SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

ARMY RESIDENTIAL COMMUNITIES INITIATIVE (RCI) PROPERTIES AT FORT BELVOIR, VIRGINIA

OCTOBER 2015

Prepared for
GARRISON COMMANDER,
FORT BELVOIR, VIRGINIA

Prepared by
APEX COMPANIES, LLC
ON BEHALF OF
FORT BELVOIR RESIDENTIAL COMMUNITIES, LLC

OCTOBER 2015

[THIS PAGE INTENTIONALLY LEFT BLANK]

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

ARMY RESIDENTIAL COMMUNITIES INITIATIVE (RCI) PROPERTIES AT FORT BELVOIR, VIRGINIA

SEPTEMBER 2015

Reviewed by:
US Army Garrison Fort Belvoir

Felix M. Mariani
Chief, Environmental and Natural Resources Division

Recommended for Approval:
US Army Garrison Fort Belvoir

Bill Sanders
Director, Public Works

Approved by:
US Army Garrison Fort Belvoir

for Michelle D. Mitchell
Colonel, US Army
Commanding

[THIS PAGE INTENTIONALLY LEFT BLANK]

Executive Summary

The Military Housing Privatization Initiative (MHPI) enables the various branches of the military to form public-private partnerships for the development, construction, and management of military family housing and other facilities. Privatization actions taken by the Department of the Army (DA) under the MHPI authority are referred to as the Army Residential Communities Initiative (RCI). In 2003, the Army prepared an Environmental Assessment (EA) for the proposed RCI at Fort Belvoir.

In 2003, approximately 576 acres of land and all existing Army family housing at Fort Belvoir was conveyed through a long-term ground lease to Fort Belvoir Residential Communities, LLC (FBRC), a privately-owned limited liability company. FBRC is a partnership between the Army and Clark Pinnacle Family Communities, which was formed to develop and manage military housing.

The purpose of the Proposed Action under the 2003 EA was to enlarge and modernize military family housing units at Fort Belvoir, to improve military families' access to housing, and to provide first-rate neighborhood centers and recreation facilities. Since the start of the project, the Army's FBRC has built and renovated over 1,888 units (approximately 1,192 new and 696 renovations) and added numerous community amenities to improve the quality of life for service members and their families. However, unforeseen development constraints prevented the redevelopment of approximately 440 units that were part of the Proposed Action analyzed in the 2003 EA. If no additional land is added to the RCI project Ground Lease, these development constraints will create a housing shortfall of approximately 161 units that will negatively impact Fort Belvoir residents and fail to meet the goals of the RCI project.

FBRC and its design team collaborated with the Fort Belvoir Garrison Command leadership team, Directorate of Public Works (DPW), Morale, Welfare, and Recreation (MWR), Army and Air Force Exchange Service (AAFES), and the Fort Belvoir Residential Communities Liaison Office (RCLO) to identify available parcels of land that would best fit with the long-term master plan for Fort Belvoir and the existing RCI neighborhoods. Selection of the Woodlawn East/Berman Tract assessed in this Supplemental Environmental Assessment (SEA) was coordinated with the installation to meet the long-term vision and needs of Fort Belvoir and the project.

Upon completion of redevelopment and rehabilitation, the total number of RCI housing units at Fort Belvoir will not differ from the current inventory of 2,106 family housing units. The Proposed Action would simply alter where on the installation a portion of the inventory of housing neighborhoods would be located. This SEA considers the action of adding a land parcel to the existing Ground Lease and developing the site with housing and related community amenities. Even with the addition of the Woodlawn East/Berman Tract, some additional developable land will likely be needed in the future to accommodate the final build-out of housing units and associated amenities, as envisioned in the 2003 EA.

This SEA is prepared for the Proposed Action to comply with the National Environmental Policy Act of 1969 (NEPA), the Council of Environmental Quality implementing regulations (CEQ) (40 CFR Parts 1500-1508), and the Army's NEPA regulation (32 CFR Part 651).

ES.1 PROPOSED ACTION

Under the Proposed Action, the Army proposes to lease the Berman Tract located on North Post east of Woodlawn Village to FBRC. The Berman Tract, the Woodlawn East parcel, and Parcel E would be developed as family housing and related amenities under the RCI Ground Lease. The Woodlawn East/Berman Tract (the 'Site') to be developed combines the Woodlawn East parcel (approximately 28 acres) and a portion of Parcel 'E' (approximately 4.5 acres) in the current Ground Lease, and the Berman Tract parcel (approximately 21 acres) to be added to the Ground Lease. Combined, the Woodlawn East/Berman Tract is approximately 53.5 acres. After development, Woodlawn East/Berman Tract is projected to accommodate approximately 102 housing units – including handicap accessible units – recreation areas, and related facilities.

ES.2 ALTERNATIVES

The Proposed Action site was selected as the Preferred Alternative through on-going conversations between FBRC and Fort Belvoir. FBRC regularly briefs the installation on RCI activities and communicates regarding alterations to the project. Through these discussions, various parcels were identified for potential transfer to the ground lease to accommodate the loss of developable land to the RCI. However, all had limitations that inhibited transfer, such as insufficient parcel size, inadequate location, proximity to sensitive resources, and insufficient utility or road network access. Based on further site screening, the Proposed Action Site was approved by the Army to undergo NEPA screening.

The No Action Alternative was also considered in this evaluation against the Proposed Action. Only the Proposed Action meets the Purpose and Need for the project. The No Action Alternative thus serves as a baseline against which to compare the impacts of the Proposed Action.

ES.3 LAND USE

The Proposed Action would be consistent with the Fairfax County Comprehensive Plan and provide beneficial impacts by sustaining the housing needs of military families on-Post. The Proposed Action would not conflict with the surrounding Fairfax County land use of suburban neighborhoods. The proposed residential development would not affect land use for Fairfax County's Huntley Meadows Park, JAWR, or the adjacent private development. A 100-foot vegetative buffer would exist between the proposed development and the adjacent private development.

On Fort Belvoir, the Proposed Action is consistent with the neighboring residential area of Woodlawn Village and would expand the residential area of the North Post sub-area. The land on the proposed development includes areas that are deemed Least Suitable for Development and Moderately Suitable for Development in the Fort Belvoir RPMP. The proposed development would conflict with these classifications. However, the conceptual design is intended to optimize development of the site and to help reduce the need for additional developable land for the project in the future.

ES.4 AESTHETICS AND VISUAL RESOURCES

During the construction period, views from adjacent properties to the east and west of the development would be affected by the presence of construction equipment and land disturbing activities. To minimize visual and aesthetic impacts, an approximately 100-foot-wide vegetation buffer separating existing off-installation housing from the new housing would be maintained to the extent practicable. Construction of new homes and roadways would be avoided in this buffer area. Trees and vegetation within the buffer area would be trimmed or removed to the extent required for safety reasons and good landscaping practices.

The visual effects of removing mature trees and replacing with young trees would continue beyond the construction period until the younger trees establish themselves. Mitigation would occur to limit the impacts of tree removal. Several areas of conserved natural space, rain gardens, bioretention areas, and existing wetlands that would be present beyond construction would complement the proposed development to the surrounding area. The resulting residential development would be consistent with the surrounding character of Fort Belvoir. Travelers on Pole Road would experience a negligible impact to their viewshed as the resulting development would be consistent with the other views along Pole Road.

ES.5 NOISE

Implementation of the Proposed Action would be expected to result in additional sources of noise during construction activities due to the operation of construction equipment and construction activities in general. Typical equipment anticipated at the project sites includes backhoes, loaders, bulldozers, rollers, motor graders, power saws, and compressors. OSHA standards serve to protect construction workers in close proximity to the source of construction noise.

During land clearing and construction, sensitive noise receptors generally would be more than 100 feet from the site and include the occupants of the residential areas to the east, west, and south of the site. Even at the highest levels of construction noise, few residents in the neighboring houses would be close enough to experience noteworthy levels of construction noise. Construction noise would be typical of other residential construction projects and limited to routine construction hours.

Noise impacts to wildlife might occur during construction and operation of the development (e.g., vehicle noise). However, the noise would be of short duration,

intermittent, and similar to existing traffic noise in these areas. Wildlife living in the vicinity of the Proposed Action is acclimated to a suburban noise environment and would not be significantly adversely affected by the closer proximity of the noise from a residential setting upon completion of the construction.

ES.6 GEOLOGY AND SOILS

Implementation of the Proposed Action would remove soils and increase the amount of impervious surface at Fort Belvoir. Due to the relatively flat nature of the site, there is low risk of causing significant erosion or other impacts to soils.

Topography at the site would be altered where residences would be constructed. Fill would be placed as foundation soil (existing soil may be removed) and to elevate the construction above areas where a perched or seasonally high water table may be present. Site grading would also be conducted to divert stormwater towards designed outfall points within the proposed development. Grading is expected to alter shallow soils and topography, and provide a more direct path for stormwater to be diverted from the site.

As a result of implementation of the Proposed Action, effects on soils would be limited to the planned disturbed area of the Woodlawn East/Berman Tract. Increased runoff and erosion are expected during site construction due to the removal of vegetation, exposure of soil, and increased susceptibility to wind and water erosion. To minimize potential erosion impacts during the construction phase, a Stormwater Pollution Prevention Plan (SWPPP) would be prepared in accordance with the Virginia Pollution Discharge Elimination System (VPDES) regulations, and a site-specific Erosion and Sediment Control (ESC) plan would be prepared prior to land disturbance. ESC measures utilized during land disturbing and construction activities would be consistent with the Virginia Erosion Sediment Control Handbook.

ES.7 WATER QUALITY

Vegetation clearing and soil disturbance during construction could result in increases in sediment, or other waterborne pollutant runoff to surface water. In the long term, impervious surfaces in the form of roads, driveways, and rooftops would increase the amount of stormwater runoff. To minimize potential impacts to the nearby and connected surface waters, the project would adhere to several ESC measures as well as stormwater BMPs. As described in Section 3.5.3, there are no streams or RPAs in the Woodlawn East/Berman Tract; therefore the Proposed Action would not have an impact on such resources.

Because this project would disturb greater than 2,500 square feet of land, a stormwater management plan would be developed prior to land disturbance activities. To minimize potential impacts during the construction phase, a SWPPP would be prepared in accordance with Virginia regulations (9VAC25-880-70). The plan would include erosion and sediment control measures that would be employed during construction. The

stormwater concept plan would also include permanent stormwater BMPs to be employed after construction.

The plan proposes to divert stormwater runoff via overland flow and closed conduit storm drain to proposed SWM/BMP areas designed to provide both water quality and quantity control. The plan would closely honor the natural drainage patterns of the site, and the SWM/BMP facilities would be designed so that overflow from the facilities would occur as sheet flow. Through the implementation of these measures and BMPs, it is expected that the short-term and long-term impacts to surface water from the implementation of the Proposed Action would not be significant.

Wetlands

Based on the site conceptual plan, it is anticipated that the Proposed Action would directly impact less than 0.5 acres of wetlands within the Woodlawn East/Berman Tract. The largest areas of impact would be in areas designed for stormwater management facilities. Before performing any construction or fill in the jurisdictional wetlands requiring a permit, a Joint Permit Application would be submitted to the Virginia Marine Resources Commission (VMRC), which would in turn be forwarded to USACE and VDEQ for review and comment. To compensate for impacts to wetlands, mitigation would be provided to the extent required by the Section 404 and VWP permit requirements. With the implementation of mitigation as specified in the wetlands permit, and the avoidance of wetlands where practicable, the adverse impacts to wetlands are not expected to be significant.

No impacts to floodplains or coastal zone resources would be expected to occur as a result of implementation of the Proposed Action. Stormwater systems would be designed using BMPs that meet Fairfax County requirements for the Chesapeake Bay Preservation Ordinance. The use of stormwater management measures as described above to increase infiltration and water quality of the proposed development areas would also reduce any adverse effects to groundwater.

ES.8 BIOLOGICAL RESOURCES

Existing plant communities would be removed with the implementation of the Proposed Action. The existing planted pine and mixed pine-hardwood setting would be replaced with a suburban setting similar to vegetation in neighborhoods on the east, south, and west sides of the Woodlawn East/Berman Tract. Vegetation from approximately 31 acres of currently wooded land would be removed for the proposed development. A site-specific tree estimate would be conducted after the final limits of clearing and grading have been established. For this proposed action, replacement trees on a ratio of 2:1 would be provided for trees greater than four inches in diameter at breast height, or Out-of-Kind habitat mitigation. Planting locations for the replacement trees would consider such aspects as species requirements (i.e., soil types, hydrologic conditions, and light requirements) planned land use, and land use restrictions (i.e., utility easements). Using these measures, overall impacts to vegetation from implementation of the Proposed Action would be insignificant.

Wildlife

The loss of potential habitat, cover, forage, and migration areas would require some wildlife to relocate during construction. Because the local wildlife is accustomed to residential conditions, they would be likely to adapt quickly. FBRC's Environmental Management Plan provides guidance in the management of wildlife in the Ground Lease areas.

To protect and minimize adverse effects to migratory bird species, project activities should avoid cutting and removal of vegetation from April 1 to July 31. If cutting and removal occurs in this time frame, a survey for birds and active bird nests would be recommended.

Rare, Threatened, and Endangered Species

In accordance with the Army's policy on natural resource protection, construction activities would avoid impacts to the habitats of listed species or observe time of year restrictions for any species determined to be affected by the project. Development would not occur in or near designated bald eagle forage areas because such areas are not present at the site. Applicable stormwater laws and regulations would be followed to minimize potential impact to the wood turtle. A supplemental turtle survey would be conducted for all listed species after erosion and sediment controls are established, but before construction activities commence. Section 7 consultation would be required for the threatened northern long-eared bat as habitat is present. A small-whorled pogonia survey was performed in 2014 and no species were identified.

No long-term adverse effects are anticipated to occur for sensitive species.

ES.9 CULTURAL RESOURCES

One archeological site was identified within the Project Site (44FX1947). A Phase II survey was performed for site 44FX1947 in coordination with the Fort Belvoir Cultural Resources Manager and was found not to be a significant National Register of Historic Places (NRHP)-eligible archeological resource. The Proposed Action is neither within any of the historic districts located on Fort Belvoir, nor is it within the viewshed of any of the listed NRHP sites on and around Fort Belvoir. No adverse impacts to cultural or historic resources would occur due to the Proposed Action.

As part of the Section 106 process that occurred during the 2003 EA, a Programmatic Agreement (PA) between US Army Garrison Fort Belvoir and the Virginia State Historic Preservation Officer for the Privatization of Family Housing at Fort Belvoir, was prepared and implemented. The 2003 PA contains requirements currently applicable to the RCI Project, and therefore to the Woodlawn East parcel, for the duration of the Ground Lease period.

ES.10 SOCIOECONOMIC RESOURCES

The overall resident population at Fort Belvoir is not expected to change as a result of the Proposed Action. The provision of modern housing units and community amenities would benefit Fort Belvoir residents.

A grant for expanding Fort Belvoir Elementary School was approved in 2014. A new elementary school will be built adjacent to the existing school with an estimated opening date of fall 2015. Since implementation of the proposed project would likely not begin until after construction at the FBES is complete, it is anticipated that all students living on-Post would be able to attend FBES with the projected additional capacity the construction would allow. Fort Belvoir middle- and high school-aged students currently attend FCPS. No impacts to schools would be expected to occur as a result of implementation of the Proposed Action.

The Proposed Action would create an estimated 40 temporary construction jobs over an 18-month period, and add two maintenance jobs in the long-term. FBRC estimates the proposed project would cost a total of approximately $15-20 million. FBRC anticipates hiring local contractors to meet the employment demands of the proposed project. Based on above average per capita and median household income characteristics and low unemployment in Fort Belvoir and Fairfax County, impacts on income and employment would likely be negligible.

ES.11 ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN

The Proposed Action does not constitute an environmental justice population because the percentage of minorities neither exceeds 50 percent nor is substantially higher than the percentage of minorities in the surrounding area. Similarly, the low-income population in Woodlawn East neither exceeds 50 percent nor is substantially higher than that of Fort Belvoir. Potential direct and disproportionate, adverse impacts to minority populations are therefore negligible.

In the long-term, adverse impacts to children residing in or around Woodlawn East/Berman Tract would be negligible. Children of families moving to the Woodlawn East/Berman Tract development would benefit from new, modern housing and community amenities.

ES.12 HAZARDOUS MATERIALS, HAZARDOUS WASTES, TOXIC SUBSTANCES

Construction activities could generate small amounts of hazardous waste, such as paints, thinners, and waste oil. Control measures would be implemented by the contractor and FBRC to ensure the safe use and proper disposal of materials and wastes. The handling of such waste would be subject to applicable laws and regulatory requirements for the protection of public health and the environment and, therefore, is not expected to result in adverse impacts.

Discovery of munitions and explosives of concern (MEC) would be addressed by Fort Belvoir through its Military Munitions Response Program. No effects to construction workers would be expected because they would be required to work under the requirements of a project-specific health and safety plan applicable to their assigned duties. Further, the project area is to undergo removal actions implemented by the Army to address the potential of remaining MEC that might be present. No impacts to future residents, visitors, and site workers are anticipated through normal use and operation of future housing areas.

ES.13 TRANSPORTATION IMPACTS

As a result of the Proposed Action, there would be increases in traffic on roadways on and surrounding Woodlawn Village compared to current conditions. However, the increase in traffic impacts would be minor compared to the impacts evaluated in the 2003 EA and would not be considered significant. This increase would be generated through a decrease in traffic in other areas of Fort Belvoir as the population shifts to Woodlawn Village. The existing transportation infrastructure has the capacity to accommodate the Proposed Action.

ES.14 CUMULATIVE IMPACTS

Environmental impacts may accumulate over time or in combination with similar events within and surrounding a proposed project. Numerous construction projects are approved or planned for the surrounding area in the next few years. For purposes of this SEA, seven major projects with direct impact to Fort Belvoir were reviewed and assessed for cumulative impacts.

Construction of the projects considered to interact cumulatively with the Proposed Action would involve land disturbance, soil excavation, increases in impervious surfaces, and loss of vegetation and wildlife habitat. The projects could result in potentially greater cumulative soil erosion and sedimentation that could lead to stormwater pollution. The necessary removal of vegetation would have adverse cumulative regional impacts.

However, these land disturbing activities would be conducted in compliance with Federal, state, and local environmental laws and regulations to reduce potential impacts. The use of soil and erosion controls and stormwater management BMPs would minimize impacts during proposed construction and would improve stormwater quality after construction causing cumulative impacts to be minor to moderate and beneficial. All of the projects would utilize best management practices and mitigation measures to reduce impacts to biological resources, including vegetation and wildlife.

Beneficial cumulative impacts would be expected to transportation due to a number of roadway improvement projects on and around Fort Belvoir.

ES.15 CONCLUSION

This SEA describes and identifies the potential impacts of the Proposed Action Alternative and the No Action Alternative. The Proposed Action would not have a significant impact on the quality of the human environment and an environmental impact statement (EIS) is not needed.

Recommended Mitigation Measures

Resource	Mitigation	Reference Section
Wetlands – An estimated 0.44 acres of wetland will be impacted by this project – 0.40 acres of palustrine forested wetland and 0.04 acres of palustrine emergent wetland.	Mitigation for wetland impacts will be as required by the Clean Water Act Section 404 and VWP permits to be obtained by the project.	4.5.1
Vegetation - An estimated 31 acres of wooded land would be cleared for the proposed development. A site-specific tree estimate would be conducted after the final limits of clearing and grading have been established. This survey would determine the final number of trees that would be removed by the project.	An approximately 100-foot-wide vegetation buffer between the new housing and existing off-installation housing to the East would be maintained to the extent practicable. Trees and vegetation within the buffer area would be trimmed or removed to the extent required for safety reasons and good landscaping practices. Replacement of removed trees on a ratio of 2:1 would be provided for trees greater than four inches in diameter at breast height that are removed as determined by the tree survey. Both on-site and out-of-kind mitigation for tree removal may be considered and implemented by the project.	4.6.1
Protected Species – A breeding bird survey conducted in 2014 identified	Project construction activities would implement time-of-year restrictions for migratory birds	4.6.1

Resource	Mitigation	Reference Section
one species of concern, the Eastern Wood-Pewee (*Contopus virens*). However, the canopy and understory may be suitable for other migratory bird species protected under the Migratory Bird Treaty Act.	by avoiding cutting and removal of vegetation from April 1 to July 31. If vegetation cutting and removal occurs in this time frame, a survey for protected birds and active nests would be performed before vegetation removal is performed.	
Protected Species – Habitat for the listed northern long-eared bat (*Myotis septentrionalis)*is present on the site.	Requirements as determined by the U.S. Fish and Wildlife Service through the Endangered Species Act Section 7 consultation would be implemented.	4.6.1

[THIS PAGE INTENTIONALLY LEFT BLANK]

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

AAFES	Army and Air Force Exchange Service
ABWR	Accotink Bay Wildlife Refuge
APE	Area of Potential Effect
AR	Army Regulation
ARPA	Archeological Resources Protection Act
BG	Census Block Group
BMP	Best Management Practices
BRAC	Base Realignment and Closure
CAA	Clean Air Act
CDMP	Community Development and Management Plan
CDP	Census Designated Place
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CDMP	Community Development and Management Plan
CGP	Construction General Permit
CFR	Code of Federal Regulations
CRMP	Coastal Resources Management Program
CT	Census Tract
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dBA	decibel A-rate
DERP	Defense Environmental Restoration Program
DMM	Discard Military Munitions
DA	Department of Army
DoD	Department of Defense
DPW	Directorate of Public Works
EA	Environmental Assessment
EBS	Environmental Baseline Survey
ECP	Environmental Condition of Property
EISA	Energy Independence and Security Act
EMP	Environmental Management Plan
ENRD	Environmental and Natural Resource Division
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESC	Erosion and Sediment Control
FBES	Fort Belvoir Elementary School
FBRC	Fort Belvoir Residential Communities
FCPS	Fairfax County Public Schools
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FPPA	Farmland Protection Policy Act
FS	Feasibility Study
HMA	Housing Market Analysis

HOV	High Occupancy Vehicle
ICRMP	Integrated Cultural Resources Management Plan
IDP	Initial Development Period
INSCOM	US Army Intelligence and Security Command
JAWR	Jackson Miles Abbott Wetland Refuge
L_{dn}	day-night level
m	meter
MBTA	Migratory Bird Treaty Act
MC	Munitions Constituents
MD	Munitions Debris
MEC	Munitions and Explosives of Concern
MHPI	Military Housing Privatization Initiative
MMRP	Military Munitions Response Program
MPPEH	Material Potentially Preserving an Explosive Hazard
MS4	Municipal Separate Storm Sewer System
msl	mean sea level
MSP	Modified Scope Plan
MWR	Morale, Welfare, and Recreation
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OSHA	Occupational Safety and Health Administration
OYP	Out Year Period
PA	Programmatic Agreement
PAL	Privatization of Army Lodging
PCB	Polychlorinated Biphenyl
PEM	Palustrine Emergent
PFM	Public Facilities Manual
PFO	Palustrine Forested
PIF	Partners in Flight
RCI	Residential Communities Initiative
RCLO	Residential Communities Liaison Office
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROC	Region of Comparison
ROI	Region of Influence
RLD	Responsible Land Disturber
RPA	Resource Protection Area
RPMP	Real Property Master Plan
RTE	Rare, Threatened, or Endangered
SEA	Supplemental Environmental Assessment
sf	square feet
SHPO	State Historic Preservation Office
SI	Site Inspection
SWPPP	Stormwater Pollution Prevention Plans

TMDL	Total Maximum Daily Load
TSCA	Toxic Control Substance Act
USACE	US Army Corps of Engineers
USCB	United States Census Bureau
USDA	United States Department of Agriculture
UXO	Unexploded Ordnance
VDCR	Virginia Department of Conservation and Recreation
VDEQ	Virginia Department of Environmental Quality
VDGIF	Virginia Department of Game and Inland Fisheries
VMRC	Virginia Marine Resources Commission
VPDES	Virginia Pollution Discharge Elimination System
VWP	Virginia Water Protection
WIP	Watershed Implementation Plan
WLA	Waste Load Allocation
WMA	Wildlife Management Area
WSSI	Wetland Studies and Solutions, Inc.

1.0 PURPOSE AND NEED

1.1 BACKGROUND

The Military Housing Privatization Initiative (MHPI) enables the various branches of the military to form public-private partnerships for the development, construction, and management of military family housing and other facilities. Privatization actions taken by the Department of the Army (DA) under the MHPI authority are referred to as the Army Residential Communities Initiative (RCI). Due to existing budgetary constraints, the Army has determined it is unable, on its own, to meet the critical housing needs of America's soldiers and their families. The purpose of the RCI is to address the Army's family housing problems by supplying safe, attractive, and modern places for soldiers and their families to live. Under RCI, installations can leverage scarce public funds by partnering with private firms who raise capital and provide development, construction, and management services. The RCI program is currently comprised of 44 installations and includes over 86,000 units (DA, No Date).

In 2003, the Army prepared an Environmental Assessment (EA) for the proposed RCI project at Fort Belvoir. The purpose of the Proposed Action was to enlarge and modernize the housing units, to improve military families' access to housing, and to provide first-rate neighborhood centers and recreation facilities. The EA also addressed the implementation of Fort Belvoir's Community Development and Management Plan (CDMP). The CDMP was implemented by leasing approximately 576 acres of land and conveying all existing Army family housing at Fort Belvoir through a long-term ground lease and conveyance of facilities (Ground Lease) to Fort Belvoir Residential Communities, LLC (FBRC), a privately-owned limited liability company. FBRC is a partnership between the Army and Clark Pinnacle Family Communities, which was formed to develop and manage military housing. The CDMP divided the project into two phases, the Initial Development Period (IDP), when significant new construction would take place, and the Out Year Period (OYP), when the project would focus mostly on operations but also occasionally replenish the housing stock as the inventory of homes ages. The IDP period concluded in 2011.

One of the major concepts in the CDMP for the OYP was that of additional empty land, also known as swing-space. Although unit-counts fluctuated during the IDP, the project's financing documents require a minimum of 2,070 houses be available for rent throughout the OYP. Without swing-space, the project cannot replenish outdated housing in the OYP, since demolishing and rebuilding outdated housing would cause the project to dip below the 2,070 minimum. This currently poses an issue as one neighborhood, Dogue Creek Village, does not meet current RCI standards. Without swing-space, there would be no way to update this neighborhood or any others in the future. With swing-space, the project can take outdated neighborhoods offline to update them while still maintaining the 2,070 unit count required by the financing documents.

Since the start of the project, FBRC has built and renovated over 1,888 units (approximately 1,192 new and 696 renovations) and added numerous community amenities to improve the quality of life for service members and their families. However,

unforeseen development constraints prevented the redevelopment of approximately 440 units that are necessary for the project and that were part of the Proposed Action analyzed in the 2003 EA. These unforeseen constraints also resulted in the project losing the swing-space it had initially set aside. If no additional land is added to the RCI project Ground Lease, these development constraints will create a housing shortfall of approximately 161 units that will negatively impact Fort Belvoir residents and the RCI project.

To mitigate these unforeseen developments, FBRC created a Modified Scope Plan (MSP) in 2009 for the construction of additional community amenities and the systematic rehabilitation of existing structures at Fort Belvoir over the full Ground Lease period. The MSP addresses the ongoing housing needs identified in the Army's 2007 housing market analysis (HMA) and furthers the development goals analyzed in the 2003 EA. The MSP set forth the following actions:

- Reduced the number of new units from approximately 1,630 to approximately 1,190 units by the end of the IDP.
- Increased the number of renovated units from approximately 170 to approximately 696 units.
- Eliminated a 50,000-square-foot recreation center and added an outdoor community pool.
- Deferred construction of 61 garages in the Historic District to the OYP.
- Adjusted the mix of community amenities and increased the end-state home count in 2011 to 2,106 per the Army's 2007 HMA.
- Approved the concept of adding additional land parcels as necessary to address the projected housing shortfall.

In the CDMP, River Village was to serve as the primary swing space parcel. The original development plan called for demolishing the existing 188 units in River Village by the end of the IDP to adjust to the target end-state unit count and to provide empty land to build new units in the OYP. However, development constraints in River Village outlined below and funding limitations prevented this approach. The MSP adjusted the development plan by performing major renovations in River Village within the IDP and retaining those units in the OYP. However, because River Village was retained rather than demolished, the project lost its primary swing space parcel. Without River Village as construction swing space, FBRC would be forced to demolish existing units in River Village or another neighborhood in order to create the space necessary to replenish the project's portfolio with new units. This action would cause the project to fall below the minimum 2,070 unit count required for project financing and by the HMA during the period the new units would be under construction. This action would also require the relocation of service members and families off-Post, which is an undesirable and disruptive action. Demolishing existing units would therefore not be feasible.
Other unforeseen development constraints in River Creek and Dogue Creek Villages include the following:

1. The floodplain boundary for River Village was revised by the Federal Emergency Management Agency (FEMA) in 2010. Due to the revision, the developable land in River Village has been reduced by an estimated 50 percent.

2. In Dogue Creek Village (an existing 270 unit community not planned to be redeveloped until the OYP), bald eagle nests are located near Dogue Creek, archeological sites encumber a portion of the leased area, and future redevelopment will require stormwater management facilities which will consume existing land within the community. Similar to River Village, FBRC projects that the redeveloped Dogue Creek Village will have 50 percent fewer units than existing conditions due to environmental constraints and due to the RCI minimum standards for housing sizes and amenity spaces.

Following approval of the MSP, FBRC and its design team collaborated with the Fort Belvoir Garrison Command leadership team, Directorate of Public Works (DPW), Morale, Welfare, and Recreation (MWR), Army and Air Force Exchange Service (AAFES), and the Fort Belvoir Residential Communities Liaison Office (RCLO) to identify available parcels of land that best fit with the long-term master plan for Fort Belvoir and the existing RCI neighborhoods. Upon completion of redevelopment and rehabilitation, the total number of RCI housing units at Fort Belvoir will not differ from the current inventory of 2,106 family housing units (USACE, 2003). The additional land parcels would simply alter where on the Installation the inventory of housing neighborhoods will be located. This supplemental Environmental Assessment (SEA) considers the action of adding one of these land parcels to the existing Ground Lease and developing the site with housing and related community amenities. Selection of the Woodlawn East/Berman Tract was coordinated with the Installation to best meet the long-term vision and needs of Fort Belvoir and the project. Even with the addition of the Woodlawn East/Berman Tract, some additional developable land will likely be needed in the future to accommodate the final build-out of housing units and associated amenities, as envisioned in the 2003 EA.

1.1.2 Fort Belvoir

The Main Post of Fort Belvoir is located in southeastern Fairfax County, Virginia, about 12 miles southwest of Washington, District of Columbia, 10 miles from the Pentagon, and 5 miles from Alexandria, Virginia (Figure 1-1).

Fort Belvoir is the Army's principal administrative and logistics center for the National Capital Region and supports a working population of 39,000 persons (US Army Garrison, 2013b). Approximately 7,000 military and family members live on base. Fort Belvoir provides community services to many military retirees living in the greater metropolitan Washington, DC area. Family housing at Fort Belvoir is also available to military personnel stationed elsewhere in the Washington, D.C. metropolitan area. There are a total of approximately 2,154 available family housing units in 15 housing villages for military families at Fort Belvoir.

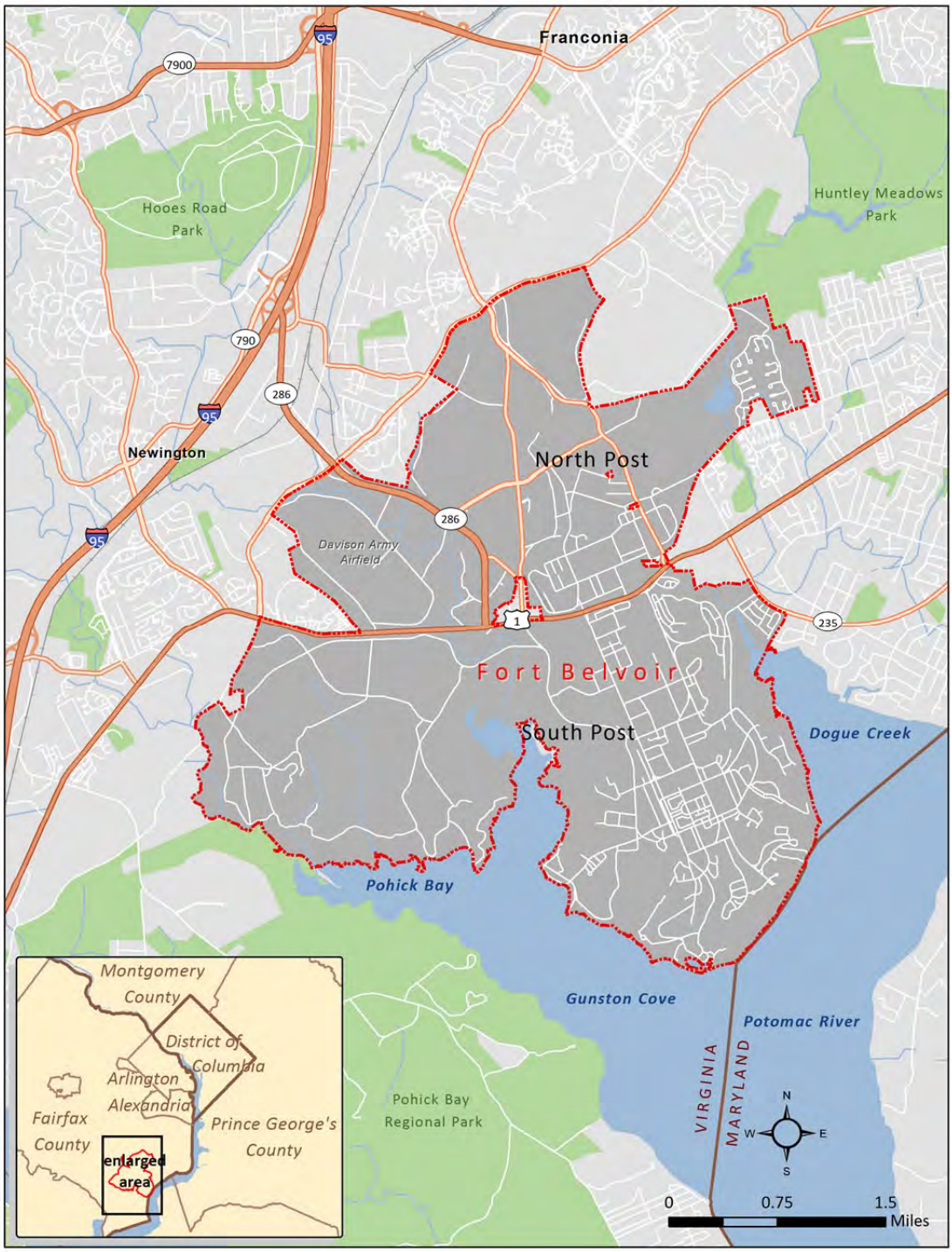


Figure 1-1 Location of Fort Belvoir (ESRI, 2010)

1.2 PURPOSE AND NEED

Prior to implementation of the RCI, the Army operated and maintained approximately 90,000 family housing units on its military bases throughout the United States. More than 75 percent of those housing units did not meet current Army standards. Through implementation of the RCI, Army family housing has dramatically improved. Fewer military families live in housing that is need of repair or renovation, or live off-Post, where the cost and quality of housing varies considerably.

The **purpose** of the Proposed Action is to allow the RCI project to enhance and sustain the portfolio of family housing units at Fort Belvoir by improving the quality and availability of housing, including handicapped accessible housing. Additional developable land is required for the project to improve the quality of life for service members and their families and to sustain neighborhoods as envisioned in the original 2003 EA for the RCI project at Fort Belvoir.

The **need** for the changes in the Proposed Action is to address unforeseen constraints due to insufficient developable land in the Ground Lease to support the long-term sustainment and improvement of Fort Belvoir's portfolio of units. The selection of the Woodlawn East/Berman Tract parcel for the proposed development was coordinated with the Installation to best meet the long-term vision and needs of Fort Belvoir.

1.3 SCOPE OF ANALYSIS

This SEA is prepared for the Proposed Action to comply with the National Environmental Policy Act of 1969 (NEPA), the Council of Environmental Quality implementing regulations (CEQ) (40 CFR Parts 1500-1508), and the Army's NEPA regulation (32 CFR Part 651). The SEA analyzes the potential environmental impacts that are expected to result from implementing the proposed changes to the RCI project and from the No Action Alternative. Elements of the human environment that are unaffected by the changes to the Proposed Action are identified in Section 2.3.1 but are not discussed in greater detail in this SEA because there are no potential changes to the impacts evaluated in the 2003 EA. The SEA also takes into consideration possible cumulative impacts from other ongoing and identified future actions. In instances where changes to the Proposed Action may result in potentially significant adverse impacts to the human environment, the SEA identifies recommended mitigation measures to reduce the environmental impacts to less than significant levels. The proposed changes to the Proposed Action would not increase the number of housing units or residents living at Fort Belvoir over the numbers previously analyzed in the 2003 EA. The Proposed Action also is not connected to the Base Realignment and Closure (BRAC) program and related Army actions at Fort Belvoir.

Key goals of NEPA are to help Federal agency officials make well-informed decisions about agency actions and to provide a role for the general public in the decision-making process. The study and documentation mechanisms associated with NEPA seek to provide decision-makers with sound knowledge of the comparative environmental consequences of the courses of action available to them. NEPA studies, and the

documents recording their results, such as this SEA, focus on providing input to the particular decisions faced by the relevant agency officials.

1.4 DECISION TO BE MADE

In addressing the environmental considerations associated with the proposed changes to the Proposed Action and No Action Alternative, the Army is guided by several statutes and Executive Orders that establish standards and provide guidance on environmental and natural resource management and planning. These include, but are not limited to:

- Clean Air Act (CAA)
- Clean Water Act (CWA)
- Chesapeake Bay Preservation Act and Chesapeake Bay Agreement
- Chesapeake Restoration Act of 2000
- Coastal Zone Management Act (CZMA)
- Noise Control Act
- Endangered Species Act (ESA)
- Migratory Bird Treaty Act (MBTA)
- Farmland Protection Policy Act (FPPA)
- National Historic Preservation Act (NHPA)
- Archeological Resources Protection Act (ARPA)
- Resource Conservation and Recovery Act (RCRA)
- Toxic Control Substance Act (TSCA)
- Federal Insecticide and Fungicide Rodenticide Act
- Sikes Act
- Energy Independence and Security Act (EISA)
- Executive Order 11988 (Floodplain Management)
- Executive Order 11990 (Protection of Wetlands)
- Executive Order 12088 (Federal Compliance with Pollution Control Standards)
- Executive Order 13148 (Greening the Government)
- Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations), and
- Executive Order 13045 (Protection of Children from Environmental Health Risks and Safety Risks)
- Executive Order 13514 (Federal Leadership in Environmental, Energy, and Economic Performance)

Where useful, these statutes and Executive Orders are described in more detail in the text of the SEA.

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

The Proposed Action and the No Action Alternative are considered and evaluated in this SEA. The Installation and FBRC have not identified other suitable parcels of land to meet the purpose and need of this Proposed Action.

2.1 PROPOSED ACTION

Under the Proposed Action the Army would lease the Berman Tract (Figure 2-1) to FBRC. The Berman Tract, the Woodlawn East parcel, and Parcel E would be developed as family housing and related amenities under the RCI Ground Lease. The Woodlawn East/Berman Tract (the 'Site') to be developed combines the Woodlawn East parcel (approximately 28 acres) and a portion of Parcel 'E' (approximately 4.5 acres) in the current Ground Lease, and the Berman Tract parcel (approximately 21 acres) to be added to the Ground Lease (Figure 2-1). Combined, the Woodlawn East/Berman Tract is approximately 53.5 acres and situated on North Post adjacent to the existing Woodlawn Village neighborhood. After development, Woodlawn East/Berman Tract is projected to accommodate approximately 102 housing units – including handicap accessible units – recreation areas, and related facilities (Figure 2-2). The final number of housing units to be constructed within the parcel may vary based upon the needs of the project and any parcel-specific development opportunities and constraints.

