
ENVIRONMENTAL ASSESSMENT

The National Museum of the United States Army Fort Belvoir, Virginia



Department of the Army
US Army Garrison Fort Belvoir, VA

September 2010



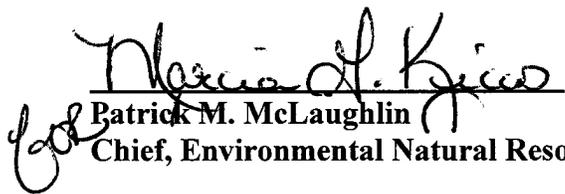
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**THE NATIONAL MUSEUM OF THE
UNITED STATES ARMY**

US Army Garrison Fort Belvoir, Virginia

September 2010

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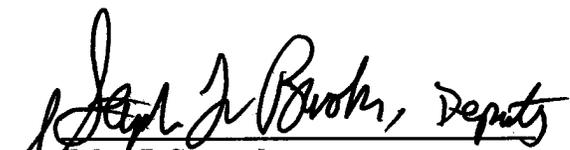

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Acronyms and Abbreviations

AASHO	American Association of State Highway Officials
ACHP	Advisory Council on Historic Preservation
ADT	Average Daily Traffic
AAFES	Army Air Force Exchange Service
AM	12 Midnight to 12 Noon
AMC	Army Materiel Command
APE	Area of Potential Effect
AR	Army Regulation
AST	Above Ground Storage Tank
ASTM	American Standards Testing and Measurements
AT/FP	Antiterrorism/Force Protection
ATM	Asynchronous Transfer Mode
BMO	Beech Mixed Oak
BMPs	Best Management Practices
BRAC	Defense Base Closure and Realignment Commission
BWP	Belvoir Woods Parkway
°C	degrees Centigrade
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAMA	Coastal Area Management Act
CBLAD	Chesapeake Bay Local Assistance Department
CBPA	Chesapeake Bay Preservation Act
CBPO	Chesapeake Bay Preservation Ordinance
CC	Conference Center
CDP	Census Designated Place
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CPNC	Comprehensive Plan for the National Capital

CRMP	Coastal Resources Management Plan
CWA	Clean Water Act
CX	Categorical Exclusion
CZMP	Coastal Zone Management Program
CZMA	Coastal Zone Management Act
CZMARA	Coastal Zone Management Act Reauthorization Amendments
DA	Department of the Army
dB	Decibel
dba	A-weighted sound pressure level in decibels
dBp	Linear peak sound level
DCEETA	Defense Communications Electronics Evaluation and Testing Activity
DCR	Department of Conservation and Recreation
DEIS	Draft EIS
DIS	Directorate of Installation Support
DLA	Defense Logistics Agency
DNH	Division of Natural Heritage
DNL	Day-Night Average Sound Level
DoD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
DSA	Delivery Screening Area
DSV	Daily Service Volume
DSWC	Division of Soil and Water Conservation
DTRA	Defense Threat Reduction Agency
DVP	Dominion Virginia Power
EA	Environmental Assessment
ECP	Entry Control Point
EDA	Explosives Detection Area
EIS	Environmental Impact Statement
EMS	Emergency Medical Service
EMT	Emergency Medical Technician
ENRD	Environmental Natural Resources Division

EO	Executive Order
EISA	Energy Independence Act
EPACT	Energy Policy Act
EPG	Engineer Proving Grounds
ESA	Endangered Species Act
°F	degrees Fahrenheit
FCPS	Fairfax County Public Schools
FCWA	Fairfax County Water Authority
FEIS	Final EIS
FEMA	Federal Emergency Management Agency
FEMP	Federal Energy Management Program
FHWA	Federal Highway Administration
FICON	Federal Interagency Committee on Noise
FNSI	Finding of No Significant Impact
FR	Federal Register
FS	Feasibility Study
FWC	Forest and Wildlife Corridor
FY	Fiscal Year
gal	Gallon
GIS	Geographic Information System
GPD	Gallons per Day
HAP	Hazardous Air Pollutant
HEC	Humphries Engineering Center
HQC	Headquarters Complex
HQDA	Headquarters, Department of Army
HUD	Department of Housing and Urban Development
I-95	Interstate-95
ICPRB	Interstate Commission on the Potomac River Basin
INCMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
INSCOM	US Army Intelligence and Security Command

IPM	Integrated Pest Management
IRP	Installation Restoration Program
ISDN	Integrated Services Digital Network
kpy	Kilograms Per Year
kV	Kilovolts
L _{eq} [h]	Hourly A-weighted Sound Level
LOS	Level of Service
MACOM	Major Army Command
MDW	Military District of Washington
MGD	Million Gallons Per Day
MOA	Memorandum of Agreement
MP	Military Police
mph	Miles Per Hour
msl	Mean Sea Level
MTMC	Military Transport Management Command
MWAQC	Metropolitan Washington Air Quality Committee
MWCOG	Metropolitan Washington Council of Governments
NAAQS	National Ambient Air Quality Standards
NAC	Noise Ambient Criteria
NAWQA	National Water Quality Assessment
NBS	National Bureau of Standards
NEPA	National Environmental Policy Act
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NCPC	National Capital Planning Commission
NCR	National Capital Region
NHP	National Heritage Program
NHPA	National Historic Preservation Act
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxide
NOA	Notice of Availability
NOI	Notice of Intent

NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSPS	New Source Performance Standards
O ₃	Ozone
Pb	Lead
PDEIS	Preliminary Draft EIS
PIDS	Personnel Intrusion Detection System
PIF	Partners in Flight
PM	12 Noon to 12 Midnight
PM 10	Particulate Matter - 10 Microns or Less
PPA	Personnel Processing Area
ppm	Parts Per Million
PPMS	Program Project Monitoring System
PX	Post Exchange
RCRA	Resource Conservation and Recovery Act
RDF	Remote Delivery Facility
REC	Record of Environmental Consideration
RMA	Resource Management Area
ROD	Record of Decision
RPA	Resource Protection Area
RPMP-LRC	Real Property Master Plan-Long Range Component
R/W	Right-of-Way
SA	Secretary of the Army
SARA	Superfund Amendments and Reauthorization Act
SCS	Soil Conservation Service
SEIS	Supplemental EIS
SF	Square Feet
SIP	State Implementation Plan
SO ₂	Sulfur Dioxide
SWMU	Solid Waste Management Unit

TES	Threatened and Endangered Species
TMH	Transportation Management Plan
TMP	Tulip Popular Mixed Hardwood
TPM	Total Particulate Matter
tpy	Tons Per Year
TSP	Total Suspended Particulate Matter
US 1	U.S. Route 1, Jefferson Davis Highway (Richmond Highway)
USASAC	US Army Security Assistance Command
USALIA	US Army Logistics Integration Agency
USBEA	US Bureau of Economic Analysis
USBLS	US Bureau of Labor Statistics
USC	United States Code
USDA	US Department of Agriculture
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
UST	Underground Storage Tank
V/C	Volume to Capacity Ratio
VAC	Code of Virginia
VDACS	Virginia Department of Agriculture and Consumer Services
VDCCR	Virginia Department of Conservation and Recreation
VDEQ	Virginia Department of Environmental Quality
VDGIF	Virginia Department of Game and Inland Fisheries
VDHR	Virginia Department of Historic Resources
VDOT	Virginia Department of Transportation
VDWM	Virginia Department of Waste Management
VEDP	Virginia Economic Development Partnership
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound
VPDES	Virginia Pollutant Discharge Elimination System
VPF	Virginia Pine Forest

VR	Virginia Regulation
VRE	Virginia Railway Express
VSMP	Virginia Stormwater Management Program
WMATA	Washington Metropolitan Area Transit Authority

INTRODUCTION

The Army proposes to build the National Museum of the US Army (NMUSA) at US Army Garrison Fort Belvoir, Virginia (Figure I-1, *Location of Fort Belvoir*). In October 2008, Fort Belvoir published a Draft Environmental Assessment (EA) on its website evaluating the potential environmental impacts of the NMUSA project, and hosted a public information meeting on 30 October, 2008 to encourage review by interested members of the public. It also distributed more than 100 copies to federal, state, and local agencies, citizen groups, and other stakeholders. As a result of the comments received from that process, the Army has reshaped its plans for the NMUSA. The current plans and alternatives are addressed in this revised Draft EA.

In 1979, the US Army began serious consideration of a national museum to collect and preserve Army memorabilia and to honor the service and sacrifice of those Soldiers who have given to our country. Since that time, over 64 sites in the Washington Metropolitan area and around the country have been evaluated as potential locations for the NMUSA, but Fort Belvoir, Virginia was selected as the best and only reasonable location. In October 2001, the Secretary of the Army officially designated Fort Belvoir as the site, and Congress made this decision into law in September 2003 (Title 10, United States Code, Section 4772).

The Army evaluated a number of potential sites within Fort Belvoir for the NMUSA (Figure I-2, *Alternative Sites on Fort Belvoir*), but had narrowed the choice to just two – the Pence Gate and Gunston sites – when the October 2008 Draft EA was published. The Draft EA evaluated designs for the NMUSA at both of these sites, with the designs differing from each other enough to accommodate site specific constraints such as

The National Environmental Policy Act

NEPA requires the consideration of environmental issues in federal agency planning and decision-making. A federal agency must prepare an Environmental Impact Statement (EIS) or an EA for any federal action not considered an emergency, categorically excluded, or otherwise exempt by law. If a federal action might significantly affect the quality of the human environment, the federal agency must prepare an EIS. An EA is meant to be a concise public document that provides the basis for determining whether or not to prepare an EIS. The EA should address:

- The need for the proposal.
- The alternatives.
- The environmental impacts of the proposed action and alternatives.
- A list of the agencies and persons consulted.

The EA results in either a Finding of No Significant Impact (FNSI) or a Notice of Intent (NOI) to prepare an EIS. If the Fort Belvoir Garrison Commander determines that the proposed action might have a significant impact on the quality of the human environment, then he will direct his staff to prepare an EIS.

topography. In January 2010, the Pence Gate site was made unavailable by the decision to construct a new Child Development Center there, as addressed in the *Finding of No Significant Impact* and *Final Environmental Assessment for the South Post Child Development Center, Fort Belvoir* (January, 2010). This draft of the EA therefore addresses a revised set of alternatives, namely those alternatives that could be implemented at the Gunston site, with the exception that the alternative design that included an entrance road from John J. Kingman Road has also been eliminated from further consideration. Fort Belvoir determined that the impacts of this alternative on the Forest Wildlife Corridor and other resources would have been too great.

This draft EA also addresses the impacts of reconfiguring the existing North Post Golf Course to replace the golf course holes that would be adversely affected by construction of the NMUSA at the Gunston site. The impact on the North Post Golf Course was one of the primary issues raised by commenters on the October 2008 draft EA.

The rationale for the selection of Fort Belvoir as the location of the NMUSA, as well as the narrowing of the choice of sites, is provided in Chapter 2.

What is the purpose of this document?

The purpose of this EA is to:

- Provide the US Army decision makers with a tool to aid in the decision process. The EA identifies and compares the environmental impacts of each of the alternatives presently available for consideration, namely two “build” alternatives (construction and operation of the NMUSA with either surface parking or a structured

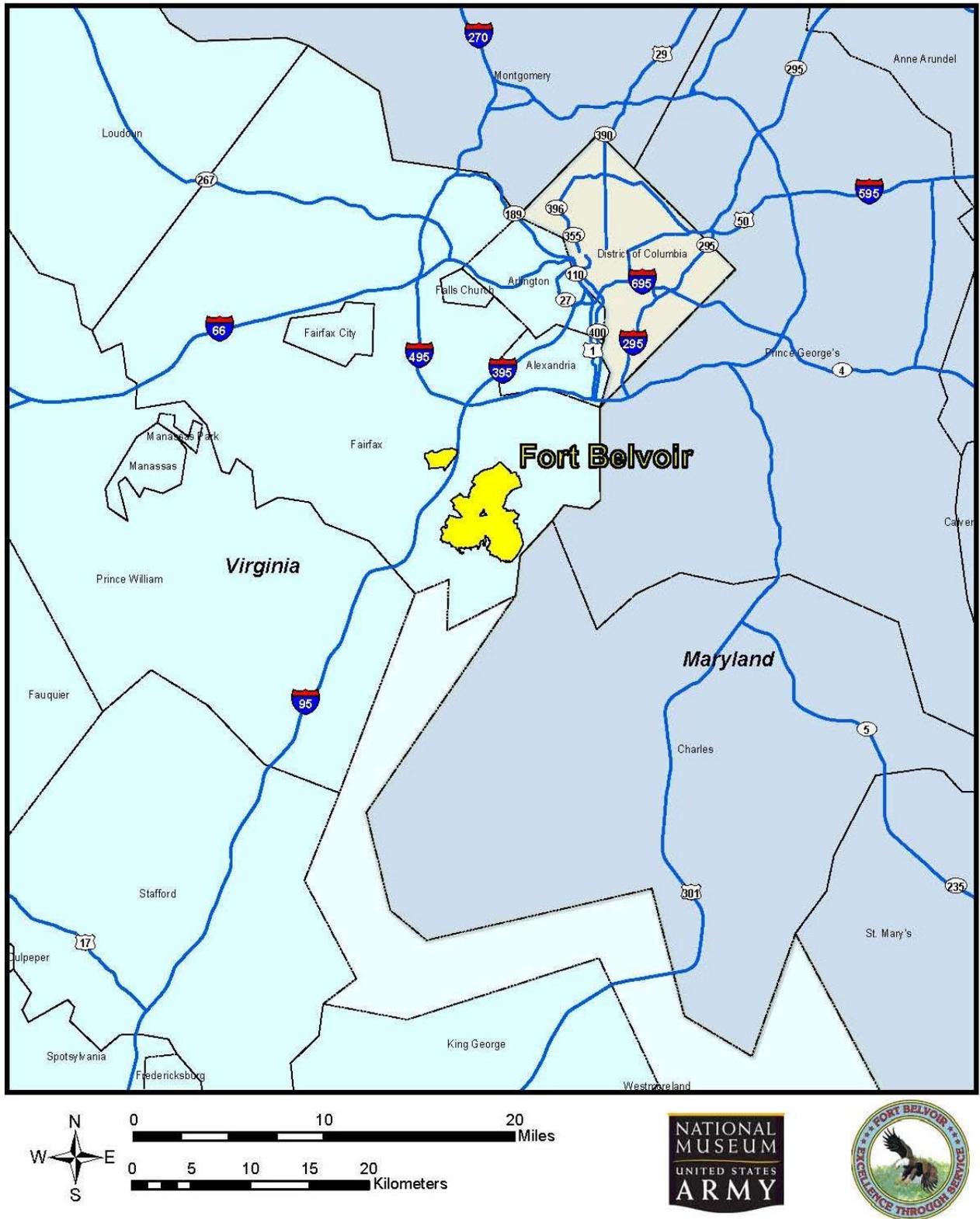


Figure I-1: Location of Fort Belvoir

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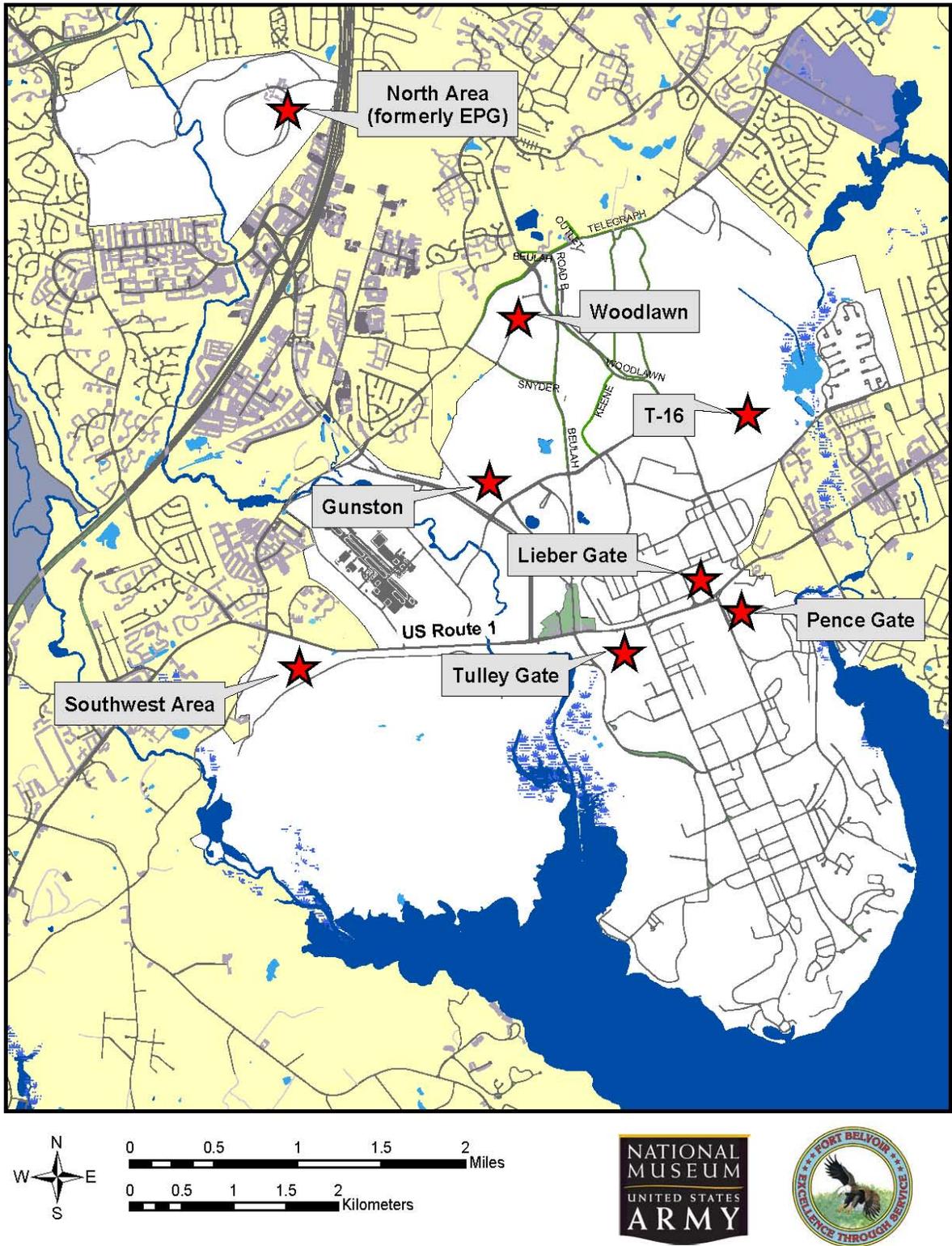


Figure I-2: Alternative Fort Belvoir Sites Considered

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parking area) and the “no build” (or “No Action”) alternative.

- Document the process that has led the Army to select Fort Belvoir as the overall location for the NMUSA;
- Inform the public of the Army’s revised plan, show how comments on the October 2008 Draft EA have been addressed, and provide another opportunity for the public and government agencies to comment; and
- Comply with the requirements of the National Environmental Policy Act (NEPA) of 1969. Fort Belvoir is preparing this EA to publicly document the environmental consequences of the proposed action. The EA has been prepared pursuant to the Council on Environmental Quality (CEQ) regulations in 40 Code of Federal Regulations (CFR) Parts 1500-1508, and 32 CFR Chapter V Part 651.

Decision Makers

The Garrison Commander of Fort Belvoir signs the Finding of No Significant Impact and the Environmental Assessment. The siting decision would be announced by the Office of the Assistant Secretary of the Army.

In what other ways is the public involved?

To date, the Army Historical Foundation, the entity responsible for raising funds to construct the NMUSA, has held public information presentations and maintained a website that focuses on their mission and fundraising efforts. The Army also held a public information meeting on October 30, 2008, 21 days after the first Draft EA was published. This revised Draft EA will also be circulated to the public and interested federal, state, and local agencies to provide an opportunity for comment. A Notice of Availability (NOA) for the revised draft will be published in newspapers to announce that the revised Draft EA is available for public review on the Fort Belvoir website, to give the public an opportunity to comment.

The Army initiated the National Capital Planning Commission (NCPC)’s review process (Subchapter 3.1) by submitting a

Concept Design to NCPC for their review. The NCPC process provides opportunities for public comment.

1 PURPOSE AND NEED FOR THE PROJECT

1.1 What is the purpose of the project?

The purpose of the NMUSA project is to provide the American public with a museum documenting the history of the US Army throughout its 235-year history, from its beginnings as the Colonial Militia to its present position as the world's most powerful ground force. The US Army proposes to house and display thousands of artifacts and works of art in a series of interpretive exhibits geared to educate visitors on the role of the Army in US and world history.

1.2 Why does the Army and the public need the NMUSA?

At present, there is no national museum for the US Army, despite the fact that it is the oldest operating branch of the US Armed Forces. The Army operates 61 smaller museums and museum activities at installations scattered throughout the country, but each of these museums commemorates a different aspect, branch, unit, theme, or historic period of the Army. A national museum would provide the American public with the complete overview of the Army's history, as well as a focal point for managing the Army's valuable collections. It would also be a central forum for those members of the government and public needing to research various aspects of the Army's history. The lessons learned from past experience will provide valuable insights for future military confrontations.

Even more important is the opportunity for the American public to pay tribute to the millions of men and women who have

The National Museum of the US Army – Strategic Vision

The Army's strategic vision for the museum is a 21st century museum of excellence, a recognized national and international visitor destination that will:

- Honor the service and sacrifice of the Soldier, Veteran, and the entire Army family.
 - Engage, entertain, and educate visitors regarding the historic role of the Army in the development of the nation, and the current relationship of the Army to the people of this Nation, in order to ensure the continued growth of the Army into the future.
 - Promote excellence in scholarship among the nation's youth.
 - Inspire visitors and promote *esprit de corps* among Soldiers.
 - Preserve the heritage and legacy of the Army.
 - Ensure accurate and comprehensive portrayal of the Army's story.
 - Serve as the capstone of the US Army museum system.
-

served this country as Soldiers, dedicating their time, their comfort, and often their lives for the sake of this country.

2 DESCRIPTION OF THE PROPOSED ACTION & ALTERNATIVES

2.1 What would the NMUSA include?

The Army is still in the process of planning the NMUSA, but it envisions a number of elements. **While the final design for the NMUSA may vary from the conceptual layout presented here, the impacts of the final design would not exceed the impacts described in this EA. It is very likely that the impacts of the final design would be less than the projected impacts of the conceptual layouts.**

Construction of the NMUSA would occur in multiple phases, ensuring that all the elements of a successful museum opening are in place without allowing construction to outpace the availability of funding. The elements of the proposed action presented below are not locked into specific phases – the schedule for constructing these elements may change due to fundraising requirements. This EA assumes the full build-out of the elements presented below, including future expansion phases.

The elements for the initial phase of construction would likely include:

- **The main Museum building** – an approximately 177,000-gross square foot (gsf) multi-story building with exhibit halls, a theater, a Veterans’ Hall, food service areas, retail areas, administrative spaces, an experiential learning center, and a lobby with a visitor reception area.
- **A Traveling Simulator** on a 2,000 gsf pad. .

Funding

The NMUSA will be constructed with funds raised by the Army Historical Foundation.

The Army intends on funding certain infrastructure elements

Proposed Parade Ground Events

- Headquarters, Department of the Army-level ceremonies/
 - Change of Command Responsibility
 - Retirement
 - Ceremonial Special Events
 - Commemorations
 - Twilight Tattoos
 - Full Honors Parades
 - Farewell and Welcome Home
 - Counterpart Visit Welcome
 - Tenant Command Events
 - Training Activities and Demonstration
 - Physical Training
 - Emergency Response Training
 - Golden Knights Demonstrations
 - Vehicle Demonstrations
 - Drill
 - Historical Interpretations
 - Organization Days and Family Events
 - Community Partnership Events
 - Independence Day
 - Oktoberfest
 - Springfest
 - Re-enactments
 - Graduation Ceremonies
 - High School Marching Band & Cheerleading Demonstrations and Competitions
-

- **A Memorial Garden** – a contemplative 1.3-acre area to honor the service and sacrifices of US Army soldiers, veterans, civilians, and their families.
- **A Parade Ground and Grandstand** – consisting of approximately 4 acres with a 6,000-gsf grandstand, as well as a 0.8-acre staging area for special and ceremonial events (see sidebar).
- **An Amphitheater** – a 6,700-gsf staging and production venue to provide a smaller, more intimate environment than the parade ground.
- **A Education, Survival, and Interpretive Trail 3,000 feet long and 6 feet wide** - that would provide an additional venue for outdoor education and be equipped with a small (2,700-gsf) comfort station.
- **A small powder storage building** – a 2,000 gsf building for temporary storage of powder for the ceremonial cannon and other reenactment weapons used in displays and ceremonies on the parade ground.
- **A drop-off and arrival plaza** – a 0.5-acre area for passenger drop-off.
- **Parking** – up to 8.2 acres of visitor and volunteer (approximately 800 to 850 spaces; 500-550 to be built in phase 1) and employee (75 spaces) parking. During the design phase of the proposed action, the total number of parking spaces may be reduced. If the Army opts for a structured parking arrangement, the footprint of the parking lot(s) would be reduced by approximately 2 to 3 acres.
- **Bus and recreational vehicle (RV) parking** – up to 0.9 acre of surface parking for larger vehicles (40 spaces).
- **A main entrance for visitors and service vehicles.** An entrance roadway with controlled access that

would branch near the entrance to the site to provide a service entrance for employees and delivery vehicles. The main entrance would be open to the public during operating hours, while being controlled access at other times, or during periods of heightened alert. The service entrance road would have controlled access (Berger/Smith Group, August 2008; Skidmore, Owings, and Merrill, LLP, June 2009).

Future expansion phases (as funds become available) might include:

- **Expansion of the Museum** – up to 72,000-gsf. This expansion would also include a **Macro Gallery** to display large artifacts such as combat and support vehicles and dioramas. Other potential features include additional galleries, an interactive theater, a resource center, and an addition to the experiential learning center.
- **Expansion of the Memorial Garden** – up to 0.7 acre.
- **Expansion of the Grandstand** – up to 12,000 gsf.
- **A small storage building** – 2,000 gsf, near the grandstand to store cannons or serve as a temporary stable.
- **An Outdoor Education Center** - 2.0 acres. This Center would consist of: a 6,500 gsf multipurpose barracks for groups to use during regular museum hours or overnight.
- **A Leadership Confidence Course and Comfort Station** adjacent to the trail proposed for construction in the initial phase; a **small picnic and viewing area** with a **small event pavilion** adjacent

to the parade ground; and an encampment area for approximately 30 tent-only campers.

Approximately 16.1 acres would be paved for internal roadways and parking areas. In addition, a 1.9 to 2-acre area of trees would be selectively cleared between the access road and the museum complex at the top of the hill to provide an iconic view of the NMUSA from the access road. During the design phase, the Army would identify specimen trees to be preserved, locate dead and diseased trees to be removed, and perform a hydrologic analysis of surface water to determine the number and location of remaining trees that could be removed to establish a view of the NMUSA. The final selection of trees would be done by a certified arborist after the building is framed.

The numbers presented above are planning numbers – the exact dimensions of some of these elements may vary depending on future planning considerations and the availability of funding. However, these numbers represent the approximate upper limit of impact.

During the initial phase of construction, the Army would provide supporting infrastructure such as internal roadways and traffic control, and changes to external roadways to accommodate visitor and employee traffic. The Army would provide stormwater drainage and management facilities (including stormwater Best Management Practices (BMPs) consistent with the Chesapeake Bay Local Assistance Department regulations and the Fairfax County Chesapeake Bay Ordinance); potable water and fire protection; sanitary sewer lines and pump stations; electrical and natural gas service lines; barriers and security compliant with anti-

terrorism and force protection (AT/FP) standards; etc. (*Berger/SmithGroup*, August 2008).

2.2 Why would the NMUSA be located at Fort Belvoir?

The Army has been planning and evaluating potential locations for the NMUSA since 1979. In 1998, the Center of Military History developed a list of 64 potential sites throughout the National Capital Region (NCR) to be considered. In 2000, an Army working group took a fresh look at sites both within and outside of the NCR, but finally rejected locations outside the NCR. A site within the NCR is critical because it is the political center of the US; it is a national and international visitor destination; and the Army senior leadership is concentrated in the NCR (US Army Center of Military History, March 2000).

The 2000 Army working group narrowed the selection to two sites – the Southeast Federal Center and Fort Belvoir. They rejected the Southeast Federal Center due to its Navy heritage and its location adjacent to the Washington Navy Yard and the US Navy Museum.

In October 2001, the Secretary of the Army announced that Fort Belvoir would be the location of the NMUSA because Fort Belvoir had the appropriate public access, educational impact, accessibility for national leaders, commercial access, logistics and maintenance support, facilitation of public law with respect to invaluable artifacts, and appropriate physical site characteristics. This preferred location has been ratified by every Secretary of the Army and Army Chief of Staff since that time, and became law with the passage of Public Law

**Table 2-1
NMUSA Location Evaluation
Criteria**

-
- a. Number of conservators within 30 miles of the site.
 - b. Distance/convenience to core research facilities: the National Archives, Library of Congress, the Museum of American History, and Military History Institute.
 - c. Accessible by public transportation at the time of the study: Metrorail, bus, train, airport.
 - d. Accessible by major roadways – not feeder roads.
 - e. Commercial touring enterprises – number of local providers.
 - f. Number of military schools, high schools, and universities in a 30-mile radius.
 - g. Proximity to foreign embassies.
 - h. Proximity to active duty Soldiers.
 - i. Proximity to the Pentagon.
 - j. Proximity to Capitol Hill.
 - k. Number of curatorial supplies and services located within 30 miles of the site.
 - l. Number of guest facilities within 10 miles of the site.
 - m. Number of food service facilities within 1 mile of the site.
 - n. Presence of existing utilities.
 - o. Actual area available for a building of 300,000 gsf. (approx. 6.8 ac) including visitor parking.
 - p. Actual area available for expansion.

Source: 2000 Army Working Group

108-375, which amended Title 10, United States Code by adding Section 4772.

2.3 What sites at Fort Belvoir are suitable for the NMUSA?

At this time, only the Gunston site is considered reasonable. The site at Pence Gate site was thoroughly evaluated in the Draft EA published and circulated in October 2008, but is no longer available because the South Post Child Development Center (CDC) will be located there. A separate EA was prepared to evaluate the impacts of the CDC project and a Finding of No Significant Impact (FNSI) was published January 2010 resulting in final decision to site the CDC at the Pence Gate site. The NMUSA facilities would be too large to co-locate with the CDC.

Figure I-2 (Alternative Sites at Fort Belvoir) shows the eight sites (including the Gunston and Pence Gate sites) that were considered at Fort Belvoir during the long planning process for the NMUSA (US Army Center for Military History, March 2004; Berger/Smith Group, August 2008). The other six sites were rejected for the reasons described below.

- **Southwest Area** – The largely undeveloped Southwest Area is too far away from the main installation to reasonably make the necessary connections to the nearest available utility and communications lines.
- **Woodlawn** – A public museum at the Woodlawn site would violate the height restriction provision of the AT/FP standards for the nearby Aero Defense Facility - East (ADF-E) complex. To conform to these standards, the height of a structure at the Woodlawn site could not exceed 225 feet above

mean sea level (msl). However, the existing elevation of the Woodlawn site ranges from 200 to 230 feet above msl, making it impossible to construct NMUSA at this site within AT/FP standards.

- **North Area (formerly referred to as “the EPG”)** – A museum at the North Area site would interfere with AT/FP restrictions for planned Base Realignment and Closure (BRAC) construction. There also are issues with the distance of this site from the main installation, potential adverse traffic impacts, the difficulty of connecting to communications and other utility systems, and its distance from other area attractions.
- **Lieber Gate** – This was the preferred site (US Army Center for Military History, March 2004) prior to the 2005 BRAC process. It is no longer available – the site is now slated for the reconfiguration of the North Post access point from Route 1.
- **Tulley Gate** – The extreme topography of the Tulley Gate site would require much more grading to attain a suitable space for NMUSA buildings and other components, compared to other potential NMUSA sites. There are major utility corridors on the site that limit potential building areas.
- **T-16** – The T-16 area was rejected because of the lack of visibility from area roadways and the limited availability of utilities and communications in the area.

BRAC (Base Realignment and Closure)

BRAC is the Department of Defense (DoD) process for reorganizing installation infrastructure to more efficiently and effectively support its forces, increase operational readiness, and facilitate new ways of doing business.

The impacts of constructing the NMUSA at the Gunston site are addressed in subsequent chapters of this EA.

2.4 What alternatives are still being considered?

There are two reasonable alternative plans for the NMUSA – a layout that involves surface parking and another that would involve construction of a parking garage or deck. Both alternatives are evaluated in this EA.

Kingman Road Alternatives

Earlier plans for the Gunston site included NMUSA layouts that were accessed by a bridge spanning the Forest and Wildlife Corridor (FWC), and intersecting with John J. Kingman Road. Referred to as the “Kingman Road Alternatives,” these layouts were removed from consideration due to unacceptable impacts to the FWC.

The Surface Parking Alternative would utilize more land and would therefore impact a larger area than the Structured Parking Alternative. Figure 2-1 shows the conceptual layout of the Proposed NMUSA – Surface Parking Alternative, and the maximum anticipated impact that would result from the NMUSA elements. The Structured Parking Alternative would include a parking deck or garage located at the interior of the site between the access road and the parade ground. This arrangement would reduce the overall area of impact by approximately 2 to 3 acres.

Throughout this EA, the effects of the Surface Parking Alternative are presented, because it would generally have a greater impact on the environment than the Structured Parking Alternative. Exceptions are noted where the Structured Parking Alternative would have a greater impact. The EA therefore addresses the “envelope” of potential impacts from the NMUSA.

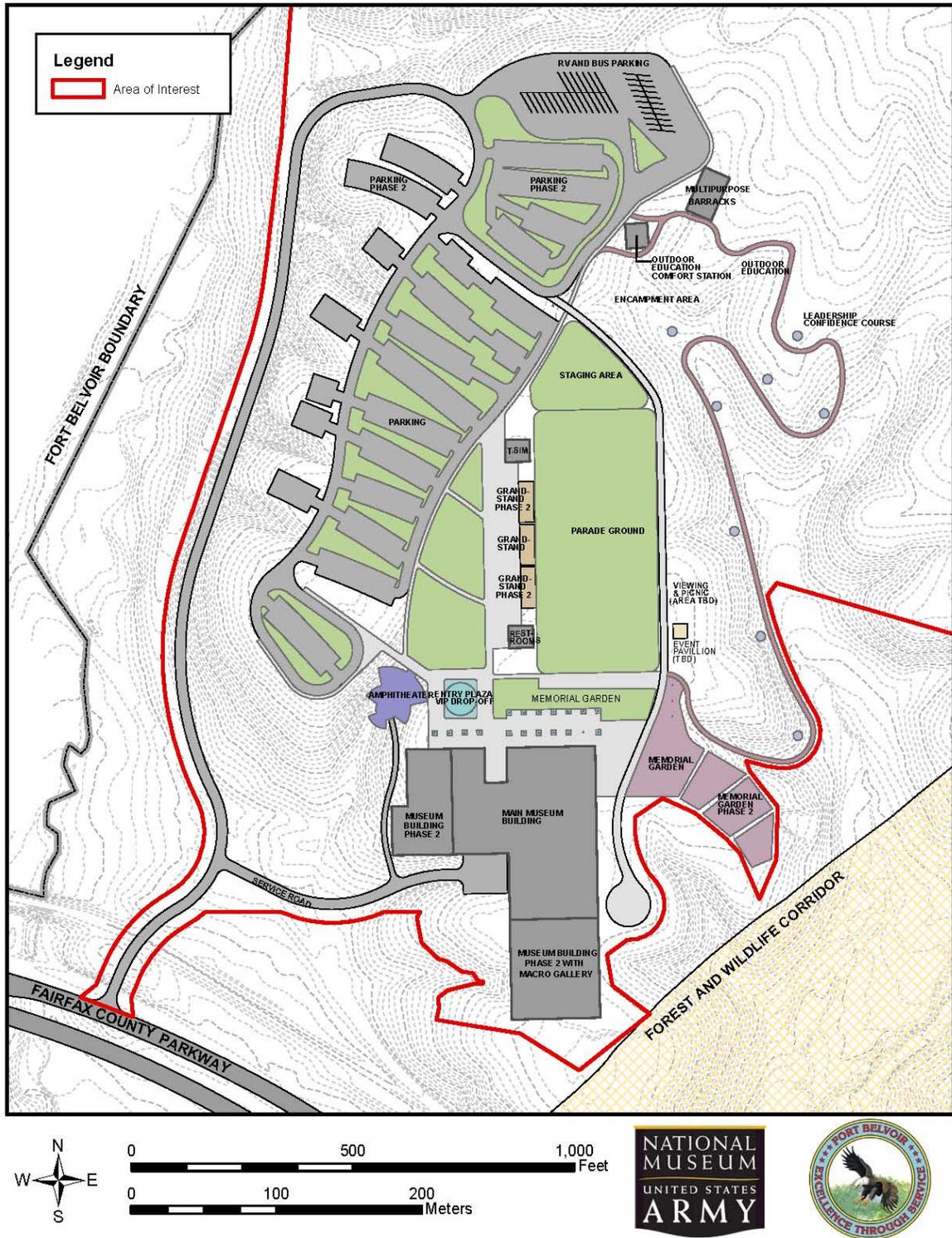


Figure 2-1: Proposed NMUSA – Surface Parking Alternative

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2.5 What site features will influence the scope of the proposed action?

The site includes a large portion of the North Post Golf Course. Construction of the NMUSA would eliminate five of the front nine golf holes (teeboxes, fairways, and greens) and a portion of a sixth hole, essentially making the front nine holes unplayable. The recent closure of the South Post Golf Course has already reduced golfing opportunities for the Fort Belvoir community, and has taken away a source of funds for the Fort Belvoir Directorate of Family and Morale, Welfare and Recreation (FMWR). Based on a Project Validation Assessment (ICF, November 2008), the Army concluded that it is critical to provide four sets of nine holes at the North Post Golf Course.

To maintain the North Post Golf Course as a 36-hole facility, the Army would replace the five holes compromised by the NMUSA, as well as reconfigure the remaining golf course to maintain play-through of four sets of nine holes. The new holes would be constructed in and around the remaining North Post Golf Course holes.

Figure 2-2 shows a conceptual plan for the new golf course holes and reconfiguration of the remaining holes. A number of existing holes north and east of the NMUSA would be altered (widened and/or lengthened, with areas re-graded to support new teeboxes or for spot stabilization of slopes), and approximately 12,000 linear feet of new cart path constructed. Five new holes (teeboxes, fairways, and greens) would be constructed in the eastern corner of the golf course. A total of approximately 14 acres would be cleared and graded for the holes and planted in turf, while 1.4 acres of existing fairway would be abandoned.

Impacts on the North Post Golf Course

Golf is played in series of nine holes. Thus the loss of even one of the front nine North Post holes would make the entire front nine unplayable, unless the impacted hole or holes are replaced somewhere on the course. The course must be reconfigured to allow players to proceed through successive nine-hole series.

Why reconfigure existing holes?

The holes to be affected are some of the best holes on the course. It will be important to have equal or better replacement holes, and the reconfiguration to maintain all 36 holes is critical. The installation hosts a large number of outings that take one of the 18-hole courses out of play, leaving the other 18 for daily play. 45% of the golfers walk the course, so the distance between holes must be manageable. To maintain the quality of the golf course, the par of each nine-hole course should be at least 35.

The new cart paths would impact an additional 4 acres – about half of this area would be paved, the other half planted with turf. The new holes would be configured to avoid stream valleys, wetlands, and other sensitive areas as much as possible.

Turning Lanes

The anticipated design for the turn lanes into the NMUSA from the Fairfax County Parkway is based on the standards outlined in the AASHTO Greenbook ("Geometric Design of Highways and Streets," 2004 ed.) for highways with a 55 mph speed limit. VDOT requires compliance with these standards.

The proposed NMUSA site also includes an approximately 1,900-linear foot section of the Fairfax County Parkway. The proposed action would require constructing an entrance and access road to the NMUSA from a point on the Fairfax County Parkway approximately 600 feet east of Ehlers Road. The crossover and westbound turn lanes at Ehlers Road would be closed to prevent left-hand turns into and out of Ehlers Road. A three-way traffic signal and additional turning lanes (one westbound deceleration and storage lane, approximately 800 to 900 feet long, for right turns, and one eastbound deceleration and storage lane, about 1,000 feet long, for left turns) into the NMUSA entrance roadway, would be included. These modifications would require approximately 0.7 acre of land for the new lanes and shoulders. For safety purposes, approximately 20 small landscape trees would be relocated along the edge of the existing tree line to provide for a full 30-foot clear zone along the new turning lanes (approximately 1.3 acres).

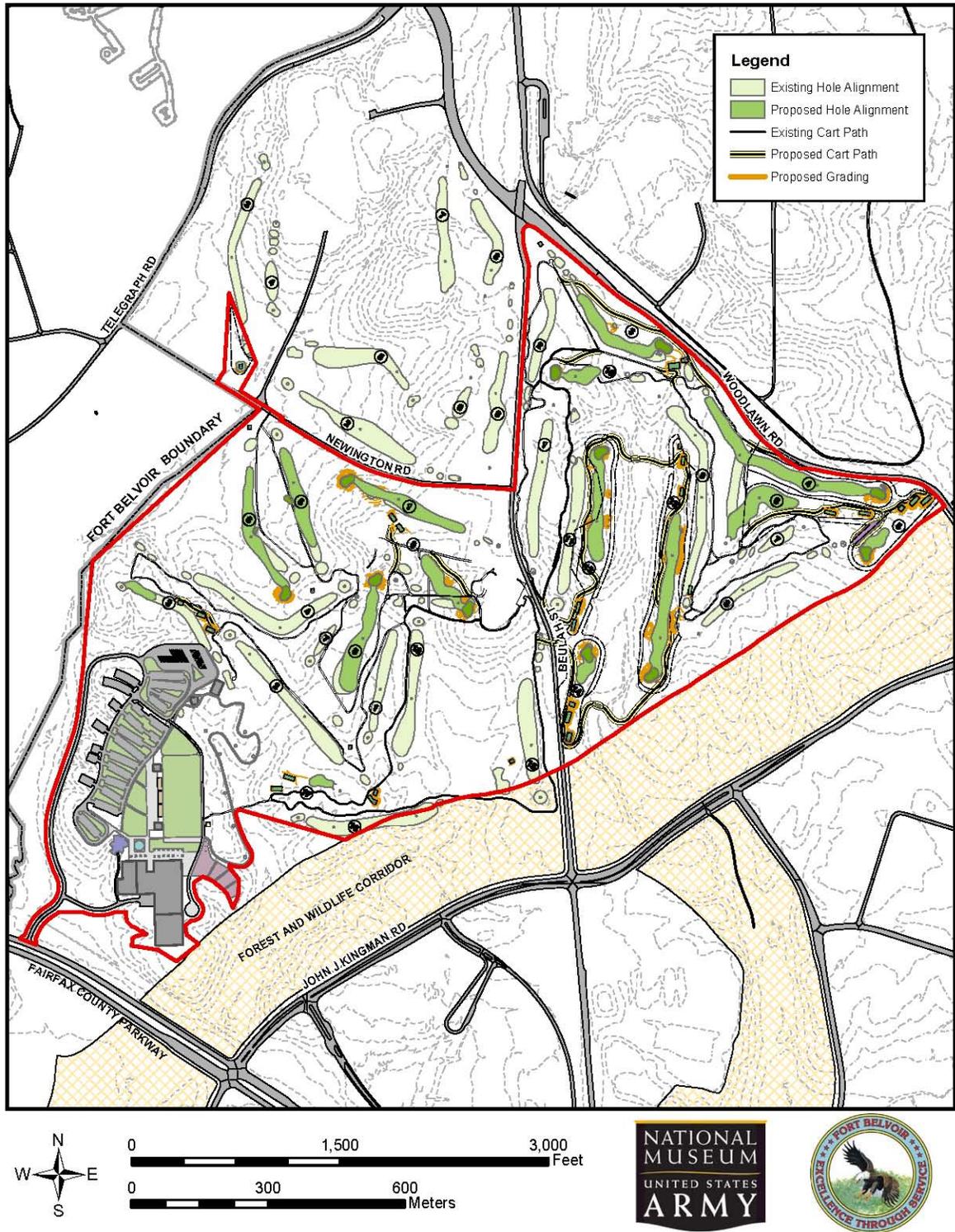


Figure 2-2: Proposed NMUSA, Including the Realignment of the North Post Golf Course

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Plans for the proposed NMUSA access road/Fairfax County Parkway intersection are being coordinated with the Virginia Department of Transportation (VDOT). As part of that coordination, the Army has also developed a concept plan to provide future modifications to the intersection, if and when VDOT and Fairfax County modify this section of the Fairfax County Parkway to accommodate a long-range plan (year 2030) for the Fairfax County Parkway/John J. Kingman Road interchange. The future VDOT or County project would include constructing a grade-separated interchange with service lanes and a crossover bridge from the Fairfax County Parkway at John J. Kingman Road, approximately 1,000 feet east of the proposed NMUSA entrance road intersection. The impacts of these changes are addressed at Subchapter 3.15 – Cumulative Impacts.

The site abuts the Fort Belvoir Forest and Wildlife Corridor (FWC), which was established as mitigation for earlier development actions on the Post. Therefore, intrusion into the FWC must be avoided or minimized. The Army previously considered providing an access road into the NMUSA site from John J. Kingman Road. However, this alternative was rejected after being evaluated in the October 2008 Draft EA due to the impact it would have on the FWC and associated resources adjacent east of the site.

The proposed site is located within the building height restriction area for the Davison Army Airfield. However, the elevation of the site as compared against the height restriction would still allow for a building height of 94 feet, which is more than sufficient for the building being considered at this point (*Berger/SmithGroup*, August 2008).

2.6 What will construction of the NMUSA involve?

The exact requirements would depend on the alternative selected, but construction would require: clearing and grading to prepare the site; excavating and trenching to lay potable water, sanitary sewer, telephone, electric, and other utility lines; and construction of the buildings and other improvements. Both personnel and heavy machinery would be needed for grading, excavating, paving, etc. Heavy trucks would be used to deliver machinery and construction materials, and haul away debris and excess materials. Approximately 22 acres would be covered with asphalt, concrete, structures, etc. Construction of the new intersection would also require heavy machinery, and would likely involve traffic management controls such as temporarily restricting traffic on the Fairfax County Parkway to one lane in each direction. The Army anticipates that the number of construction workers would vary depending on the phase of construction, but would not likely exceed 200 at any one time.

2.7 What would operation of the NMUSA involve?

When opened, the Army anticipates that approximately 740,000 visitors would visit NMUSA annually, with approximately 4,800 visitors on peak days. The Army anticipates that at any one time there would be up to 2,200 visitors onsite during the NMUSA's operating hours (*Market Analysis of Attendance and Physical Planning Parameters*, Economic Research Associates, April 2006).

A workforce of approximately 90 people would be needed to operate NMUSA, including the various programs, the food center, the gift shop, the public entrances, and building and landscape maintenance. As many as 185 people might work at the NMUSA on a typical day when the anticipated number of volunteers, Army Historical Foundation personnel, and contract personnel are included. The Army also anticipates approximately 3 to 4 truck deliveries per day (USPS, FedEx, UPS, food, solid waste hauling, etc.), once the NMUSA is in full operation.

Periodically, the NMUSA would host parades, training programs, reenactments, ceremonies, and other events (see sidebar on this page and page 12). Smaller events, such as plays and other small productions, would be staged at the amphitheater.

2.8 When would the NMUSA be built, and how long would it take?

The Army anticipates starting construction on the NMUSA campus early in 2012. Construction of the major elements of Phase 1, including installation of exhibits, would take over three years with the NMUSA opening to visitors in 2015. This schedule is dependent on the availability of funding. Construction of the remaining initial phase elements listed in Subchapter 2.1 may continue until 2017. The Army anticipates that reconfiguration of the North Post Golf Course golf holes would start in advance of the museum construction, likely in 2011. The holes would be available for play by 2012, after turf grows in sufficiently to support normal playing conditions. The intent is to have no

Proposed Museum Programs:

The NMUSA would be the site of numerous indoor and outdoor programs, with multiple activities appealing to a broad audience.

Education Program – educates visitors on a wide variety of subjects. Designed for students (public and home school), teachers, Reserve Officer Training Corps (ROTC) cadets, and staff.

Outdoor Education Program - includes a Nature, Survival, and Interpretive Trail; Army Leadership Confidence Course; Picnic Grounds; Adventure Playground; and barracks for overnight retreats, workshops, etc.

