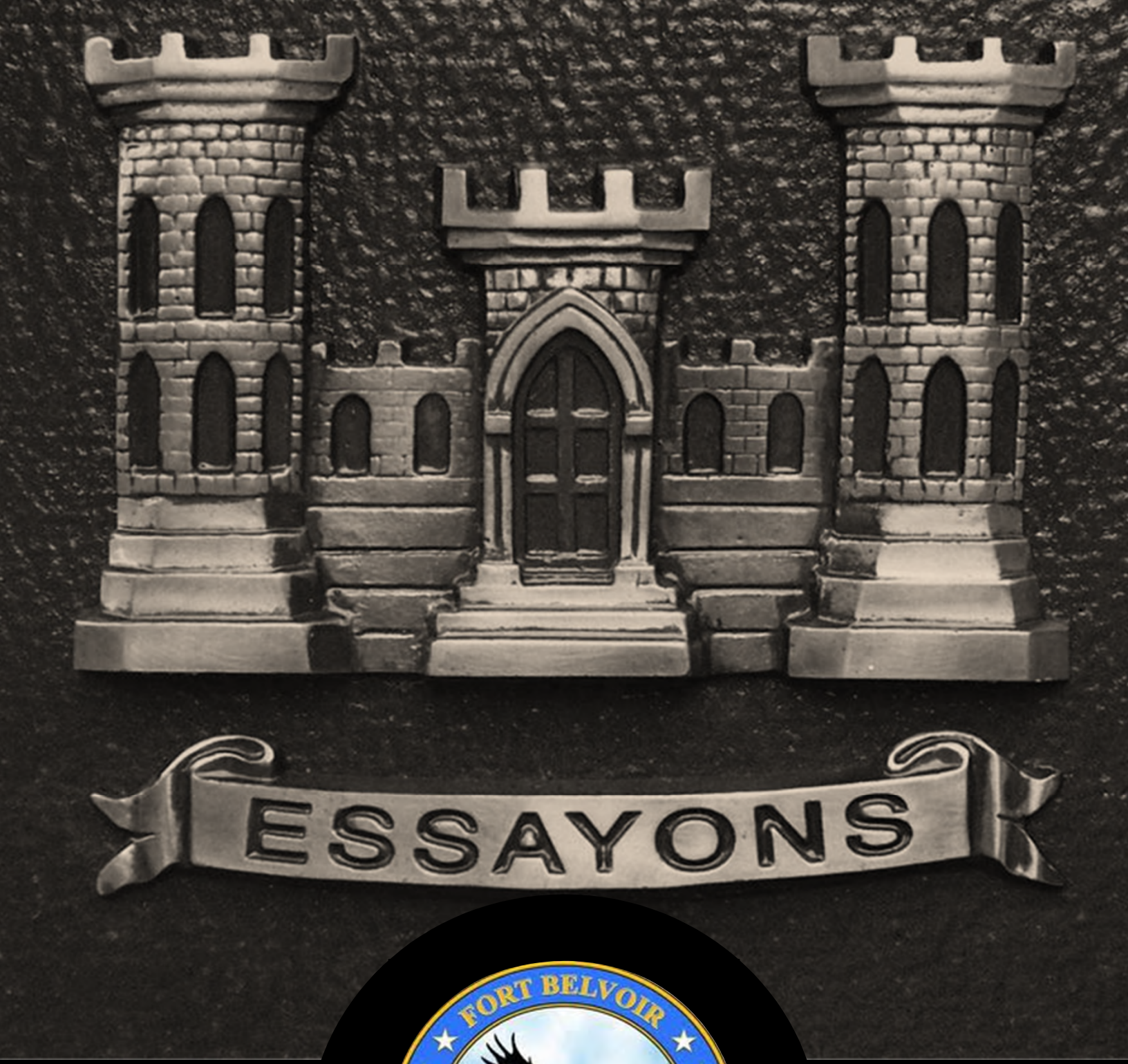
Sincerely,

Pamela G. Nee

Pamela G. Nee, Assistant Director
Planning Division, Department of Planning and Zoning

PGN: MPD

cc: Board of Supervisors
Edward L. Long Jr., County Executive
Robert A. Stalzer, Deputy County Executive
Maya Dhavale, Environmental Planner, DPZ
Danielle Wynne, Ecologist, Stormwater Planning, DPWES



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