Figure 2-1 Woodlawn East/Berman Tract Location (ESRI, 2010)

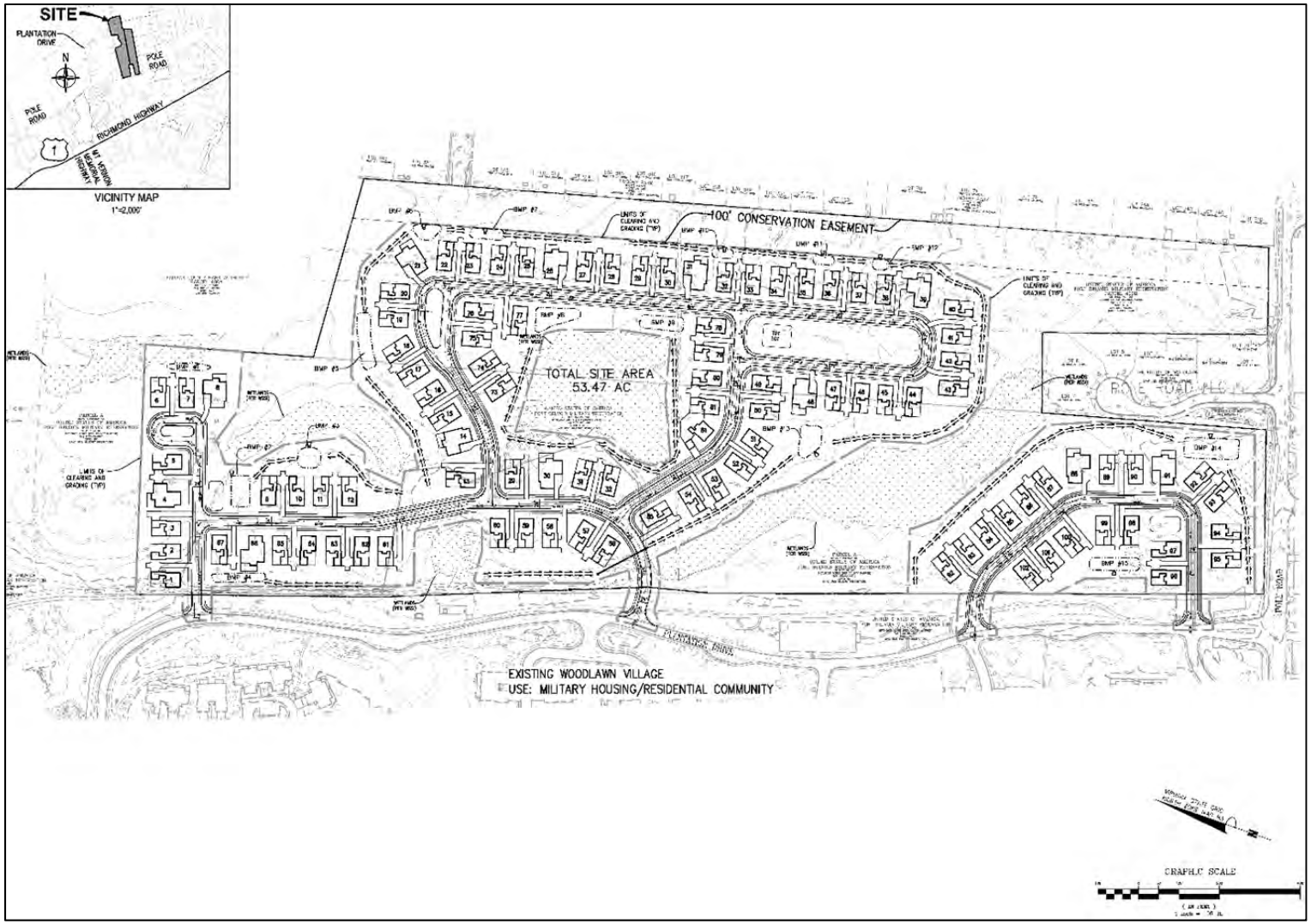


Figure 2-2 Conceptual Site Plan for Woodlawn East/Berman Tract (Bowman Consulting, 2015)

2.2 NO ACTION ALTERNATIVE AND PREFERRED ALTERNATIVE SELECTION

Under the No Action Alternative, no additional land would be transferred to the RCI Ground Lease and the Woodlawn East/Berman Tract would not be developed. Without the Proposed Action, development of a sufficient number of new units within the existing RCI Ground Lease is not feasible. Because FBRC must maintain at least 2,106 units according to the HMA, existing sub-standard units would need to be renovated rather than replaced under the No Action Alternative. Site constraints exist that would prevent existing units from being renovated to be fully handicap accessible. Also, under the No Action Alternative, there would be no additional land space to meet the parking, garage, and storage space requirements of Army's RCI guidelines. These constraints would result in the provision of less desirable units and communities for Fort Belvoir families in the long-term.

The Proposed Action Site was selected as the Preferred Alternative through on-going conversations between FBRC and Fort Belvoir. FBRC regularly briefs the installation on RCI activities and communicates alterations to the project. Previously identified constraints have been discussed between FBRC and Fort Belvoir during these meetings. Subsequent discussions have identified various parcels for potential transfer to the ground lease. During initial screening these parcels were identified as having limitations that inhibited transfer. Such limitations have included insufficient parcel size, inadequate location, proximity to sensitive resources, and insufficient utility or road network access. Based on the on-going regular discussions and site screening, the Proposed Action Site was approved by the Army to undergo NEPA screening.

2.3 ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION AND NO ACTION ALTERNATIVE

The following resource areas have been identified for study within this SEA: land use, aesthetics and visual resources, noise, geology and soils, water quality (including surface water, wetlands, and floodplains), biological resources (including threatened and endangered species), cultural resources, socioeconomic resources (including schools), environmental justice and the protection of children, transportation, and hazardous and toxic substances.

2.3.1 Elements of the Human Environment Considered and Eliminated from Further Review

Based on the nature and scope of the Proposed Action and No Action Alternative, the elements of the human environment identified below do not require additional analysis in this SEA. The descriptions of the affected environment and analysis of potential consequences in the 2003 EA are unaffected by the changes in the Proposed Action.

Air Quality

The Clean Air Act defines the U.S. Environmental Protection Agency's (EPA) responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer. The changes to the Proposed Action will relocate some housing units within the RCI project area, but will not change the overall number or makeup of the housing

units in a way that affects air emissions. Therefore, the construction- and operations-related air quality impacts have been fully evaluated in the 2003 EA. Additionally; there will be no net increase in traffic-related air emissions, so there are no additional air quality-related impacts due to an increase in traffic.

Utilities

The changes to the Proposed Action outlined in this SEA will not change the impact to utilities discussed in the 2003 EA. The 2003 EA analyzed the project impacts to potable water supply, sewer, stormwater, energy sources, communications, and solid waste. Because the net number of units is not changing with this action, no increase in utility demand is expected. Changes in stormwater management are discussed in Sections 3.5 and 4.5.

Human Health and Safety

The proposed changes to the Proposed Action will not affect the types of health and safety risks generally associated with construction activities, and will not affect the Occupational Safety and Health (OSHA) requirements that apply to these activities. Following proper Best Management Practices (BMPs) and regulations construction workers at the proposed site would be subject to the same types of health risks that are generally associated with their professions.

Solid Waste

Solid waste impacts were analyzed in the 2003 EA, and the additional action proposed in this SEA would not change the findings of that analysis. There would be no expected change in the type or amount of solid waste generated due to the Proposed Action.

2.3.2 Elements of the Human Environment Considered and Carried Forward for Further Review

Based on the nature and scope of the changes in the Proposed Action and No Action Alternative, the following elements of the human environment warrant additional analysis in this SEA:

Land Use

Adding the Berman Tract to the Ground Lease and developing the Woodlawn East/Berman Tract area for use as residential communities would involve change to land use. Depending on proximity to other existing structures and roadways, such a change could create conflicts in resource uses. Therefore, potential impacts to the human environment due to changes in land use are assessed in this SEA.

Aesthetics and Visual Resources

Changes in land use can alter the visual quality of an area. Thus, impacts to visual quality are assessed in this SEA.

Noise

The operation of machinery (including vehicles) during construction of housing on the additional parcel has the potential to increase noise-related impacts to nearby receptors that were not fully evaluated in the EA. Therefore, impacts to the acoustic environment are analyzed.

Geology and Soils

Construction activities have the potential to contribute to erosion at the proposed project sites. Identification of areas where erosion is likely to occur is dependent on parameters such as soil type and extent and proximity of vegetative cover to the affected area. Erosion prone soils at the proposed project sites are identified based on documented soil surveys.

Water Quality

The removal of trees and the change in impervious surfaces under the Proposed Action creates the potential for an increase in the volume and quality of stormwater runoff from the additional parcel. Impacts to wetlands and coastal zone resources are also possible. Therefore, potential water quality impacts are analyzed.

Biological Resources

The proposed change in land use has the potential to impact vegetation, wildlife, rare and threatened endangered species, and protected habitat. The extent of the potential impacts to biological resources is evaluated, with focus on those species identified within the project area and that may be sensitive to such impacts.

Cultural Resources

Cultural resources, such as archeological sites or historic structures, have been identified at Fort Belvoir. The Proposed Action has the potential to impact cultural resources that fall within the project footprint through ground disturbing activities during construction and use of the additional parcel. Thus, potential impacts to cultural resources are assessed.

Socioeconomic Resources

The socioeconomic resources section of the SEA addresses the potential for beneficial and adverse impacts to occur in the local economy of which Fort Belvoir is a part. This SEA quantifies and assesses impacts to employment, income, population, and schools.

Environmental Justice and Protection of Children

Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) requires Federal agencies to identify and address actions that may disproportionately impact low income or minority communities. Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, requires Federal agencies to address actions that may present environmental and safety risks to children. Specifically, the Executive Order requires identification of large populations of children (e.g., schools and childcare facilities).

Transportation

Construction of the proposed housing would cause some residents to use different roadways within Fort Belvoir compared to the transportation consequences evaluated in the EA. Depending on proximity to existing roadway or intersection traffic issues, such a change could increase traffic-related impacts. Therefore, potential impacts due to changes in resident traffic patterns are assessed in this SEA.

Hazardous and Toxic Substances

Implementing the changes in the Proposed Action would not change the impacts associated with generating construction-related waste and trash from the use and occupancy of the housing units. Therefore, these potential impacts will not change from the conditions evaluated in the 2003 EA. However, the proposed development parcel may contain pre-existing environmental conditions, such as chemical contamination or munitions, due to its prior use as training grounds. Potential impacts associated with pre-existing disposal areas or other environmental hazards are analyzed in this SEA.

3.0 AFFECTED ENVIRONMENT

3.1 LAND USE

3.1.1 Regional Setting

Fort Belvoir is situated on 8,500 acres of land (IMC, 2014) located along the Potomac River in the southeastern portion of Fairfax County, Virginia, about 16 miles southwest of Washington, DC (USCB, 2010a). Fairfax County is the most populated county in the Washington, DC metropolitan area and encompasses approximately 400 square miles. Fort Belvoir is located southeast of Interstate I-95 and bisected by US Route 1 (Richmond Highway); separating it into North Post and South Post. The Proposed Action is located within North Post. The South Post juts into the Potomac River with Dogue Creek to its east and Pohick Bay and Gunston Cove to its west (Figure 1-1).

3.1.2 Fort Belvoir and Surrounding Area Land Use

Land use was described in the 2003 EA according to the 1993 Fort Belvoir Real Property Master Plan (RPMP), and the 2000 Fairfax County Comprehensive Plan. Both of these documents have been updated since 2003, and relevant information from the 2013 Fairfax County Comprehensive Plan and 2014 Draft Fort Belvoir RPMP is included here.

Fairfax County

Fort Belvoir is located in the Fairfax County Lower Potomac Planning District and makes up the LP4-Fort Belvoir Community Planning Sector, which is one of four Community Planning Sectors in the Lower Potomac Planning District. Local zoning regulations do not apply to Federal property; Fairfax County's land use plan classifies Fort Belvoir as a Large Institutional Land Area. However, the Fairfax County Comprehensive Plan does make recommendations for the LP4 Sector; and the following recommendations are applicable to the Woodlawn East/Berman Tract:

- Proposed development or redevelopment on Fort Belvoir should be undertaken in cooperation with the County. Development or redevelopment plans should be supported only if they are consistent with the County goals and Comprehensive Plan.
- Consideration should be given to the construction of on-Post housing to meet the needs of military families in southern Fairfax County. On-Post housing for military families reduces the competition for affordable housing in the County. The on-Post homes should be well-designed and buffered, and not located near the frontage of Richmond Highway (Fairfax County, 2013a).

The Fairfax County land to the east and south (Figure 2-1) of the proposed development is classified as 'suburban neighborhood.' The Fairfax County Comprehensive Plan concept for that classification is as follows:

- Parks and recreation facilities should be distributed throughout suburban neighborhoods as needed to serve residents.

- Access and internal circulation for non-residential and higher density residential uses should be designed to prevent adverse traffic impacts on nearby lower-density residential uses. Reliance on the automobile should be diminished by encouraging the provision of pedestrian accessible community-serving retail and support uses.
- For development within or adjacent to suburban neighborhoods that propose either a significantly higher density or a change in land use, primary access should be from major or secondary roadways which do not traverse adjacent stable residential areas. Transit service, generally bus service, should be provided to those portions of the suburban neighborhoods that are most likely to generate substantial ridership (Fairfax County, 2013b).

Approximately ¼ mile to the north (Figure 1-1) of the proposed development is Huntley Meadows Park; Fairfax County Land classified as 'Low Density Residential Areas.' The Fairfax County Comprehensive Plan concept for that classification is as follows:

- Low Density Residential Areas typically contain large lot single family detached housing and open space. They are generally located along the Potomac River and the Difficult Run and Occoquan watersheds. Policies emphasize the preservation of significant and sensitive natural resources, especially protection of the County's water resources.
- Institutional or other neighborhood serving uses should be of a compatible scale and intensity.
- Public facilities infrastructure is to be provided at an acceptable level of service without substantial negative impacts to the natural environment. Public facilities in low density residential neighborhoods should be limited to those which are required to be located in these areas. Public water and sanitary sewer service are generally not to be provided in these areas (Fairfax County, 2013b).

Fort Belvoir

Land use throughout the installation is highly varied and consists of the following categories: administrative, research and development, medical, community facilities, barracks, family housing, service and storage, recreation, environmentally sensitive areas, and training areas (USACE, 2003).

The Fort Belvoir RPMP divides the installation into 20 sub-areas, or districts, for planning purposes. The proposed project is within the North Residential District, which is located in the Fort Belvoir North Post. The upper portion of the North Post is approximately 1,930 acres, and includes the Defense Logistics Agency, Defense Threat Reduction Agency, Defense Communications Electronics Evaluation Testing Agency, and the U.S. Army Intelligence and Security Command (INSCOM). It also houses a number of community facilities including: Fort Belvoir North Post Golf Course, Post support facilities, Fort Belvoir Elementary School, the Post Exchange, Commissary, class VI store, convenience store, gas station, bank, and Main Post chapel. Residential land on Fort Belvoir consists of approximately 576 acres and is currently developed and managed by FBRC through the RCI program (IMC, 2014).

Woodlawn Village is one of two family housing clusters on the North Post, and is located within the North Post's easternmost portion. This area is categorized as Residential. It currently houses approximately 1,444 residents (Jiang, 2014a) in 342 existing homes. Woodlawn Village is adjacent to the proposed development on the west (Figure 3-1) (IMC, 2014). The land to the north of the proposed development is the Jackson Miles Abbott Wetland Refuge (JAWR), which is connected to the open space land in Fairfax County's Huntley Meadows Park. Development is restricted in this area (IMC, 2014).

3.1.3 Land Use at Proposed Site

Currently, the Woodlawn East/Berman Tract is undeveloped, as described in Section 3.6.1. The Fort Belvoir RPMP classified the undeveloped land on-Post based on its development potential and constraints. The classifications are as follows:

- *Most Suitable for Development* – Areas have no environmental constraints and are recommended for development.
- *Moderately Suitable for Development* – Areas have some constraints associated with them that require mitigation before development can occur.
- *Least Suitable for Development* – Areas have constraints that may require significant mitigation measures (for example, a sensitive natural area). Sites within the "Least Suitable for Development" areas should only be developed when they are unavoidable (e.g., a necessary road crossing) or where than can take place with no adverse impacts to the ecological services that these constrained areas are providing. It is recommended that values lost, if any, due to the encroachments on these areas be directly mitigated where possible (IMC, 2014).

The Woodlawn East Parcel includes areas classified as Most Suitable for Development, Moderately Suitable for Development, and Least Suitable for Development (Figure 3-1). The Limited Development areas in the Woodlawn East parcel are wetlands and a mapped archeological resource site. The Berman Tract was not classified in the Draft RPMP, but the wetlands described on the in Section 3.5.3 would likely also be designated as Moderately Suitable for Development.

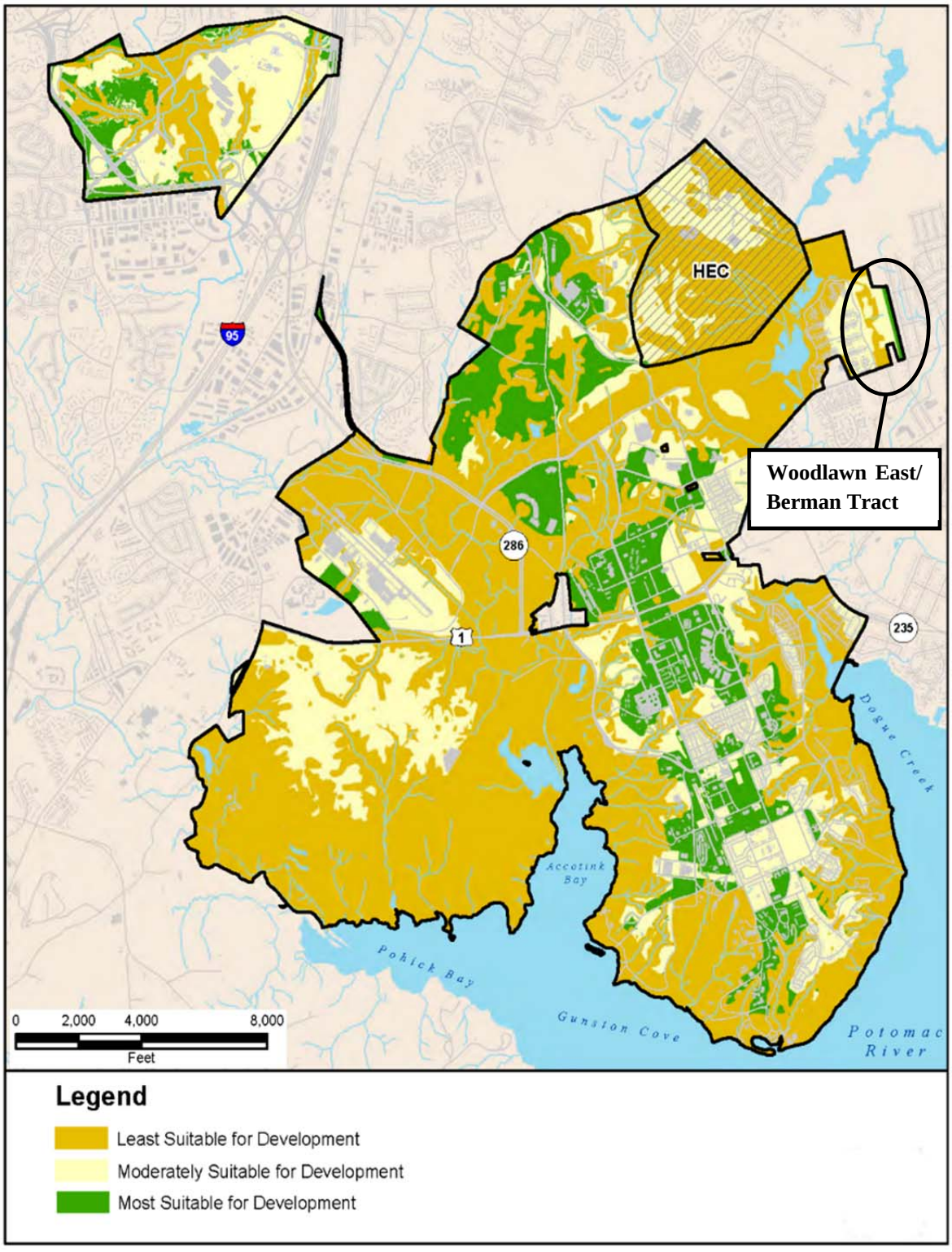


Figure 3-1 Fort Belvoir Development Constraints (IMC, 2014)

3.2 AESTHETICS AND VISUAL RESOURCES

A visual resource (or aesthetics) is the interaction between a human observer and the landscape he or she is observing. The subjective response of the observer to the various natural and/or artificial elements of a given landscape and the arrangement and interaction between them is fundamental to visual resources impacts analysis (USDA, 1995). A related term, "viewshed" is a subset of a landscape unit and consists of all the surface areas visible from an observer's viewpoint.

Fort Belvoir Generally

Fort Belvoir displays three forms of land use features that contribute to this aesthetic atmosphere: unimproved, semi-improved, and improved areas on the Post. Unimproved areas feature many diverse landscapes (forests, marshes, and meadows). These natural areas are usually surrounded by semi-improved areas, which include such things as mowed fields and wooded areas that have been cleared of undergrowth. Improved areas at Fort Belvoir include features such as recreational and community facilities, golf courses, housing, research buildings, administration buildings, maintenance facilities, parking lots, and roadways.

Woodlawn East/Berman Tract

The Woodlawn East/Berman Tract is bordered by existing Woodlawn Village on the west and by Fairfax County neighborhoods on the south and east. Power lines currently run along the edge of the site. The primary viewing of the site is by travelers on Pole Road, and homeowners to the east and west with lots that back up to the Woodlawn East/Berman Tract. Viewers traveling on Pole Road would generally be those commuting to and from work or home, and generally not particularly attentive to the visual character of the surrounding landscape. Those viewing from their home generally are aware of the visual character of the surrounding landscape.

3.3 NOISE

Noise is defined as unwanted sound that interferes with normal human activities. There is a wide diversity of human responses to noise, which vary according to the type and characteristics of the noise source. For the Army, high sound levels are both part of the job of operating weapons systems and a necessary training condition since soldiers must learn to function in an environment similar to what they would encounter on the battlefield. Noise also affects wildlife populations.

The basic unit used to represent given sound levels is the decibel. Table 3-1 presents a range of decibel sound levels. A straight, unmodified decibel level is not used, however. To quantify the intrusiveness of nighttime noise, the EPA recommends a special type of 24-hour average known as the day-night level, or L_{dn}. The L_{dn} is calculated so that noises that occur after 10:00 p.m. and before 7:00 a.m. are treated as if they are 10 decibels more intense (USACE, 2003).

Table 3-1. Common Sound Levels

Location/Activity	Sound Levels (decibels)
Near jet plane at takeoff	140
Near air-raid siren	130
Threshold of pain	120
Thunder	110
Garbage truck, trailer truck at roadside	110
Stone crushing (temporary construction site)	90 to 108*
Power lawnmower at 50 feet	90
Backhoe, Paver	85
Cement mixer, Power saw	80
Compressor	75
Freeway traffic at 50 feet	70
Conversational speech	60
Average residence	50
Bedroom	40
Soft whisper at 15 feet	30
Rustle of leaves	20
Breathing	10
Threshold of hearing	0

* - Estimated sound pressure levels for all activities involved in stone crushing (i.e., crusher, feeder, and screen). (USACE, 2003)

Noise naturally dissipates as it travels through the air by a process called atmospheric attenuation. Some other factors that can affect the amount of attenuation are ground surface, foliage, topography, and humidity. For each doubling of distance from a noise source, the level can be expected to decrease by approximately six decibels.

Currently, the major noise sources on Fort Belvoir include the Davidson Army Airfield and the 249th Engineering Battalion (Prime Power). Prime Power uses diesel generators for training purposes. The noise level of the generators range from 107 decibel A-rated (dBA) to 114 dBA. These noise sources are not in the vicinity of the proposed project on the Woodlawn East/Berman Tract (USACE, 2003). Currently, the noise within the residential areas where development is proposed would be considered consistent with normal suburban residential noise conditions.

3.4 GEOLOGY AND SOILS

3.4.1 Geology and Topography

Fairfax County lies within the Coastal Plain and Piedmont Physiographic Provinces. The fall line separating these provinces trends northeast to southeast, and is roughly parallel to Interstate I-95 in the vicinity of Fort Belvoir.

Fort Belvoir's Main Post lies within the Coastal Plain Physiographic Province. The Coastal Plain Physiographic Province consists of unconsolidated sand, silt, and clay underlain by residual soil and weathered crystalline rocks.

The topography of Fort Belvoir consists of two plateaus, lowlands, and steeply sloped terrain. The plateaus run south-southeast towards the Potomac River, and are surrounded by the floodplains of Accotink and Dogue Creeks (US Army Garrison, 2001). Steep slopes (i.e., slopes of 15 percent grade or greater), ravines, and stream valleys surround the two plateaus on the east, south, and west sides. The installation ranges in elevation from approximately mean sea level (msl) along the Potomac River to 230 feet above msl at the intersection of Beulah and Woodlawn Roads. Uplands and plateaus make up about 40 percent of the Main Post's land area, lowlands make up another 40 percent, and steep slopes make up the remaining 20 percent.

A combination of weakly cemented sedimentary substrates and exposure to erosive forces of wind and water near the Potomac River are mainly responsible for unstable steep slope conditions. Steep and highly erodible slopes are also found along the eastern and western edges of the western plateau and in deeply cut stream channels (US Army Garrison, 2001).

The topography of the Woodlawn East/Berman Tract is flat with an elevation of 35.2 feet above msl in the northwest portion of the site to an elevation of 34.4 feet above msl in the southeast portion of the site (Bowman Consulting, 2015a). Previous disturbances, most likely due to training activities, are apparent through berms and other small land forms that appear inconsistent with local surroundings and were observed to divide areas or modify natural topographical patterns (e.g. ditch).

3.4.2 Soils

Fort Belvoir's uplands are underlain by sands, silts, and clays of riverine origin. Uplands underlain by sands and silts tend to be more stable than those underlain by clays. Uplands that are underlain by clayey soils form undulating and rolling hills and the dominant geomorphic process in these areas is mass wasting that includes downhill creep, landslides, slumping, and rock falls. Lowlands and valley bottoms are typically underlain with alluvium. The dominant geomorphic process is active riverine erosion and deposition during overbank flooding. Surface drainage is commonly poor due to the shallow water table. Drainage usually occurs as surface runoff, with runoff greatest on the steeper slopes and increasing with construction activity and the removal of vegetation, which greatly increases the rate of erosion and the probability of creep and slumping (US Army Garrison, 2001).

According to the Natural Resources Conservation Service (NRCS) there are five different named soil series on the Woodlawn East/Berman Tract site including Beltsville, Grist Mill, and Gunston, Mattapex, and Woodstown (USDA, 2014). Table 3-2 lists the soils, the percent slope of each soil, and the drainage class in which they fall. Soil units at Fort Belvoir are also summarized in Figure 3-2.

Table 3-2. Soil Types Woodlawn East/Berman Tract

Map Unit Symbol	Soil Name	Percent Slope	Soil Problem Class	Acres (approximate)
7B	Beltsville silt loam	2 to 7	II	3.9
40	Grist Mill sandy loam	0 to 25	IVB	4.8
48A	Gunston silt loam	0 to 2	III	27.8
77B	Mattapex loam	2 to 7	II	8.5
109B	Woodstown sandy loam	2 to 7	IVA	8.5

According to the Description and Interpretive Guide to Soils in Fairfax County, all soils in the county are identified by a Soil Problem Class that ranges from I to IV (Class I have the fewest limitations). The class designations serve as a guide to determine if and what type of geotechnical engineering study is required for site development (Fairfax County, 2013a) and for identifying potential methods to address the limitations of the soils. Typical limitations of these soils include: poor drainage, seasonally high water tables/saturation, high shrink/swell potential, and weak bearing strength (Fairfax County, 2013a).

A geotechnical investigation of the Woodlawn East/Berman Tract (Appendix A, GC&T, 2015) indicates that soils at the site are predominantly fine-grained, consisting of two strata: (1) low plasticity fine-grained soils and (2) high plasticity fine-grained soils. Stratum 1 was encountered under topsoil at all boring locations up to the 15-foot terminal boring depth. Stratum 2 was encountered in roughly half of the borings throughout the site and was commonly interbedded with the low plasticity soils.

The recommendations of the geotechnical report indicate that soils from Stratum 1, exhibiting low to medium plasticity, are generally suitable for use as structural fill and recommends limits on the use of high-plasticity soils from Stratum 2 (GC&T, 2015). Specifically, the geotechnical report recommends undercutting a minimum of four feet at foundations and two feet at pavement subgrades and building pads where unsuitable highly plastic soils are encountered. Thus, undercutting and/or replacement of on-site soils is expected, especially under wet conditions, when construction sequencing doesn't allow adequate drying of soils to attain optimum moisture, and when separation of interbedded sequences of suitable and unsuitable soils is not feasible (e.g., narrow utility trenches).

The Fort Belvoir Master Plan designates soils with slopes of 15 percent or greater as steep slopes. Soils on these slopes have a greater tendency to erode and wash away during rain events than soils on slopes of less than 15 percent. Because construction activities on Fort Belvoir are discouraged on these unstable slopes, these areas are designated as a severe land constraint (US Army Garrison, 2003). There are no steep slopes on the Woodlawn East/Berman Tract site.

3.4.3 Prime Farmland

Prime farmland soils are protected under the Farmland Protection Policy Act (FPPA) of 1981. The intent of the FFPA is to minimize the extent to which Federal programs contribute to the unnecessary or irreversible conversion of farmland soils to nonagricultural uses. The FFPA also ensures that Federal programs are administered in a manner that, to the extent practicable, would be compatible with private, state, and local government programs and policies to protect farmland. The NRCS is responsible for overseeing compliance with the FPPA and has developed rules and regulations for its implementation (USDA, 1981).

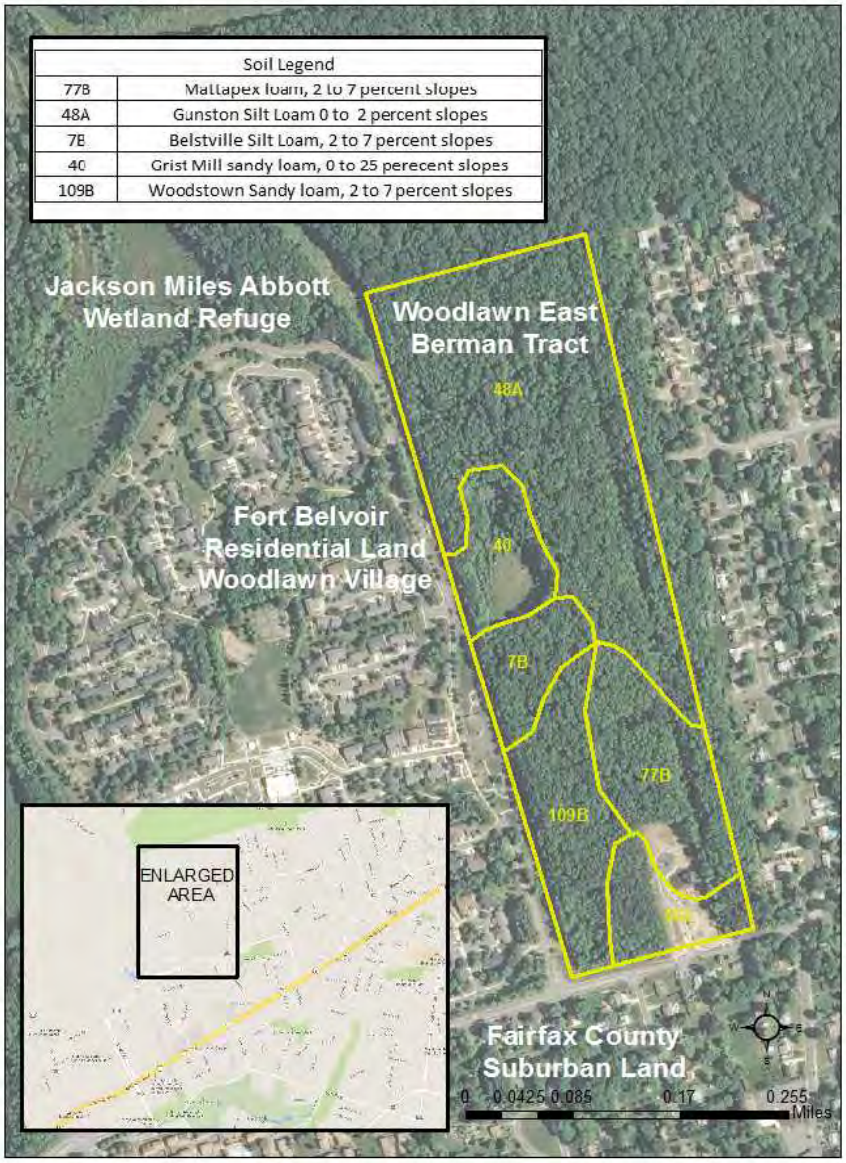


Figure 3-2 Soil Types (USDA, 2014)

Development in areas containing prime farmlands is allowed at Fort Belvoir due to the impracticality of farming on a military installation (US Army Garrison, 2003). Map units that are complexes or associations containing components of urban land or miscellaneous areas as part of the map unit name cannot be designated as prime farmland. Three soils mapped as prime farmland are identified by the USDA on the site: Beltsville, Mattapex, and Woodstown (USDA, 2014).

3.4.4 Seismic Activity

Major seismic activity is not a significant concern for buildings in Fairfax County (US Army Garrison, 2003). Despite historical and relatively recent (August 2012) earthquakes in Virginia, Fort Belvoir and the surrounding area are identified as having a low potential (Figure 3-3) for earthquakes (USGS, 2014).

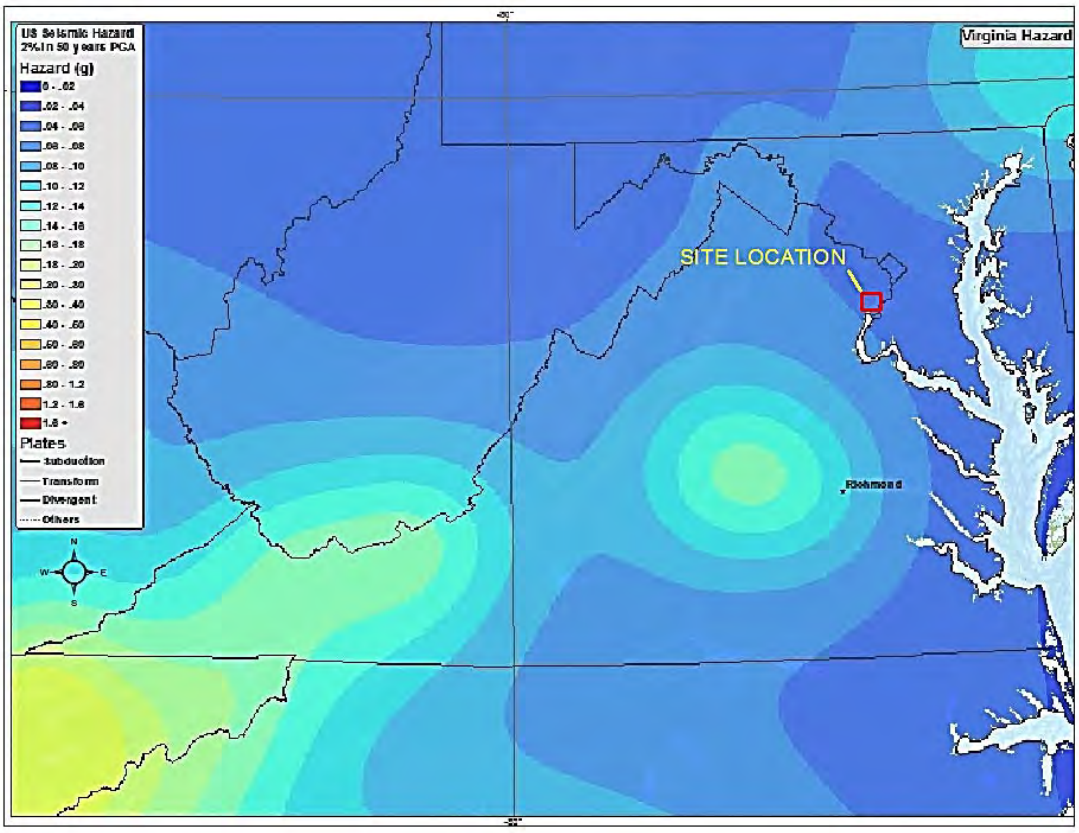


Figure 3-3 Virginia Seismic Hazard Map (USGS, 2014)

3.5 WATER QUALITY

3.5.1 Surface Water

Fort Belvoir lies on the Potomac River, the second largest tributary to the 64,000-square-mile Chesapeake Bay watershed (USACE, 2003). Flowing into the Potomac River, to the east of Fort Belvoir, is Dogue Creek. The Proposed Action is within the Dogue Creek Watershed (Figure 3-4). Dogue Creek flows approximately ½ mile to the north and west of the site, and then opens into an embayment two miles south of the site before entering the Potomac River.

Stormwater from the site moves via overland flow towards on-site wetlands throughout the site and towards Woodlawn East parcel (Bowman Consulting 2015b, Appendix B). Stormwater is expected to accumulate in low areas and wetlands, and slowly infiltrate into the subsoil of the site. Water from the site drains to the south to a storm drainage

system along Pole Road, to the east through storm drainage systems in the Timothy Park community, and to the northeast into a small tributary and eventually to Dogue Creek (WSSI, 2014c). On-site wetlands are described in Section 3.5.3.

Figure 3-4 Surface Water Resources (USGS, No Date)

The Dogue Creek embayment, along with the stretch of the Potomac River that it enters has historically been listed as impaired under section 303(d) of the CWA, for exceeding the amount of polychlorinated biphenyls (PCBs) allowed in fish tissue, specifically channel catfish. The Dogue Creek embayment waters are in attainment, though, for wildlife and recreation uses (VDEQ, 2014). The Woodlawn East/Berman Tract is not known to have stored PCB-containing materials (US Army Garrison, 2013c).

Approved in December 2010, a TMDL for Nitrogen, Phosphorous, and Sediment has been developed for the Chesapeake Bay due to the non-attainment of water quality

standards under Section 303(d) of the Clean Water Act (VDEQ, 2014). This TMDL for the Chesapeake Bay is an aggregate of tidal segments and its tributaries individual TMDLs. Fort Belvoir does not have an individual pollution allocation for the Chesapeake Bay TMDL for Nitrogen, Phosphorus, and Sediment (US Army Garrison, 2013a).

The Department of Defense (DoD) and the Army are partners in watershed management of the Chesapeake Bay, and are required as Federal agencies that own or operate a facility within the Chesapeake Bay watershed to participate in regional and sub-watershed planning and restoration programs. Fort Belvoir adheres to several interagency and interstate Chesapeake Bay agreements and policies, with the most recent being the renewed Chesapeake Bay Agreement, (US Army Garrison, 2001; Chesapeake Bay, 2014). The Virginia Watershed Implementation Plans (WIP) to address the Chesapeake Bay TMDL includes strategies for Federal facilities such as:

- Compliance with Executive Order 13514, Section 438 of the Energy Independence and Security Act (EISA) by commitment to controlling pollution and contributing to improving the health of the Chesapeake Bay, and
- Utilizing MS4 permits to ensure that BMP implementation of Federal lands achieves nutrient and sediment reductions (US Army Garrison, 2013a).

Stormwater discharge at Fort Belvoir is regulated under a Phase II (small) MS4 general permit. The six minimum control measures under this permit program are:

- Public education and outreach on stormwater impacts
- Public involvement and participation
- Illicit discharge detection and elimination
- Construction site stormwater runoff control
- Post-construction stormwater management in new development or re-development
- Pollution prevention/good housekeeping for military operations (US Army Garrison, 2013a).

3.5.2 Resource Protection Areas

The Fairfax County Chesapeake Bay Preservation Ordinance restricts development in Resource Protection Areas (RPA). RPAs are designed to protect water quality, filter pollutants out of stormwater runoff, reduce the volume of stormwater runoff, prevent erosion, and perform other biological and ecological functions (Fairfax County, No Date). RPAs are land with one of the following features:

- Tidal wetland
- Tidal shore
- Water body with perennial flow
- Nontidal wetland connected by surface flow and contiguous to a tidal wetland or water body with perennial flow; and
- Buffer area that includes any land within a major floodplain or within 100 of a feature listed above.

Fort Belvoir's RPMP indicates that there are RPAs within the bounds of the site. However, the site-specific wetland field survey (Appendix C) of the Woodlawn East/Berman Tract, determined that there are no RPAs within the bounds of the Proposed Action (WSSI, 2014b). The conclusions of the wetland survey were verified by the USACE through the issuance of a Jurisdictional Determination (JD) confirming the wetland delineation on November 18, 2014 (Appendix D).

3.5.3 Wetlands

Wetlands are defined as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (DA, 2007). Wetland functions include flood control; flood storage; groundwater recharge; breeding, nesting, and habitat areas for a variety of plant and animal species; critical habitat for migratory waterfowl; removal of excess nutrients and toxic materials; reducing sedimentation; and trapping suspended sediments that produce turbidity in water (VDEQ, 2012). Wetlands are regulated under Section 404 of the CWA, AR 200-1 Environmental Protection and Enhancement, AR 200-3 Natural Resources-Land, Forest and Wildlife Management, and Executive Order 11990 Protection of Wetlands. The Army strives to achieve a no net loss of wetlands on Army-controlled lands (USACE, 2003).

A survey was performed in March 2014 to determine the extent of wetlands within the Woodlawn East/Berman Tract. The revised survey report, provided in Appendix C, determined that there are jurisdictional wetlands (meeting the criteria to be regulated under the CWA) on the site which includes palustrine forested (PFO) and palustrine emergent (PEM) wetlands (WSSI, 2014b). No tidal wetlands, tidal shores, or water bodies with perennial flow as defined by the Department of Conservation and Recreation (DCR, 2010) are present on or within 100 feet of the site. Additionally, there are isolated PFO wetlands that do not meet the criteria for Federal jurisdiction for regulation under the CWA, but are still regulated by the Virginia Water Protection (VWP) permit program. The USACE confirmed the wetlands delineation by issuing a JD dated November 18, 2014 (Appendix D). See Figure 3-5 for the distribution of wetlands at the site.