Interpretation Program - tells the stories of Soldiers, the US Army, and its relationship to the nation through live dramatic presentations and other interpretive techniques.

Veterans Program - honors the service and sacrifice of US Army Veterans, Soldiers, Department of the Army civilians, and family members by hosting ceremonies, reunions, traveling exhibits, and The Registry of the American Soldier, and partnering with the Wounded Warrior Initiative.

Interactive Web Program – provides online access to the NMUSA Campus, collections, exhibitions, programs, education initiatives, museum staff, and other specialists.

Modeling Simulation & Technology Program – provides a simulation of Army training methods.

Public Programs –hosts films, documentaries, lectures, and other special events related to the US Army.

Family Programs –hosts social events for Army and non-Army families, including festivals, workshops, and informal classes.

Research and Oral History Program – promotes a thorough understanding of the Army Family story and US Army culture through curatorial research, historical collections, and NMUSA educational and interpretive programs.

Volunteer Program – provides opportunities for individuals to serve as welcome attendants, gallery representatives, docents, interpreters, and more.

interruption of play, but due to the seasonal nature of the work there may be an interruption of services.

2.9 Why do we consider a “No Action” alternative?

The Army evaluates the No Action alternative to create a baseline for comparing the effects associated with the Action alternatives. The No Action alternative maintains the status quo, meaning that only routine activities would occur over the next 20 years. The No Action alternative does not satisfy the project’s intended purpose of constructing and operating the NMUSA and is therefore not the preferred course of action.

2.10 Did environmental factors affect the selection of sites or project design?

The site selection process always includes consideration of the extent to which wetlands, seeps, riparian buffers and Chesapeake Bay Resource Protection Areas (RPAs), steep slopes, critical habitats for threatened and endangered species, or other environmentally-sensitive habitats occur on a site, and whether the project can avoid or minimize the impacts to these resources. As indicated in Subchapter 2.5, the alternative for an entrance to the NMUSA from John J. Kingman Road was dropped from consideration because it would have an unacceptable impact on the FWC.

The Army continues to refine the conceptual designs to avoid sensitive resources as much as possible. As it does so, the Army will continue to evaluate measures that could further reduce adverse impacts, such as using retaining walls

to contain steep slopes and avoid encroaching on the stream valleys and wetlands.

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3 ENVIRONMENTAL IMPACTS: A COMPARISON BETWEEN ALTERNATIVES

The environmental impacts of the proposed action would vary based on the alternative design selected. In the following subchapters, the Army assesses the impacts of the two alternatives. Subchapter 3.14 provides a summary table comparing the impacts of the alternatives.

3.1 Land Use, Plans, and Coastal Zone Management

What is the study area for this analysis?

The study area for this project includes Fort Belvoir and the adjacent Fairfax County neighborhoods. The proposed action is likely to have limited impacts on land uses beyond the confines of the proposed project site, as discussed below.

What are the current land uses in the study area?

Land uses around Fort Belvoir are predominantly residential, although some commercial and industrial areas, such as the Lorton Valley Industrial Park and a number of retail malls, are located along US Route 1 and near Interstate 95 (I-95). Several sizable public lands are located nearby, including Huntley Meadows Park, Pohick Bay Regional Park, Mason Neck State Park, the Washington Grist Mill Park, Mount Vernon Estate and Parkway, Gunston Hall Plantation, Woodlawn Plantation, Potomac River National Wildlife Refuge, and Mason Neck National Wildlife Refuge. Many of these tracts are located along

“Proposed Site”

The proposed site for this EA includes the planned location of the NMUSA, portions of the North Post Golf Course, and the access road connecting the NMUSA to the Fairfax County Parkway. See Figure 2-2 for site boundaries.

the Potomac River, resulting in a continuous band of natural habitat along the river.

Fort Belvoir is divided into five general areas: North Post, South Post, the Southwest Area, the Davison Army Airfield, and the Fort Belvoir North Area (formerly the EPG). The South Post is a 2,720-acre area that includes the garrison headquarters and associated functions, many administrative offices, warehouses, 11 housing areas, the new Fort Belvoir Community Hospital, and the proposed Warrior in Transition Unit complex. The Gunston site is located on the 2,400-acre North Post, which is the location of administrative facilities for larger tenant agencies, two housing areas, and the North Post Golf Course (*U.S. Army Corps of Engineers Mobile District*, August 2007). The proposed project site is located on the southwestern portion of the North Post Golf Course.

What are the current uses at and next to the proposed site?

The proposed site is presently a golf course. It is located northeast of the Davison Army Airfield, within an area where buildings are subject to height restrictions for the safety of aircraft. Given the distance from the airfield and the site topography, the maximum height a building can be at the proposed NMUSA site is 94 feet. This height is more than sufficient to construct a multi-story building up to 8 stories (at 12 feet per story).

The site is bordered to the southeast by the Fort Belvoir Forest and Wildlife Corridor (FWC). The FWC is a special natural area that follows stream valleys and other undeveloped areas within Fort Belvoir, and allows the migration of wildlife from the Accotink Bay Wildlife Refuge (located 0.8 mile south of the Gunston site) to the Jackson Miles Abbott Wetland Refuge

(located 0.75 mile to the east). The FWC also connects wildlife habitats outside Fort Belvoir, such as Huntley Meadows County Park and the Pohick Bay Regional Park. This section of the FWC follows a small tributary flowing southwest to Accotink Creek.

To the north and east is the rest of the North Post Golf Course. To the southwest is the Fairfax County Parkway, and to the northwest is another stream valley and a residential neighborhood.

What comprehensive plan currently guides land use decisions at Fort Belvoir?

Until recently, land use at Fort Belvoir was guided by the 1993 Real Property Master Plan (RPMP), which consisted of four elements: the *RPMP Long Range Component (LRC) – 1993*; the *RPMP Short Range Component 1993 – 2000*; the *Capital Investment Strategy*; and the *Mobilization Mission Planning Component*. In 2002, the Army revised the RPMP to include the *Regional Community Support Center Subarea Development Plan*, to address plans for construction of the Fort Belvoir Community Hospital, expansion of the Post Exchange (PX), and development of a chapel (*US Army Corps of Engineers Mobile District*, August 2007).

The Army again updated the RPMP-LRC to comply with Army requirements (AR 210-20) that mandate the update of current installation master plans as circumstances require. This most recent update was triggered by Congress when the 2005 Defense Base Realignment and Closure (BRAC) Commission recommendations became law in November 2005. Those recommendations included moving several Army agencies and their personnel to Fort Belvoir. The Army published a Final Environmental Impact Statement (FEIS) entitled *Implementation of the 2005 Base Realignment and Closure Recommendations*

AR 210-20

Real Property Master Planning For Army Installation provides that an RPMP be organized into five components: the RPMP Digest, the Long Range Component (LRC), the Installation Design Guide (IDG), the Capital Improvements Strategy (CIS), and the Short Range Component (SRC).

and Related Army Actions at Fort Belvoir, Virginia, in August 2007 addressing the adoption of the land use categorization changes to the RPMP-LRC as well as the BRAC realignments.

Under the 2007 RPMP-LRC, the proposed NMUSA site is designated as land use category “Community,” defined as a land use that “*encourages a mix of uses. Facilities allowed include religious, family support, personnel services, professional services, medical, community, housing, commercial and recreational services. Users live both on- and off-post and may include soldiers, dependents, retirees, and other civilian personnel.*” (PBS&J Corporation, July 2007).

The Army, through the master planning process (AR-120), continues to revise the RPMP to address future land uses at the garrison, beyond those immediate changes needed to accommodate the BRAC 2005 actions.

What other land use planning standards or restrictions apply?

Federal actions in the National Capital Region must be reviewed by the National Capital Planning Commission (NCPC) and must be consistent to the maximum extent practicable with the enforceable policies of the applicable state’s Coastal Zone Management Program.

The NCPC is the central planning agency for the federal government in the National Capital Region, which includes the District, several Maryland counties, and the counties of Northern Virginia. NCPC prepares the *Federal Elements of the Comprehensive Plan for the National Capital*. One element of the Comprehensive Plan, *Federal Workplace: Location, Impact, and the Community*, lists policies for building and development codes, energy efficiency, working environment, and physical

security. Policies applicable to the proposed action include:

- Using innovative energy conserving techniques such as High Performance and Sustainable Building, Low Impact Building, Leadership in Energy and Environmental Design (LEED) strategies, and requirements of the Energy Policy Act of 2005 (*EPACT*, 2005).
- Designing security barriers and checkpoints at vehicular entry points on federal installations to accommodate vehicular queuing onsite, and to avoid adverse effects on adjacent public roadways operations and safety.

A second element of the NCPC Comprehensive Plan, *Transportation*, lists federal parking policies and associated parking ratios in response to the area's congestion and poor air quality. For suburban federal facilities more than 2,000 feet from a Metrorail Station, the parking ratio should reflect a phased approach linked to planned improvements over time. Federal facilities not served by High Occupancy Vehicle (HOV) lanes today or in the future are expected to achieve a parking ratio of one space per 1.5 employees (National Capital Planning Commission, August 2004). From I-95, Fort Belvoir is accessed by the Fairfax County Parkway; there is no entrance to or exit from the HOV lanes at that intersection.

A third element of the NCPC Comprehensive Plan, *Visitors*, lists policies regarding the placement and operation of new memorials and museums. While these policies largely relate to the Monumental Core and other areas of DC, the *Visitors Section of the Comprehensive Plan* encourages dispersing new attractions and activities away from the National Mall. "By looking to other areas of the city and region, the federal government can protect and enhance the unique historic resources of the Monumental Core, while aiding local and

Sustainability Strategies

High Performance/Sustainable Building – buildings that reduce the lifetime operational cost of a building by increasing water and energy efficiency, providing healthy indoor environments, and using construction materials in a sustainable manner.

Low Impact Development – land planning, design practices, and technologies that conserve and protect natural resources and reduce infrastructure needs. This allows land to be developed in a more cost effective manner that mitigates environmental impacts.

Leadership in Energy and Environmental Design (LEED) - LEED is a certification program for building design, construction, and operation. LEED promotes sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.

Federal Policies – several federal laws require the use of sustainable building practices. These include the Energy Policy Act of 2005, the Energy Independence and Security Act of 2007, and Executive Orders 13423 and 13514. Adhering to these requirements improves energy efficiency, reduces water use, and improves the overall quality of the environment.

regional efforts to stimulate economic activity in areas not traditionally associated with federal visitor attractions.”

Federal agencies must also be consistent to the maximum extent practicable with federally-approved coastal zone management plans. The Commonwealth of Virginia has developed and implemented a federally-approved **Coastal Resources Management Program (CRMP)** with the following enforceable policies applicable to the federal government:

- Fisheries Management
- Subaqueous Lands Management
- Wetlands Management
- Dune Management
- Non-point Source Pollution Control
- Point Source Pollution Control
- Shoreline Sanitation
- Air Pollution Control
- Coastal Lands Management

Virginia’s coastal zone includes all of Fairfax County and Fort Belvoir. Therefore, federal actions at Fort Belvoir are subject to federal consistency requirements. The Virginia Department of Environmental Quality (VDEQ) serves as the lead agency for consistency reviews.

How would the proposed action affect ongoing and designated land uses at the proposed site?

As noted, use of the proposed site would result in the direct loss of five golf holes (Holes 3 through 7) and would impact two more (Holes 8 and 12) at the North Post Golf Course (see Subchapter 2.5), but new holes would be constructed to replace the impacted holes and several other holes upgraded to maintain two 18-hole golf courses with an equivalent par (no less than 35 for each nine holes). The reconfiguration, including the

installation of utilities and irrigation systems, would temporarily interrupt play, but would not require a permanent change in the use or the nature of the course.

Is the proposed use consistent with the Fort Belvoir RPMP designated land use for the site?

Yes. The 2007 draft RPMP-LRC designates the proposed site as “Community,” which includes commercial and recreational uses for users such as soldiers, dependents, retirees, and other civilian personnel, as well as other uses such as medical and professional services (*PBS&J Corporation*, July 2007).

Is the proposed use consistent with the NCPC Comprehensive Plan?

Yes. The Army intends for the proposed NMUSA and its associated facilities to qualify for a LEED® Silver designation, and would incorporate other energy-saving measures, including High Performance and Sustainable Building, Low Impact Building, and requirements of the Energy Policy Act of 2005 (*EPACT*, 2005). The Army is also evaluating needed roadway changes (signalization, turn-lanes, etc.) for vehicular access points.

This project intends to meet the requirements of the Energy and Independence Act of 2007 (*EISA*, 2007), and Executive Orders (EOs) 13423 and 13514. The project team would design the building systems to achieve a 30 percent energy use reduction compared to the baseline building per the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) 90.1 – 2004 in compliance with *EPACT* 2005 and help to achieve the energy reduction goals of EO 13423. Requirements for Federal Energy Management Program (FEMP)/Energy Star rated products and green products, in accordance with EO13423, would be incorporated into the

specifications of the project. The project would study solar water heating systems for 30 percent of the hot water demand in accordance with EISA 2007. In addition to using the LEED rating system and mandating a silver rating, the project would incorporate the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings in accordance with EO13514. The project would evaluate technologies and features such as green or reflective roofs, rainwater harvesting, alternative Heating, Ventilating, and Air Conditioning (HVAC) systems, and alternative lighting technologies to help achieve the LEED silver rating and meet the requirements of EO13514.

An estimated 185 employees and volunteers would work at the NMUSA. The current plans provide only 75 employee parking spaces, which is less than the 1:1.5 federal facility parking ratio recommended by NCPC. (The recommendation is for an upper limit; the NCPC wants to encourage carpooling and use of public transit by limiting available parking.) The reconfiguration of the golf course would not change staffing.

Approximately 500 to 550 NMUSA visitor and volunteer parking spaces are also planned for the first phase of construction, to be expanded another 300 spaces in future phases of construction, if needed. However, visitor parking is not restricted by the NCPC policy.

Is the proposed use consistent with the Coastal Resources Management Plan policies?

Fort Belvoir's Coastal Zone Consistency Determination for the proposed action is included in Appendix A. This determination includes all elements of the NMUSA and the realigned golf course. Fort Belvoir has determined that the proposed action, regardless of whether the Surface Parking or Structured Parking Alternative is selected, would be consistent with the

Commonwealth of Virginia's CRMP's enforceable policies to the maximum extent practicable. The proposed action would not affect fisheries, subaqueous lands, coastal dunes, or shoreline sanitation. It would have minor effects on resources subject to the following policies:

- **Wetlands Management:** Subchapter 3.5 of this EA summarizes the impacts of the proposed action on wetlands. The proposed action would likely cause minor impacts to wetlands and waterways. However, the Army would obtain wetland permits, would avoid and minimize impacts to the extent practicable, and mitigate any unavoidable wetland losses. Therefore, the proposed action would be consistent with this enforceable policy to the maximum extent practicable.
- **Non-point Source Pollution Control:** The Army would follow the standards required by the Code of Virginia and implementing regulations to ensure that non-point source pollution control impacts are minimized during construction (Subchapter 3.2). The Army would also act consistently with the Fairfax County Chesapeake Bay Preservation Area regulations (Chapter 118 of the Fairfax County Code) to minimize long-term impacts on water quality. The stormwater management ponds would be designed to provide compliance with Chesapeake Bay Best Management Practice (BMP) nutrient and sediment reduction goals. Therefore the proposed action would be consistent with this enforceable policy to the maximum extent practicable.
- **Point Source Pollution Control:** The proposed action would result in a new source (construction activity) of point source pollution control. Adverse impacts would be minimal, controlled through the Virginia Stormwater Management Program (VSMP) Permit (see Subchapter 3.2) and the associated Stormwater Pollution Prevention

Plan (SWPPP). No new sanitary point sources would result from the proposed action. Therefore the proposed action would be consistent with this enforceable policy to the maximum extent practicable.

- Air Pollution Control: The impacts of the proposed action on air quality are addressed in Subchapter 3.8 of this EA. Adverse impacts would be minimal. Therefore, the proposed action would be consistent with this enforceable policy to the maximum extent practicable.
- Coastal Lands Management: Subchapters 3.4 and 3.5 outline the impacts of the proposed action on sensitive lands, including Resource Protection Areas (RPAs) and Resource Management Areas (RMAs). (At Fort Belvoir, as in Fairfax County, the RMA includes all lands not classified as RPA.) The Army would minimize impacts to the RPA to the maximum extent practicable and would comply with requirements for impacts in the RMA. Impacts would be minimal and the proposed action would be consistent with this enforceable policy to the maximum extent practicable.

How would the proposed action affect uses of other properties in the immediate vicinity?

The construction of the NMUSA and the realignment of the golf course would temporarily generate noise, fumes, and dust from machinery. These impacts are addressed under Subchapters 3.8 and 3.9 of this document. Construction of turning lanes on traffic along (depending on the alternative) US Route 1 or the Fairfax County Parkway is addressed in Subchapter 3.13. Otherwise, the impacts from construction activity would have little or no effect outside of the actual project site.

Long-term operation would contribute minimally to peak traffic over area roadways as employees commute to work, but the

majority of new traffic would be from visitors and would likely be during off-peak hours. There would be little difference in impacts between the alternatives.

Activities on the parade ground (ceremonies, re-enactments, etc.) would periodically generate noise that would carry to adjacent properties. Those potentially affected by the noise would include golf course patrons and wildlife in the adjacent Fort Belvoir FWC. Subchapter 3.9 of this EA addresses the potential noise impacts, which would not be significant.

The impacts of operating the realigned golf course would not be distinguishable from the operation of the existing course.

What would be done to avoid or minimize negative effects on land use?

Subchapter 2.2 of this EA outlines the factors already considered in selecting the proposed site, and still being considered in designing the project, to avoid and minimize adverse impacts on people and environmental resources. When practicable, the Army provides mitigation for any unavoidable impacts.

For that reason, as described in Subchapter 2.5, the Army would construct new and alter existing golf course holes to reconfigure the North Post Golf Course and maintain 36 playable holes. Mitigation for noise impacts, because of the distance to the nearest receptors, would not likely be needed.

In terms of impacts on the Coastal Zone, compliance with the individual enforceable policies and corresponding regulatory requirements would adequately mitigate impacts. For example, the CZM enforceable policy for wetlands requires obtaining wetland permits. Mitigation would be required as part of the wetland permitting process (Subchapter 3.5).

Mitigation

Mitigation measures are steps taken to reduce the impacts of a project. The Army does not consider steps taken to comply with existing laws and regulations as mitigation.

What effect would the “No Build” alternative have on land use at or next to Fort Belvoir?

At this time, no impacts are foreseeable.

3.2 Soils and Topography

Understanding the soils and topography of the study area is important to understanding the potential for wetlands and wildlife habitats, and for determining how surface and groundwater moves across the site. Soil and topography can also affect development plans, because construction on areas of steep topography or weak soil can affect soil erosion and drainage.

What is the study area for soil and topography?

The study area for topography and soils includes all areas within the boundaries of the proposed site, where grading and construction could change the current conditions. This includes the entire project site.

What is the geology of the study area like?

All of Fort Belvoir, including the proposed site, is located in the Coastal Plain Physiographic Province, an area composed primarily of unconsolidated, alternating layers of sand, gravel, shell rock, silt, and clay (USGS, 2006). The Coastal Plain is underlain by a thick wedge of sediments that increases in thickness from the Fall Zone in the west to the Atlantic coast in the east. These sediments rest on an eroded surface of Precambrian to early Mesozoic rock.

What soil types are located in the study area?

Fort Belvoir Geographic Information Systems (GIS) mapping identifies the soils on the proposed site as Beltsville silt loam,

Dumfries sandy loam, Galestown loamy fine sand, Hyattsville silt loam, Keyport silt loam, loamy and gravelly sediments, Lunt fine sandy loam, Matapeake silt loam, Mattapex silt loam, Mixed alluvial land, Sassafras fine sandy loam, and Wehadkee silt loam. This information is generally consistent with geotechnical investigations performed at the site (Louis Berger Group, May 2008).

Table 3.2-1 summarizes the relevant information about soils at the proposed site. “Problem Class A” refers to soils with a potential for unstable slopes, land slippage, high shrink-swell clays, poor foundation support, and high water tables. “Problem Class B” refers to soils with problems related to wetness and drainage that can be addressed in construction. “Problem Class C” soils are not considered problem soils for building foundations.

Table 3.2-1: Soil Types Identified on the Proposed Site

Name	Drainage Class	Problem Class	Flooding	Foundation Support	Hydric
Beltsville silt loam	MWD	B	No	Good with proper drainage; foundation drains and waterproofing necessary.	No
Dumfries sandy loam	WD	A	No	Could be unstable, especially near marine clays.	No
Hyattsville silt loam	SPD	B	Yes (in drainages)	Marginal to poor, foundation drains and waterproofing as needed.	No
loamy and gravelly sediments	WD	A	No	Marginal, potentially unstable.	No
Lunt fine sandy loam	WD-MWD	A	No	Stable above sands; could be unstable near marine clays.	No
Matapeake silt loam	WD	C	No	Generally favorable.	No
Mattapex silt loam	WD-MWD	B	No	Marginal; foundation drains and waterproofing needed.	No
Mixed alluvial land	PD	A	Frequent	Poor.	Yes
Sassafras fine sandy loam	WD	C	No	No data.	No
Wehadkee silt loam	PD	A	Frequent	Poor; basements not recommended.	Yes

Drainage Class Abbreviations:

WD: well drained MWD: moderately well drained SPD: somewhat poorly drained PD: poorly drained

Source: Natural Resource Conservation Service (NRCS), Soil Survey Report, Fort Belvoir, 1982 and Fairfax County GIS Soil Layers

What is the general topography of the study area?

The topography of the proposed site is complex, but generally slopes from north to south, with elevations ranging from approximately 238 feet above mean sea level (msl) in the northern portion of the site (along the abandoned Woodlawn Road) to 56 feet above msl on the southern portion of the site (along the Fairfax County Parkway). The majority of the site slopes somewhat gently. The southwestern portion of the golf course, where construction of the NMUSA is planned, includes numerous steep ravines trending towards the southeast, southwest, and west. Flat upland areas are limited to the northeastern and south-central portions of the proposed NMUSA site. These upland areas range in elevation from 115 to 135 feet above msl (*Fort Belvoir GIS data, 2009*).

How would the proposed action affect soils and topography in the study area?

Site preparation would require cut-and-fill work to prepare for the various NMUSA improvements. The estimated amounts of cut-and-fill required for the two NMUSA alternatives (surface parking and structured parking) are presented in Table 3.2-2 below.

Table 3.2-2: Estimated Cut-and-Fill Requirements for the NMUSA

NMUSA Alternative	Estimated Cut (cubic yards)	Estimated Fill (cubic yards)	Total (cubic yards)
Surface Parking	96,000	96,000	192,000
Structured Parking	165,300	96,000	261,300

Source: Skidmore, Owings and Merrill (SOM), 2009

These estimates do not include the grading required for the realignment of the North Post Golf Course. Estimates provided by Ault Clark and Associates, Ltd., indicate that approximately 61,150 cubic yards of cut and fill would be required for the golf course realignment, regardless of which parking alternative is selected. The amount of soil to be cut would be essentially equal to the amount to be filled, this grading is not expected to result in the need to import or export soil to the proposed site.

Based on the available information, it appears that the material excavated at the proposed site for the surface parking alternative can be used as fill on-site, without the need to either dispose of excavated materials elsewhere, or to import off-site materials (SOM, 2009). If the final design of the surface parking alternative requires excavated materials to be disposed of off-site, the volume of soil would be well within the Structured Parking Alternative disposal estimates. Because the Structured Parking Alternative involves the construction of sub-grade parking areas, this alternative would include a larger amount of excavation, and

approximately 69,225 cubic yards of excavated soil may need to be exported from the site if this alternative is selected (SOM, 2009).

Grading, paving, and other development could result in localized changes in slopes, soil infiltration rates, and surface runoff patterns. Because the proposed action would affect more than 1 ac, both an erosion and sediment control (ESC) plan employing soil best management practices, and a Virginia Stormwater Management Program (VSMP) Permit would be required for clearing and grading activities. The ESC plan would include measures consistent with the Virginia Erosion and Sediment Control Handbook, such as silt fences around the limits of clearing and grading, to reduce construction impacts.

How would the No Action alternative affect the soils and topography of the study area?

Under the No Action alternative, no construction or grading would be performed. The proposed site would continue to consist of undeveloped, forested land and a golf course.

3.3 Vegetation and Wildlife

The Army considers both vegetation and wildlife as it plans any proposed action. Wildlife species tend to be associated with specific plant communities, and changes in plant communities can affect the populations and distribution of wildlife.

What is the study area for this analysis?

The study area for vegetation and wildlife includes all areas within the boundaries of the proposed site where the effects from construction would occur.

What types of vegetation and wildlife habitat are located in the study area?

The vegetation types identified for the proposed site include: beech – mixed oak forest; mixed pine – hardwood forest; oak – ericad forest; seeps/wetlands/streams; tulip poplar – mixed hardwood forest; maintained lawn and golf course turf; old field grassland; loblolly pine forest; Virginia pine forest; and floodplain hardwood forest. These categories are general descriptions, and categories such as “seeps/wetlands/streams” do not necessarily provide an accurate location or extent of wetland features. Wetlands are dealt with in detail in Subchapter 3.5. Similarly, the floodplain hardwood forest category does not exactly indicate the presence of a 100-year floodplain in the study area. Subchapter 3.4 provides information on floodplains at the site.

Table 3.3-1 identifies vegetation cover types located in the study area. The Army has mapped wildlife habitats using the same cover types. A category for wetlands is listed because existing wetlands within the study area provide important habitat for a wide variety of wildlife. Wetlands are addressed in detail in Subchapter 3.5.

Table 3.3-1: Land Cover and Wildlife Habitat Type within the Study Area

Cover Type	Characteristic Species	Land Cover (Acres)
Beech – Mixed Oak Forest	American beech (<i>Fagus grandifolia</i>), white oak (<i>Quercus alba</i>), northern red oak (<i>Quercus rubra</i>), flowering dogwood (<i>Cornus florida</i>), cherryleaf viburnum (<i>Viburnum prunifolium</i>).	50.29
Mixed Pine – Hardwood Forest	Virginia pine (<i>Pinus virginiana</i>), loblolly pine (<i>Pinus taeda</i>), white oak (<i>Quercus alba</i>), northern red oak (<i>Quercus rubra</i>), chestnut oak (<i>Quercus prinus</i>).	1.72
Oak – Ericad Forest	Chestnut oak (<i>Quercus prinus</i>), white oak (<i>Quercus alba</i>), northern red oak (<i>Quercus rubra</i>), scarlet oak (<i>Quercus coccinea</i>), huckleberry (<i>Gaylussacia baccata</i>), deerberry (<i>Vaccinium stamineum</i>), mountain laurel (<i>Kalmia latifolia</i>).	40.78
Seeps/Wetlands /Streams	Red maple (<i>Acer rubrum</i>), blackgum (<i>Nyssa sylvatica</i>), sweetbay magnolia (<i>Magnolia virginiana</i>), skunk cabbage (<i>Symplocarpus foetidus</i>), sensitive fern (<i>Onoclea sensibilis</i>), royal fern (<i>Osmunda regalis</i>), fetterbush (<i>Leucothoe racemosa</i>), lizard tail (<i>Saururus cernuus</i>) and smooth alder (<i>Alnus serrulata</i>).	0.01
Tulip Poplar – Mixed Hardwood Forest	Tulip poplar (<i>Liriodendron tulipifera</i>), red maple (<i>Acer rubrum</i>), white oak (<i>Quercus alba</i>), American beech (<i>Fagus grandifolia</i>), northern red oak (<i>Quercus rubra</i>), cherryleaf viburnum (<i>Viburnum prunifolium</i>).	10.58
Maintained Lawn / Turf	Tall fescue (<i>Festuca elatior</i>), Kentucky bluegrass (<i>Festuca arundinacea</i>)	209.73
Old Field Grassland	Broomsedge (<i>Andropogon virginicus</i>), tall fescue (<i>Festuca elatior</i>), and bushclover (<i>Lespedeza cunneata</i>).	0.45
Loblolly Pine Forest	Loblolly pine (<i>Pinus taeda</i>).	15.34
Virginia Pine Forest	Virginia pine (<i>Pinus virginiana</i>).	7.61
Floodplain Hardwood Forest	Pin oak (<i>Quercus palustris</i>), willow oak (<i>Quercus phellos</i>), red maple (<i>Acer rubrum</i>), sweetgum (<i>Liquidambar styraciflua</i>), green ash (<i>Fraxinus pennsylvanica</i>), river birch (<i>Betula nigra</i>), sycamore (<i>Platanus occidentalis</i>), and highbush blueberry (<i>Vaccinium corymbosum</i>).	0.40
Total		336.91
Habitat Type	Description	Wildlife Habitat (Ac)
Forest	See characteristic species above for Beech-Mixed Oak, Mixed Pine Hardwood, Oak Ericad, Tulip Poplar-Mixed Hardwood, Virginia pine, Loblolly pine, and Floodplain Hardwood Forest.	126.72
Seeps/Wetlands /Streams	Red maple (<i>Acer rubrum</i>), blackgum (<i>Nyssa sylvatica</i>), sweetbay magnolia (<i>Magnolia virginiana</i>), skunk cabbage (<i>Symplocarpus foetidus</i>), sensitive fern (<i>Onoclea sensibilis</i>), royal fern (<i>Osmunda regalis</i>), fetterbush (<i>Leucothoe racemosa</i>), lizard tail (<i>Saururus cernuus</i>) and smooth alder (<i>Alnus serrulata</i>).	0.01
Maintained Lawn/Grassland	Tall fescue (<i>Festuca elatior</i>), Kentucky bluegrass (<i>Festuca arundinacea</i>), Broomsedge (<i>Andropogon virginicus</i>), and bushclover (<i>Lespedeza cunneata</i>).	210.18
Total		336.91

Do any special status plant species occur in the study area?

There are no documented occurrences of special status plant species which would be impacted by the proposed action (*correspondence from the Virginia Department of Conservation and Recreation [VDCR], 2009*). However, the United States Fish and Wildlife Service (USFWS) indicated that the federally-listed threatened small whorled pogonia (*Isotria medeoloides*) may be present in the study area (USFWS, 2008).

What common wildlife species live in the study area?

Based on the habitat available in the study area, the Army expects common wildlife to be located at the proposed site. This includes species such as deer, turkeys, shrews, Great Horned Owls, Barred Owls, raccoons, coyotes, opossum, American crows, American robins, wood thrushes, eastern wood pewees, scarlet tanagers, and other common mammal and migratory and non-migratory bird species.

How are wildlife habitats connected in the study area?

Fort Belvoir has designated 742 acres as the Fort Belvoir Forest and Wildlife Corridor (FWC). The FWC traverses the installation, connecting Huntley Meadows Park and the Jackson Miles Abbott Wetland Refuge (JMAWR), located northeast of Fort Belvoir, to the Accotink Bay Wildlife Refuge (ABWR) on South Post and the Mason Neck State Park and the Potomac River National Wildlife Refuge Complex, located south of the installation (*Integrated Natural Resources Management Plan, US Army Garrison Fort Belvoir, 2001b*). The proposed site is located adjacent to and northwest of the FWC.

Special Status Wildlife Species

Special status wildlife species include those listed as endangered or threatened under the Endangered Species Act (ESA); those that are candidates or are proposed for listing under the Endangered Species Act; species of federal concern; and species listed by the Virginia Department of Conservation and Recreation (VDCR) as endangered, threatened, candidate, or sensitive, in the Commonwealth of Virginia and other priority species.

Do any special status wildlife species occur in the study area?

Coordination with the USFWS, the Virginia Department of Game and Inland Fisheries (VDGIF), and the VDCR indicates that the Laura's clubtail dragonfly has been documented on streams located on the proposed site. There is the potential for three additional special status species (Table 3.3-2) to be located at the proposed site, although no specific occurrences have been documented (VDCR, 2008). In addition, Accotink Creek, located approximately 1,100 feet south of the proposed site at its closest point, is an anadromous fish use area. Copies of the Army's correspondence with these agencies are presented in Appendix B. These species, their statuses, and their documented occurrences in the study area are shown in Table 3.3-2.

Table 3.3-2: Special Status Wildlife Species Documented near, or Potentially Occurring in, the Study Area

Species	Status	Occurrence in Study Area
Laura's Clubtail Dragonfly <i>Stylurus laurae</i>	State Rare	Documented at the site (VDCR 2009)
Bald Eagle <i>Haliaeetus leucocephalus</i>	State Threatened; Federal Species of Concern	Documented within 1.5 miles of the proposed site (VDGIF 2008)
Wood Turtle <i>Glyptemys insculpta</i>	State Threatened	Documented within 0.75 mile of the site. Coordination recommended (VDGIF 2008)
Northern Virginia Well Amphipod <i>Stygobromus phreaticus</i>	Federal Species of Concern	Documented at Fort Belvoir – Surveys recommended (VDCR 2008)
Anadromous fish	N/A	Documented at Accotink Creek (VDGIF 2008)

What other wildlife resources/programs are important at Fort Belvoir?

The potential forest impact areas for the proposed action are within buffer zones designated by the Partners in Flight Program

(PIF). PIF is a cooperative effort launched in 1990 to emphasize the conservation of birds not covered by existing conservation initiatives. PIF is a partnership among federal, state, and local government agencies, philanthropic foundations, professional organizations, conservation groups, industry, the academic community, and private citizens (*Partnersinflight.org*, accessed 2009).

The PIF buffer areas at the proposed site are associated with the wood thrush, scarlet tanager and eastern wood pewee. Both the wood thrush and scarlet tanager species are ranked as Entry Level IA in the PIF Priority Species Pool Order of Concern. The eastern wood pewee is ranked as Entry Level IIA (*Partnersinflight.org*, accessed 2005).

Fort Belvoir manages a deer hunting program on-post to manage the local population of white-tailed deer. This program would be unaffected by the proposed action.

Do any rare ecological communities occur in the study area?

No. The VDCR Division of Natural Heritage (VDCR-DNH) searched its Biotics Data System for occurrences of natural heritage resources in the study area. The VDCR-DNH files do not indicate that any State Natural Area Preserves under VDCR’s jurisdiction are located in the study area (VDCR, 2009).

Do any Special Natural Areas occur in the study area?

No, although one (the FWC) is located adjacent to the proposed site. Fort Belvoir has designated four Special Natural Areas: the ABWR, the JMAWR, the T-17 Ravine Conservation Site, and the Fort Belvoir FWC described above. The ABWR is 1,480

Entry Levels in the PIF Priority Species Pool

- Tier I - High Continental Priority
 - Tier I A - High Continental Priority – High Regional Responsibility
 - Tier I B - High Continental Priority – Low Regional Responsibility
 - Tier II – High Regional Priority
 - Tier II A - High Regional Concern
 - Tier II B - High Regional Responsibility
 - Tier II C - High Regional Threats
 - Tier III – Additional Watch List
 - Tier IV – Additional Federally Listed
 - Tier V – Additional State Listed
- Source: partnersinflight.org

Natural Heritage Resources

Natural Heritage Resources are habitats of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

acres located along Accotink Bay and Accotink Creek in the central portion of the South Post. The JMAWR is 234 acres located in the northeastern corner of the North Post. The T-17 Ravine Conservation Site is 69 acres located at Tompkins Basin, along the north bank of Gunston Cove. The Fort Belvoir FWC, a 742-acre area that traverses the installation and connects the ABWR to the JMAWR, is located adjacent southeast of the proposed site.

How would the proposed action affect vegetation and wildlife habitat?

Table 3.3-3 shows the impacts of the proposed action on different vegetation communities and habitat types. Unlike Table 3.3-1, which shows the type and amount of land cover and habitat present on the proposed site, Table 3.3-3 shows the land cover and habitat which would actually be cleared and redeveloped in the course of constructing the NMUSA and realigning the golf course.

Table 3.3-3: Land Cover and Wildlife Habitat Type Affected

Cover Type	Land Cover Affected (Acres)
Beech – Mixed Oak Forest	12.35
Mixed Pine – Hardwood Forest	1.72
Oak – Ericad Forest	16.93
Seeps/Wetlands/Streams*	0.01
Tulip Poplar – Mixed Hardwood Forest	1.41
Maintained Lawn / Turf	39.14
Loblolly Pine Forest	1.72
Virginia Pine Forest	1.58
Floodplain Hardwood Forest	0.04
Total	74.9
Habitat Type	Wildlife Habitat Affected (Acres)
Forest	35.75
Seeps/Wetlands/Streams*	0.01
Maintained Lawn / Turf	39.14
Total	74.9

* Based on Fort Belvoir GIS Data, not field-verified.

The impacts in Table 3.3-3 represent a very small fraction of Fort Belvoir's land area – even when considered in the context of the cumulative impacts from a number of projects being proposed at Fort Belvoir, particularly with respect to BRAC. Subchapter 3.15 of this EA addresses cumulative impacts.

Construction equipment may cause additional disturbance in adjacent upland areas, beyond the footprint of the proposed action. This disturbance would be temporary – disturbed areas would be reseeded and vegetation restored following completion of construction.

How would the No Action alternative affect vegetation?

Under the No Action alternative, the Army would continue to manage the vegetation at the proposed site in its current condition. Management activities would include periodic mowing, removal of dead or dying trees and tree limbs, and clearing of brush that encroaches on roadways and the golf course. These activities affect vegetation by preventing trees from establishing themselves in mowed areas and preventing forested areas from developing natural features such as snags and downed wood.

How would the proposed action affect wildlife?

Effects on wildlife in general would result largely from loss of habitat, i.e., vegetation. Reduction in the cover types listed in Table 3.3-3 would likely cause a reduction in the number of animals supported by that cover type and the overall landscape. Although construction noise would be noticeable to wildlife, animals in the vicinity of the proposed action are well-acclimated to noise from human sources, and this impact would be temporary.

Partners in Flight (PIF)

The construction of the NMUSA and the realignment of the golf course would impact approximately 18.7 acres of the PIF buffer. The vegetation types present in these PIF areas include 9.01 acres of maintained lawn, 2.41 acres of beech/mixed oak forest, 5.62 acres of oak/ericad forest, 0.01 acre of seeps/wetlands/streams, 0.50 acre of tulip poplar/mixed hardwoods, 0.66 acre of loblolly pine forest, and 0.50 acre of Virginia pine forest. These PIF impacts are only a small fraction of the approximately 3,750 acres of PIF buffer areas located on Fort Belvoir, and the effects of the proposed action on the associated species (wood thrush, scarlet tanager and eastern wood pewee) should be minimal. These impacts are considered in the context of the cumulative impacts of other planned projects on Fort Belvoir at Subchapter 3.15.

Utility access to the proposed site is still under review, and would likely require a maintained (brush and saplings removed every one to three years) corridor. The Army intends to make every effort to combine the utilities with the existing features such as the access road (i.e., to route the utility lines within the road shoulder), the transit corridor, or other paved surfaces in order to avoid or minimize impacts to the Fort Belvoir FWC. The Army would align utility locations with existing disturbed areas to the extent practicable. Some intrusion into the edge of the corridor and other habitats might be required. Alternately, some utilities could be routed to the north, through the golf course.

Utilities lines specific to the realigned golf course (such as lighting and irrigation lines) would be placed in areas interior to the existing golf course, and would therefore not impact PIF buffer areas.

The proposed site is already partially developed as a golf course. It is unlikely that the operation of the NMUSA would, beyond the loss of habitat, adversely affect most species. At least a portion of the site has already been altered and converted to managed turf or grassland (e.g., the golf course teeboxes, holes, and fairways). Abandoned portions of the golf course would be evaluated for replanting. These replanted areas and the NMUSA grounds would provide partial replacement for the habitats lost. The species associated with grassland habitats and those that adapt well to developed areas would be least affected.

Fort Belvoir (and all of northern Virginia) has an overabundance of resident Canada geese (*Branta canadensis*) (*US Army Garrison Fort Belvoir*, 2001b). Because the proposed site already has extensive grassy areas, it is not expected that the proposed action would cause an increase in “attractiveness” to geese. However, the introduction of permanent standing water in the form of stormwater management ponds at the proposed site could attract geese to the project area. If geese do become a problem at the NMUSA complex, the installation would take management actions to control the geese.

How would the proposed action affect special status wildlife or plant species?

Table 3.3-2 shows the special status animal species of concern in the vicinity of the proposed site. The impacts on these species are addressed below.

USFWS and VDGIF Bald Eagle
Protection Guidelines for Virginia

Guide Lines for Eagle Nests

Primary Management Zone – This is defined as the area 750 ft in radius around an active nest.

Secondary Management Zone – This is defined as 750 ft to 1,320 ft in radius around an occupied nest.

The Army's coordination with the
Virginia Department of Game and
Inland Fisheries (VDGIF)

In a letter dated January 28, 2008, the Army requested the VDGIF's opinion on the potential for the proposed action to impact special status species at both the Gunston site as well as the Pence Gate site, which was still under consideration for the NMUSA at that time. The VDGIF presented its conclusions and recommendations in a response dated June 25, 2008.

Subsequently, the Gunston site was expanded to include the re-development of the North Post Golf Course. In a second letter, the Army requested that the VDGIF update its recommendations in light of this change. In an email response dated August 19, 2009, the VDGIF indicated that its conclusions and recommendations were not altered by the changes to the proposed action at the Gunston site (now identified as the "proposed site").

Bald Eagles

Bald eagles are protected under the Bald and Golden Eagle Protection Act of 1940 and the Migratory Bird Treaty Act of 1918. Bald eagles have been known to forage within Fort Belvoir; however, they tend to nest in areas away from human contact. Shorelines along creeks, rivers and lacustrine areas on Fort Belvoir provide valuable nesting, foraging, and loafing habitat for resident and migratory bald eagles. Potential threats to bald eagle nesting, foraging and loafing habitat include disturbances caused by near shore activities and waterfowl hunting.

The USFWS and VDGIF have published Bald Eagle Protection Guidelines for Virginia, which will be revised in accordance with the USFWS National Bald Eagle Management Guidelines. Based on these guidelines, the proposed action would be far enough away from bald eagle nests to preclude an adverse effect.

In a letter dated June 25, 2008, the VDGIF indicated that *"impacts upon the bald eagle are not likely to result from the development of either site."* (The reference to "either site" in this response is due to the fact that the Pence Gate site and the Gunston site -- now identified as the "proposed site" -- were both under consideration for the NMUSA at that time.)

Anadromous Fish

Anadromous fish are those fish species which live in salt water but migrate to fresh water areas to spawn. Example fish species include alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), and striped bass (*Morone saxatilis*). The VDGIF comment document dated November 10, 2008, indicates that Accotink Creek is a confirmed Anadromous Fish Use Area, but VDGIF *"does not anticipate that this project will result in impacts to anadromous fish."*

Wood Turtle

Because potential wood turtle habitat occurs within the stream valleys at or near the proposed site, Fort Belvoir contracted a survey of the entire proposed site for the wood turtle, including the entire golf course and the planned location of the NMUSA facilities. The survey report (*Wood Turtle Surveys of Potential Sites for the 338 Child Development Center, the North Post Golf Course Realignment, and the National Museum of the United States Army*, Mitchell Ecological Research Service, LLC, 2009) indicated that “*the first-order streams in each of the study areas do not provide sufficient shelter that would allow successful hibernation.*” Mitchell found no wood turtles on the proposed site. The report concluded that “*wood turtles are not going to be impacted by construction above these creeks.*”

Northern Virginia Well Amphipod

The Northern Virginia well amphipod (*Stygobromus phreaticus*) is a subterranean crustacean with a very limited range. Its habitat is limited to groundwater seeps, and it has been collected only three times since 1921, including once at Fort Belvoir’s T-17 training area in 1996 (VDCR - *Division of Natural Heritage*, June 2003). This amphipod is listed as G1/S1, indicating that it is critically imperiled because of its extreme rarity, or because factors in its biology make it especially vulnerable to extinction (MACTEC *Engineering and Consulting, of Georgia, Inc.*, June 2003).

The Northern Virginia well amphipod may occur in the seeps on, or adjacent to, the proposed site. It is possible that the proposed action could also affect seeps offsite – it would increase impervious surfaces and soil compaction, reducing the rate at which rainfall infiltrates into the site soils and recharges local groundwater. This could potentially reduce the flow of

groundwater to nearby seeps, including potential habitat for the Northern Virginia well amphipod.

The VDCR reviewed the project and recommended “*the implementation of, and strict adherence to, applicable state and local erosion and sediment control/ storm water management laws and regulations (VDCR correspondence, 2009)*” as a measure to protect the amphipod and the Laura’s clubtail dragonfly (see next paragraph). The Army intends to fully comply with these laws and regulations (Subchapters 3.2 and 3.4). The VDCR also recommended that the Army avoid impacts to springs and seeps, and maintain forested buffers along slopes to protect groundwater recharge areas, which the Army would do to the extent practicable.

Laura’s Clubtail Dragonfly

Laura’s clubtail dragonfly (*Stylurus laurae*) has been documented at only two places in the Commonwealth of Virginia. One of these locations is the streams located on the proposed site. As noted above, to minimize the proposed action’s adverse impacts to the aquatic ecosystem, VDCR recommended strict adherence to erosion and sediment control and stormwater management laws and regulations” (*VDCR correspondence, 2009*), which the Army proposes to do.

Small Whorled Pogonia

The small whorled pogonia is most frequently found on steep north or east-facing slopes, such as those present on the proposed site. In order to determine the potential for the proposed action to impact this plant species, Fort Belvoir conducted two surveys for the small whorled pogonia at the proposed site. The first of these covered approximately 70 acres that included the site of the planned NMUSA and the immediate vicinity. This survey was conducted on July 1-3 and July 8, 2008 by Mr. William Sipple of

W.S. Sipple Wetland & Environmental Training and Consulting, (WSS), a USFWS-approved small whorled pogonia surveyor. WSS identified three areas of “high potential” habitat and nine areas of “somewhat favorable” habitat. However, no small whorled pogonia individuals were located during the survey (*Small Whorled Pogonia Search, National Museum of the Army Feasibility Study*, WSS, 2008).

Fort Belvoir conducted a small whorled pogonia survey at the golf course site on June 23 - 25, 2009. Specifically, the survey covered an area of approximately 370 acres that includes all portions of the golf course which would have to be realigned to maintain a 36-hole course. This survey was conducted by Mr. Taylor Sprenkle of Environmental, Engineering and Educational Solutions, Inc., (EEE), a USFWS-approved small whorled pogonia surveyor. EEE identified two areas of “high potential” habitat and 19 areas of “medium potential” habitat (*Small Whorled Pogonia Habitat Evaluation and Survey, North Post Golf Course, Fort Belvoir, EEE, August 14, 2009*). In response, the Army created a plan for the realignment of the North Post Golf Course that does not disturb any of these areas.

How would the Army avoid or minimize adverse effects on vegetation and wildlife?

Construction impacts to both vegetation and wildlife would be minimized by adhering to Virginia and Fairfax County Erosion and Sediment Control, stormwater, and air quality requirements. In addition to complying with these regulatory requirements, the Army would take additional measures to ensure that impacts from construction do not exceed the planned impact area or are unnecessarily disturbing to vegetation and wildlife. Prior to construction, the Army (or its contractors) would flag the limits of impact areas to provide a clear sign to construction workers where they may be exceeding the project area. The contract

specifications would also include any recommended measures for avoiding impacts to any special status species.

The North Post Golf Course participates in the Audubon Cooperative Sanctuary Program for Golf Courses. The program focuses on environmental management practices in Environmental Planning, Wildlife and Habitat Management, Chemical Use Reduction and Safety, Water Conservation, Water Quality Management, Outreach, and Education. This program would continue throughout the design of the reconfigured golf course holes. The Army would evaluate opportunities to incorporate the principles for sustainability resource management through one of the Audubon International gold, silver and bronze signature sanctuary programs as part of the design process.

Would the Army mitigate any unavoidable adverse effects?

Yes. The Army plans to take the following measures to mitigate the effects of the construction:

- Protect existing trees to the extent feasible by removing only those trees that would interfere with NMUSA program features as well as selective clearing to preserve the high-value trees that do not adversely impact the visitor's view of the NMUSA as they enter the site from the Fairfax County Parkway. To protect the watershed and reduce the number of trees removed, Fort Belvoir would follow the results of a planned hydrologic analysis that would identify vegetation that is critical to maintaining proper drainage. During the design phase, the Army would identify specimen trees to be preserved and locate dead and diseased trees to be removed. The final selection of trees would be done by a certified arborist after the building is framed.