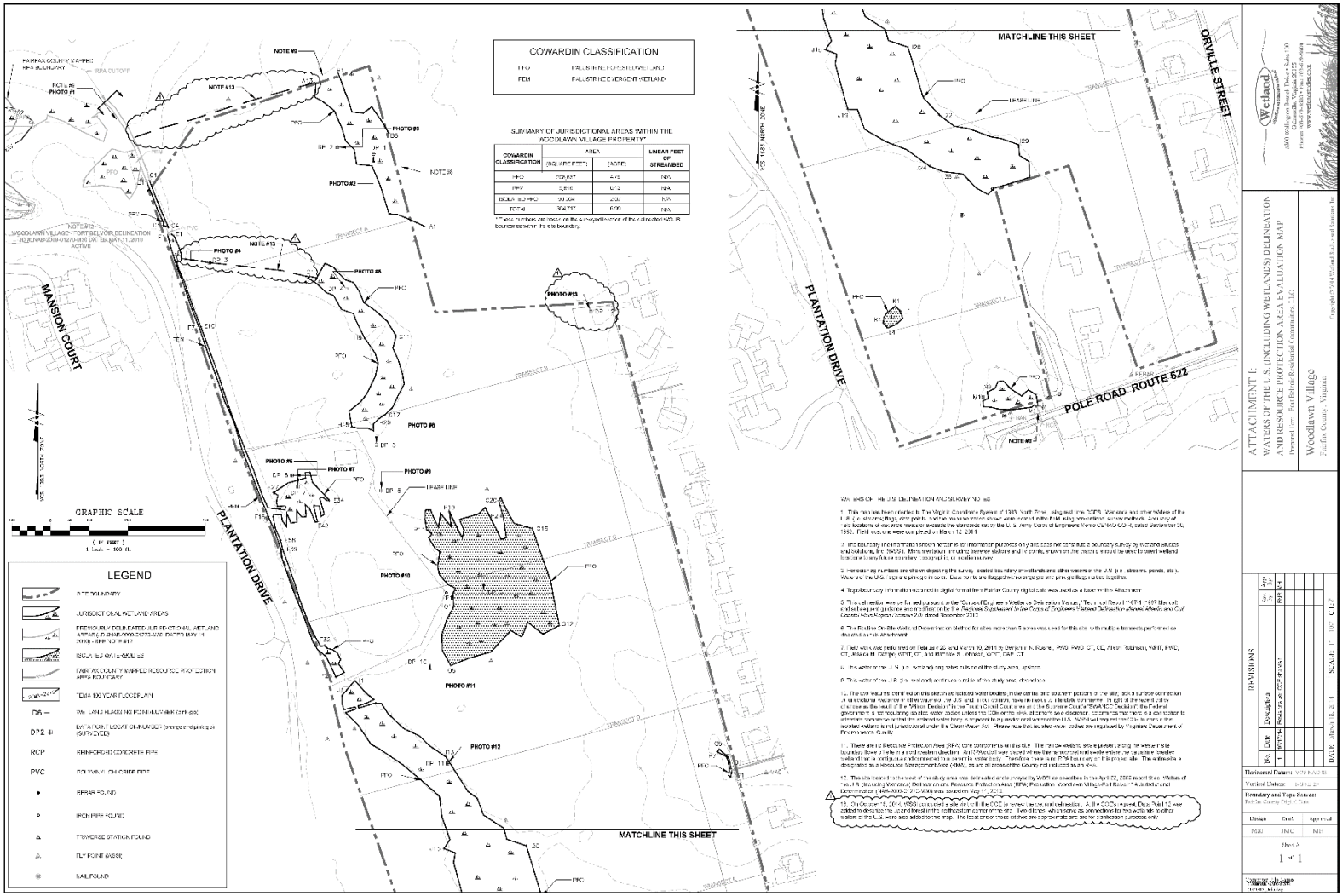


Figure 3-5 Wetlands in Woodlawn East/Berman Tract (WSSI, 2014b)

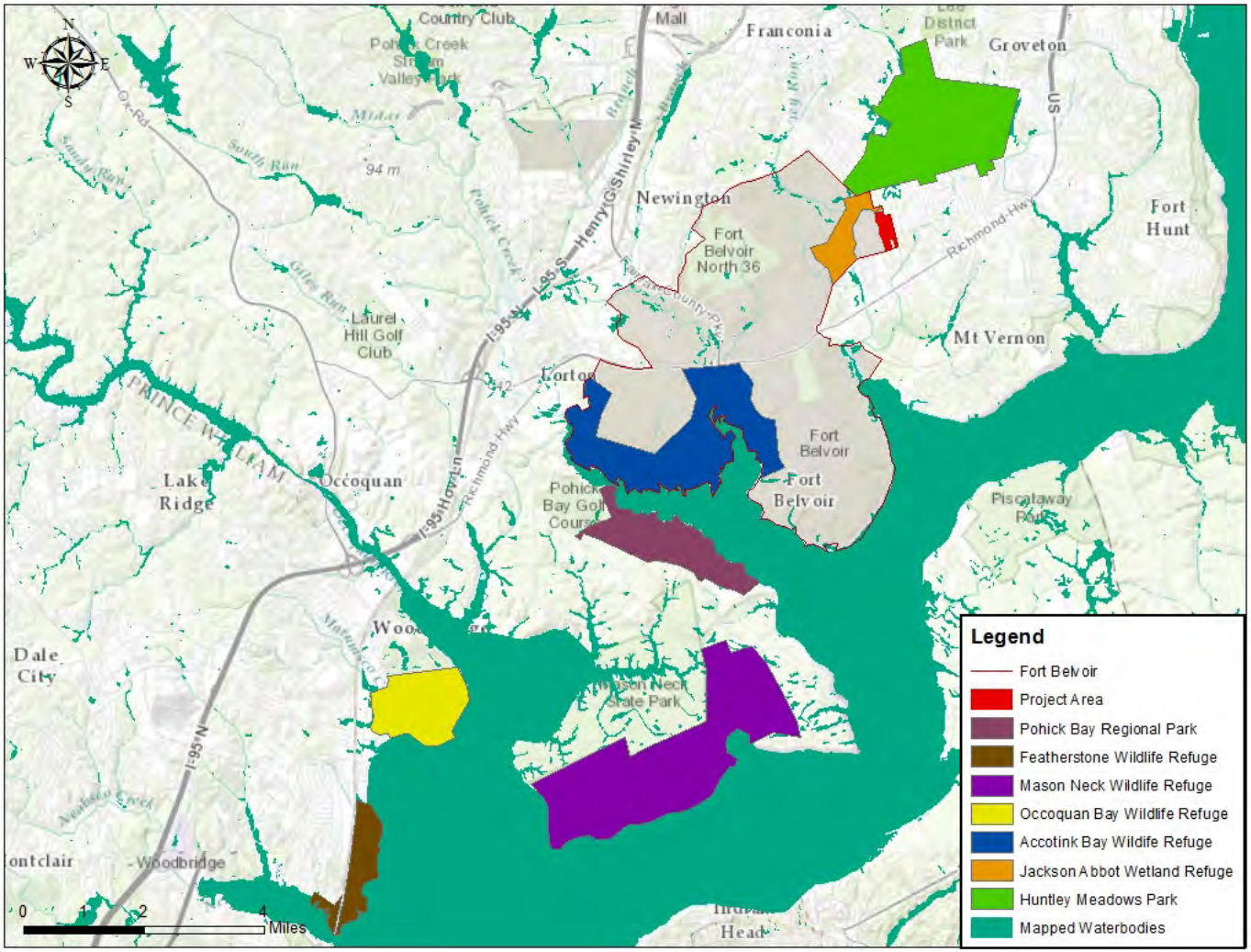


Figure 3-6 Wildlife/Wetland Refuges and Natural Areas Near Fort Belvoir (ESRI, 2010)

3.5.4 Floodplains

An investigative summary was performed for the Woodlawn East/Berman Tract (Appendix E), and it was determined that there are no floodplains within its bounds to which Fairfax County or FEMA floodplain regulations apply. Water from the site drains to the south to a storm drainage system along Pole Rd, to the east through storm drainage systems in the Timothy Park community, and to the northeast into a small tributary and eventually to Dogue Creek (WSSI, 2014c).

3.5.5 Coastal Zone Management

The Coastal Zone Management Act (CZMA) of 1972 requires that Federal projects affecting land uses, water uses, or coastal resources of a state's coastal zone must be consistent to the maximum extent practicable with the enforceable policies of that state's Federally approved coastal zone management plan. The Commonwealth of Virginia has developed and implemented a Federally-approved Coastal Resources Management Program (CRMP) describing current coastal legislation and enforceable policies. Virginia's enforceable policies subject to Federal consistency include commercial fishing; recreational fishing in freshwater tidal rivers; encroachments on subaqueous lands; encroachments on wetlands; encroachments on primary sand dunes; land-disturbing activities needing erosion and sediment control; actual or potential wastewater discharges; control of septic and other onsite domestic waste systems; coastal land management; and air pollution control. Virginia's coastal zone encompasses the eastern third of the state including the Chesapeake Bay and its tributary rivers. Therefore, all of Fort Belvoir, including the Woodlawn East/Berman Tract, is considered to be within the jurisdiction of the CZMA. A CZMA Consistency Determination was prepared and is included as Appendix F.

3.5.6 Groundwater

Fort Belvoir is underlain by three main groundwater aquifers: the lower Potomac, middle Potomac, and Bacons Castle Formation. The lower Potomac aquifer is the primary aquifer in eastern Fairfax County and on the installation. This aquifer exists between a layer of crystalline bedrock and a thick wedge of clay. Water in the lower Potomac aquifer flows to the southeast and is recharged in the western section of Fort Belvoir and to the north and west of the installation (US Army Garrison, 2001). Water from this aquifer below Fort Belvoir is potable; however it is not currently a drinking water source. Any abandoned potable wells on the Post have been closed and filled. Additionally, there are five groundwater wells located elsewhere on Fort Belvoir that are used for irrigation purposes (USACE, 2003).

The middle Potomac aquifer consists of inter-fingering lenses of medium sand, silt, and clay of differing thickness. The middle Potomac confining unit is not present in the Fort Belvoir area. Water flow in the middle Potomac aquifer has not been well studied. The Bacons Castle Formation is the shallowest aquifer in the North and South Posts. This aquifer's flows are localized, originating from various recharges on the installation and draining to nearby streams, creeks, and large surface water bodies (US Army Garrison, 2001).

Although the water table fluctuates based on precipitation, leakage, and evapotranspiration, depth to the water table at Fort Belvoir is typically 10 to 35 feet below the ground surface. The water table may be at or near the surface in areas near streams. Under saturated conditions, artesian wells (in which water rises to the surface) have been encountered at Fort Belvoir. This suggests that shallow groundwater flow closely relates to surface drainage features (US Army Garrison, 2001).

A Subsurface Investigation and Preliminary Geotechnical Engineering Report – Woodlawn Village East was prepared by GC&T in January 2015 and determined that the depth to the groundwater table was 10.6 to 12 feet though fluctuations may occur seasonally. Perched groundwater is expected during excavations, particularly in low-lying areas of the site (GC&T, 2015).

3.6 BIOLOGICAL RESOURCES

3.6.1 Vegetation

The plant communities in many undeveloped areas at Fort Belvoir contain predominantly native species as compared to surrounding developed areas in northern Virginia where introduced invasive species often dominate. Fort Belvoir's natural plant communities are highly influenced by the wide variety of landforms found on the installation, which include gently rolling plateaus, high bluffs that descend sharply into adjacent stream valleys, and tidal shorelines. Factors such as topographic location, soil, moisture, slope, and natural and human disturbances influence vegetation composition within each plant community type (USACE, 2003).

An installation-wide vegetation study of Fort Belvoir was completed for the RCI which identified the 16 community types on the installation. The Woodlawn East/Berman Tract includes Loblolly Pine Forest, Mixed Pine—Hardwood Forest, Old Field Grassland, Tulip Poplar Mesic—Mixed Hardwood Forest, and Virginia Pine Forest (USACE, 2003). Detailed descriptions of each of these communities including dominant vegetation and the list of plants on Fort Belvoir are provided in Appendix G. The wetlands include palustrine forested and palustrine emergent vegetation communities (WSSI, 2014b).

Vegetation at the site consists of both areas of planted pine, and areas that appear to be in transition from a Mixed Pine to a Hardwood Forest based on the dominant tree species observed. Dominant tree species included: Sweet gum (*Liquidambar styraciflua*), Pin and Willow oaks (*Quercus palustris* and *Quercus phellos*, respectively), Red Maple (*Acer rubrum*), Virginia pine (*Pinus virginiana*), American Elm (*Ulmus americana*) and Northern Red Oak (*Quercus rubra*) (WSSI, 2014b).

3.6.2 Wildlife

The undeveloped areas of Fort Belvoir, including the Accotink Bay Wildlife Refuge (ABWR), the Jackson Miles Abbott Wetland Refuge (JAWR), and the Forest and Wildlife Corridor (or the Corridor) contain potential habitat for approximately 42 species

of mammals, 260 species of birds, 32 species of reptiles, and 27 species of amphibians (USACE, 2003).

The Corridor was established by Fort Belvoir in 1993 as a mitigation commitment to offset the ecological impacts of habitat fragmentation caused by several major construction projects on Fort Belvoir. The Corridor is approximately 15 miles long with a minimum width of 250 meters. The Corridor protects a wildlife habitat and migratory corridor, while also maintaining a continuous area of natural forest habitat between JAWR and the ABWR. The Corridor is not open to the public except as authorized by Fort Belvoir.

The Corridor includes a wide range of wetlands, riparian forest buffers, habitat for the state-listed wood turtle and several high priority breeding species listed with the Partners in Flight (PIF) program, and waterways for passage of, and spawning habitats for anadromous fish. The Corridor connects with off-Post forested areas of wildlife habitat, notably the Huntley Meadows Park (a 1,425-acre natural area), and allows animal movement between the larger forested areas, thus maintaining a diverse gene pool and helping ensure species survival.

The Woodlawn East/Berman Tract is surrounded on three sides by residential development, including the existing Woodlawn Village, and is not located within the Corridor. The JAWR is located to the north of the Woodlawn East/Berman Tract. Due to the close proximity of large housing developments, wildlife typical of housing areas (deer, raccoons, squirrels, skunks, etc.) likely inhabits the Woodlawn East/Berman Tract area.

There are many migratory bird species found at Fort Belvoir. On June 27, 2014 a PIF Species of Concern breeding bird survey was conducted by installation Natural Resource Specialists at the 53.5-acre Woodlawn East/Berman Tract at Fort Belvoir (PIF 2014). The typical species expected to be found in the region were detected with only one PIF species of concern. Those expected to be found include, but are not limited to, Red-Eyed Vireo (*Vireo olivaceus*), Eastern Tufted Titmouse (*Parus bicolor*), Carolina Chickadee (*Parus carolinensis*), Northern Cardinal (*Cardinalis cardinalis*), Carolina Wren (*Thyrothrus ludovicianus*), Acadian Flycatcher (*Empidonax virescens*), and woodpecker spp. The only PIF species of concern detected was the Eastern Wood-Pewee (*Contopus virens*). The Eastern Wood-Pewee was detected in the center of the western boundary of the survey area by vocalization. Migratory bird species are protected from unlawful activities by the Migratory Bird Treaty Act (MBTA). A table listing the known or expected birds, mammals, amphibians, fish, and reptiles at Fort Belvoir is included in Appendix H.

3.6.3 Rare, Threatened, and Endangered Species

The Endangered Species Act (ESA) of 1973 and amendments provide for the conservation of threatened and endangered species of animals and plants and their habitats. The Army, through Army Regulation (AR) 200-1, conducts regular consultations as required by Section 7 of the ESA for any action that may affect

Federally-listed species. The Army also complies with local and state threatened and endangered species regulations, to the extent practicable.

In accordance with the Environmental Management Plan (EMP) for FBRC, and the Fort Belvoir Bald Eagle Management Plan, designated bald eagle (*Haliaeetus leucocephalus*) foraging and nesting areas are protected by the enforcement of 750-foot linear buffers from shoreline inland. The Woodlawn East/Berman Tract where development is proposed is not located within any bald eagle use or occasional use area; therefore, this SEA does not address bald eagle buffer zones or impacts to bald eagles (USACE, 2003).

An EMP has been prepared for the FBRC RCI Project and approved by the Army and Fort Belvoir (FBRC, 2007). The EMP addresses a variety of environmental topics as they arise during operation of the Ground Lease at Fort Belvoir. The EMP discusses site-specific rare, threatened, or endangered (RTE) species protection and includes provisions dealing with the management of bald eagles, the Federally-listed small whorled pogonia (*Isotria medeoloides),* and the state-listed wood turtle (*Glyptemys insculpta)* habitats.

The USFWS published a final listing decision for the northern long-eared bat (*Myotis septentrionalis)* in the *Federal Register* on April 2, 2015. The final listing became effective on May 4, 2015(USFWS, 2015). Habitat for this species is present within the site.

The Virginia Department of Conservation and Recreation (VDCR) stated that the state-threatened wood turtle has been documented in the project vicinity. The wood turtle inhabits areas with clear streams. Clear streams are typically adjacent to forested floodplains, nearby fields, wet meadows, and farmlands. The wood turtle overwinters on the bottoms of these streams (WSSI, 2014a). On February 28 and March 10, 2014, Wetland Studies and Solutions, Inc. (WSSI) environmental scientists conducted a habitat evaluation for wood turtles, focusing primarily on the riparian zone habitats associated within the site. Although terrestrial wood turtle habitat is present within the site, winter-phase habitat is not present on the site and no wood turtles were observed during this investigation (WSSI, 2014a), as expected based on lack of winter habitat. WSSI revisited the site on June 6, 2014 to conduct an additional terrestrial survey for the wood turtle. Although terrestrial phase habitat is present in the site, no wood turtles were observed (Robinson, 2014). Though wood turtles may be present nearby in Dogue Creek, based on the results of this study, the probability that the site supports a viable population of wood turtles is low; due to the lack of streams on the site and the distance of the site from Dogue Creek.

The Federally-listed small whorled pogonia also has the potential to exist on the site (FBRC, 2007). In June 2014, a small whorled pogonia habitat and species survey was conducted by WSSI at the site. No small whorled pogonias were found during the survey and only "low-quality" habitat for this species is present at the site (WSSI, 2014d). Based on prior assessments, other state-or Federally-listed species (e.g., peregrine falcon (*Falco peregrinus*), and loggerhead shrike (*Lanius ludovicanus*)) are unlikely to inhabit the parcel (USACE, 2003; US Army Garrison, 2010; VDGIF, 2002).

3.7 CULTURAL RESOURCES

Cultural resources are associated with human use of an area. They may include archeological sites, ethnographic locations, or built structures associated with past and present use of an area. A cultural resource can be physical remains, intangible traditional use areas, or entire landscapes, encompassing past cultures or present, modern-day cultures. Physical remains of cultural resources are usually referred to as archeological sites or historic properties.

A wide variety of cultural resources have been identified for Fort Belvoir, including buildings, structures, archeological sites, historic districts, and historic landscapes. Fort Belvoir's 2014 Integrated Cultural Resources Management Plan (ICRMP) can be consulted for a detailed description of the prehistoric and historic background of the RCI project area. Additional information about specific resources is also maintained in the Fort Belvoir Environmental and Natural Resource Division's (ENRD) geographical information system (GIS) planning layers. Fort Belvoir's 2014 ICRMP also includes detailed information on applicable cultural resources regulatory frameworks, regional prehistoric and historic background, the history of Fort Belvoir, cultural resources investigations and recorded properties, and installation-specific standard operating procedures for the management and protection of important sites, and is referenced throughout this section (US Army Garrison, 2014).

The Area of Potential Effect (APE) for changes to the Proposed Action is defined as the Woodlawn East/Berman Tract proposed for development and the area immediately surrounding the Woodlawn East/Berman Tract. Cultural resources within the boundaries of the APE are discussed and considered for direct and indirect impacts associated with changes to the Proposed Action.

3.7.1 National Historic Preservation Act (NHPA)

In compliance with Section 106 of the National Historic Preservation Act (NHPA), the 2003 EA included an evaluation of RCI's potential to effect sites listed, or eligible for listing in the National Register of Historic Places (NRHP). Cultural resources, such as archeological sites or historic structures, were identified at Fort Belvoir and considered in detail in the 2003 EA (exclusive of the Berman Tract, which became Army property in 2004); and Section 106 Consultation with the Virginia State Historic Preservation Office occurred. With the implementation of the 2003 Programmatic Agreement (PA) between US Army Garrison Fort Belvoir and the Virginia State Historic Preservation Officer (SHPO) for the Privatization of Family Housing at Fort Belvoir, Virginia (Appendix I), the 2003 EA did not result in impacts to historic properties.

In 2015, Fort Belvoir proposed and the SHPO concurred that the addition of the Berman Tract would have no effect on historic properties (VDHR File #2015-0594). Fort Belvoir also proposed to amend the RCI PA to include Berman Tract and other lands leased since the execution of the RCI PA, but the SHPO did not express interest in amending the RCI PA at this time.

The aforementioned 2003 PA contains requirements currently applicable to the RCI Project, and therefore to the Woodlawn East parcel, for the duration of the Ground Lease period. Descriptions of unanticipated discoveries that could affect the integrity or upkeep of the historic properties, or any other activities or policies that affect or may affect the historic properties on Woodlawn East will be reported to the SHPO and the Advisory Council on Historic Preservation.

3.7.2 National Register of Historic Places (NRHP)

The 2003 EA discusses cultural resources listed or eligible for listing on the NRHP or the Virginia Landmarks Register occurring in or around the APE in relation to the 2003 Proposed Action. While the Berman Tract was acquired by the Army after completion of the 2003 EA, the EA evaluated the Woodlawn East parcel and immediately surrounding areas, which included the Berman Tract. It also includes a discussion of the landscapes that contribute to the NRHP-eligible and Virginia Register-listed Fort Belvoir Historic District; and archeological resources that are eligible or potentially eligible for listing on the NRHP.

The 2014 ICRMP includes an inventory of archeological and architectural resources listed or eligible for listing in the NRHP and those that potentially may be eligible for listing (US Army Garrison, 2014). Fort Belvoir routinely evaluates the buildings on the installation that are 50 years old or older for eligibility for listing in the NRHP. These evaluations have resulted in the identification of more than 220 buildings and structures as eligible for NRHP listing. These include the Fort Belvoir Historic District, Fort Belvoir Military Railroad Historic District, Thermo-Con House, Camp A. A. Humphrey's Pump Station and Filter Building, and the US Army Package Power Reactor (Figure 3-6).

Fairfax County's historic property inventory has identified a number of resources located on or adjacent to Fort Belvoir. Three of the historic properties near Fort Belvoir have an established historic overlay district: Mount Air, Pohick Church and Woodlawn (Figure 3-7).

Fort Belvoir's Cultural Resources Management Program-ENRD have assessed archeological surveys that have resulted in the identification of more than 300 archeological sites, of which more than 150 have been either recommended for further study or determined eligible for listing in the NRHP. One archeological site, Fort Belvoir Mansion and Fairfax Grave Site (44FX0004), is listed in the NRHP (IMC, 2014).

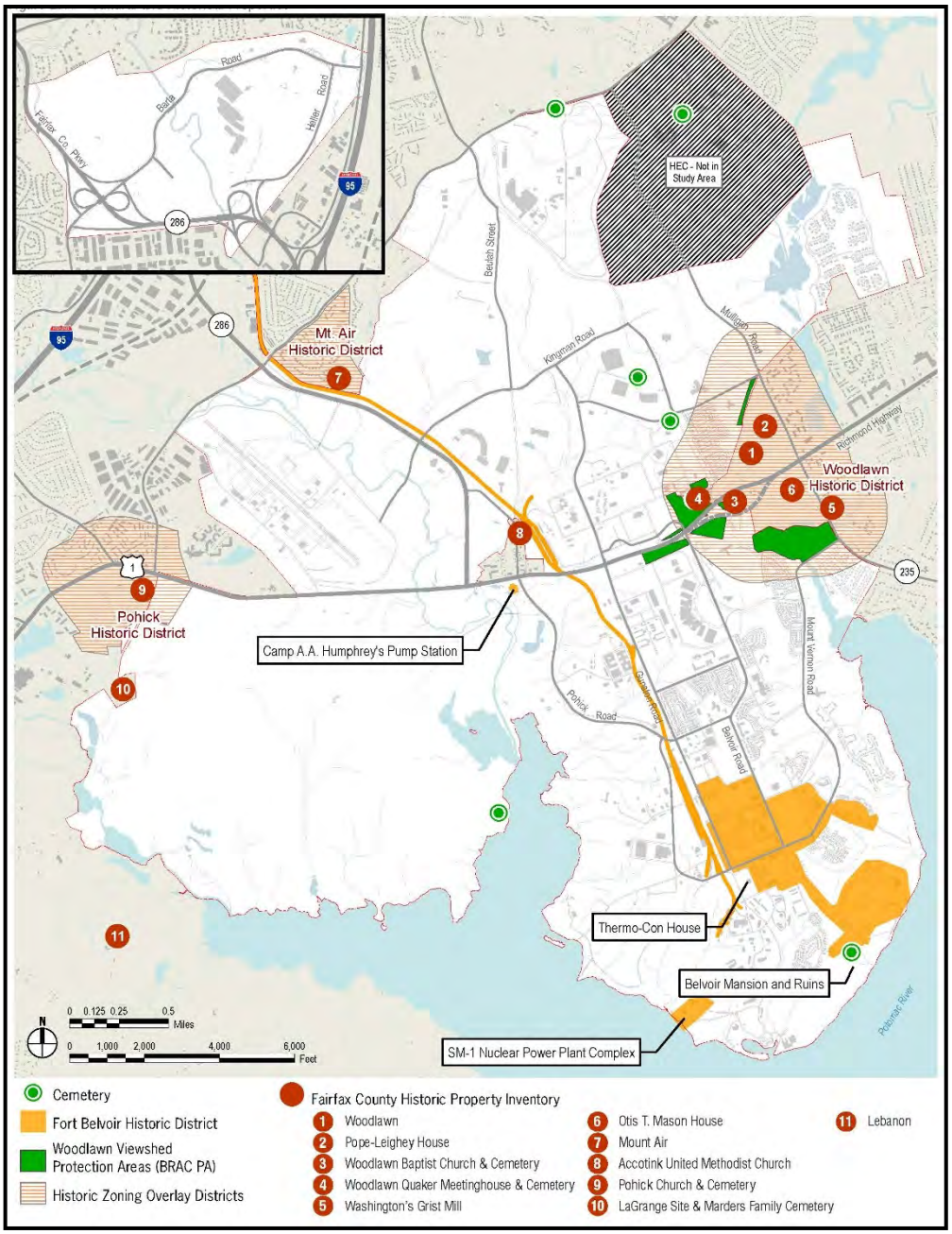


Figure 3-7 Cultural and Historic Properties (IMC, 2014)

3.7.3 Archeological Resources

A review of known archeological and archeologically sensitive areas by Fort Belvoir, included in the 2003 EA, determined that one archeological site (44FX1947) is present in Woodlawn East. Due to the protected nature of the information, details about the specific locations of these sites are not provided in this document. Fort Belvoir will provide site-specific information to appropriate individuals or agencies on a need-to-know basis.

A Phase I archeological survey documents the presence of any prehistoric or historic sites in a project area slated for some form of development [Virginia Department of Historic Resources (VDHR), 2009]. A Phase I Cultural Resources Investigation for Woodlawn Village Land Exchange (Parcel 1011 01 009) was conducted in 2005 as part of the 2004 Woodlawn Land Exchange Survey or in association with property exchange between the US Army Garrison Fort Belvoir and the Fairfax County Park Authority. This investigation aided Fort Belvoir in meeting their obligations under Section 110 of the NHPA and AR 200-1 (previously known as AR 200-4). The goal was to identify potentially significant archeological or historic architectural sites within the project area (Parcel 1011 01 009). This parcel is known as the Berman Tract.

Field investigations included a preliminary walkover, shovel testing, and mapping. During the walkover, areas of disturbance and drainage features were noted. These features are associated with the construction of the Woodlawn Village neighborhood, and presumably with agricultural fields. The shovel-test survey included the excavation of 184 shovel tests, spaced primarily at 20-meter (m) intervals. No artifacts were found.

The one archeological site (44FX1947) that occurs in the southeastern portion of the APE is a late 19th-20th-century historic farmstead. Contents discovered include historic whiteware, green bottle glass, clear bottle glass, window glass, coal, and peach pit. It was probably occupied by H. Truax in the middle of the 1860s and by F. Brellar in 1878. The Phase I survey identified the site as potentially eligible for listing on the NRHP. While the Phase I survey usually identifies the need for further (Phase II) investigation, further evaluation of site 44FX1947 was not warranted as it occurred outside the APE defined in the 2003 EA.

A Phase II archeological survey is designed to document the context, integrity, and significance of a site. Context refers to the environmental setting of each site, including a more precise definition of site boundaries in horizontal and vertical space, and its depositional or stratigraphic disposition. It also refers to the functional and chronological nature of a site as determined by an analysis of artifacts, features, and structures. Integrity refers to the preservation state of a site, including disruptions to the stratigraphy, features, and/or depositional setting of artifacts by any natural or cultural forces (VDHR, 2009). The Phase II archeological study was completed in January 2015 (JMA, 2015). The results of the survey indicate that site 44FX1947 is not eligible for the NRHP. DPW and VDHR concur with the Phase II archeological study findings (VDHR, 2015) (Appendix J).

3.8 SOCIOECONOMIC RESOURCES

The analysis of socioeconomic impacts identifies those aspects of the social and economic environment that are sensitive to changes and that may be affected by actions associated with the Proposed Action. Socioeconomic factors describe the local demographics, income characteristics, and employment of the potentially affected region of influence that could be impacted by the proposed project. For purposes of this analysis, Fort Belvoir Census Designated Place (CDP) is the analytical region of influence (ROI) for consideration of socioeconomic effects. A CDP is a concentration of population identified by the United States Census Bureau (USCB) for statistical purposes (USCB, 2013). In addition, Fairfax County is considered for indirect impacts and as a point of comparison. The data supporting this analysis are collected from standard sources, including the USCB.

3.8.1 Demographics

The demographic profile of military residential communities tends to differ from that of the general population, due in large part to the ages of active-duty service members. As of 2014, the total resident population in Woodlawn Village is 1,444 persons (Jiang, 2014a). As of the 2010 Census, the total resident population of Fort Belvoir is 7,100 persons, of which 45 percent are children under 18 years of age and 33 percent are school aged (5 to 18 years). The median age is 22.6, and only 23 persons are over the age of 65 (USCB, 2010b and 2010c).

Table 3-3. Demographic Profile (2010)

Indicator	Fort Belvoir	Fairfax County
Total Population	7,100	1,081,726
Population Under 18	3,174	262,648
Population over 65	23	106,290
Median Age	22.6	37.3

Source: USCB, 2010b and 2010c.

3.8.2 Housing

A housing unit indicates a house, an apartment, a mobile home or trailer, a group of rooms, or a single room occupied as separate living quarters, or if vacant, intended for occupancy as separate living quarters (USCB, 2013). Fort Belvoir currently provides an estimated 2,018 housing units and Woodlawn Village 321 housing units, respectively (USCB, 2010b; Jiang, 2014a). There are approximately 1,700 family and 77 non-family households living at Fort Belvoir. Of the total population at Fort Belvoir, over 95 percent live in households and the remaining 5 percent (345 people) in group quarters or barracks. The average household size on Fort Belvoir is 3.8 persons and the average household size in Woodlawn Village is 4.5 persons (USCB, 2010b; Jiang, 2014a). In Fort Belvoir, 79.3 percent of the households have children under the age of 18 (USCB, 2010b).

Table 3-4. Housing Characteristics (2010)

Indicator	Fort Belvoir	Fairfax County
Housing Units	2,018	407,998
Family Households	1,700	276,277
Non-Family Households	77	115,350
Average Household Size	3.8	2.73
Vacancy Rate	11.9%	4.0%

Source: USCB, 2010b.

3.8.3 Schools

As of September 2013, there were 1,512 elementary age students residing within the boundaries of Fort Belvoir. Approximately 1,085 (70 percent) of these elementary students attend classes at the existing Fort Belvoir Elementary School (FBES) on North Post. The remaining 427 (30 percent) of these students attend school off-Post at five different Fairfax County Public School (FCPS) facilities (Rawat, 2014).

Fort Belvoir Elementary School (FBES) has been in operation since September 1998 and replaced three former schools (Cheney, Markham, and Barden) that closed in 1998. FBES is part of the FCPS system and is the county's largest elementary school, serving approximately 1,112 students from kindergarten through sixth grade during the 2013-2014 school year (FCPS, 2013a). The student-to-teacher ratio of 16:1 is equal to that of Virginia's average student-to-teacher ratio (PSR, 2014). The 136,000-square foot (sf) facility contains four instructional wings with 57 classrooms and numerous resource activities (USACE, 2003). A projected enrollment of 1,262 is anticipated at FBES for the school year 2018-2019 (FCPS, 2013a).

In 2013 FCPS submitted an initial plan under DoD's Program for Construction, Renovation, Repair or Expansion of Public Schools Located on Military Installations. The grant for the Fort Belvoir Elementary School Expansion was officially approved July 17, 2014 (Pilakowski, 2014). A new elementary school will be built adjacent to the existing school with an estimated opening date of fall 2015 (FCPS, 2013b).

The FBES is technically over capacity, so children who live on the base now attend five FCPS elementary schools in addition to FBES (FCPS, 2013b). About 30 percent of students residing on Fort Belvoir have temporarily been moved to elementary schools off-Post. Prior to 2009, all elementary-aged children residing in housing at Fort Belvoir were assigned to FBES. Elementary-aged children residing in housing to be constructed on the Woodlawn East/Berman Tract would attend school off-Post at Woodlawn Elementary, but parents would also have the option of sending their children to either Lane Elementary School or Island Creek Elementary School due to provisions of the No Child Left Behind Act (FCPS, 2010). Woodlawn, Lane, and Island Creek Elementary Schools are all part of the FCPS system (FCPS, 2010). Approximately 99 percent of students currently living within Woodlawn Village attend school at Woodlawn Elementary School, or a total of 351 students (Rawat, 2014). Students living in Woodlawn Village will be able to attend FBES once the expansion has been completed.

Total enrollment at Woodlawn Elementary in 2013-2014 was 786 students and has a current capacity of 629 students, with a student-to-teacher ratio of 13:1 (FCPS, 2013a and PSR, 2014). A projected enrollment of 792 is anticipated for Woodlawn Elementary for the school year 2018-2019 (FCPS, 2013a).

Total enrollment at Lane Elementary in 2013-2014 was 789 students with a student-to-teacher ratio of 17:1 (FCPS, 2013a and PSR, 2014). Lane Elementary has a current capacity of 865 students and a projected enrollment of 1,106 for the school year 2018-2019 (FCPS, 2013a).

Total enrollment at Island Creek Elementary in 2013-2014 was 745 students, and a student-to-teacher ratio of 18:1 (FCPS, 2013a and PSR, 2014). Island Creek Elementary has a current capacity of 867 students and a projected enrollment of 873 for the school year 2018-2019 (FCPS, 2013a).

Table 3-5. Current and Projected Enrollment for Elementary Schools

School	Current (2013-2014)			Projected (2018-2019)*		
	Capacity	Enrollment	Utilization Capacity	Capacity	Enrollment	Utilization Capacity
Fort Belvoir	1,106	1,112	100 %	1,106	1,262	114%
Woodlawn	629	768	122%	670	792	118%
Lane	865	789	91%	865	1,106	128%
Island Creek	867	745	86%	867	873	100%

Source: FCPS, 2013a.

These figures do not assume approval of the grant for construction at FBES.

Upon completion of their elementary education, FBES students attend Walt Whitman Middle School and then Mount Vernon High School. Both schools are off-Post but located near Fort Belvoir, provide school bus services to Fort Belvoir residents, and are part of the FCPS system. Whitman Middle School serves 973 students in grades 7 and 8, and has a student-to-teacher ratio of 16:1 (FCPS, 2013a and PSR, 2014). Mount Vernon High School serves 1,969 students in grades 9-12, and has a student-to-teacher ratio of 17:1 (FCPS, 2013a and PSR, 2014). Students living on Fort Belvoir also have access to other Fairfax County schools through nationwide programs and authorized transfers, as well as private and religious schools in the area.

3.8.4 Income Characteristics

Personal income data are measured and reported for the place of residence. Per capita income is the personal income for the CDP or county divided by the resident population (USCB, 2013). Median household income is the amount which divides the income distribution into two equal groups: one-half of the cases falling below the median income and one-half above the median. Median household income is computed on the basis of a standard distribution in an attempt to take into account all households in a given area

(USCB, 2013); and it is perhaps the most widely used and accepted measure of income. Both the per capita and median household incomes are substantially lower in Fort Belvoir as compared to the larger Fairfax County. Unemployment rates for both Fort Belvoir and Fairfax County are among the lowest in the country and are below five percent (USCB, 2010d).

Table 3-6. Income Characteristics (2010)

Indicator	Fort Belvoir	Fairfax County
Labor Force	2,670	608,225
Unemployment Rate	4.9	4.25
Median Household Income*	$73,648	$105,416
Per capita income*	$22,830	$49,001

Source: USCB, 2010d.
*In 2010 dollars

3.9 Environmental Justice and Protection of Children

3.9.1 Environmental Justice

Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (February 11, 1994), requires that Federal agencies consider as a part of their action any disproportionately high and adverse human health or environmental effects to minority and low-income populations. Federal agencies are required to ensure that these potential effects are identified and addressed.

The EPA defines environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." The goal of "fair treatment" is not to shift risks among populations, but to identify potential disproportionately high adverse impacts on minority and low-income communities and identify alternatives to mitigate any adverse impacts.

Minority Populations

Due to the site-specific nature of the proposed project, the ROI for minorities consists of two Census Block Groups (BGs) that overlap with Woodlawn East; 4219001 and 4217021. These two BGs are referred to as "Woodlawn East BGs" throughout the remainder of this section. Notably, more than half of BG 4217021 (one of the two Woodlawn East BGs) is not contained within Fort Belvoir CDP. A Census BG is a statistical subdivision of a Census Tract, generally defined to contain between 600 and 3,000 people and 240 and 1,200 housing units. BGs are bounded by visible features such as roads, streams, and railroad tracks, and by nonvisible boundaries such as property lines, city, township, school district, county limits and short line-of-sight extensions of roads.

Figure 3-8 identifies the proposed project site with respect to the Woodlawn East BGs and surrounding BGs; and shows the distribution and percentage of minority populations by BGs.

Minority data for the Woodlawn East BGs is compared to its seven surrounding BGs, as well as Fort Belvoir CDP. Fort Belvoir CDP consists of nine Block Groups, five of which are partially contained within the boundaries of the CDP. The seven surrounding Block Groups are considered the Region of Comparison (ROC). In addition, Fort Belvoir and Fairfax County minority figures are included as a point of comparison

The CEQ defines 'minority' as including the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic Origin; or Hispanic (CEQ, 1997). Calculation of the percentage minorities (sum of population groups) and individual population groups is based on population data available from the 2010 U.S. Census. The CEQ defines a minority (or "environmental justice") population in one of two ways:

1. "… If the percentage of minorities exceeds 50 percent...(CEQ, 1997). In this more straightforward scenario, if more than 50 percent of the Woodlawn East BG population consists of minorities, this would qualify it as consisting of an environmental justice population.
2. "… [If the percentage of minorities] is substantially higher than the percentage of minorities in the general population or other appropriate unit of geographic analysis (CEQ, 1997). For purposes of this analysis, a discrepancy of 10 percent or more between minorities (the sum of all minority groups) in the Woodlawn East BGs as compared to the ROC would be considered "substantially" higher. This approach also applies to individual minority groups. A discrepancy of 10 percent or more between individual minority groups (American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic Origin; or Hispanic) as compared to the percentage of individual minority groups in the ROC would be considered "substantially" higher and constitute an environmental justice population.

The breakdown of minority populations is presented below in Table 3-7.

Table 3-7. Minority Populations (2010)

Indicator	Woodlawn East BGs (ROI)	Surrounding BGs (ROC)	Fort Belvoir	Fairfax County
Total Population	1,990	14,397	7,100	1,081,726
Minority Population	930 (46.7%)	8,282 (57.5%)	2,732 (38.5%)	458,268 (42.3%)
American Indian and Alaska Native	17 (.8%)	84 (0.6%)	43 (0.6%)	43 (0.6%)
Black of African American	467 (23.5%)	4,106 (28.5%)	1,541 (21.7%)	99,218 (9.2%)
Asian	183 (9.2%)	1,290 (8.9%)	176 (2.5%)	189,661 (17.5%)
Native Hawaiian and Other Pacific Islander	6 (0.3%)	23 (0.2%)	32 (0.5%)	864 (0.1%)
Hispanic or Latino	293 (14.7%)	2,788 (19.3%)	940 (13.2%)	168,482 (15.6%)

Source: USCB, 2010b.

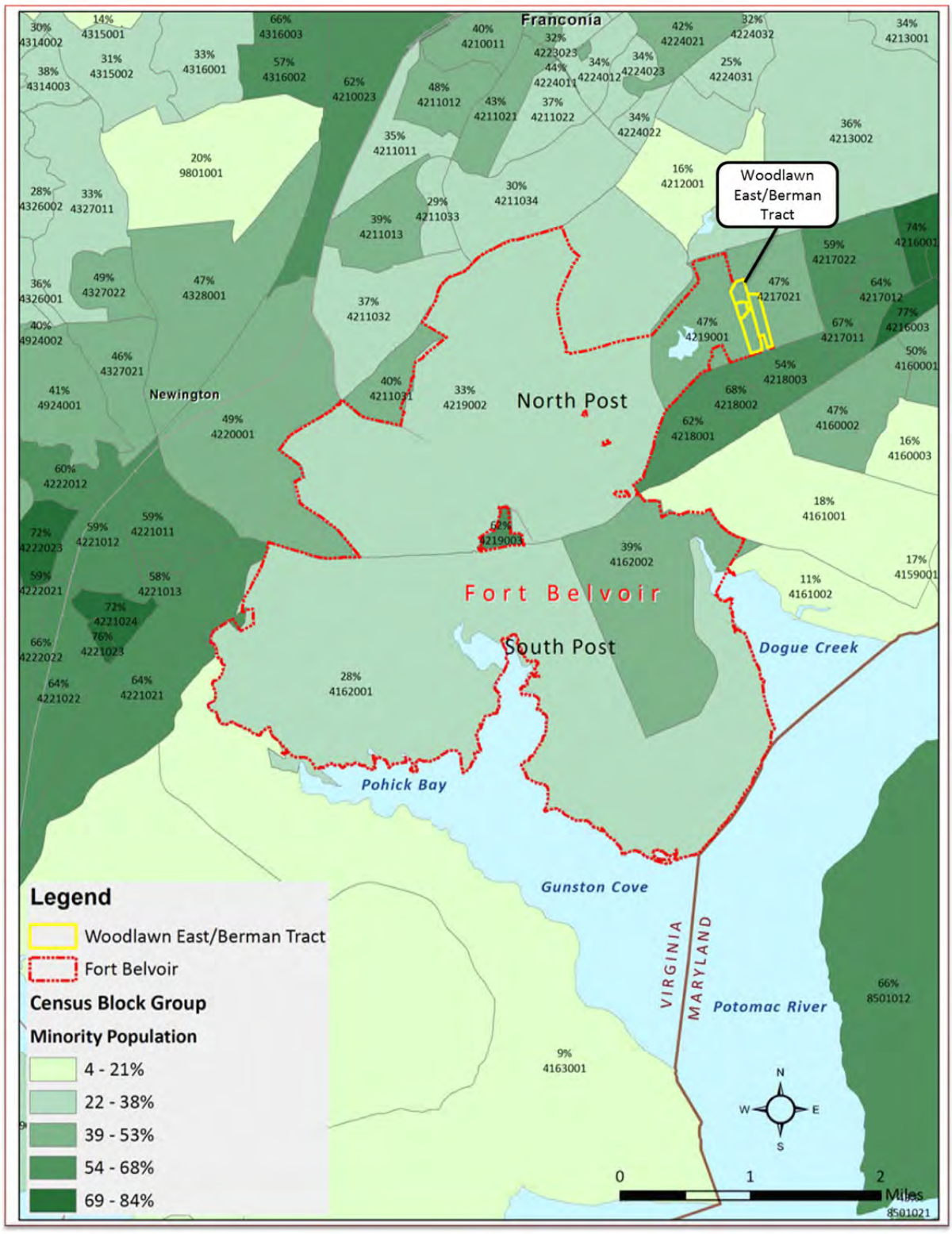


Figure 3-8 Percentages of Minority Populations by Census Block Group (USCB, 2010)

The data reveals that the changes to the Proposed Action would occur in an area where minority populations represent 47 percent of the population. The minority population in the surrounding BGs represents 57.5 percent of the population, about 10 percent more than the ROI. Fort Belvoir's minority population represents almost 39 percent, or about 8 percent less than Woodlawn East BGs. Because the representation of minorities in the Woodlawn East BGs is not substantially higher than that of Fort Belvoir overall, it does not constitute an environmental justice populations on this basis. Note that the minority populations in the surrounding BGs, or the ROC, exceed 50 percent and it therefore constitutes an environmental justice population.

Low-Income Populations

2010 income and poverty statistics are not available on the BG level. As such, data from Census Tracts (CTs) 4217.02 and 4219 is presented below. CT 4217.02 consists of two BGs, and CT 4219 consists of three BGs. This ROI is referred to as "Woodlawn East CT" throughout this section, and the ROC is Fort Belvoir CDP. Table 3-8 provides some measures relevant to assessing low-income populations in the areas that could be affected by the proposed project.

Table 3-8. Low-Income Populations (2010)

Indicator	Woodlawn East CTs (ROI)		Fort Belvoir CDP (ROC)	Fairfax County
	4217.02	4219		
Median Household Income*	$99,750	$62,151	$73,648	$105,416
Per capita income*	$32,900	$22,225	$22,830	$49,001
Persons Below Poverty	4.3%	7.3%	3.1%	5.1%
Persons Under 18 Below Poverty	5.5%	11.9%	3.7%	6.1%

Source: USCB, 2010d.
*In 2010 inflation-adjusted dollars

Median household income and per capita income were both higher in CT 4217.02 than in Fort Belvoir CDP; and the poverty rates are lower. Conversely, median household income and per capita income were both slightly lower in CT 4219 than in Fort Belvoir CDP (USCB, 2010d).

According to the U.S. Department of Health and Human Services, the 2010 poverty threshold is defined as a maximum annual income of $18,310 or less for a family of three (USDHHS, 2010). The poverty rate in Census Tract 4217.02 is lower than in the Fort Belvoir CDP. In Census Tract 4219, approximately 12 percent of persons under the age of 18 are living at or below the poverty line, which is more than 8 percent higher than for Fort Belvoir CDP (USCB, 2010d). The poverty rate in Census Tract 4219 is not considered "substantially" higher than the poverty rates in Fort Belvoir and as such is not considered an environmental justice population on this basis.

3.9.2 Protection of Children

Executive Order 13045 "Protection of Children from Environmental Health Risks and Safety Risks" (February 11, 1994), places a high priority on the identification and assessment of environmental health and safety risks that may disproportionately affect children. The Executive Order requires that each agency "shall ensure that its policies, programs, activities, and standards address disproportionate risks to children." It considers that physiological and social development of children makes them more sensitive than adults to adverse health and safety risks and recognizes that children in minority, low-income, and indigenous populations are more likely to be exposed to, and have increased health and safety risks from, environmental contamination than the general population.

Executive Order 13045 defines "environmental health risks and safety risks [to] mean 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 (such as the air we breathe, the food we eat, the water we drink or use for recreation, the soil we live on, and the products we use or are exposed to)." Children may have a higher exposure level to contaminants because they generally have higher inhalation rates relative to their body size. Young children also exhibit behaviors such as spending extensive amounts of time in contact with the ground and frequently putting their hands and objects in their mouths that can lead to higher exposure levels to environmental contaminants.

As with minority populations, the ROI for children is defined as "Woodlawn East BGs," or the two BGs overlapping with the Woodlawn East/Berman Tract. Age distribution in the Woodlawn East BGs is compared to the surrounding BGs as well as Fort Belvoir CDP (the ROC).

Table 3-9. Age Distribution (2010)

Indicator	Woodlawn East BGs (ROI)	Surrounding BGs (ROC)	Fort Belvoir CDP	Fairfax County
Total Population	1,900	14,397	7,100	1,081,726
Children Under 5 (%)	153 (8.1%)	1,171 (8.1%)	974 (13.7%)	72,960 (6.7%)
Children 5 to 19 years (%)	342 (18%)	2887 (20.0%)	2356 (33.1%)	212,445 (19.6%)

Source: USCB, 2010c.

In general, Fort Belvoir CDP consists of higher concentrations of children than the Woodlawn East BGs, the surrounding BGs, and Fairfax County (Table 3-9). The Woodlawn East BGs contain approximately 495 children: 8 percent are under the age of 5 years and 18 percent are between the ages of 5 years and 19 years. Percentages for the surrounding BGs are very similar. In the Fort Belvoir CDP, on the other hand, approximately 14 percent of children are under 5 years and 33 percent between the ages of 5 years and 19 years. Overall, the representation of children under the age of 19 years is lower in the Woodlawn East BGs than in Fort Belvoir CDP (USCB, 2010c).

3.10 HAZARDOUS AND TOXIC SUBSTANCES

Specific environmental statutes and regulations govern hazardous material and hazardous waste management activities at Fort Belvoir. For the purpose of this SEA, the terms hazardous waste, hazardous materials, and toxic substances include those substances defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Resource Conservation and Recovery Act (RCRA), or the Toxic Substances Control Act (TSCA). Hazardous waste, hazardous materials, and toxic substances may present substantial danger to the public health, welfare or the environment if improperly used, stored, or disposed.

To identify possible areas of historic uses and disposal of hazardous substances or petroleum-related products, an Environmental Condition of Property (ECP) of the Woodlawn East/Berman Tract was conducted for the Proposed Action. The ECP is included in Appendix K.

3.10.1 Uses and Storage of Hazardous Materials

Military operations performed at Fort Belvoir historically required the storage and use of hazardous substances and petroleum products to successfully accomplish missions. Fort Belvoir manages these materials and substances pursuant to programs regulated by EPA, the VDEQ, and U.S. Army regulations. Fort Belvoir Directorate of Public Works – Environmental and Natural Resource Division (DPW-ENRD) office includes environmental programs specific to hazardous substances and petroleum products.

The Woodlawn East/Berman Tract is unimproved and is not presently used as a storage area for hazardous substances or petroleum products. However, the Woodlawn East parcel is part of a larger area that was formerly used as a military training area. As such, the potential for existing hazardous substances and materials are related to past military munitions training activities, as described in Section 3.10.3. No records indicate that hazardous materials, waste, and more specifically munitions and explosives of concern (MEC) were used or stored on the Berman Tract. No other releases of hazardous substances or petroleum products have been identified in proximity to the Woodlawn East/Berman Tract.

3.10.2 Hazardous Waste Storage

Hazardous wastes are generated from the normal maintenance and operations of Army programs at Fort Belvoir. The handling of hazardous waste is tracked by Fort Belvoir's DPW-ENRD office in accordance with a Hazardous Waste Management Plan. Fort Belvoir is permitted to store hazardous waste under a RCRA Part B permit issued by the VDEQ at Building 1490. Building 1495 serves as the primary waste receiving facility for the Post and stores waste for a period less than 90 days. Hazardous waste is also stored at several storage areas for a period less than 90 days as well as satellite accumulation areas on-Post. No waste receiving facilities or storage areas are currently located within the boundaries of the Woodlawn East/Berman Tract (US Army Garrison, 2013c).

3.10.3 Munitions and Explosives of Concern (MEC) and Material Potentially Presenting an Explosive Hazard (MPPEH)

MEC is a specific category of military munitions that may pose explosive, toxic, or other health and safety risks. MEC includes Unexploded Ordnance (UXO), Discarded Military Munitions (DMM), or Munitions Constituents (MC).

Material Potentially Presenting an Explosive Hazard (MPPEH) is material potentially containing explosives or munitions (e.g., munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris), or material potentially containing a high enough concentration of explosives such that it presents an explosive hazard (e.g., equipment, drainage systems, holding tanks, piping, or ventilation ducts that were associated with munitions production, demilitarization, or disposal operations).

The Defense Environmental Restoration Program (DERP), established in 1986, requires the DoD to identify, assess, and remediate military munitions contamination. Under DERP, Congress established the Military Munitions Response Program (MMRP) as a way to address non-operational range lands that are suspected or known to contain UXO, DMM or MC contamination (AEC, 2014). The MMRP program at Fort Belvoir addresses UXO and any associated contamination.

The Woodlawn East parcel is part of a larger 312-acre MMRP site known as FTBL-018-R-01, or Demolition Area 01 (Figure 3-9) (US Army Garrison, 2013b). The Berman Tract was transferred to the DA after training activities ceased, and is not part of the Demolition Area-01 site. Demolition Area 01 was used from 1940 until 1951 to train Army engineers in the use of demolition materials and to practice demolition techniques (FBRC, 2014a). A 2008 Site Inspection (SI) noted one MEC item (smoke grenade), Munitions Debris (MD) (flare) and several possible blast holes. The results of soil samples collected during the SI did not exceed Fort Belvoir's established background levels for MC. Based on historical usage of the Demolition Area 01 site and the SI findings, a Remedial Investigation (RI) was recommended for possible MEC and MC. RI fieldwork began in July 2010 and was completed in December 2012, during which three areas were identified as containing training or practice landmines (US Army Garrison, 2013c). A fourth area identified appeared to have been used for open burning of spotting charges, specifically as the fusing mechanism in training landmines. No MC or explosives-related chemicals were identified in soil samples at the fourth site (US Army Garrison, 2013c).

As a result of the RI, a Feasibility Study (FS) was initiated in July 2013. Although no MEC were identified in the fourth area, there are potential hazards associated with fusing mechanisms of practice landmines. In light of adjacent residential housing, the most likely outcome of the FS is a focused MEC removal at the three areas identified as containing training or practice landmines (FBRC, 2014a). At this time, Fort Belvoir anticipates fieldwork for the MEC removal to be completed by December 2015, with the remedial action report slated for completion in April 2016 (FBRC, 2014a).

The MMRP program at Fort Belvoir would provide a UXO brief and construction oversight through the US Army Corps of Engineers (USACE) to workers that would be at risk of encountering MEC during construction (FBRC, 2014a). In addition, Fort Belvoir would provide information and guidance to RCI and residents after construction is complete.

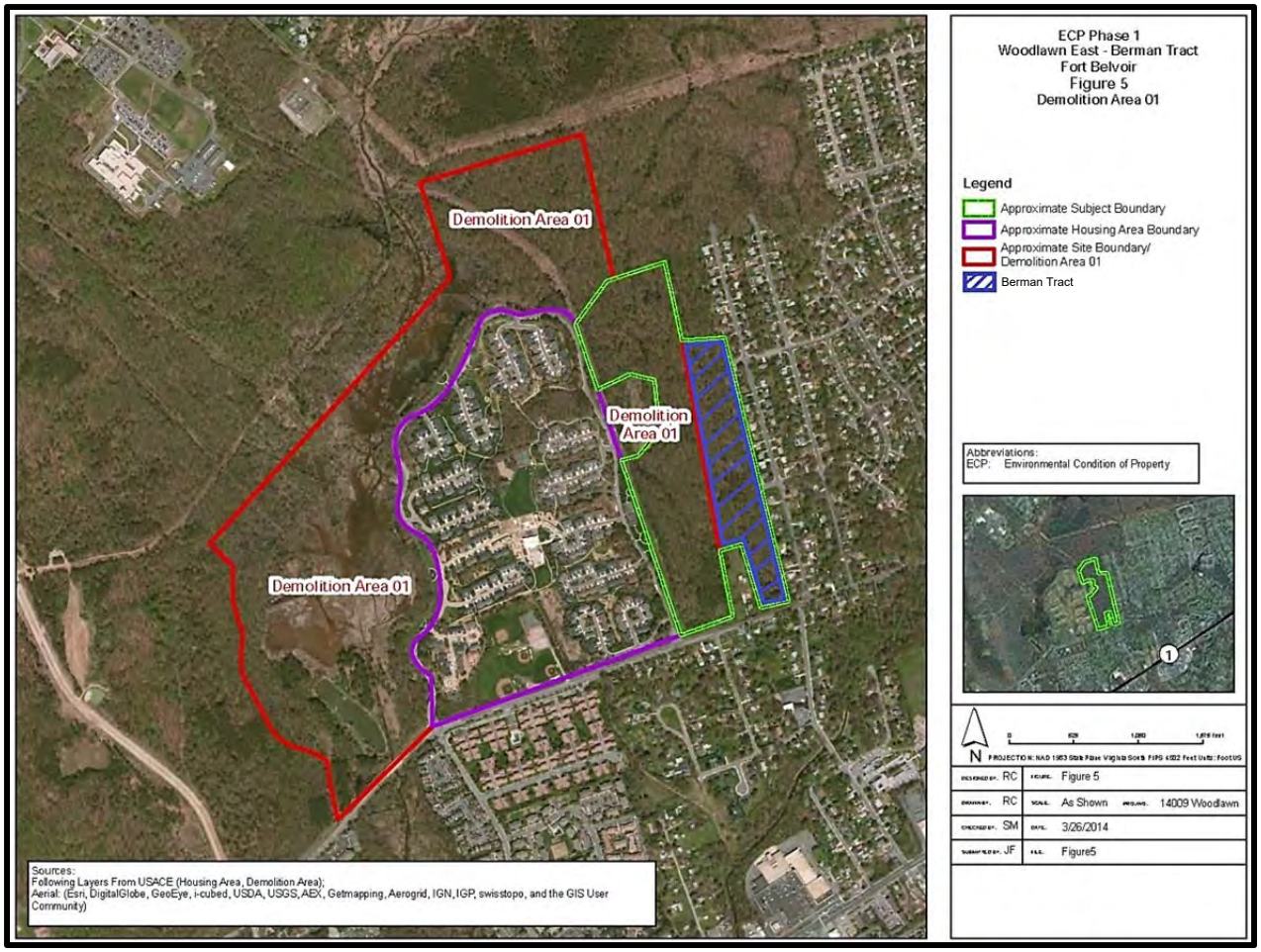


Figure 3-9 MMRP Demolition Area 01 Location (USACE, 2014)

3.11 TRANSPORTATION

Transportation around the Woodlawn East/Berman Tract is primarily via roadways. Primary roads serve as main arteries carrying traffic on- and off Post through gates and connecting the main portions of the installation (USACE, 2012). The inbound flow of traffic into Fort Belvoir is approximately 4,000 vehicles per hour during the morning peak hour of the cumulative daily flow of about 26,400 vehicles (14.7 percent of the daily flow) (USACE, 2010). The Site is located on Pole Road, which is connected to the primary road US-1/Richmond Hwy via four secondary roads (Figure 3-10). US-1 provides access to the Fort Belvoir access gates for within installation travel, and to Fairfax County Parkway and I-95 for regional travel. Traffic in and around Fort Belvoir is congested during the morning and evening peak periods, but flows uninterrupted during off peak hours.

A Traffic Evaluation was conducted by Wells + Associates (Wells, 2014) using the estimated number of units to be added to the Woodlawn East/Berman Tract. The evaluation is included as Appendix L.

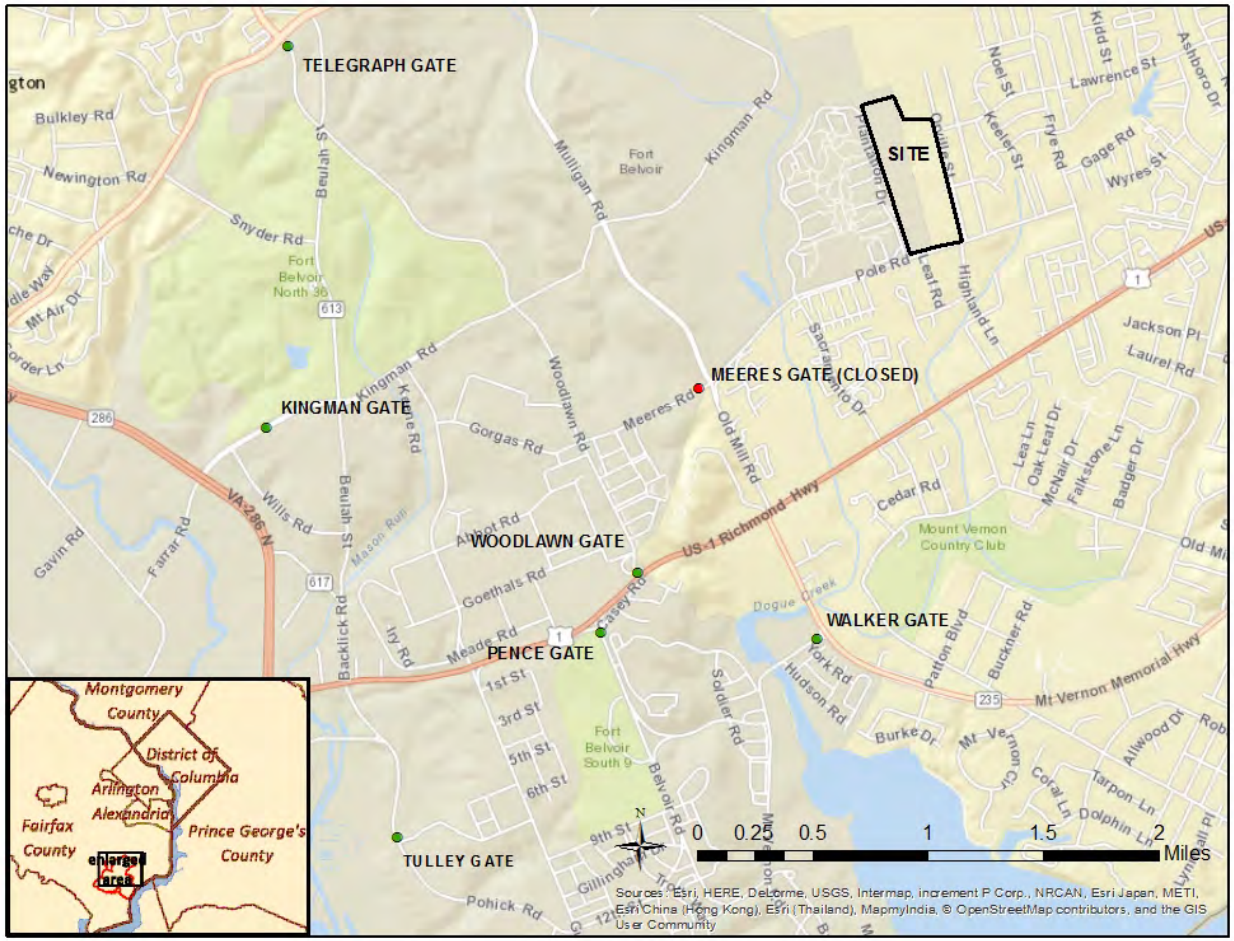


Figure 3-10 Proposed Action Road Network (ESRI, 2015; IMC, 2014)

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 LAND USE

4.1.1 Proposed Action

The Proposed Action would result in long-term, minor, adverse, and beneficial impacts to land use. The Proposed Action would be consistent with the Fairfax County Comprehensive Plan and provide beneficial impacts by sustaining the housing needs of military families on-Post, reducing competition for housing off-Post, and providing appropriate recreational opportunities on site or in the adjacent Woodlawn Village neighborhood. The Proposed Action would not conflict with the surrounding Fairfax County land use of suburban neighborhoods, and would match the existing density of 2-3 units per acre. Access to the development is via a secondary roadway, not neighboring residential streets.

Fort Belvoir manages the JAWR located to the north of the proposed development. JAWR is connected to Fairfax County's Huntley Meadows Park (IMC, 2014) to the east. Huntley Meadows Park borders the proposed development to the north as does a private development. The proposed residential development would not affect land use for Fairfax County's Huntley Meadows Park, JAWR, or the adjacent private development. A 100-foot vegetative buffer will exist between the proposed development and the adjacent private development.

On Fort Belvoir, the Proposed Action is consistent with the neighboring residential area of Woodlawn Village and will expand the residential area of the North Post sub-area; providing beneficial impacts to the Woodlawn Village. The land on the proposed development includes areas that are deemed Least Suitable for Development and Moderately Suitable for Development in the Fort Belvoir RPMP. The proposed development would conflict with these classifications. However, the decision process for locating the Proposed Action involved consultation with the installation, as described in Section 2.2. The conceptual design is intended to optimize development of the site and to help reduce the need for additional developable land for the project in the future. Mitigation activities recommended for wetlands and cultural resources as discussed in Sections 4.5 and 4.7 would make the impacts to land use insignificant.

4.1.2 No Action Alternative

No effects would be expected as a result of the No Action Alternative. No changes to existing land use would occur under the No Action Alternative. Existing land uses would be maintained as they currently are, with no changes or improvements anticipated to occur to existing conditions, other than those undertaken in the course of normal activities.

4.2 AESTHETICS AND VISUAL RESOURCES

4.2.1 Proposed Action

Short-term and long-term minor, adverse effects to aesthetics are expected due to the removal of mature trees and vegetation, and the construction of new homes. During the construction period, views from adjacent properties to the east and west of the development would be affected by the presence of construction equipment and land disturbing activities. To minimize visual and aesthetic impacts to the residential area located to the east of the proposed development, an approximately 100-foot-wide vegetation buffer separating these areas from the new housing would be maintained to the extent practicable. Construction of new homes and roadways would be avoided in this buffer area, although some minor construction (such as the installation of fencing or stormwater management areas) may be required within the buffer area. Trees and vegetation within the buffer area would be trimmed or removed to the extent required for safety reasons and good landscaping practices.

The visual effects of removing mature trees and replacing with young trees would continue beyond the construction period until the younger trees establish themselves. Mitigation would occur to limit the impacts of tree removal, as discussed in Section 4.6.1. Several areas of conserved natural space, rain gardens, bioretention areas, and existing wetlands that would be present beyond construction would complement the proposed development to the surrounding area. These areas will also act as natural buffers between the proposed development and some surrounding areas. The resulting residential development would be consistent with the surrounding character of Fort Belvoir. Travelers on Pole Road would experience a negligible impact to their viewshed as the resulting development would be consistent with the other views along Pole Road.

4.2.2 No Action Alternative

Under the No Action Alternative, there would be no change to the Woodlawn East/Berman Tract. No new visual and aesthetic effects would be expected.

4.3 NOISE

4.3.1 Proposed Action

Short-term, minor, adverse effects would be expected as a result of implementation of the Proposed Action. Implementation of the Proposed Action would be expected to result in additional sources of noise during construction activities due to the operation of construction equipment and construction activities in general. Noise produced by construction equipment varies depending on the type of equipment used and its operation and maintenance (Table 3-1). Typical equipment anticipated at the project sites includes backhoes, loaders, bulldozers, rollers, motor graders, power saws, and compressors. OSHA standards serve to protect construction workers in close proximity to the source of construction noise.

Typical noise levels (dBA at 50 feet) that the EPA has estimated for the main phases of outdoor construction are presented in Table 4-1. Individual pieces of construction

equipment typically generate noise levels of 80 to 90 dBA at a distance of 50 feet. The zone of relatively high construction noise typically extends to distances of 400 to 800 feet from the site of major equipment operations. Locations more than 1,000 feet from construction sites seldom experience noteworthy levels of construction noise (USACE, 2012; EPA, 1974).

Table 4-1. Noise Levels at 50 Feet Associated with Outdoor Construction

Construction phase	dBA
Ground clearing	84
Excavation, grading	89
Foundations	78
Structural	85
Finishing	89

Source: EPA, 1974

During land clearing and construction, sensitive noise receptors generally would be more than 100 feet from the site and include the occupants of the residential areas to the east, west, and south of the site (Figure 2-2). Even at the highest levels of construction noise, few residents in the neighboring houses would be close enough to experience noteworthy levels of construction noise. Construction noise would be typical of other residential construction projects and limited to routine construction hours. Construction-related noise would not occur during more noise sensitive nighttime hours.

Noise impacts to wildlife might occur during construction and operation of the development (e.g., vehicle noise). However, the noise would be of short duration and intermittent and similar to existing traffic noise in these areas. Wildlife living in the vicinity of the Proposed Action is acclimated to a suburban noise environment and would not be significantly adversely affected by the closer proximity of the noise from a residential setting upon completion of the construction.

4.3.2 No Action Alternative

No new noise effects would be expected to occur as a result of the No Action Alternative.

4.4 GEOLOGY AND SOILS

4.4.1 Proposed Action

Geology, Topography, and Seismic Activity

No effects to geology or seismic activity would be expected from implementation of the Proposed Action. Minor beneficial effects to topography would be expected from implementation of the Proposed Action.

Within the Woodlawn East/Berman Tract, there are no areas with slopes greater than 15 percent. Due to the relatively flat nature of the site, there is low risk of causing significant erosion or other impacts to soils.

Topography at the site would be altered where residences would be constructed. Fill would be placed as foundation soil (existing soil may be removed) and to elevate the construction above areas where a perched or seasonally high water table may be present. On-site soils would be used where practicable. Site grading would also be conducted to divert stormwater towards designed outfall points within the proposed development. Grading is expected to alter shallow soils and topography, and provide a more direct path for stormwater to be diverted from the site. Stormwater is further discussed in Section 4.5.1.

Soils and Prime Farmland

Both short-term, minor, adverse effects and long-term, moderate, beneficial effects to soils would be expected as a result of implementation of the Proposed Action. Effects on soils would be limited to the planned disturbed area of the Woodlawn East/Berman Tract. To minimize potential erosion impacts during the construction phase, a Stormwater Pollution Prevention Plan (SWPPP) would be prepared in accordance with VDEQ Virginia Pollution Discharge Elimination System (VPDES) regulations, and a site-specific Erosion and Sediment Control plan would be prepared prior to land disturbance. The use of typical stormwater BMPs would help minimize impacts to soils following construction.

In the short-term, increased runoff and erosion could occur during site construction due to the removal of vegetation, exposure of soil, and increased susceptibility to wind and water erosion. However, these effects would be minimized or eliminated by the use of erosion and sediment control (ESC) measures for controlling runoff, erosion, and sedimentation in accordance with Virginia regulations.

In the long term, implementation of the Proposed Action would remove soils and increase the amount of impervious surface at Fort Belvoir, but an overall decrease in soil erosion from stormwater runoff would occur through permanent stabilization and the use of stormwater BMPs.

Class II, III and IV soils are located within the site (Fairfax County, 2008), as described in Section 3.4.2. Stratum 1 soils as identified in the geotechnical report (GC&T, 2015), would be suitable for use as structural fill. Stratum 2 soils would not be recommended due to the high-plasticity. Undercutting of the Stratum 2 soils to a minimum of four feet at foundations and two feet at pavement subgrades and building pads would be required where unsuitable highly plastic soils are encountered. Undercutting and/or replacement of on-site soils is expected. Suitable soils would be utilized to backfill the undercut areas to provide suitable base for development.

In addition to the expected replacement of soils unsuitable for structural fill at the site, the seasonally high water table reported in site soils would require the elevation of the land surface underlying foundations and the road network. Land disturbance would increase during construction, thereby increasing erosion and sedimentation in the short-term. These impacts would be minimized or eliminated by the use of ESC measures for controlling runoff, erosion, and sedimentation.

ESC measures from the Virginia Erosion and Sediment Control Handbook are recommended for soil protection, including for example: silt fences, diversion dikes, and rip-rap channels. These ESC measures would be utilized to reduce soil erosion and sedimentation as required by applicable Federal, state, and local environmental laws and regulations.

This project would require VDEQ review and approval for Erosion and Sediment Control and Stormwater Management Plans. A Stormwater Pollution Prevention Plan (SWPPP) would be prepared and a Construction General Permit (CGP) would be obtained from VDEQ.

Soils classified as Prime Farmland would be removed. This effect would be minor due to the impracticability of farming on Fort Belvoir.

4.4.2 No Action Alternative

No effects would be expected to geology, topography, prime farmland, and seismic activity as a result of the No Action Alternative. Without the use of soil-related BMPs, natural erosion would continue and stormwater quality would not improve, causing a minor to moderate adverse effect depending on the natural rate of erosion.

4.5 WATER QUALITY

4.5.1 Proposed Action

Surface Water

The Proposed Action would create approximately 12 acres of impervious area. The proposed development would honor the natural drainage divides and the six existing outfall locations. Both long-term and short-term adverse effects to surface water would be expected as a result of stormwater management during and after construction of the proposed housing. Vegetation clearing and soil disturbance during construction could result in increases in sediment, or other waterborne pollutant runoff to surface water. In the long term, impervious surfaces in the form of roads, driveways, and rooftops would increase the amount of stormwater runoff. In order to minimize potential impacts to the nearby and connected surface water (i.e., Dogue Creek, Potomac River, Chesapeake Bay), the project would adhere to several ESC measures as well as stormwater BMPs. As detailed in Section 4.4, Geology and Soils, adherence to the ESC measures would minimize construction related erosion problems and its corresponding effect on water quality. As described in Section 3.5.3, there are no streams or RPAs in the Woodlawn East/Berman Tract; therefore the Proposed Action would not have an impact on such resources.

Because this project would disturb greater than 2,500 square feet of land, a stormwater management plan meeting current local, state, and Federal regulations would be developed prior to land disturbance activities. Because the project would disturb greater than 5,000 square feet, it is subject to and would comply with Section 438 of the Energy

Independence and Security Act (EISA 438), which states that the sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow. The onsite BMPs would retain the 95th percentile rainfall event onsite (through the use of infiltration). In addition, technical criterial applicable to the site will be implemented (9VAC25-870).

To minimize potential impacts during the construction phase, a SWPPP would be prepared in accordance with Virginia regulations (9VAC25-880-70). The SWPPP would provide measures to control surface water runoff and prevent contamination of surface water during construction activities. The plan would include erosion and sediment control measures that would be employed during construction activities, including, for example:

- Silt fencing to trap waterborne sediments.
- Diversion of stormwater flows to sediment traps and basins.
- Reseeding/re-vegetation of disturbed sites following construction.
- Control practices for limiting fugitive dust and wind erosion from construction areas.
- Installation of storm drain inlet protection devices.
- Construction entrances and wash station to clean construction vehicles prior to exiting the construction site.

The stormwater concept plan (Appendix B) would also include permanent stormwater BMPs to be employed after construction, including, for instance:

- Rooftop disconnect to pervious areas.
- Creation of bio-retention facilities.
- Use of grass swales.
- Minimal use of detention basins within the currently established neighborhoods.
- Drainage swales planted with native, wet tolerant plants after construction to promote water quality through infiltration and/or filtration.

The Stormwater Management plan shall be in compliance with the Technical Criteria in IIB of the Virginia Administrative Code (9VAC25-870-62 through 9VAC25-870-92) for water quality and water quantity. The plan proposes to convey stormwater runoff and flow to stormwater BMPs. Closed conduit storm drains would also convey stormwater to proposed SWM/BMP areas designed to provide both water quality and quantity control. The plan would closely honor the natural drainage patterns of the site, and the SWM/BMP facilities would be designed so that overflow from the facilities would occur as concentrated flow towards the respective storm drainage systems at the property boundaries (Verdi, 2014). Through the implementation of ESC measures and permanent stormwater management BMPs designed to comply with current local, state, and Federal regulations, it is expected that the short-term and long-term impacts to surface water from the implementation of the Proposed Action would not be significant.

Compliance with technical criteria in IIB of the Virginia Administrative Code applicable to the site (9VAC25-870-62 through 9VAC25-870-92) would be shown utilizing the Virginia Runoff Reduction Method (VRRM) or similar approved methodology.

The Proposed Action is not expected to increase the runoff of PCBs, or impact the Dogue Creek Waste Load Allocation for PCBs. The site has not been a storage site for PCBs in the past, so it is not expected that the stormwater runoff would be contaminated.

Impervious areas would increase with the Proposed Action, but water flowing from those surfaces would be controlled by stormwater BMPs to prevent flooding, minimize erosion, and improve the quality of stormwater before it is discharged.

Wetlands

Short- and long-term adverse impacts to wetlands would occur as a result of the Proposed Action. Based on the site conceptual plan, it is anticipated that the Proposed Action would directly impact less than 0.5 acres of wetlands within the Woodlawn East/Berman Tract (Appendix M, Bowman Consulting, 2015a). The largest areas of impact would be in areas designed for stormwater management facilities. Before performing any construction or fill in the jurisdictional wetlands requiring a permit, a Joint Permit Application would be submitted to the Virginia Marine Resources Commission (VMRC), which would in turn be forwarded to USACE and VDEQ for review and comment. Separately, the permit application would also be submitted directly to the USACE Baltimore District. The USACE would be included on the JPA submittal. To compensate for impacts to wetlands, mitigation would be provided to the extent required by the Section 404 and VWP permit requirements. Mitigation of impacted wetlands would include an evaluation of the functionality of the impacted wetlands. With the implementation of mitigation as specified in the wetlands permit, and the avoidance of wetlands where practicable, the adverse impacts to wetlands are not expected to be significant.

Floodplains

No impacts to floodplains would be expected to occur as a result of implementation of the Proposed Action. The proposed development site is not within the FEMA 100-year floodplain.

Coastal Zone Management

No adverse effects to Coastal Zone resources are expected to occur from implementation of the Proposed Action. Collected stormwater runoff would be discharged to stormwater systems designed using BMPs and that meet Fairfax County requirements for the Chesapeake Bay Preservation Ordinance. As required by the CZMA, a Consistency Determination (Appendix F) has been prepared for concurrence of findings by the VDEQ for the Proposed Action.

Groundwater

Long-term, adverse effects to groundwater would be expected to be minor to negligible from the increase in impervious surfaces (such as buildings and roadways) associated

with the Proposed Action. This is because the area has poor drainage and infiltration. The use of stormwater management measures as described above to increase infiltration and water quality of the proposed development areas would also reduce any adverse effects to groundwater.

4.5.2 No Action Alternative

Under the No Action Alternative, no clearing of vegetation or soil disturbance would occur and the Woodlawn East/Berman Tract would remain in its current undeveloped state. Therefore, no impacts to water quality would occur.

4.6 BIOLOGICAL RESOURCES

4.6.1 Proposed Action

Vegetation

If not properly mitigated, significant adverse effects to vegetation would be expected to occur as a result of implementation of the Proposed Action due to the necessary removal of vegetation during the construction process. The existing plant communities would be removed with the development of the Proposed Action. The existing planted pine and mixed pine-hardwood setting would be replaced with a suburban setting similar to vegetation in neighborhoods on the east, south, and west sides of the Woodlawn East/Berman Tract.

Based upon an estimate provided by Fort Belvoir DPW (Appendix N), an estimated 177 trees per acre of trees four inches in diameter or greater at breast height would be removed during construction. Vegetation from approximately 31 acres of currently wooded land (approximately 5,432 trees) would be removed for the proposed development. A site-specific tree estimate (Appendix N) would be conducted (with determinations as to trees to remove and trees that can be preserved) after the final limits of clearing and grading have been established. This survey would determine the number of trees greater than four inches in diameter at breast height that would be removed by the project. For this proposed action, replacement trees on a ratio of 2:1 would be provided for trees greater than four inches in diameter at breast height.

Each home, garage, and road location would be considered for opportunities to reduce tree and viewshed impacts. Impacts would be reviewed on a tree-by-tree and house-by-house basis prior to completing any of the final construction site plans in an attempt to reduce impacts to vegetative communities. To the extent practicable, an approximately 100-foot wide vegetative buffer area would be maintained between the proposed construction area and the existing residential area to the east. Limited tree removal would occur in the buffer area to the extent required for stormwater management facilities, safety reasons, and good landscaping practices.

Planting locations for the replacement trees would consider such aspects as species requirements (i.e., soil types, hydrologic conditions, and light requirements) planned land use, and land use restrictions (i.e., utility easements). To reduce the amount of upkeep

following construction activities, native trees and native drought-tolerant vegetation would be planted near units, in parks, and in open spaces. Shade trees would be planted along new streets to reduce the heat-island effect. Any trees planted along streets, in yards, open areas and elsewhere in the new housing villages would count towards the final mitigation numbers of trees to be replaced.

For mitigation purposes plantings may occur within the RCI villages or elsewhere within Fort Belvoir. Any such planting areas outside of the RCI neighborhoods would be coordinated with Fort Belvoir ENRD to identify areas in need of vegetative improvement or tree plantings. Fort Belvoir ENRD maintains a list of projects where vegetative restoration may be utilized to off-set reductions in vegetation elsewhere on the installation. Out-of-kind mitigation may also be considered and implemented as needed.

Using these measures, overall impacts to vegetation from implementation of the Proposed Action would be insignificant. Replacement of mature trees with younger trees results in a temporary loss of service to the environment (shade and cover and food for wildlife) from the time of removal until the younger trees begin to provide similarly beneficial services. However, trees are a renewable resource, and the younger replacement trees would provide these services at a lesser level as soon as they are planted and would continue to increase their services each year until they reach full maturity.

With the recommended mitigation measures, minor adverse effects to vegetation would be expected as a result of the overall number of trees reduced by implementation of the Proposed Action.

Wildlife

Wildlife impacts associated with the development of the Woodlawn East/Berman Tract would be short-term and minor. The site is surrounded by existing suburban residential housing on three sides and is likely inhabited by wildlife accustomed to these habitats. The loss of potential habitat, cover, forage, and migration areas would require some wildlife to relocate during construction. Because this type of wildlife is accustomed to residential conditions, they would be likely to adapt quickly.

The Site also borders Huntley Meadows Park and JAWR. Wildlife present in these areas may utilize the site for some foraging or transient purposes. However, the loss of this vegetated acreage would not be significant relative to the total acreage of the Huntley Meadows and JAWR acreage. Additionally, these species currently exist in areas adjacent to residential conditions and would be accustomed to the bordering habitat created by the proposed development.

Although only one PIF Species of Concern was detected, the large hardwood canopy would be suitable for Northern Flicker (*Colaptes auratus*), Scarlet Tanager (*Piranga olivacea*), and Eastern Wood-Pewee. The dense understory would be suitable for Wood Thrush (*Hylocichla mustelina*) and Eastern Towhee (*Piplio erythrophthalmus*). Although the Kentucky Warbler (*Oporornis formosus*), was not detected and was only documented

at Fort Belvoir eight times during breeding bird surveys that occurred from 1998-2013, the dense understory is suitable. Migratory bird species are protected under the MBTA and in order to minimize adverse impacts, project activities should avoid cutting and removal of vegetation from April 1 to July 31. If cutting and removal occurs in this time frame, a survey for birds and active bird nests would be recommended.

FBRC's EMP provides guidance in the management of wildlife in the Ground Lease areas. Wildlife such as deer, raccoons, skunks, squirrels, and mice may be encountered in housing areas once developed. Tenant notification and education regarding wildlife management is a primary responsibility of Fort Belvoir DPW-ENRD and is supported by FBRC to the extent practicable.

Rare, Threatened, and Endangered Species

In accordance with the Army's policy on natural resource protection, construction activities would avoid impacts to the habitats of listed species or observe time of year restrictions for any species determined to be affected by the project. Development would not occur in or near designated bald eagle forage areas because such areas are not present at the site. Listed species would be protected through time of year restrictions, surveys for turtles (or other sensitive species such as the northern long-eared bat) would be conducted and individuals removed and relocated. As such, short-term impacts to sensitive species are not expected, however, if individuals were located, impacts would be minor due to relocation. Applicable stormwater laws and regulations would be followed to minimize potential impact to the wood turtle.