- Plant trees at a 2:1 ratio to replace those lost after clearing and grading. A tree restoration plan would be developed to establish tree mitigation requirements. The Army would replace trees providing habitat for PIF bird species to the extent practicable.
- Remove the least amount of native vegetation possible during clearing.
- Re-vegetate areas between the NMUSA site and reconfigured portions of the golf course. A transitional vegetation buffer would be approximately 50 feet wide in areas adjacent to the Fort Belvoir FWC. Establish herbaceous and woody species to provide for aesthetics, food and cover for wildlife.
- Identify additional areas for possible re-vegetation to support the habitats of PIF bird species on-site or elsewhere on Fort Belvoir as identified by ENRD.
- Plant native wetland or water-tolerant plants in storm drainage areas which would also promote water quality through filtration.
- Landscape with a mixture of deciduous shade and flowering trees, such as maple, southern red oak and eastern redbud, and plant seedlings, such as dogwood, viburnum, euonymus, and deerberry throughout the landscaping.
- Integrate reconfigured holes with natural topography to avoid or reduce impacts to streams and loss of habitat.
- Continue to participate in the Audubon Cooperative Sanctuary Program for Golf Courses, and evaluate Audubon International signature sanctuary programs during the design process.

Types of Wetlands and Other Surface Waters

Palustrine Forested Wetlands are swamps with an overstory of trees.

Perennial Streams are natural open channels that are primarily groundwater fed and support a continuous flow of water all year long.

Intermittent Streams are natural open channels that have flowing water in for a portion of the year.

How would the No Action alternative affect wildlife, including Special Status Species?

Under the No Action alternative, the Army would continue to manage vegetation through periodic mowing, removal of dead or dying trees and tree limbs, and clearing of brush. These actions would prevent additional trees from establishing in mowed areas and prevent forested areas from developing more natural features such as snags and downed wood that would otherwise support a greater variety of wildlife. However, no additional effects to wildlife, including special status species, would occur under the No Action alternative.

3.4 Surface Water, Water Quality, and Floodplains

What is the study area for this analysis?

The study area is defined as the area in which surface water and floodplains could be directly or indirectly impacted by construction or operation of the NMUSA. This includes on-site streams and down-stream water bodies.

What surface water features occur in or near the study area?

Surface water features on the proposed site include several unnamed, perennial and intermittent streams that flow from north to south, extending off-site. In addition, a man-made pond is located on the eastern border of the proposed site, near the Forest and Wildlife Corridor. This pond feeds a small, off-site stream that flows south (Figures 3.5-1 and 3.5-2).

All of these surface water features discharge to Accotink Creek,

located approximately 1,100 feet south of the proposed site at its closest point. Accotink Creek, in turn, discharges to the Potomac River at a point approximately 2.25 miles south of the proposed site.

What is the quality of surface water in the study area?

The VDEQ defines surface water quality standards that protect designated uses of surface waters in Virginia. These standards have three components: general criteria, use designations, and numeric water quality criteria necessary to protect those uses. All streams in Virginia, including those flowing through Fort Belvoir, are minimally assigned the uses of:

- Recreation (e.g., swimming, boating).
- Propagation and growth of a balanced, indigenous population of aquatic life, including game fish, which might reasonably be expected to inhabit them.
- Wildlife.
- The production of edible and marketable natural resources (e.g., fish and shellfish) (*VDEQ Website*, accessed July 2008).

To date, there are no numeric water quality data available for the perennial and intermittent streams located at the proposed site.

A benthic Total Maximum Daily Load (TMDL) for sediment in Accotink Creek is currently in draft form and is scheduled to be finalized in 2010. This TMDL pertains to the entire length of Accotink Creek, including the portion that receives runoff from the proposed site.

Two TMDLs for Accotink Creek have already been established (*Fecal Coliform TMDL for Accotink Creek, Fairfax County*,

Total Maximum Daily Loads (TMDL)

The Clean Water Act of 1977 requires that water bodies that do not meet water quality standards be studied to develop TMDLs for their impaired parameters. TMDLs are, in essence, pollution "diets" designed to bring the impaired water body back into compliance with water quality standards.

Virginia, VDEQ and VDCR, 2002 and *Bacteria TMDL for the Lower Accotink Creek Watershed*, George Mason University and Louis Berger Group, 2008). However, both of these TMDLs refer to portions of Accotink Creek located upstream of the proposed site. These areas would not be impacted by the proposed action. In addition, the proposed action is not expected to include any discharges of water containing bacteria (such as human or animal waste), so the potential for the proposed action to cause an increase in the amount of fecal coliform or other bacteria even in downstream portions of Accotink Creek is negligible.

Do flood hazard or floodplain areas exist at the proposed site?

No. According to floodplain mapping for Fort Belvoir prepared by the Federal Emergency Management Agency (*FEMA Flood Insurance Rate Map Panel 515525-0125-D*, dated March 5, 1990), there are no 100-year flood hazard areas located on the proposed site. No direct or indirect impacts to floodplains are anticipated.

Would the proposed action affect surface water quality?

Construction of the NMUSA would cause minor, short term impacts to streams due to clearing, grading, and excavation during construction. Compliance with state and federal regulations would address potential changes in the duration of elevated stream velocities and reductions in water infiltration rates. Construction of the structured parking alternative would have less impact than the surface parking alternative.

While the impacts of the proposed action would not be significant, they would contribute to cumulative impacts when

taken together with other planned development at Fort Belvoir in the near future (See Subchapter 3.15).

What mitigation is appropriate?

Compliance with Erosion and Sediment Control requirements, Virginia Stormwater Management regulations, Virginia Pollutant Discharge Elimination System (VPDES) requirements for construction sites (incorporated in the Virginia Stormwater Management Permit) and the Fairfax County Chesapeake Bay Ordinance would minimize transport of sediments and other contaminants into Accotink Creek and its tributaries during construction.

Mitigations beyond the requirements of these regulations would be determined at the same time as the permitting process.

Possible mitigation strategies include:

1. The use of low impact development techniques (bioretention, vegetated swales in lieu of curb and gutter, etc.) to promote infiltration of stormwater, replenish the surface groundwater table, and reduce the need for stormwater management (SWM) facilities.
2. Stream improvements for the Forest and Wildlife Corridor, where it traverses the Fairfax County Parkway.
3. Removal of a culvert along an unpaved road at the northwestern corner of the NMUSA site.
4. Stream restoration work at the unnamed tributary of Accotink Creek located east of Beulah Road.
5. To protect the watershed and reduce the number of trees removed from the vicinity of the iconic entrance view, Fort Belvoir would follow the results of the hydrologic analysis.

Fort Belvoir, in accordance with its Integrated Pest Management Plan, uses the minimum amount of fertilizers and pest control required to be effective. The golf course’s participation in the Audubon Cooperative Sanctuary Program also reduces the use of fertilizers and herbicides.

Would the No Action alternative affect surface water, water quality, or floodplains in the study area?

No. Existing conditions would continue under the No Action alternative.

Characteristics of a Wetland

Vegetation that is able to grow and thrive under wet soil conditions.

Soils that lack oxygen during persistently wet conditions, technically known as anaerobic conditions.

Hydrology that induces persistently wet soil conditions.

3.5 Wetlands & Chesapeake Bay Preservation Areas

Wetlands provide habitats for many plants and animals. They help to moderate stormwater flows and reduce flooding by slowing down and retaining floodwater during rain events. Wetlands improve water quality and help control erosion by slowing down water so sediment and chemicals can settle to the bottom. For these reasons, wetlands and streams are regulated by both the US Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act, and by the VDEQ under their Water Protection Permit Program.

The Fairfax County Chesapeake Bay Preservation Ordinance

The Chesapeake Bay Preservation Ordinance was enacted pursuant to the Chesapeake Bay Preservation Act (CBPA), Sections 10.1-2100, et seq., of the Code of Virginia (VAC).

Fort Belvoir also ensures its actions are consistent to the maximum extent practicable with the Fairfax County Chesapeake Bay Preservation Ordinance, and gives special consideration to the Fairfax County designated Chesapeake Bay Resource Protection Areas (RPAs) on the installation. These areas include streams with perennial flow, their contiguous wetlands, a 100-foot buffer, and the 100-year floodplain where present.

RPAs are sensitive areas where development is largely restricted (with certain exceptions) to water dependent activities, maintenance of public activities, passive recreation, water wells, and historic preservation. These areas are compatible only with very low-density or no development (*US Army Garrison Fort Belvoir*, 2001b).

Any land in Fairfax County that is not a RPA is considered a Resource Management Area (RMA). Development within RMAs must use BMPs to reduce nutrients in stormwater discharges.

For non-perennial streams without RPAs, Fort Belvoir also designates buffer areas (“riparian areas”). While not RPAs, these riparian areas are considered environmentally sensitive.

What is the study area for this analysis?

The study area for this analysis includes all areas within or adjacent to the boundaries of the proposed site. This is where the effects of the proposed action (both construction and operation) are most likely to occur.

What are the wetlands in the study area and what are their characteristics?

Figures 3.5-1 and 3.5-2 show the waterways, wetlands, and RPAs at and near the proposed site. These figures are based on wetland delineations completed by Paciulli, Simmons and Associates (PSA) (*The National Museum of the United States Army Wetland Delineation Report: Gunston Site, Fort Belvoir, Virginia*, PSA, 2009 and *The North Post Golf Course Wetland Delineation Report, Fort Belvoir, Virginia*, PSA, 2010).

What functions do the wetlands in the study area provide?

Based on aerial photographs and maps, the Army expects that the wetlands at the study area likely provide habitat for fish and wildlife, improvement of water quality, minor flood water storage, erosion protection, and aesthetic appreciation.

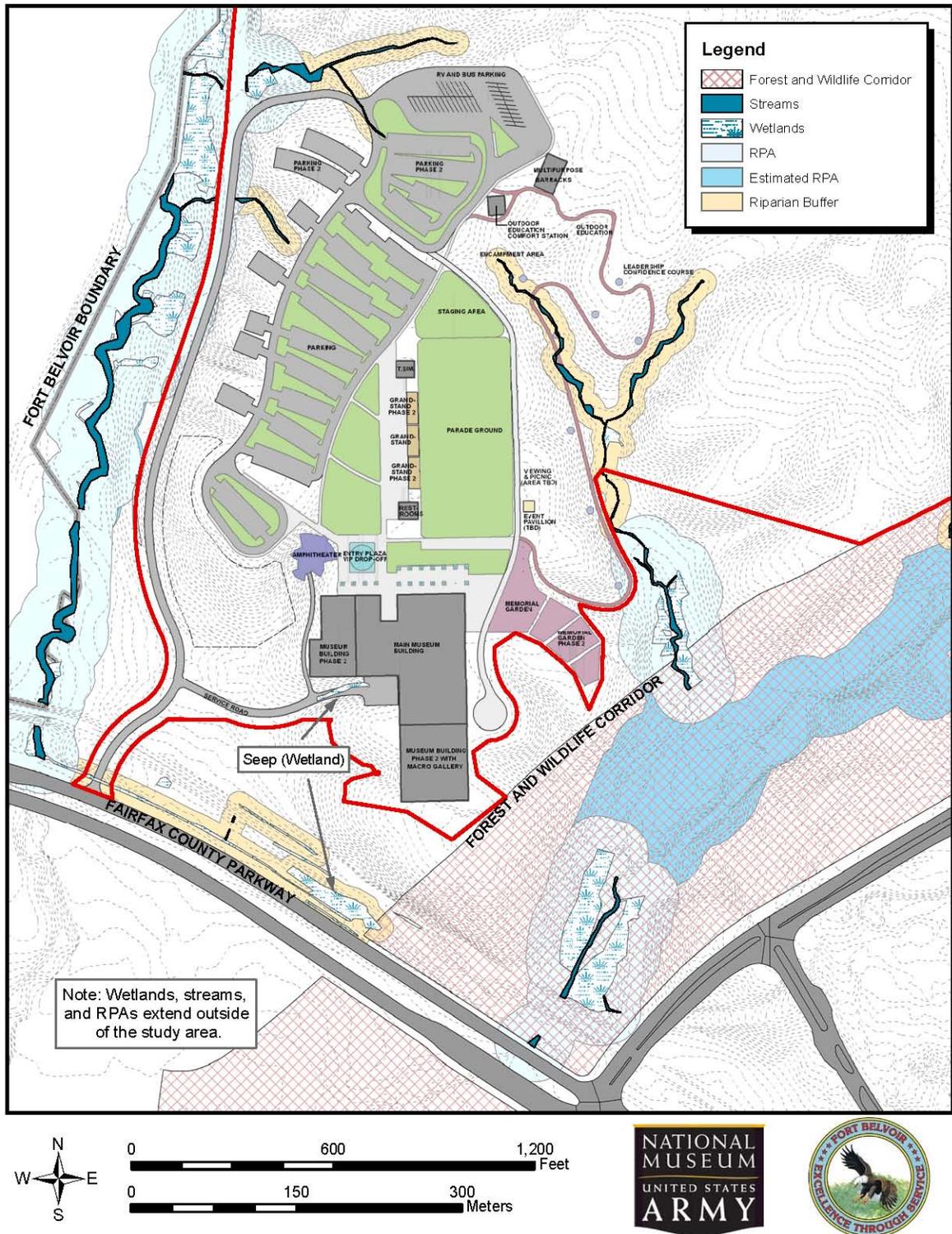


Figure 3.5-1: Wetlands, Streams, RPAs, and Riparian Areas at the Proposed Site (Golf Course Realignment Not Shown)

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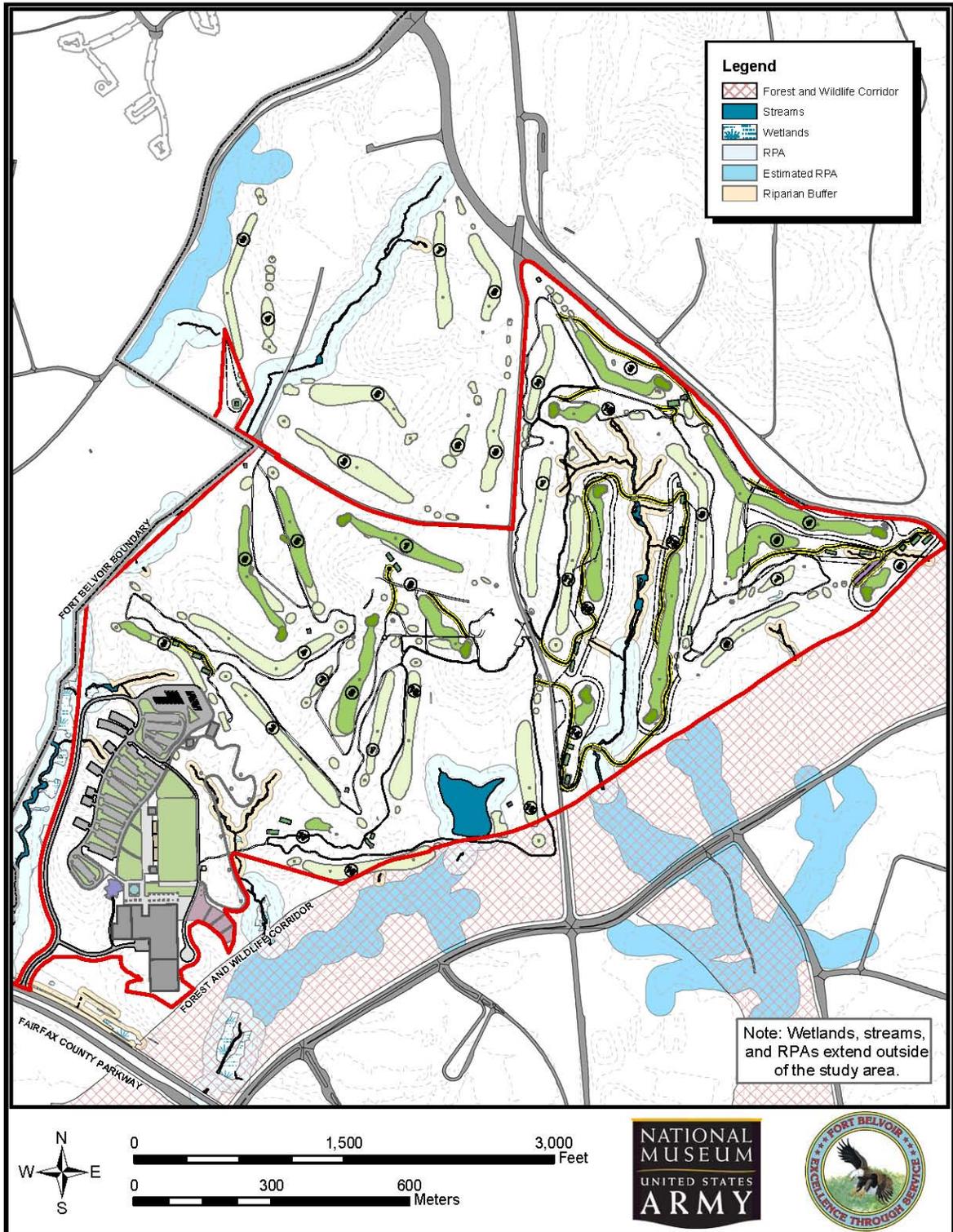


Figure 3.5-2: Wetlands, Streams, RPAs, and Riparian Areas at the Proposed Site (Including the Golf Course Realignment)

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How would the proposed action affect wetlands and Resource Protection Areas?

Construction of the NMUSA would impact approximately 209 linear feet of streams, 0.114 acre (4,964 square feet) of wetlands, and 2.113 acres (92,053 square feet) of RPA (Figures 3.5-1 and 3.5-2). Planning for utilities to service the NMUSA is still underway, but their construction may also impact small areas of wetlands, streams, and stream buffer areas. In all cases, any utilities brought into the site would be along, and as close as possible to, the access road and other areas already disturbed or to be disturbed during construction. Where utilities cannot be aligned along these disturbed areas, they would be oriented as much as practicable to minimize impacts on streams, wetlands, RPA and other riparian buffers. The Chesapeake Bay Preservation Ordinance exempts public utility and roadway crossings of the RPA, if no better alternative can be found. However, these crossings must, to the extent practicable, be aligned in a way (usually at right angles) that minimizes impacts on the RPA.

How would the Army compensate for unavoidable negative effects on wetlands?

For unavoidable impacts, the Army would obtain the necessary USACE and VDEQ permits before construction. (Part of that process would include having USACE verify that the wetland delineation reports [*PSA, 2009* and *2010*] are correct.) Given the small area of wetland and stream impacts, the construction would likely qualify for authorization under general permits issued by both agencies. As part of the permit process, the Army would be required to show both agencies that planning has avoided and minimized the adverse effects to the extent practicable. The Army would also be required to provide compensatory mitigation as determined by the two agencies. The objective of compensatory mitigation is to ensure no net loss of

wetlands or waterways. Therefore, the mitigation would offset any potential direct or cumulative impacts caused by the proposed action.

The access roadway as shown in Figure 3.5-1 runs parallel and along the edge of the RPA, which is inconsistent with the Fairfax County Chesapeake Bay Preservation Area ordinance, unless the Army has no practicable alternative to this route. At this time, Figure 3.5-1 is a conceptual plan. The Army would work with its designers to examine ways they can reduce RPA impacts.

How would the Army avoid or minimize adverse effects from construction?

During construction, the Army would be required by the USACE and VDEQ to minimize the unnecessary disturbance of wetlands and ensure their restoration when work is complete. The Army would mark impact and non-impact areas of wetlands in the field prior to construction to avoid unnecessary disturbance. If heavy equipment must work from wetlands, the equipment would be placed on mats, geotextile fabric, or other suitable material to minimize soil disturbance, and would be removed immediately upon completion of work. All temporarily disturbed wetlands and streams would be restored to preconstruction conditions within 30 days of completing work. Restoration would include re-establishing pre-construction contours, and planting or seeding with appropriate native wetland vegetation according to type that was present (i.e. emergent, scrub/shrub, or forested). Compliance with Erosion and Sediment Control, stormwater management, and wetland permit requirements would also minimize unnecessary impacts.

How would the No Action alternative affect wetlands?

The No Action alternative would have no effect on wetlands.

3.6 Historic, Cultural, and Architectural Resources

Cultural resources are the things, places, and human institutions that provide information about people from the past, their experiences, and their cultural identities. Cultural resources can include archeological sites, landscapes, spiritual places, documents, sites, buildings, and objects. Several interrelated federal, state, and local laws and regulations require consideration of how development projects might adversely affect cultural resources.

Broadly speaking, historic resources fall into two categories. The first is *architectural resources*, defined as “*a resource created principally to shelter any form of human activity, such as a house,*” or “*a functional construction made for purposes other than creating shelter, such as a bridge.*” The second category is *archeological resources*, defined in this report as “*the location of a significant prehistoric or historic event, occupation, or activity, where the location itself possesses historic, cultural, or archeological value regardless of the presence of any existing improvements,*” (http://www.nps.gov/nr/publications/bulletins/nrb16a/nrb16a_appendix_IV.htm, [National Park Service website], accessed 2009). Common examples of archeological sites include trash sites or burial sites.

What is the study area for this analysis?

For cultural resources, the study area is called the Area of Potential Effect (APE). For the purposes of this study, the APE is defined as the cumulative area of three sub-APEs; the land disturbance APE, the visual APE, and the auditory APE. The land disturbance APE is defined as the limits of land disturbance required for site clearing and construction activities. The visual APE is defined as the viewshed to and from the proposed site.

Section 106 of the National Historic Preservation Act (NHPA)

Under Section 106, the head of any federal agency having direct or indirect jurisdiction over a proposed federal or federally financed undertaking is required to account for the effects of this action on any district, site, building, structure, or object that is included or eligible for inclusion in the National Register of Historic Places. Eligibility determinations are based on criteria for historic significance contained in 36 CFR 60.4.

The Virginia Department of Historic Resources (VDHR) is the designated State Historic Preservation Office (SHPO), in charge of administering Section 106 in the Commonwealth of Virginia. The SHPO must be consulted about any potential adverse effects from a federal action to protected architectural or archaeological resources. If adverse effects are expected, appropriate mitigation measures must be developed, also in cooperation with the SHPO.

The auditory APE is defined as area where noise generated by the proposed action would be audible. The visual and auditory APEs extend one-quarter mile from the limits of disturbance. The operation of the reconfigured golf course would not significantly alter the visual landscape or increase noise, so there are no visual or auditory APEs for this portion of the proposed action.

Are any cultural resources located in or near the area of potential effect for the proposed action?

Yes. The North Post Golf Course, constructed around 1950, is an architectural site that was evaluated and determined to be ineligible for inclusion in the National Register of Historic Places (NRHP) in 2007 (VDHR File No. 2007-0971). No NRHP-eligible architectural properties have been identified in any of the APEs for the proposed action.

Twelve archeological resources have been identified within the land disturbance APE. However, all of these sites have been determined ineligible for listing in the NRHP.

Seven archeological sites have been identified within the visual and auditory APEs of the proposed action. Of these, two (Sites 44FX0663 and 44FX1939) were determined to be ineligible for listing in the NRHP. Archeological Site 44FX2277 is a Fairfax County Historical Park identified as Mount Air, located approximately 800 feet west of the proposed site. This site was evaluated and determined eligible for listing in the NRHP in 2010. However, the evaluation determined that the site lacks a historic viewshed. Any noise effects to the site would be temporary, occurring only during the construction phase. Three of the sites; 44FX0425, 44FX2096, and 44FX2097 are located in a contemporary housing development and appear to have been

significantly impacted by construction. The housing development has also compromised the viewsheds of these sites. Finally, although Site 44FX0035 has been recommended for further study, a significant portion of this prehistoric site is located in the middle of the Fairfax County Parkway. Any visual or auditory impacts resulting from the NMUSA would not adversely impact this site.

How would the proposed action affect cultural resources?

The proposed action would have no adverse effect on historic properties. There are no NRHP-eligible properties within the land disturbance APE. Historic resources within the visual and auditory APEs are limited to archeological resources which lack noise/viewsheds that contribute to their historic significance.

How would the No Action alternative affect cultural resources?

The No Action alternative would not impact cultural resources.

3.7 Petroleum and Hazardous Substances

Fort Belvoir uses, stores, generates, and transports a wide variety of chemicals during its day-to-day operation. This includes both petroleum products and certain materials defined as hazardous substances by the US Environmental Protection Agency (USEPA). Current and former hazardous substance / petroleum facilities are potential constraints to future development, because closure of such sites is required prior to reuse.

Solid Waste

The USEPA, under RCRA, defines "solid waste" as *"any solid, semi-solid, liquid, or contained gaseous materials discarded from industrial, commercial, mining, or agricultural operations, and from community activities."* This definition includes, but is not limited to, hazardous waste.

(www.epa.gov/epawaste/nonhaz/index.htm, accessed August 10, 2009)

Solid Waste Management Unit (SWMU)

The USEPA generally defines a Solid Waste Management Unit as *"Any discernable unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released."* (40 CFR 265.501) However, the USEPA reserves the right to define SWMUs on a case-by-case basis. Petroleum storage tanks are not typically considered SWMUs by the USEPA.

Management of hazardous waste (a sub-category of "hazardous substances") at Fort Belvoir is conducted in compliance with the Resource Conservation and Recovery Act (RCRA). Fort Belvoir has a Hazardous Waste Management / Waste Minimization Plan and a Master Spill Plan. Fort Belvoir also has a RCRA Part B permit from the Virginia Department of Environmental Quality (VDEQ) for the storage of hazardous wastes.

There are three specific environmental concerns:

1. Above ground and underground storage tanks (ASTs and USTs) These are the past or present storage locations of petroleum or hazardous materials.
2. Spill response features. These areas may have been impacted by a historical release of petroleum or hazardous substances.
3. Solid Waste Management Units (SWMUs). These areas are the past or present locations of solid waste. (See sidebar for a definition of SWMU).

What is the study area for this analysis?

For petroleum and hazardous substances, the study area is the area in which the use or storage of petroleum products or hazardous substances would change as a result of the proposed action. This includes any contaminated soil and/or groundwater present that could be encountered during construction. Because no offsite work or storage of petroleum or hazardous substances is planned as a part of the proposed action, the limits of disturbance for the proposed site represent the extent of the study area.

Are any petroleum products or hazardous substances in use at the proposed site?

Two SWMUs (identified as site E-09 and site L-46) and six

storage tanks are located near the golf course club house, on the central portion of the proposed site. Both SWMUs were above ground storage areas for waste chemicals (including pesticides, oil, lubricants, and other forms of petroleum). Neither SWMU is currently in use; site E-09 is a concrete pad overgrown with vegetation, and site L-46 has been redeveloped. Fort Belvoir has requested closure of these sites, and these requests are under review by the USEPA.

There are no records of a release from any of the six storage tanks located near the club house (*email communication with Mr. Ben Wallen of the Fort Belvoir Department of Public Works, August 19, 2009*). Based on this information, the potential for these SWMUs and storage tanks to have released hazardous substances is considered minimal.

How would the construction of the NMUSA affect the use or storage of petroleum products and hazardous substances?

Based on a review of the conceptual layouts, the Army does not expect the construction of the NMUSA to include the removal or abatement of any SWMUs, storage tanks, or spill response features. The realignment of the golf course would not involve disturbance of any areas in the immediate vicinity of storage tanks or SWMUs, although one portion of the realignment would involve work within 150 feet of SWMU L-46.

Construction of the NMUSA would include a short-term increase in the use of fuel, oil, asphalt, and fertilizers, and would generate solid and sanitary waste. Various control measures would be used to minimize such releases. It is also possible that existing contaminated soil and/or groundwater from historical or existing storage tanks or SWMUs could be encountered during construction.

If a release occurs during construction - or if evidence of an existing release is discovered - the NMUSA construction contractors would follow the Fort Belvoir Master Spill Plan, which explains required petroleum and hazardous substances spill response procedures.

How would the operation of the NMUSA affect the storage or use of petroleum products or hazardous substances?

The NMUSA facilities may require USTs or ASTs to fuel emergency power generators. All federal, state, and local requirements would be followed to ensure the safe storage and transfer of fuel to the storage tanks. The Environmental and Natural Resources Division (ENRD) of the Fort Belvoir Department of Public Works is responsible for obtaining required environmental permits from the appropriate regulatory agencies for activities on Fort Belvoir. A tank activity permit is required to be submitted to Fort Belvoir ENRD prior to installation of USTs. Permits from ENRD are also required for installation, upgrade, repair, or closure of USTs. If a fuel spill were to occur, Fort Belvoir personnel would follow the Fort Belvoir Master Spill Plan, and ENRD would be notified. Any hazardous substances, petroleum products, or impacted soils removed as a result of the release would be disposed of in accordance with state and federal regulations.

Other than fuel for heating and cooling, operation of the NMUSA would not involve use of more than minimal amounts of hazardous materials, e.g., household cleaners for cleaning and fertilizers and pesticides for grounds maintenance. Events at the parade grounds could involve the discharge of dummy ordnance from small firearms or the use of gunpowder for cannons. All materials and ordnance would be properly stored and used according to state and federal regulations.

Because Fort Belvoir tightly controls the use, storage, and transfer of fuel and hazardous substances, and the storage and discharge of gunpowder and dummy ordnance, the operation of the NMUSA should contribute little to cumulative impacts from the use and storage of these substances.

The golf course staff would continue to use appropriate amounts of pesticides and fertilizer at the realigned golf course; the storage and use of these materials would not be significantly changed by the proposed action. Pesticides and fertilizers would be used in accordance with the Fort Belvoir Integrated Pest Management Plan, which calls for the use of the least toxic pesticides that are effective in controlling the target species.

How would the No Action alternative affect the storage or use of petroleum products or hazardous substances?

Under the No Action alternative, there would be no short- or long-term change in the production of hazardous substances.

3.8 Air Quality

Who regulates air quality in Virginia?

Air quality in Virginia is regulated by the USEPA Region 3 and the VDEQ.

What standards apply to air quality?

The Clean Air Act (42 USC. 7401-7671q), as amended, gives the USEPA responsibility to establish the primary and secondary National Ambient Air Quality Standards (NAAQS) (40 CFR Part

50) that set acceptable concentrations for seven criteria pollutants: particulate matter, fine particulate matter (PM_{2.5}), sulfur dioxide (SO₂), carbon monoxide (CO), nitrous oxides (NO_x), ozone (O₃), and lead. Short-term NAAQS (1-, 8-, and 24-hour periods) have been established for pollutants contributing to acute health effects, while long-term NAAQS (annual averages) have been established for pollutants contributing to chronic health effects. While each state has the authority to adopt standards stricter than those established under the federal program, the Commonwealth of Virginia has generally adopted the federal standards.

How is the air quality in this region?

Air-quality Control Regions (AQCRs) in violation of the NAAQS are designated as *nonattainment* areas. AQCRs with levels below the NAAQS are designated as *attainment* areas. *Maintenance* AQCRs are areas that have previously been designated nonattainment and have been re-designated to attainment for a probationary period through the implementation of maintenance plans. According to the severity of the pollution problem, nonattainment areas can be categorized as marginal, moderate, serious, severe, or extreme. Fort Belvoir and Fairfax County are within the National Capital Interstate AQCR (AQCR 47) (40 CFR 81.12). The National Capital Interstate AQCR is in the O₃ transport region that includes 12 states and Washington, DC. The USEPA has designated Fort Belvoir and Fairfax County as the following:

- Moderate nonattainment for the 8-hour O₃ NAAQS.
- Nonattainment for the PM_{2.5} NAAQS.
- Attainment for all other criteria pollutants (40 CFR 81.347)

How does the Army evaluate air quality effects from the proposed action?

Both the USEPA and VDEQ have established General Conformity Rules (GCR) specifically to ensure that the actions taken by federal agencies in nonattainment and maintenance areas do not affect a region's ability to meet the NAAQS in a timely fashion. The GCR plays an important role in helping states and tribal regions improve air quality in those areas that do not meet the NAAQS. The GCR sets applicability thresholds, below which it is understood that emissions associated with a federal action would not have significant affect on air quality.

To determine the applicability of the GCR, air emissions from construction and proposed stationary and mobile sources at the proposed NMUSA site were compared to the applicability thresholds and regional emissions budgets. The construction emissions estimates included equipment use for site preparation, construction, and landscaping for the new facilities. The facility's operational emissions estimates included emissions from vehicles operated by employees and NMUSA visitors, and from boilers and emergency generators. The estimated emissions are shown in Table 3.8-1.

Table 3.8-1: Estimated Air Emissions

Year	Estimated Emissions (Tons per Year)			
	NO _x	VOC	PM _{2.5}	SO ₂
Year 1 (2012)	20.9	1.5	2.6	3.7
Year 2 (2013)	23.8	2.6	2.8	4.0
Year 3 (2014)	7.0	1.0	0.7	1.1
Operational emissions	12.6	5.9	1.0	0.4
<i>Applicability</i> threshold	100	50	100	100
Exceeds threshold?	No	No	No	No

How would the proposed action affect air quality?

The NMUSA's construction and operation could affect air quality in three ways: generating pollutants during construction; introducing new stationary sources of pollutants, such as heating boilers and standby generators; and changes in vehicular emissions.

For either alternative, construction would generate equipment exhaust and fugitive dust emissions during site preparation, construction, and landscaping. Construction emissions would be below the general conformity applicability thresholds and therefore low enough so as not to interfere with the region's ability to meet the NAAQS in a timely fashion.

The new facilities would likely be equipped with dual-fired (natural gas and #2 fuel oil) boilers and diesel fuel emergency generators. Relatively low levels of emissions would be generated by these sources. Operational emissions would be below the general conformity applicability thresholds and therefore would not interfere with the region's ability to meet the NAAQS in a timely fashion. The proposed action would not lead to violations of federal, state, or local air regulations.

Mobile emissions of concern primarily include vehicular traffic. Emissions from motor vehicles were included in the overall operational emission estimations, which as stated above were below the applicability thresholds. The proposed action is not located in a nonattainment or maintenance area for CO; therefore, CO is not anticipated to be an air quality concern. Particulate matter or Mobile Source Air Toxics from vehicles are not anticipated to be an air quality concern because the intersections affected are primarily secondary arterial roads

(USEPA, 2006 and Federal Highway Administration [FHWA], 2006).

How would the proposed action comply with existing air regulations?

Construction activities would be in full compliance with current and pending Virginia regulatory requirements, with compliant practices and/or products. Applicable requirements include:

- Visible emissions and fugitive dust and emissions (9 VAC 5-40-60);
- Asphalt paving operations (9 VAC 5-40-5490);
- Open burning (9 VAC 5-40-5600);
- Portable fuel containers (9 VAC 5-40-5700);
- Architectural and industrial maintenance coatings (9 VAC 5-40-7120); and
- Consumer products (9 VAC 5-40-7240 *et seq.*).

This listing is not all-inclusive; the Army and all contractors would comply with all applicable air pollution control regulations.

The dual-fired boilers (natural gas and #2 fuel oil) and diesel fuel generators would be subject to federal and state air permitting regulations. These requirements include, but are not limited to: minor new source review (NSR), nonattainment NSR, prevention of significant deterioration, and new source performance standards (NSPS) for selected categories of industrial sources. Exceedence of the major modification thresholds of 40 tons per year (tpy) is not anticipated with any of the alternatives. Therefore, only a new minor NSR permit would be required to construct new boilers and emergency generators. The boilers and emergency generators may require a Best Available Control Technology review for each criteria pollutant,

and predictive air dispersion modeling, depending upon VDEQ's requests. These new stationary sources of air emissions would be added to Fort Belvoir's Title V air permit. Monitoring and recordkeeping requirements outlined in the permit would apply.

Manufacturer specifications for the generators and boilers have not been finalized. Generators and boilers ultimately selected may differ in specific features from the ones described in this EA, but the emissions profiles would be consistent with or lower than the Tier 2 engines described herein.

Moderate changes in the size or type of equipment ultimately selected would not change the level of impact described in this EA. In the final design stage, extra care would be taken to ensure all equipment selected would be in full compliance with federal, state, and local air regulations.

The extent to which this proposed action would contribute to cumulative impacts on air quality in the region is addressed in Subchapter 3.15 of this EA.

Do the air impacts from the proposed action require mitigation?

No Mitigation would be required beyond the BMPs and regulatory requirements outlined above.

Would the No Action alternative cause any air impacts?

The No Action alternative would not cause any impacts to air quality.

3.9 Noise

Sound consists of vibrations that travel through a medium, such as air, and are sensed by the ear. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies depending on the type and characteristics of the noise, the distance between the noise source and the receptor, receptor sensitivity, and time of day. Noise is often generated by activities essential to a community's quality of life, such as construction or vehicular traffic.

Sound varies by both intensity and frequency. Sound pressure level, described in decibels (dB), is used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Hertz (Hz) are used to quantify sound frequency. The human ear responds differently to different frequencies. *A-weighting*, measured in A-weighted decibels (dBA), approximates a frequency response expressing the perception of sound by humans. Sounds encountered in daily life and their dBA levels are provided in Table 3.9-1.

The dBA noise metric describes steady noise levels, although very few noises are, in fact, constant. Therefore, A-weighted day-night Sound Level (ADNL) has been developed. Day-night Sound Level (DNL) is defined as the average sound energy in a 24-hour period with a 10-dB penalty added to the nighttime levels (10 P.M. to 7 A.M.). DNL is a useful descriptor for noise because: (1) it averages ongoing yet intermittent noise, and (2) it measures total sound energy over a 24-hour period. In addition, Equivalent Sound Level (L_{eq}) is often used to describe the overall noise environment. L_{eq} is the average sound level in dB.

Table 3.9-1 Common Sound Levels

Outdoor	Sound Level (dBA)	Indoor
Motorcycle	100	Subway train
Tractor	90	Garbage disposal
Noisy restaurant	85	Blender
Downtown (large city)	80	Ringling telephone
Freeway traffic	70	TV audio
Normal conversation	60	Sewing machine
Rainfall	50	Refrigerator
Quiet residential area	40	Library

Source: Harris, 1998.

What standards apply to noise?

The Noise Control Act of 1972 (PL 92-574) directs federal agencies to comply with applicable federal, state, and local noise control regulations. In 1974, the USEPA provided information suggesting continuous and long-term noise levels in excess of DNL 65 dBA are normally unacceptable for noise-sensitive land uses such as residences, schools, churches, and hospitals.

The Fairfax County Code prohibits the creation of sound louder than 55 dB in a residential area, and 60 dB in a commercial area. In addition, they prohibit the creation of any excessive noise on any street adjacent to any school, institution of learning, court, or hospital that interferes with its function (Fairfax County Code Section 108-4-1). Sounds generated from construction and demolition activities are exempt from the Fairfax County ordinance between 7:00 AM and 9:00 PM. Having adopted Fairfax County's Noise Ordinance, Fort Belvoir intends to comply with the ordinance. .

What is the current noise environment near the proposed site?

Existing sources of noise near the proposed site includes roadway traffic, high-altitude aircraft overflights, rotorcraft, lawn maintenance equipment, and natural noises such as the rustling of leaves and bird vocalizations. Noise levels are typical for a suburban setting. There are no noise-sensitive receptors (residences, churches, hospitals, or schools) located within 1,000 feet of the proposed site.

How would the proposed action affect the existing noise environment?

Short- and long-term minor adverse effects to the noise environment would be expected with the implementation of

either build alternative. Short-term effects would be primarily due to heavy equipment noise during construction and demolition activities. Construction noise may be audible to golf course patrons. However, construction would not normally occur during weekend daytime hours, which should help minimize the number of golfers exposed. Therefore, these effects would be minor.

Construction noise may be also audible to wildlife in the adjacent FWC or other habitats. Most wildlife on Fort Belvoir are common species adapted to a suburban noise environment. Construction noise would temporarily displace animals further into adjacent habitats, away from the work site, but this would not cause a permanent displacement or a loss of habitat. Occasional noise from concerts, reenactments, and other events would have similar, minor effects. The species of concern potentially present at or near the proposed site (the Northern Virginia well amphipod and Laura's clubtail dragonfly - Subchapter 3.3) would not likely be affected by noise from construction. The well amphipod is an underground dweller and the dragonfly would be in the stream valleys, too far away from either the NMUSA or the golf course construction areas, especially given the noise dampening effects of trees and other forest vegetation and the change in topography, to be exposed to large increases in noise levels.

No appreciable long-term increases in the overall noise environment can be expected with the implementation of either build alternative. No regular military training activities, demolitions, or aircraft operations would occur. Military bands, re-enactment activities, parades, and educational activities (camping, occasional discharge of dummy ordnance, amplification of voices and music to reach a large crowd) would occur. Fort Belvoir would comply with its noise ordinances, as

adopted from Fairfax County, during the operation of the museum.

How would the proposed action comply with existing noise regulations?

Construction noise is expected to dominate the soundscape for all on-site personnel. Construction personnel, and particularly equipment operators, would wear adequate personal hearing protection to limit exposure and ensure compliance with federal health and safety regulations.

Because construction activities (the primary source of noise associated with the alternatives) would occur primarily during normal weekday business hours, no violation of Fort Belvoir's noise ordinances, as adopted from Fairfax County, would be anticipated.

Does the proposed action require mitigation for noise impacts?

Although construction-related noise effects would be small, the following best management practices would be used to reduce noise effects:

- Construction would predominately occur during normal weekday business hours.
- Construction equipment mufflers would be properly maintained and in good working order.

No mitigation measures for noise would be required.

3.10 Infrastructure and Utilities

Construction of any new facility generally requires an examination of the availability of utilities including potable water, sanitary wastewater, solid waste service, electricity,

natural gas, communications, and stormwater. It is important to identify the needs that would be generated by the proposed facility and compare those needs against what is already supplied to the site. This process helps identify what additional utilities infrastructure would be required to implement the proposed action. Note that the realignment of the golf course is not expected to cause any additional utility requirements.

What is the study area for this analysis?

The study area for utilities includes the proposed site and those nearby areas which are serviced by the same utility providers, as the utility availability to these areas could be impacted by the increased demand created by the NMUSA.

How would potable and irrigation water be supplied to the NMUSA and realigned golf course?

Fairfax Water provides potable water for Fort Belvoir; American Water owns, operates, and maintains the installation's water supply and distribution system. This system is also be used to provide irrigation water for the golf course.

Potable water would be provided to the NMUSA from an existing Fort Belvoir water main located along Beulah Street, approximately 4,100 feet northeast of the most likely connection point for the NMUSA. To connect to this main, Fort Belvoir would construct a new water line trending east from the NMUSA to the water main across the southern boundary of the golf course. Alternatively, the NMUSA could connect to this water main by installing a water line that trends north, through the North Post Golf Course.

Is the proposed site currently supplied with sufficient potable water?

The NMUSA is expected to generate a peak need of approximately 408,000 gallons per day of potable water. Planned water system upgrades to the Beulah Street water main would have to be completed to maintain a water pressure in the desired 40-60 pounds per square inch (psi) range (*Fort Belvoir Hydraulic Evaluation of the Proposed National Museum of the U.S. Army, EA Science and Technology, Inc., 2008*). These improvements, which are taking place separately from the proposed action to address the overall potable water needs of Fort Belvoir, include the installation of a 12-inch line along Beulah Street (replacing a 6-inch line) and connection of the Post to existing water storage tanks.

During the design stage of the NMUSA, the designers would send a load letter to American Water to ensure that sufficient potable water capacity is available. The proposed action would therefore not significantly affect the availability of potable water in the study area.

The realignment is not expected to impact potable water needs because the irrigation water requirements of the realigned golf course are not expected to be any different from the present course. The realigned golf course would require the Army to re-route the irrigation lines to better serve the realigned golf course.

How would the Army mitigate the increase in potable water use from the NMUSA?

The upgrades mentioned above would mitigate the potable water demands of the NMUSA.

How would sanitary sewer service be supplied to the NMUSA?

American Water owns, operates, and maintains the installation's sanitary sewer system, which includes 37 sewage pumping/lift stations and two main pumping stations. The installation discharges approximately 1.3 million gallons (5 million liters) of wastewater per day to the Fairfax County sanitary sewer system (*US Army Garrison Fort Belvoir*, 2001b).

The closest connection point is an existing 15-inch sanitary sewer line located approximately 3,100 feet east of the proposed site, across John J. Kingman Road.

Is the proposed site supplied with sufficient sanitary sewer service?

The NMUSA is expected to generate approximately 255,000 gallons of sanitary sewage per day (*Berger /SmithGroup*, August 2008). It is not currently known if the 15-inch line located across John J. Kingman Road has enough capacity to accept the estimated peak and average wastewater flows from the NMUSA. Additional studies are planned to determine the suitability of this line. If the Army determines that this line would not be sufficient, a connection to another line would be made.

The NMUSA would also require a new pump station along the new sanitary sewer line (*Berger/Smith Group*, August 2008). The location of the new pump station has not yet been determined.

During the design stage of the NMUSA, the designers would send a load letter to American Water to ensure that sufficient sanitary sewer capacity is available.

What about stormwater requirements?

Fort Belvoir's stormwater system consists predominately of open channels that receive sheet flow. Fort Belvoir is classified as a small municipal separate storm sewer system (MS-4) discharger under applicable stormwater regulations. It has a general stormwater permit that is in effect through July 18, 2013.

Stormwater Regulatory Requirements

Section 402 of the Clean Water Act of 1977 established requirements for discharges of industrial and sanitary wastewater effluents, and of storm water through the National Pollutant Discharge Elimination System (NPDES) permit program. In Virginia, the stormwater portion of the NPDES program is administered through the Virginia Stormwater Management Program administered by the VDCR. The VDCR is also responsible for enforcing the other requirements of the Virginia Stormwater Management Law (Title 10.1, Chapter 6, Article 1.1 of the Code of Virginia) and regulations (4VAC3-20 et seq.) of the Virginia Administrative Code.

The construction of the NMUSA would require a Virginia Stormwater Management Program (VSMP) Permit. In addition, based on the Executive Council of the Chesapeake Bay Program Directive 01-1, *Managing Storm Water on State, Federal and District-owned Lands and Facilities*, Fort Belvoir personnel are to lead by example in controlling nutrient, sediment, and chemical contaminant runoff during construction and operation of the proposed site. Fort Belvoir does this by following the Fairfax County Chesapeake Bay Preservation Ordinance (Chapter 118 of the Fairfax County Code).

Stormwater on the proposed site currently drains to the perennial and intermittent tributaries of Accotink Creek. The "worst case" estimated peak stormwater discharge for the NMUSA would be approximately 90 cubic feet per second for a two-year storm, and 116 cubic feet per second for a 10-year storm, assuming there would be no stormwater detention. An estimated stormwater detention capacity of 93,900 cubic feet (2.2 acre-feet) would reduce the runoff rates to the pre-developed condition. See Appendix F for the stormwater discharge calculations. These estimates would be recalculated during the design process, as more specific information becomes available, to comply with all applicable regulations.

This stormwater system would use stormwater management/ best management practices (SWM/BMP) to ensure compliance with

stormwater regulations and consistency with Chesapeake Bay quantity and quality control requirements. The impacts of the stormwater discharge from the NMUSA would be addressed in a stormwater management plan, to be developed later in the planning process.

What about natural gas requirements?

Fort Belvoir's natural gas system is owned and operated by Washington Gas. As of 2000, natural gas was distributed to the Post through 25 miles of gas main and 11 miles of service lines mostly servicing housing areas.

The proposed site is not currently serviced by natural gas. The closest natural gas main is located at the corner of Telegraph Road and Snyder Road, approximately 3,100 feet north of the site (*Berger/SmithGroup*, August 2008). No natural gas main locations have been selected at this time, but a likely scenario is to install a natural gas main that would trend west from the proposed site along Fairfax County Parkway to its intersection with Telegraph Road, and from there northeast to an existing natural gas trunkline.

At peak usage times, the NMUSA is expected to require approximately 12,500 cubic feet per hour of natural gas (*Berger/SmithGroup*, August 2008). Based on telephone conversations between representatives of Washington Gas and the Louis Berger Group, this peak usage is expected to be well within the capacity of the existing infrastructure. During the design stage of the NMUSA, the designers would send a load letter to Washington Gas to ensure that sufficient capacity is available. The Army would also adhere to all applicable local, state, and federal laws.

What about electricity requirements?

Dominion Virginia Power owns the entire on-post electrical system, including the distribution feeder system. As of 2000, 10 electrical sub-stations were located on-post. These sub-stations were used to transform from the Dominion Virginia Power substation to a Fort Belvoir-owned combination substation to switching stations (*US Army Garrison Fort Belvoir*, 1998a), prior to Dominion Virginia Power ownership.

Three-phase electrical power is currently available to the proposed site from an elevated line located along John J. Kingman Road, located approximately 750 feet southeast of the proposed NMUSA location. However, this line requires further evaluation to determine if it would meet the NMUSA's needs (*Berger/SmithGroup*, August 2008).