Section 7 consultation would be required for the threatened northern long-eared bat as habitat is present. Requirements that are outlined by USFWS during the consultation, including time-of-year restrictions and survey guidelines, would be implemented. Therefore, no long-term adverse effects are anticipated to occur for sensitive species.

As described in Section 3.6.3 above, if construction at the Woodlawn East/Berman Tract commences more than two years after the 2014 pogonia survey was performed, a supplemental survey would be performed for the small-whorled pogonia during the months of June and July. No individuals of this species were found in the 2014 survey. If this survey identifies this species on the site, construction activities would follow applicable USFWS and VDCR requirements regarding this species.

In order to comply with VDCR and VGDIF recommendations, a supplemental turtle survey would be conducted for all listed species after erosion and sediment controls are established but before construction activities commence. Any identified individuals would be relocated to outside of the erosion and sediment control fencing.

4.6.2 No Action Alternative

No effects to vegetation, wildlife, or sensitive species would be expected from the No Action Alternative. The Woodlawn East/Berman Tract would remain undeveloped, and no removal of vegetation or habitat would occur.

4.7 CULTURAL RESOURCES

4.7.1 Proposed Action

As indicated in Section 3.7, a Phase II survey was performed for site 44FX1947 in coordination with the Fort Belvoir Cultural Resources Manager to determine the NRHP-eligibility of 44FX1947. The site was found not to be a significant NRHP-eligible archeological resource due to the absence of stratified deposits and significant features and the presence of large-scale disturbance (JMA, 2015; VDHR, 2015).

Fort Belvoir's 2014 ICRMP provides guidance that would be followed for unexpected discoveries during construction. If archeological resources, such as archeological artifacts, features, human remains, etc., are discovered, work would cease in the area of the discovery and reasonable efforts to protect the discovery would be initiated. The Fort Belvoir Cultural Resource Manager would be contacted immediately following the discovery. The Cultural Resource Manager would make reasonable efforts to avoid or minimize damage to the property until it has been assessed (36 CFR Part 800.11[b][3]) in accordance with NHPA, 36 CFR Part 800, and the Native American Graves Protection and Repatriation Act, as applicable..

As shown in Figure 3-7, the building(s) or structure(s) eligible for NRHP listing in closest proximity to the Woodlawn East/Berman Tract is the Fort Belvoir Historic District. Woodlawn East/Berman Tract is not located in or within the immediate view shed of any of Fairfax County's three historic properties with an established historic overlay district. If the Proposed Action is neither within any of the historic districts located on Fort Belvoir, nor is it within the viewshed of any of the listed NRHP sites on and around Fort Belvoir; no impacts to historic resources would occur. Because the Phase II survey determined that Site 44FX1947 is not a significant NRHP-eligible archeological resource, no adverse impacts to archeological resources would occur.

4.7.2 No Action Alternative

Under the No Action Alternative, impacts to cultural resources would be the same as those discussed in the 2003 EA.

4.8 SOCIOECONOMIC RESOURCES

4.8.1 Proposed Action

Demographics

The overall resident population at Fort Belvoir is not expected to change as a result of the Proposed Action. The provision of modern housing units and community amenities would benefit Fort Belvoir residents.

Schools

Minor adverse impacts to local elementary schools would occur from changes to the Proposed Action. Elementary school-aged students living in the Woodlawn East/Berman Tract development would attend Woodlawn Elementary School, with the option of attending Lane or Island Creek Elementary School, rather than attending FBES.

Enrollment at Woodlawn Elementary School would increase while the current utilization capacity is above "optimal." Both Lane Elementary and Island Creek Elementary have available capacity, while FBES is currently at optimal capacity.

Woodlawn Elementary School has a current capacity of 629 students, a total enrollment of 768 students; and a utilization capacity of approximately 122 percent. Woodlawn Elementary has a projected capacity of 700 and a projected enrollment at 792 students in the school year 2018-2019, or approximately 118 percent capacity utilization (FCPS, 2013a).

Lane Elementary has a current capacity of 865 students, a total enrollment of 789 students, and a utilization capacity of approximately 91 percent. Lane has a projected enrollment of 1,106 students in the school year 2018-2019, or approximately 128 percent capacity utilization.

Island Creek Elementary has a current capacity of 867 students, a total enrollment of 745, and utilization capacity of approximately 86 percent. Island Creek has a projected enrollment of 873 students in the school year 2018-2019, or approximately 100 percent capacity utilization (FCPS, 2013a).

Capacity utilization between 95 and 105 percent is optimal for elementary schools (Rawat, 2014). Island Creek Elementary and Lane Elementary are currently functioning below capacity. Fort Belvoir is currently functioning at optimal capacity; and Woodlawn Elementary above optimal capacity. Based on projected enrollment, Fort Belvoir, Woodlawn, and Lane Elementary Schools would be over-capacity in 2018-2019; and capacity utilization at Island Creek Elementary would be optimal. Based on the average number of children under the age of six years old per family (0.15) and the addition of an estimate 102 housing units under the Proposed Action, Woodlawn Elementary, Island Creek Elementary, and Lane Elementary Schools could expect to receive an additional 15 students. Based on these estimates, the number of students enrolled at these elementary schools pursuant implementation of the Proposed Action would have minor impacts on the schools' future capacities. While the exact distribution of students could vary, the majority of students would likely attend Woodlawn Elementary School, which is currently over-capacity.

As noted in Section 3.8, in 2013 the Fairfax County Public Schools (FCPS) submitted an initial plan under DoD's Program for Construction, Renovation, Repair or Expansion of Public Schools Located on Military Installations. The grant for the Fort Belvoir Elementary School Expansion was officially approved July 17, 2014 (Pilakowski, 2014). A new elementary school would be built adjacent to the existing school with an estimated opening date of fall 2015 (FCPS, 2013b). Since the proposed project would likely not begin until after construction at the FBES is complete, it is anticipated that all students living on-Post, including those to be relocated to Woodlawn East, would be able to attend FBES with the projected additional capacity the construction would allow. With decreased enrollment at Lane, Island Creek, and Woodlawn Elementary Schools, impacts to schools would be negligible.

No impacts to local middle and high school students would be expected to occur as a result of implementation of the Proposed Action. Fort Belvoir middle- and high school-aged students currently attend FCPS (Whitman Middle School and Mount Vernon High School). The Proposed Action would not change this status.

Income Characteristics

The Proposed Action would create an estimated 40 temporary construction jobs over an 18-month period, and directly add (create or retain) two maintenance jobs in the long-term. FBRC estimates the proposed project would cost a total of approximately $15-20 million, with each unit priced at $300,000-$400,000. FBRC anticipates that local contractors would fill many jobs created by the proposed project (Jiang, 2014b). The Proposed Action would create beneficial impacts to the local economy in the short-and long-term, as the salaries and wages paid to workers would flow through the local and regional economy in the purchase of goods and services.

FBRC anticipates hiring local contractors to meet the employment demands of the proposed project (Jiang, 2014b). Based on above average per capita and median household income characteristics and low unemployment in Fort Belvoir and Fairfax County, impacts on income and employment would likely be negligible. Potential impacts to housing (i.e., vacancy rates) in Fairfax County would be negligible. Though the Proposed Action involves construction of an estimated 102 housing units, the total end-state number of proposed RCI housing units would remain unchanged and these units would merely be shifted from South Post villages to the Woodlawn East/Berman Tract development.

With any investment, as with the Proposed Action, it is important to note how much of the initial investment would remain in the local economy. Hiring a local contractor to meet employment needs increases the likelihood that salaries and wages would be spent (and retained) in the local economy for a longer period of time. Not only would spending increase during the short-term in Fort Belvoir, salaries and wages would also likely be invested back into Fairfax County over the long-term.

4.8.2 No Action Alternative

No effects would be expected under the No Action Alternative. No changes to demographics and schools would occur. Overcrowding at FBES as well as Woodlawn Elementary School would continue. Socioeconomic resources would be maintained as they currently exist.

4.9 ENVIRONMENTAL JUSTICE AND PROTECTION OF CHILDREN

4.9.1 Proposed Action

Minority and Low-Income Populations

The Woodlawn East BGs do not constitute an environmental justice population because the percentage of minorities in Woodlawn East BGs, or the ROI, neither exceeds 50 percent nor is substantially higher than the percentage of minorities in the surrounding

BGs (ROC). Similarly, the low-income population in Woodlawn East CTs (ROI) neither exceeds 50 percent nor is substantially higher than that of Fort Belvoir CDP's (ROC). Potential direct and disproportionate, adverse impacts to minority populations are therefore negligible.

Insignificant construction-related impacts could occur affecting minority populations directly surrounding the proposed project, where the percentage of minority residents exceeds 50 percent. Construction activities could create temporary dust and noise impacts. As discussed in Section 4.3 Noise, construction noise would be typical of other residential construction projects and limited to routine construction hours. Construction-related noise would not be expected during more noise sensitive nighttime hours.

In the long-term, no adverse impacts or beneficial impacts on minority populations are anticipated.

Protection of Children

The Woodlawn East BGs (ROI) does not constitute an environmental justice population because the percentage of children neither exceeds 50 percent nor is substantially higher than the percentage of children in the surrounding BGs (ROC). However, indirect impacts are considered because the percentage of children in Fort Belvoir CDP is substantially higher than the percentages in the ROI, surrounding BGs, and Fairfax County.

Residential communities directly surrounding the Woodlawn East/Berman Tract are considered in the Woodlawn East BGs data. Construction sites can present an increased risk to children's safety. This potential impact does not represent a disproportionate impact because the Woodlawn East BG does not constitute an environmental justice population. Standard safety practices, such as barriers and "no trespassing" signs, would be placed around construction sites to deter children from entering these areas. Construction vehicles, equipment, and materials would be secured when not in use. During construction, safety measures stated in 29 CFR 1926, Safety and Health Regulations for Construction, and other applicable regulations would apply to protect the health and safety of children as well as construction workers.

In the long-term, adverse impacts to children residing in or around Woodlawn East/Berman Tract would be negligible. Children of families moving to the Woodlawn East/Berman Tract development would benefit from new, modern housing and community amenities.

4.9.2 No Action Alternative

No effects would be expected under the No Action Alternative. No changes are anticipated in the short- or long-term to the resident population in Fort Belvoir or the ROI demographics.

4.10 HAZARDOUS MATERIALS, HAZARDOUS WASTE, AND TOXIC SUBSTANCES

4.10.1 Proposed Action

In the short-term, negligible to minor, adverse impacts could occur due to additional hazardous waste generated during construction. In the long-term, any solid or hazardous wastes generated at the residential housing development would be managed in accordance with FBRC's recycling and waste management programs; and all potential impacts would be negligible.

Discovery of MEC would be addressed by Fort Belvoir through its MMRP program. No effects to construction workers would be expected because they would be required to work under the requirements of a project-specific health and safety plan applicable to their assigned duties. No impacts to future residents, visitors, and site workers are anticipated through normal use and operation of future housing areas.

Hazardous and toxic substances would be managed in accordance with established regulatory requirements. Construction activities could generate small amounts of hazardous waste, such as paints, thinners, and waste oil. The handling of such waste would be subject to applicable laws and regulatory requirements for the protection of public health and the environment and, therefore, is not expected to result in adverse impacts.

4.10.2 No Action Alternative

Beneficial effects from the removal of MEC would occur under this alternative. Transportation and/or generation of discovered MEC would occur under the No Action Alternative. The No Action Alternative would not result in the transportation and/or generation of additional solid waste.

4.11 TRANSPORTATION

4.11.1 Proposed Action

As a result of the Proposed Action, there would be increases in traffic on roadways on and surrounding Woodlawn Village compared to current conditions. However, the increase in traffic impacts would be minor compared to the impacts evaluated in the 2003 EA and would not be considered significant. The existing transportation infrastructure has the capacity to accommodate the Proposed Action.

Prior to implementation of the RCI project, Woodlawn Village was comprised of 444 residential units (USACE, 2003). Under the Proposed Action studied in 2003, the build-out of Woodlawn Village was expected to total approximately 410 new homes and the traffic-related impacts were determined not to be significant. Under current conditions after the IDP, Woodlawn Village is comprised of 342 units (Nolan, 2014). Thus, the anticipated build-out of approximately 102 new units under the Proposed Action would add approximately 34 additional units (an approximately 8 percent increase) over the previously estimated 410 units.

To analyze the impact of the Proposed Action to transportation, a traffic evaluation was performed to estimate the number of trips generated from the site. The evaluation is provided in Appendix L. As discussed in Section 1.1, approximately 102 units proposed for the Woodlawn East/Berman Tract are not additional to the total number of housing units in the RCI project, and are approximately 34 additional units to the previously estimated final build-out of Woodlawn Village. Therefore, the number of trips generated is not new to Fort Belvoir roadways, but reflects changes in the origin/end point locations.

To evaluate whether traffic patterns to/from the proposed site would be substantially different from those that would have been assumed in the original EA, the location of the Woodlawn East/Berman Tract was compared to the location of River Village and Dogue Creek Village (i.e., where the units were planned according to the original EA). Table 4-2 shows the project number of trips generation from the Proposed Action. The traffic patterns to/from the west would utilize the same patterns as the 2003 EA, and therefore no impact would occur from the Proposed Action. Traffic to/from the east, which was projected at 35 percent in the EA may be slightly altered under the Proposed Action, but the change would not be significant (Wells, 2014).

Table 4-2. Trip Generation Summary

	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Trips Generated at Woodlawn East/Berman Tract (80-100 units)	16-20	50-60	66-80	54-66	32-39	86-105

4.11.2 No Action Alternative

No movement of the location of units to be constructed under the RCI project would occur under the No Action Alternative. No additional impacts to transportation would be expected.

4.12 CUMULATIVE EFFECTS

Environmental impacts may accumulate over time or in combination with similar events within and surrounding a proposed project. A cumulative impact is defined as the impact to the environment that results 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 actions (40 CFR 1508.7). This section addresses the cumulative effects that could arise from consideration of the Proposed Action in combination with other ongoing actions at Fort Belvoir. Principal actions that are considered in the evaluation of cumulative impacts are those that have or could affect the same resource(s) and for which the effect is still residual in the environment. The cumulative impact of the Proposed Action is evaluated within the context of other known actions at Fort Belvoir, although the specific area of influence varies with the resource being addressed.

The following projects are considered for evaluation and depicted on Figure 4-1 :

- *Fort Belvoir Elementary School (FBES)* – In 2013, FCPS submitted an initial plan under DoD's Program for Construction, Renovation, Repair or Expansion of Public Schools Located on Military Installations. The FBES, located less than 1.5 miles from the proposed project, is technically over capacity and children who live on the base currently attend five FCPS elementary schools in addition to FBES (FCPS, 2013b). The plan involves the construction of a new school, phased-occupied renovation within the existing school, and combining parking lots/travel lots between the facilities (FCPS, 2013a). The grant for the FBES expansion was officially approved July 17, 2014 (Pilakowski, 2014). A new elementary school would be built adjacent to the existing school with an estimated opening date of fall 2015 (FCPS, 2013b). Upon completed construction of FBES all students living on Fort Belvoir, including residents of the proposed development, are expected to be able to attend FBES.
- *The New Commissary, Exchange, and Future Mixed Use Development* – Located about 1.5 miles west of the proposed project, this development would provide residents and eligible patrons enhanced and expanded shopping and dining services and amenities. In 2010, the Army and AAFES submitted an initial EA that proposed a new 132,000-square-foot Commissary and a 270,000-square-foot AAFES Post Exchange. Construction of the 35-acre Post Exchange began in

2011; and opened on June 19, 2013 (Creech, 2013). The old Post Exchange was subsequently demolished. Construction of the new Commissary has not yet commenced and it is anticipated to begin in 2015. The final phase of the project would demolish the old Commissary for a mixed-use community area, which is estimated for completion in 2016/2017. Demolition of the old Commissary and development of the new town center, or mixed-use community area could coincide with development of the proposed project.

Figure 4-1 Cumulative Impacts Project Locations (USACE, 2014)

- *Water/Wastewater Utility Upgrade* – In 2013, Fort Belvoir proposed to implement a number of projects to upgrade the water and wastewater system

infrastructure. Fort Belvoir awarded a contract to American Water Operations and Maintenance, Inc. (American Water) in September 2009. Under a 50-year lease, American Water assumed ownership and maintenance of the potable water distribution and wastewater collection systems at Fort Belvoir. The proposed maintenance projects associated with this contract include replacement of water storage tanks, and aging sanitary sewer mains, construction of permanent access for sewer main maintenance, protection of water and sewer lines from erosion, proper preventative maintenance of aging infrastructure elements, replacement of force mains, annual maintenance of gravity sewer mains (general maintenance), and reinstallation of aerial stream crossings with stream bank repair. These upgrades would occur throughout the base; water and sewer improvement projects would occur at Woodlawn Village adjacent to the proposed project.

- *Implementation of the Privatization of Army Lodging (PAL) Program* – In 2012 Fort Belvoir proposed implementing a PAL program. The main focus of the PAL program at Fort Belvoir is the construction of a new Army lodging facility owned by the InterContinental Hotels Group. The proposed location of the new lodging facility is near the Fort Belvoir Community Hospital on Belvoir road (near Pence Gate), or about two miles southwest of the proposed project. The new lodging facility may be constructed over a period of approximately five years from the date of groundbreaking. The new lodgings would help Fort Belvoir accommodate the growth that has occurred since the implementation of the 2005 BRAC.
- *Richmond Highway-Telegraph Road Connector* – In 2006, the Federal Highway Administration (FHWA) Eastern Federal Lands Highway Division submitted an initial EA that proposed the construction of a new connector road Jeff Todd Way (formerly known as Mulligan Road) between Richmond Highway (US Route 1) and Telegraph Road (VA Route 611). The project originates at a reconfigured Old Mill road, adjacent to the Woodlawn Plantation property, and proceeds northward through Fort Belvoir and HEC land to a point on Telegraph Road east of Piney Run, approximately ¾ mile from Beulah Street. It runs approximately ½ mile along Old Mill Road and approximately 1.5 miles though Fort Belvoir and HEC. The connector is about one mile west of the proposed project. The project included construction of a four-lane divided roadway with a median; construction of new bridges and large culverts at stream crossings/wildlife passages; asphalt pavement removal and reconstruction through a portion of the project limits; construction of a new shared use path along Jeff Todd Way; utility relocations, right-of-way acquisition/Federal lands transfers, traffic signal installation; and other miscellaneous work (FHWA, 2014a). Jeff Todd Way opened in the fall of 2014.
- *I-95 Defense Access Roads Ramps to Engineer Proving Ground* – In 2008, the FHWA Eastern Federal Lands Highway Division submitted an initial EA that proposed the construction of two access ramps from I-95 to the Engineer Proving Ground (EPG, now Fort Belvoir North Area) at Fort Belvoir. The first involves expanding and extending the existing ramp from southbound I-95 to westbound Fairfax County Parkway to provide a connection to the EPG South Spine Road, in the southeastern corner of the EPG tract. The second involves constructing a new

connection between South Spine Road on the eastern side of the EPG and the existing flyover bridge that connects the high occupancy vehicle (HOV) lanes with the northbound I-95 conventional lanes (FHWA, 2008). The project commenced construction in 2010 and is expected to be completed in 2015. Both access ramps are located on the EPG at Fort Belvoir, directly northwest of the Fort Belvoir Installation. While the closest point from the ramps to the Installation is about one mile, they are about three miles from the proposed project.

- *US Route 1 at Fort Belvoir* – In 2010, the FHWA Eastern Federal Lands Highway Division, in cooperation with Fairfax County, US Army Garrison Fort Belvoir, and the Virginia Department of Transportation, proposed improvements to the 3.4-mile section of US Route 1 between Telegraph Road (Route 611) and Mount Vernon Memorial Highway (Route 235) in Fairfax County, Virginia. Pursuant 42 U.S.C 4332(2)(C), the 2012 EA/Draft Section 4(f) Evaluation evaluated potential impacts from increasing US Route 1 from four lanes to six lanes (FHWA, 2014b). The improvements are located just west of the intersection of US Route 1 and Virginia Route 286 (formerly 7100), and about three miles southwest of the proposed project. Construction began in 2014 and is expected to be completed by 2016.

4.12.1 Land Use

According to the Fort Belvoir Real Property Master Plan, in the future, Woodlawn Village (the development west of the development site) may be relocated and the land categorized as 'community' The change in future designation of this land would be a park or recreation area for the local community; however, an official future use for this land has not been determined (IMC, 2014). In the event that the residential development of Woodlawn village is moved, the Proposed Action residential development would be an isolated residential development on Fort Belvoir, though residential development to the east in Fairfax County would minimize this impact. The new community land use designation would be compatible with the Proposed Action residential land use. Given that the future land use is not finalized, cumulative impacts are not expected at this time.

4.12.2 Aesthetics and Visual Resources

Jeff Todd Way is located approximately one mile to the west of Woodlawn East/Berman Tract, but an existing housing area and a large wooded area create a separation that blocks the road from view. Because of the physical barriers separating the areas there is no aesthetic or visual cumulative impact. US Route 1 is an existing road located approximately half a mile south of Woodlawn East/Berman Tract that is not within the view shed of the proposed housing development. Since neither project is within the view shed, no cumulative impacts are expected.

4.12.3 Noise

The majority of the projects located within the vicinity of Woodlawn East/Berman Tract are expected to be complete before construction of the proposed project commences. However, the US Route 1 widening project could possibly occur simultaneously; but

noise would not be experienced by the same receptors, so no cumulative construction noise impacts are anticipated.

4.12.4 Geology and Soils

Construction of the proposed sites would involve land disturbances associated with soil excavation. Impervious surfaces would also increase in conjunction with the Proposed Action. These activities, together with other construction activities on Fort Belvoir, could result in potentially greater cumulative soil erosion and sedimentation that could lead to stormwater pollution. However, these land disturbing activities would be conducted in compliance with Federal, state, and local environmental laws and regulations to reduce potential impacts. The use of soil and stormwater management BMPs (discussed in Section 4.5, Water Quality) would minimize impacts during proposed construction and would improve stormwater quality after construction, causing cumulative impacts to be minor to moderate and beneficial.

4.12.5 Water Quality

Adverse and beneficial cumulative impacts to water quality are expected. Beneficial impacts would occur to Fort Belvoir's watershed through the water/wastewater utility upgrade project. Improved stream crossings, and stream bank restoration would decrease sediment erosion into the watershed. Additional adverse impacts would come from construction activities, and an increase in impervious surfaces associated with the Army Lodging project, and the Commissary/Exchange project. The same Federal and state regulations and permitting would be required for these projects to minimize the impacts to sediment and pollutants entering the Fort Belvoir waterways.

4.12.6 Biological Resources

Impacts to vegetation, wildlife, and sensitive species have the potential to increase cumulatively from the additional projects presented above. The Proposed Action would disturb approximately 31 acres of wooded land due to clearing and grading (Appendix N). Reductions in vegetation, habitat, cover, and forage areas for wildlife would occur. Time-of-year restrictions would be observed to minimize the impact to sensitive species. Impacts would be off-set or minimized through mitigation negotiated with Fort Belvoir ENRD. It is anticipated that some mitigation would include habitat creation and/or restoration at other appropriate locations within Fort Belvoir.

Since significant adverse effects to vegetation would be expected to occur as a result of implementation of the Proposed Action due to the necessary removal of vegetation during the construction process, this, combined with other projects that may require tree removal, would have adverse cumulative regional impacts.

All projects that occur on Post comply with the Fort Belvoir Tree Policy. Additionally, all projects identified vegetation and/or habitat mitigation to compensate for the losses associated with those projects.

4.12.7 Cultural Resources

Cumulative impacts to cultural resources are not expected because any impacts within Fort Belvoir would be mitigated through consultation with the Virginia SHPO as conducted through the expected Section 106 consultation action to occur.

4.12.8 Socioeconomic Resources

As discussed in Section 4.8, the FBES is technically overcrowded, and as a result children who live on Fort Belvoir currently attend one of the local FCPS elementary schools (FCPS, 2013b). About 30 percent of students residing on Fort Belvoir attend elementary schools off-Post. In 2013, the FCPS submitted an initial plan under DoD's Program for Construction, Renovation, Repair or Expansion of Public Schools Located on Military Installations. The project involves the construction of a new school, phased-occupied renovation and the maintenance replacement of multiple systems within the existing school and the conjoining of parking lots/travel lots between the facilities (FCPS, 2013a). The grant for the FBES expansion was officially approved July 17, 2014 (Pilakowski, 2014). A new elementary school will be built adjacent to the existing school with an estimated opening date of fall 2015 (FCPS, 2013b).

Because construction of the Proposed Action likely would not begin until after construction at the FBES is complete, cumulative impacts on school enrollment is not anticipated. Upon completed construction of FBES, it is anticipated that all students living on Fort Belvoir would be able to attend FBES with the projected additional capacity the construction will allow.

4.12.9 Environmental Justice and Protection of Children

As discussed in Section 4.9, the Woodlawn East BGs (ROI) do not constitute environmental justice populations. As such, no disproportionate cumulative impacts to minority or low income populations or to children are anticipated.

4.12.10 Hazardous Materials, Hazardous Waste, and Toxic Substances

No adverse cumulative impacts related to hazardous materials are anticipated. Any risks associated with pre-existing MEC and MPPEH impacts would be site-specific; therefore other proposed projects would not affect MEC and MPPEH removal at the Woodlawn East/Berman Tract. No cumulative impacts of these risks are anticipated.

4.12.11 Transportation

Beneficial cumulative impacts would be expected to transportation due to a number of roadway improvement projects on and around Fort Belvoir. These projects include the widening of US Route 1, the widening of Telegraph Rd, construction of Lieber gate, and I-95 N HOV access ramp. Specifically, the planned Jeff Todd Way would connect US Route 1 and Telegraph Rd to the west of the Woodlawn East/Berman Tract. This route provided an additional road for travel from the development around Fort Belvoir, and is expected to ease congestion during peak travel periods.

4.13 CONCLUSION

The anticipated consequences of the Proposed Action Alternative and No Action Alternative are summarized in Table 4-3. These impacts represent a subjective rating that is representative of:

- Quality/uniqueness of the resources affected
- Intensity and duration of the impact
- Potential to minimize the impact through mitigation.

In summary, this EA described and identified the potential impacts of the Proposed Action Alternative and the No Action Alternative. The Proposed Action would not have a significant impact on the quality of the human environment and an environmental impact statement (EIS) is not needed.

Table 4-3 Anticipated Effects on Resources as a Result of the Proposed Action

Resource	No Action	Proposed Action	Mitigation/BMPs
Land Use	No impact	Long-term, minor, adverse impacts due to changes in land classifications as described in the RPMP. Beneficial impacts from sustaining the housing needs of military families on-Post; reducing competition for housing off-Post; providing recreational opportunities on site or in adjacent neighborhood.	Mitigation activities recommended for wetlands would make the impacts to land use insignificant.
Aesthetics and Visual Resources	No impact	Short- and long-term minor, adverse effects due to the removal of mature trees and vegetation; and the construction of new homes.	Approximately 100-foot-wide vegetation buffer separating these areas from the new housing would be maintained to the extent practicable.
Noise	No impact	Short-term, minor, adverse effect from additional noise during construction due to operation of construction equipment and construction activities.	OSHA standards to protect construction workers
Geology and Soils	No impact	Short-term, minor, adverse, and long-term, moderate, beneficial effects to soils from planned land disturbance and grading for the development.	Mitigation through erosion and sediment control measures and permanent stabilization would minimize adverse effects.
Water Quality	No impact	Short- and long-term adverse impacts to wetlands would occur as a result of the Proposed Action. Both long-term and short-term minor adverse effects to surface water would be	An anticipated total of 0.44 acres of wetland will be impacted by this project – 0.40 acres of palustrine forested wetland and 0.04 acres of palustrine emergent wetland. Wetland impacts will

		expected as a result of stormwater management during and after construction of the proposed housing. The proposed action would require a substantial amount of ground disturbance and an increase in impervious surfaces for housing construction that may increase erosion and sediment and pollutant run-off during stormwater events.	require permits from the USACE and the Virginia DEQ. The creation of permanent permitted stormwater BMPs would mitigate impacts through compliance with the installation's Storm Water Pollution Prevention Plan (SWPPP) and Virginia Pollutant Discharge Elimination System (VPDES) Municipal Sanitary Storm Sewer Systems (MS4) permit requirements. Construction would utilize erosion, sediment control, and post-construction best management practices (BMPs) as outlined in the stormwater management plan.
Biological Resources	No impact	Significant adverse effects to vegetation would be expected, if not properly mitigated, to occur as a result of implementation of the Proposed Action due to the necessary removal of vegetation during the construction process. Minor, short-term effects to sensitive species would be expected due to loss of habitat during the construction process.	Mitigation through the Tree Replacement Policy at a 2:1 ratio and/or Out-of-Kind habitat mitigation would make the impacts due to vegetation removal insignificant. A survey will be conducted after construction fencing is erected, and sensitive species will be relocated outside of the construction area.
Cultural Resources	No impact	No impact as there are not NRHP-eligible sites within the project ROI.	None
Socioeconomic Resources	No impact	Short-term, minor, adverse impacts due	None

		to capitalization utilization at elementary schools. Beneficial effects with the provision of modern housing units and community amenities; and increase in local spending in short-term and salaries and wages invested back into Fairfax County over long-term.	
Environmental Justice and Protection of Children	No impact	Negligible, disproportionate, adverse impacts to minority and low-income populations since ROI does not constitute EJ populations. Children of families moving to Woodlawn East/Berman Tract would benefit from new housing.	Standard safety practices (e.g., barriers, "no trespassing" signs) around construction sites to deter children.
Hazardous and Toxic Substances	No impact	Negligible to minor adverse impacts due to additional hazardous waste generated during construction.	FBRC's recycling and waste management programs; Fort Belvoir MMRP program.
Transportation	No impact	Negligible impact as traffic patterns to/from site and trips generated would not be substantially different.	None

5.0 GLOSSARY

Alluvium – A deposit of clay, silt, sand, and gravel left by flowing streams in a river valley or delta.

Anadromous fish – Fish born in fresh water, spends most of its life in the sea and returns to fresh water to spawn.

Area of Potential Effect – The geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of the historic properties, if any such properties exist.

Atmospheric attenuation – A process in which the flux density of a parallel beam of energy decreases with increasing distance from the source as a result of absorption or scattering by the atmosphere.

Block Group – A statistical subdivision of a census tract, generally defined to contain between 600 and 3,000 people and 240 and 1,200 housing units.

Census Designated Place – A concentration of population identified by the United States Census Bureau for statistical purposes.

Census Tract – A geographic region defined for the purpose of taking a census. Usually these coincide with the limits of cities, towns or other administrative areas and several tracts commonly exist within a county.

Crystalline rocks – Any rock composed entirely of crystallized minerals without glassy matter.

Day-night level – A-weighted equivalent sound level for a 24 hour period with an additional 10 dB imposed on the equivalent sound levels for night time hours of 10 p.m. to 7 am.

Decibel – A unit used to measure the intensity of a sound or the power level of an electrical signal by comparing it with a given level on a logarithmic scale.

Discarded Military Munitions – Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal.

Embayment – An indentation of a shoreline larger than a cove but smaller than a gulf

Endangered species – Any species in danger of becoming extinct.

Foliage – The leaves of a plant or of many plants.

Fugitive Dust – A type of nonpoint source air pollution - small airborne particles that do not originate from a specific point such as a gravel quarry or grain mill. Fugitive dust originates in small quantities over large areas.

Geomorphic process – The physical and chemical interactions between the Earth's surface and the natural forces acting upon it to produce landforms.

Housing Unit – Indicates a house, an apartment, a mobile home or trailer, a group of rooms, or a single room occupied as separate living quarters, or if vacant, intended for occupancy as separate living quarters.

Housing Vacancy Rate – The proportion of the housing inventory which is vacant for rent, sale, or otherwise unoccupied. It is computed by dividing the number of unoccupied housing by the total housing units, and then multiplying by 100.

Labor Force – Includes all people classified in the civilian labor force, plus members of the U.S. Armed Forces on active duty. The Civilian Labor Force consists of people classified as employed or unemployed.

Median Household Income – Median household income is the amount which divides the income distribution into two equal groups: one-half of the cases falling below the median income and one-half above the median. It is computed on the basis of a standard distribution in an attempt to take into account all households in a given area.

Munitions Constituents – Any materials originating from unexploded ordnance (UXO), discarded military munitions (DMM), or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

Munitions Debris – Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal.

Palustrine – This word comes from the Latin word *palus* or marsh. Wetlands within this category include inland marshes and swamps as well as bogs, fens, tundra and floodplains. Palustrine systems include any inland wetland which lacks flowing water, contains ocean-derived salts in concentrations of less than 0.05%, and is non-tidal.

Per Capita Income – Per capita income is the personal income for the county divided by the population resident in the county.

Perennial stream – A stream that has continuous flow in parts of its stream bed all year round during years of normal rainfall.

Physiographic – The study of physical features of the earth's surface.

Piedmont – a gentle slope leading from the base of mountains to a region of flat land.

Potable – Safe to drink.

Riparian – A riparian zone or riparian area is the interface between land and a river or stream.

Seismic Activity – The frequency, type and size of earthquakes experienced over a period of time.

Threatened species – Any species (including animals, plants, fungi, etc.) which are vulnerable to endangerment in the near future.

Topography – Features such as mountains and rivers in an area of land.

Total Maximum Daily Load – A calculation of the maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards.

Unconsolidated Sand, Silt and Clay – A loose, caving sand, silt and clay. Sediments of this kind have connected pore spaces that allow groundwater to be stored and transported.

Unemployment Rate – Represents the number unemployed as a percent of the labor force.

Unexploded Ordnance – Explosive weapons (bombs, bullets, shells, grenades, land mines, naval mines, etc.) that did not explode when they were employed and still pose a risk of detonation.

Upland – An area of high or hilly land.

Viewshed – An area of land, water, or other environmental element that is visible to the human eye from a fixed vantage point.

Wetlands – Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

6.0 REFERENCES

(AEC, 2014). US Army Environmental Command, Department of Defense. 2014. Military Munitions Response Program. Accessed July 2014: http://aec.army.mil/Services/Restore/MilitaryMunitionsResponseProgram.aspx.

(BLM, 2006). Bureau of Land Management, United States Department of the Interior. 2006. Military Munitions and Explosives of Concern: A Handbook for Federal Land Managers, with Emphasis on Unexploded Ordinance.

(Bowman Consulting, 2015). Bowman Consulting 2015. Overall Site Plan – Fort Belvoir – Woodlawn Village East/Berman.

(Bowman Consulting, 2015a). Bowman Consulting. 2015. Wetland Areas to Be Impacted Exhibit.

(Bowman Consulting, 2015b). Bowman Consulting. 2015. Storm Water Management – Woodlawn East Concept Plan.

(CEQ, 1997). Council on Environmental Quality. 1997. *Environmental Justice, Guidance under the National Environmental Policy Act.* Accessed February 2014: http://ceq.hss.doe.gov/nepa/regs/ej/justice.pdf.

(Chesapeake Bay, 2014). Chesapeake Bay Watershed Agreement. 2014. Chesapeake Bay Program. Accessed March 2015:

(Creech, 2013). Justin Creech Staff Writer. 2013. *New Exchange Opens at Fort Belvoir*. Accessed February 2014: https://www.belvoir.army.mil/news/News2013/ExchangeOpening.asp.

(DA, No Date). Department of the Army, No Date. *Residential Communities Initiative.* Accessed March 2015: http://www.rci.army.mil/

(DA, 2007). Department of the Army. 2007. Army Regulation 200-1, Environmental Quality: Environmental Protection and Enhancement. Accessed February 2014: http://www.apd.army.mil/pdffiles/r200_1.pdf

(DCR, 2010). Virginia Department of Conservation and Recreation. *Determination of Water Bodies with Perennial Flow*. June 21, 2010.

(EPA, 1974). US Environmental Protection Agency. 1974. Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances. Washington, DC: s.n., Publication. NTID300.1

(ESRI, 2010). Environmental Systems Research Institute. 2010. *ESRI Data & Maps*. Redlands, CA.

(ESRI, 2015). Environmental Systems Research Institute. 2015. *ESRI Data & Maps*. Redlands, CA.

(Fairfax County, No Date). Fairfax County. No Date. *FAQs: Resource Protection Areas.* Accessed March 2014: http://www.fairfaxcounty.gov/dpwes/navbar/faqs/rpa.htm

(Fairfax County, 2013a). Fairfax County Department of Public Works and Environmental Services and Northern Virginia Soil and Water Conservation District. 2013. *Description and Interpretive Guide to Soils in Fairfax County.* Accessed February 2014: http://www.fairfaxcounty.gov/dpwes/environmental/soils_map_guide.pdf.

(Fairfax County, 2013b). Fairfax County. *2013 Fairfax County Comprehensive Plan, 2013 Edition: Area IV.* Accessed February 2014: http://www.fairfaxcounty.gov/dpz/comprehensiveplan/.

(FBRC, 2007). Fort Belvoir Residential Communities LLC, Army Residential Communities Initiative. 2007. Environmental Management Plan.

(FBRC, 2014a). Fort Belvoir Residential Communities LLC. 2014. Woodlawn East Land Action Due Diligence Kickoff Meeting Minutes.

(FCPS, 2010). Fairfax County Public Schools. 2010. Memo to Woodlawn Elementary Parents: Transfer Options for Woodlawn Village Residents.

(FCPS, 2013a). Fairfax County Public Schools, Facilities and Transportation Services. 2013. *Proposed Capital Improvement Program for the Fiscal Years 2015-2019.* December 13, 2013

(FCPS, 2013b). Fairfax County Public Schools. 2013. *FCPS to Submit Grant Application to Fund New Elementary School on Fort Belvoir.* Accessed February 2013: http://commweb.fcps.edu/newsreleases/newsrelease.cfm?newsid=2315.

(FHWA, 2008). Federal Highway Administration, Eastern Federal Lands Highway Division. 2008. I-95 Defense Access Roads Ramps to Engineer Proving Ground Environmental Assessment. Fort Belvoir, Virginia.

(FHWA, 2014a). Federal Highway Administration, Eastern Federal Lands Highway Division. 2014. Mulligan Road Project. Accessed July 2014: http://www.efl.fhwa.dot.gov/projects/rhtrc.aspx

(FHWA, 2014b). Federal Highway Administration, Eastern Federal Lands Highway Division. 2014. US Route 1 – Fort Belvoir. Accessed July 2014: http://www.efl.fhwa.dot.gov/projects/Rt1_ftbelvoir.aspx

(GC&T, 2015). Subsurface Investigation and Preliminary Geotechnical Engineering Report, Woodlawn Village East, Fort Belvoir, Virginia. Prepared by GC&T. 2015.

(Goodwin, 2001). Integrated Cultural Resources Management Plan, United States Army Garrison, Fort Belvoir, Virginia. Prepared by R. Christopher Goodwin & Associates, Inc. (Goodwin) for Dewberry & Davis. 2001.

(IMC, 2014). Installation Management Command. 2014. Draft Real Property Master Plan, Installation Vision and Development. Fort Belvoir, Virginia. Prepared by: Atkins. March 2014.

(Jiang, 2014a). Michael Jiang, Fort Belvoir Residential Communities LLC. 2014. Personal Communication – Demographics Answers. May 13, 2014.

(Jiang, 2014b). Michael Jiang, Fort Belvoir Residential Communities LLC. 2014. Personal Communication – Socioeconomics Questions/Answers. February 25, 2014.

(JMA, 2015). JMA, A CCRG Company. Phase II Archaeological Evaluation of Site 44FX1947 – Woodlawn East, Fairfax County and Fort Belvoir, Virginia. Draft Report. January 2015.

(Nolan, 2014). Casey Nolan, Fort Belvoir Residential Communities LLC. 2014. Personal Communication – FBRC Woodlawn East Berman Tract Second Internal Review. May 12, 2014.

(PIF, 2014). Partners in Flight Report – Woodlawn East. September 8, 2014.

(Pilakowski, 2014). Ashley Pilakowski. URS Corporation, United States Army Garrison, Fort Belvoir (Directorate of Public Works, Environmental and Natural Resources Division). Personal Communication – Fort Belvoir Elementary School Grant Approval. July 17, 2014.

(PSR, 2014). Public School Review. 2013-2014. Overview. Accessed February 2014: http://www.publicschoolreview.com/school_ov/school_id/84561.

(Rawat, 2014). Ajay Rawat. Fairfax County Public Schools, Facilities and Transportation Services. Personal Communication – Fort Belvoir Area Students and Proposed Capital Improvement Project. March 4, 2014.

(Robinson, 2014). Alison Robinson. Wetland Studies and Solutions, Inc. Personal Communication – Woodlawn Village June 2014 wood turtle survey. August 13, 2014.

(US Army Garrison, 2001). United States Army Garrison Fort Belvoir. 2001. Integrated Natural Resources Management Plan 2001-2005. Accessed February 2014: https://www.belvoir.army.mil/docs/inrmp_4_web.pdf

(US Army Garrison, 2010). US Army Garrison, Fort Belvoir. Draft Environmental Assessment: The New Commissary, Exchange, and Future Mixed Use Development. August 2010. Accessed May 2014: https://www.belvoir.army.mil/wtu/Draft_Environmental_Assessment.pdf

(US Army Garrison, 2013a). United States Army Garrison, Fort Belvoir, Virginia Municipal Separate Storm Sewer Systems (MS4) Program Plan. Accessed February 2014: https://www.belvoir.army.mil/docs/environdocs/MS4%20Program%20Plan%20Proposed%20Revision%20September%202013.pdf

(US Army Garrison, 2013b). United States Army Garrison, Fort Belvoir. *Water/Wastewater Utility Upgrade Fort Belvoir, Virginia Environmental Assessment.* Accessed February 2014: https://www.belvoir.army.mil/environdocssection11.asp.

(US Army Garrison, 2013c). United States Army Garrison, Fort Belvoir. 2013. Final Virginia Pollutant Discharge Elimination System (VPDES) MS4 Permit Fort Belvoir PCB TMDL Action Plan. Accessed February 2014:

https://www.belvoir.army.mil/docs/environdocs/PCB%20TMDL%20Action%20Plan%20Final_130312.pdf

(US Army Garrison, No date). United States Army Garrison, Fort Belvoir. Date Unknown. Fort Belvoir Policy Memorandum #27, Tree Removal and Protection.

(US Army Garrison, Date Unknown). United States Army Garrison, Fort Belvoir. (USACE, 2003). United States Army Corps of Engineers. 2003. Environmental Assessment of the Army Residential Communities Initiative (RCI) Properties at Fort Belvoir, Virginia.

(USACE, 2010). United States Army Corp of Engineers, Mobile District. 2010. Final Environmental Assessment for the Implementation of 2005 Base Realignment and Closure Recommendations 5 and 132 at Fort Belvoir, Virginia

(USACE, 2012). United States Army Corps of Engineers. 2012. *Final Environmental Assessment for the Alternate Implementation of the Privatization of Army Lodging Program at Fort Belvoir, VA.* Accessed February 2014: https://www.belvoir.army.mil/docs/Belvoir%20PAL-C_FEA-2.pdf.

(USACE, 2014) United States Army Corps of Engineers, Norfolk and Fort Belvoir Residential Communities. 2014. Draft Environmental Condition of Property Report for the Woodlawn East-Berman Tract Parcel at Fort Belvoir, Virginia

(USCB, 2010a). United States Census Bureau. State and County Quickfacts – Fort Belvoir CDP. Accessed February 2014: http://quickfacts.census.gov/qfd/states/51/5129008.html.

(USCB, 2010b). United States Census Bureau. 2010. *Profile of General Population and Housing Characteristics (DP-1).* Accessed February 2014: http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_SF1_SF1DP1&prodType=table.

(USCB, 2010c). United States Census Bureau. 2010. *Age Groups and Sex: 2010 (QT-P1).* Accessed February 2014: http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_SF1_QTP1&prodType=table.

(USCB, 2010d). United States Census Bureau. 2010. *2006-2010 American Community Survey 5-Year Estimates, Selected Economic Characteristics (DP-03).* Accessed February 2014: http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_10_5YR_DP03&prodType=table.

(USCB, 2013). United States Census Bureau. 2013. *American Fact Finder – Glossary Terms.* Accessed February 2014.

(USDA, 1981). United States Department of Agriculture. 1981. Farmland Protection Policy Act of 1981. Accessed February 2014: http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1042432.pdf

(USDA, 1995). United States Department of Agriculture, US Forest Service. 1995. Landscape Aesthetics. A Handbook for Scenery Management. Agricultural

Handbook Number 701.
Washington, D.C.

(USDA, 2014). United States Department of Agriculture, Natural Resources Conservation Service. 2014. Web Soil Survey. Accessed February 2014: http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

(USDHHS, 2010). United States Department of Health and Human Services. 2010. *The 2010 HHS Poverty Guidelines.* Accessed February 2013: http://aspe.hhs.gov/poverty/10poverty.shtml.

(USFWS, 2015). United States Fish and Wildlife Service. Threatened Species Status for the Northern Long-Eared Bat With 4(d) Rule. 80 Fed. Reg. 17974 (April 2, 2015). .

(USGS, No Date). United States Geological Survey. No Date. Watershed Boundary Dataset. Accessed March 2014: http://nhd.usgs.gov/wbd.html.

(USGS, 2014). United States Geological Survey. 2014. *Virginia Seismic Hazard Map.* Accessed March 2014: http://earthquake.usgs.gov/earthquakes/states/virginia/hazards.php.

(Verdi, 2014). Anthony Verdi, P.E. Bowman Consulting. Personal Correspondence. Comments on existing stormwater flow and the conceptual stormwater plan. August 12, 2014.

(VDEQ, 2012). Virginia Department of Environmental Quality. 2012. A Public Guide to the Wetland Permitting Process in Virginia. Accessed March 2014: http://www.deq.virginia.gov/Portals/0/DEQ/Water/WetlandsStreams/PublicGuideRevised2012.pdf

(VDEQ, 2014). Virginia Department of Environmental Quality. 2014. Final 2012 305(b)/303(d) Water Quality Assessment Integrated Report. Accessed March 2014: http://www.deq.state.va.us/Programs/Water/WaterQualityInformationTMDLs/WaterQualityAssessments/2012305(b)303(d)IntegratedReport.aspx

(VDGIF, 2002). Virginia Department of Game and Inland Fisheries, Environmental Services Section. Agency Correspondence. 2002.

(VDHR, 2009). Virginia Department of Historic Resources. Conducting Archaeological Investigations: Excerpt from unpublished Guidelines for Conducting Survey in Virginia. April 2009. Accessed April 2014 at http://www.dhr.virginia.gov/pdf_files/Guidelines_For_Conducting_Archaeological_Survey_in_VA_June2009.pdf.

(VDHR, 2015). Virginia Department of Historic Resources. Concurrence Letter for Section 106 Consultation, Woodlawn Village East Geotechnical Survey, Fort Belvoir, Virginia. March 27, 2015.

(Wells, 2014). Wells and Associates. 2014. Memorandum: Traffic Evaluation for Fort Belvoir RCI—Environmental Assessment, Fort Belvoir, Fairfax County, Virginia.

(WSSI, 2014a). Wetland Studies and Solutions, Inc., 2014. Wood Turtle (*Glyptemys insculpta*) Habitat Evaluation.

(WSSI, 2014b). Wetland Studies and Solutions, Inc., 2014b. Woodlawn Village, Fairfax County, Virginia, Revised Waters of the U.S. (Including Wetlands) Delineation and Resource Protection Area Evaluation

(WSSI, 2014c). Wetland Studies and Solutions, Inc, 2014a. Woodlawn East—Berman Tract Floodplain Investigative Summary Memorandum.

(WSSI, 2014d). Wetland Studies and Solution, Inc. Woodlawn Village, Fairfax County, Virginia, Small Whorled Pogonia (*Isotria medeoloides*) Habitat Evaluation and Search.

7.0 LIST OF PREPARERS

Table 7.1. List Of Preparers

Name	Education	Years of Experience	Project Role
Jason Franti – Apex	M.S. Soil Science	15	Senior Project Manager, Geology and Soils, Transportation, QA/QC Manager
Nathalie Jacque – Solv	B.S., Environmental Economics and Environmental Science	4	Socioeconomics, Environmental Justice & Protection of Children, Cultural Resources, Document Management
Gavin Kitchens – Apex	M.S., Environmental Management	12	Geology and Soils, Water Quality
Jeffrey Knight – Pillsbury Winthrop Shaw Pittman, LLP	J.D. - 1996	18	Project Review, QA/QC
Bobby Lin – Apex	B.S. Biological Sciences B.S. Environmental Sciences	2	GIS & Figure Preparation, Geology and Soils
Daniel Perkins – Solv	B.S., Environmental Analysis and Policy	3	Hazardous and Toxic Substances
Chelsie Romulo – Solv	PhD, Environmental Science and Public Policy (to be conferred May 2016)	7	Biological Resources and Water Quality
Julie Sepanik – Solv	BS, Environmental Mapping and Data Management	4	Transportation, Land Use, Aesthetics & Visual Resources, Noise
Brett Spencer – Apex	B.S. Integrated Science and Technology	2	GIS & Figure Preparation
Marissa Staples – Solv	M.A. Environmental Science and Policy	11	Project Review, QA/QC, FONSI

8.0 APPENDICES

Appendix A – GCT Geotechnical Report – Woodlawn East
Appendix B – Stormwater Concept Plan
Appendix C – Wetland Survey
Appendix D – Jurisdictional Determination
Appendix E – Floodplain Investigation
Appendix F – CZMA Consistency Determination
Appendix G – Plant Communities
Appendix H – Wildlife at Fort Belvoir
Appendix I – Programmatic Agreement
Appendix J – Berman Tract Historic Properties Consultation Package
Appendix K - Environmental Condition of Property
Appendix L – Traffic Evaluation
Appendix M – Wetland Areas Impacted Exhibit
Appendix N – Tree Survey Specifications

APPENDIX A – GCT GEOTECHNICAL REPORT – WOODLAWN EAST

SUBSURFACE INVESTIGATION
AND
PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

WOODLAWN VILLAGE EAST

Fort Belvoir, VIRGINIA

Prepared for:

CLARK REALTY CAPITAL, LLC

4401 Wilson Boulevard, Suite 600
Arlington, Virginia 22203

GC&T Project No. 214M-7353

February 3, 2015

GC&T

Geotechnical Environmental Construction Services

4899 Prince William Parkway
Woodbridge, VA 22192
(703) 730-4160
FAX (703) 337-5359

21505 Greenoak Way
Dulles, VA 20166
(703) 421-4000
FAX (703) 337-5571

February 3, 2015

Mr. Oliver Lee
Clark Realty Capital, LLC
4401 Wilson Boulevard, Suite 600
Arlington, VA 22203

Re: Woodlawn Village East
Fort Belvoir, Virginia
Subsurface Investigation & Preliminary Geotechnical Engineering Report
GC&T Agreement No. 214M-7353

Dear Mr. Lee,

GC&T has completed the authorized subsurface investigation and preliminary geotechnical engineering report for the above referenced project site.

This report describes the details of the exploratory methods used; summarizes the findings of the field investigation and laboratory testing; and presents our evaluation and recommendations to assist in the planning and design of the proposed development. The report is preliminary in nature and once the final plans have advanced, GC&T should be contacted to review our recommendations and drill additional borings, if needed, and update our recommendations based on the final design plans.

We thank you for your confidence in our services. We will remain available for future consultation during the design and construction phases of the project. Should you have any questions regarding the content of this report, please do not hesitate to call us at (703) 730-4160.

Respectfully submitted,
GC&T

Mohamed Soliman
Project Engineer

COMMONWEALTH OF VIRGINIA
JANIS ASARE-BEDIAKO
Lic. No. 0402050203
FEB 03 2015
PROFESSIONAL ENGINEER

Janis Asare-Bediako, P.E.
Senior Project Engineer

P:\Reports and Letters\GEOTECH\Clark Realty Capital, LLC\Woodlawn Village East\Clark Realty Capital - 214M-7353 - Woodlawn Village East - Geotechnical Report.docx

TABLE OF CONTENTS

1.0 INTRODUCTION

GC&T has completed a subsurface investigation and preliminary geotechnical engineering study for a property within the Fort Belvoir Military Reservation identified as *Woodlawn Village East* in Fairfax County, Virginia. The scope of our services was performed in accordance with GC&T Proposal/Agreement No. 214M-7353 approved on December 16, 2014 by Fort Belvoir Residential Communities, LLC.

1.1 Purpose and Scope of Work

Based on the *Overall Site* and *Stormwater Concept plans* for *Fort Belvoir – Woodlawn Village East* last dated May 2014 (herein the plans), we understand that the project will consist of the design and construction of 100 residential units in a parcel located east of the existing Woodlawn Village. The project will also include a total of seventeen (17) BMP facilities including bioretention basins, rain gardens, grass channels, wet or dry swales, and extended detention /wet pond at the southern end of the property.

Our scope of work included a total of twenty seven (27) soil borings to a maximum depth of 15 feet below existing grades each. The borings were widely spread throughout the overall development in order to identify existing subsurface conditions in areas where proposed residential dwellings, BMP facilities, roadways and underground utilities are expected.

The objectives of this study were to determine the physical and geotechnical engineering characteristics of the subsoils at the project site, and to evaluate those conditions with respect to the proposed development of the property. More specifically, this preliminary geotechnical engineering study was performed to:

- Identify and evaluate the various types of overburden soils and groundwater conditions, at the designated boring locations.
- Provide general construction guidelines for site grading and earthwork activities, including an assessment of the suitability and engineering applications of the on-site and borrow materials, temporary control of groundwater, and placement of compacted fill and backfill for the proposed building, pavement, and site utilities areas.
- Provide assessment of the presence of groundwater, both as perched condition, or as permanent water table within the substrata.
- Provide preliminary recommendations for most feasible building foundations and slab-on-grade construction.
- Provide preliminary recommendations for permanent dewatering system for the foundation and lateral drains beneath grade slabs.

- Provide earth pressure and backfill recommendations for below-grade walls as well as earth retention support.
- Provide a description of the in-situ soils with respect of the proposed BMP facilities.
- Discuss relevant geotechnical concerns encountered or noted during our presence on site that may impact the proposed development.

The scope of this work included a site reconnaissance, a subsurface exploration consisting of soil test boring; laboratory testing of selected soil samples; a geotechnical analysis of the field and laboratory test results; and the preparation of this preliminary geotechnical engineering report.

1.2 Site Location and Description

The project site is located in an undeveloped parcel of land north of the intersection of Longfields Lane and Pole Road identified as Parcel "A" which is a portion of the United States of America Fort Belvoir Military Reservation identified with TM# 1152-01-0001, according to Fairfax County Tax Mapping. The site is bound to the north by an undeveloped parcel, to the south by a residential development along Longfields Lane and Pole Road, to the east by a residential development and to the west by Plantation Road.

The site is flat to moderately sloping with maximum elevations at approximately EL. 37.5 feet above MSL at the center of the site; and minimum elevations at approximately EL. 26.5 feet above MSL, at the southern end of the property along Pole Road. The site is intersected by several preservation areas and moderately wooded wetlands. A Site Vicinity Map showing the location of the site is presented as a Figure at the end of this report.

1.3 Project Description

Based on the plans and the information provided to us by the client, we understand that the project will consist of: (i) a total of 100 residential single family dwellings; (ii) a total of seventeen (17) stormwater management BMP facilities including bioretention basins, rain gardens, grass channels, wet/dry swales and one extended detention/wet pond at the southern end of the property; (iii) a tot lot at the center of the site; and, (iv) all roadways and underground utilities to serve the property.

Due to the preliminary nature of the plans, structural loads for the proposed building were not available at the time of completion of this report. Therefore, based on our experience with similar projects in the vicinity of the site, we believe that the planned homes will be constructed as wood-framed structures with below grade or walkout basements.

For the purpose of this report, we have assumed that footings and slabs for the buildings will be cast-in-place concrete. The perimeter wall footings and the interior column footings are expected to have loads on the order of 3 to 4 kips per linear foot and a maximum of 50 kips, respectively. Should these assumptions be different, GC&T kindly requests the opportunity to be provided with the updated information, in order to revise this report accordingly.

2.0 METHODOLOGY

2.1 Subsurface Investigation

As mentioned earlier, a total of twenty seven (27) borings were performed for this exploration. However, due to specific restrictions indicated by the *US Army Garrison – Fort Belvoir*, Borings B-1 to B-3 and B-5 were not drilled. All borings were located in the field by *Bowman Consulting* based on layout plans provided by a GC&T geotechnical engineer. The aforementioned engineering firm also provided the boring elevations on the boring logs.

The locations of the borings are shown on the Boring Location Plan in the Appendix to this report.

2.1.1 Soil Test Borings

All test borings were drilled with all-terrain (ATV) D50 and a GEMCO 45 ATV drill rigs, utilizing 2-1/4 and 3-1/4 inch inside diameter hollow-stem augers. The spoils generated during drilling were backfill on completion. The soil borings were performed utilizing the Standard Penetration Tests (SPT) at pre-determined intervals in general accordance with ASTM D-586-84. The Standard Penetration Test employs a two-inch outside diameter, split-barrel sampler driven 18-inches into the ground by a 140-pound safety hammer with a free fall of 30 inches.

The number of blows required to drive the sampler the second and third six-inch intervals is recognized as the standard penetration resistance or the N-value of the soil at the specified depth of sampling. The N-value is used to provide a quantitative indication of the in-place relative density of non-cohesive soils or the consistency of cohesive soils. The soil samples were recovered from the test borings using the split spoon sampler in conjunction with performing the Standard Penetration Test.

A field log of the soils encountered in each boring was maintained. The soil samples were placed in sealed jars and transported to our office in Dulles, Virginia for further laboratory testing purposes.

2.1.2 Groundwater Conditions

In auger drilling operations, out-sourced water is not introduced into the boreholes. Therefore, groundwater conditions can be determined by observing and measuring the natural groundwater flow into or out of the boreholes.

Groundwater observations were made during drilling of all test borings by visual examination of recovered samples from the Standard Penetration Tests, auger cuttings, and watermarks on the split-barrel sampler and drill rods. Further, groundwater readings were made upon the completion of each boring and prior to backfilling after a minimum 24-hour period.

2.2 Laboratory Testing

Representative soil samples collected during the subsurface exploration were transported to GC&T's materials laboratory in Dulles, Virginia. Selected samples were classified using specific laboratory tests in accordance with ASTM Standard D-2487 - *Classification of Soils for Engineering Purposes*. The testing program included the following test methods:

ASTM D-2216	Determination of Moisture Content of Soils
ASTM D-422	Particle Size Analysis of Soils
ASTM D-4318	Atterberg Limits

The tests were performed to determine the physical characteristics and soil classification of the various soils encountered during the subsurface investigations. The laboratory test results are presented on the individual data sheets, which can be found in the Appendix of this report. All soil samples obtained during past explorations have been retained in our laboratory, until further instructions from the client are received.

3.0 RESULTS

3.1 Regional Geology and Soil Mapping

A review of the published geological information indicates that the site is geologically within the *Atlantic Coastal Plain Physiographic Province of Virginia*. This province is characterized by sedimentary soils that have been deposited in layers over geologic time. The *Coastal Plain* deposits are composed of sand, gravel, silt, and clay in well sorted and bedded fluvial deposits. The deposits are generally described as well-rounded cobbles and pebbles of gravel and quartz sand interbedded with layers of silt and highly plastic clay.

Although the clay sediments appear to be very strong and overconsolidated, these soils are unstable due to their inherent low residual shearing strength and the presence of fissures in their blocky structure. The clay and silt sediments are also known to be expansive and prone to shrink and swell due to the presence of montmorillonite as the predominant clay mineral. The site soils encountered in the borings were primarily sedimentary soils of the *Atlantic Coastal Plain*.

The on-site soils, as mapped by Fairfax County, are predominately *Grist Mill Sandy Loam* (40), *Gunston Silt Loam* (48A), *Beltsville Loam* (7B); *Woodstown Sandy Loam* (109B); and *Mattapex Loam* (77B) The majority of these soils are classified by Fairfax County as Soil Class III and IV; which have characteristics such as high shrink/swell potential, landslide susceptibility, high compressibility, low bearing strength, and shallow water tables. Soils such as *Belstville Loam* (7B) located in the center of the site are classified as Class II soils consisting of undisturbed natural soils that have shallow water tables or restrictive soil layers.

A Soil Type Map, indicating the location and extent of the aforementioned soils as provided by the official Fairfax County Soils Map has been included as part of the Appendix of this report.

3.2 Subsurface Observations

The test borings generally confirm the description of subsurface conditions presented in the geology section of this report. Approximately 2 to 6 inches of topsoil was encountered in the majority of the test borings. Underlying the topsoil layer, the soil types generally reflect the parent bedrock type. The majority of the soils observed are Coastal Plain soils consisting with the geology of the site. Auger refusal was not encountered in any of the borings explored.

The majority of the on-site soils consist mostly of fine-grained low plasticity SILT (ML), and Lean CLAY (CL) with varying amounts of sand; and highly plastic soils consisting of Elastic SILT, and FAT CLAY (CH) with varying amounts of sand and gravel. Therefore, the general subsurface soil profile encountered during our field explorations can be described as two (2) distinct soil strata; non-cohesive and cohesive soils:

Stratum I: Low Plasticity Fine-grained Soils
Stratum I consists of brown, tan brown and orange brown SILT (ML) and Lean CLAY (CL) with varying amounts of sand and gravel.

This stratum was encountered in all borings below the topsoil, and/or interbedded with Stratum II soils to the maximum drilled depth of 15 feet. The consistency of the soils within this Stratum is generally medium stiff to hard based on SPT N-values ranging between 5 and over 56 blows per foot (bpf) of split spoon penetration. The plasticity of the soils was considered low to medium based on Plasticity Index values ranging between 12 and 23.

Stratum II: Highly Plastic Fine-grained Soils
This stratum consists of brown, gray and greenish-brown, moist to very moist SILT (ML), Lean CLAY (CL), FAT CLAY (CH), and Elastic SILT (MH) with varying amounts of sand and gravel.

Stratum II soils were encountered in borings B-8, B-9, B-11 to B-13, B-15 to B-17, B-20, B-22, B-24, B-25, and B- 27 below the topsoil layer and/or interbedded with Stratum I soils to the maximum drilled depth of 15 feet. This stratum ranged in consistencies from medium stiff to hard base on SPT N-values ranging between 5 and over 49 blows per foot (bpf) of split spoon penetration. The plasticity of these fine-grained soils was considered high for the FAT CLAY (CH) soils based on Plasticity Index value of 28.

3.3 Groundwater Observations

Groundwater was not encountered in any of the borings after 24 hours of drilling completion. However, cave-in depths after 24 hours of drilling completion were recorded at depths ranging between 10.6 feet and 12.0 feet below existing grades.

Based on these site elevations, the cave-in depth indicates are most probable an indication of a groundwater table and not a perched water condition. Fluctuations in perched or groundwater levels should be expected with variations in conditions such as precipitation, evaporation, construction activity, etc.

3.4 Laboratory Test Results

A review of the laboratory test results indicates that the coarse-grained soil samples classify as fine-grained Lean CLAY (CL) with low to medium plasticity. The fine-grained FAT CLAY (CH) soils sample classified as high plasticity with a PI value of 28. A summary of the laboratory test results is presented in the table below:

Table I – Summary of Laboratory Test Results

Boring/ Sample	Depth (ft.)	USCS	Liquid Limit	Plasticity Index	Sieve #200	Moisture Content
B-4/S-2	2.0-3.5	CL	49	23	95.1	24.4
B-7/S-4	8.5-10.0	CL	29	12	97.8	14.3
B-11/S-4	8.5-10.0	CL	37	17	93.6	17.9
B-12/S-2	2.0-3.5	CH	57	28	91.1	27.5
B-21/S-4	8.5-10.0	CL	40	19	92.6	20.6
B-26/S-4	8.5-10.0	CL	36	17	91.1	19.0

The individual laboratory test reports are included in the Appendix of this report.

4.0 GEOTECHNICAL RECOMMENDATIONS

The following information is based upon the findings of this geotechnical engineering study and a review of the *Overall Plans* for the *Woodlawn Village East* project prepared by *Bowman Consulting Group* last revised on May 2014 (*the plans*). We believe that the project site is generally suitable for the proposed construction of the proposed residences, roadways, BMP facilities; and all associated site improvements.

The following sections provide general construction guidelines for site grading and earthwork activities, which include excavations for underground site utilities, and roadways. Preliminary geotechnical requirements are also provided for the support of building foundations, slab-on-grade, and below grade foundation walls.

4.1 Suitability of On-site Materials

The fine-grained low plasticity material encountered in the borings generally consists of Lean CLAY (CL); and Sandy SILT (ML) with low to medium plasticity. Therefore, natural on-site fine-grained soils of Stratum I are considered suitable for use as structural fill for building pads, road embankments, and backfill against over site utilities.

Low plasticity natural soil suitable for use as structural fill will likely be inter-layered with high plasticity soils. If high plasticity soils with liquid limit values greater than or equal to 40 and plasticity indices greater than or equal to 15 are encountered during construction phase, these soils are not suitable for use as structural fill or the direct subgrade support for building foundations or paved roadways. These soils, if encountered within the offset stakes of buildings and roadways, shall be undercut and replaced with approved structural fill to provide a minimum buffer of 4 feet below footings and 2 feet below grade slabs and pavement subgrades. High plasticity soils, identified as materials with values higher than those indicated above, are not suitable for use as backfill material against foundation walls.

We anticipate that the natural soil moisture of the on-site material will generally be near optimum moisture conditions. However, if earthwork is performed during wet seasons of the year or after periods of heavy precipitation, the material may have to be scarified and aerated to be properly compacted for use as structural fill.

All borrow materials that include coarse-grained fraction of (SM–SC) type soils, shall be tested for classification and shrink/swell characteristics prior to their use as structural fill or backfill material.

Based on the information obtained from the boring logs and laboratory test results, selective excavation and testing of the onsite soils should be expected during construction, in order to properly differentiate between suitable and non suitable structural fill.

Some soils may be wet or dry of the optimum moisture required for compaction; therefore, scarifying and drying by spreading and aerating or the use of a water truck during construction and prior to their reuse as compacted structural fill or backfill should be expected.

4.2 Earthwork

4.2.1 Stripping of Topsoil

All areas proposed for cut or fill shall be cleared, grubbed and stripped of all topsoil and root mat layer to the proposed limits of construction as shown on the approved plans for this project. The depth of the topsoil encountered at the boring locations varied between 2 and 6 inches. Therefore, for budgeting purposes, we recommend that an average of 10 inches of topsoil be used in estimating the site stripping.

However, due to the heavily wooded nature of the site, root-balls from the trees must be excavated deeper to remove the major roots; thus, increasing the volume to be excavated and trucked off site. Therefore, the depth of stripping shall be determined in the field. Topsoil may be stockpiled for later use in as the final 8 to 12 inches of over lot site grading around buildings.

4.2.2 Proof-rolling

All areas delineated and surveyed in the field to receive structural fill should be proof-rolled with a fully-loaded rubber-tired dump truck, having an axle weight of at least 10 tons, in order to identify all soft or unstable areas to be undercut.

The geotechnical engineer or his assigned representative should decide on the depth of undercut in order to avoid the removal of suitable or otherwise firm soils.

4.2.3 Borrow Material

All borrow material, whether on-site or imported from an off-site source, shall be tested for suitability and quality prior to its use as fill or backfill. The material shall be tested to determine particle gradation, plasticity and maximum dry density. The following standard tests shall be performed to determine the above properties of all imported fill material:

Determination of Moisture Content of Soils	ASTM D-2216
Particle Size Analysis of Soils	ASTM D-422
Atterberg Limits	ASTM D-4318
Organic Content	ASTM D-2974
Standard Proctor Test	VTM-1, ASTM D-698
CBR Test	VTM-8

Structural fill material shall consist of quality, free of organic, low plasticity soils that classify as GW, GP, GM, GC, SW, SP, SC, CL, ML or SM in accordance with ASTM D-2487. All suitable fill materials shall have a Plasticity Index value equal or less than 14 and meet the suitability requirements stated in IBC 2009 Section 1802.3 *Expansive Soils Classification* as indicated in **Section 4.1** of this report. All fill material shall be free of ice, snow, topsoil, trash, construction debris, rock sizes greater than 4 inches, or other deleterious material.

4.2.4 Fill Placement and Testing

Fill material placed in *roadway or paved areas* should be placed in no greater than 8-inch loose lifts and compacted to at least 95% of the maximum dry density as determined per VTM-1 method. Where fill depth in excess of 10 feet are required, we recommend that the compaction criteria be increased to 98% of the maximum dry density obtained in accordance with the Standard Proctor Method for the full depth of fill. However, the final 1-foot of fill shall be compacted to 100% of the maximum dry density as determined per VTM-1 method. The moisture content of the compacted fill should be within 2 percentage points of the optimum moisture of the material.

The controlled fill shall extend a minimum of 2 feet laterally outside the curb line plus 1 foot for every foot of fill above the subgrade. All VDOT roadways and frontage improvements should be constructed in accordance with VDOT Road and Bridge Specifications.

Fill materials for the *building pads* should be placed in no greater than 8-inch loose lifts and compacted to at least 95% of the maximum dry density as determined in accordance with specifications set forth in ASTM D-698 (Standard Proctor). Where fill depths in excess of 10 feet are required, we recommend that the compaction criteria be increased to 98% of the maximum dry density obtained in accordance with ASTM D-698 the Standard Proctor Method for the full depth of fill.

The moisture content of the compacted fill shall be within 2 percentage points of the optimum moisture of the material. The controlled fill for the building pads shall extend a minimum of 5 feet laterally outside the building pad plus 1-foot for each foot of fill above the existing subgrade.

Granular soils (i.e. SM or more granular soils) should be compacted with a smooth drum vibratory roller or rubber-tired compactors. Cohesive soils should be compacted with a sheep foot roller.

To ensure proper compaction efforts, field density determinations should be performed in accordance with specifications set forth in ASTM D-6938 (Nuclear Method) or D-1556 (Sand Cone Method). Compaction tests should be performed on every lift of fill placed. These tests shall be performed at a minimum frequency of 3 tests for every 500 feet along the alignment of site utilities and roadway fill and 2 tests for every lift of fill placed for building pads. All earthworks should be monitored on a full-time basis by a qualified inspector, acting under the guidance of a Professional Engineer, registered in the Commonwealth of Virginia.

4.3 Underground Site Utilities

We anticipate that conventional earth-moving equipment will be suitable for the excavation of the on-site soils to the depths indicated in the borings. We expect that perched groundwater will be encountered during trench excavations, particularly in low-lying areas of the site. Temporary dewatering methods may consist of ditching or sump pits and continuous pumping.

Temporary excavations greater than 4 feet should be properly shored or sloped away from the excavation with a minimum grade of 1.5H:1V. If sloping of temporary trenches and pits is not desired, then trench boxes should be utilized. All excavations should be performed in accordance with the current OSHA and VOSHA regulations.

4.4 Foundation Support

The proposed residential buildings can be supported on conventional shallow foundations consisting of continuous wall or column spread footings. The footings should be supported on approved structural fill or natural soils that meet the criteria outlined in **Section 4.1**.

If high plasticity CLAY (CH) or Elastic SILT (MH) type soils are encountered at or near footing subgrade during construction, the footing subgrade should either be lowered a minimum of 4 feet into the CH/MH stratum or undercut and replaced with a minimum of 4 feet of properly compacted fill material. This minimum depth for the foundation placement is recommended to prevent differential movement of the footing because of variable moisture changes in the high plasticity soils. Compacted fill may consist of the on-site coarse-grained Sandy SILT (ML), Clayey or Silty SAND (SC-SM) or approved imported structural fills.

We recommend that the building foundations of the residential buildings be designed for a net allowable soil bearing pressure of 2,500 pounds per square foot (psf) supported on either firm natural soils or approved structural fills. Soils suitable to support the recommended bearing pressure can be identified on the boring logs as those natural soils having a minimum Standard Penetration Test (SPT) value of 10 blows per foot (bpf).

In order to reduce the possibility of foundation bearing capacity failure and excessive settlement due local shear failure or punching shear failure, we recommend that as a minimum, wall footings should not be less than 16 inches in width and column footings should not be less than 30 inches in size. Adequate frost cover protection for all exterior footings should be provided at 2.5 feet below exterior grade along the footing lines. Interior footings, however, located within permanently heated areas may be located at nominal depth of 2 feet below the floor slab elevation.

Settlement of individual footings, designed in accordance with our recommendations outlined in this report, is expected to be small and within tolerable limits for the proposed residential buildings. For footings placed on suitable natural soils or properly compacted structural fill, total settlement is expected to be 1 inch.

Maximum differential settlement between adjacent columns is expected to be approximately 3/4-inch. These settlement values are based on our engineering experience of the soil and the anticipated structural loading, and are to guide the structural engineer with his design.

Proper construction procedures should be followed to maintain the quality of the footing excavations. Footing subgrade should be protected from precipitation, seepage, surface run-off and frost. We recommend that footings be cast the same day of excavation.

4.5 Foundations Walls, Backfill and Drainage

The *plans* indicate that residences may be constructed with below grade foundation walls. These walls should be designed for an equivalent fluid pressure of 45 psf per foot of wall depth. The equivalent fluid pressure is required based on the assumption that the backfill material may consist of on-site or imported soils, which classify as Silty SAND (SM) or more granular having liquid limit of 40 or less and plasticity index less than 15.

However, if more cohesive soils, such SILT (ML) or Lean CLAY (CL) are used as backfill material, the basement walls should be designed for an equivalent fluid pressure of 60 psf per foot of the wall depth. High plasticity clayey soils, such as FAT CLAY (CH) or Elastic SILT (MH) soils are not suitable for backfill material against foundation walls. Backfill material should not contain rock sizes greater than 4 inches in diameter.

The design lateral pressure assumes that adequate drainage behind the wall will be provided to prevent accumulation of free water. The requirements do not include the effects of surcharge loading which should be included in the wall design as additional lateral pressure acting uniformly against the wall.

We anticipate that seasonal groundwater levels may rise to foundation elevations during the wet periods of the year, i.e. between November and May. Therefore, exterior foundation drains are required around the perimeter of the buildings.

The exterior drain should consist of a 4-inch perforated PVC pipe embedded in 12 inches of VDOT #57 stone or washed bank run gravel. The stone should be wrapped in an approved filter fabric having an Equivalent Opening Size (EOS) of 70*m* to prevent clogging of the gravel with fines as shown on the *Foundation Wall Drainage Detail* provided in the Appendix of this report.

The interior drain shall be installed under the slab and should tie into the exterior drain via weep holes through the footings. The weep holes, 1.5-inch diameter PVC pipe, should be spaced at no more than eight (8) feet on center. The interior drain should also consist of a 12-inch layer of VDOT #57 stone wrapped in filter fabric.

Where drainage by gravity is not permitted, the invert of the exterior drain should be located above the invert of the interior drain and the interior drainpipe should be extended to the sump pump.

However, if drainage by gravity can be achieved through extending the outlet pipe of the exterior drain to a safe daylight point, then the invert of the interior drain should be higher than the exterior drain to allow the flow of groundwater through the weep holes and safely discharge away from the house. The outlet pipe from the exterior drain or the sump pump shall discharge to a point of daylight as directed by the project's Civil Engineer. Finished grades around buildings should be positively sloped at a gradient of not less than 5 percent.

4.6 Ground-supported Slabs

The lower floor slab-on-grade should be supported on low to medium plasticity natural soils, or on approved compacted structural fill that meets the specific requirements stated in **Section 4.1** of this report. A subgrade reaction modulus of 60 pci may be used for the design of floor slabs-on-grade supported on low to medium plasticity natural soils or approved compacted structural fill.

If the visual inspection of the subgrade material and/or hand auger recovered material reveals the presence of fine-grained soils, i.e. clays or silts, we recommend that a sample of the soil subgrade be tested to ensure that high plasticity soils, having plasticity index values equal or greater than 15, are not present at subgrade. Highly elastic or plastic soils, when encountered, should be undercut to at least 2 feet below the slab subgrade and replaced with properly compacted structural fill.

We recommend that all grade slabs be designed to be discontinuous at walls and pier footings. The slab should rest upon a minimum of 4 inches of free draining granular base. In addition, we recommend that wire mesh or fiber mesh reinforcement be included in the slab design. This reinforcement will minimize the crack width of any shrinkage cracks that may develop near the surface of the floor slab. A 6-mil polyethylene liner or similar vapor barrier should be provided between the underside of the slab and the granular base to limit moisture migration.

Where below-grade basement walls are considered, we recommend that interior and exterior drains be installed below grade foundation as discussed in **Section 4.5** of this report. Slab-on-grade subgrades shall be inspected by the Geotechnical Engineer for suitability and firmness prior to placement of the stone layer.

4.7 Pavement Subgrade Preparation

The subgrade for paved areas within the right-of-way of roadways, including curbs and sidewalks, shall consist of low plasticity soils of Stratum I, II or new compacted structural fill. If silt and clay type soils having liquid limit of 40 or more and plasticity index values equal or greater 15, respectively, are encountered at proposed subgrade elevations for roadways, curbs, and sidewalks, these materials should be undercut to a minimum depth of 2 feet below pavement subgrade and replaced with properly compacted structural fill.

Prior to placement of subbase stone, the subgrade shall be proof-rolled with a loaded dump truck to detect any soft, yielding or high plasticity soils. Unstable areas should be undercut and replaced with properly compacted controlled fill.

As the engineering characteristics of the on-site soils vary throughout the site, CBR tests should be performed within the proposed pavement areas at the time of construction in order to permit proper pavement design.

However, for preliminary design purposes, an average CBR value of 4 to 6 may be anticipated for subgrade soils consisting of on-site Silty to Clayey SAND (SM-SC). All pavement materials and construction methods should comply with the current VDOT specifications. The construction of roadway embankment and pavement materials, shall comply with the requirements and specifications of the Virginia Department of Transportation VDOT - *Road and Bridge Specifications.*

We recommend that the pavement design cross sections be designed using actual design traffic data from available traffic counts and volume projections. This is important for the design of pavements that will support truck traffic. The pavement materials should also be in accordance with those specified by VDOT *Superpave Guidelines and Special Provisions.*

Since groundwater at the site is perched, shoulder drains and French drains should be installed in accordance with VDOT standards. In general, where excavation is required to achieve the design subgrade elevation, shoulder drains should be installed.

Also, if perched groundwater is encountered at or near pavement subgrade levels during construction, the Geotechnical Engineer may recommend the use of pavement underdrains (Standard VDOT UD-4) as necessary.

4.8 Construction Considerations

It is expected that soils observed at the design subgrade elevation will include both granular soils and predominantly cohesive materials. The granular soils are usually not moisture and disturbance sensitive, and therefore, special considerations are not usually required to minimize disturbance. However, the silty and clayey soils that will probably be encountered over the majority of the subgrade area are extremely moisture and disturbance sensitive.

Because of this, it may be desirable to halt the excavation 1 to 2 feet above the design subgrade elevation so that any equipment required to excavate footing foundations can negotiate the site on material that will ultimately be removed. If the excavation is extended down to the design subgrade level, the disturbance caused by construction traffic will probably necessitate some undercutting of what would otherwise be suitable materials.

Deep dewatering wells as well as sump pit and pumping operations are expected to be required for dewatering the low lying areas at the site. As indicated in our boring logs, the groundwater levels taken in our borings indicate that groundwater will be a major issue; therefore, some sump pit and pumping operations are expected, as well as deep well pumping.

During construction operations, the contractor should continuously monitor the effect of the dewatering operations to insure that no fine materials are being pumped from the surrounding overburdened soils.

If excessive fines migrate into the excavation as a result of the dewatering apportions, subsidence of adjacent structures can occur. This is especially true if the adjacent buildings are not underpinned, and especially where a soldier beam and lagging system is installed.

Exposure to the environment may weaken the soils at the footing bearing level if the foundation excavations remain open for an extended period of time. Therefore, foundation concrete should be placed the same day that excavations are dug. If the bearing soils are softened by surface water intrusion or exposure, the softened soils must be removed from the foundation excavation bottom immediately prior to placement of concrete. If the excavation must remain open overnight, or rainfall becomes eminent while the bearing soils are exposed, we recommend that a 1 to 3-inch "mud-mat" of "lean" concrete be placed on the bearing soils before the placement of reinforcing steel.

All soils which become loosened or softened at the base of the excavation should be carefully removed and the subgrade extended to a suitable, undisturbed soil surface prior to the placement of foundation concrete. In addition, it should be pointed out that portion of old building foundations, utility lines, or other such construction obstacle may be encountered during excavation for this project. The contractor should be aware of this possibility. Care should be exercised during the excavation work to prevent loss of support of adjacent structures or streets. The sides of the excavation should be promptly braced in order to minimize the possibility of such occurrences.

OSHA safety regulations should be followed in all cases. We would be pleased to review the construction specifications after they have been prepared, so that we may have the opportunity to comment on the effects of the soil and groundwater conditions as they affect the design.

4.9 Stormwater Management Facilities

As indicated in the plans, the project will include a total of seventeen (17) BMP facilities according to the following detail:

Table 2 – Summary of Stormwater Management Facilities

BMP #	Type	Boring / Vicinity
BMP #1	Rain Garden	B-27
BMP#2	Rain Garden	B-26
BMP # 3	Swale	B-24
BMP # 4	Swale	B-25
BMP # 5	Swale	B-20
BMP # 6	Swale	B-22
BMP # 7	Rain Garden	B-16
BMP # 8	Rain Garden	B-15
BMP # 9	Rain Garden	B-10
BMP # 10	Rain Garden	B-9
BMP # 11	Rain Garden	B-7
BMP # 12	Swale	B-6
BMP # 13	Rain Garden	No boring
BMP # 14	Rain Garden	B-12
BMP # 15	Swale	B-13
BMP # 16	Wet Pond	No boring
BMP # 17	Open Space/Sheet Flow	B-8

Due to access restrictions at the time of field exploration borings B-1 to B-3 and B-5 were not advanced. Therefore, information from areas nearby BMP #13 and BMP #16 were not obtained.

Due to the preliminary nature of this exploration, no specific information was provided regarding the design and invert elevations of the proposed structures. However, it should be noted that the theoretical permeability rates[1] assigned by Fairfax County to the majority of these soils on the northern half of the site such as *Grist Mill* (40), *Gunston Silt Loam* (48A) and *Belstville Loam* (7B) range between 0.06 and 0.02 inches/hour; is considered low per the Virginia DEQ requirements.

The permeability rates of the majority of the soils in the southern end of the property such as *Mattapex Loam* (77B) and *Woodstown Sandy Loam* (109B) exhibit a wider range of permeability with values ranging between 0.2 and 6 inches/hour.

Additional subsurface investigation is required to determine the specific infiltration rates of the in-situ soils at proposed invert depths.

All BMP facilities shall be designed and constructed in strict accordance with the latest edition of the *Virginia Stormwater Management Handbook* (Volumes I & II) and its corresponding Technical Bulletins, when applicable.

5.0 CLOSING REMARKS

5.1 Qualifications

This report has been prepared for the exclusive use of Clark Realty Capital, LLC to assist them and their engineers during the design and construction phases of the proposed development. The opinions, conclusions, and recommendations contained herein are based upon the soil test borings, our interpretation of the data, and generally accepted principles of geotechnical engineering.