The estimated peak demand of the NMUSA would be 2,500 kilowatt hour (kWh) (*Berger/SmithGroup*, August 2008). Based on telephone conversations between representatives of Dominion Virginia Power and the Louis Berger Group, this peak usage is expected to be within the capacity of the existing infrastructure. During the design stage of the NMUSA, a load letter would be sent to Virginia Dominion Power, and the Army would adhere to all applicable local, state, and federal laws.

What about communications requirements?

The installation owns the entire Fort Belvoir communications system, including copper and fiber optic cables, utility poles, and computerized switchboard systems. Most distribution cable is carried overhead on utility poles, while most fiber-optic cable is carried through an underground duct bank, along with some conventional cable (*US Army Garrison Fort Belvoir*, 1998a).

Copper telecommunication lines are currently available to the proposed site. In addition, fiber optic cables are available to the DLA facility located to the east of the site. The nearest fiber optic connection appears to be located approximately 6,500 feet from the site, at the intersection of John J. Kingman Road and Beulah Street (*Berger/SmithGroup*, 2008).

It is not currently known if the existing communications infrastructure is sufficient, because the communications needs of the NMUSA have not been established. Once these needs are determined, the Army would provide the necessary infrastructure.

What about solid waste generated by the NMUSA?

The amount of solid waste generated by the NMUSA is primarily determined by the following three factors.

- 1) The number of full-time employees at the site.
- 2) The number of visitors at the site.
- 3) The number of meals served at the site.

The NMUSA is expected to require up to 185 employees and volunteers and an average of 2,200 visitors per day (*Economics Research Associates*, April 2006). Approximately 1,500 meals would be served each day at the NMUSA (*Berger/SmithGroup*, August 2008). Based on an estimated solid waste generation rate of one pound (lb) per day per employee, 0.25 lb per day per visitor, and two lbs per meal, the NMUSA is expected to generate approximately 4,400 lbs of solid waste per day, or 1,600,500 lbs (800 tons) per year.

A civilian contractor currently collects Fort Belvoir's solid waste (approximately 10,460 tons per year), which is disposed of at a state-approved, off-post landfill (*US Army Garrison Fort*

Belvoir, 2001a). The anticipated solid waste generated by the NMUSA represents a 7.6 percent increase in the amount of solid waste generated by the installation, and is therefore expected to be well within the capacity of Fort Belvoir's existing infrastructure and contractual arrangements.

Fort Belvoir has a mandatory post-wide Qualified Recycling Program (QRP) which collects white paper, colored paper, newspaper, aluminum cans, tin/steel cans, scrap metal, cardboard, glass bottles, plastic containers, and toner cartridges. In 2008, 657 tons of cardboard, 387 tons of scrap metal, 346 tons of paper and 172 tons of commingled recyclables including aluminum, glass, plastic, and newspaper were collected and separated off-site. Controlled non-regulated solid waste (special and universal waste), such as tires, used oil, paint, fluorescent lights, batteries, pesticides, thermostats, mercury-containing equipment, and scrap metal is handled through the ENRD in accordance with the Resource Conservation and Recovery Act (40 CFR Part 273).

Greater Washington Metropolitan Area

The counties of Prince William, Fauquier, Stafford, King George, Loudoun, and Arlington, and the city of Alexandria in Virginia; the counties of Montgomery, Prince George's, and Charles in Maryland; and the District of Columbia are within a 30-mile (48 km) radius of Fort Belvoir.

3.11 Socioeconomics

What is the study area for this analysis?

The study area for this project includes Fort Belvoir, Fairfax County, and to a lesser extent, other jurisdictions within the Greater Washington Metropolitan Area. The NMUSA workforce would come primarily from Fairfax and neighboring counties. Revenue generated by the NMUSA would most likely benefit the entire Greater Washington Metropolitan Area.

Who lives in the study area?

The Greater Washington Metropolitan Area is a large and growing metropolitan area with a population estimated at over 4.9 million people in 2005. Strong population growth is expected to continue through 2030 (*Metropolitan Washington Council of Governments [MWCOG], 2005[a]* in: *US Army Corps of Engineers, Mobile District*, August 2007), and the population along Northern Virginia's I-95 corridor (including Fairfax County, Fairfax City, Falls Church City, Prince William County, Manassas, and Manassas Park City, and Stafford County) is expected to have increase by 177,000 (11 percent) by this year 2010 (*US Army Corps of Engineers, Mobile District*, August 2007). Fairfax County is the jurisdiction with the largest population in the Greater Washington Metropolitan Area. In 2009, an estimated 1.05 million people lived in Fairfax County (*Fairfax County Website*, 2010). Fairfax County's population is expected to increase by 31,000 people (3.2 percent) by the year 2015.

As of January 2006, Fort Belvoir had a working population of about 22,150 persons and supported 2,070 family housing units (*US Army Garrison Fort Belvoir Website*, 2006). This number is growing by about 12,730 additional at the main post (for a total of 34,880) and approximately 6,409 personnel at Mark center, a 24-acre site at the intersection of Seminary Road and I-395 in Alexandria as a result of the 2005 Defense Base Closure and Realignment actions (*College*, August 2007; *US Army Fort Belvoir BRAC EIS Website*, May 2009). Other personnel being shifted to Fort Belvoir functions as a part of BRAC would be sent elsewhere in the Greater Washington Metropolitan Area, and are not included in the analysis of this Subchapter.

Approximately 6,630 people live on Fort Belvoir (*US Army Garrison Fort Belvoir Website*, 2006). Table 3.11-1 provides

Census Designated Place

A CDP is a non-incorporated area identifiable by name with sufficient density of population to justify singling them out for census purposes.

Minority Populations

According to CEO guidance on Executive Order (EO) 12898, “minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.”

data from the 2000 US Census on race and ethnicity for Fort Belvoir, Fairfax County, and Virginia. Table 3.11.2 provides similar data as estimated for 2005 by the American Community Survey. These data are important because Executive Order (EO) 12898 (*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*) requires all federal agencies to evaluate how their programs, policies, and activities could affect minority and low income neighborhoods. Federal agencies must examine whether their proposed actions are having an unfair effect on neighborhoods or communities because of their race, color, or national origin.

For Tables 3.11-1 and 3.11-2, the “Fort Belvoir Census Designated Place (CDP)” coincides with the boundaries of Fort Belvoir, while Accotink Village is a small village on US Route 1, surrounded by Fort Belvoir property. Accotink Village and Fairfax County are home to proportionately more non-white minorities than the state as a whole, but more than half of the population of Accotink Village (210 out of 390 residents) belongs to a racial or ethnic minority. Therefore, Accotink Village qualifies as an environmental justice community on the basis of racial or ethnic criteria.

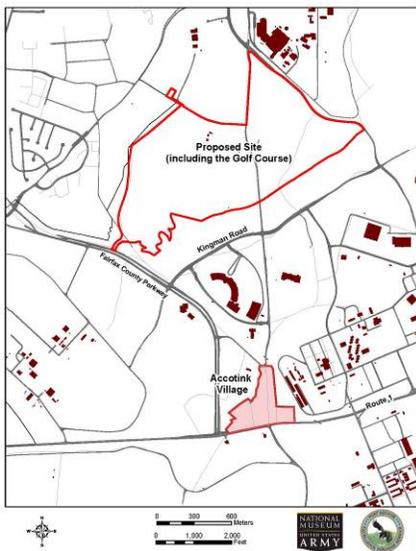


Figure 3.11-1: Accotink Village, In Relation to the Proposed Site

Table 3.11-1 Race and Ethnic Distribution for 2000 Census (Percent)

Jurisdiction	White	Black ¹	Other Non-White	Two or More Races	Total Non-White	Hispanic ²
Fort Belvoir CDP	55.7	31.8	8.2	4.3	44.3	10.5
Accotink Village ³	46.2	37.4	12.1	4.3	53.8	7.9
Fairfax County	69.9	8.6	17.9	3.7	30.1	11
Commonwealth of Virginia	72.3	19.6	6.1	2.0	27.7	4.7

Source: US Census Bureau Website, February 2005

¹ Having origins in any black racial groups of Africa.

² Hispanic origin, may be of any race.

³ Block group 2 of census tract 4220.

Table 3.11-2 2005 Total Population Estimate (Percent)

Race	State of Virginia	Fairfax County	8 th Congressional District
White	71.7	68.3	68.8
Black or African American	19	9.2	13
Other Non-white	9.3	22.5	18.2
Hispanic (any race)	6	12.6	15.6

Source: US Census Bureau, 2005 American Community Survey

Note: The 2005 American Community Survey does not break out data for the Fort Belvoir CDP or Accotink Village. Instead, data for the 8th Congressional District (109th Congress) are presented; it is adjacent to Fort Belvoir, and includes Accotink Village and other parts of Fairfax

Table 3.11-2 shows that little change has occurred in the racial and ethnic distribution of Virginia and Fairfax County from 2000 to 2005. It also shows that both Fairfax County and the 8th Congressional District are more ethnically diverse than the state as a whole.

Are there low income communities located within the study area?**Low Income Populations**

According to CEQ guidance on EO 12898, low-income populations in an affected area should be identified using the annual statistical poverty thresholds from the Bureau of the Census.

Based on Census 2000 data, 5.6 percent of the population within the Fort Belvoir CDP was living in poverty (Table 3.11-3). However, military personnel salaries do not necessarily reflect benefits such as on-base housing or off-base housing allowances, Army-provided medical care, or the ability to purchase goods through the Post Exchange (PX). Income alone is therefore probably not a good metric for poverty level when considering a military community.

Table 3.11-3 Median Income and Poverty for 1999

Jurisdiction	Median Household Income (\$)	Median Family Income (\$)	Persons Living in Poverty (Percent)
Fort Belvoir CDP	39,592	39,107	5.6
Accotink Village ¹	31,696	26,875	N/A
Census Tract 4218 Block Group 1	46,284	47,440	N/A
Fairfax County	81,050	92,146	4.5
Commonwealth of Virginia	46,677	54,169	9.6

Source: US Census Bureau Website, 2005 and 2008.

¹ Block group 2 of census tract 4220

No Census 2000 poverty data are available for Accotink Village alone. However, income data from 1999 indicate that the median household income in Accotink Village at that time was \$31,696, as opposed to \$81,050 for Fairfax County and \$46,677 for Virginia as a whole. Thus, Accotink Village is significantly poorer than the surrounding jurisdictions, and qualifies as an environmental justice community on the basis of income.

Fairfax County, on the other hand, is one of the most prosperous jurisdictions in the United States. The Fairfax County Website (2008) does indicate a census tract (Census Tract 4218) located immediately east of the Post along US Route 1 where the 1999 median family income distribution is less than \$50,000. The US Census Bureau Website shows median household and median family incomes of \$46,284 and \$47,440, respectively. While significantly lower than the county medians, these figures are not greatly lower than the state medians.

Would the project unfairly affect minority or low-income populations?

To answer this, one needs to determine 1) how would the proposed action affect people living in the area, and 2) whether

the residents of Accotink would be more (disproportionately) affected as compared to other residents in the area.

The most likely impacts to residents around Fort Belvoir and especially the proposed site would be:

- The noise, dust, and fumes generated by construction machinery, as well as increases in traffic from construction workers and trucks delivering construction materials or hauling away debris; and
- During operation of the NMUSA and the golf course, the noise generated by ceremonies, re-enactments, and events on the parade ground, re-enactment camps, and amphitheatre, as well as the traffic generated by visitors and employees to the NMUSA.

The details of these impacts – how the project would affect traffic and air quality for all residents – are addressed in Sections 3.7 and 3.12 of this document.

Accotink Village is located 3,500 feet from the site. The Mount Air neighborhood, which is not a minority or low income community, is the closest residential area. Construction and operation of the NMUSA is unlikely to cause noise at levels that would be perceived by Accotink Village, while residents of Mount Air may experience slightly elevated noise levels during construction, or again during special events such as reenactments.

Neither location would likely be exposed to a greater degree of air quality impacts, either during construction or operation, than other residents of the post, the area, or travelers along US Route 1. As for traffic, the additional vehicle trips from NMUSA visitors and employees/volunteers would not be significant, and any impact from these trips would be shared by residents at Fort

Belvoir, Accotink Village, and this part of Northern Virginia equally. Therefore, the proposed NMUSA project would not result in disproportionate impacts to residents of Accotink Village.

What about children living in the study area?

Table 3.11-4 shows the percentages of the populations at Fort Belvoir CDP, Accotink Village, Fairfax County, and Virginia that are under 18, as of 2000. The Fort Belvoir CDP had a higher proportion of under-18 residents than the state as a whole, because of the many military families housed on the Post. These under-18 residents are likely to be concentrated in the residential areas of the Post, most of which are located on the South Post.

Similar to the EO 12898, EO 13045, Protection of Children from Environmental Health Risks and Safety Risks, requires government agencies to recognize that children may suffer more than adults from environmental health and safety risks. (Children are more apt to ingest or touch items that contain contaminants, e.g., lead paint on window sills). This EO directs federal agencies to identify and assess such risks, and to ensure that its policies, programs, activities, and standards address effects on children.

Environmental Health and Safety Risks

EO 13045 defines these risks as “risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest.” Regulatory actions that are affected by this EO are those substantive actions that involve an environmental health risk or safety risk that an agency has reason to believe may disproportionately affect children.

Table 3.11-4 Under-18 Population in 2000 (Percent)

Jurisdiction/Area	Population under 18
Fort Belvoir CDP	44.4
Accotink Village ¹	20.3
Fairfax County	25.4
Commonwealth of Virginia	24.5

Source: US Census Bureau Website, February 2005.

¹ Block group 2 of census tract 4220

Would the proposed action disproportionately affect children?

The first thing to consider is that the proposed action would involve no industrial processes likely to generate contaminants. All materials used for construction would be free of lead paint and similar toxic materials.

Lawn and garden maintenance would involve use of fertilizers, herbicides, and pesticides, and maintenance of the buildings would involve use of cleaners. Pesticides would be applied by certified applicators, using the principles of Integrated Pest Management. The products used for cleaning and grounds maintenance would be similar to the products used in household applications.

The NMUSA would also store cannons, gunpowder, and dummy ordnance for ceremonies involving salutes and re-enactments. Children would be excluded from access to locked storage closets and vaults where these materials would be kept. It is very unlikely that children from adjacent neighborhoods would gain access to the NMUSA grounds without adult supervision. Therefore, the project would be unlikely to have the an adverse affect on children.

Is there a high or low rate of employment within the study area?

The Virginia Employment Commission reported Fairfax County's employment in April 2009 to be 568,789. The number for Virginia as a whole was 3,879,460; thus, Fairfax County accounted for almost 14.7 percent of statewide employment. Unemployment in Fairfax County for April was 4.5 percent, as compared with 6.6 percent for Virginia and 8.6 percent for the United States as a whole (*Virginia Employment Commission*

Website, June 2009). However, these rates have risen from 2007, when the comparable rates were 2.2 percent for Fairfax County, 3.0 percent for Virginia, and 4.6 percent for the United States as a whole (*Virginia Employment Commission Website*, July 2008).

Would the proposed action increase or decrease area employment?

The project would very slightly increase employment. The anticipated workforce at the NMUSA would be 170 additional people (15 employees are already working at Fort Belvoir), but many of these workers would be volunteers. Most of the paid positions could be filled from the local workforce, with very few potential employees having to move their residence to the area. The realignment of the golf course would not change the staffing requirements of the North Post Golf Course. There would be no measurable impact to the demographics of Fairfax County and Fort Belvoir.

Even if all 170 additional workers were paid employees, this number would only represent approximately 0.83 of a percent of the current population and 0.43 of a percent of the future population under the changes mandated by BRAC (which would bring about 12,730 new workers to the main Post, as per the Record of Decision (ROD) for the BRAC EIS and subsequent decisions (*College*, August 2007; *Fort Belvoir BRAC EIS Website*, May 2009)). Therefore, the impact of the proposed action on the Fort Belvoir working population, from both a direct and cumulative perspective, would be small. The impacts of the proposed action on employment in Fairfax County from both a direct and cumulative perspective would be even smaller.

Construction of the NMUSA and the realignment of the golf course would generate direct economic benefits for the contractors and employees performing the work, and indirect

benefits to the communities in which the contractors are based. The additional earnings generated by the work would be felt further down the line as these earnings are spent in the local economy. These positive impacts would be relatively small and temporary.

Operation of the NMUSA would generate more substantial benefits as visitors and participants in the ceremonies and reenactments spend money at local hotels, restaurants, and service stations.

3.12 Community Facilities & Services

What are community facilities and services?

Community services include government-provided safety, security, and medical services. Community facilities are primarily schools and active and passive recreational facilities in public ownership. An increase in population living or working within a specific area can increase the need to use these services and facilities, thus pressuring governments to expand services or provide additional new facilities.

Because the proposed action is unlikely to cause an influx of new residents, the Army has not addressed impacts on schools or hospital services in this EA.

What is the study area for this analysis?

The study area for this project includes Fort Belvoir and that part of Fairfax County adjacent to the Post. It is these communities that would most likely provide the services and facilities that would be used by the proposed NMUSA employees, volunteers, and visitors.

Who provides safety and security services in the study area?

Safety and security issues at Fort Belvoir are handled by the Army's Military Police (MP) and Fire and Emergency Medical Services (EMS). The MP headquarters are located on Abbot Road, on the North Post.

There are three fire stations on Fort Belvoir, housing five fire companies (three engine companies, one ladder truck company, and one airport crash company), with a total staff of approximately 65 firefighters (Fort Belvoir Directorate of Public Works [DPW] ENRD, 2002, in: US Army Corps of Engineers, Mobile District, August 2007). At least 21 firefighters are on duty 24 hours a day. The closest Fort Belvoir fire station to the site is located across the Fairfax County Parkway at Davison Army Airfield (Station 66) (Fairfax County Geographic Information Systems [GIS] Website, May, 2008).

Fort Belvoir also has mutual aid police and fire service agreements with Fairfax County (US Army Corps of Engineers, Mobile District, August 2007). The Fairfax County stations located closest to the site are Fairfax County Fire Station 37 at 7936 Telegraph Road, and the Franconia Police Department at 6121 Franconia Road (Fairfax County GIS Website, May 2008).

How would the proposed action affect these services?

Any proposal that has the potential to increase the number of buildings, employees, or visitors to an area would have the potential to cause a proportionate increase in the demand for fire, police, and emergency medical services. However, the increase in number of buildings is minimal when compared to the number

of buildings in Fairfax and the neighboring sections of Fairfax County.

Fewer than 185 employees, volunteers, and contractors are expected to be associated with the NMUSA and the reconfigured golf course. Most of these people would come from Fairfax County, and therefore already use County services. Added to the peak daily average of 4,800 visitors per day, this impact would be minor compared to the number of Fort Belvoir employees that are presently using (22,150), or that would be using (34,880) these services by the time the NMUSA would be fully constructed - especially since these visitors would be likely to only spend 2 or 3 hours a visit, and their visits would be spread throughout the day. The impact of the project on these services would therefore be minimal.

What recreational facilities are available to Fort Belvoir workers and residents?

Fort Belvoir offers 1,006 acres of recreational areas that are convenient to the population they serve. Facilities include the two 18-hole golf courses at the North Post Golf Course, officers and non-commissioned officers clubs, tennis courts, swimming pools, softball and soccer fields, etc. In addition, the Dogue Creek Marina rents boats and slips and dry-storage facilities. There are a number of smaller parks and picnic areas, including the Anderson Park Picnic Area, located just south of the Gunston site on Ehlers Road, across from the Davison Army Airfield.

Some of Fort Belvoir's undeveloped areas are open to recreational use: two wildlife refuges; fishing at Mulligan Pond and along Gunston Cove, Accotink Creek, Dogue Creek, and Pohick Creek; bow hunting in designated areas; bird watching, hiking, nature photography, and environmental education

programs at the Accotink Bay Wildlife Refuge Education Center along with 10 miles of trails.

The Fort Belvoir FMWR program manages the 36-hole North Post Golf Course. The former 9-hole South Post Golf Course has been displaced to make room for the new Belvoir Community Hospital and proposed Warrior in Transition Unit (WTU) complex.

The Fairfax County Park Authority operates 388 parks on more than 23,000 acres. Facilities include nine indoor recreational centers, nature and visitor centers, eight golf courses, five nature centers, a horticulture center, a working farm, an activities/equestrian center, an indoor ice-skating rink, a skate park, a water park, campgrounds, and hundreds of athletic fields, tennis courts, picnic areas, playgrounds, historic sites and trails. A wide variety of activities and programs are operated at the county parks and recreational centers (Fairfax County Website, 2005).

How would the construction of the NMUSA and the realignment of the golf course affect these facilities?

Construction of the NMUSA would cause the loss of the front nine (direct loss of five and functional loss of one more) holes on the North Post Golf Course. This loss would functionally, if not mitigated, reduce the course from 36 to 27 holes relatively soon after the loss of the 9-hole South Post Golf Course. The loss of the South Post Golf Course through BRAC has reduced the revenues to the MWR program by an estimated 30 percent. Moreover, closure of the South Post Golf Course has likely resulted in an increase in use of the North Post Golf Course, causing peak period tee-time competition, frustrating patrons,

and reducing opportunity to play golf (*US Army Corps of Engineers, Mobile District*, August 2007).

As addressed in Chapter 2, the Army would construct new holes and redesign the North Post Golf Course to return it to 36 holes in a timely manner following the construction of the NMUSA. The financial impact of the loss of nine holes (i.e., if only 27 holes remained after construction of the NMUSA) to FMWR would be significant (from \$108,000 to more than \$250,000 annually) (*Golf Course Market Analysis and Feasibility Study*, NGF Consulting, November 2008).

Overall, the construction of the NMUSA would have a moderate, short-term impact to the North Post Golf Course, as nine golf holes are made temporarily unavailable to patrons.

How would the operation of the NMUSA and the realigned golf course affect these facilities?

Because the Army would reconfigure the North Post Golf Course to retain 36 holes (with a par of no less than 35 for each of the nine holes) the operation of the NMUSA would not have a significant long-term impact to golf course patrons and the FMWR program.

The impacts to other recreational facilities would be similar to the impacts on fire, police, and emergency medical services – a negligible increase in the demand for, and therefore pressure on, recreational areas. Some impacts to traffic entering Anderson Park would be expected. Specifically, closing the existing median break would cause an increase in travel distance, because drivers would have to perform a U-turn to enter the park.

As a recreational and educational facility, the NMUSA itself would represent an additional amenity for local residents, and would therefore have positive impact on these resources.

How would the Army mitigate the impact to community facilities and services?

The Army would use a phased approach to construction that would not remove golf holes from play until absolutely required for the safe and efficient completion of the NMUSA. The long-term impacts to the golf course from the NMUSA would be mitigated through the subsequent redesign of the course to retain 36 holes. The Army Historical Foundation would provide a gift to the Army which would encompass the construction of NMUSA and mitigation measures to include the reconfiguration of the golf course holes.

3.13 Transportation and Traffic

The team of Berger-Smith Group and their sub-consultants has conducted a feasibility study (Berger/SmithGroup, August 2008). It is therefore possible that the estimate of expected future conditions may change as more up-to-date information is provided. The full review of the feasibility study is included as part of the transportation technical document in Appendix E.

What is traffic like now?

Traffic on roadways surrounding Fort Belvoir is generally congested in the peak direction of traffic flow in both the morning (AM) and evening (PM) peak periods; the morning peak direction is towards the District of Columbia while the evening peak direction is south and westbound. Traffic tends to flow unimpeded in the off-peak direction of flow, except for traffic queuing to turn into Fort Belvoir. Peak period traffic

congestion affects all three major arteries that serve Fort Belvoir: the Fairfax County Parkway, US Route 1, and I-95. I-95 is typically congested for up to three hours during each of the peak flow periods.

Congestion also occurs at intersections that are the access points or adjacent to the access points for Fort Belvoir: US Route 1 intersections with the Fairfax County Parkway, Pohick Road (Tulley Gate) and Belvoir Road (Pence Gate); and the intersection of the Fairfax County Parkway and John J. Kingman Road (Kingman Gate). During the AM peak period, Fort Belvoir often has heavy inbound flows at all the gates; queues form as people wait for security checks. Sometimes, traffic backs up onto US Route 1.

Once vehicles are on the installation, some congestion occurs at key intersections scattered around Fort Belvoir: Gunston Road near Jackson Loop, where ingress and egress can be difficult for turning vehicles; the Twelfth Street, Pohick Road and Gunston Road intersection; and the Gunston and Gorgas Road intersection. Generally speaking, traffic congestion on Fort Belvoir is less severe than on US Route 1 or Fairfax County Parkway.

In the PM peak period, traffic leaving Fort Belvoir is very heavy. On John J. Kingman Road and Belvoir Road, vehicles often have to wait several cycles at the traffic signals in order to get onto US Route 1 or Fairfax County Parkway. These corridors are often congested in the peak direction of traffic.

During the off-peak hours, little traffic congestion occurs on roadways near the installation. Traffic turning along Gunston Road at Jackson Loop has longer wait times because drivers have to find an acceptable gap to enter the traffic stream. On-

Post, Gunston Road is the major internal north-south connection between North and South Posts.

Under the current design, all NMUSA patron traffic would enter the NMUSA's parking lots directly, without going through one of the Post's security gates. Patrons of the North Post Golf Course would continue to enter through one of the installation's security gates.

Are there safety concerns in the study area?

No safety concerns exist at this time along the Fairfax County Parkway. However, as part of the BRAC 2005 Implementation, Fort Belvoir is reviewing the infrastructure needs on Main Post. Included with this is the identification of safety concerns and measures to correct the concerns. As roadway improvements are designed, any deficiencies to correct safety issues would be included in the upgrades and/or improvements.

What transit service is available in the study area?

The Washington Metropolitan Area Transit Authority (WMATA) operates the REX Express along the US Route 1 Corridor, linking Fort Belvoir to the Yellow Line Metrorail Station, the King Street Virginia Railway Express (VRE) commuter rail station, and the Amtrak Station to the northeast. On South Post, the route runs along Belvoir Road, 9th Street, and Jackson Loop.

The Fairfax Connector bus service, operated by Fairfax County, includes a route that provides service to the DLA complex off John J. Kingman Road on North Post. The route links North Post to the Springfield Transportation Center, where a Blue Line Metrorail Station, a VRE station, and a bus transfer station are

located. VRE links to points south, and the Metrorail line provides service to Ronald Reagan National Airport, the Pentagon, and central Washington, DC, with connections to each of the other Metrorail lines. A number of private commuter bus operators have services at the Springfield Transportation Center. Metrorail stations are located within four miles (Blue Line) and seven miles (Yellow Line) of Fort Belvoir. Currently, few on-Post shuttle circulator services exist.

There is also an old railroad bed along the north side of the Fairfax County Parkway that has been reserved as right-of-way for a future transit corridor. It is Fort Belvoir's intention to make every effort to preserve this transit corridor for future use.

How does the Army determine future traffic volumes?

The first step in the process is to document the existing traffic volumes at key intersections near the site by performing traffic counts. Once the current volumes are known, historical growth factors are used to project future traffic volumes. Then, traffic generation rates from other similar projects (or rates published by the Institute of Transportation Engineers) are used to add site-specific traffic impacts expected due to the proposed project.

For this project, traffic was first projected to the year 2013. Then the projected traffic due to BRAC was factored in. This produces the 2013 No-Build volumes, which are then used as a comparison to measure the impacts of the proposed project. The full details of the development of the future volumes and the traffic analysis can be found in Appendix E. (The traffic analysis measured the impacts at both the proposed site and the Pence Gate site. The latter has since been removed from consideration.) Clark-Nexsen (*Clark-Nexsen, 2005*) also examined traffic patterns at other museums in the region to develop projections of

traffic volumes for the NMUSA based on its size and the expected number of daily visitors. It was assumed that the golf course would maintain current traffic volumes and patterns. These volumes were layered onto the roadway network – on top of the No-Build volumes – to develop the Build alternative volumes.

Access to the site would be from the Fairfax County Parkway, from an intersection located between the Parkway's intersection with John J. Kingman Road and Ehlers Road.

How would the proposed action affect future traffic volumes?

The proposed action would increase traffic volumes on regional roadways surrounding Fort Belvoir – mainly the Fairfax County Parkway. It is assumed that there would be no net change in traffic for the golf course. Because most of the traffic to and from the NMUSA is expected to occur during the off-peak hours – after the morning peak period and before the evening peak – little impact is expected to commuting traffic. The NMUSA would contribute less than 10 percent of the total traffic stream during the AM and PM peak hours. The traffic generated by the proposed action would increase traffic volumes on the Fairfax County Parkway during the off-peak hours, but is expected to have little impact on traffic flows because sufficient capacity already exists during the off-peak hours. The additional NMUSA traffic that would occur during the peak hours would increase traffic volumes at key intersections, and increase delays slightly.

The existing median break for Ehlers Road and Anderson Park would need to be closed. This would require some vehicles accessing the Park to make a U-turn at the Telegraph Road interchange or at Kingman Road to enter or exit the Park, based on their origins and destinations.

Overall, the impact to future traffic volumes is expected to be minor in the long-term.

How would the proposed action affect transit?

Impacts to transit are expected to be negligible. As most of the visitors are expected to travel to and from the NMUSA during the off-peak period, it is expected that little impact to the existing transit services would occur. Currently, the site has no direct transit service. It is unknown at this time whether the site would be serviced in the future by either WMATA's Metrobus or the Fairfax Connector. These agencies periodically review their service plans and make adjustments at a regional level. The Army is currently working to develop mass transit options for Fort Belvoir which would include the NMUSA. These options, still under development, could include connections to local Metrorail stations and may include the old railroad bed mentioned above.

How would local surface streets operate in the future?

For the No Build alternative, it is expected that traffic conditions would continue to deteriorate as traffic volumes continue to grow. Prior to the opening of the NMUSA, a number of roadways would have been widened or improved as part of the BRAC action (including Belvoir, Pohick and Gunston Roads, and Ninth Street), existing gates would have been improved (Pence and Tulley Gates), and a new gate is proposed for construction in the location of the old Lieber Gate. These projects are being implemented in conjunction with the BRAC action and would be in place for the baseline (No-Build) analysis. Because most of the NMUSA traffic is expected to enter and leave the site during off-peak commuting hours, little impact is expected to occur during the peak hours.

For the Build alternative, delays would increase at the intersection of Fairfax County Parkway and John J. Kingman Road, and at the NMUSA access road intersection. The operational performance of the local roadways is expected to deteriorate slightly over the No Build alternative. It should be noted that while some intersection turning movements would worsen, other movements would improve as the results of new signal operations. Therefore the expected impact would be minor over the long-term.

The impacts of the proposed action on future plans to improve the John J. Kingman Road/Fairfax County Parkway intersection, and traffic in general, are addressed in Subchapter 3.15. The Army intends to work with VDOT to develop a Memorandum of Agreement to document their mutual understanding of the transportation solutions required by the NMUSA.

How would the proposed action affect bicycle and pedestrian facilities?

The new access roads into the NMUSA would be designed to minimize conflicts with existing bicycle and pedestrian facilities. Depending on the construction sequence, short-term closures of bicycle and pedestrian facilities might be required during construction. However, these facilities would reopen once construction is completed.

The final site design would include bicycle racks and access from public roadways for bicycles and pedestrians. Access to and from the Potomac Heritage Trail may also be available at the NMUSA. However, the trail is still in planning stages, and its exact alignment is not currently known.

Impacts to bicycle and pedestrian facilities are expected to be negligible.

How would the NMUSA affect transportation?

The proposed action would have minimal impact to the transportation network, because most of the trips to and from the site are expected to occur during off-peak hours. Some localized impacts at the direct point of access are expected to occur, but these impacts would not affect the overall transportation network around Fort Belvoir.

How would the Army avoid or minimize adverse effects from construction?

Because most of the construction would occur off of existing roadways, the traffic impacts are expected to be minimal. At the site access point, minimal impacts would result from tying in the new roadway improvements. Before the start of any project that affects VDOT roadways (including intersection improvements due to a new entrance), the developer is required to submit Maintenance of Traffic (MOT) plans to VDOT for review (VDOT Location and Design Division, *Instructional and Informational Memorandum IIM-LD-241.2*, Richmond Virginia, September 2007). This required submission would also include engineering studies that demonstrate that the MOT sequencing would not affect the peak hour traffic.

To minimize adverse traffic effects, the Army would develop MOT plans for any access point tying in to state roadways during the final design phase. VDOT would review and approve the MOT plans to ensure that impacts are minimized, prior to granting access to state roadways. Typically, VDOT does not permit construction on the roadways during the peak hours, to avoid impacts to the peak hour traffic flows.

3.14 Impact Summary

Table 3.14-1 provides a summary of the impacts of the proposed action compared to the No Action alternative. Substantial differences between the surface and Structured Parking Alternatives have been noted. Otherwise, the impacts of the Surface Parking Alternative would, for the most part, be only slightly greater than the impacts of the Structured Parking alternative, depending on the issue or resource impacted.

Table 3.14-1 Impact Summary

ISSUE	PROPOSED ACTION	NO ACTION
Land Use, Plans and Coastal Zone Management	Moderate impact – temporary, functional reduction of 36-hole golf course. (Fort Belvoir MWR would reconfigure the golf course to provide 36 holes with par 35 for each nine.)	No impact
Soil and Topography	Minor impacts - 192,000 cubic yards of cut and fill (Surface Parking) 261,300 cubic yards of cut and fill (Structured Parking)	No impact
Upland Vegetation and Wildlife	74.9 acres of mixed habitat affected. Minor impact to potential habitats for special status wildlife and plants (Northern Virginia well amphipod and small whorled pogonia). Impact to RPA, wetlands riparian buffer and intermittent stream.	No impact
Surface Water, Water Quality, and Floodplains	Minor direct (shoulder of access road) and indirect impacts to streams. Increase in surface water runoff, velocities, and infiltration rates.	No impact
Wetlands and Chesapeake RPAs	Direct minor impacts from road crossing the perennial stream (209 lf) to the west, associated wetlands (0.114 ac), and Chesapeake Bay RPA (2.113 ac). Minor direct impact to either stream, RPA, and riparian buffer based on the final design of utilities.	No impact
Historic, Cultural, and Architectural Resources	Negligible	No impact
Hazardous Substances	Minor impacts from construction, generator tanks	No impact
Air Quality	Minor impacts - Temporary construction impact; impact from generators.	No impact

ISSUE	PROPOSED ACTION	NO ACTION
Noise	Short and long-term minor impacts from construction machinery and ceremonies and other events.	No impact
Infrastructure and Utilities	Moderate impacts - Sanitary sewer pump station required, sanitary sewer line might require upgrade;	No Impact
Socioeconomics	No impact	No impact
Community Facilities and Services	Moderate impact - Temporary, functional reduction of 36-hole golf course.	No impact
Transportation and Traffic	Minor impact – Minor long-term increases in traffic on local roadways.	No impact

Description of Impacts

- 1. Negligible: lowest impact; generally unnoticeable
- 2. Minor: second-lowest impact; limited or minute
- 3. Moderate: third lowest impact; not significant
- 4. Significant: greatest impact

Cumulative Impacts

The Council on Environmental Quality's (CEQ) regulations for implementing NEPA define cumulative impacts as:

Impacts on the environment, which result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.

3.15 Cumulative Impacts

What are cumulative impacts?

Cumulative impacts are the incremental impacts caused by one action added to other past, present, and reasonably foreseeable future actions. The consideration of cumulative impacts is not necessarily restricted to only those actions caused by the same agency or project proponent. It is important that the effects of the project be examined in the context of other development in the community or region (CEQ, January, 1997).

What is the study area for this analysis?

The study area for this project includes Fort Belvoir and the adjacent portions of Fairfax County.

What other actions are reasonably foreseeable in the project area?

A number of other, reasonably foreseeable actions could contribute to impacts on the human environment along with the expected impacts from the NMUSA. Implementation of BRAC 2005 is involving construction of more than 40 facilities at Fort Belvoir to support realignment of Army agencies and associated transfers of personnel. In addition, the Army foresees approximately 30 non-BRAC projects at the installation – including this project – that would occur at roughly the same time as the BRAC actions.

Both BRAC and non-BRAC actions would range from small scale projects involving only renovations to existing buildings, to large projects involving the construction of new structures and associated parking, utilities, and other infrastructure. For the BRAC 2005 EIS process, Fairfax County identified over 185 publicly and privately-proposed projects, planned within three

miles of Fort Belvoir, 20 of which are at least 20 acres in size (US Army Corps of Engineers, Mobile District, August 2007). As indicated in Subchapter 2.6, long-range transportation plans (circa 2030) for the Fairfax County Parkway/John J. Kingman Road intersection include the construction of an overpass to handle projected traffic volumes. This overpass would be built whether or not the NMUSA is constructed, and the environmental impacts of its construction and operation would be dealt with in a separate NEPA document. However, the preliminary overpass design would be modified to accommodate the NMUSA entrance and exit.

To what extent would the proposed action contribute to cumulative impacts?

The proposed action would change land uses at the proposed site and contribute to the development of open land that has been occurring in Northern Virginia over the past three decades. However, the proposed site was previously disturbed when the golf course was constructed. While relatively open, much of it is not natural habitat but is constantly maintained by mowing and other maintenance activities. Use of the golf course for the NMUSA would, together with the recent loss of the South Post Golf Course, temporarily contribute to a cumulative reduction in golfing at the Post, but only for the short term while construction of new holes and upgrading old holes is underway. The proposed action would contribute to the development of open and forested land.

Construction of the NMUSA and the realignment of the golf course, along with nearby, reasonably foreseeable projects would involve soil excavation and would cause an increase in impervious surface in numerous locations, many within the same watershed. These activities could result in greater cumulative soil erosion and sedimentation and other pollution impacts to the

receiving water bodies and wetlands, and eventually, the Potomac River and Chesapeake Bay. Cumulatively, these effects could adversely impact sensitive aquatic resources, as well as other users (wildlife and human) of these water bodies and wetlands. However, any land disturbing activity greater than one acre would require a VSMP and Stormwater Pollution Prevention Program (SWPPP), and adherence to the Virginia erosion and sediment control standards would ensure that non-source pollution control impacts are minimized during construction.

The Army would also follow the Fairfax County Chesapeake Bay Preservation Area regulations to minimize long-term impacts on water quality. Stormwater management ponds would be designed to provide compliance with BMP nutrient and sediment reduction goals. Therefore, the NMUSA contribution to cumulative impacts on receiving surface waters at either site would be minor.

The air quality and traffic modeling for this EA have included the construction and operation of other reasonably foreseeable projects (on- and off-post, BRAC and non-BRAC) as background conditions against which to measure the impacts generated by the NMUSA project. Moreover, the effects of all past, present, and reasonably foreseeable projects in the region and their associated emissions are taken into account during the development of the State Implementation Plan (SIP). Estimated emissions generated by any of the NMUSA alternatives would conform to the SIP or be below the applicability thresholds, and not contribute to significant adverse cumulative air quality effects.

State Implementation Plan (SIP)

The SIP contains mobile, non-road, and vehicle emissions broken down by county. It accounts for growth as part of its planning process – it accounts for emissions on a county level and then sums them into a regional level.

The proposed action would not cause any appreciable long-term increases in the overall noise environment, or significant, adverse cumulative effects to the noise environment.

In response to VDOT's comments on the draft EA, the Army contracted a highway design expert to provide a concept plan that shows how the NMUSA entrance can be incorporated into the future upgrade and expansion of the Fairfax County Parkway / John J. Kingman Road intersection (Subchapter 2.6). (The Fairfax County Comprehensive Plan includes improvements to this intersection around the year 2030.) Traffic is already degraded at the Fairfax County Parkway / John J. Kingman Road intersection (it serves as a main entrance to the post) and anticipated future projects would degrade the LOS even more. The proximity of the NMUSA entrance to the Fairfax County Parkway / John J. Kingman Road intersection would drive the need for a more elaborate interchange configuration in 2030, to accommodate both the interchange and the NMUSA entrance, but it can be done (Figure 3.15-1). The Army intends to enter into a Memorandum of Agreement with VDOT to document future commitments on transportation solutions for the NMUSA site.

Whether or not the NMUSA is constructed at the Gunston site, the Fairfax County Parkway / John J. Kingman Road interchange improvements would most likely impact the Forest and Wildlife Corridor where it is crossed by the Fairfax County Parkway. Even without the NMUSA, the reconfigured east and westbound lanes and collector-distributor roads on either side of the Fairfax County Parkway would intrude approximately 75 feet further north and south into the corridor, where the Fairfax County Parkway already bisects the corridor. The NMUSA entrance would be moved about 700 to 750 feet to the southeast, but

Fairfax County Parkway / John J.
Kingman Road

For the 2030 intersection improvements, John J. Kingman Road and the NMUSA entrance could be connected with a collector-distributor road and with grade-separated bridges. The detailed operational analysis shows that the interchange concept allowing access to the NMUSA (see Figure 3.15-1) would perform acceptably under a 2030 condition (*Gorove / Slade Associates Inc., NMUSA Interchange Analysis – Fairfax County Parkway at Kingman Road*, August 2009).

would still be outside the FWC, and would not therefore increase impacts to the FWC.

The interchange and collector-distributor roads would also likely impact an old railroad bed along the north side of the Fairfax County Parkway that has been reserved as right-of-way for a future transit corridor. This would pose a higher construction cost when the interchange is developed because it would have to be elevated over the transit corridor. The height of both the interchange and possible extension of the transit corridor could be constrained by the height restrictions associated with the Nearby Davison Army Airfield. The full environmental impacts of the interchange improvements would be considered in a future NEPA analysis.

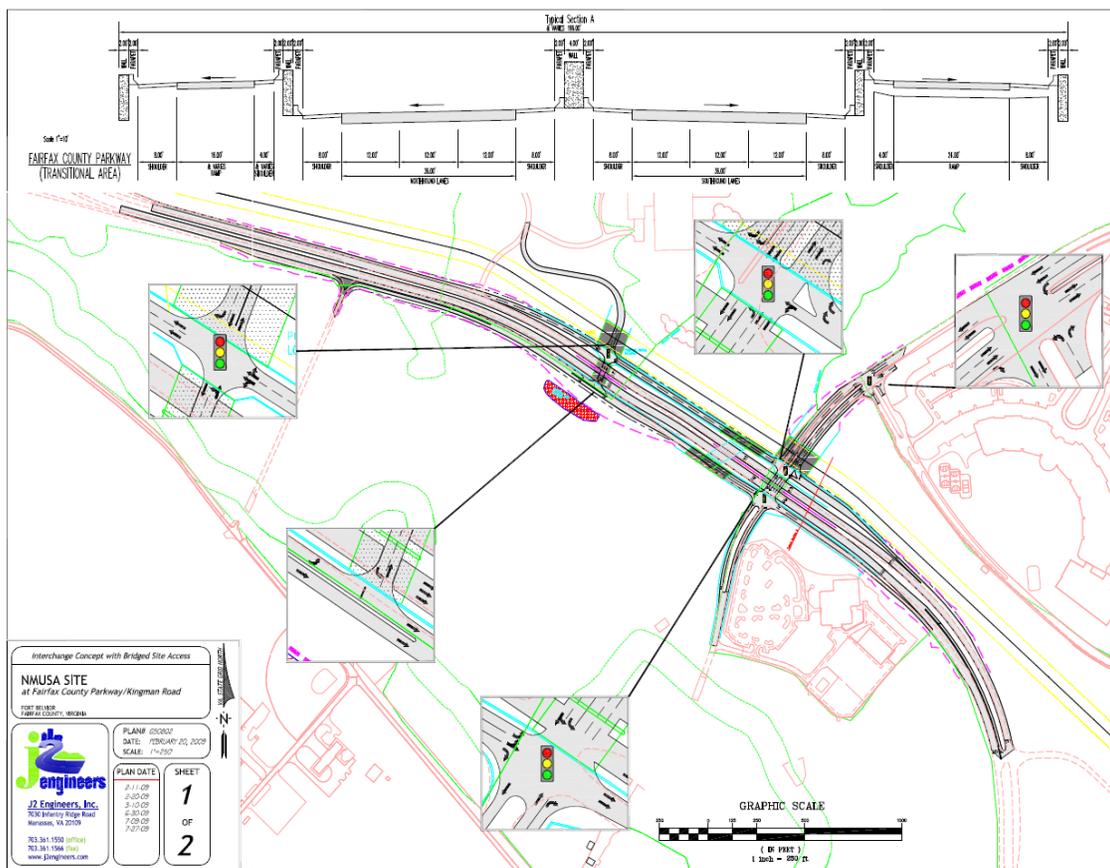


Figure 3.15-1: Concept for the Fairfax County Parkway/Kingman Road Interchange with Access to NMUSA

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Appendix A

Determination of Consistency with Virginia's Coastal Resources Management Program

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

REPLY TO
ATTENTION OF

OCT 14 2010

Directorate of Public Works

SUBJECT: Determination of Consistency with Virginia's Coastal Zone Management Program, National Museum of the United States Army

Ms. Laura McKay
Virginia Coastal Zone Management Program Manager
Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Dear Ms. McKay:

The Army plans to construct and operate the National Museum of the United States Army (NMUSA) at Fort Belvoir, Virginia. A draft Environmental Assessment (EA) has been prepared to evaluate the potential environmental effects of the proposed action.

The Army proposes to construct and operate the NMUSA on the Fort Belvoir North Post. The initial phase of construction would include a main museum building, a memorial garden, a parade ground, a grandstand, an amphitheater, an educational trail, and small comfort station, a small powder storage building, parking, roadways for visitors, employees, and service vehicles, and utility infrastructure. Subsequent construction could include expansion of the main museum building, the memorial garden and grandstand, a storage building, and an outdoor education center. The Proposed Action alternative is evaluated in the EA along with the No Action alternative. Construction would require: clearing and grading, excavating and trenching for utilities, and construction of buildings and other improvements.

We previously coordinated with your office in regard to this proposed action; however, the decision was made to prepare a second draft EA to accommodate the reconfiguration and realignment of the Fort Belvoir North Post Golf Course.

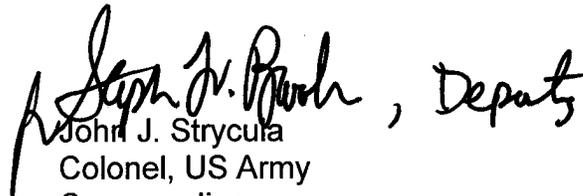
Enclosed is a topographic map to illustrate the proposed location for the NMUSA and golf course reconfiguration. We have determined that the Virginia coastal zone will not be adversely affected by the proposed action, and we request your concurrence with our determination.

“LEADERS IN EXCELLENCE”

The consistency determination incorporated as Appendix A of the draft EA represents an analysis of project activities in light of established Virginia Coastal Zone Management Program (CRMP) enforceable policies and programs. Submission of this consistency determination reflects the commitment of the Army to comply with the Virginia CRMP. The Army has determined that the construction and operation of the NMUSA and reconfigured 36-hole golf course would have negligible impact on land and water uses or natural resources of the Commonwealth of Virginia's coastal zone.

Point of contact is Bill Sanders, Director of Public Works at 703-806-3017.

Sincerely,


John J. Strycula, Deputy
Colonel, US Army
Commanding

Enclosures

Determination of Consistency with Virginia's Coastal Resources Management Program

Pursuant to Section 307 of the Coastal Zone Management Act of 1972, as amended, this is a Federal Consistency Determination for the construction and operation of the National Museum of the United States Army (NMUSA). The Army is required to determine the consistency of its activities affecting Virginia's coastal resources or coastal uses with 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 would 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 NMUSA would have a negligible impact on any land and water uses or natural resources of the Commonwealth of Virginia's coastal zone.

1 Description of Proposed Action

Under the proposed action, the Army would construct and operate the NMUSA on the North Post of Fort Belvoir. Construction of the NMUSA would occur in multiple phases, ensuring that all the elements of a successful museum opening are in place without allowing construction to outpace the availability of funding. The initial phase of the NMUSA would include a 177,000-gross square foot (gsf) multi-story main museum building with exhibit halls, a theater, a Veterans' Hall (auditorium), food service areas, retail areas, administrative spaces, an experiential learning center, and a lobby with a visitor reception area. This phase also includes Memorial Garden, Parade Ground, Grandstand, Amphitheater, Education, Survival and Interpretive Trail and small comfort station, and small powder storage building, parking, roadways for visitors, employees and service vehicles and utility infrastructure. Future expansion of the NMUSA may include expansion of the main museum building (up to 72,000 gsf), expansion of the Memorial Garden (up to 0.7 acre), expansion of the Grandstand (up to 12,000 gsf), a small storage building (2,000 gsf) and an Outdoor Education Center.

The proposed NMUSA site is located on the southern end of the North Post Golf Course, which would have to be realigned to maintain a 36-hole course. The Proposed Action alternative is evaluated in the Environmental Assessment along with the No Action alternative. Construction would require: clearing and grading, excavating and trenching for utilities, and construction of buildings and other improvements.