Please be advised that the scope of this report is intended for geotechnical purposes only and has not addressed any environmental-related issues, such as the presence or potential presence of hazardous materials, asbestos-containing materials, and/or the discovery/disclosure of any subsurface soil or groundwater contaminants.

[1] *"Permeability refers to the quality that enables air and water to move through the soil. Permeability is expressed as a rate, in inches per hour, in which water moves downward through the soil. Subsurface permeability refers to the permeability of the least permeable subsurface layer" (http://www.fairfaxcounty.gov/dpwes/environmental/soils_map_guide.pdf)* .

Please be advised that although the test borings were logged by experienced engineers, it is sometimes difficult to record changes in subsoil stratigraphy within narrow limits; therefore, some deviation in the materials reported on the field logs and the materials encountered in the field should be anticipated.

Any change in soil type observed during construction, or change in proposed location of the structures or grades should be provided to us so that we may modify portions of this text if necessary. Any conclusions or recommendations that are based on data contained in this report that are made by others are the responsibility of others.

The report is final in nature and once the final plans have advanced, GC&T should be contacted to review our recommendations and drill additional borings, if needed, and update our recommendations based on the final design plans.

APPENDICES

Test Boring Log (B-4, and B-6 to B-27)

Laboratory Test Results

Foundation Wall Drainage Details
(Buried Basement Condition)
(Walkout Basement Condition)

Site Vicinity Map

Soil Map

Boring Location Plan (BLP)

TEST BORING LOG

BORING NO. B-4 ELEVATION: 30.9 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01/14/15
DRILL RIG:	D-50 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 11.2 ft 11.0 ft

ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
30 / 0	3/6 4/6 9/6 8/6	13	OH	Topsoil (3"-6")					
			ML	Tan brown sandy SILT, trace of mica, and gravel moist, stiff.					
	6/6 10/6 15/6	25	CL	Orange brown LEAN CLAY, trace of mica, moist, very stiff.	24.4	49	23	95.1	
25 / 5	6/6 10/6 13/6	23							
20 / 10	5/6 9/6 12/6	21							
15 / 15	4/6 5/6 7/6	12		Turning stiff at 13.5 ft.					
				End of boring at 15.0 ft.					
10 / 20									
5 / 25									
0 / 30									

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

BORING NO. B-6 ELEVATION: 33.8 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-07-15
DRILL RIG:	GEMCO 45 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 11.0 ft 11.0 ft

ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
0 / 30	2/6, 3/6, 3/6, 4/6	6	OH	Topsoil (2"-6")					
			CL	Tan brown LEAN CLAY, trace of root, moist, medium stiff.					
	5/6, 6/6, 10/6	16		Turning very stiff at 2.5 ft.					
5 / 25	18/6, 23/6, 23/6	46		Turning hard below 5.0 ft.					
	8/6, 14/6, 18/6	32		Turning orange brown below 8.5 ft.					
10 / 20	8/6, 9/6, 14/6	23		Turning very stiff below 13.5 ft.					
15 / 15				End of boring at 15.0 ft.					
20 / 10									
25 / 5									
30 / 0									

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

BORING NO. B-7 ELEVATION: 33.0 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-17-15
DRILL RIG:	GEMCO 45 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 11.0 ft. 11.0 ft.

ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
0 / 30	2/6, 3/6, 4/6, 7/6	7	OH	Topsoil (3"-6")					
	8/6, 9/6, 15/6	24	ML	Tan brown SILT, moist, medium stiff. Turning very stiff at 2.5 ft.					
5 / 25	9/6, 19/6, 25/6	44	CL	Orange brown LEAN CLAY, moist, hard.	14.3	29	12	97.8	
	9/6, 14/6, 16/6	30		Turning gray at 8.5 ft.					
10 / 20	8/6, 14/6, 15/6	29		Turning very stiff, gray brown and sandy below 13.5 ft.					
15 / 15				End of boring at 15.0 ft.					
20 / 10									
25 / 5									
30 / 0									

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

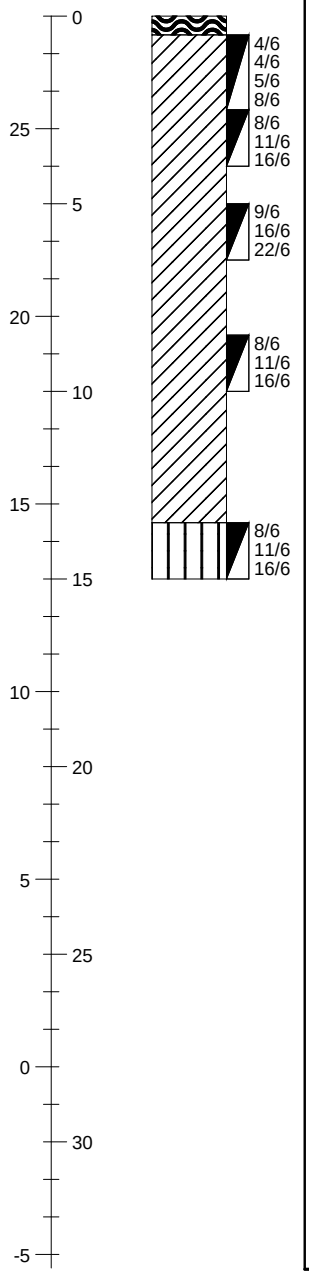
BORING NO. B-8 ELEVATION: 28.0 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-07-15
DRILL RIG:	GEMCO 45 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 11.1 ft. 11.0 ft.



ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
		9	OH	Topsoil (3"-6")					
			CL	Brown sandy LEAN CLAY, trace of root and gravel, moist, medium stiff.					
		27		Turning very stiff, and gray brown below 2.5 ft.					
		38		Turning hard and orange brown below 5.0 ft.					
		27		Turning very stiff and tan brown below 8.5 ft .					
		27	MH	Gray brown sandy PLASTIC SILT, moist, very stiff.					
				End of boring at 15.0 ft.					

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

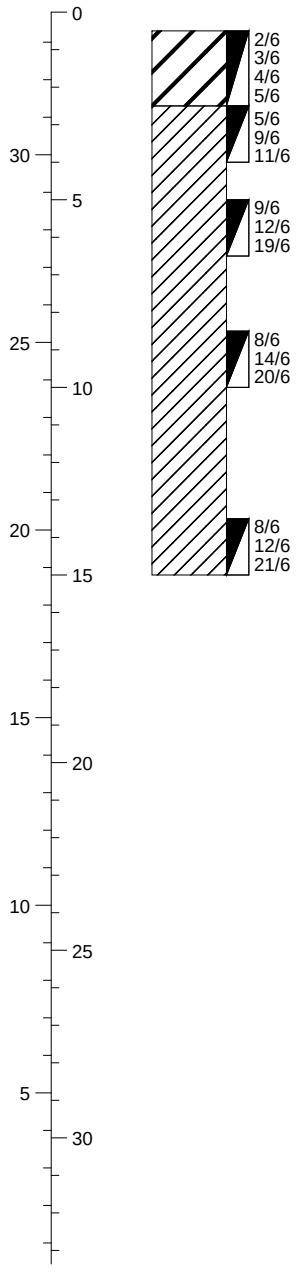
BORING NO. B-9 ELEVATION: 33.8 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-08-2015
DRILL RIG:	GEMCO 45 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 11.0 ft. 11.0 ft.



ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
		7	CH	Topsoil (3"-6") Brown sandy FAT CLAY, moist, medium stiff.					
		20	CL	Tan brown sandy LEAN CLAY, moist, very stiff.					
		31		Turning hard below 5 ft.					
		34		Turning orange brown below 8.5 ft.					
		33		Turning tan brown below 13.5 ft.					
				End of boring at 15.0 ft.					

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

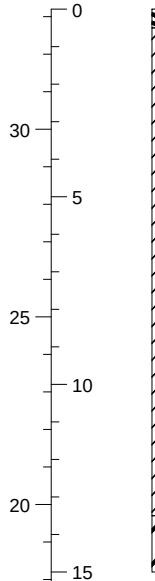
BORING NO. B-10 ELEVATION: 33.2 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-05-15
DRILL RIG:	GEMCO 45 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 11.3 ft. 11.3 ft.



ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
		7	OH	Topsoil (3"-6")					
		28	CL	Tan brown LEAN CLAY, moist, medium stiff. Turning very stiff at 2.0 ft.					
		46		Turning hard below 5.0 ft.					
		45							
		36	CH	Red brown FAT CLAY, moist, hard.					
				End of boring at 15.0 ft.					

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

BORING NO. B-11 ELEVATION: 34.2 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-05-2015
DRILL RIG:	GEMCO 45 ATV	LOGGED BY:	xl

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 11.0 ft. 11.0 ft.

ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
0 / 30	2/6 3/6 7/6 7/6	10	OH	Topsoil (3"-6")					
			CH	Tan brown FAT CLAY, trace of root, moist, stiff.					
	9/6 17/6 23/6	40	CL	Tan brown sandy LEAN CLAY, moist, hard.					
5 / 25	14/6 28/6 28/6	56							
	8/6 14/6 20/6	34		Turning orange brown below 8.5 ft.	17.9	37	17	93.6	
10 / 20	7/6 15/6 16/6	31							
15 / 15				End of boring at 15.0 ft.					
20 / 10									
25 / 5									
30 / 0									

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

BORING NO. B-12 ELEVATION: 33.0 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-08-15
DRILL RIG:	GEMCO 34 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 11.0 ft. 11.0 ft.

ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
0 / 30	2/6, 3/6, 4/6, 5/6	9	OH	Topsoil (3"-6")					
			CH	Tan brown FAT CLAY, moist, medium stiff.					
	7/6, 14/6, 20/6	34		Turning hard and orange brown below 2.5 ft.	27.5	57	28	91.1	
5 / 25	11/6, 14/6, 25/6	39		Turning tan brown and sandy at 5 ft.					
	8/6, 14/6, 18/6	32	ML	Light gray silt, moist, hard.					
10 / 20	8/6, 13/6, 18/6	31	CH	Red brown FAT CLAY, moist, hard.					
15 / 15				End of boring at 15.0 ft.					
20 / 10									
25 / 5									
30 / 0									

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

BORING NO. B-13 ELEVATION: 30.0 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-05-15
DRILL RIG:	GEMCO 45 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 11.6 ft. 11.6 ft.

ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
30 — 0	2/6 3/6 5/6 6/6	8	OH	Topsoil (3"-6")					
	7/6 9/6 11/6	20	CH	Yellow brown FAT CLAY, moist, medium stiff. Turning gray and very stiff at 2.5 ft.					
25 — 5	8/6 9/6 14/6	23	CL	Gray brown LEAN CLAY, moist, very stiff.					
	9/6 12/6 15/6	27		Turning tan brown at 8.5 ft.					
20 — 10									
	8/6 14/6 20/6	34	CH	Gray FAT CLAY, moist, hard.					
15 — 15				End of boring at 15.0 ft.					
10 — 20									
5 — 25									
0 — 30									

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

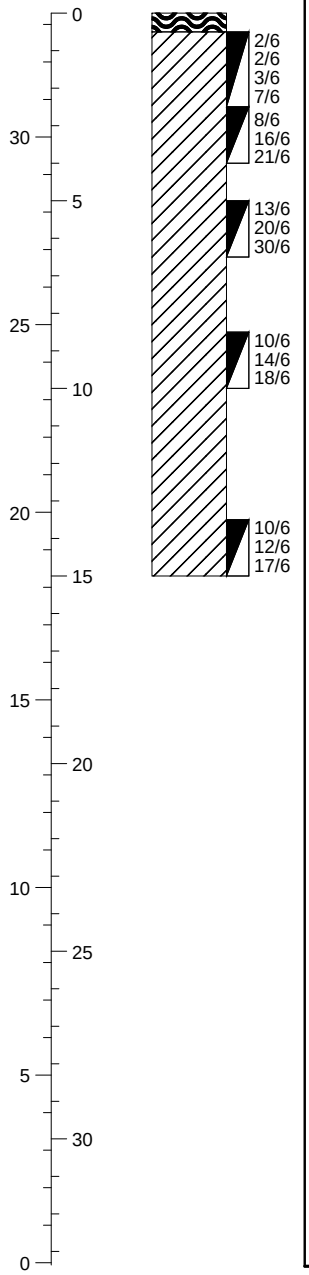
BORING NO. B-14 ELEVATION: 33.3 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	RECON
DRILL RIG:	GEMCO 45 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 11.0 ft. 11.0 ft.



ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
		5	OH	Topsoil (3"-6")					
			CL	Brown LEAN CLAY, trace of root, moist, medium stiff.					
		37		Turning hard, gray and without root below 2.5 ft.					
		50							
		32							
		29		Turning very stiff, tan brown, and sandy at 13.5 ft.					
				End of boring at 15.0 ft.					

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

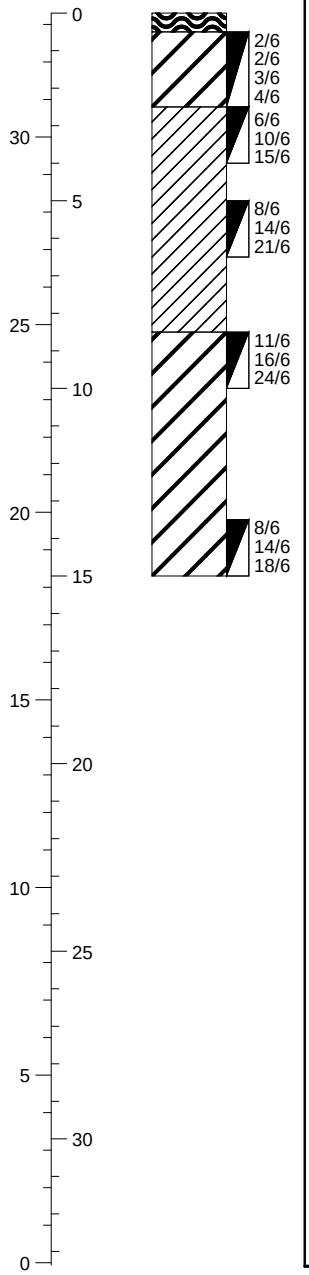
BORING NO. B-15 ELEVATION: 33.3 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-09-15
DRILL RIG:	GEMCO 45 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 11.5 ft. 11.3 ft.



ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
		5	OH	Topsoil (3"-6")					
			CH	Gray brown FAT CLAY, moist, medium stiff.					
		25	CL	Tan brown sandy LEAN CLAY, moist, very stiff.					
		35		Turning hard below 5.0 ft.					
		40	CH	Tan brown FAT CLAY, moist, hard.					
		32		Turning reddish brown at 13.5 ft.					
				End of boring at 15.0 ft.					

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

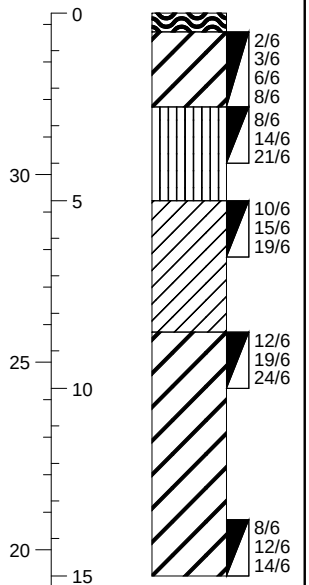
BORING NO. B-16 ELEVATION: 34.3 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-09-15
DRILL RIG:	GEMCO 45 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 10.3 ft. 10.2 ft.



ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
		9	OH	Topsoil (3"-6")					
			CH	Gray brown FAT CLAY, moist, stiff.					
		35	ML	Brown sandy SILT, moist, hard.					
		34	CL	Tan brown LEAN CLAY, moist, hard.					
		43	CH	Gray FAT CLAY, moist, hard.					
		26		Turning very stiff at 13.5 ft.					
				End of boring at 15.0 ft.					

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

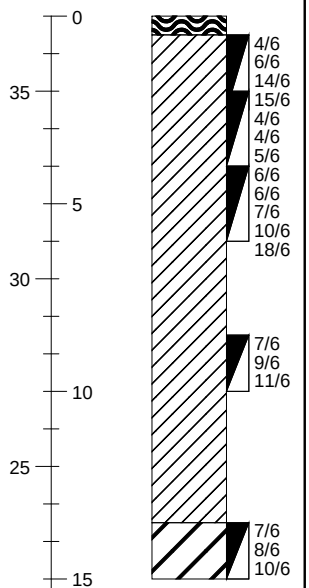
BORING NO. B-17 ELEVATION: 37.0 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-14-15
DRILL RIG:	GEMCO 45 ATV	LOGGED BY:	xl

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 12.1 ft. 12.0 ft.



ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
		20	OH	Topsoil (3"-6")					
			CL	Dark brown LEAN CLAY, trace of root, moist, very stiff.					
		9		Turning stiff and dark gray at 2.0 ft.					
		17		Turning very stiff and gray brown below 4.0 ft.					
		20		Turning brown at 8.5 ft.					
		18	CH	Brown FAT CLAY, moist, very stiff.					
				End of boring at 15.0 ft.					

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

BORING NO. B-18 ELEVATION: 34.7 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-14-15
DRILL RIG:	gem co 45 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 11.1 ft. 11.0 ft.

ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
0 / 30	2/6, 3/6, 5/6, 6/6	8	OH	Topsoil (3"-6")					
			ML	Tan brown sandy SILT, trace of mica and root, moist, medium stiff.					
5 / 25	3/6, 4/6, 6/6	10		Turning stiff without mica at 2.5 ft.					
	3/6, 6/6, 9/6	15	CL	Orange brown LEAN CLAY, moist, very stiff.					
10 / 20	7/6, 9/6, 12/6	21							
	4/6, 5/6, 8/6	13		Turning stiff below 13.5 ft.					
15 / 15				End of boring at 15.0 ft.					
20 / 10									
25 / 5									
30 / 0									

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

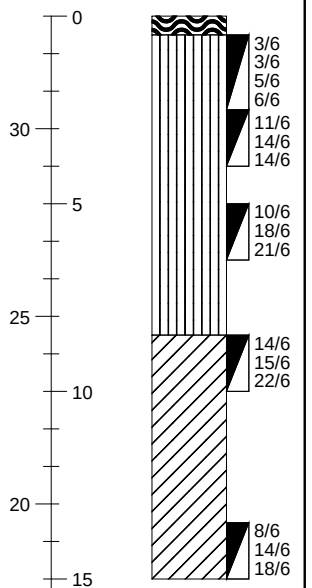
BORING NO. B-19 ELEVATION: 33.0 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-09-15
DRILL RIG:	GEMCO 45 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 11.0 ft. 11.0 ft.



ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
		8	OH	Topsoil (3"-6")					
			ML	Brown SILT, moist, medium stiff.					
		28		Turning very stiff at 2.5 ft.					
		39		Turning hard, and gray at 5.0 ft.					
		37	CL	Orange brown LEAN CLAY, moist, hard.					
		32		Turning dark brown and sandy at 13.5 ft.					
				End of boring at 15.0 ft.					

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

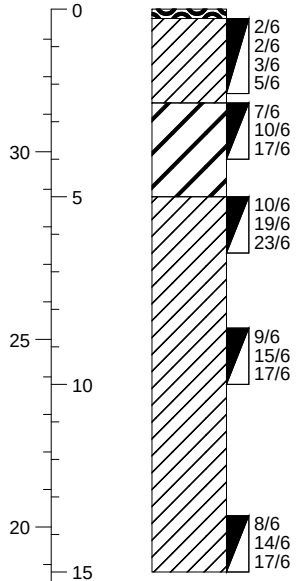
BORING NO. B-20 ELEVATION: 33.8 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-09-15
DRILL RIG:	GEMCO 45 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 11.5 ft. 11.3 ft.



ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
		7	OH	Topsoil (3"-6")					
			CL	Brown LEAN CLAY, moist, medium stiff.					
		27	CH	Gray sandy FAT CLAY, trace of root, moist, very stiff.					
		42	CL	Orange brown LEAN CLAY, moist, hard.					
		32							
		31		Turning dark brown below 13.5 ft.					
				End of boring at 15.0 ft.					

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

BORING NO. B-21 ELEVATION: 34.3 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-09-15
DRILL RIG:	GEMCO 45 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 12.0 ft. 12.0 ft.

ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
0 / 30	3/6, 5/6, 6/6, 6/6	11	OH	Topsoil (3"-6")					
			ML	Tan brown SILT, moist, stiff.					
	7/6, 13/6, 14/6	27		Turning very stiff at 2.5 ft.					
5 / 25	12/6, 18/6, 26/6	44	CL	Orange brown LEAN CLAY, moist, hard.					
	9/6, 14/6, 18/6	32		Turning gray brown at 8.5 ft.					
10 / 20	6/6, 11/6, 13/6	24		Turning very stiff, brown and sandy below 13.5 ft.					
15 / 15				End of boring at 15.0 ft.					
20 / 10									
25 / 5									
30 / 0									

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

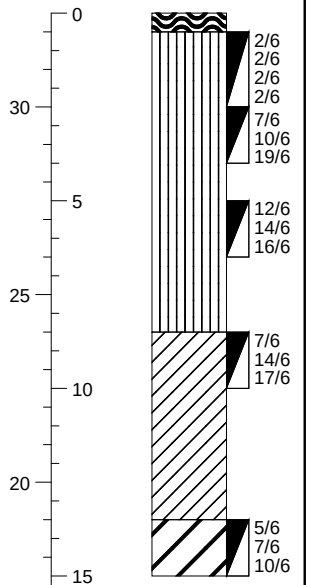
BORING NO. B-22 ELEVATION: 32.5 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-14-15
DRILL RIG:	D-59 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 11.2 ft. 11.1 ft.



ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
		4	OH	Topsoil (3"-6")					
		29	ML	Tan brown SILT, trace of root, moist, soft. Turning very stiff below 2.5 ft.					
		30							
		31	CL	Gray brown LEAN CLAY, moist, hard.					
		17	CH	Dark brown FAT CLAY, moist, stiff.					
				End of boring at 15.0 ft.					

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

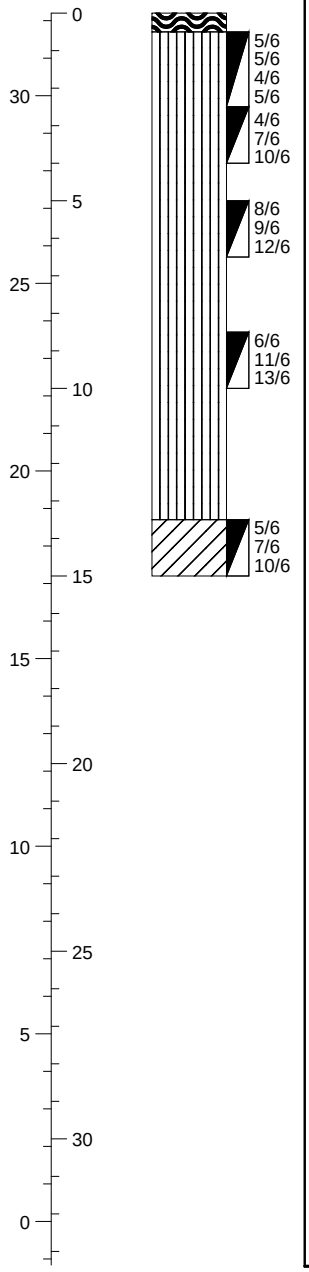
BORING NO. B-23 ELEVATION: 32.2 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-14-15
DRILL RIG:	D-50 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 11.6 ft. 11.2 ft.



ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
		9	OH	Topsoil (3"-6")					
			ML	Tan brown SILT, trace of root, moist, stiff.					
		17		Turning very stiff without root below 2.5 ft.					
		21		Turning dark brown at 5.0 ft.					
		24		Turning gray brown and trace of mica at 8.5 ft.					
		17	CL	Tan brown LEAN CLAY, moist, very stiff.					
				End of boring at 15.0 ft.					

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

BORING NO. B-24 ELEVATION: 33.9 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-13-15
DRILL RIG:	GEMCO 45 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 11.3 ft. 11.2 ft.

ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
0 / 30	4/6, 3/6, 3/6, 5/6	6	OH	Topsoil (3"-6")					
			ML	Tan brown SILT, trace of root, moist, medium stiff.					
5 / 25	10/6, 15/6, 20/6	35	CL	Tan brown LEAN CLAY, moist, hard.					
	11/6, 16/6, 22/6	38		Turning gray brown below 5.0 ft.					
10 / 20	10/6, 17/6, 26/6	43							
15 / 15	7/6, 12/6, 17/6	29	MH	Red brown sandy ELASTIC SILT, moist, very stiff.					
				End of boring at 15.0 ft.					
20 / 10									
25 / 5									
30 / 0									

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

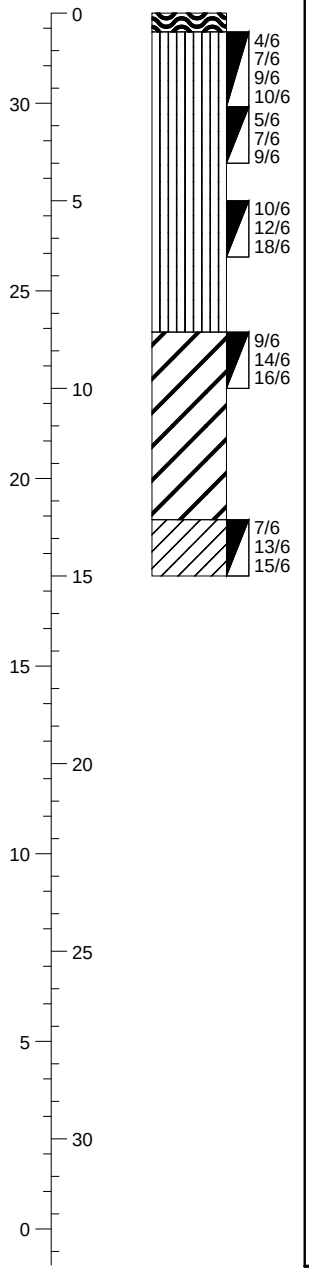
BORING NO. B-25 ELEVATION: 32.4 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-13-15
DRILL RIG:	GEMCO 45 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 12.0 ft. 11.6 ft.



ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
		16	OH	Topsoil (3"-6")					
			ML	Tan brown SILT, moist, very stiff.					
		16		Turning hard below 5.0 ft.					
		30							
		30	CH	Gray FAT CLAY, moist, hard.					
		28	CL	Tan brown LEAN CLAY, moist, very stiff.					
				End of boring at 15.0 ft.					

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

BORING NO. B-26 ELEVATION: 33.7 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-13-15
DRILL RIG:	GEMCO 45 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 11.2 ft. 11.0 ft.

ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
0 / 30	2/6 2/6 4/6 6/6	18	OH	Topsoil (3"-6")					
			ML	Tan brown SILT, trace of root, moist, very stiff.					
5 / 25	10/6 12/6 16/6	28	CL	Gray LEAN CLAY, trace of root, moist, very stiff.					
	10/6 15/6 21/6	36		Turning hard and yellowish brown below 5.0 ft.					
10 / 20	9/6 12/6 14/6	26		Turning very stiff below 8.5 ft.					
15 / 15	9/6 14/6 19/6	33		Turning hard and dark brown below 13.5 ft.					
				End of boring at 15.0 ft.					
20 / 10									
25 / 5									
30 / 0									

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

TEST BORING LOG

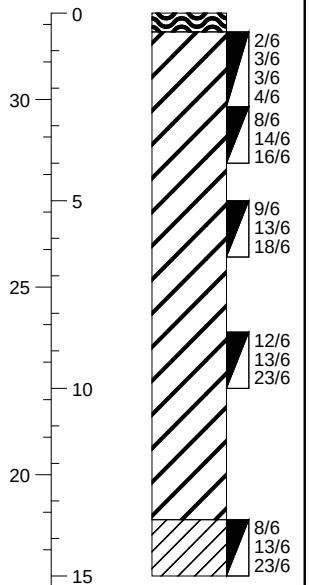
BORING NO. B-27 ELEVATION: 32.3 ft.

PROJECT:	Fort Belvoir Woodlawn Village	GC&T JOB NO.:	214M-7353
CLIENT:	Clark Realty	DATE DRILLED:	01-13-15
DRILL RIG:	GEMCO 45 ATV	LOGGED BY:	XL

AT COMPLETION -- AFTER 24 HOURS

WATER DEPTH: Dry Dry

CAVE-IN DEPTH: 11.6 ft. 11.3 ft.



ELEVATION and DEPTH	SOIL SYMBOLS SAMPLERS AND TEST DATA	SPT "N" VALUE	USCS	DESCRIPTION	MOIST. %	LIQUID LIMIT	PLASTIC INDEX	% PASS # 200	LOGGERS REMARKS
		6	OH	Topsoil (3"-6")					
			CH	Gray brown FAT CLAY, moist, medium stiff.					
		30		Turning very stiff and gray at 2.5 ft.					
		31		Turning hard at 5.0 ft.					
		46		Turning gray brown at 8.5 ft.					
		36	CL	Dark brown LEAN CLAY, moist, hard.					
				End of boring at 15.0 ft.					

Test boring terminated at 15 feet.

ENGINEER'S COMMENTS:

Lines between material descriptions indicate approximate boundaries; actual transitions may vary between test boring locations.

FIELD CLASSIFICATION SYSTEM FOR SOIL EXPLORATION

Soil identification is made based on the estimated particle size for predominately course-grained soils and on the cohesiveness of predominately fine-grained soils. When a soil sample consists of two or more types, the soil percentages are estimated by weight and indicated as follows:

Soil Type	Particle Size
Boulder	12"+
Cobble	3 – 12"
Gravel	
(Course)	¾" - 3"
(Fine)	#4 – ¾"
Sand	
(Course)	#10 - #4
(Medium)	#40 – #10
(Fine)	#200 - #40
Silt / Clay	<#200

Soil Component	Soil Type	Percentage
Major (Uppercase Letters)	SILT	50+
	CLAY	50+
	SAND	50+
	GRAVEL	50+
Secondary (Adjective)	Clayey / Silty	over 12%
	Sandy / Gravelly	over 30%
(with)	Clay / Silt	5 to 12%
	Sand / Gravel	15 to 30%
(trace)	Presence only	

The Standard Penetration Resistance values (N-values) are used to describe the relative density of coarse-grained soils or the consistency of fine-grained soils

RELATIVE DENSITY

N-value	Term
0 – 4	Very Loose
5 – 10	Loose
11 – 29	Medium Dense
30 – 50	Dense
51+	Very dense

CONSISTENCY

N- value	Term
0 – 1	Very Soft
2 – 4	Soft
5 – 8	Medium Stiff
9 – 15	Stiff
16 – 30	Very Stiff
31 – 60	Hard
60+	Very Hard

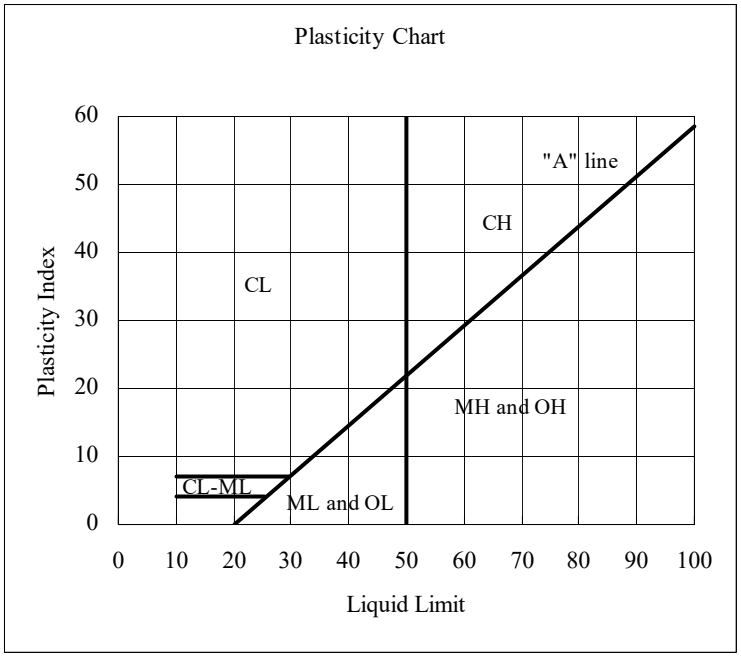
Geotechnical Consulting & Testing Inc.
4899 Prince William Parkway
Woodbridge, Virginia 22192
Tel.: (703) 730-4160 Fax: (703) 337-5359

BORING LOG SOIL CLASSIFICATION AND N-VALUE CHART

VISUAL CLASSIFICATION PROCEDURE

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487)

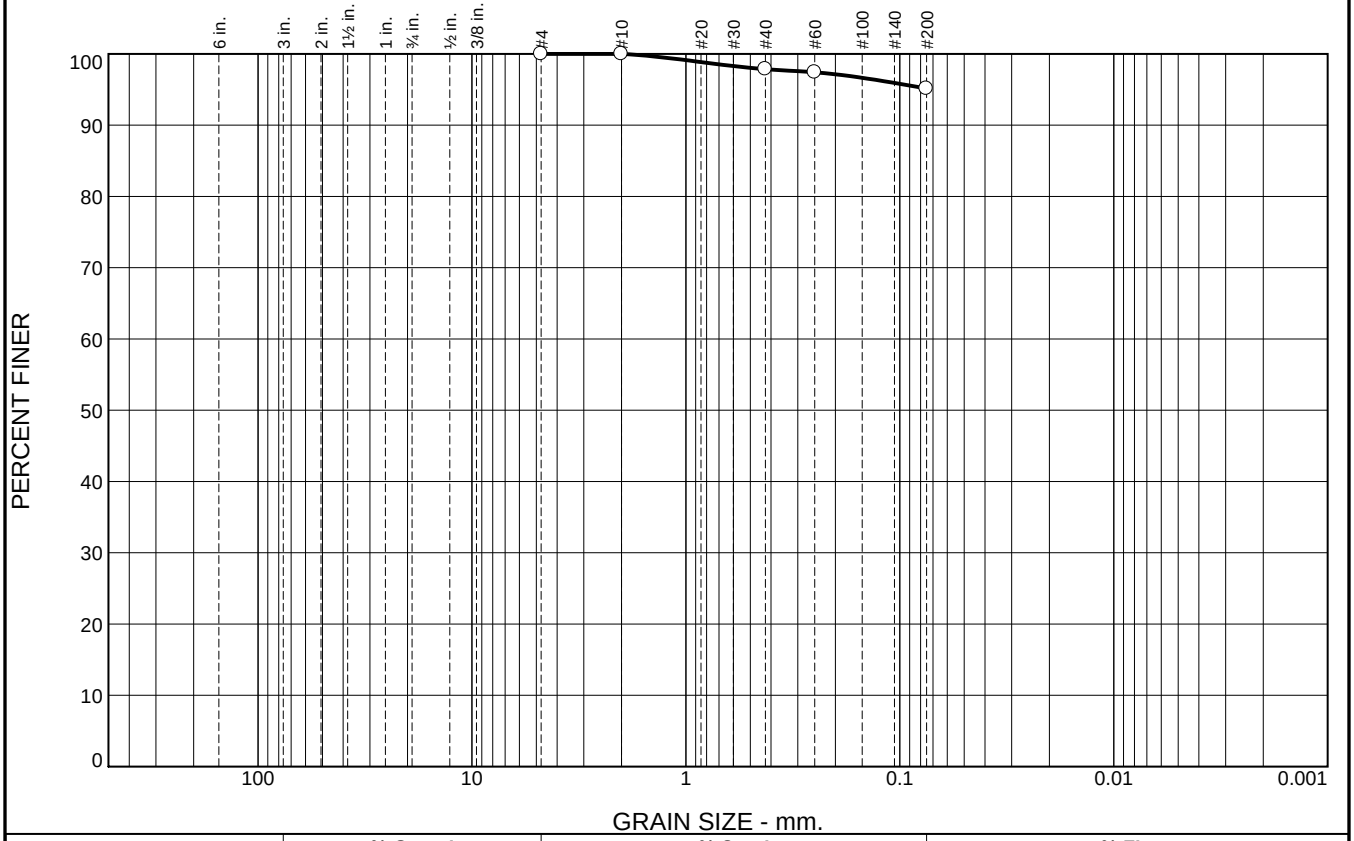
Major Divisions			Group Symbols		Typical Names	Laboratory Classification Criteria		
Coarse-grained soils (More than half of material is larger than No. 200 Sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (Little or no fines)	GW		Well-graded gravels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows: Less than 5 percent GW, GP, SW, SP; More than 12 percent GM, GC, SM, SC; 5 to 12 percent Borderline cases requiring dual symbols [b]	$C_u = D_{60}/D_{10}$ greater than 4; $C_c = (D_{30})^2/(D_{10}xD_{60})$ between 1 and 3	
			GP		Poorly graded gravels, gravel-sand mixtures, little or no fines		Not meeting all gradation requirements for GW	
		Gravels with fines (Appreciable amount of fines)	GM [a]	d	Silty gravels, gravel-sand mixtures		Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
				u				
			GC		Clayey gravels, gravel-sand-clay mixtures		Atterberg limits below "A" line or P.I. less than 7	
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW		Well-graded sands, gravelly sands, little or no fines		$C_u = D_{60}/D_{10}$ greater than 6; $C_c = (D_{30})^2/(D_{10}xD_{60})$ between 1 and 3	
			SP		Poorly graded sands, gravelly sands, little or no fines		Not meeting all gradation requirements for SW	
		Sands with fines (Appreciable amount of fines)	SM [a]	d	Silty sands, sand-silt mixtures		Atterberg limits above "A" line or P.I. less than 4	Limits plotting in CL-ML zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
				u				
			SC		Clayey sands, sand-clay mixtures		Atterberg limits above "A" line with P.I. greater than 7	
Fine-grained soils (More than half material is smaller than No. 200 Sieve)	Silts and clays (Liquid limit less than 50)		ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity			
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL		Organic silts and organic silty clays of low plasticity			
	Silts and clays (Liquid limit greater than 50)		MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts			
			CH		Inorganic clays of high plasticity, fat clays			
			OH		Organic clays of medium to high plasticity, organic silts			
	Highly Organic soils		Pt		Peat and other highly organic soils			



[a] Division of GM and SM groups into subdivisions of d and u are for roads and airfields only. Subdivision is based on Atterberg limits; suffix d used when L.L. is 28 or less and the P.I. is 6 or less; the suffix u used when L.L. is greater than 28.