2 Assessment of Probable Effects

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

Fisheries - The Proposed Action alternative has no foreseeable impacts on fish or shellfish resources and would not affect the promotion of commercial or recreational fisheries. The proposed site is located approximately 2.6 miles northwest of the Potomac River and 1.4 miles from Accotink Bay. The closest water features are two perennial streams located adjacent east and west of the proposed building site. Both of these streams discharge to Accotink Creek, which is located approximately 1,500 feet south of the proposed building site, and discharges to the Potomac River. The contractor would be required to implement best management practices (BMPs) recommended by the Virginia Departments of Conservation and Recreation (DCR) and Forestry (DOF).

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

Tidal and Non-tidal Wetlands Management – The Proposed Action alternative would involve minor effects on tidal and non-tidal wetlands. The Army anticipates that the Proposed Action alternative would impact 209 linear feet of streams and 0.11 acre of wetlands. Minimal additional impacts are possible from the construction of utility corridors. The Army would try to avoid these impacts as much as possible during siting of the access road and utilities. In areas where avoidance is not possible, the contractor would use bridging, culverts or other methods to minimize impacts, or mitigations would be identified during the permitting process. The Army would obtain permits from the U.S. Army Corps of Engineers (USACE) and the Virginia Department of Environmental Quality (DEQ) prior to construction. The Army would provide compensation as required by the USACE and the DEQ for unavoidable impacts.

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

Non-Point Source Water Pollution Control – Land disturbing activities during construction would affect more than one acre and would require a Virginia Stormwater Management Program (VSMP) permit, and a Storm Water Pollution Prevention Plan (SWPPP). The Army would follow the Virginia erosion and sediment control standards of Title 10.1 Chapter 5, Article 4 of the Virginia Code to ensure that non-source pollution control impacts are minimized during construction. The Army would also follow the Fairfax County Chesapeake Bay Preservation Area regulations (Chapter 118 of the Fairfax County Code) to minimize long-

term impacts on water quality. Construction activities would be monitored to ensure that erosion and stormwater management practices are adequate to prevent sediment and pollution migration into nearby surface waters. Stormwater management ponds would be designed to provide compliance with BMP nutrient reduction goals. From these ponds, stormwater would be discharged into tributaries Accotink Creek. The Proposed Action alternative would therefore have a negligible impact on non-point source pollution.

Point Source Water Pollution Control –The Proposed Action alternative would be connected to the on-post sanitary sewer system. The Army would comply with the Virginia Pollutant Discharge Elimination System (VPDES) Stormwater General Permit for associated construction activities. Construction and operation of the NMUSA would therefore have negligible impact on point source pollution.

Shoreline Sanitation – The proposed NMUSA site is not located on or near a shoreline, and the NMUSA would not be equipped with a septic system. The Proposed Action alternative would therefore have no impact on shoreline sanitation.

Air Pollution Control – Adverse impacts would be minimal. Construction and operation of the NMUSA would be subject to Virginia DEQ Regulations 9 VAC 5-50-60, Control and Abatement Air Pollution, such as:

9 VAC 5-50-80/90	Visible and fugitive dust emissions.
9 VAC 5-40-55120	Restricting the use of cut-back asphalt (liquefied asphalt cement, blended with petroleum solvents) for paving during the months of April through October.

The proposed site is located within an ozone and PM2.5 non-attainment area, triggering the need to analyze emissions and determine the applicability of General Conformity Rule under the Clean Air Act (CAA). A construction emissions estimate indicates that the construction activity would not generate sufficient emissions to trigger a need for a full General Conformity Analysis. No changes to the Fort Belvoir’s Title V air permit would be required.

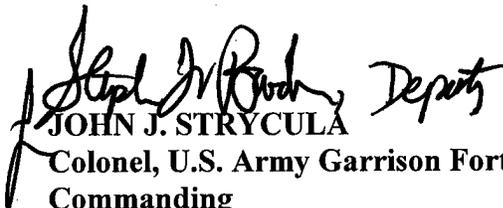
Coastal Lands Management – Construction and operation of the NMUSA would have no impact on any coastal lands.

Chesapeake Bay Preservation Areas – Fort Belvoir must be consistent with the performance criteria of the Chesapeake Bay Local Assistance Department Regulations to meet the enforceable policies of VCOMP. Construction and operation of the NMUSA would impact approximately 2.11 acres of Chesapeake Bay Resource Protection Area (RPA). The project would include BMPs to comply with Chesapeake Bay Resource Management Area Requirements.

3 Summary of Findings

Based on the above analysis, which is elaborated on in the EA, Fort Belvoir personnel would: ensure that the construction contractor uses and maintains appropriate BMPs; obtain the requisite permits and approvals; and implement measures to mitigate potential environmental impacts. With the proposed mitigation measures, Fort Belvoir finds that the proposed construction and operation of the NMUSA would be consistent to the maximum extent practicable with the federally approved enforceable provisions of Virginia CRMP, pursuant to the Coastal Zone Management Act of 1972, as amended and in accordance with 15 CFR 930.30.

By certification that the proposed action is consistent with Virginia CRMP Enforceable Policies, the Commonwealth of Virginia is hereby notified that it has six months from receipt of this letter to concur with, or object to, this Consistency Determination. However, pursuant to 15 CFR 930.62(b), if the Commonwealth of Virginia has not issued a decision within three months from receipt of this determination, it shall notify Fort Belvoir the status of the matter and the basis for further delay. The State's concurrence, objection, or notification of review status shall be sent to:

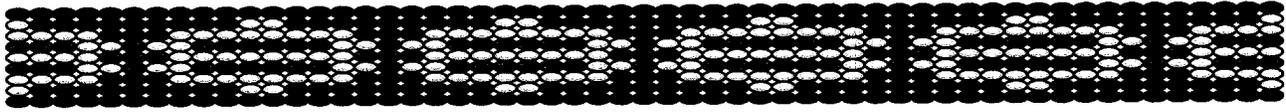

JOHN J. STRYCULA
Colonel, U.S. Army Garrison Fort Belvoir
Commanding
9430 Jackson Loop Suite 100
ATTN: IMNE-BEL-ELE
Fort Belvoir, VA 22060-5116

Appendix B
Correspondence

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Catawba Indian Nation
Tribal Historic Preservation Office
1536 Tom Steven Road
Rock Hill, South Carolina 29730

Office 803-328-2427
Fax 803-328-5791



February 25, 2010

Attention: Derek Manning
Cultural Resources Manager
9430 Jackson Loop, Suite 107
Fort Belvoir, VA 22060-5116

Re. THPO #	TCNS #	Project Description
2010-253-9		Boundary Delineation and Site Assessment Archaeological Site 44FX0663 Ft. Belvoir, VA

Dear Mr. Manning,

The Catawba have no immediate concerns with regard to traditional cultural properties, sacred sites or Native American archaeological sites within the boundaries of the proposed project areas. **However, the Catawba are to be notified if Native American artifacts and / or human remains are located during the ground disturbance phase of this project.**

If you have questions please contact Caitlin Totherow at 803-328-2427 ext. 226, or e-mail caitlinh@ccppcrafts.com.

Sincerely,

Wenonah G. Haire
Tribal Historic Preservation Officer



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

REPLY TO
ATTENTION OF

JAN 21 2010

Directorate of Public Works

SUBJECT: Section 106 Consultation, National Museum of the United States Army, Fort Belvoir, Virginia (VDHR File # 2003-1374)

Mr. Marc Holma
Architectural Historian
Department of Historic Resources
2801 Kensington Avenue
Richmond, Virginia 23221

Dear Mr. Holma:

The Army has proposed to build the National Museum of the United States Army (NMUSA) at Fort Belvoir, Virginia. Authority to site the NMUSA at Fort Belvoir was codified into law in 2004 (Public Law 108-375). After consideration of eight potential sites, Fort Belvoir has identified two suitable locations for the NMUSA (map enclosed). The two sites, Gunston and Pence Gate, are currently under National Environmental Policy Act (NEPA) analysis. The Gunston site has been identified as the preferred site for this project.

Based on its historic resource identification efforts, Fort Belvoir identified a National Register-eligible archeological site (44FX0663) in close proximity to the Gunston Road site. Based on earlier consultation, Fairfax County and the Virginia State Historic Preservation Office requested that Fort Belvoir reconsider its earlier determination that Mount Air (a Fairfax County historic site) was not eligible for listing in the National Register.

In November 2009 Fort Belvoir conducted site investigation efforts at 44FX0663. The original intent of this investigation was to identify the southern and western boundaries of the site and to subsequently adjust the boundary of the ground disturbance Area of Potential Effect so as to avoid the site. During the course of the investigation, the archeology team (John Milner Associates) discovered significant disturbance at the site. With this new information, Fort Belvoir directed the archeologist to reevaluate the site for National Register eligibility. Based on the results of that effort, the archeologist determined, and Fort Belvoir agrees, that the site is no longer eligible for National Register listing.

“LEADERS IN EXCELLENCE”

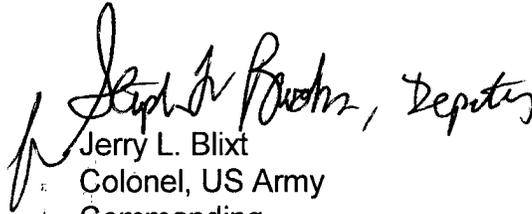
Fort Belvoir has completed a National Register evaluation of Mount Air and determined that it is eligible for listing in the National Register under Criterion D as a property that has yielded, or is likely to yield, information important in prehistory or history. Based on its evaluation, Fort Belvoir has determined that the historic viewshed of Mount Air has been significantly compromised to the north and west by a recent housing development and to the south and east by the encroachment of wooded areas. As such, Fort Belvoir has determined that historic views do not contribute to the significance of Mount Air.

Please review the enclosed archeological report for 44FX0663 and the enclosed National Register Nomination for Mount Air and provide comment on Fort Belvoir's determination that archeological site 44FX0663 is no longer eligible for listing in the National Register and that Mount Air is National Register-eligible under Criterion D. If we do not receive your comments within the 30 day allowed time period, we will assume concurrence.

Copies of this letter, the archeological report and the National Register Nomination have been provided to the Virginia State Historic Preservation Office and the Catawba Tribal Historic Preservation Office.

Point of contact is Bill Sanders, Director of Public Works, at 703-806-3017.

Sincerely,


Jerry L. Blixt
Colonel, US Army
Commanding

Enclosures



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

REPLY TO
ATTENTION OF

JAN 21 2010

Directorate of Public Works

SUBJECT: Section 106 Consultation, National Museum of the United States Army, Fort Belvoir, Virginia (VDHR File # 2003-1374)

Dr. Wenonah G. Haire
Catawba Indian Nation
Tribal Historic Preservation Office
1536 Tom Steven Road
Rock Hill, South Carolina 29730

Dear Dr. Haire:

The Army has proposed to build the National Museum of the United States Army (NMUSA) at Fort Belvoir, Virginia. Authority to site the NMUSA at Fort Belvoir was codified into law in 2004 (Public Law 108-375). After consideration of eight potential sites, Fort Belvoir has identified two suitable locations for the NMUSA (map enclosed). The two sites, Gunston and Pence Gate, are currently under National Environmental Policy Act (NEPA) analysis. The Gunston site has been identified as the preferred site for this project.

Based on its historic resource identification efforts, Fort Belvoir identified a National Register-eligible archeological site (44FX0663) in close proximity to the Gunston Road site. Based on earlier consultation, Fairfax County and the Virginia State Historic Preservation Office requested that Fort Belvoir reconsider its earlier determination that Mount Air (a Fairfax County historic site) was not eligible for listing in the National Register.

In November 2009 Fort Belvoir conducted site investigation efforts at 44FX0663. The original intent of this investigation was to identify the southern and western boundaries of the site and to subsequently adjust the boundary of the ground disturbance Area of Potential Effect so as to avoid the site. During the course of the investigation, the archeology team (John Milner Associates) discovered significant disturbance at the site. With this new information, Fort Belvoir directed the archeologist to reevaluate the site for National Register eligibility. Based on the results of that effort, the archeologist determined, and Fort Belvoir agrees, that the site is no longer eligible for National Register listing.

“LEADERS IN EXCELLENCE”

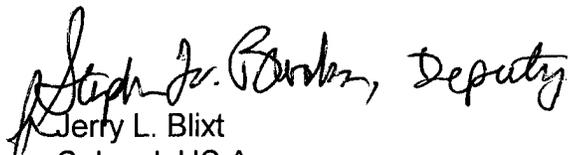
Fort Belvoir has completed a National Register evaluation of Mount Air and determined that it is eligible for listing in the National Register under Criterion D as a property that has yielded, or is likely to yield, information important in prehistory or history. Based on its evaluation, Fort Belvoir has determined that the historic viewshed of Mount Air has been significantly compromised to the north and west by a recent housing development and to the south and east by the encroachment of wooded areas. As such, Fort Belvoir has determined that historic views do not contribute to the significance of Mount Air.

Please review the enclosed archeological report for 44FX0663 and the enclosed National Register Nomination for Mount Air and provide comment on Fort Belvoir's determination that archeological site 44FX0663 is no longer eligible for listing in the National Register and that Mount Air is National Register-eligible under Criterion D. If we do not receive your comments within the 30 day allowed time period, we will assume concurrence.

Copies of this letter, the archeological report and the National Register Nomination have been provided to the Virginia State Historic Preservation Office and the Catawba Tribal Historic Preservation Office.

Point of contact is Bill Sanders, Director of Public Works, at 703-806-3017.

Sincerely,


Jerry L. Blixt
Colonel, US Army
Commanding

Enclosures



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

REPLY TO
ATTENTION OF

SEP 23 2009

Directorate of Public Works

SUBJECT: Section 106 Consultation, National Museum of the United States Army, Fort Belvoir, Virginia (VDHR File # 2003-1374)

Mr. Marc Holma
Architectural Historian
Department of Historic Resources
2801 Kensington Avenue
Richmond, Virginia 23221

Dear Mr. Holma:

The Army has proposed to build the National Museum of the United States Army (NMUSA) at Fort Belvoir, Virginia. Authority to site the NMUSA at Fort Belvoir was codified into law in 2004 (Public Law 108-375). After consideration of eight potential sites, Fort Belvoir has identified two suitable locations for the NMUSA (map enclosed). The two sites, Gunston and Pence Gate, are currently under National Environmental Policy Act (NEPA) analysis. The Gunston site has been identified as the preferred site for this project.

Based on museum requirements and conceptual site layouts Fort Belvoir has developed preliminary Areas of Potential Effect (APE) for each site, as follows:

a. Gunston Site (map enclosed)

1. Ground disturbance APE: A roughly 38.5 acre area for the museum, located at the northwest corner of the installation and the Fort Belvoir Golf Course which will need to be reconfigured to replace holes lost to the museum site.

2. Visual/Auditory APE: Based on a review of proposed activities at the museum and assuming a two-story building with a 95 foot tower the visual/auditory APE is defined as one-quarter mile from the project site.

b. Pence Gate Site (map enclosed)

1. Ground disturbance APE: A roughly 40 acre area located along the southern side of Route 1 to the east of Belvoir Road.

“LEADERS IN EXCELLENCE”

2. Visual/Auditory APE: Based on a review of proposed activities at the museum and assuming that the building will not exceed two stories in height the visual/auditory APE is defined as one-quarter mile from the project site. Note: the proposed 95 foot tower will not be constructed if this site is selected.

In accordance with 36 CFR 800.4 Fort Belvoir has identified historic resources within each APE.

a. Gunston Site

1. Ground disturbance APE: Eight archeological sites have been identified within the museum portion of this APE. Seven of these sites, 44FX672, 673, 674, 675, 676, 683 and 1784, have been determined ineligible for listing in the National Register of Historic Places (NR). The remaining site 44FX633 has been determined to be National Register eligible. Site 44FX663 is located at the northwest corner of the APE. Fort Belvoir has identified the need to perform further archeological work to accurately define the boundaries of this site. A proposed methodology for defining the site boundaries is enclosed for your review.

Seven archeological sites have been identified in the golf course portion of this APE, 44FX620, 668, 1495, 1496, 1587, 1588 and 1678. All of these sites have been determined NR ineligible for the NR.

2. Visual/Auditory APE: No historic resources have been identified within these APEs. Mount Air, a Fairfax County historic park is located within these APEs however; it has been determined NR ineligible.

b. Pence Gate Site

1. Ground disturbance APE: Two archeological sites, 44FX1917 and 1918, have been identified within this APE. These sites were determined ineligible for NR listing in 2009 and 2007 respectively.

2. Visual/Auditory APE: Portions of the NR eligible Woodlawn Historic District falls within this APE. The portions of Woodlawn Historic District within the APE include: the Woodlawn National Historic Landmark, Alexandria Monthly Meeting (Quaker) Meetinghouse and Woodlawn Baptist Church Cemetery.

In accordance with 36 CFR 800.3 Fort Belvoir has identified the following consulting/interested parties: Catawba Tribal Historic Preservation Office, Woodlawn

Baptist Church, Alexandria Monthly Meeting (Quaker) Meetinghouse, Advisory Council on Historic Preservation, Woodlawn & Frank Lloyd Wright's Pope-Leighy House, Fairfax County, National Park Service and National Trust for Historic Preservation. All of these groups have been copied on this correspondence.

Fort Belvoir will coordinate National Historic Preservation Act (NHPA) compliance with National Environmental Policy Act compliance in accordance with 36 CFR 800.8.

Please provide comments on Fort Belvoir's preliminary APE definitions, as outlined above, our proposed methodology for defining the boundaries of archeological site 44FX663, our historic resource identification efforts, our list of consulting/interested parties and our intention to coordinate NHPA and NEPA compliance.

Point of contact is Bill Sanders, Director of Public Works, at 703-806-3017.

Sincerely,


Jerry L. Blixt
Colonel, US Army
Commanding

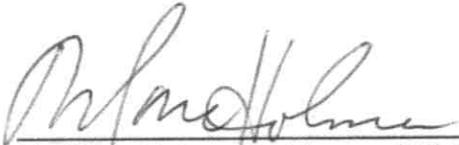
Enclosures

RE: Section 106 Consultation, National Museum of the United States Army, Fort Belvoir, Virginia (VDHR File #: 2003-1374)

I have reviewed this project, DHR File number 2003-1374 : National Museum of the United States Army, Fort Belvoir, Virginia.

I concur/do not concur with Fort Belvoir's finding that archeological site 44FX0663 is not eligible for listing in the National Register of Historic Places

I concur/do not concur with Fort Belvoir's finding that Mount Air is eligible for listing in the National Register of Historic Places under Criterion D



Mr. Marc Holma, Architectural Historian
Office of Review and Compliance
Virginia Department of Historic Resources

10 MARCH 10
Date

DHR# 2003-1374

Please return this form via fax or hard copy to:

USAG Fort Belvoir
Directorate of Public Works
Mr. Patrick McLaughlin
Chief, Environmental and Natural Resource Division
9430 Jackson Loop, Suite 200
Fort Belvoir, VA 22060

Fax: 703-806-0622

November 17, 2009

**SENT VIA ELECTRONIC MAIL TO
Bill.L.Sanders@belvoir.army.mil**

Mr. Bill Sanders
Directorate of Public Works
DPW-ENRD
9430 Jackson Loop, Suite 107
Fort Belvoir, VA 22060-5116

**NATIONAL
TRUST
FOR
HISTORIC
PRESERVATION®**

**Law
DEPARTMENT**

Re: NMUSA, Preliminary APE Comments

Dear Mr. Sanders:

The National Trust for Historic Preservation received notice from Fort Belvoir on October 14, 2009 regarding the preliminary Areas of Potential Effect (APE) for the National Museum of the United States Army (NMUSA).

Our comments on the APE are as follows:

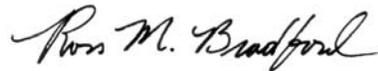
Pence Gate Site

The notice provided from Fort Belvoir states that with regard to the "Visual/Auditory APE: Portions of the NR eligible Woodlawn Historic District falls within this APE. The portions of the Woodlawn Historic District within the APE include: the Woodlawn National Historic Landmark, Alexandria Monthly Meeting (Quaker) Meeting House, and Woodlawn Baptist Church Cemetery."

We agree with this finding; however, the map provided with the notice does not clearly depict this statement. In particular, the Meeting House is shaded in pink, but no key is provided on the map that explains this shading (i.e. does shading denote only those structures with direct visual/auditory impacts?). On other maps provided in the materials, pink denotes archaeological sites; however, it would seem that ground disturbance for the NMUSA would not affect the Meeting House directly. Please clarify the use of pink shading for the Meeting House and indicate why other historic resources were not shaded in a similar manner.

If you have any questions regarding this letter, please feel free to contact me at 202-588-6252 or via email at ross_bradford@nthp.org.

Sincerely,



Ross M. Bradford
Associate General Counsel

Cc: Derek Manning, Cultural Resources Manager, Fort Belvoir
Betsy Merritt, Deputy General Counsel
Laurie Ossman, Director, Woodlawn



Preserving America's Heritage

November 3, 2009

Jerry L. Blixt
Colonel, US Army
Commanding
US Army Installation Management Command
Headquarters, United States Army Garrison, Fort Belvoir
9820 Flagler Road, Suite 213
ATTN: Directorate of Public Works
Fort Belvoir, VA 22060-5928

**Ref: *Preparation of Environmental Assessment (EA)
Proposed National Museum of the United States Army (VDHR File #2003-1374)
Fort Belvoir, Fairfax County, Virginia***

Dear Colonel Blixt:

On October 9, 2009, the Advisory Council on Historic Preservation (ACHP) received Fort Belvoir's notification pursuant to Section 800.8(c) of the ACHP's regulations, "Protection of Historic Properties" (36 CFR Part 800). We appreciate receiving your notification, which establishes that Fort Belvoir will use the process and documentation required for the preparation of an EA to comply with Section 106 of the National Historic Preservation Act in lieu of the procedures set forth in 36 CFR § 800.3 through 800.6.

In addition to notification to the ACHP, Fort Belvoir must meet the standards in Section 800.8(c)(1)(i) through (v) for the following:

- identifying consulting parties;
- involving the public;
- identifying historic properties and assessing the undertaking's effects on historic properties; and
- consulting regarding the effects of the undertaking on historic properties with the State Historic Preservation Officer/Tribal Historic Preservation Officer (SHPO/THPO), Indian tribes and Native Hawaiian organizations that might attach religious and cultural significance to affected historic properties, other consulting parties, and the ACHP, where appropriate, during National Environmental Protection Act (NEPA) scoping, environmental analysis, and the preparation of NEPA documents.

To meet the requirement to consult with the ACHP as appropriate, Fort Belvoir should notify the ACHP in the event Fort Belvoir determines, in consultation with the SHPO/THPO and other consulting parties,

ADVISORY COUNCIL ON HISTORIC PRESERVATION

1100 Pennsylvania Avenue NW, Suite 803 • Washington, DC 20004
Phone: 202-606-8503 • Fax: 202-606-8647 • achp@achp.gov • www.achp.gov

that the proposed undertaking(s) may adversely affect historic properties listed, or eligible for listing, on the National Register of Historic Places. The regulations do not specifically require that an agency submit an EA to the ACHP. However, keep in mind that, in the case of an objection from the ACHP or another consulting party, Sections 800.8(c)(2)(ii) and (c)(3) provide for ACHP review of an EA to determine whether preparation of the EA has met the standards set forth in Section 800.8(c)(1) and/or to evaluate whether the substantive resolution of the effects on historic properties proposed in an EA is adequate.

If Fort Belvoir's determination of adverse effect will be documented in an EA, we request that you notify us of the adverse effect and provide adequate documentation for its review. The ACHP's decision to review an EA will be based on the applicability of the criteria in Appendix A of the ACHP's regulations.

Thank you for your notification pursuant to Section 800.8(c). If you have any questions or if we may be of assistance, please contact Ms. Katharine R. Kerr at (202) 606-8534 or via e-mail at kkerr@achp.gov.

Sincerely,



Caroline D. Hall
Assistant Director
Federal Property Management Section
Office of Federal Agency Programs

L. Preston Bryant, Jr.
Secretary of Natural Resources



Joseph H. Maroon
Director

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

217 Governor Street
Richmond, Virginia 23219-2010
(804) 786-7951 FAX (804) 371-2674

August 20, 2009

Jay Nunenkamp
Paciulli, Simmons and Associates, Ltd.
11212 Waples Mill Rd, Suite 100
Fairfax, VA 22030

Re: National Museum of the United States Army

Dear Mr. Nunenkamp:

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 Laura's clubtail (*Stylurus laurae*, G4/S2/NL/NL), a state rare dragonfly, has been historically documented at the project site. Their habitat consists of moderated gradient streams with many shallow riffles and runs (TNC, 1996). This species is currently known from only two locations in Virginia.

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.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (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.

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

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

A fee of \$125.00 has been assessed for the service of providing this information. Please find enclosed an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, **DCR - Division of Natural Heritage, 217 Governor Street Richmond, VA**

23219. Payment is due within thirty days of the invoice date. Please note the change of address for remittance of payment as of July 1, 2008. Late payment may result in the suspension of project review service for future projects.

The Virginia Department of Game and Inland Fisheries 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/fwjs/> or contact Shirl Dressler at (804) 367-6913.

Should you have any questions or concerns, feel free to contact me at (804) 692-0984. Thank you for the opportunity to comment on this project.

Sincerely,

A handwritten signature in black ink that reads "Kristal McKelvey". The signature is written in a cursive, flowing style.

Kristal McKelvey
Coastal Zone Locality Liaison

Literature Cited

The Nature Conservancy. 1996. Biological and Conservation Data System. Arlington, Virginia, USA

**Virginia Department of Game and Inland Fisheries
(VDGIF) Correspondence**

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DGIF reply RE ESSLog#20159; Construction of the National Museum of the US Army Fort Belvoir Virginia .
DGIF reply RE: ESSLog#20159; Construction of the National Museum of the US Army Fort
Belvoir, VirginiaFrom: Lisa Wolff [LMWolff@psaltd.com]
Sent: Wednesday, June 25, 2008 10:07 AM
To: cturner@psaltd.com
Subject: FW: DGIF reply RE: ESSLog#20159; Construction of the National Museum of the
US Army Fort Belvoir, Virginia

Attachments: WOOD TURTLE form.doc

From: Ernie Aschenbach@dgif.virginia.gov [mailto:Ernie.Aschenbach@dgif.virginia.gov]

Sent: Wednesday, June 25, 2008 10:04 AM
To: fairfax@psaltd.com
Cc: Ernie.Aschenbach@dgif.virginia.gov
Subject: DGIF reply RE: ESSLog#20159; Construction of the National Museum of the US
Army Fort Belvoir, Virginia

To:
Attention: Cara Turner
Environmental Scientist
Paciulli Simmons & Associates
11212 Waples Mill Road, Suite 100
Fairfax, Virginia 22030-7404
Phone: (703) 934-0900
FAX: (703) 934-9787
Email: fairfax@psaltd.com

We have reviewed the project consisting of an approximately 300,000 square foot (sf) museum building, walks, curb and gutter, HVAC, power generating equipment, and parking for 1,000 vehicles and buses. We understand that two potential sites are being considered for the construction of this museum. The first is the proposed Gunston Site which consists of a portion of an existing 18-hole golf course located northeast of the Fairfax County Parkway, between Kingman and Telegraph roads. The second is the Pence Gate Site. The western portion of the proposed Pence Gate Site is located southeast of the intersection of Route 1 and Belvoir Road. Existing site consists of roads from a former housing area, two baseball diamonds, an existing 30,000 sf community club, and 3-acre parking area. The eastern portion of the proposed Pence Gate Site is wooded. The materials do not mention instream work, and do not provide a detailed site plan or photographs. The following resources are known from the project area:

The state Threatened peregrine falcon is known to occur in the project area. However, based on the scope and location of this project, we do not anticipate adverse impact to this species.

According to our records, state Threatened bald eagle nests and the Upper Potomac Winter and Summer Bald Eagle Concentration Area have been documented in the area of both sites. However, neither of the sites fall within the management zones for these resources. Therefore, impacts upon the bald eagle are not likely to result from the development of either site.

The state Threatened wood turtle is known to occur in the project area. Dogue Creek, designated a Threatened and Endangered Species water due to the presence of the state Threatened wood turtle, is approximately 0.25 mile from the Pence Gate Site. If proposed work at the Pence Gate Site involves instream work or construction of a stormwater management system that may result in impact to Dogue Creek or its tributaries, we recommend further coordination with this agency

DGIF reply RE ESSLog#20159; Construction of the National Museum of the US Army Fort Belvoir Virginia . regarding the protection of this species. We recommend that all contractors associated with work at this site be made aware of the possibility of wood turtles on site and become familiar with their appearance, status and life history. If any wood turtles are encountered and are in jeopardy during the development or construction of this project, immediately remove them from danger and move them safely to suitable habitat in or near the closest perennial stream. Any relocations should be coordinated with J.D. Kleopfer, VDGI F Wildlife Diversity Biologist, (telephone (804) 829-6580) and the attached wood turtle observation form should be completed and sent to DGIF.

An appropriate information sheet to distribute to contractors and employees could include the following text below a picture of a wood turtle: "The wood turtle is a State Threatened species that may be found in or near the project area. Description: A medium sized semi-terrestrial turtle, adults are 6-8 inches long. The dull brown upper shell is very rough; each section of the shell is composed of growth rings that form an irregular pyramid. However, there can be great variation in appearance and especially in older turtles, the upper shell may appear smooth. The bottom shell is yellow with black blotches. It has a black head and dark brown extremities. The yellow to burnt orange skin on the neck and in the leg sockets is a distinguishing characteristic. If one of these turtles is found within the project/road area, it should be carefully removed to safety in suitable habitat (a run or deep pool with sandy or muddy bottom and submerged roots, branches, or logs) in the nearest perennial stream. It is a violation of Virginia law to harm or keep for personal possession a wood turtle. If you have any questions concerning this species, please call the Virginia Department of Game and Inland Fisheries (telephone (804) 367-6913)." Further information about wood turtles can be found online at: <http://www.dgif.virginia.gov/wildlife/species/dipsley.asp?id=030062>

Dogue Creek and Accotink Creek are confirmed Anadromous Fish Use Areas and are in close proximity to the sites. Both Accotink Creek and Dogue Creek are tributaries of the Potomac River, a designated Anadromous Fish Use Area. Based on the proposed scope and distance from these resources, we do not anticipate that this project will result in impacts to anadromous fish.

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. Avoidance and minimization of impact may include relocating stream channels as opposed to filling or channelizing as well as using, and incorporating into the development plan, a natural stream channel design and wooded buffers. We recommend maintaining undisturbed wooded 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 are willing to assist the applicant in developing a plan that includes open-space, wildlife habitat, and natural stream channels which retain their wooded buffers.

We recommend implementing strict erosion and sediment control measures. 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.

Thank you for the opportunity to provide comments.

Ernie Aschenbach

DGIF reply RE ESSLog#20159; Construction of the National Museum of the US Army Fort Belvoir Virginia .
Environmental Services Biologist
Virginia Dept. of Game and Inland Fisheries
4010 West Broad Street
Richmond, VA 23230
Phone: (804) 367-2733
FAX: (804) 367-2427
Email: Ernie.Aschenbach@dgif.virginia.gov

Attachment.

<<WOOD TURTLE form.doc>>

Jay Nunenkamp

From: Ewing, Amy (DGIF) [Amy.Ewing@dgif.virginia.gov]
Sent: Wednesday, August 19, 2009 4:43 PM
To: Jay Nunenkamp
Subject: RE: ESSLog# 20159_Construction of National Museum of the US Army_Ft. Belvoir_Guston Site

You are correct in your assumptions. No NEW comments based on the increase in the size of the parcel...all of our comments are based on resources known from within 2 miles of the site, so unless a site grows much larger than it previously had been or shifts significantly, we typically don't get "new" data coming up in our new searches.

We have the same problem...as you can tell, we send comments about the same project back and forth to a number of places. So, it gets confusing on our end as well. I was looking in the hard copy file and saw Ernie's email to Cara to which he had attached the 1.5 pages of recommendations, so I assumed they had been sent that day. Had I looked at it closer, I would have seen that they were actually sent to DEQ earlier. But, you pieced it all together correctly.

Amy M. Ewing
Environmental Services Biologist
Virginia Dept. of Game and Inland Fisheries
4010 West Broad Street
Richmond, VA 23230
804-367-2211
amy.ewing@dgif.virginia.gov

From: Jay Nunenkamp [mailto:JNunenkamp@psaltd.com]
Sent: Wednesday, August 19, 2009 4:18 PM
To: Ewing, Amy (DGIF)
Cc: David Walls
Subject: RE: ESSLog# 20159_Construction of National Museum of the US Army_Ft. Belvoir_Guston Site

Ms. Ewing:

Thank you.

As the project changes and we all coordinate with different people and agencies, things have gotten a bit confused. I think I am understanding the chain of responses and recommendations correctly, but let me try to explain what I have in front of me here, working backwards from a December 8, 2008 email (the one I think you're referring to):

Cara Turner of PSA received an email from Mr. Aschenbach on 12/08/08 indicating that she should use the GIF comments provided to DEQ on 11/10/08.

In a copy of a 11/10/08 email to Mr. John Fisher (I presume of the DEQ – it isn't clear, because we have this only in hardcopy format provided by the DEQ), GIF indicated that "*we reiterate our comments dated June 25, 2008.*" We have a June 25, 2008 email from GIF (to fairfax@psaltd.com) with 1.5 pages of recommendations and a wood turtle form. I presume these are the recommendations you're referring to. If so, then we have everything we need, and thanks again.

However: the 6/25/08 recommendations refer to a Gunston site that "*consists of a portion of an 18-hole golf course...*" This is no longer true. As we indicated in a June 18, 2008 letter (which GIF had probably not received before your 6/25/08 email), the Gunston site now consists of the entire 36-hole course – approximately 400 acres. This was a

change that came late in the process – otherwise we would not be in this sad situation of multiple requests for coordination.

I just wanted to bring that to your attention. At this point, PSA will assume that GIF's recommendations for the smaller site also pertain to the larger site, and PSA will use the GIF's 6/25/08 recommendations. Please let me know if I have misunderstood anything.

Sincerely,

Jay Nunenkamp

Paciulli, Simmons & Associates, Ltd.

*Engineers - Planners - Surveyors - Landscape Architects
Wetland Specialists - Environmental Scientists - Archaeologists*
11212 Waples Mill Road, Suite 100 - Fairfax, VA 22030
Phone: 703-934-0900 Fax: 703-934-9787
www.psald.com

From: Ewing, Amy (DGIF) [mailto:Amy.Ewing@dgif.virginia.gov]
Sent: Wednesday, August 19, 2009 12:09 PM
To: Jay Nunenkamp
Subject: ESSLog# 20159_Construction of National Museum of the US Army_Ft. Belvoir_Guston Site

Jay,
I have looked over the information pertaining to the subject project and the expansion of the proposed Gunston Site. The expansion does not change our original follow-up comments regarding the site which were provided to Cara Turner, Paciulli Simmons & Associates, on December 8, 2008.

We recommend that the concerns/information provided in the follow-up comments that were provided to Ms. Turner be addressed in the EA, assuming one is being prepared for this project. If one is not, please further coordinate this project with my office to ensure protection of the species and resources detailed in the comments sent to Ms. Turner.

If you need me to re-send those comments, please contact me.

Thanks, Amy

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
6669 Short Lane
Gloucester, VA 23061



February 29, 2008

Ms. Cara Turner
Paciulli Simmons & Associates, Ltd.
11212 Waples Mill Road, Suite 100
Fairfax, Virginia 22030-7404

Re: National Museum of the US Army
Ft. Belvoir, Fairfax County, Virginia

Dear Ms. Turner.:

The U.S. Fish and Wildlife Service has received your request for information on federally listed or proposed endangered and threatened species and their habitats for the above referenced project. This letter is submitted in accordance with provisions of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

Based on the information you sent, the Service recommends that surveys be conducted for the following species:

- Small whorled pogonia (*Isotria medeoloides*) - Federally listed threatened. Appropriate habitat for this orchid is mixed-deciduous or mixed deciduous/coniferous forests with an open understory on terrain that is almost level or gently to moderately sloping, but it has been found on steep slopes. Although the pogonia may be found more often on slopes with northerly or easterly exposures, all aspects with appropriate habitat may contain the pogonia. Small whorled pogonia sites can be generally characterized by their proximity to canopy openings, the presence of dead standing trunks, little herbaceous ground cover, and wood litter on the ground. The Service recommends a survey within appropriate habitat at the project site. Surveys should be conducted from June 1 through July 20 in Caroline County and counties to the north.

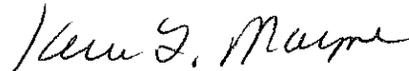
The small whorled pogonia is protected under the Virginia Endangered Plant and Insect Act, which is administered by the Virginia Department of Agriculture and Consumer Services (VDACS). Under the Memorandum of Agreement established between VDACS and the Virginia Department of Conservation and Recreation (VDCR), VDCR has the authority to report for VDACS on state-listed plant and insect species. You should contact VDCR at the address below:

Virginia Department of Conservation and Recreation
Division of Natural Heritage
217 Governor Street, 3rd Floor
Richmond, VA 23219
(804) 786-7951

The attached list(s) contains individuals who are qualified to conduct surveys for the species listed above. These lists do not include all individuals qualified or authorized to survey for these species. If you select someone not on the pre-approved surveyor list, please provide the proposed surveyor's qualifications to this office 30 days prior to the start of the survey. To ensure that an adequate survey is conducted, the surveyor names and proposed survey design should be submitted to this office prior to the survey. Send copies of all survey results to this office or inform this office if a survey will not be conducted. If the survey determines that any rare species are present, please contact this office to allow us the opportunity to work with you to ensure that this project avoids or minimizes adverse effects to rare species and their habitats.

Upon receipt of the surveys and a detailed project description, we can provide additional recommendations on this species. The Service also recommends that you consider survey needs of and potential effects to state listed endangered and threatened species. You can find species information, qualified surveyors and other pertinent information on project reviews within Virginia at our website http://www.fws.gov/northeast/virginiafield/Project_Reviews.html. If you have any questions or need further assistance, please contact Sumalee Hoskin of this office at (804) 693-6694, extension 136.

Sincerely,



Karen L. Mayne
Supervisor
Virginia Field Office

Enclosures

FAIRFAX COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>STATUS</u>
<u>VASCULAR PLANTS</u>		
Aeschynomene virginica ²	Sensitive joint-vetch	LT
Isotria medeoloides	Small whorled pogonia	LT
Species of Concern (No official Federal status)		
<u>BIRDS</u>		
Haliaeetus leucocephalus ¹	Bald eagle	G5
<u>INVERTEBRATES</u>		
Elliptio lanceolata	Yellow lance	G2G3
Sphalloplana holsingeri	Holsinger's groundwater planarian	G1G2
Sphalloplana subtilis	Bigger's groundwater planarian	G1G2
Stygobromus kenki	Rock Creek groundwater amphipod	G2G3
Stygobromus phreaticus	Northern Virginia well amphipod	G2G3
Stygobromus sp. 15	A groundwater amphipod	G1
<u>VASCULAR PLANTS</u>		
Pycnanthemum torrei	Torrey's mountain-mint	G2

¹Nesting occurs in this county; concentrated shoreline use has been documented on the Potomac River.

²This species has been documented in an adjacent county and may occur in this county.

Small Whorled Pogonia

Isotria medeoloides



© D.D. Tyler

Description - The small whorled pogonia is a herbaceous perennial orchid. It has a widely scattered distribution in the eastern United States along the Atlantic coast from Maine to Georgia with outlying occurrences in the midwest and Canada. This species has pale green, elliptical leaves, usually five or six, that grow in a single whorl at the top of a hairless, grayish-green stem. The one or two flowers per plant are yellowish-green, unscented, and form in the center of the whorl.

Life History - In Virginia, the small whorled pogonia is found in ordinary looking third-growth upland forests with an open understory and a closed canopy where the topography is typically moderately sloping or almost level. The plants are usually associated with decaying vegetative matter such as fallen trunks and limbs, leaf litter, bark, and tree roots. The pogonia is found in soils that are acidic sandy loams with low nutrient

content. The flowers appear in late April to mid-May. The small whorled pogonia reproduces primarily through self-pollination and occasionally vegetatively. It is often confused with the Indian cucumber-root (*Medeola virginiana*) and the large whorled pogonia (*Isotria verticillata*). The Indian cucumber-root has deep green leaves with a stem that is thin, hairy, and wiry. The large whorled pogonia has a reddish-purple stem and dark green leaves; its flower is reddish-purple.

Conservation - The small whorled pogonia was federally listed as an endangered species on September 10, 1982. It was reclassified as threatened on November 7, 1994. This was possible because at the time of reclassification 61% of the viable populations had been protected. The small whorled pogonia and its habitat continue to be threatened, directly and indirectly, by residential and commercial development. The upland habitat where it is found is seldom protected by federal or state laws unless it occurs on federally-owned property. Without voluntary landowner protection many pogonia populations have been and will be destroyed. Other threats to this species are collection by plant enthusiasts and browsing by white-tailed deer and invertebrates.

What You Can Do To Help - If you find a plant that appears to be the small whorled pogonia, take note of the location and photograph the plant, if possible. Please do not remove the plant!

Contact one of the following agencies for assistance:

Virginia Department of Agriculture
and Consumer Services
Office of Plant Protection
P.O. Box 1163
Richmond, Virginia 23209
(804) 786-3515

Virginia Department of
Conservation and Recreation
Division of Natural Heritage
217 Governor Street, 3rd Floor
Richmond, Virginia 23219
(804) 786-7951

U.S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061
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References

U.S. Fish and Wildlife Service. 1992. Small whorled pogonia (*Isotria medeoloides*) recovery plan, first revision. Newton Corner, Massachusetts.

Ware, D.M.E. 1991. Small whorled pogonia. Pages 95-97 in K. Terwilliger, ed. Virginia's Endangered Species, Proceedings of a Symposium. McDonald and Woodward Publishing Company, Blacksburg, Virginia.



U.S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061
(804) 693-6694
<http://www.fws.gov>
August 1999

SMALL WHORLED POGONIA
(Isotria medeoloides)
SURVEY CONTACTS IN VIRGINIA

This list contains individuals who we have already determined are qualified to conduct surveys for the species listed above. This list does not include all individuals qualified or authorized to survey for this species. If you select someone not on this pre-approved surveyor list, please provide the proposed surveyor's qualifications to this office 30 days prior to the start of the survey. Please send copies of all survey results to this office. If the survey determines that any rare species are present, please contact this office to allow us the opportunity to work with you to ensure that a project avoids or minimizes adverse effects to rare species and their habitats. Inclusion of names on this list does not constitute endorsement by the U.S. Fish and Wildlife Service or any other U.S. Government agency. Listed alphabetically. The Service recommends surveys within appropriate habitat be conducted from June 1 through July 20 in Caroline County and counties to the north **OR** from May 25 through July 15 in counties south of Caroline County. Outside of these months, a site visit by a qualified individual can determine if appropriate habitat exists at the project site. January 15, 2008

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Appendix C

Air Conformity Analysis and Emissions Calculations

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**NATIONAL MUSEUM OF THE
UNITED STATES ARMY
ENVIRONMENTAL ASSESSMENT**

**U.S. ARMY GARRISON FORT BELVOIR
FAIRFAX COUNTY, VIRGINIA**

Appendix C: Air Conformity Analysis and Emissions Calculations

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Acronyms and Abbreviations

AQCR	Air Quality Control Region
AQCR 47	National Capital Interstate Air Quality Control Region
AST	Aboveground Storage Tank
BACT	Best Available Control Technology
BRAC	Base Realignment and Closure
CAA	Clean Air Act
CFR	Code of Federal Regulations
DOE	Department of Energy
GCR	General Conformity Rules
GSA	General Services Administration
HAP	Hazardous Air Pollutants
MACT	Maximum Achievable Control Technology
MSAT	Mobile Source Air Toxics
MWCOG	Metropolitan Washington Council of Governments
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NNSR	nonattainment new source review
NSPS	new source performance standards
NSR	New Source Review
NO ₂	Nitrogen Dioxide
NO _x	nitrogen oxides
O ₃	ozone
OTR	Ozone Transport Region
PM	particulate matter
PM ₁₀	particulate matter less than 10 microns in diameter
PM _{2.5}	particulate matter less than 2.5 microns in diameter
PPM	Parts Per Million
PSD	prevention of significant deterioration
PTE	potential to emit
RONA	Record of Non-Applicability
SIP	State Implementation Plan
SO ₂	sulfur dioxide
TF	transportable fraction
tpy	tons per year
ULSD	ultra low sulfur diesel
U.S.C.	United States Code
USEPA	U.S. Environmental Protection Agency
UST	Underground Storage Tank
VAC	Virginia Administrative Code
VDEQ	Virginia Department of Environmental Quality
VOC	volatile organic compounds

1.0 Introduction

This air quality analysis includes a description of the existing air quality conditions, a general conformity analysis, and a regulatory review.

2.0 Affected Environment

2.1 National Ambient Air Quality Standards and Local Ambient Air Quality

U.S. Environmental Protection Agency (USEPA) Region 3 and VDEQ regulate air quality in Virginia. The Clean Air Act (CAA) (42 U.S.C. 7401-7671q), as amended, gives the USEPA responsibility to establish the primary and secondary National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) that set acceptable concentration levels for six criteria pollutants: matter (measured as both particulate matter (PM₁₀) and fine particulate matter (PM_{2.5})), sulfur dioxide (SO₂), carbon monoxide (CO), nitrous oxides (NO_x), ozone (O₃), and lead. Short-term NAAQS (1-, 8-, and 24-hour periods) have been established for pollutants contributing to acute health effects, while long-term NAAQS (annual averages) have been established for pollutants contributing to chronic health effects. While each state has the authority to adopt standards stricter than those established under the federal program, the Commonwealth of Virginia accepts the federal standards.

2.2 Attainment Status

Federal regulations designate Air-quality Control Regions (AQCRs) in violation of the NAAQS as *nonattainment* areas. Federal regulations designate AQCRs with levels below the NAAQS as *attainment* areas. *Maintenance* AQCRs are areas that have previously been designated nonattainment and have been redesignated to attainment for a probationary period through implementation of maintenance plans. According to the severity of the pollution problem, nonattainment areas can be categorized as marginal, moderate, serious, severe, or extreme.

Fairfax County (and therefore Fort Belvoir) is within the National Capital Interstate AQCR (AQCR 47) (40 CFR 81.12). AQCR 47 is in the O₃ transport region (OTR) that includes 12 states and Washington, DC. The USEPA has designated Fairfax County as the following:

- Moderate nonattainment for the 1997 8-hour O₃ NAAQS
- Nonattainment for the 1997 PM_{2.5} NAAQS
- Attainment for all other criteria pollutants (40 CFR 81.347)

2.3 Installation Wide and Regional Emissions.

Fort Belvoir tracks air emissions from the significant stationary emission sources on the installation. These include more than 30 boilers, 50 generators, a gasoline dispensing facility, degreasers, a dual-phase soil remediation system, and firefighter training equipment. Fort Belvoir also has hundreds of insignificant emission sources including closed sanitary landfills, fuel storage tanks, spray painting operations, woodworking activities, oil-water separators, small boilers, and small emergency generators. The emissions from the insignificant sources are not tracked. Concurrently, the Metropolitan Washington Council of Governments (MWCOG) compiles an emissions inventory for AQCR 47 and sets regional emissions budgets. Table 2-1 lists the total emissions from significant sources at Fort Belvoir and the estimated total emissions for AQCR 47.

**Table 2-1.
Existing Air Emissions for Fort Belvoir and AQCR 47**

2008 Annual Emissions (Tons per Year)		
Criteria Pollutants	Fort Belvoir ¹	AQCR 47 ^{2,3}
VOC	2.9	81,190
NO _x	43.8	117,102
SO ₂	20.0	231,898
PM _{2.5}	2.2	23,364

Notes:

1 - Source: U.S. Army Fort Belvoir 2009.

2 - Source: MWCOG 2007, 2009 Projected Levels of VOC.

3 - Source: MWCOG 2008, 2009 Projected Levels of NO_x, SO₂, and PM_{2.5}.

3.0 Environmental Consequences

3.1 Proposed Action

Implementing the proposed action would have both short- and long-term minor adverse effects to air quality. However, increases in emissions would not exceed the applicability threshold values, and would not violate federal, state, or local air regulations. Implementing either the “Structured Parking” and “On Grade” alternative could affect air quality in three ways: generating emissions during construction; introducing new stationary sources of emissions, such as heating boilers and standby generators; and changes in vehicular traffic that could raise vehicle emission levels locally.

**Table 3-1.
Construction Components for the Proposed Action**

	Area	
	(sf)	(acres)
Phase 1		
Main Building	155,000	3.6
Memorial Garden	56,628	1.3
Parade Ground	169,884	3.9
Grandstand	3,150	0.1
Speaking Area	34,848	0.8
Amphitheater	6,700	0.2
Drop Off and Arrival Plaza	21,780	0.5
Parking	248,292	5.7
RV parking	39,204	0.9
Nature/survival Trail	30,000	0.7
Picnic/viewing Area	65,340	1.5
Multipurpose Barracks	6,500	0.1
Armored tank Simulator	2,000	0.0
Total Area (Gross Building) (Phase I)	195,130	19
Total Graded Area (Phase I)	1,034,456	24
Total Paved Area (Phase I)	287,496	7
Golf Course		
Cleared	596,772	13.7
Regraded	60,984	1.4
Cart Path	174,240	4.0
Tree Clearing	87,120	2.0
Total Graded Area (Golf Course)	919,116	21
FCP Intersection		
New Turn Lane	30,492	0.7
Additional clearing for clear zone	56,628	1.3
Total Area (FCP Intersection)	87,120	2
Total Paved Area (Phase I)	30,492	1

	Area	
	(sf)	(acres)
Expansion Phases		
Museum Building Expansion	95,000	2.2
Memorial Garden	30,492	0.7
Expanded Parking	108,900	2.5
Encampment /Education Area	87,120	2.0
Grandstand Expansion	12,000	0.3
Small Storage Building Near Grandstand	2,000	0.0
Restroom Near Grandstand	2,000	0.0
Total Area (Gross Building) (Expansion Phases)	111,000	8
Total Graded Area (Expansion Phases)	448,512	10
Total Paved Area (Expansion Phases)	108,900	3

When compared to other alternatives, the “Structured Parking” Alternative would include additional excavation, and the fabrication of a structured parking garage. Although only slight variation in the overall emissions would be expected with the different alternatives, this alternative is considered the “worst case” scenario, and represents the upper bound of potential emissions associated with any of the alternatives within this EA. All direct and indirect emissions associated with the “Structured Parking” Alternative were estimated (Table 3-1). The construction emissions were generated by estimating equipment use for site preparation, construction, and landscaping for the new facilities. The individual components for each phase construction are outlined in Table 3-1.

The facility’s operational emissions estimates included emissions from employee vehicles, museum visitors, from boilers, and from an emergency generator. Operational emissions would be the same for all alternatives within this EA.

3.1.1 General Conformity

To determine the applicability of the General Conformity Rule (GCR), air emissions from construction and proposed stationary and mobile sources were compared to the applicability thresholds and regional emissions budgets (Table 3-2 and 3-3). The requirements of this rule are not applicable because the highest estimated or calculated total annual direct and indirect emissions from these alternatives would not exceed the applicability threshold for any criteria pollutant during any years, and would not be regionally significant. Detailed emission calculations and a Record of Non-Applicability (RONA) are provided in Attachment B and C respectively.

**Table 3-2.
Total Estimated Emissions for the Proposed Action**

Year	Estimated emissions (tpy)			
	NO _x	VOC	PM _{2.5}	SO ₂
Year 1	20.9	1.5	2.6	3.7
Year 2	23.8	2.6	2.8	4.0
Year 3	7.0	1.0	0.7	1.1
Operational	10.9	5.9	0.9	0.3
<i>Applicability</i> threshold	100	50	100	100
Exceeds threshold?	No	No	No	No

tpy = tons per year

Emissions estimations were based on the three year construction schedule as it is known at this time. Notably, the total emissions for all criteria pollutants for all three years combined would not

exceed the applicability thresholds. Therefore, this determination would be accurate regardless of whatever schedule ultimately implemented.

**Table 3-3.
Annual Emissions Compared to Regional Emissions**

	Criteria Pollutant or Precursor			
	NO _x	VOC	PM _{2.5}	SO ₂
Highest Annual Emissions (tpy)	23.8	5.9	2.8	4.0
Regional Emissions (tpy)	117,102	81,190	23,364	231,898
Percent Regional Emissions	<0.01%	<0.01%	<0.01%	<0.01%
Regionally Significant?	No	No	No	No

Source: MWCOG 2007 and 2008

tpy = tons per year

3.1.2 Regulatory Review and Air Permit Requirements

Stationary sources of air emissions associated with the proposed action would be subject to federal and state air permitting regulations. These requirements include, but are not limited to, minor new source review (NSR), nonattainment new source review (NNSR), prevention of significant deterioration (PSD), and new source performance standards (NSPS) for selected categories of industrial sources. The new facilities would be equipped with dual fueled boilers and a diesel-fired emergency generator. No other stationary sources of air emissions are planned. Estimated potential emissions from proposed new sources are outlined in Table 3-4.

**Table 3-4.
Estimated Potential to Emit (PTE) for Stationary Sources**

Source	Estimated emissions (tpy)			
	NO _x	VOC	PM _{2.5}	SO ₂
Boilers	4.1	0.6	0.8	0.2
Emergency Generator	3.6	0.0	0.0	0.2
Total	7.7	0.6	0.8	0.4

tpy = tons per year

All proposed sources are expected to be below the minor NSR thresholds in 9 VAC 5-80-1320; therefore, a minor NSR permit would not be required to construct new stationary sources of emissions. Proposed sources may require a Best Available Control Technology (BACT) review for each criteria pollutant, a MACT review for regulated HAPs, and designated categories and predictive air dispersion modeling, depending upon VDEQ's requests (Table 3-5).

Table 3-5
Air Quality Regulatory Review for Proposed Stationary Sources

Regulation	Project Status
NNSR (9 VAC 5-80-2000 to 2240)	The potential emissions would not exceed the NNSR thresholds. Therefore, a NNSR construction permit would not be required.
NSR (9 VAC 5-80-1100 and 1320)	All proposed sources would be sized below the minor NSR thresholds in 9 VAC 5-80-1320 for the applicable source categories. Therefore, a minor NSR construction permit would not be required.
PSD (9 VAC 5-50-10)	Potential emissions would not exceed the 250-tpy PSD threshold. Therefore, the project would not be subject to PSD review.
Title V Permitting Requirements (9 VAC 5-80-50)	New stationary sources of air emissions would be required to be added to the Title V permit. Recordkeeping requirements may apply.
NSPS	Emergency generator would be subject to NSPS. However, the boilers would only be subject to NSPS if greater than 10 MMBTU/hr which is not anticipated at this time.

tpy = tons per year

In December of 2006, a federal appellate court issued a slip opinion in which the court partially invalidated USEPA's implementation of the 8-hour ozone standard (U.S. Court of Appeals, 2006). On June 8, 2007, the U.S. Court of Appeals for the District of Columbia Circuit reaffirmed its decision stating that the USEPA improperly determined that areas designated as nonattainment under the 1-hour ozone NAAQS would no longer be subject to 1-hour NSR requirements. As of the time of this writing, no changes in effective regulations have been issued based on this court decision. If at the time of permitting the PTE exceeds major modification thresholds, engineering controls or federally enforceable limits on the hours of operation would be established to remain a minor modification.

3.1.3 Mobile Emissions

Mobile emissions of concern include primarily automobiles and vehicular traffic. The primary air pollutants from mobile-sources are CO, NO_x, and VOCs. Lead emissions from mobile sources have declined in recent years through the increased use of unleaded gasoline and are extremely small. Potential SO₂ and particulate emissions from mobile sources are small compared to emissions from point sources, such as power plants and industrial facilities. Air quality impacts from traffic are generally evaluated on two scales: *mesoscale* and *microscale*.

Mesoscale analysis is performed at the regional level. NO_x, VOCs, PM_{2.5}, and SO₂ are of regional concern in nonattainment areas for O₃ and PM_{2.5}. Changes in traffic patterns in AQCR 47 resulting from the proposed action would introduce very small changes in regional O₃ and PM_{2.5} levels. The Metropolitan Planning Organization, using regional O₃ airshed models, generally evaluates regional effects on O₃. Mesoscale analysis is not generally conducted on a project-specific basis and is not necessary for this EA.

Microscale analysis is performed to identify localized hot spots of criteria pollutants. CO is a site-specific pollutant with higher concentrations found adjacent to roadways and signalized intersections. Microscale analysis is often conducted on a project-specific basis in regions where CO is of particular concern. Fairfax County, and therefore Fort Belvoir, is neither a nonattainment, nor a maintenance area for CO; therefore, micro-scale analysis is not necessary for this EA.

The traffic associated with the proposed action is not anticipated to be an air quality concern for particulate matter (PM) because it does not involve any new highways or expressways, and the intersections affected are primarily secondary arterial roads (USEPA, 2006). Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics emitted from highway vehicles and non-road

equipment. As with PM, traffic is not anticipated to be an air quality concern for MSATs because the intersections affected are primarily secondary arterial roads, and new traffic is expected to be below the threshold that would have potential for meaningful MSAT effects. Quantitative procedures to address PM and MSATs are not standard practice for nontransportation projects on secondary arterials; therefore they are not included in this EA (FHWA, 2006).

3.1.4 Transportation Conformity

The federal transportation conformity rule (40 CFR Parts 51 and 93) in general requires air quality conformity determinations for transportation plans, programs and projects in “non-attainment or maintenance areas for transportation-related criteria pollutants for which the area is designated non-attainment or has a maintenance plan” (40 CFR 93.102(b)). The federal conformity rule requires a currently conforming plan and program to be in place at the time of project approval (40 CFR 93.114) and for the project to be included in the conforming plan and program (40 CFR 93.115). The design and scope of the project as specified in the plan and program at the time of a regional conformity determination should be properly programmed and adequate to determine its contribution to regional emissions (40 CFR 93.115(c)). If the project is not required to be specifically listed, it still must be consistent with the policies and purpose of the plan and not interfere with other projects specifically included (40 CFR 93.115(b)).

The Kingman Interchange Upgrade project, including those portions required by the proposed NMUSA would not be regionally significant, yet would not be exempt from regional conformity requirements. In its planning stages, this project will need to be modeled properly in the appropriate State-wide Transportation Improvement Program (STIP) and the Constrained Long Range Plan (CLRP) approved by National Capital Transportation Planning Board (TPB), the Federal Transit Authority (FTA) and the Federal Highway Administration (FHWA). A demonstration of conformity for CLRP in their entirety is made by MWCOC on a regular basis. The project completion schedule, design concept, and scope would need to be correctly reflected in the approved transportation plan and program.

3.3 No Action Alternative

Under the No Action Alternative, the proposed action would not be implemented and no construction or operational activities would take place. Therefore, the changes in ambient air quality conditions otherwise expected from the action would not occur.

4.0 BMPs/Mitigation

BMPs would be required and implemented for both construction emissions and stationary point source emissions associated with the proposed action. The construction would be accomplished in full compliance with current and pending Virginia regulatory requirements, with compliant practices and/or products. These requirements include:

- Visible emissions and fugitive dust and emissions (9 VAC 5-40-60)
- Asphalt paving operations (9 VAC 5-40-5490)
- Open burning (9 VAC 5-40-5600)
- Portable fuel containers (9 VAC 5-40-5700)
- Architectural and industrial maintenance coatings (9 VAC 5-40-7120)
- Consumer products (9 VAC 5-40-7240 *et seq.*)

This listing is not all-inclusive; the Army and any contractors would comply with all applicable air pollution control regulations.

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Attachment A: Emissions Estimations and Methodology

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A.1 Emissions Estimations and Methodology

The Army has considered net emissions generated from all direct and indirect sources of air emission that are reasonably foreseeable. *Direct emissions* are emissions that are caused or initiated by a federal action and occur at the same time and place as the action. *Indirect emissions* are defined as reasonably foreseeable emissions that are caused by the action but might occur later in time and/or be farther removed in distance from the action itself, and that the federal agency can practicably control. More specifically, project-related direct emissions would result from the following:

- *Construction activities*: the use of non-road equipment (e.g., bulldozers, backhoes), worker vehicles, the use of volatile organic compound (VOC) paints, paving off-gasses, and fugitive particles from surface disturbances
- *Operational activities*: Emergency generators and heating boilers not subject to major new source review, and the use of private motor vehicles

A.1.1 Demolition and Construction Emissions

All direct and indirect emissions associated with the proposed action were estimated. The construction emissions were generated by estimating equipment use for site preparation, construction, and landscaping for the new facilities, including:

- Main museum building ,
- Memorial Garden,
- Parade Ground and Grandstand,
- Amphitheater,
- Drop-off and Arrival Plaza,
- Structured Parking Facility,
- Bus and RV parking,
- Screened Service Court,
- Access Control Point,
- Expansion of the Museum,
- Expansion of the Memorial Garden,
- Expansion of the Grandstand,
- Additional Building,
- Macro Gallery,
- Additional Parking, and
- Encampment Area/Outdoor Education, and
- Relocation of the golf course.

Construction emissions associated with the use of heavy equipment (e.g., bulldozers, backhoes), worker vehicles, the use of VOC paints, paving off-gasses, and fugitive particles from surface disturbances are presented in Table A-1 for all the years of construction. This section also outlines all the calculations and assumptions made to derive these construction emission estimations.

A.1.1.1 Heavy Construction Equipment

Pollutant emissions resulting from activities associated with constructing the new buildings, parking facilities, and roadways were estimated. The typical construction would involve such activities as utility installation, road construction, site clearing and grading, building construction, and asphalt paving.

Construction would involve the use of various non-road equipment, power generators, and trucks. Pieces of equipment to be used for building construction include, but are not limited to, backhoes, loaders, excavators, air compressors, chain saws, chipping machines, dozers, cranes, pavers, graders, rollers, and heavy trucks. Information regarding the number of pieces and types of construction equipment to be used on the project, the schedule for deployment of equipment (monthly and annually), and the approximate daily operating time (including power level or usage factor) were estimated for each individual construction project based on a schedule of construction activity.

Emissions from construction activities were estimated based on the projected construction activity schedule, the number of vehicles/pieces of equipment, and vehicle/equipment utilization rates. Emission factors for heavy-duty diesel equipment were obtained from EPA's *NONROAD2005 Emissions Model* (USEPA, 2004). The equipment and vehicle operation hours were estimated based on R.S.Means' *Building Cost Construction Data*, 64th annual edition (Waier, 2006), and field experience from similar projects.

**Table A-1.
Estimated Construction Emissions**

Year	Construction Emissions (tpy)			
	NO _x	VOC	PM _{2.5}	SO ₂
Year 1	20.9	1.5	2.6	3.7
Year 2	23.8	2.6	2.8	4.0
Year 3	7.0	1.0	0.7	1.1
Year 1 Construction Emissions				
Construction Activity	NO _x	VOC	PM _{2.5}	SO ₂
Heavy Equipment Emissions	20.8	1.4	1.5	3.7
Worker Trip Emissions	0.1	0.1	0.0	0.0
Fugitive Dust Emissions	0.0	0.0	1.1	0.0
Total	20.9	1.5	2.6	3.7
Year 2 Construction Emissions				
Construction Activity	NO _x	VOC	PM _{2.5}	SO ₂
Heavy Equipment Emissions	23.4	1.8	2.1	4.0
Worker Trip Emissions	0.4	0.4	0.0	0.0
Architectural Coating Emissions	0.0	0.4	0.0	0.0
Fugitive Dust Emissions	0.0	0.0	0.7	0.0
Total	23.8	2.6	2.8	4.0
Year 3 Construction Emissions				
Construction Activity	NO _x	VOC	PM _{2.5}	SO ₂
Heavy Equipment Emissions	6.8	0.6	0.7	1.1
Worker Trip Emissions	0.2	0.2	0.0	0.0
Architectural Coating Emissions	0.0	0.2	0.0	0.0
Total	7.0	1.0	0.7	1.1

Emission factors in grams of pollutant per hour were multiplied by the estimated running time to calculate total grams of pollutant from each piece of equipment. Finally, these total grams of pollutant were converted to tons of pollutant. The following formula was used to calculate hourly emissions from non-road engine sources, including cranes, backhoes, and the like:

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

where: M_i = mass of emissions of i^{th} pollutant during inventory period

N = source population (units)

EF_i = average emissions of i^{th} pollutant per unit of use (e.g., grams per hour)

AI = anti-idling factor (0.98).

The total annual emissions levels are summarized in Table A-2.

**Table A-2.
Estimated Annual Emissions from Construction Equipment**

Year	Annual Emissions (tpy)			
	NO _x	VOC	PM _{2.5}	SO ₂
Year 1	20.8	1.4	1.5	3.7
Year 2	23.4	1.8	2.1	4.0
Year 3	6.8	0.6	0.7	1.1
Total	51.1	3.9	4.3	8.8

Source: USEPA, 2004; SQAQMD, 1993.

A.1.1.2 Construction Worker Vehicle Operations

Emissions due to construction worker vehicle use were included in the analysis. Emission factors for motor vehicles were conservatively calculated using the EPA *MOBILE6.2*. MWCOG provided *MOBILE6.2* input files applicable to the project during the years of interest. These emission factors were then multiplied by the vehicle operational hours to determine motor vehicle emissions. The analysis assumed conservatively that the worker's vehicle would drive 30 miles per day on post at an average speed of 35 miles per hour. The total annual emissions levels are summarized in Table A-3.

**Table A-3.
Estimated Annual Emissions from Construction Worker Vehicles**

Year	Annual Emissions (tpy)			
	NO _x	VOC	PM _{2.5}	SO ₂
Year 1	0.1	0.1	Less than 0.05	
Year 2	0.4	0.4		
Year 3	0.2	0.2		
Total	0.7	0.7		

Source: USEPA MOBILE 6.2 and SQAQMD 1993

A.1.1.3 Emissions from Architectural Coatings

Emission factors relating emissions to total square footage to be built were used to estimate VOC emissions from architectural coating activities – primarily painting activities. For office space, the area to be painted was assumed to be approximately twice the heated area of the facility, and the dry film thickness was assumed to be three millimeters (mm). VOC content in was taken from 9 VAC 5-40-7120 – Architectural and Industrial Maintenance Coatings. The following formula was used to calculate emissions from the painting of the facilities:

$$E = [(F \times G) / 1000] \times H$$

where: *E* = emissions of VOCs from architectural coatings

F = pounds of VOC emissions per gallon

G = total area to be coated (heated area x 2)

H = paint coverage.

A sample calculation for architectural coating VOC emissions during construction of an example facility is provided below:

$$\text{Heated area} = 100,000 \text{ ft}^2$$

$$E = [(0.83 \text{ [lb/gallon]} / 400 \text{ [ft}^2\text{/gallon]}) \times [(100,000 \text{ [ft}^2\text{]} \times 2)] / 2,000 \text{ [lb/ton]}]$$

$$= 0.208 \text{ tons}$$

The total annual emissions levels are summarized in Table A-4. In addition, estimated emissions from the potential construction are presented in Attachment 1.

Table A-4.
Annual VOC Emissions from Architectural Coatings

Year	Annual VOC Emissions (tpy)
Year 2	0.4
Year 3	0.2

Source: SQAQMD, 1993; and 9 VAC 5-40-7120

A.1.1.4 Asphalt Curing Emissions

Asphalt paving would generate emissions from (1) asphalt curing, (2) operation of onsite paving equipment, and (3) operation of motor vehicles, including paving material delivery trucks and worker commuting vehicles. Because the emissions resulting from the operation of onsite paving equipment, trucks, and vehicles were included in the previous section, only asphalt curing-related emissions are discussed in this section. Asphalt curing-related VOC emissions were calculated based on the amount of paving anticipated for the onsite parking lot and new roadways. The following assumption was used in VOC emission calculations for asphalt curing (SQAQMD 1993):

$$E = \text{area paved} \times 2.62 \text{ lb VOC/acre}$$

A sample calculation is provided below:

$$\text{Paved area} = 100 \text{ acres}$$

$$E = 100 \text{ acres} \times 2.62 \text{ lb VOC/acre} / 2000 \text{ lb/ton}$$

$$= 0.131 \text{ ton}$$

Due to the minimal paving anticipated, negligible off gas emissions are anticipated.

A.1.1.5 Surface Disturbance

The quantity of dust emissions from construction operations is proportional to the area of land being worked and to the level of construction activity. The following assumptions were used in PM_{2.5} emission calculations for fugitive dust emissions (AP-42 Section 13.2.3 (USEPA, 1995); USEPA, 2005).

$$E = \text{open area} \times EF \times \text{PM}_{10}/\text{TSP} \times \text{PM}_{2.5}/\text{PM}_{10} \times \text{capture fraction}$$

where: open area = number of acres open

$$EF = 80 \text{ lb TSP/acre}$$

$$\text{PM}_{10}/\text{TSP} = 0.45 \text{ lb PM}_{10}/\text{lb TSP}$$

TSP = total suspended particulates

$$PM_{2.5}/PM_{10} = 0.15 \text{ lb } PM_{2.5}/\text{lb } PM_{10}$$

$$\text{Capture fraction} = 0.5$$

A sample calculation is provided below:

$$\text{Disturbed area} = 100 \text{ acres}$$

$$E = 100 \text{ ac} \times 80 \text{ lb TSP /acre} \times 0.45 \text{ lb } PM_{10}/\text{lb TSP} \times 0.15 \text{ lb } PM_{2.5}/\text{lb } PM_{10} \\ \times 2000 \text{ lb/ton}$$

$$= 1.35 \text{ tons}$$

The total annual emissions levels are summarized in Table A-5.

Table A-5.
Annual PM_{2.5} Emissions from Surface Disturbance

Year	Annual PM _{2.5} emissions (tpy)
Year 1	1.1
Year 2	0.7

Sources: AP-42 Section 13.2.3 (USEPA, 1995), USEPA 2005.

A.1.2 Operational Emissions

Operational emissions occur as a result of the operation of the new facilities. The remaining direct and indirect emissions due to heating boilers, commuter vehicles, and emergency generators constitute a small net decrease in CO emissions when compared to the no-action (no-build) scenario. The total annual operational emissions levels are summarized in Table A-6.

Table A-6.
Estimated Net Operating Emissions

	Annual Emissions (tpy)			
	NO _x	VOC	PM _{2.5}	SO ₂
Visitors SOV	4.2	4.7	0.1	0.1
Visitors Busses	1.6	0.1	0.0	0.0
Employees	0.4	0.5	0.0	0.0
Boilers	4.1	0.6	0.8	0.2
Generators	0.6	0.0	0.0	0.0
Total	10.9	5.9	0.9	0.3

A.1.2.1 Heating Boiler Emissions

Each building is assumed to be adequately heated, with heating values based on the U.S. Department of Energy's *Consumption and Gross Energy Intensity by Census Region for Sum of Major Fuels, Commercial Buildings Energy Consumption Survey* (DOE, 1999). It is expected that building boiler emissions from each building would occur immediately after the completion of the project. The total annual emissions levels are summarized in Table A-9.

A.1.2.2 Vehicular Emissions

Emission factors for motor vehicles were conservatively calculated for the year 2010 for commuter vehicles (modeled as light-duty gasoline vehicles and light-duty gasoline trucks such as sport utility vehicles [SUVs]) using the EPA *MOBILE6.2* mobile source emission factor model. Metropolitan Washington Council of Governments provided the most current input

parameters containing the current planning assumptions for the region. A sample calculation for the annual emission rate for NO_x from new employee vehicles from a sample project is presented below:

Additional employees = 150
Number of trips per day = 2
Number of days per year = 250
Average vehicle commute distance = 35 miles
MOBILE6.2 emission factor = 0.3 grams/mile

Annual emission level = 150 x 2 trips/day x 250 days/yr x 35 miles/trip
x 0.3 grams/mile x 0.000011 tons/gram
= 0.87 tpy

The estimated net annual vehicular emissions are presented Table A-9.

Attachment B: Emissions Calculations

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Table B-1. Project Areas and Durations

Project Name	Year	Clearing Area [Acres]	Building Area [SqFt]	Paving [Acres]	Days of Clearing	Days of Building	Days of Paving
Phase I(Year 1),Clearing and Grading	1	23.8	0.0	0.0	230.0	0.0	0.0
Expansion Phase(Year 1),Clearing and Grading	1	10.3	0.0	0.0	230.0	0.0	0.0
FCP Intersection(Year 1),Clearing and Grading	1	2.0	0.0	0.0	230.0	0.0	0.0
Phase I(Year 2),Building Construction	2	0.0	195130.0	0.0	0.0	230.0	0.0
Golf Course(Year 2),Clearing and Grading	2	21.1	0.0	0.0	230.0	0.0	0.0
Expansion Phase(Year 3),Building Construction	3	0.0	111000.0	0.0	0.0	230.0	0.0
FCP Intersection(Year 3),Paving	3	0.0	0.0	0.7	0.0	0.0	28.4
Phase I(Year 3),Paving	3	0.0	0.0	6.6	0.0	0.0	28.4
Expansion Phase(Year 3),Paving	3	0.0	0.0	2.5	0.0	0.0	28.4

Table B-2. Annual Equipment Use

Equipment Type	Year 1	Year 2	Year 3	Total Hours
Generator Sets	0	3142	947	4089
Air Compressors	0	1795	541	2336
Pavers	0	0	64	64
Plate Compactors	0	3590	1118	4708
Rollers	0	0	128	128
Scrapers	5814	3404	4085	13303
Cement & Mortar Mixers	0	6283	1893	8176
Cranes	0	6283	1893	8176
Graders	5814	3404	4085	13303
Off-highway Trucks	5814	9687	6042	21543
Tractors/Loaders/Backhoes	5814	9687	5978	21479
Crawler Tractor/Dozers	5814	3404	4085	13303

Table B-9. Heavy Equipment Emissions

Project	NOx [tons]	PM _{2.5} [tons]	SO ₂ [tons]	VOC [tons]
Phase I(Year 1),Clearing and Grading	13.727	0.9932	2.4451	0.9291
Expansion Phase(Year 1),Clearing and Grading	5.9517	0.4306	1.0601	0.4028
FCP Intersection(Year 1),Clearing and Grading	1.1561	0.0836	0.2059	0.0782
Phase I(Year 2),Building Construction	12.2921	1.065	1.8665	1.0612
Golf Course(Year 2),Clearing and Grading	11.1374	1.0348	2.1107	0.7785
Expansion Phase(Year 3),Building Construction	6.4581	0.6927	1.0271	0.5809
FCP Intersection(Year 3),Paving	0.0237	0.0028	0.0046	0.0017
Phase I(Year 3),Paving	0.223	0.026	0.0431	0.0163
Expansion Phase(Year 3),Paving	0.0845	0.0098	0.0163	0.0062
Total Non-Road	51.05	4.34	8.78	3.85

Source: USEPA NONROAD2004 and SQAQMD 1993

Table B-10. Worker Trip Emissions

Project	VMT	EFNO _x [g/mile]	NO _x [tons]	EFPM _{2.5} [g/mile]	PM _{2.5} [tons]	EF _{SO₂} [g/mile]	SO ₂ [tons]	EFVOC [g/mile]	VOC [tons]
Phase I(Year 1),Clearing and Grading	205210	0.32	0.07	0.01	0	0.01	0	0.29	0.07
Expansion Phase(Year 1),Clearing and Grading	88974	0.32	0.03	0.01	0	0.01	0	0.29	0.03
FCP Intersection(Year 1),Clearing and Grading	17282	0.32	0.01	0.01	0	0.01	0	0.29	0.01
Phase I(Year 2),Building Construction	969406	0.32	0.34	0.01	0.01	0.01	0.01	0.29	0.31
Golf Course(Year 2),Clearing and Grading	182330	0.32	0.06	0.01	0	0.01	0	0.29	0.06
Expansion Phase(Year 3),Building Construction	551448	0.32	0.19	0.01	0.01	0.01	0.01	0.29	0.18
FCP Intersection(Year 3),Paving	746	0.32	0	0.01	0	0.01	0	0.29	0
Phase I(Year 3),Paving	7031	0.32	0	0.01	0	0.01	0	0.29	0
Expansion Phase(Year 3),Paving	2663	0.32	0	0.01	0	0.01	0	0.29	0

Source: USEPA MOBILE 6.2 and SQAQMD 1993

**Table B-11.
Fugitive Dust Emissions**

Project	PM ₁₀ /TSP	PM _{2.5} /P M ₁₀	EFTSP [lbs/acre/day]	Capture Fraction	Duration of Grading [days]	Cleared Area [acres]	PM _{2.5} [tons]
Phase I (Year 1), Clearing and Grading	0.45	0.15	80	0.5	230	23.79	0.74
Expansion Phase (Year 1), Clearing and Grading	0.45	0.15	80	0.5	230	10.32	0.32
FCP Intersection (Year 1), Clearing and Grading	0.45	0.15	80	0.5	230	2	0.06
Golf Course (Year 2), Clearing and Grading	0.45	0.15	80	0.5	230	21.14	0.66
Total Fugitive Dust Emissions							1.78

Source: AP-42 Section 13.2.3 and USEPA 2005

**Table B-12.
Emergency Generator Emissions**

Emergency Generators ¹	Total Capacity	Number of Generators	NO _x	NO _x	VOC	VOC	PM	PM	SO _x	SO _x
	(kW)	(units)	(g/hpxhr)	(tpy)	(g/hpxhr)	(tpy)	(g/hpxhr)	(tpy)	(g/hpxhr)	(tpy)
Potential to Emit	1000	1	4.8	3.6	0.0	0.0	0.0	0.0	0.2	0.1
Estimated Actual Emissions			-	0.6	-	0.0	-	0.0	-	0.0

- Although all engines will be Tier II certified, nominal manufacturer's data were used for the NO_x emission factor, CO emission factor, and PM emission factor included in these calculations. Emissions data were not provided for PM₁₀, so it was assumed that PM₁₀ = PM. The emission factor for SO_x was obtained from USAF IERA Air Emissions Inventory Guidance for Stationary Sources at Air Force Installations, 1999, Revised December 2003. The SO_x emission factor uses "S", a sulfur content of 0.05 wt%.
- Assumed 500 hours for potential to emit and 80 hours for actual emissions.

**Table B-13.
Boiler Emissions**

	Total Heat Input	Total Fuel Limit	NO _x	NO _x	VOC	VOC	PM	PM	SO _x	SO _x
	(MMBtu/hr)	(10 ⁶ cf/yr)	(lb/10 ⁶ cf)	(tpy)	(lb/10 ⁶ cf)	(tpy)	(lb/10 ⁶ cf)	(tpy)	(lb/10 ⁶ cf)	(tpy)
Natural Gas										
Museum	16.8	136	36	2.45	5.5	0.38	7.6	0.52	0.6	0.04
Support Facilities	8.4	68	36	1.23	5.5	0.19	7.6	0.26	0.6	0.02
	Total Heat Input	Total Fuel Limit	NO _x	NO _x	VOC	VOC	PM	PM	SO _x	SO _x
No. 2 Fuel Oil²	(MMBtu/hr)	(gal/yr)	(lb/10 ³ gal)	(tpy)	(lb/10 ³ gal)	(tpy)	(lb/10 ³ gal)	(tpy)	(lb/10 ³ gal)	(tpy)
Museum	16.8	28,800	20	0.58	0.34	0.01	3.3	0.10	7.2	0.21
Support Facilities	8.4	14,400	20	0.29	0.34	0.00	3.3	0.05	7.2	0.10
Total				4.55		0.58		0.92		0.37

Notes:

1. Heat Content 1020 BTU/cf, 345 days per year.

2. Heat Content 140,000 BTU/gallon, 20 days per year.

^a Natural gas emission factors for all pollutants except NO_x were obtained from USEPA's AP-42, Section 1.4 (USEPA, 1995). The low NO_x burners reduce NO_x emissions to 30 ppm and 15 ppm according to manufacturer specifications. Using a standard conversion: lb/MMBtu = ppm / 850, the NO_x emission factor appropriate for burning natural gas in the proposed burners is 0.035 lb/MMBtu or 36 lb/MMcf, and 0.018 lb/MMBtu or 18 lb/MMcf. (This conversion assumes that the NO_x concentration reflects 3% oxygen.) Conservatively assume that PM₁₀ = PM.

^b No. 2 fuel oil emission factors for all pollutants were obtained from USEPA's AP-42, Section 1.3 (USEPA, 1995). Conservatively assume that PM₁₀ = PM. The SO_x emission factor uses a sulfur content of 0.05 wt%.

Appendix D

Record of Non-Applicability (RONA) to the General Conformity Rule

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**Draft Record of Non-Applicability (RONA)
to the General Conformity Rule for the Construction and Operation of
the National Museum of the U.S. Army, Fort Belvoir, VA**

September 28, 2010

Air emissions were estimated for the construction and operation of the proposed construction and operation of the National Museum of the U.S. Army facilities at Fort Belvoir. Emissions from land clearing and grading, construction of buildings, associated parking areas and structures, traffic control upgrades, and stormwater systems and support utility upgrades were assessed. Operational emissions from motor vehicles, emergency generators, and boilers were assessed. General Conformity under the Clean Air Act, Section 176 has been evaluated according to the requirements of 40 CFR 93.153, Subpart B. The requirements of this rule are not applicable because:

The highest total annual direct and indirect emissions from this proposed action have been estimated at 23.8 tons NO_x, 5.9 tons VOCs, 2.8 tons PM_{2.5}, and 4.0 tons SO₂ per year, which would be below the conformity threshold values of 50 tons VOCs and 100 tons for SO₂, PM_{2.5}, and NO_x, and would not be *regionally significant*.

Emissions estimations were based on the three year construction schedule as it is known at this time. Notably, the total emissions for all criteria pollutants for all three years combined would not exceed the applicability thresholds. Therefore, this determination would be accurate regardless of whatever schedule ultimately implemented.

Supported documentation and emission estimates:

- () Are Attached
- (X) Appear in the NEPA Documentation
- () Other (Not Necessary)


bol PATRICK M. MCLAUGHLIN
Chief
Environmental and Natural Resources Division
US Army Garrison, Fort Belvoir

Appendix E
Traffic Impact Analysis

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**United States Army Museum
Draft February 26, 2010**

Transportation Technical Documentation Input to the Draft Environmental Assessment

Introduction

The U.S. Army Museum is slated to be located at Fort Belvoir in Fairfax County, Virginia. Fort Belvoir, an installation of approximately 8,400 acres, currently accommodates 7,600 residents and 23,000 employees. The BRAC Action will increase the employment levels on Fort Belvoir to over 29,000 employees by the year 2011, and the residential population is expected to expand to nearly 9,400 employees at that same timeframe. Today there are transportation challenges on roadways in and surrounding Fort Belvoir during the AM and PM peak periods, as off-post roadways are congested and queues form at the gates for access into the installation.

The program would include construction of the main building, exterior space and parking areas. The main building would be approximately 177,000 sq ft, and would include exhibit halls, food service areas, an auditorium, retail areas, an administrative space, an education center and a lobby with a visitor reception area. The exterior program includes a 4 acre parade ground, a 6,000 sq ft grandstand, a memorial garden and an amphitheater. The parking area, depending on site layout, will be either surface or structured (garage) parking, or a combination of the two. The parking will accommodate 575 – 625 spaces for employees and visitors and 40 spaces for buses.

Transportation Analysis Assumptions

For the Gunston Site Study, the Berger SmithGroup retained Gorove/Slade Associates to perform the operational analysis.

1. Data collection efforts for the Gunston Site were completed in May 2008, in addition to obtaining the Synchro network and signal timing files from VDOT. The volumes collected were entered into Synchro to evaluate the existing conditions for the intersections of:
 - a. Fairfax County Parkway and Route 1
 - b. Fairfax County Parkway and JJ Kingman Road
 - c. Fairfax County Parkway and the ramps termini at Telegraph Road
2. The 2013 No Action Alternative forecasts were prepared by taking the 2008 volumes and accounting for inherent regional growth of 1.5% per year compounded annually until 2013. Increases of traffic volumes due to the BRAC action at Fort Belvoir were taken from the Environmental Impact Statement for the *Record of Decision for the Implementation of 2005 Base Realignment and Closure (BRAC) Recommendations and Related Army Actions at Fort Belvoir, Virginia*, dated August 7, 2007. The difference between the BRAC Action No Action and the Action Alternative were layered onto the factored volumes. This procedure developed the 2013 No Action Alternative forecast.
3. No roadway improvements in the study area were included in the 2013 No Action Alternative for this site.
4. Site generated traffic was taken from the consultant firm Clark Nexsen's traffic study completed in 2005 for the U.S. Army Museum Study. According to the trip generation analysis performed in this study, in the AM peak hour, 124 employees would drive to the site and in the PM peak hour, 124 employees would leave the site by car. For visitors, no trips would occur during the AM Peak hour, while in the PM peak hour, 73 visitors would arrive at the site and 232 visitors would leave the site.
5. One access scenario was considered. All visitors and employees would reach the Museum Site via a direct connection from the Fairfax County Parkway. This connection would be a new signalized

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intersection, to be located just east of Elhers Road, and west of Kingman Road. It would require closing the median for Elhers Road, such that it would be a right-in right-out only for the southbound direction.

Transportation Network

This section covers the transportation network for the existing conditions, 2013 No Action and 2013 Action conditions.

Existing Network

Fort Belvoir is well served by the regional roadway network. In the vicinity of Fort Belvoir, the following roadways serve as commuter routes, with I-95 and I-495 serving longer distance, non-commuter traffic as well:

- Interstate 95 (I-95) / I-395 (Shirley Highway) / I-95/I-495 (Capital Beltway) system
- U.S. Route 1 (Richmond Highway)
- State Route 7100 (Fairfax County Parkway)
- State Route 235 (Mount Vernon Memorial Highway)
- State Route 611 (Telegraph Road)
- State Route 613 (Beulah Street)
- George Washington Memorial Parkway

The regional roadways, serving as major commuter routes to employment locations in Fairfax County, Alexandria, Arlington, and the Washington, DC core, also provide access to land uses adjacent to Fort Belvoir.

The roadway system on Fort Belvoir's Main Post includes the following:

- John J. Kingman Road on North Post, which provides access from the Fairfax County Parkway to a number of sites, including the Andrew T. McNamara Headquarters Complex, InsCOM, North Post Golf Course, Mosby Reserve Center, and Davison Army Airfield.
- Beulah Street, which provides access to the North Post from Telegraph Road, and connects to Kingman Road.
- Woodlawn, Meade, Goethals, Abbot, Gorgas, and Meeres Roads provide internal circulation within North Post.
- Gunston Road, the only connector between North and South Post that has a bridge crossing over Route 1, serves as the north-south connection.
- Pohick Road, which provides access to the South Post from U.S. Route 1 via Tulley Gate. Currently, all visitors and trucks to Fort Belvoir must enter the post via Tulley Gate and be processed at the Post Visitor Center.
- Belvoir Road, which provides access to the South Post from U.S. Route 1 via Pence Gate.
- Mount Vernon Road, which provides access to South Post from Mount Vernon Memorial Highway via Walker Gate, and also links to Surveyor Road to provide connections Belvoir Road.
- 9th, 12th, 16th, 18th, 21^s, and 23rd Streets, which provide for east-west movement on South Post and connect Gunston Road with Belvoir Road.

While no rail transit service is provided directly to Fort Belvoir, two rail services—WMATA's Metrorail and the VRE—have stations within a few miles of Fort Belvoir, as discussed below.

Metrorail has two stations that serve Fort Belvoir. The Franconia-Springfield station on the Blue Line is approximately 3 miles north of Fort Belvoir. The Huntington Station on the Yellow Line is located just south of Alexandria, approximately 7 miles northeast of Fort Belvoir. Both the Blue and Yellow Lines

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provide service to Ronald Reagan National Airport and the Pentagon as well as the central core area of Washington, DC, with connections to each of the other Metrorail lines. Metrorail operates 7 days a week with weekday service generally available from 5:30 AM to midnight. Service frequency on the Blue and Yellow Lines generally is 6 minutes during peak times and 12 minutes during off-peak times.

The Fort Belvoir area of Fairfax County is served by VRE's Fredericksburg Line. Two VRE stations are in the general vicinity of Fort Belvoir. The Lorton station is approximately 1.5 miles west of Fort Belvoir, east of I-95, and south of Pohick Road. The Franconia-Springfield VRE station is adjacent to the Franconia-Springfield Metro station, approximately 3 miles north of Fort Belvoir. The Fredericksburg Line operates between Fredericksburg and Union Station in Washington, DC. It serves locations in Stafford County, Prince William County, Fairfax County, Alexandria, and Arlington County. Service frequency at these stations is every 30 minutes from approximately 6:00 AM to 8:30 AM and from 4:00 PM to 7:00 PM.

Six bus routes directly serve portions of Main Post, including one WMATA Metrobus route, four Fairfax Connector routes, and one private bus line. Each route is described briefly below.

- *Metrobus REX* (Richmond Highway Express). The REX route provides express service between Fort Belvoir and the King Street Metro station in Alexandria.
- *Fairfax Connector Route 171* (Richmond Highway Line). Route 171 provides service between the Franconia-Springfield Metro station and the Huntington Metro station.
- *Fairfax Connector Route 301* (Telegraph Road Line). Route 301 also provides local service between the Franconia-Springfield Metro station and the Huntington Metro station.
- *Fairfax Connector Routes 331/332* (I-95 Circulator). These two routes operate in a loop connecting the Franconia-Springfield Metro station, Springfield Mall, the Springfield business district, Fort Belvoir, and various destinations along both sides of the I-95 corridor.
- *Lee Coaches*. A private bus company in Stafford County, Lee Coaches operates one weekday round trip between the Route 208 Commuter Lot in Spotsylvania and Fort Belvoir. It also serves the Route 17 North Commuter Lot near Fredericksburg. At Fort Belvoir, the bus circulates through the South Post and makes a number of stops.

The Fairfax County Parkway and a portion of Telegraph Road are the only roadways around Fort Belvoir that have dedicated shared-use trails or dedicated on-street bike lanes. However, Fairfax County's Countywide Trails Plan envisions an improved network for on-street bike lanes and shared use trails – these include roadways around Fort Belvoir. Such a network would improve the long-range mobility for pedestrian and cyclists. Generally throughout the Post low vehicle volumes and low speeds make pedestrian and bicycle travel feasible. This is especially true of the older areas on South Post. Although trails exist sporadically throughout, there is no organized bike or multi-use trail that traverses the post.

No Action Network Improvements

By 2013, a number of roadway links both on-post and surrounding the post will be improved, below is a summary of the improvements, some of which are yet to be approved. They are expected to be open by 2013.

- Provide an additional general-purpose lane on I-95 between Route 123 and Fairfax County Parkway,
- Complete the Springfield Interchange, by constructing Phase 8, which provides direct HOV/HOT connection from the existing HOV lanes to/from the Beltway,
- Convert the I-95 HOV lanes into HOT lanes (HOV/bus traffic would still be free, but SOV traffic to pay a toll), and add a third lane,
- Extend the Fairfax County Parkway through EPG and provide direct connections into EPG from I-95,

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- Construct the Woodlawn Connector Road between Telegraph Road and Route 1, tying into Route 1 at Mount Vernon Highway,
- Widen Pohick Road from 2 to 4 lanes between Route 1 and Gunston Road on-post,
- Widen Gunston Road from 2 to 4 lanes, with appropriate turn lanes between Pohick Road and Kingman Road,
- Widen Belvoir Road from 2 to 4 lanes between Route 1 and Ninth Street
- Widen Ninth Street from 2 to 4 lanes between Belvoir and Gunston Road
- Improve/construct gates at current locations: Tulley, Pence and Lieber
- Add signals to improve circulation on-post.
- Add additional left turn lanes at the Route 1 intersection with Belvoir Road to account for the BRAC Implementation and the addition of the lower North Post Access Control Point. It was assumed by the Feasibility Study Team that this intersection will have double left turn lanes on all approaches; currently the intersection has only a single left turn lane on the existing three approaches.

Route 1 is expected to be widened to 6 lanes in some point in the future; however, at this time, the widening is expected to occur in the year 2015, at the earliest. Thus, this will occur after the opening of the Museum, and therefore is not part of the analysis. It should be noted that for the No Action analysis, improvements were assumed by the Feasibility Team to be in place at the Route 1/Belvoir Road intersection. These improvements would indeed provide better operational performance of the intersection. However, funding at this time has yet to be allocated, and the improvements have not been approved by VDOT. The consequence of this improvement not being in place is that the intersection will not perform as indicated. But in terms of analysis of the alternatives, it is a relative comparison between the No Action and each proposed scenario that is considered when assessing the impacts of the proposed action.

Planned improvements to the transit services are not known at this time. Service providers routinely review their operations to improve ridership levels and make adjustments to their service plans. Any changes to their service plans would typically result in improved services and higher ridership levels.

Action Network Improvements

One access scenario was considered for the Gunston Site. For the direct connection off of the Parkway, it is proposed to close the median break for Elhers Road to allow for construction of a new signalized intersection into the Museum. The signal will include the needed left and right turn bays from the Parkway into the site, as well as capacity to handle exiting traffic. This new signal would be coordinated with the signal at Kingman, so as to not disrupt the progression along the Parkway between the two signals.

Traffic Volumes

The analysis year for the existing conditions was set to 2008 as the data was collected in May 2008 for the Gunston Site. As mentioned previously, the existing volumes were factored accounting for inherent regional growth. The difference between the BRAC Action No Action and the Action Alternative were layered onto the factored volumes. This procedure developed the 2013 No Action Alternative forecast.

Traffic volumes for existing, No Action and the Action Alternative are presented in **Appendix A**.

There are several on-going actions at Fort Belvoir that could affect the future traffic volumes. Currently Fort Belvoir is in the process of developing an overall Transportation Management Plan (travel demand

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management plan) to reduce single-occupancy vehicle (SOV) trips, but at this time, the program has not been defined. Therefore no trip reductions were assumed for the 2013 traffic volumes. By assuming no trip reductions, it means that the analysis assumes the higher volume scenario, i.e. the “worst case” is assessed. If a TMP program is implemented, then total volume into and out of Fort Belvoir will likely decrease, and could include the Museum as part of the TMP program. This would provide museum employees as a means carpool/vanpool to work. For every one high-occupancy vehicle, assuming three people per vehicle, would take two SOV trips of the road. If such a plan is implemented, then it can be expected that peak hour trips to/from Fort Belvoir could decrease.

Operational Analysis

A traffic operational analysis was completed for the intersections affected by the Museum for the Gunston Site. **Table 1** presents the MOEs for the study area intersections for the Gunston Site under existing conditions.

Table 1: Intersection Measures of Effectiveness – 2008 Existing

Signalized Location	Intersection	AM Peak Hour			PM Peak Hour		
		V/C	LOS	Delay	V/C	LOS	Delay
Fairfax County Parkway/Route 1 FCP/Kingman/Farrar Telegraph/NB FCP ramps Telegraph/SB FCP ramps		0.93	D	39.8	0.92	D	42.1
		0.70	C	33.3	0.82	E	61.7
		0.44	B	14.5	0.66	C	20.5
		0.54	C	22.5	0.87	D	37.6

Source: Gorove Slade Associates, June 2008

One intersection, per the operational analysis performed by Gorove/Slade, performs at a less than desired level of service (LOS). It is the intersection of Fairfax County Parkway and Kingman Road. Ideally, in a region such as Northern Virginia, an intersection’s LOS would be “D” or better. All other intersections perform at an acceptable level of service. Using the technique to factor traffic to 2013 conditions as described previously, the 2013 No Action conditions were assessed. **Table 2** presents the MOEs for the 2013 No Action conditions for the Gunston Site.

Table 2: Intersection Measures of Effectiveness – 2013 No Action

Signalized Location	Intersection	AM Peak Hour			PM Peak Hour		
		V/C	LOS	Delay	V/C	LOS	Delay
Fairfax County Parkway/Route 1 FCP/Kingman Telegraph/NB FCP ramps Telegraph/SB FCP ramps		1.17	F	103.6	1.05	E	64.9
		0.86	E	65.4	1.1	F	127
		0.61	B	17.3	0.68	C	22.3
		0.56	C	22.1	0.94	E	56.8

Source: Gorove Slade Associates, June 2008

The analysis shows that intersection operational performance will deteriorate over existing conditions as no improvements are currently slated for these intersections. This deterioration is due to the background growth and not the Museum. To access the traffic impacts due to the Museum, the site traffic was layered onto the No Action network, and the new roadways were added, depending on the access scenario. The signal timings were optimized with the additional site traffic, which would be appropriate as timings are routinely optimized considering the traffic flow. **Table 3** presents the MOEs for the Action access scenario that includes the roadway that ties directly into the Fairfax County Parkway.

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Table 3: Intersection Measures of Effectiveness – 2013 Action

Signalized Location	Intersection	AM Peak Hour			PM Peak Hour		
		V/C	LOS	Delay	V/C	LOS	Delay
Fairfax County Parkway/Route 1		1.17	F	106.1	1.1	E	76.4
FCP/Kingman		0.87	E	63.6	1.19	F	108.6
Telegraph/NB FCP ramps		0.61	B	18.6	0.7	C	23.6
Telegraph/SB FCP ramps		0.57	C	22.2	0.95	E	60.7
FCP/Museum Entrance		0.98	C	25.5	0.89	B	17.8

Source: Gorove Slade Associates, June 2008

The analysis shows that the additional museum traffic would have some impact to the overall intersection MOEs along the Fairfax County Parkway, however the increases are marginal over the No Action network.

Other Information

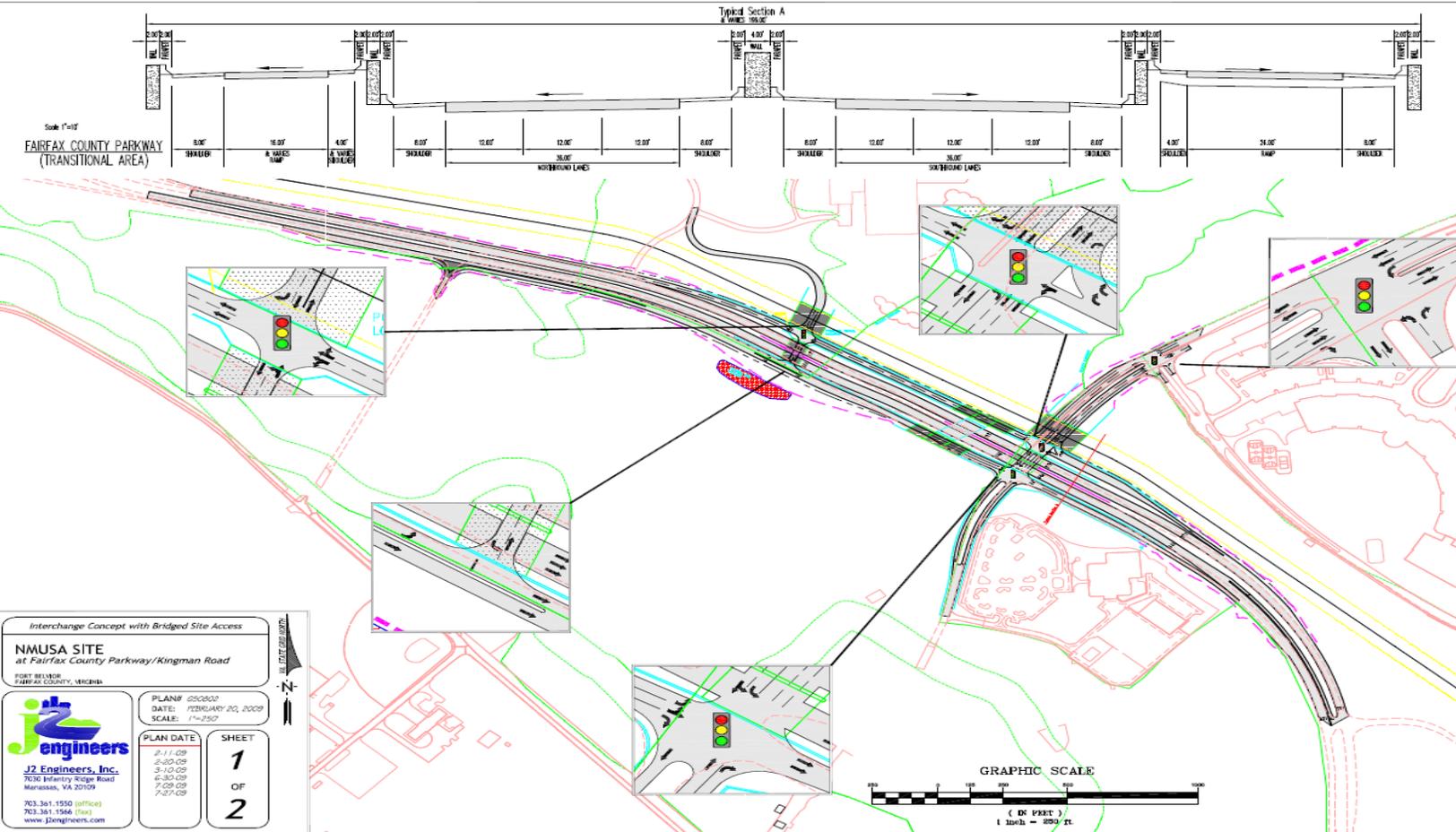
NMUSA Interchange Analysis – Fairfax County Parkway at Kingman Road

Gorove/Slade Associates developed and analyzed a preliminary interchange concept for the Fairfax County Parkway at Kingman Road intersection in August 2009. The design concept is shown in Figure 1. In addition, a No Action interchange concept was analyzed, which would not include access from the interchange to the NMUSA.

Tables 4 and 5 show the projected levels of service under the Action and No Action concepts. The analysis year is 2030 for the interchange analyses. As shown, the Action alternative does not result in LOS levels below LOS D. Most of the movements do not experience degradation in LOS from the No Action to Action scenarios.

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Figure 1: Conceptual Interchange at the Fairfax County Parkway/Kingman Road Intersection and Access to NMUSA



Source: Grove/Slade, 2009. Note: Concept only

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Table 4. 2030 No Action Interchange Analysis Results

Intersection (Approach/Movement)	AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Eastbound CD Rd / J.J. Kingman Rd				
Overall (Signalized)	D	42.1	C	23.5
Eastbound Left	D	47.2	D	45.6
Eastbound Left-Through	D	47.4	D	45.6
Eastbound Right	B	11.7	D	35.3
Northbound Through	E	58.5	E	56.2
Northbound Right	D	53.3	D	50.3
Southbound Left	A	1.6	A	2.9
Southbound Left-Through	A	1.6	A	3
Westbound CD Rd / J.J. Kingman Rd				
Overall (Signalized)	B	19.1	B	17.6
Westbound Left-Through	D	50.7	D	47.3
Westbound Right	E	64.8	B	14.3
Northbound Left	D	37.3	C	21.2
Northbound Through	A	1.3	A	1.3
Southbound Through	E	59	C	28.4
Southbound Right	A	6.8	B	18.2

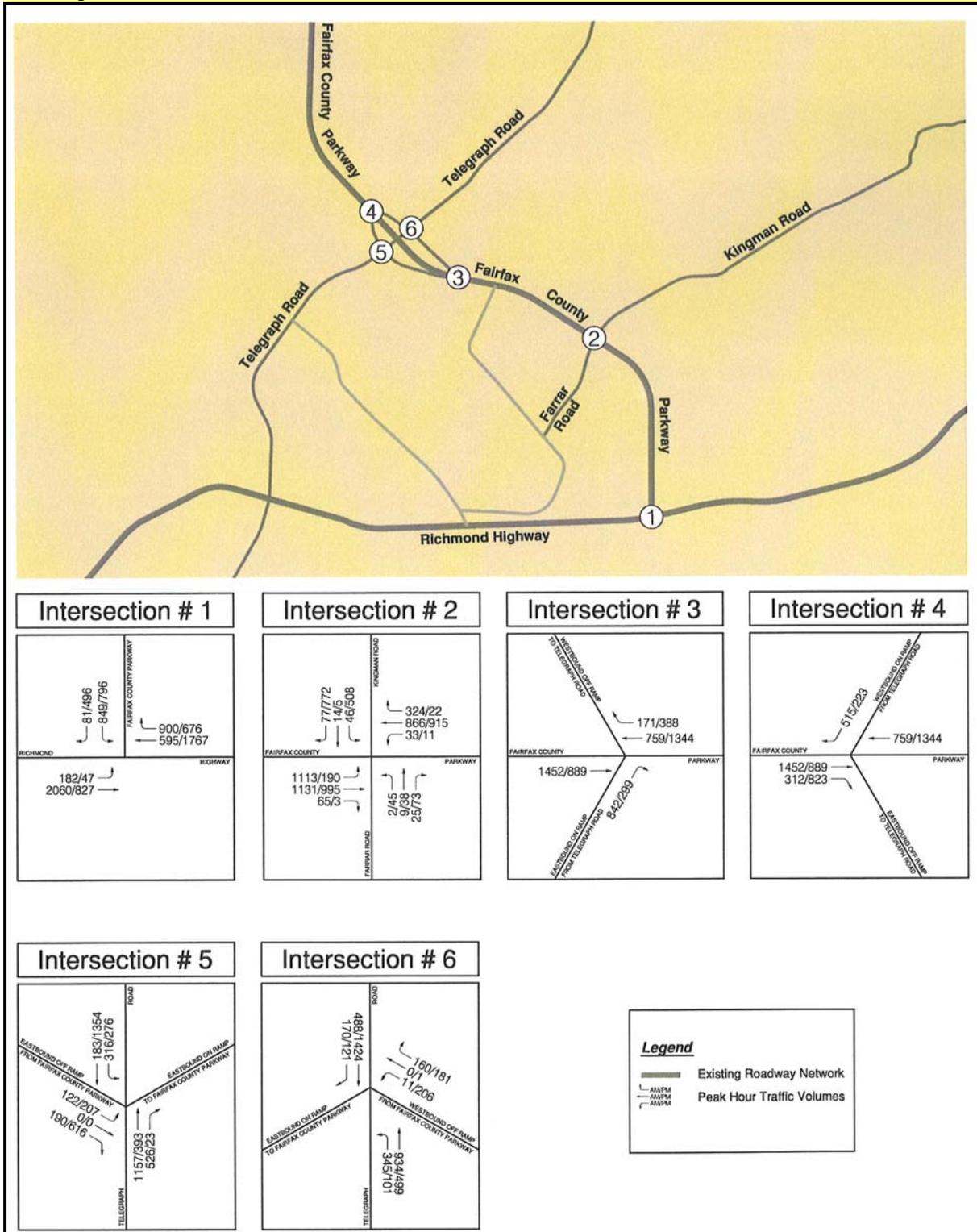
Table 5. 2030 Action Interchange Analysis Results

Intersection (Approach/Movement)	AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Eastbound CD Rd / J.J. Kingman Rd				
Overall (Signalized)	D	41.5	D	37.4
Eastbound Left	D	42	E	61.8
Eastbound Left-Through	D	42.2	E	66.2
Eastbound Right	B	11.0	D	36.1
Northbound Through	E	72.0	D	51.4
Northbound Right	D	54.7	D	47.8
Southbound Left	D	37.7	B	12.5
Southbound Left-Through	D	37.4	B	12.8
Westbound CD Rd / J.J. Kingman Rd				
Overall (Signalized)	C	22.9	C	22.9
Westbound Left-Through	D	51.1	D	40.6
Westbound Right	E	77.9	B	14.9
Northbound Left	D	39.3	B	17.4
Northbound Through	A	1.5	A	0.5
Southbound Through	E	71.3	D	46.6
Southbound Right	A	5.7	C	20.1

Appendix - Turning Movement Volumes

Gunston Site Turning Movement Volumes

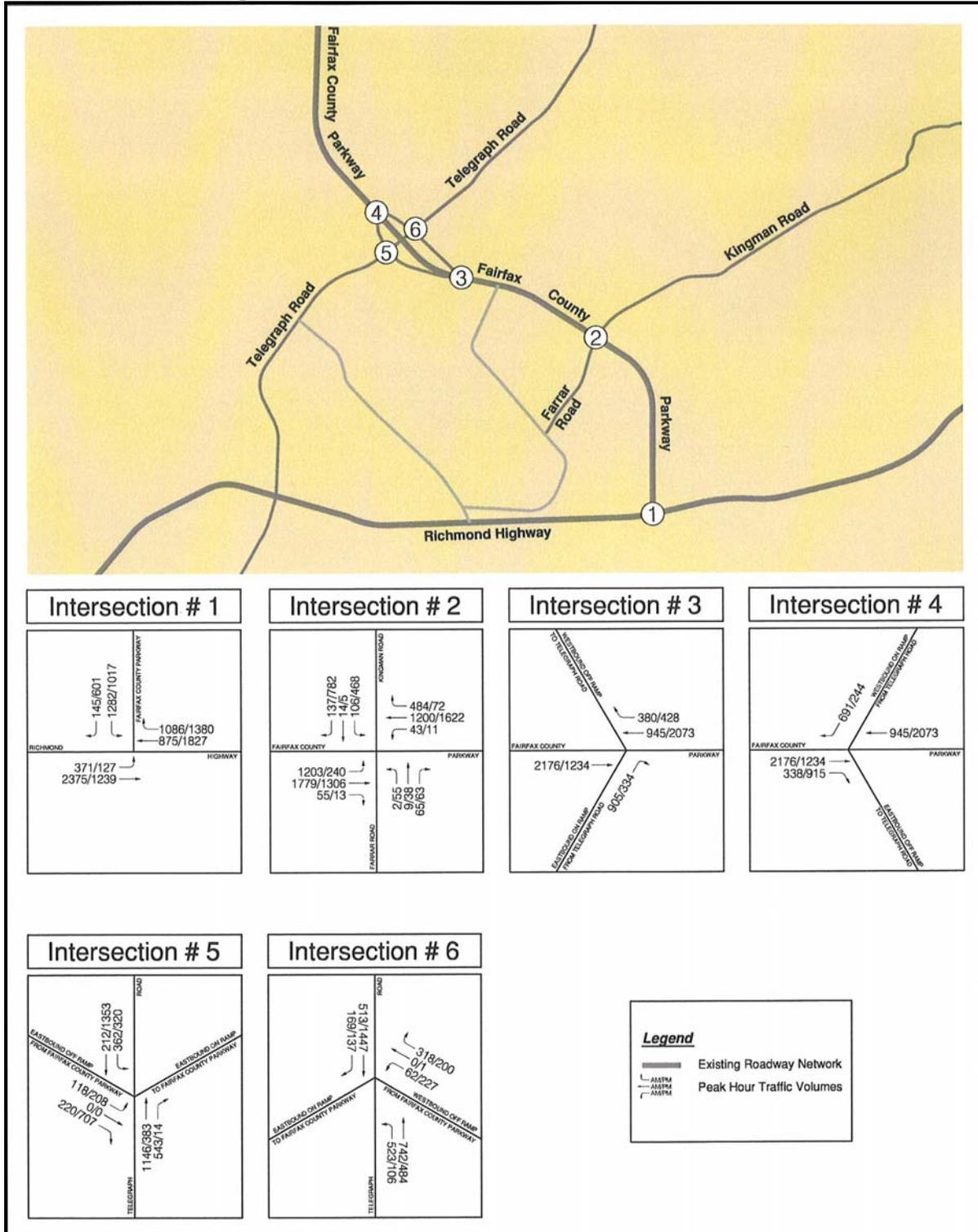
Existing Traffic Volumes (2008)



Source: Gorove Slade Associates, June 2008

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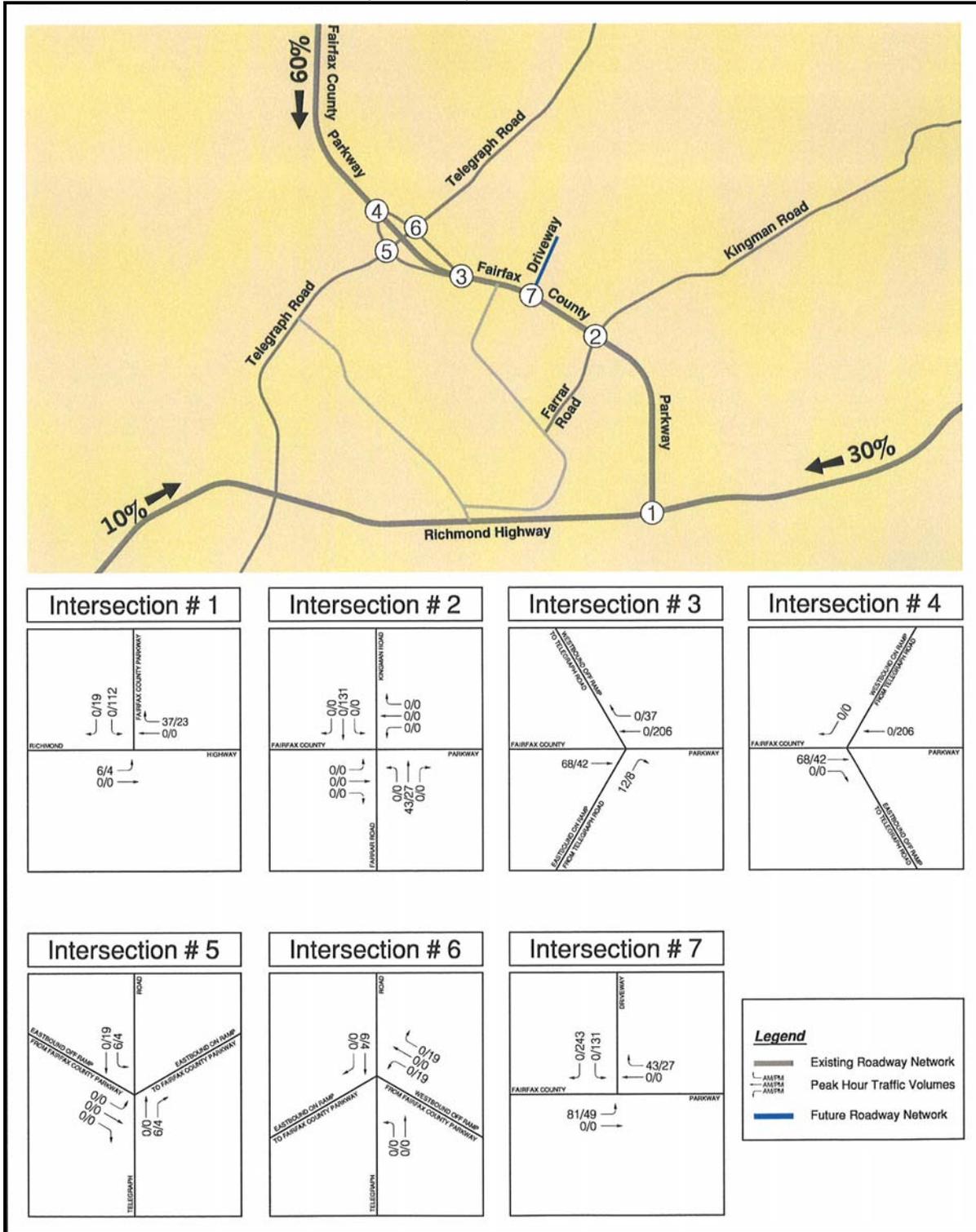
Future without Development Traffic Volumes (2013 No Action)



Source: Gorove Slade Associates, June 2008

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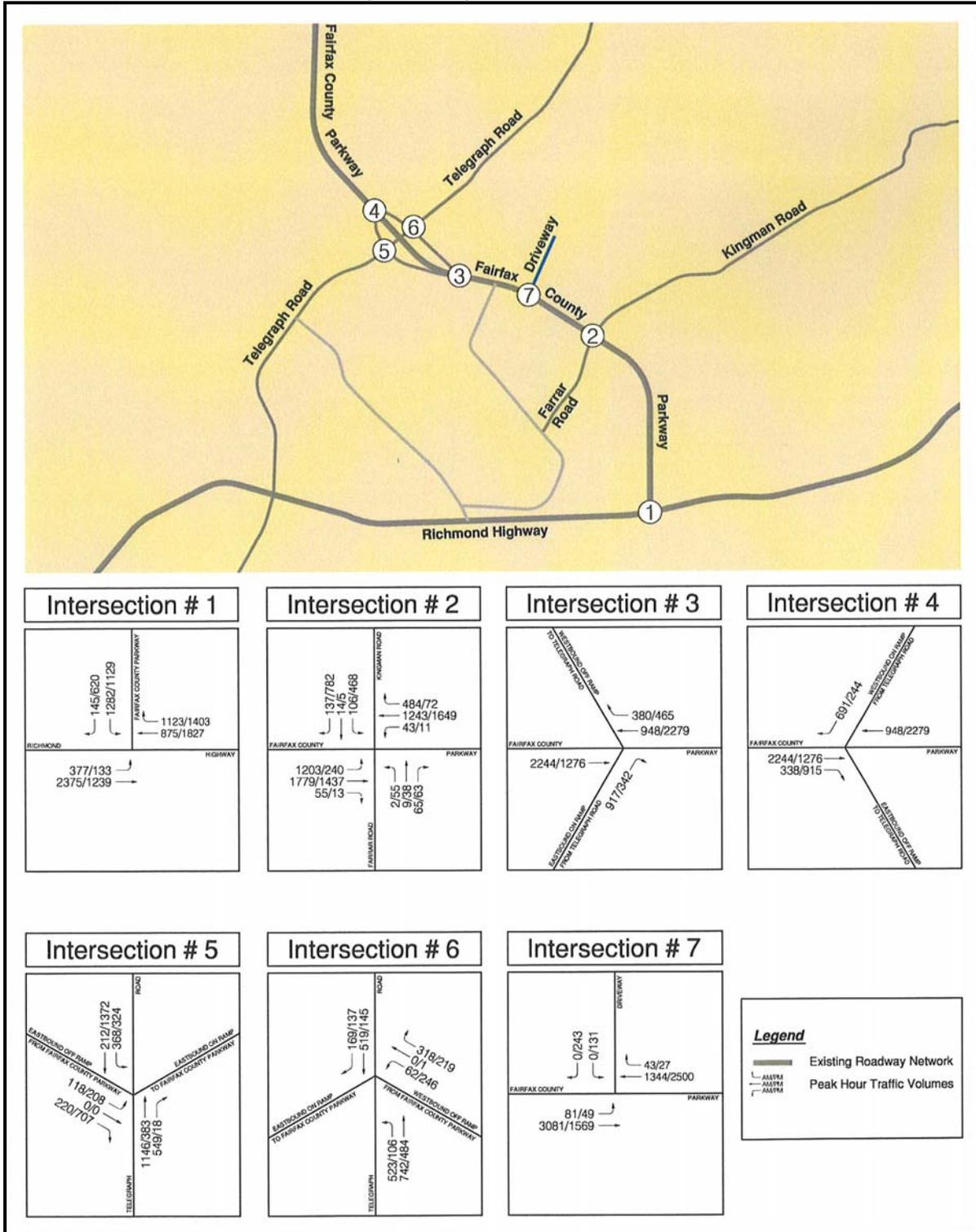
Site Generated 2013 Traffic Volumes
Direct connection to Fairfax County Parkway



Source: Gorove Slade Associates, June 2008

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Future with 2013 Development Traffic Volumes
Direct connection to Fairfax County Parkway



Source: Gorove Slade Associates, June 2008

Appendix F
Stormwater Calculations

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Increase in stormwater runoff from proposed development of the Fort Belvoir Army Museum:

The following is a preliminary analysis for determination of stormwater storage required to control stormwater runoff for storms of two and ten year frequency for the proposed Fort Belvoir Army Museum.

The change of impervious area for the proposed site consists of 21.64 acres of land, the site is located near the intersection of Kingman Road and the Fairfax County Parkway in Fairfax County Virginia. The preliminary stormwater storage required is based on design guidelines from chapter six of the Fairfax County Public Facilities Manual.

Existing Site Conditions and Proposed Improvements:

The existing site is generally vegetated pervious area comprised in part of existing wooded area and part of an existing golf course. The runoff from the site flows in a southwesterly direction approximately 1500' to Accotink Creek.

Pre-development runoff from the site:

Pre-development site area = 21.64 acres

Runoff coefficient:

Wooded and area within existing golf course = 21.64 acres; $C_2=0.20$, $C_{10}=0.30$

Estimated Time of Concentration:

Based on "Time of Concentration of Small Drainage Basins", Plate 4-6, Fairfax County PFM

Travel time sheet flow: = 100' travel with 5' vertical fall = 1.9 Minutes

Travel time shallow channel flow = 350' travel with 10' vertical fall = 2.6 Minutes

Travel time channel flow = 1,950' travel with 60' vertical fall = 10.0 Minutes

Travel time total = 14.5 Minutes

Time of concentration: Use $T_c = 15$ minutes; $I_2 = 3.90$, $I_{10} = 5.10$

$Q_2 = 16.88$ c.f.s. $Q_{10} = 33.11$ c.f.s.

Post-development runoff from the site:

Post-development site plan area = 21.64 acres

Runoff coefficient:

Proposed impervious area, (building, parking area, walks, etc.)= 21.64 acres; C_2 & $C_{10}=0.90$

C_2 & $C_{10} = 0.90$

Estimated Time of Concentration:

Based on "Time of Concentration of Small Drainage Basins", Plate 4-6, Fairfax County PFM

Travel time sheet flow: = 100' travel with 5' vertical fall = 0.8 Minutes

Travel time shallow channel and pipe flow = 650' travel with 10' vertical fall = 1.2 Minutes

Travel time channel flow = 1,650' travel with 60' vertical fall = 8.4 Minutes

Travel time total = 10.4 Minutes

Time of concentration: Use $T_c = 10$ minutes: $I_2 = 4.60$, $I_{10} = 5.92$

$Q_2 = 89.59$ c.f.s. $Q_{10} = 115.30$ c.f.s.

Increase runoff due to site development:

$Q_2 = 89.59 - 16.88 = 72.71$ c.f.s. Increase – Required decrease in runoff for storms of two year intensity

$Q_{10} = 115.30 - 33.11 = 82.19$ c.f.s. Increase – Required decrease in runoff for storms of ten year intensity

Estimated 10-Year stormwater detention required = 93,900 CF or 2.2 Acre-feet

See attachments for additional information.

Calculation of Unit Inflow Hydrographs for Pre- & Post-Development Runoff for Storms of Two and Ten Year Intensity
PROPOSED SITE of FORT BELVOIR ARMY MUSEUM, FORT BELVOIR, VIRGINIA

Unit Inflow Hydrograph for Pre-Development Storms of Two Year Intensity

TIME (Minute)	2-Yr. Storm Incremental Unit Hydro. Intensities	Time of Con. Tc=15 Min.	Site Area (Acres)	Runoff (c.f.s.)
5	1.65	0.20	21.64	7.14
10	3.18	0.20	21.64	13.76
15	3.90	0.20	21.64	16.88 Peak Flow
20	3.27	0.20	21.64	14.15
25	2.31	0.20	21.64	10.00
30	1.76	0.20	21.64	7.62
35	1.42	0.20	21.64	6.15
40	1.17	0.20	21.64	5.06
45	0.97	0.20	21.64	4.20
50	0.80	0.20	21.64	3.46
55	0.67	0.20	21.64	2.90
60	0.55	0.20	21.64	2.38
65	0.50	0.20	21.64	2.16
70	0.46	0.20	21.64	1.99
75	0.41	0.20	21.64	1.77
80	0.37	0.20	21.64	1.60
85	0.32	0.20	21.64	1.38
90	0.28	0.20	21.64	1.21
95	0.23	0.20	21.64	1.00
100	0.18	0.20	21.64	0.78
105	0.14	0.20	21.64	0.61
110	0.09	0.20	21.64	0.39
115	0.05	0.20	21.64	0.22
120	0.00	0.20	21.64	0.00

Unit Inflow Hydrograph for Pre-Development Storms of Ten Year Intensity

TIME (Minute)	10-Yr. Storm Incremental Unit Hydro. Intensities	Time of Con. Tc=15 Min.	Site Area (Acres)	Runoff (c.f.s.)
5	2.20	0.30	21.64	14.28
10	4.24	0.30	21.64	27.53
15	5.10	0.30	21.64	33.11 Peak Flow
20	4.36	0.30	21.64	28.31
25	3.08	0.30	21.64	20.00
30	2.34	0.30	21.64	15.19
35	1.89	0.30	21.64	12.27
40	1.56	0.30	21.64	10.13
45	1.29	0.30	21.64	8.37
50	1.07	0.30	21.64	6.95
55	0.89	0.30	21.64	5.78
60	0.73	0.30	21.64	4.74
65	0.67	0.30	21.64	4.35
70	0.61	0.30	21.64	3.96
75	0.55	0.30	21.64	3.57
80	0.49	0.30	21.64	3.18
85	0.43	0.30	21.64	2.79
90	0.37	0.30	21.64	2.40
95	0.30	0.30	21.64	1.95
100	0.24	0.30	21.64	1.56
105	0.18	0.30	21.64	1.17
110	0.12	0.30	21.64	0.78
115	0.06	0.30	21.64	0.39
120	0.00	0.30	21.64	0.00

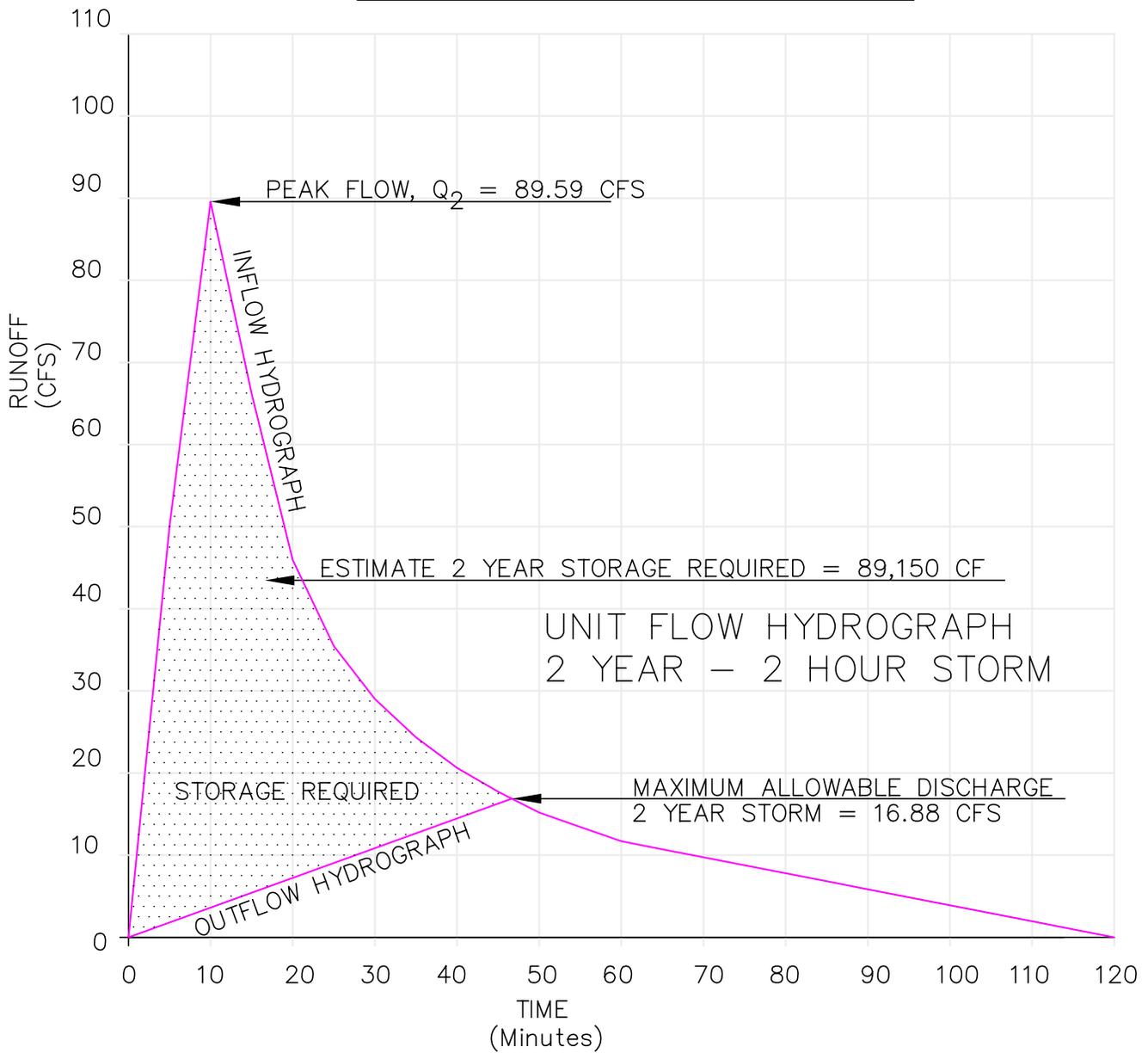
Unit Inflow Hydrograph for Post-Development Storms of Two Year Intensity

TIME (Minute)	2-Yr. Storm Incremental Unit Hydro. Intensities	Time of Con. Tc=10 Min.	Site Area (Acres)	Runoff (c.f.s.)
5	2.57	0.90	21.64	50.05
10	4.60	0.90	21.64	89.59 Peak Flow
15	3.40	0.90	21.64	66.22
20	2.36	0.90	21.64	45.96
25	1.82	0.90	21.64	35.45
30	1.49	0.90	21.64	29.02
35	1.25	0.90	21.64	24.35
40	1.06	0.90	21.64	20.64
45	0.91	0.90	21.64	17.72
50	0.78	0.90	21.64	15.19
55	0.69	0.90	21.64	13.44
60	0.60	0.90	21.64	11.69
65	0.55	0.90	21.64	10.71
70	0.50	0.90	21.64	9.74
75	0.45	0.90	21.64	8.76
80	0.40	0.90	21.64	7.79
85	0.35	0.90	21.64	6.82
90	0.30	0.90	21.64	5.84
95	0.25	0.90	21.64	4.87
100	0.20	0.90	21.64	3.90
105	0.15	0.90	21.64	2.92
110	0.10	0.90	21.64	1.95
115	0.05	0.90	21.64	0.97
120	0.00	0.90	21.64	0.00

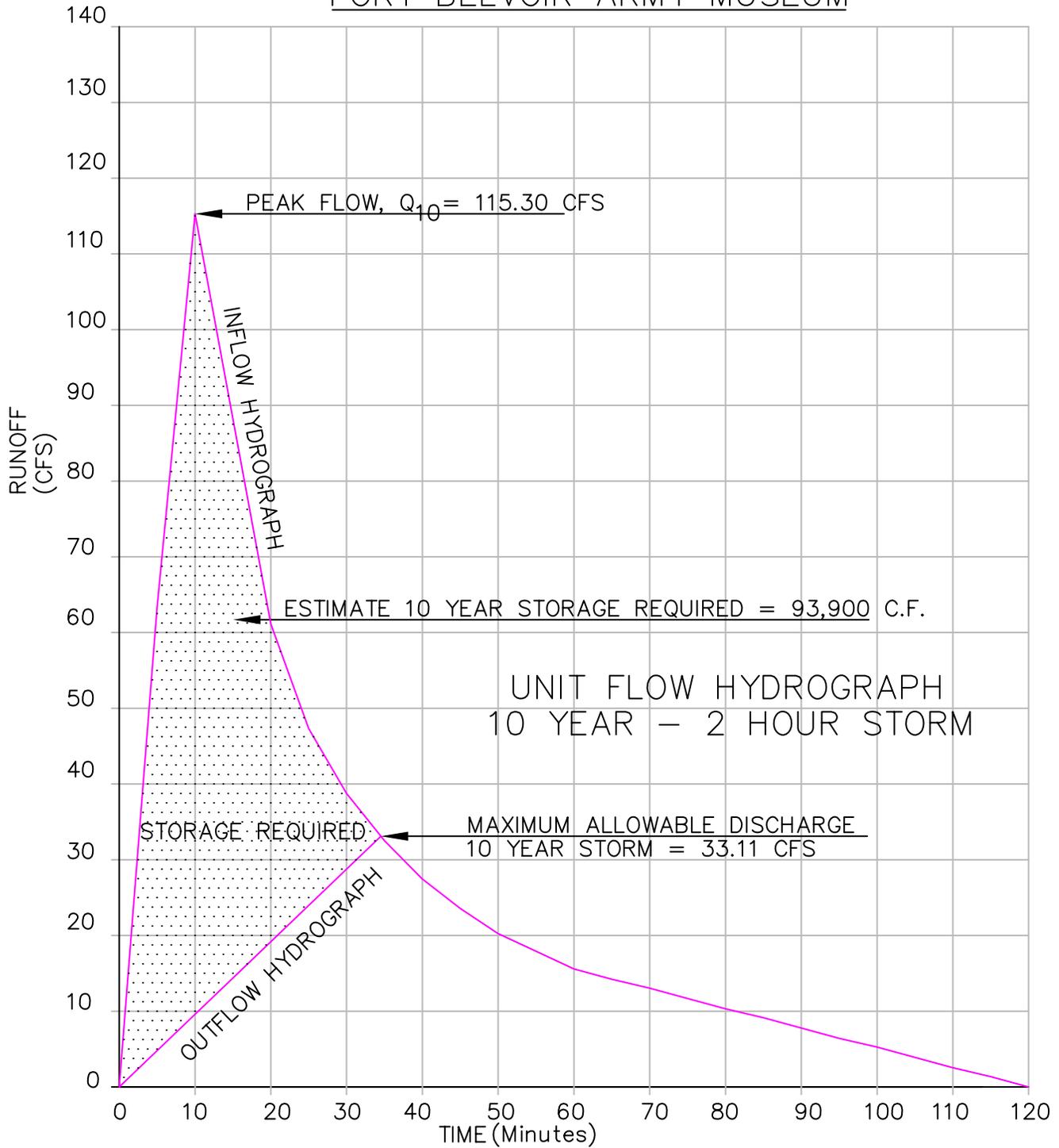
Unit Inflow Hydrograph for Post-Development Storms of Ten Year Intensity

TIME (Minute)	10-Yr. Storm Incremental Unit Hydro. Intensities	Time of Con. Tc=10 Min.	Site Area (Acres)	Runoff (c.f.s.)
5	3.25	0.90	21.64	63.30
10	5.92	0.90	21.64	115.30 Peak Flow
15	4.53	0.90	21.64	88.23
20	3.14	0.90	21.64	61.15
25	2.43	0.90	21.64	47.33
30	1.99	0.90	21.64	38.76
35	1.67	0.90	21.64	32.52
40	1.41	0.90	21.64	27.46
45	1.21	0.90	21.64	23.57
50	1.04	0.90	21.64	20.26
55	0.92	0.90	21.64	17.92
60	0.80	0.90	21.64	15.58
65	0.73	0.90	21.64	14.22
70	0.67	0.90	21.64	13.05
75	0.60	0.90	21.64	11.69
80	0.53	0.90	21.64	10.32
85	0.47	0.90	21.64	9.15
90	0.40	0.90	21.64	7.79
95	0.33	0.90	21.64	6.43
100	0.27	0.90	21.64	5.26
105	0.20	0.90	21.64	3.90
110	0.13	0.90	21.64	2.53
115	0.07	0.90	21.64	1.36
120	0.00	0.90	21.64	0.00

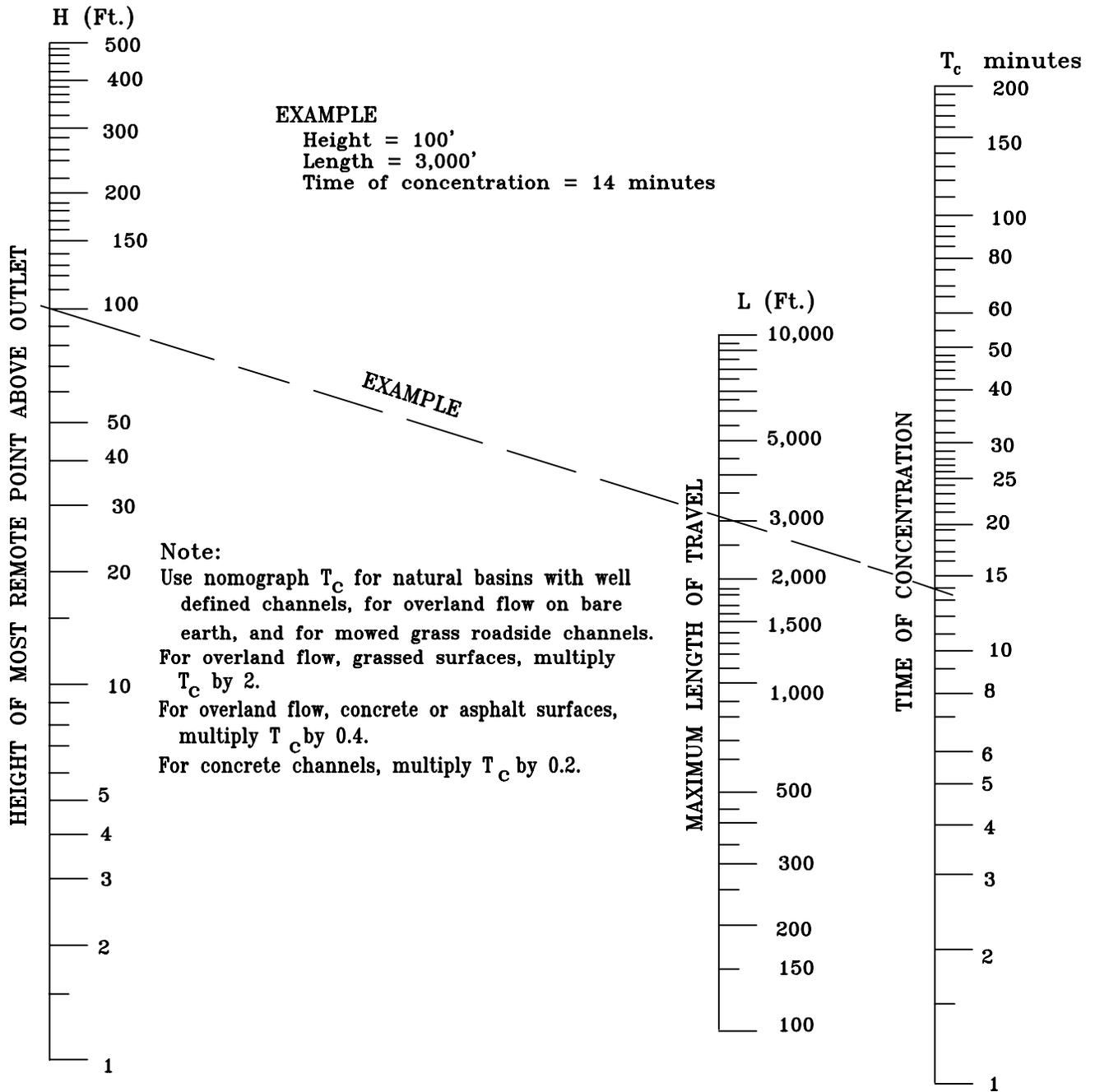
PRELIMINARY ESTIMATE OF STORMWATER DETENTION
 REQUIRED FOR STORMS OF TWO YEAR INTENSITY
FORT BELVOIR ARMY MUSEUM



PRELIMINARY ESTIMATE OF STORMWATER DETENTION
REQUIRED FOR STORMS OF TEN YEAR INTENSITY
FORT BELVOIR ARMY MUSEUM



FAIRFAX COUNTY PUBLIC FACILITIES MANUAL



Ref. Sec. 6-0803.3C(1)

TIME OF CONCENTRATION OF SMALL DRAINAGE BASINS

PLATE NO.

STD. NO.

4-6

Rev. 1-00

6-0000 STORM DRAINAGE

6-0806 INCREMENTAL UNIT HYDROGRAPH – 1 IMPERVIOUS ACRE

TABLE 6.7 INCREMENTAL UNIT HYDROGRAPH INTENSITIES-INCHES/HOUR

TIME (Minute)	$t_c=5$ Minute				$t_c=10$ Minute				$t_c=15$ Minute			
	2-YR	10-YR	25-YR	100-YR	2-YR	10-YR	25-YR	100-YR	2-YR	10-YR	25-YR	100-YR
5	5.45	7.27	8.27	9.84	2.57	3.25	3.42	3.68	1.65	2.20	2.44	2.81
10	3.51	4.68	5.34	6.37	4.60	5.92	6.77	8.10	3.18	4.24	5.92	5.99
15	2.60	3.46	3.95	4.73	3.40	4.53	5.29	6.47	3.90	5.10	5.86	7.05
20	2.08	2.77	3.15	3.74	2.36	3.14	3.65	4.44	3.27	4.36	4.88	5.69
25	1.72	2.29	2.62	3.13	1.82	2.43	2.85	3.50	2.31	3.08	3.40	3.89
30	1.46	1.94	2.23	2.65	1.49	1.99	2.33	2.86	1.76	2.34	2.66	3.17
35	1.28	1.68	1.93	2.33	1.25	1.67	2.97	2.43	1.42	1.89	2.22	2.73
40	1.10	1.47	1.70	2.07	1.06	1.41	1.71	2.17	1.17	1.56	1.89	2.40
45	1.00	1.31	1.53	1.88	0.91	1.21	1.49	1.93	0.97	1.29	1.63	2.16
50	0.89	1.18	1.38	1.69	0.78	1.04	1.33	1.78	0.80	1.07	1.42	1.98
55	0.82	1.08	1.26	1.55	0.69	0.92	1.21	1.67	0.67	0.89	1.26	1.83
60	0.74	0.99	1.16	1.42	0.60	0.80	1.10	1.58	0.55	0.73	1.10	1.68
65	0.68	0.91	1.06	1.30	0.55	0.73	1.01	1.45	0.50	0.67	1.01	1.54
70	0.62	0.83	0.97	1.18	0.50	0.67	0.92	1.32	0.46	0.61	0.92	1.40
75	0.56	0.74	0.87	1.07	0.45	0.60	0.83	1.19	0.41	0.55	0.83	1.26
80	0.49	0.66	0.77	0.95	0.40	0.53	0.73	1.05	0.37	0.49	0.73	1.12
85	0.43	0.58	0.68	0.83	0.35	0.47	0.64	0.92	0.32	0.43	0.64	0.98
90	0.37	0.50	0.58	0.71	0.30	0.40	0.55	0.79	0.28	0.37	0.55	0.84
95	0.31	0.41	0.48	0.59	0.25	0.33	0.46	0.66	0.23	0.30	0.46	0.70
100	0.25	0.33	0.39	0.47	0.20	0.27	0.37	0.53	0.18	0.24	0.37	0.56
105	0.19	0.25	0.29	0.36	0.15	0.20	0.28	0.40	0.14	0.18	0.28	0.42
110	0.12	0.17	0.19	0.24	0.10	0.13	0.18	0.26	0.09	0.12	0.18	0.28
115	0.06	0.08	0.10	0.12	0.05	0.07	0.09	0.13	0.05	0.06	0.09	0.14
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix G
Comment Response from
the 2008 Draft EA

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Comment Summary Number	Reviewer Comment Number	Name of Reviewer	Agency/Source of Reviewer	Comment	Action Taken To Address the Comment
1	1	Ms. Harwood	email	Construction of NMUSA at Ft. Belvoir Comments: I have been working at Ft. Belvoir for two years. The traffic is extremely difficult surrounding the base, at the gates, and on base. The newspaper statement said the museum "would not significantly affect Fort Belvoir traffic". Traffic is very much an issue on base and widely recognized as a problem. If the museum were to be built here, along with the thousands of jobs the Army is adding to Ft. Belvoir and the proving ground, I would like to see the traffic issues addressed and solved first.	Subchapter 3.13 addresses current and proposed project traffic conditions. Subchapter 3.15 addresses cumulative impacts on traffic and future improvements.
2	1	Mr. Tom Fahrney	VDOT	Gunston Alternative - The Parkway is designed and operates as a limited access facility and is listed as a National Highway System facility. The Army's proposal to construct an additional intersection on the Parkway complicates VDOT's long term plan to build a grade-separated interchange at JJ Kingman Drive. The additional access point may also increase the cost of the interchange.	Subchapter 3.15 discusses how the new interchange can be integrated with planned improvements to the Kingman Road/Fairfax County Parkway interchange. The Army believes that this is a cumulative impact and is best addressed in this section.
3	2	Mr. Tom Fahrney	VDOT	Gunston Alternative - Commonwealth Transportation Board's considerate of a change in the limited access designation. Future Kingman Drive interchange could be modified or eliminated...Army should not plan to utilize this access for any other type of development. VDOT prefers the Army to design access to Gunston Site from Kingman Drive instead of Fairfax County Parkway due to these limited access designation and complications to future Kingman Drive interchange improvements.	Subchapter 3.13 discusses how the new signalized interchange at the Fairfax County Parkway will operate. Appendix E contains the supporting traffic analysis.
4	3	Mr. Tom Fahrney	VDOT	Pence Gate Alternative - U.S. Route 1 corridor is heavily congested and improvements to this corridor would be necessary. The extent of those improvements will be jointly reviewed and determined by the Army, Fairfax County, and VDOT during the detailed design phase for the project.	The Pence Gate alternatives have been removed from consideration. This is addressed in the Introduction of this EA.
5	4	Mr. Tom Fahrney	VDOT	General --Transportation opportunities presented by the project include recognition by the Army of long term improvements planned to Fairfax Parkway and US Route 1 and the need of a dedicated transit system to serve the museum site. VDOT requests the Army recognize the need for these improvements by dedicating necessary right of way for the Kingman interchange and/or US Route 1 widening prior to VDOT's approval of the museum's road improvement plans.	As stated in Subchapter 3.15, the Army would enter into a Memorandum of Agreement with VDOT to document future commitments on transportation solutions for the NMUSA site after a site selection has been made.
6	5	Mr. Tom Fahrney	VDOT	General -- Additionally, the Army should work with region's transit providers to ensure visitors have the option to access the facility via dedicated bus service.	As stated in Subchapter 3.13, the Army intends to develop mass transit solutions for Fort Belvoir, including NMUSA.
7	6	Mr. Tom Fahrney	VDOT	Once the preferred site is chosen, the Army and VDOT should enter into discussions concerning the development of a Memorandum of Agreement in order to memorialize its understanding of the transportation solutions for the museum site. Because of limited transportation resources, VDOT, the Army and Fairfax County should work together to ensure short term access needs are designed and constructed to accommodate longer term transportation improvements.	As stated in Subchapter 3.15, the Army would enter into a Memorandum of Agreement with VDOT to document future commitments on transportation solutions for the NMUSA site after a site selection has been made.
8	1	Ms. Judy Riggan	Woodlawn Friends Meeting letter	...inconsistent language - study area, project area, site, architectural resources - study area	The Pence Gate alternatives have been removed from consideration. This is addressed in the Introduction of this EA.
9	2	Ms. Judy Riggan	Woodlawn Friends Meeting letter	This ignores the potential effect of "activity and noise" to Woodlawn Friends Meeting, an NR-eligible property, especially when we worship in silence, as is the Quaker practice.	The Pence Gate alternatives have been removed from consideration. This is addressed in the Introduction of this EA.
10	3	Ms. Judy Riggan	Woodlawn Friends Meeting letter	I quote the Draft EA description of what those activities will be: "Military bands, re-enactment activities, parades, and educational activities (camping, occasional discharge of dummy ordnance, amplification of voices and music to reach a large crowd) would be expected." These are noisy activities. Such activity and noise would be significantly disruptive for our Meeting during our periods of silent worship on Sunday mornings and other occasions. I quote from Marc Holma of the Virginia Department of Historic Resources (SHPO) in a 12/17/03 letter to Fort Belvoir officials in regard to possible siting near the Meetinghouse of the National Museum of the United States Army: "Due to the importance that the Friends place on silent reflection in their worship services, DHR believes that a low ambient noise level around the meetinghouse is a characteristic that contributes to the significance of the property."	The Pence Gate alternatives have been removed from consideration. This is addressed in the Introduction of this EA.
11	4	Ms. Judy Riggan	Woodlawn Friends Meeting letter	This section indicates that if NMUSA were built at the Pence Gate site, a new driveway entrance for visitors would be added to the intersection at Woodlawn Road traffic light. Woodlawn Friends Meeting is on Woodlawn Road, using that traffic light to enter our property. No consideration of the effect to our access of this increase in traffic is noted in the EA. This is an oversight.	The Pence Gate alternatives have been removed from consideration. This is addressed in the Introduction of this EA.
12	1	Mr. Marc Holma	VA DHR	If the NMUSA is constructed at the Pence Gate site it would likely have considerable visual and noise impacts to these historic properties. It should be noted that although the DEA identified the Woodlawn Historic District as being adjacent to the Pence Gate site, neither the Friends Meeting house nor Woodlawn Plantation is mentioned. This is a considerable failing of the DEA and should be corrected in future drafts.	The Pence Gate alternatives have been removed from consideration. This is addressed in the Introduction of this EA.
13	1	Mr. David Levy	NCPC	...visitor vehicle trips anticipated to occur between the morning and evening peak periods, when most of the visitors will be arriving, have not been evaluated in the draft EA. Additional analysis should be performed to determine the potential impacts and appropriate mitigation of these vehicle trips on local transportation system.	Comment noted.
14	2	Mr. David Levy	NCPC	Further, NCPC Comprehensive Plan policies recommend a parking ratio of one space for every two employees (1:2) for federal facilities at this location and also generally recommend structured parking over surface parking.	The planned employee parking ratio for NMUSA will exceed the NCPC minimum requirement.

Comment Summary Number	Reviewer Comment Number	Name of Reviewer	Agency/Source of Reviewer	Comment	Action Taken To Address the Comment
15	1	Ms. Tara Hands	Email	This entire project will have an impact on the surrounding neighborhoods due to changing the wetlands, severe traffic problems on route I due to limited access to Ft. Belvoir, gun salute noise with traffic and bands causing the wounded at the present and new hospital veterans additional trauma. Taxpayers are in distress now with the Congress voting to take future earnings of \$770 B. This museum is not really needed. The challenges of the base adding additional personnel and activities need to be put on hold for at least six months. Please inform me by email as to the decision of obtaining an environmental impact statement as well as the gate decision	The Pence Gate alternatives have been removed from consideration. This is addressed in the Introduction of this EA. Significant thresholds for noise at the Gunston site are addressed in subchapter 3.9.
16	1	Mr. Donald B. Legg	Email	EA states in Section 3.1, page 3-8 that NMUSA is not specifically addressed in the RPMP (which means it does not have a land use category) and that both NMUSA sites are designated as "Community." If the NMUSA is not addressed in the RPMP as a type category how can a determination be made that its type category is consistent with the current approved land use? Section 3.15, page 3-101 states that the museum is office, industrial and commercial. That is not a "community land use" description. A facility with parking lots or parking garage and buildings are definitely not consistent with baseball fields and a golf course on the current land sites. Section 3.1, page 3-9 also addresses the current and future use on the Pence Gate site but says nothing about the description of the current use of the Gunston site. EA must address the Gunston site in this section. Section 3.15, Cumulative Impacts, page 3-101 states that "the construction and operation of the NMUSA would change land uses at one of the two alternatives sites and contribute to the substantial conversion of unused land into office, industrial and commercial land." How can the NUMSA be considered "Community Use" with the above	The Gunston site is classified as "Community," which includes commercial and recreational uses for users such as soldiers, dependents, retirees, and other civilian personnel, as well as other uses such as medical and professional services. This is addressed in subchapter 3.1. The Army believes the NMUSA fits this description. Pence Gate is no longer an alternative.
17	2	Mr. Donald B. Legg	Email	EA, Section 3.1, page 3-12, states that the loss of the front nine North Post Golf Course holes at the Gunston site would be considered a moderate impact. There is inconsistency in the EA on the impact to the golf course. Some places it states it has "minimal" impact, other places it states "moderate" impact, and other places "no significant" impact. What is the real impact? Everyone is aware that if the impacts are significant then an EIS has to be completed and it seems Fort Belvoir leadership is trying to not go there and categorize some impacts as less than they really are. In addition the Final BRAC EIS and ROD stated that the NMUSA located on the Gunston Golf Course would have a significant impact on the MWR program and the recreational facilities on Fort Belvoir. Nothing has changed since that document has been published and became a legal document. EA must be consistent in the description of the impact of the NMUSA on the Gunston site to the golf course. The EA must quantify the impact. The EA must also address the revenue loss and recreational loss of 9 holes of golf in a 36-hole complex to patrons and the Fort Belvoir MWR community. For a time period the complex may only have 18 holes because the NMUSA does not seem to be very interested	This EA includes potential golf course impacts and reconfiguring the golf course to maintain 36 holes. This is addressed throughout the document, including the introduction, subchapter 2.5, and chapter 3.
18	3	Mr. Donald B. Legg	Email	Section 3.1, page 3-8 - The environmental impact and cumulative effects of utility lines going through the golf course to support NMUSA has not been assessed. Neither has the environmental and cost impact on the extension of all utilities to either the Pence Gate or Gunston sites. There is a significant difference to extend all utilities as the Pence Gate is built-up site; whereas, the Gunston site is undeveloped land except for the golf course irrigation system and further from main utility lines. It is understood that the infrastructure costs to run utility lines to the NUMSA site is going to be Appropriated Funding but it is still a cost to the government and the wise use of tax payer dollars is important. Choosing a site that costs less to the government should carry weight. In numerous locations in the EA there is a statement such as "the possibility that a utility corridor (water, electric, sewer, communication) may have to be routed from the north through the golf course." There has been neither an analysis nor an impact on these possible utility lines, which may have environmental impacts, also cause further d The EA must include an environmental survey and review of all possible utility lines that may have to run through	Utilities are addressed in subchapter 3.10, based upon the preliminary design. Utilities are also addressed in subchapter 3.5.

Comment Summary Number	Reviewer Comment Number	Name of Reviewer	Agency/Source of Reviewer	Comment	Action Taken To Address the Comment
19	4	Donald B. Legg	email	<p>Section 2.6, page 2-14 and Table 3.14-1, pages 3-98 & 99, Impact Comparison Alternatives – There are numerous references in the EA to further analyze and complete studies and surveys on the impacts of utility easement, upland vegetation and wildlife, and impacts to numerous species. The impacts to the Forest and Wildlife Corridor bridge over the ESA from Kingman Road would be accomplished with an EIS if and when that decision is made.</p> <p>Also Section 3, page 3-12 "What have we done – what would we do - to avoid or minimize negative effects? Right box - "Mitigation measures are steps taken to reduce impacts of a project. Steps taken to comply with existing laws and regulations, however, are not considered mitigation." There seems to be no steps identified that will comply with existing laws and regulations with regards to wildlife corridors, environmentally sensitive areas, etc. It seems that existing laws and regulations are not being complied with.</p> <p>EA reads as though Fort Belvoir does not want to complete an Environmental Impact Statement (EIS) and desires to accomplish the easiest site selection as possible and hope the impact on the environment can be under</p>	The Kingman Road entrance alternative has been removed from consideration. This is addressed in the Introduction of this EA.
20	5	Mr. Donald B. Legg	Email	<p>Section 2.6, page 2-13 to 2-20 – What are the plans for the Gunston Site Alternative? – Specifically the Kingman Road Alternative for entry into the NMUSA, EA provides two alternatives for entry into the NUMSA. A third alternative should have been studied and must be studied. This alternative provides entry from the first DLA intersection on Kingman Road. This entry would also require a bridge over the ESA but the access road should then bear left and then run parallel to the Fairfax County Parkway and enter through the same entrance NMUSA as the Fairfax County Parkway alternative. This alternative will save an additional complete golf hole (#2) and save two partial golf holes (#11 and #12) and cost less than the proposed Kingman Road access road. The location of the current Kingman Road alternative has numerous environmental impacts, infringes on more golf course property and gives the impression that the NMUSA does not care where the access road goes and its impact on the golf course, does not care about the lack of revenue generated by less than 36-holes, the retention of 36-holes of championship golf and the total benefits of the golf courses as recreational and he</p>	Comment noted.
21	6	Mr. Donald B. Legg	Email	<p>Section 2.6, page 2-3 and Section 2.12, page 2-23 – "What are the plans for the Gunston Alternative Site." Specifically, to use a Surface Parking or Structured Parking.</p> <p>Description: The EA describes the alternatives very clearly and concisely and also addresses the pros and cons to both options for both the Fairfax County Parkway and Kingman Road Access. The cost is less for Surface Parking but the Structured Parking is more environmentally friendly, takes less golf course property and is the right decision to make. To allow the Army Historical Foundation (AHF) to be given a majority vote in favor of the Surface Parking because "it will cost them less to construct the museum" is the wrong decision.</p>	Comment noted.

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22	7	Mr. Donald B. Legg	Email	<p>Section 3.11, Socioeconomics, pages 3-42-50. Specifically, this section does not address the socioeconomic impacts to the general military population in Northern Virginia that use the North-36 Golf Course nor the lack of revenue that will be generated to the Fort Belvoir MWR Community.</p> <p>The EA describes only the impacts to the local community near the museum sites. It does not address the impacts to the thousands of golfers who will not be able to play the Fort Belvoir Golf Course because they will not be able to get a tee-time because the number of tee-times has been reduced by 53% and would have to drive further and pay more to play golf while they are on a fixed income. A 27-hole complex will generate less revenue that could be used to support other Fort Belvoir MWR Activities. The patrons who use these activities will be directly affected by the decision to put the museum on the Gunston site. These socioeconomic impacts must be addressed in the EA in Section 3.11, Socioeconomics before a site selection is made.</p> <p>It cannot be assumed the former Fort Belvoir Garrison Commander understood nor was he given the authority to</p> <p>The reduction of the 36-hole golf complex to only a 27-hole complex is a "significant human environment impact"</p>	This is now addressed in subchapter 3.12, "How would the construction of the NMUSA and the realignment of the golf course affect these facilities?"
23	1	Travis Hilton	Woodlawn Baptist Church -Public Informational Meeting -Court Reporter	<p>My concern on behalf of our church is that we would have an alternative access to our facility. Currently, the road and the congestion that we experience on a daily basis is considerable danger and making left-hand turns into our facility, and even leaving the facility with the congestion on Highway 1. With the possibility of the location of the museum at the Pence Gate property, we would appreciate consideration for easement for Woodlawn Baptist Church. If an alternative location is chosen, we would still appreciate consideration of an easement to be granted to Woodlawn Baptist Church so that we would have access. There is a piece of property there that stands between us and the lot at the Pence Gate. That would be the entrance to what is Woodlawn Road, and we would appreciate access to our property. We know and are aware that this would also take communication with VDOT and with Fairfax County officials, but as far as the easement is concerned, that would be the responsibility, obviously, of Fort Belvoir. And we would appreciate their consideration in the future, whatever projects in the future. Whether it be the hospital or this coming museum, there's still going to be anticipated</p>	The Pence Gate alternatives have been removed from consideration. This is addressed in the Introduction of this EA.
24	1	Mr. Gerald Connolly	Fairfax County	...believes the impacts associated with this action in conjunction with the 2005 BRAC actions and Real Property Plan update that the NMUSA should be considered through an EIS. EA acknowledges repeatedly that additional analysis is required for complete understanding of the impacts...Marine Corps Museum was evaluated using an EIS. EPA citation	Comment noted.
25	2	Mr. Gerald Connolly	Fairfax County	EA seems to lack the specificity and detailed analysis required to make an informed decision on the best location for the NMUSA. ...references are made to on-going or future studies...seem appropriate that an EA or EIS include all relevant studies required to make location decision. Specific studies listed from the EA.	The Kingman Road entrance alternative has been removed from consideration. This is addressed in the Introduction of this EA.
26	3	Mr. Gerald Connolly	Fairfax County	Springfield Planning District future development information	This is addressed in subchapter 3.1.
27	4	Mr. Gerald Connolly	Fairfax County	Mount Air Historic District overlays to the west of Gunston site...early nineteenth century structures and its surroundings ...importance of careful site planning for all new construction...landscape buffers and oriented to complement the historic site and grounds --possible Section 106	This is addressed in subchapter 3.6.
28	5	Mr. Gerald Connolly	Fairfax County	How is the conclusion supported that impacts of the final design on site would be less than the projected impacts of the conceptual layout?	This EA was prepared to publicly document the potential environmental consequences of the proposed action. The final design would fall within the environmental impacts examined in the preliminary design.
29	6	Mr. Gerald Connolly	Fairfax County	Should finalize RPMP with proper review and adoption before decisions are based on its contents -- will RPMP discuss where displaced proposed uses will be located for either NMUSA alternative? Specifically - educational campus and hotel	Comment noted.
30	7	Mr. Gerald Connolly	Fairfax County	75 spaces for 185 employees is aggressive. EA fails to provide an aggressive Transportation Demand Management plan and mitigation strategy as part of the proposed NMUSA. Page 3-10 suggests that parking for visitors would be phased. There would be an initial construction of 500-550 spaces, with expansion occurring during later phases of construction if needed. The phased provision of parking should be supported in order to ensure that parking capacity, and associated impervious cover, will not exceed that which is necessary to serve the facility. The full parking capacity of 850 visitor spaces should only be pursued if proven by experience to be necessary.	Proposed parking is consistent with NCPD and is addressed in subchapters 2.1 and 3.1.
31	8	Mr. Gerald Connolly	Fairfax County	other projects. expansion of Commissary and Exchange. timeline. Cumulative analysis on impacts of these projects combined with NMUSA and other BRAC actions	Subchapter 3.15 addresses cumulative impacts on traffic and future improvements.

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32	9	Mr. Gerald Connolly	Fairfax County	...acknowledges that most traffic would occur primarily during off peak hours...still significant impact and would generate peak period trips in PM period...EA fails to adequately incorporate the cumulative impacts from various projects and lacks any commitment to contribute to improvements to the local roads beyond the boundaries to the Post.	Subchapter 3.15 addresses cumulative impacts on traffic and future improvements.
33	10	Mr. Gerald Connolly	Fairfax County	EA does not adequately address multi-modal, transit, pedestrian, and bicycle infrastructure to either site, especially important is the failure to address the proposed Potomac Heritage National Scenic Trail along Richmond Highway in vicinity of Pence Gate location	Subchapter 3.13 addresses current and proposed project impacts on multimodal facilities. The Pence Gate alternatives have been removed from consideration.
34	11	Mr. Gerald Connolly	Fairfax County	Intersection comments Gunston: ...experience with this segment of parkway...fatal flaws in the two interchange concepts #2 doesn't appear to handle the heavy movements, both concepts do not address FX Parkway peds and bike trail impacts, how is exiting the museum handled - appears to only allow turn to north on Parkway. Minimum distance between Kingman and Telegraph ramps...how is Ehlers Road operations be handled. Not clear that railroad corridor would be preserved as rail/trail commuter connection to Franconia Springfield Metro Station. FX Transportation Plan calls for grade-separated interchange for FX Parkway/Kingman and presence of an at-grade intersection between two interchanges (Telegraph and Kingman) is inconsistent with through travel mobility and conflicts with VDOT and AASHTO standards and guidelines.	Subchapter 3.15 addresses cumulative impacts on traffic and future improvements, including an updated conceptual plan for a new interchange.
35	12	Mr. Gerald Connolly	Fairfax County	Site access -Gunston - o [Both Sites]Access improvements outlined in the draft EA at Appendix E should be implemented prior to NMUSA facility construction, o [Pence] The assumption in the EA that proposed the NMUSA entrance opposite Woodlawn Road would have "no effect" on the Main Post/Pence Gate located less than 1,000 feet to the south does not seem realistic. o If the NMUSA is located at the Pence Gate location the site design should accommodate the future widening of Richmond Highway and the possibility of rail along this corridor. o The Gunston site alternative would require a break in the Fairfax County's limited access line and create a new at grade signalized intersection along the Parkway. This will impact operation of the Fairfax County Parkway in the vicinity of Kingman and Telegraph roads. While the majority of NMUSA traffic is expected to be off-peak, traffic exiting the museum will impact northbound Fairfax County Parkway traffic. This is especially true given merge/weave patterns that will be impacted with the interchange ramp to access Telegraph Road from the northbound Fairfax County Parkway. The Army site o If the Army selects the Gunston site, it should include in the site layout plan a concept design on how the future Kingman in o Fairfax County strongly supports VDOT and the Commonwealth Transportation Board's approval of any break in the limited o Access to the Gunston site through the existing Kingman gate entrance would consolidate access points along the Parkway	Subchapter 3.15 addresses cumulative impacts on traffic and future improvements, including an updated conceptual plan for a new interchange. Appendix E contains detailed traffic analysis documentation.
36	13	Mr. Gerald Connolly	Fairfax County	The Fort Belvoir Main Post Infrastructure Working Group has studied the Kingman Gate as a possible location for upgraded transit interface facilities that pose a potential conflict for both the proposed NMUSA entrance road connection and potential transit service turn-around lanes.	Assumptions made in the transportation analysis for future transportation facility improvements are documented in Appendix E.
37	14	Mr. Gerald Connolly	Fairfax County	* Fairfax County, led by the Fairfax County Department of Planning and Zoning and the Fairfax County Planning Commission, is current undertaking an Area Plans Review (APR) land-use review for the Base Realignment and Closure (BRAC) actions.	Comment noted.
38	15	Mr. Gerald Connolly	Fairfax County	Section 3.13, the draft EA fails to address the transportation needs associated with BRAC growth at and near Fort Belvoir Main Post other than noting, "Fort Belvoir, as part of the BRAC 2005 Implementation, is reviewing the infrastructure needs on Main Post near both sites..."	The BRAC Action is included as part of the No Build analysis in Subchapter 3.13.
39	16	Mr. Gerald Connolly	Fairfax County	* FCDOT encourages the Army to review and identify access improvement and corridor needs at points along the Fairfax County Parkway and Richmond Highway. While most trips associated with the Army would occur during non-peak hours, the County believes that PM peak periods will be impacted. In addition special events at the NMUSA to include the frequency and size should be evaluated. The draft EA does not indicate how the NMUSA would address future intersection operations should degradation in service occur during peak periods at locations near either site, of specific concern are: o Fairfax County Pkwy & SB Telegraph Rd ramps Existing AM: LOS B; PM: LOS D o Fairfax County Pkwy & NB Telegraph Rd ramps Existing AM: LOS B; PM: LOS C o Fairfax County Pkwy & Kingman Rd Existing AM: LOS D; PM: LOS F o Richmond Hwy & Fairfax County Parkway Existing AM: LOS D; PM: LOS C o Richmond Hwy & Backlick/Pohick Roads (Tulley Gate) Existing AM: LOS C; PM: LOS F o Richmond Hwy & Belvoir Road Existing AM: LOS D; PM: LOS D	This is addressed in subchapter 3.13 and Appendix E.

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40	17	Mr. Gerald Connolly	Fairfax County	<p>Transit - several bullets earlier than those below has good information to compare to EA language and possibly add some of the language for clarity of current transit options</p> <ul style="list-style-type: none"> • FCDOT encourages the NMUSA and Army to work with WMATA and the Fairfax Connector to ensure provisions for improved transit access and connections at either location are provided to the Metrorail system. Metrorail connections will allow for travel by museum patrons to locations throughout the National Capital Region (NCR) and provide a connection to Washington National Airport in Arlington County. Efficient and well-marketed connections to the NMUSA site would have the potential to reduce vehicle trips to the site, reducing the need for visitor parking, and ensuring visitors to the NCR would be able to access NMUSA without having to rent a vehicle. In addition, improved transit service has the potential to increase museum attendance. • The Pence Gate site should include provisions for a future transit transfer station which could be used as part of improved transit services in both the Richmond Highway corridor and for future transit service on Fort Belvoir's Ma • The existing former railroad right-of-way generally follows the north side alignment of the Fairfax County Parkway 	Subchapter 3.15 addresses cumulative impacts on traffic and future improvements, including an updated conceptual plan for a new interchange. Appendix E contains detailed traffic analysis documentation.
41	18	Mr. Gerald Connolly	Fairfax County	<p>Non-Motorized</p> <ul style="list-style-type: none"> • General Comments <ul style="list-style-type: none"> o All alternatives need to address non-motorized transportation access and parking (Bicycles and Pedestrians). o Bicycle parking should be conveniently located in close proximity to the main entrance and should be located in order to maximize security. Covered bicycle parking is preferred. Bicycle parking will include both employee parking as well as museum visitors. • Pence Gate Sites <ul style="list-style-type: none"> o Pedestrian and bicycle amenities should be included in the site construction along both US Route 1 and Belvoir Road frontages. The Potomac Heritage Trail is planned to traverse this area and should be addressed. o Gunston Site (access off Fairfax County Parkway) o It appears that the proposed entrance falls between the two wildlife corridor tunnels, installed as part of the parkway construction as requested by the Fort's Environmental and Natural Resources staff. o At the proposed Gunston site, an existing pedestrian trail follows the alignment of the Fairfax County Parkway between the roadway and abandoned railroad right-of-way. No detail was provided in the draft EA on incorporating the non-motorized trail into the NMUSA o John Kingman Highway/Parkway intersection. If this plan is advanced, the NMUSA access should be incorporated with the interchange • Gunston Site (access off John Kingman) o Based on this site configuration, the County suggests that ped/bike access be provided from two... points of access; from the Parkway o The narrative mentions minimizing conflicts and short term closures of the ped/bike facilities (Page 3-92 - "How would the project affect 	Subchapter 3.13 addresses current and proposed project traffic conditions. Subchapter 3.15 addresses cumulative impacts on traffic and future improvements.
42	19	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> • Either access approach for the Gunston site would require disturbance to a Resource Protection Area. RPA impacts would appear to be avoided for the Pence Gate alternatives. • While the graphical information provided in the EA is unclear, it would appear that the Gunston alternatives may result in one or more encroachments into Environmental Quality Corridors. Steeply sloping areas (slopes of 15% or greater) adjacent to streams or floodplains are included in EQCs. Clarification is needed regarding the extent to which, if any, the development would encroach into such areas. 	RPA and EQCs would be avoided to the extent practicable. This is addressed in subchapter 3.5.
43	20	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> • The Army should explore the possible re-use of water from Fairfax County's Noman Cole Pollution Control Plant for non-potable water uses such as lawn irrigation, cooling systems, toilet flushing, etc for this project and future projects identified in the master plan for Fort Belvoir. This will help to reduce peak demand of potable water and also support protection of the Chesapeake Bay. 	The Army has explored this possibility with Fairfax County dating back to 2006. Does not have adequate reliability to meet mission demands and not cost effective.

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44	21	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> • For stream impacts, the Pence Gate site is also the better alternative. As stated in the EA, "Development of the Gunston alternatives would likely generate more severe impacts than the Pence Gate site, due to the more extensive grading required and the proximity of the site to the nearest streams." It goes on to say that "the access road for the Kingman Road alternatives would bridge the perennial stream to the east of the site, associated forested wetlands, and its Chesapeake Bay RPA (approximately 400 to 500 linear ft)." • The Pence Gate alternative would impose a lesser negative impact than the Gunston site. We would also further suggest the Pence Gate site structured parking scheme over the surface parking scheme to reduce the percent impervious cover added to the land area, although it is recognized that the cost of a structured parking facility would need to be considered. With structured parking, impervious cover would be reduced, and design flexibility to protect steeply sloping and other wooded areas would be optimized. As the percent impervious cover of a parcel increases, the resultant increase in stormwater runoff commonly degrades the biotic and abiotic integrity of • The Pence Gate structured parking alternative appears to be the preferable option for several reasons: <ul style="list-style-type: none"> o This alternative makes use of a site that has already been disturbed and developed in the past. o Requires the least number of cubic yards cut-and-fill to construct the museum. o No wetland/stream habitat type is found within the Pence Gate study area (as apposed to 1.9 acres in the Guns o The Pence site option does not identify any perennial stream impact or RPA encroachment (as apposed to two 	The Pence Gate alternatives have been removed from consideration. This is addressed in the Introduction of this EA.
45	22	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> • The County encourages the Army to look at the use of innovative stormwater techniques, such as green roofs, throughout the facility to reduce the impact that this construction will create on the land. • The County does not agree with the statement in section 3.5, "Would the project affect surface water or water quality" that "over the long term, re-routing of water through stormwater management features could cause an increase in stream velocities and a reduction in water infiltration rates." Proper stormwater management techniques should reduce both the volume and velocity of stormwater runoff coming from a site. Ideally, low impact development practices should be pursued to infiltrate stormwater runoff into the ground, thereby reducing (or avoiding) increased stormwater runoff volumes. The EA states that the Army will explore the use of such techniques. • The Army should be aware that there may be public education/exhibit value in low impact development practices; they could complement the educational functions of the museum by highlighting and educating the public on the Army's environmental sensitivity. 	This is addressed in subsection 3.4.
46	23	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> • The Fairfax County Department of Public Works and Environmental Services, Stormwater Planning Division requests the opportunity to review future comprehensive plans to provide more detailed comments regarding adequate stormwater management for the site. Fort Belvoir should ensure that all local and state stormwater management and water quality requirements (including adequate outfall requirements) are satisfied. 	Comment noted.
47	24	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> • The Pence Gate alternatives would not affect Fort Belvoir's Forest and Wildlife Corridor. The Gunston alternatives involving direct access to and from the Fairfax County Parkway would not have any direct impacts to this corridor as defined by Fort Belvoir. However, there would be clearing needed in the forested area that is contiguous to, and therefore is effectively serving as part of, this corridor; the habitat value of this area would be reduced, and edge habitats that may adversely affect interior forest areas of the corridor would also increase. The Gunston alternatives involving access to and from Kingman Road would have these impacts as well as direct impacts associated with a new crossing of the Forest and Wildlife Corridor. 	The Pence Gate alternatives have been removed from consideration. This is addressed in the Introduction of this EA.

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48	25	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> Pages 3-28 and 3-29 of the EA discuss the potential impacts to the Forest and Wildlife Corridor associated with the Gunston/Kingman alternatives—it is noted that a 750-foot long bridge would span the corridor, but even this action “would require removal of trees and placement of footers in the corridor, and would still create a disturbance, both temporarily during construction and over the long-term by its presence.” The EA describes this impact as “one of the most important in terms of direct and cumulative impacts.” The Forest and Wildlife Corridor in the area of the Gunston site is far from pristine; nearby road crossings include the Fairfax County Parkway and Beulah Street, an upland hardwood forest does not appear (from aerial photos) to be present in the northwestern quadrant of the Kingman Road/Beulah Street intersection, and clearing in an area along Kingman Road and within the golf course has reduced the width of the woodland to well under 750 feet in the area where the Kingman Road entrance would be provided. The EA does not discuss the cumulative effects of these encroachments on the function of the corridor and suggests that the additional impacts 	The Kingman Road entrance alternative has been removed from consideration. This is addressed in the Introduction of this EA.
49	26	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> The EA indicates that there remains considerable uncertainty regarding the significance of impacts of the Gunston/Kingman Road alternatives to Fort Belvoir’s Forest and Wildlife Corridor and that access from Kingman Road may prove to be infeasible upon further study of the corridor issue. Even if access from Kingman Road is determined to be feasible, the Gunston alternatives would appear to require a decision between the provision of access that could be undesirable from a transportation standpoint (an at-grade intersection with the Fairfax County Parkway and a crossing of a rail alignment that could conceivably be used in the future to provide rail transit access to Fort Belvoir) and the provision of access that would be undesirable from an environmental standpoint (the crossing of the wildlife corridor and a Resource Protection Area located within this corridor). The Pence Gate site would not create this conflict. 	The Kingman Road entrance alternative has been removed from consideration. This is addressed in the Introduction of this EA.
50	27	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> The EA notes that noise generated on the Gunston site may be audible to wildlife in the Forest and Wildlife Corridor but that noise impacts will be minor. It is not clear how this conclusion has been reached, in that the EA states: “If additional noise sources are identified, additional studies could be conducted to determine the impact to these receptors, including mammals, birds, and reptiles in the [Forest and Wildlife Corridor].” 	Subchapter 3.9 of the EA has been revised based on this comment.
51	28	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> Wildlife habitat impacts and clearing for the Gunston site would be approximately 60% greater (40 acres versus 25 acres) than the impacts for the Pence Gate site. As stated in the EA, “The Gunston alternatives would therefore have the largest impacts on wildlife based on habitat loss alone.” With respect to impacts to forests/tree cover, the EA indicates that the Gunston alternatives would impact between 16.2 and 18 acres of woodland (including the “Upland Forest,” “Urban Forest/Landscape Trees,” and “Forested Wetlands/Seeps” categories presented in the EA) while the Pence Gate alternatives would impact only 8.6 acres of woodland. The EA notes Fort Belvoir’s 2:1 tree replacement policy. All cleared trees, and not just those larger than a certain diameter, should be replaced. Ideally, the tree cover that is cleared for the project should be replaced. Section three of the project EA states that the Partners in Flight (PIF) program survey conducted at Ft. Belvoir in 2005 identified suitable habitat for neotropical migratory birds in the buffer areas at both sites. Given the more remote location, greater site size, and larger buffer impacts, impacts to neotropical migratory birds will be higher o 	Comment noted.
52	29	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> Besides human land disturbance and non-native invasive species, the greatest threat to terrestrial biological communities in our region is the over population of white-tailed deer and the subsequent heavy browse. The planning and construction of the Army Museum at Ft. Belvoir should ensure that features and activities allow for the continuance of the effective deer hunting program that has helped keep deer populations in check on Ft. Belvoir for many years. 	Fort Belvoir would continue their deer hunting program.
53	30	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> As stated in the project EA, “the United States Fish and Wildlife Service (USFWS) has recommended that a survey be completed at either site, whichever is selected, for the federally listed threatened small whorled pogonia (Isotria medeoloides).” This survey should be completed. In addition, the EA states that “there is the potential for four special status species to be there [at Ft. Belvoir] (Table 3.3-2) (VDCR, 2008). Surveys for the presence of these species would be needed prior to construction at either site. These species, their status, and their documented occurrences in the study area are shown in Table 3.3-2.” 	Required surveys have been completed.

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54	31	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> The Park Authority supports the efforts proposed by the Army to mitigate the impacts of the land disturbance for the proposed project (in part) by revegetating disturbed areas with native plant species to include trees, shrubs and wet-tolerant species in drainage ways. In addition the 2005 report by the USDA Forest Service summarizing bird research at Ft. Belvoir as part of the PIF Program (referenced above) cites great species richness and recommends establishment and management of warm season grass dominant early succession field habitats where possible. Areas cleared for grading and temporary construction as well as stormwater features associated with road improvements should be stabilized and maintained for native warm season grass habitat for wildlife as well as water quality benefits wherever reforestation is not planned. All project plans should include provisions to control non-native invasive plant species during stabilization/restoration and in long-term maintenance. Such species as <i>Ailanthus altissima</i> and <i>Microstegium vimineum</i> as well as aggressive vines and ground covers should be identified and controlled to the greatest extent possible. 	Mitigation is addressed in subchapter 3.3.
55	32	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> Either alternative could have additional, indirect and as yet undefined impacts associated with future development that could occur to replace existing or planned activities/facilities on the development sites. In the case of the Gunston alternatives, the EA notes that the museum would displace several holes of the North Post golf course and that the golf course would be reconfigured to retain 27 playable holes. However, the construction of replacement holes somewhere in the area is also under consideration; the EA notes that, should this replacement effort be pursued, it would be subject to a separate analysis. Therefore, it is possible that the selection of the Gunston site could result in additional indirect impacts to natural resources beyond what has been presented in the EA. For the Pence Gate alternative, the EA notes that the site is currently planned for an educational campus and a hotel. If this site is selected for the museum, a new site on the South Post would need to be identified for these facilities. Therefore, the selection of the Pence Gate site could also result, indirectly, in impacts to natural resources. 	This EA includes potential golf course impacts and reconfiguring the golf course to maintain 36 holes. This is addressed throughout the document, including the introduction, subchapter 2.5, and chapter 3.
56	33	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> Fairfax County is located within a nonattainment area for the federal 8-hour ozone (O3) and fine particulate (PM2.5) standards. Under the general conformity rule (GCR), a project conforms if such activities DO NOT: <ul style="list-style-type: none"> o Cause or contribute to any new violations of an NAAQS in an area o Increase the frequency or severity of any existing violation of any NAAQS in an area o Delay timely attainment of any NAAQS or any required interim emission reductions or other milestones in an area. <p>The EA notes that construction-related emissions of ozone precursors, fine particles and sulfur dioxide will be well below applicability thresholds associated with Environmental Protection Agency and Virginia Department of Environmental Quality requirements. Therefore, no mitigation measures are identified. While this conclusion is reassuring, it is noteworthy that a series of air quality mitigation measures have been incorporated into a "Final Construction Performance Plan for the Reduction of Air Emissions . . ." for the Base Realignment and Closure projects at Fort Belvoir. These include limitations on construction on Code Orange, Red and Purple ozone days, and</p>	Subchapter 3.8 of the EA has been revised based on this comment.
57	34	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> Regarding fine particulates (PM2.5): PM2.5 formation is a year-round phenomenon and it is expected that there will be a number of additional heavy-duty construction vehicles and equipment generating particulate matter in the area. This activity will have a cumulative impact on the project which will add to the background concentrations in the project area during the construction period. Therefore, feasible contingency measures should be identified to address this problem. 	Subchapter 3.8 of the EA has been revised based on this comment.

Comment Summary Number	Reviewer Comment Number	Name of Reviewer	Agency/Source of Reviewer	Comment	Action Taken To Address the Comment
58	35	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> • Gunston Site: Fairfax County does not concur with the Draft Finding of No Significant Impact for cultural resources for the Gunston site at Kingman Road because it does not appear that the potential effects on Mount Air have been evaluated. • Section 3.6 of the Draft EA states: "For this project, the area of potential effect (APE) for either site is considered to include the site itself, as well as any resources within the viewshed of either sites' boundaries, or any resources within the range of noise generated by NMUSA activities". This section also states: "Site 44FX2277 is historic with dwellings and associated formal gardens. It is known as Mount Air and was identified in a reconnaissance level survey in 1997. It is outside the Gunston project site." Figures 2-5 and 2-6 of the EA show the Gunston site abuts Mount Air and the Mount Air Historic Overlay District. • The Fairfax County Park Authority owns and operates the Mount Air Historic Site properties which border the Gunston site identified in the project EA as one of the two preferred alternative locations for the Army Museum. Kernan Branch, a tributary of Accotink Creek lies alternately on Fairfax County parkland and US Army property along the common boundary of the two sites. Development of the G 	The Pence Gate alternatives have been removed from consideration. Cultural resources are addressed in subchapter 3.6.
59	36	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> • Pence Gate Site: The County concurs with the Draft Finding of No Significant Impact for cultural resources for the Pence Gate site because the document cites the Section 106 Programmatic Agreement (PA) for the Base Realignment and Closure (BRAC) related expansion of Fort Belvoir requirement to conduct a viewshed study if the museum is constructed at the Pence Gate site. • The PA Section II., PROTECTION OF THE WOODLAWN HISTORIC DISTRICT VIEWSHED stipulates that Fort Belvoir, in consultation (as defined below) with Alexandria Monthly Meeting of the Religious Society of Friends at Woodlawn, the National Trust, Fairfax County, and SHPO, shall develop a study of the potential adverse effects of development projects on Fort Belvoir, for which funding has been requested, within the Woodlawn Historic District viewshed. The study shall conform to the Secretary of the Interior's Guidelines for the Treatment of Cultural Landscapes and shall be conducted utilizing the skills of a landscape architect with experience in historic landscape preservation. • The Woodlawn Historic District viewshed study will examine the scope of the viewshed from the District and dete 	The Pence Gate alternatives have been removed from consideration. This is addressed in the Introduction of this EA.
60	37	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> • The Draft EA states that Fire and EMS services will be provided by the Army's Fire and Emergency Medical Services (EMS) which includes three fire stations on Fort Belvoir housing five fire companies and a staff of 65 firefighters. In addition, Fort Belvoir has mutual aid fire service agreements with Fairfax County. <ul style="list-style-type: none"> o Since the National Museum of the US Army would be constructed on Fort Belvoir, the impact on the Fairfax County Fire and Rescue Department would primarily be in response to incidents on Fort Belvoir through existing mutual aid agreements. However, the estimate of 1,000,000 annual visitors travelling to the National Museum may increase the demand for Fairfax County Fire and Rescue emergency services specifically from FXCO Fire Station 24 located at 8701 Lukens Lane and FXCO Fire Station 37 located at 7936 Telegraph Road. Since the visitors to the National Museum will most likely be travelling during non-peak times such as weekends, the potential increase in demand for Fairfax County Fire and Rescue emergency services should not have a significant impact. • Fairfax County Police Department has reviewed the EA for the NMUSA and has not identified any significant imp 	Comment noted.

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61	38	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> The EA notes that there will occasionally be noise impacts associated with military bands, re-enactment activities, parades, discharges of dummy ordnance and amplification of voices and music to reach a large crowd. The EA does not indicate the anticipated frequency of such events and whether or not noise from these events will be audible at residential receptors west of the Gunston site. It is noted that mitigation measures may be needed at the Pence Gate site in order to ensure that "the effects of noise on the historical soundscape" will be limited, but there is no mention of possible impacts of noise from the Gunston site to sensitive receptors to the west. The EA does note that all residences are greater than 1,000 feet from the site, but this does not necessarily mean that there will not be any adverse noise impacts. Ideally, noise from these activities should not be audible at any noise-sensitive location. In no case should noise levels exceed thresholds for stationary noise sources established in Fairfax County's Noise Ordinance. The EA notes that construction activities "would occur primarily during normal weekday business hours" and that 	Subchapter 3.9 of the EA has been revised based on this comment.
62	39	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> The Draft Environmental Assessment stated there were no pre-existing hazardous waste problems for the proposed sites on Fort Belvoir. Therefore, there are no negative comments for the Hazardous Materials section of the draft EIS and recommend accepting this portion of the Environmental Assessment. Fairfax County Fire and Rescue Department, Hazardous Material Section provided the following comment related to the release of hazardous materials: <ul style="list-style-type: none"> Fairfax County does not have jurisdiction on Fort Belvoir but is concerned with the statement in the EA on "reportable quantity" for release of hazardous materials. The EA states that any release of 50 gallons or more would have to be reported to the appropriate authorities. Fairfax County requires notification of any quantity of a hazardous material release, this is particularly important if the release involves a stream or storm sewer. Therefore the County would like to be notified of any release of hazardous material associated with NMUSA. 	This is addressed in subchapter 3.7.
63	40	Mr. Gerald Connolly	Fairfax County	<ul style="list-style-type: none"> Any Fairfax Water facility upgrades necessary to accommodate increased flows into the Main Post at Fort Belvoir, such as additional pumping capacity at the Fort Belvoir Booster Pumping Station or meter vault modifications at Telegraph Road, shall be accomplished according to provisions of the amended Water Supply Agreement. 	Comment noted.
64	1	Mr. Ron Snyder	Concerned MWR Patron Comment Sheet/Public Meeting	EA does not provide the Army decision-maker with adequate data to assess the impact on the MWR Program and the Total Military Family in Northern Virginia. Quantify changes to Fort Belvoir which mitigate against the "significant adverse effects" stated in the August 2007 BRAC Record of Decision to justify a Finding of No Significant Impact (FNSI). Show that our impact Study recommendations were seriously considered. Federal EA guidelines require interested party ideas to be sought out early in the EA planning process. We were not contacted.	This EA includes potential golf course impacts and reconfiguring the golf course to maintain 36 holes. This is now addressed in subchapter 3.12, "How would the construction of the NMUSA and the realignment of the golf course affect these facilities?"
65	2	Mr. Ron Snyder	Concerned MWR Patron Comment Sheet/Public Meeting	Background : Concerned MWR Patrons founded October 2007... Are not opposed to NMUSA at Fort Belvoir...raise sufficient private funds before construction. Provided the Army in April 2008 a comprehensive 112 pg. "Impact Study, Examining the Impact of Constructing the NMUSA on the Fort Belvoir Golf Facility - North 36 Golf Course"...Study not referenced in the draft EA. ..quantified "socioeconomic impact on MWR programs ...recommended for inclusion in the draft EA. Know that 82% of MWR patrons surveyed, believe there would be "significant adverse impact" to their "quality of life" if course reduced from 36 to 27 holes. Concludes...alternative NMUSA site the minimum requirements ...[golf patrons and museum]... is Gunston Site, Fairfax County Parkway Entrance - Structured Parking Scheme (A-36 in the NMUSA FS).	This EA includes potential golf course impacts and reconfiguring the golf course to maintain 36 holes. This is now addressed in subchapter 3.12, "How would the construction of the NMUSA and the realignment of the golf course affect these facilities?"
66	3	Mr. Ron Snyder	Concerned MWR Patron Comment Sheet/Public Meeting	The further reduction from 36 to 27 holes would reduce revenue at least 40% - this would impact other MWR programs; Disenfranchise 53% of the MWR Patrons on weekend starting in 2010; Disenfranchised MWR Patrons would pay 40-100% more at outside courses. Goal: To insure the Army mitigates the quantified impacts on MWR Programs and Patrons caused by NMUSA construction by providing a fully-funded, integrated design/construction program, which would meet the needs of NMUSA and MWR Patrons in a timely manner.	This EA includes potential golf course impacts and reconfiguring the golf course to maintain 36 holes. This is now addressed in subchapter 3.12, "How would the construction of the NMUSA and the realignment of the golf course affect these facilities?"

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67	1	Mr. Ted Cummings and Mr. Ronald Snyder	Concerned MWR Patrons/email	<p>The NMUSA Siting on the Gunston Course causes a significant impact on 2 the MWR Golf Facilities and its MWR Patrons. We maintain this position for the reasons below.</p> <p>1. The August 7, 2007 BRAC Record of Decision (ROD) stated: "Long-term significant adverse effects on Fort Belvoir's MWR recreation program..."</p> <p>2. Our Impact Study (ref D) ... impacts on MWR Patrons from NMUSA construction on the N-36 Golf facility. ...register our judgment that all options currently depicted present significant impacts for the MWR N-36 golf facility and patrons.</p> <p>3. It our understanding Fort Belvoir's Director, FMWR has expressed concern about the significant loss of revenue if the North-36 were downsized to 27 holes as a result of NMUSA construction.</p> <p>4. ... (Section 3.1, p 3-13)." ... This paragraph is internally inconsistent as to the significance of its impact. We believe a fair and logical reading of that statement is that "without the appropriate mitigation measures, it will have a significant impact".</p>	This EA includes potential golf course impacts and reconfiguring the golf course to maintain 36 holes.This is now addressed in subchapter 3.12, "How would the construction of the NMUSA and the realignment of the golf course affect these facilities?"
68	2	Mr. Ted Cummings and Mr. Ronald Snyder	Concerned MWR Patrons/email	<p>Draft EA in Noncompliance with Federal Guidelines</p> <p>The Draft EA does not appear to comply with Federal Guidelines IAW Part 651 of Title 32, Code of Federal Regulations (CFR) governing the Army's implementation of EAs in three important respects.</p> <p>1. No Early Consultation with Concerned MWR Patrons as an Interested Party</p> <p>2. No detailed "Hard Look" at the Impact on MWR Golf Facility and Its Patrons</p> <p>Flawed 2007 Army Guidance Preempted the Hard Look.</p> <p>...This implies downsizing the North-36 golf facility to 27 holes would not present a significant impact on the MWR golf facility or its patrons... Thus, the need to build replacement holes to reconstitute a North-36 layout was never an essential tasking square to fill for installation planners or the Draft EA preparers. It was conceived as an afterthought, a separate project for MWR to pursue with NAF monies. Our April 2008 Impact Study (Ref D)...careful look at the magnitude of potential adverse impacts and offered reasonable alternatives to mitigate them through construction of replacement holes...</p> <p>Section 3.11 (Impacts on Socioeconomics)</p> <p>This section does not address the effect of the NMUSA siting on the FBGF N-36. It only addresses the socioeconomic impact</p>	This EA includes potential golf course impacts and reconfiguring the golf course to maintain 36 holes.This is now addressed in subchapter 3.12, "How would the construction of the NMUSA and the realignment of the golf course affect these facilities?"
68-A	2-A	Mr. Ted Cummings and Mr. Ronald Snyder	Concerned MWR Patrons/email	<p>Section 3.12 (Impacts on Community Facilities & Services)</p> <p>This section's area of study provides only a cursory appraisal of the adverse impacts of downsizing from original 45 holes to 27 holes. It describes the impacts in terms of number of holes lost (nine), revenue reduced (30%), complications in the availability of tee times, and frustration of patrons. ... There is no quantification of the impact of downsizing to 27 holes as a result of NMUSA construction in the following areas: reduction of available tee times, the effect on number of rounds played, the effect on golf membership, the effect on supporting DoD/DoD-related organizational outings, and tournaments, and level of frustration of MWR patrons.</p> <p>Regarding the later point, ascribing the impact on MWR patrons as one of "frustration" can be misleading...</p> <p>Our research used the simple analytical tool of a conducting a formal survey consisting of 25 questions, which addressed MWR patrons' attitudes toward downsizing... The research points to MWR patrons becoming more than frustrated over Army plans for downsizing. Therefore, we believe the Draft EA 's cursory treatment of this issue does not fulfill the requirement...</p> <p>3. Decoupling of NMUSA's Impact on MWR Golf Facilities in the Draft EA. ... It appears</p>	Comment 68 continued - See response above.
69	3	Mr. Ted Cummings and Mr. Ronald Snyder	Concerned MWR Patrons/email	<p>This section does not address the effect of the NMUSA siting on the FBGF N-36. It only addresses the socioeconomic impacts from an NMUSA siting on minorities, low-income populations, children, and employment in the study area. Thus it ignores the effects of NMUSA siting alternatives on the 120,000 eligible MWR patrons in Northern Virginia...</p>	This EA includes potential golf course impacts and reconfiguring the golf course to maintain 36 holes.This is now addressed in subchapter 3.12, "How would the construction of the NMUSA and the realignment of the golf course affect these facilities?"
70	4	Mr. Ted Cummings and Mr. Ronald Snyder	Concerned MWR Patrons/email	<p>Section 3.12 (Impacts on Community Facilities & Services)</p>	This EA includes potential golf course impacts and reconfiguring the golf course to maintain 36 holes.