[b] Borderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols. For example: GW-GC,well-graded gravel-sand mixture with clay binder. (From Table 2.16 - Winterkorn and Fang, 1975)

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	2.1	2.8	95.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#40	97.9		
#60	97.4		
#200	95.1		

* (no specification provided)

Soil Description

Orange Brown, Lean Clay. (Low Mica)

Atterberg Limits

PL= 26 LL= 49 PI= 23

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(25)

Remarks

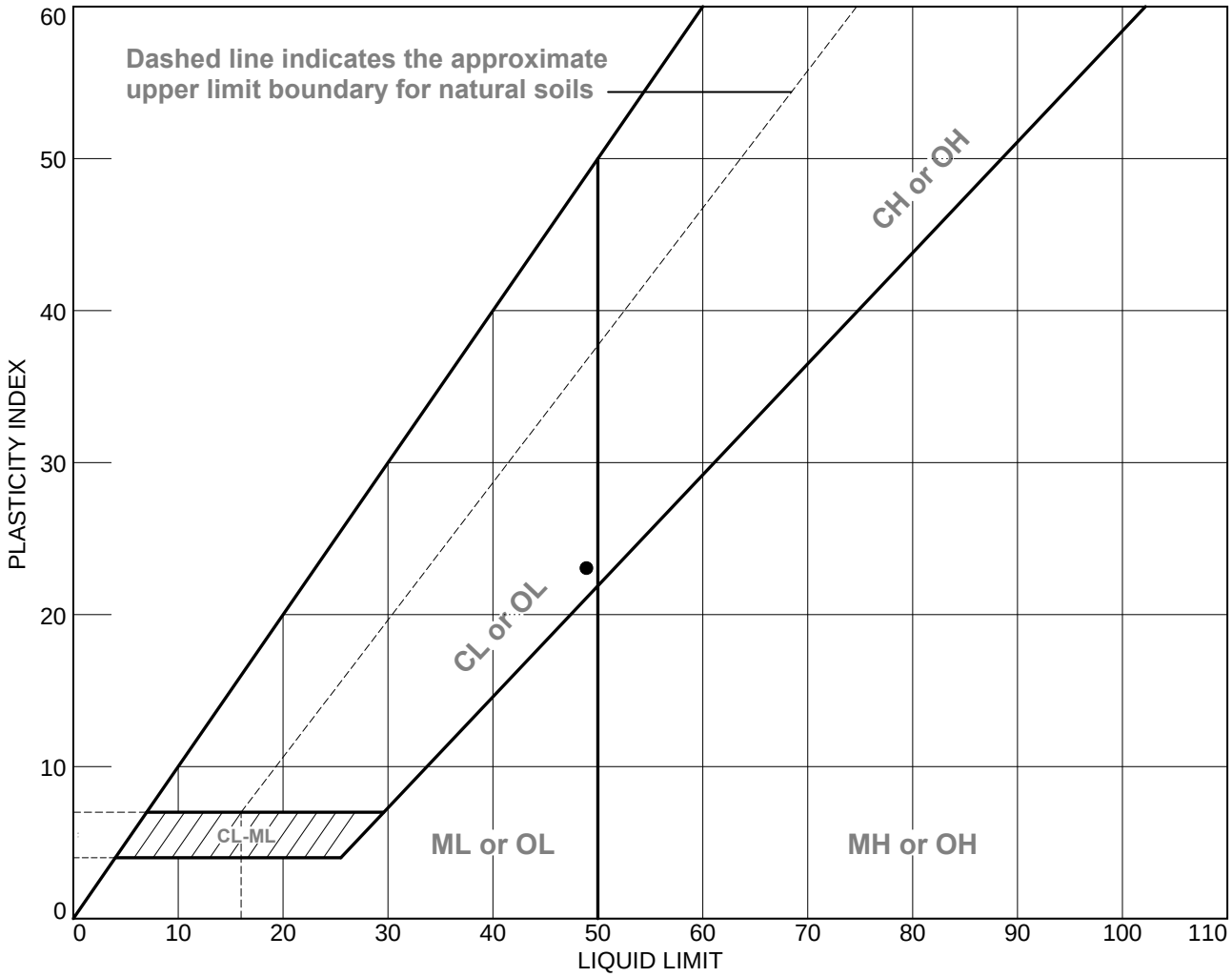
Location: B-4
Sample Number: S-2 **Depth:** 2.0 - 3.5' **Date:** 01-28-15

Geotechnical Consulting & Testing, Inc.
Dulles, VA

Client: Clark Realty
Project: Woodlawn Village

Project No: 214M-7353 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



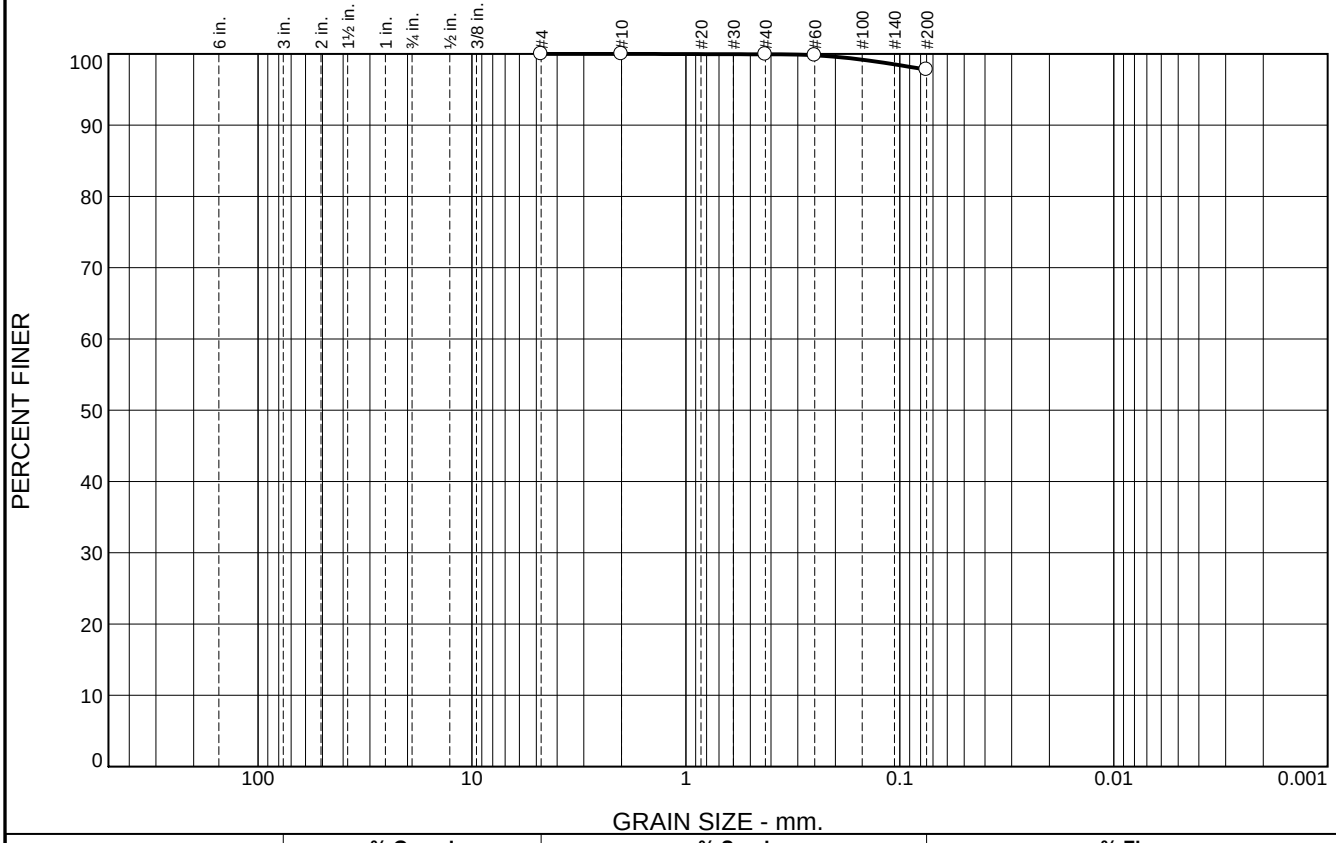
SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	B-4	S-2	2.0 - 3.5'	24.4	26	49	23	CL

Geotechnical Consulting & Testing, Inc.
Dulles, VA

Client: Clark Realty
Project: Woodlawn Village

Project No.: 214M-7353 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	2.1	97.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#40	99.9		
#60	99.8		
#200	97.8		

* (no specification provided)

Soil Description

Orange Brown, Lean Clay. (Low Mica)

Atterberg Limits

PL= 17 LL= 29 PI= 12

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(11)

Remarks

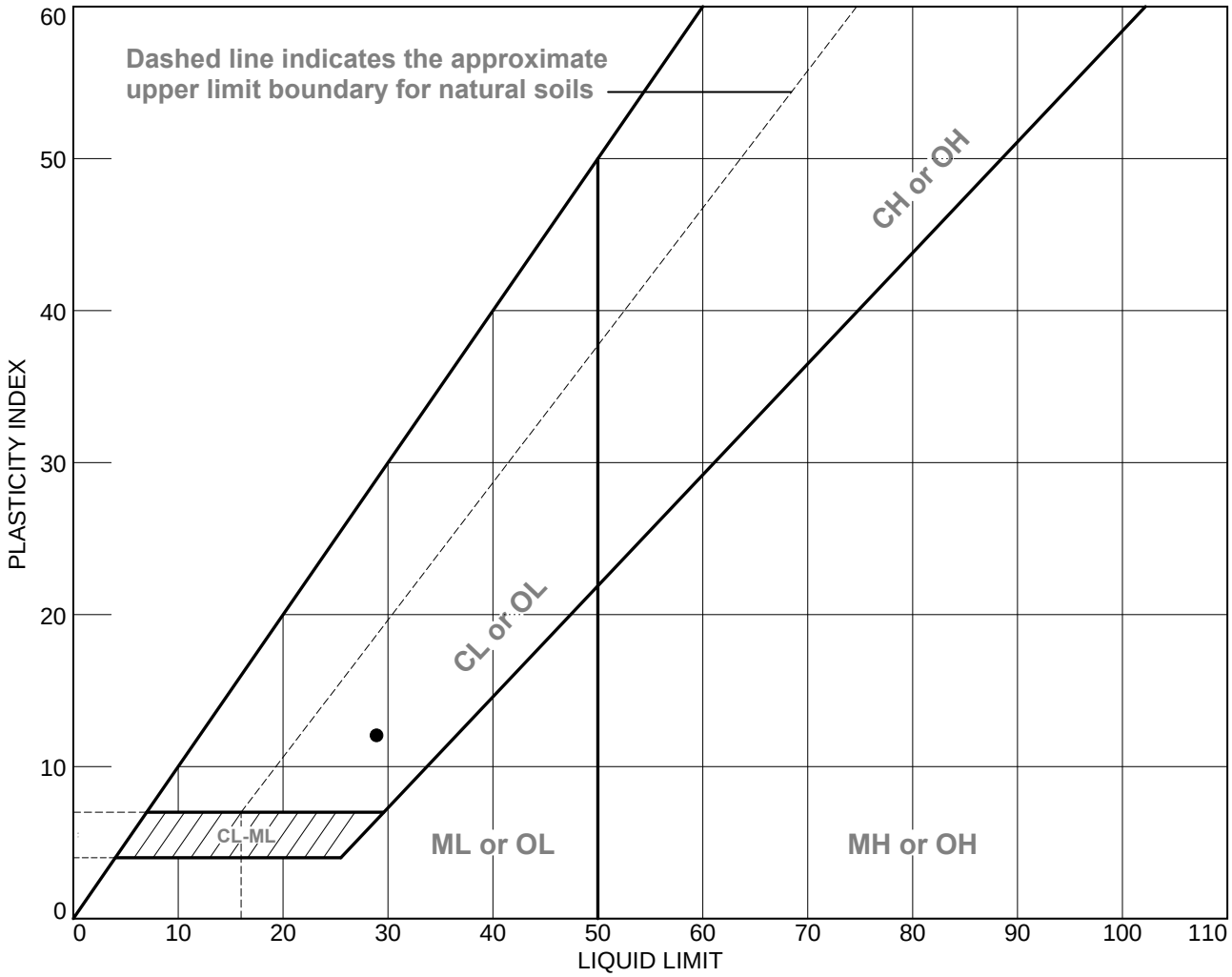
Location: B-7
Sample Number: S-4 **Depth:** 8.5 - 13.5' **Date:** 01-28-15

Geotechnical Consulting & Testing, Inc.
Dulles, VA

Client: Clark Realty
Project: Woodlawn Village

Project No: 214M-7353 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



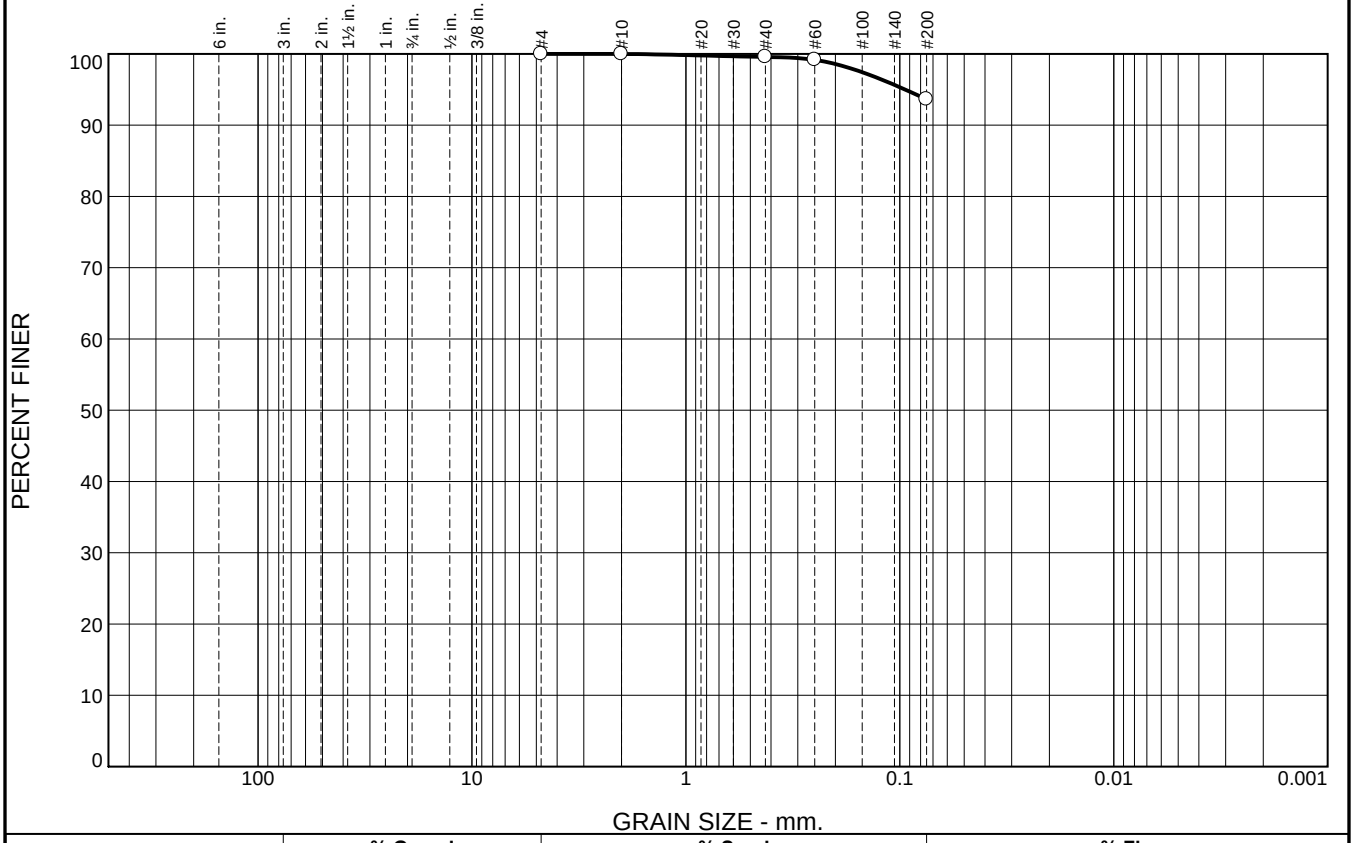
SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	B-7	S-4	8.5 - 13.5'	14.3	17	29	12	CL

Geotechnical Consulting & Testing, Inc.
Dulles, VA

Client: Clark Realty
Project: Woodlawn Village

Project No.: 214M-7353 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.4	6.0	93.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#40	99.6		
#60	99.2		
#200	93.6		

* (no specification provided)

Soil Description

Orange Brown, Lean Clay. (Low Mica)

Atterberg Limits

PL= 20 LL= 37 PI= 17

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(16)

Remarks

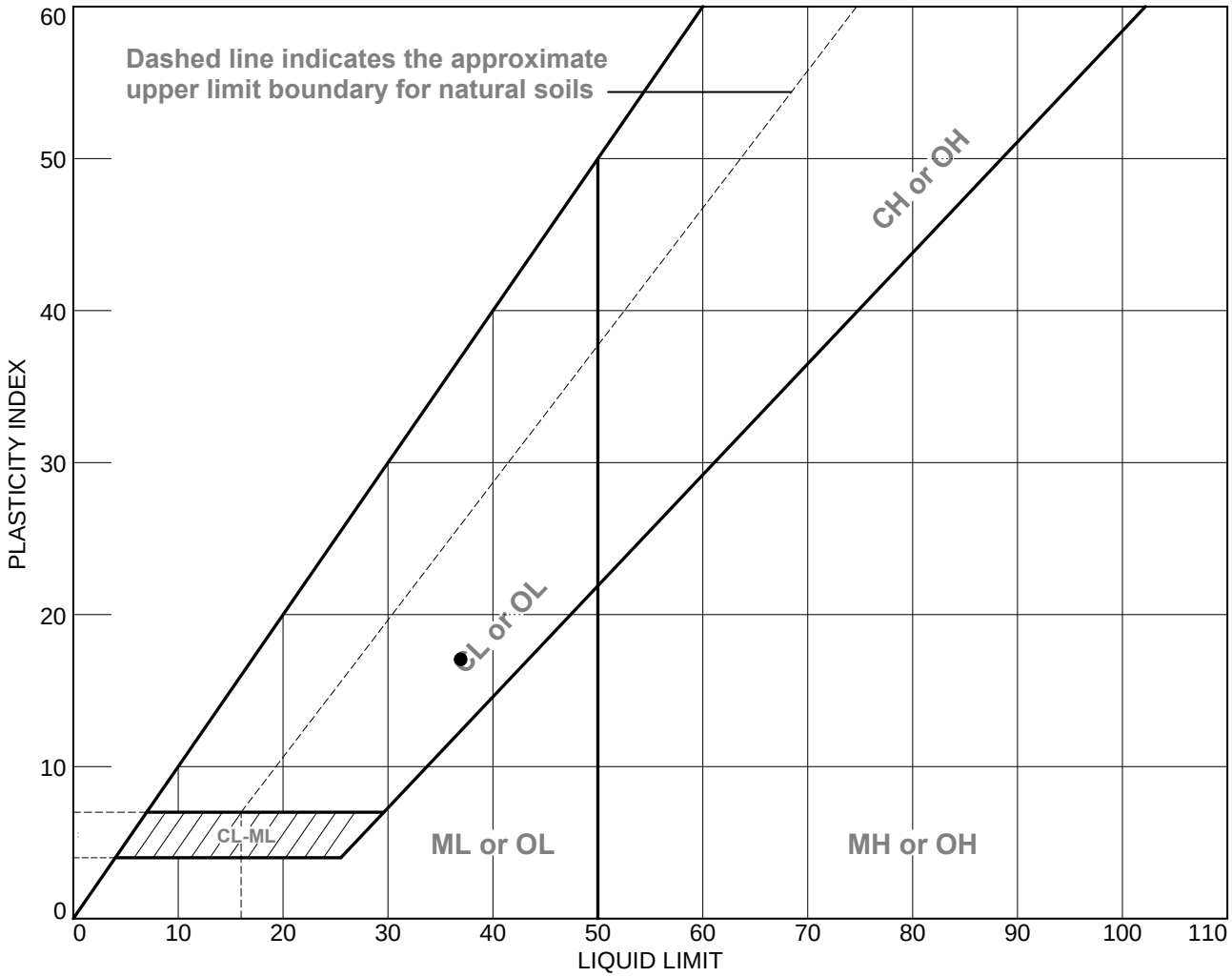
Location: B-11
Sample Number: S-4 **Depth:** 8.5 - 13.5' **Date:** 01-28-15

Geotechnical Consulting & Testing, Inc.
Dulles, VA

Client: Clark Realty
Project: Woodlawn Village

Project No: 214M-7353 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



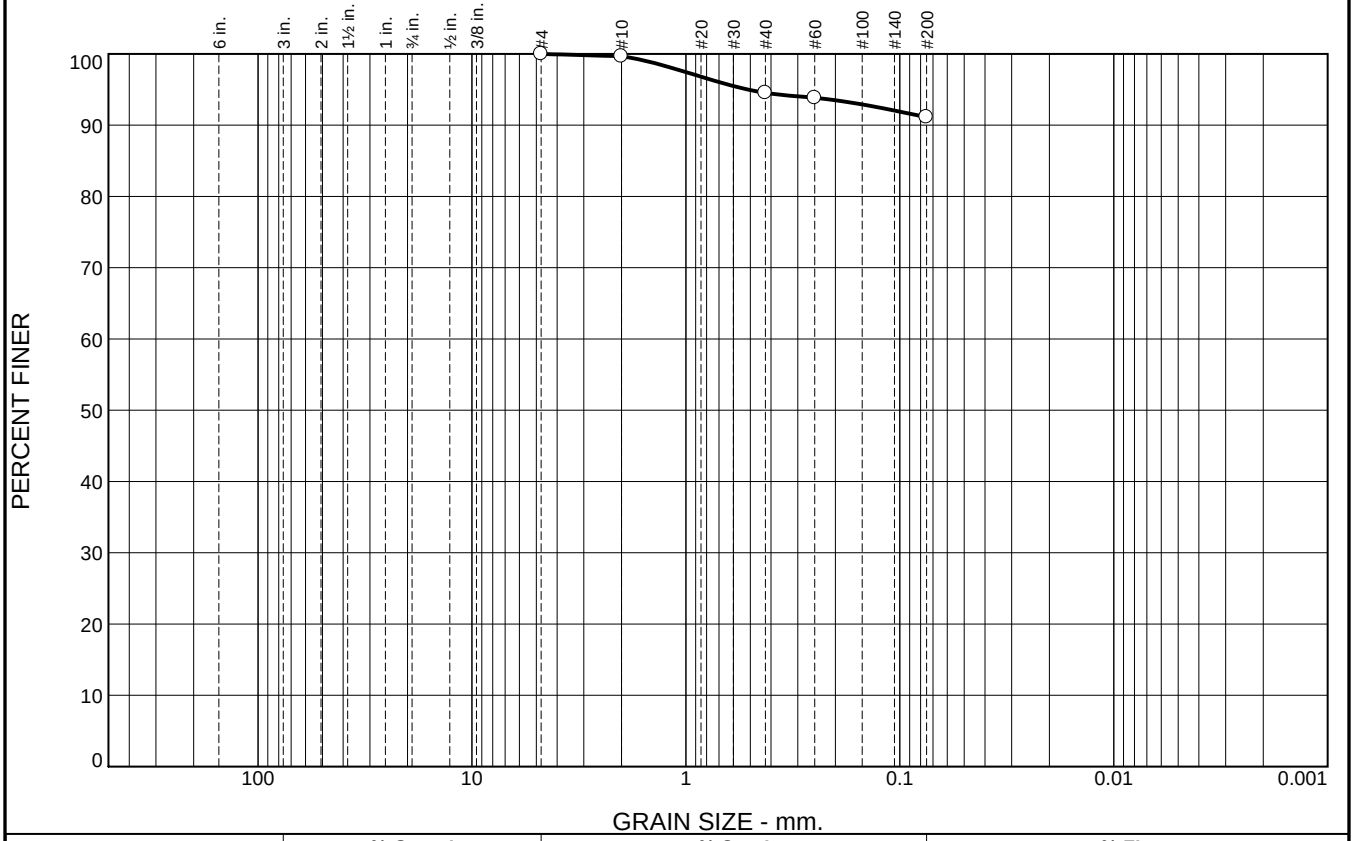
SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	B-11	S-4	8.5 - 13.5'	17.9	20	37	17	CL

Geotechnical Consulting & Testing, Inc.
Dulles, VA

Client: Clark Realty
Project: Woodlawn Village

Project No.: 214M-7353 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	5.2	3.4	91.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.7		
#40	94.5		
#60	93.8		
#200	91.1		

* (no specification provided)

Soil Description

Orange Brown, Fat Clay

Atterberg Limits

PL= 29 LL= 57 PI= 28

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(30)

Remarks

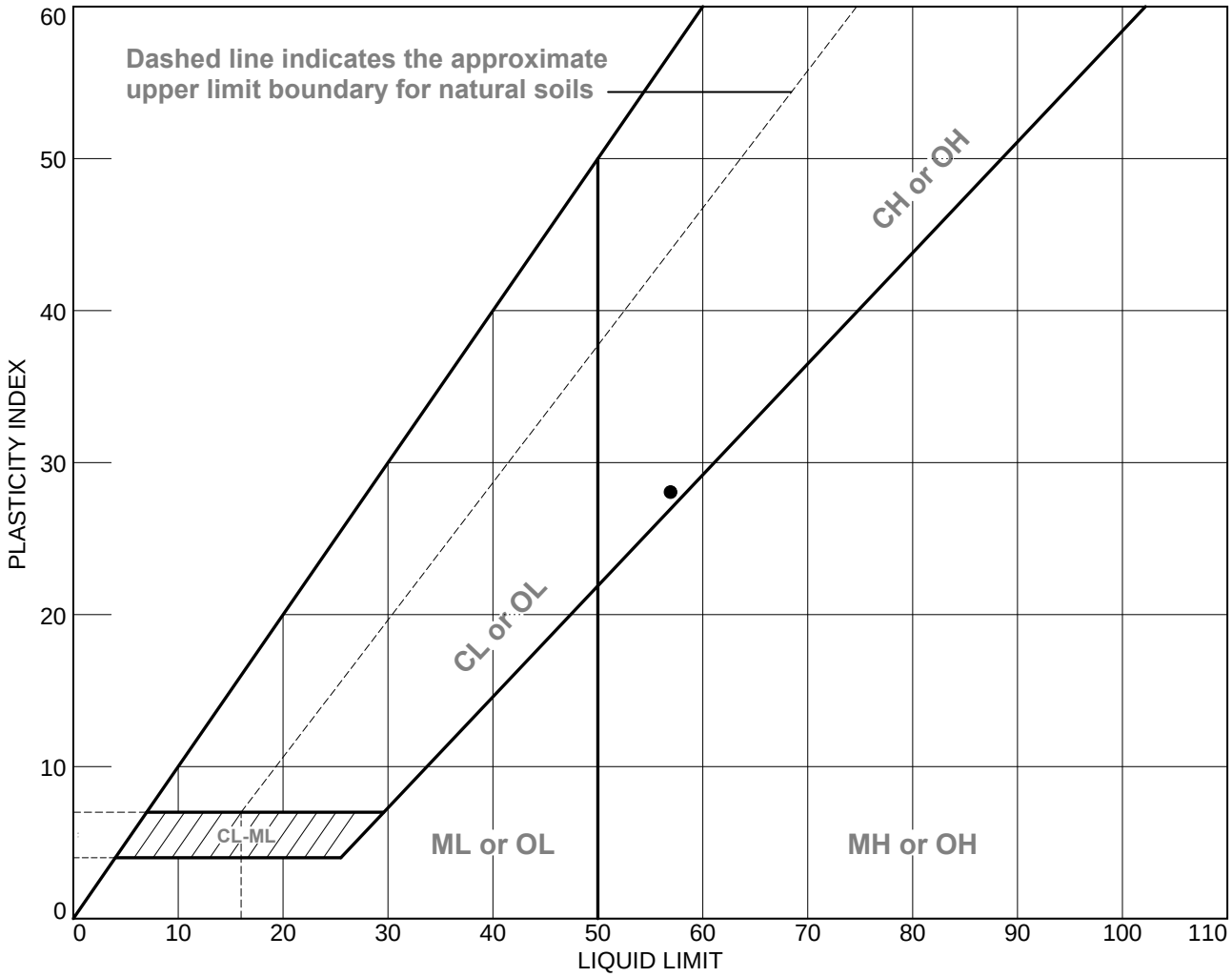
Location: B-12
Sample Number: S-2 **Depth:** 2.0 - 3.5' **Date:** 01-28-15

Geotechnical Consulting & Testing, Inc.
Dulles, VA

Client: Clark Realty
Project: Woodlawn Village

Project No: 214M-7353 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



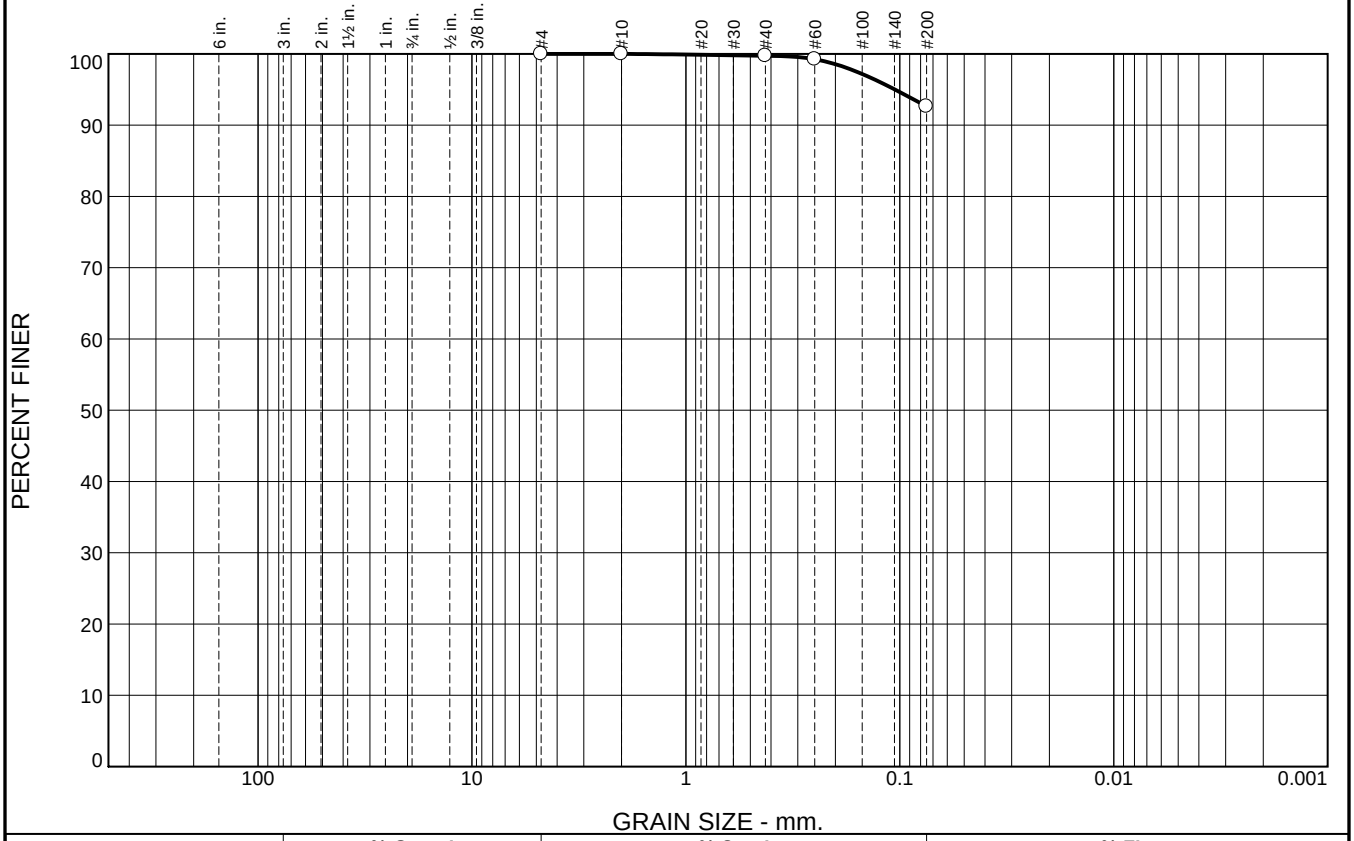
SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	B-12	S-2	2.0 - 3.5'	27.5	29	57	28	CH

Geotechnical Consulting & Testing, Inc.
Dulles, VA

Client: Clark Realty
Project: Woodlawn Village

Project No.: 214M-7353 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.3	7.1	92.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#40	99.7		
#60	99.3		
#200	92.6		

* (no specification provided)

Soil Description

Orange Brown, Lean Clay. (Low Mica)

Atterberg Limits

PL= 21 LL= 40 PI= 19

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(19)

Remarks

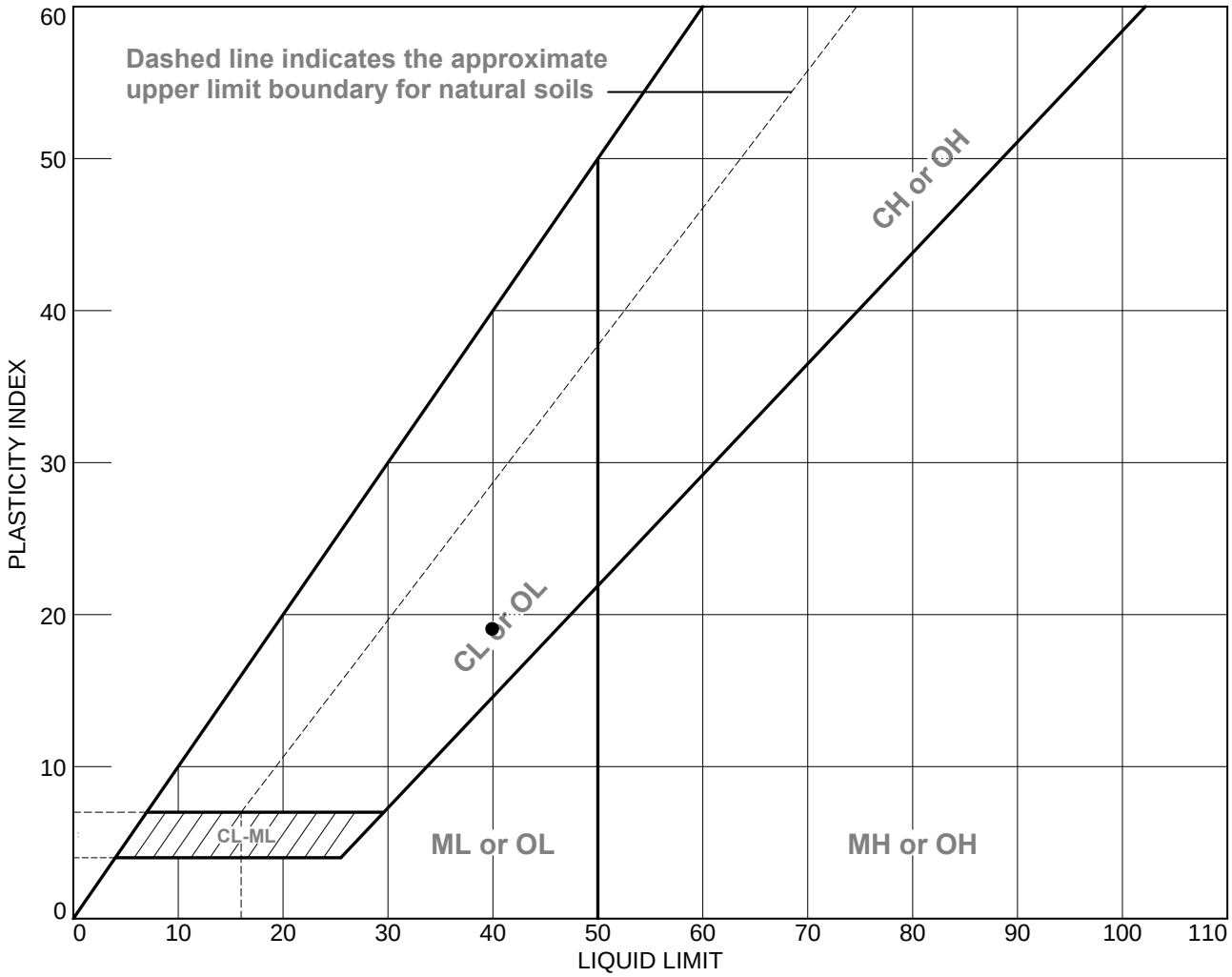
Location: B-21
Sample Number: S-4 **Depth:** 8.5 - 13.5' **Date:** 01-28-15

Geotechnical Consulting & Testing, Inc.
Dulles, VA

Client: Clark Realty
Project: Woodlawn Village

Project No: 214M-7353 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



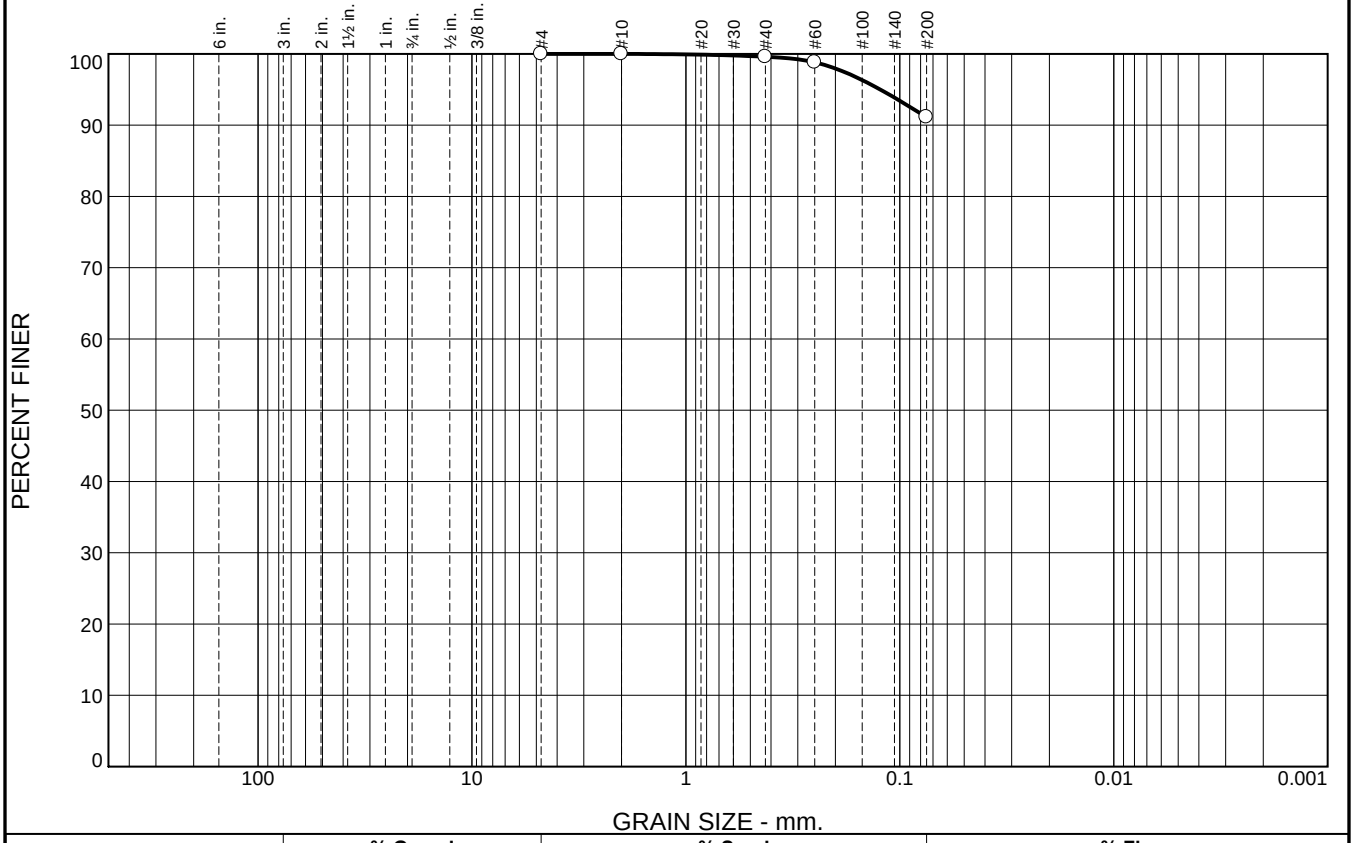
SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	B-21	S-4	8.5 - 13.5'	20.6	21	40	19	CL

Geotechnical Consulting & Testing, Inc.
Dulles, VA

Client: Clark Realty
Project: Woodlawn Village

Project No.: 214M-7353 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.4	8.5	91.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#40	99.6		
#60	98.8		
#200	91.1		

* (no specification provided)

Soil Description

Yellowish Brown, Lean Clay. (Low Mica)

Atterberg Limits

PL= 19 LL= 36 PI= 17

Coefficients

D_{90}= D_{85}= D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(15)

Remarks

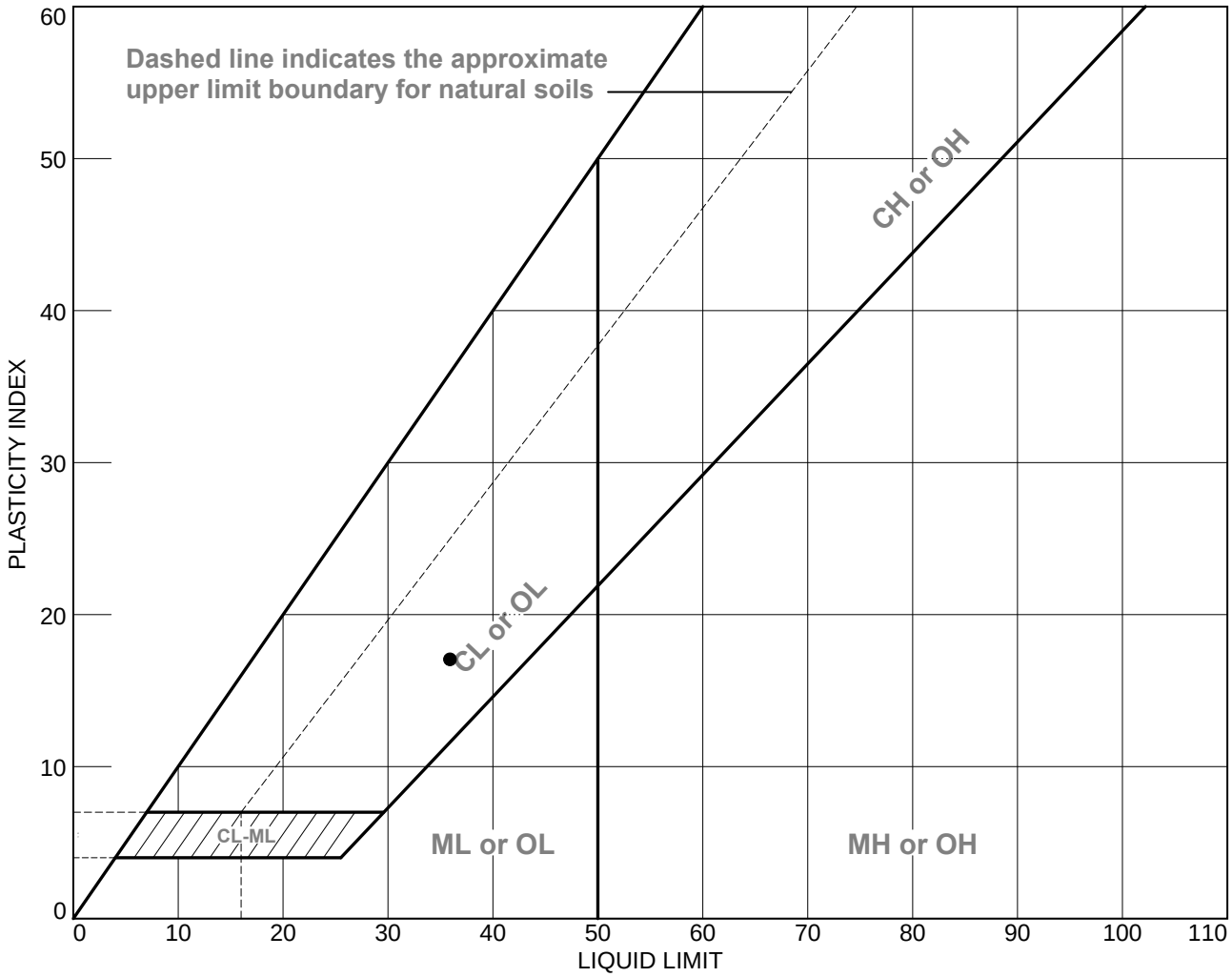
Location: B-26
Sample Number: S-4 **Depth:** 8.5 - 13.5' **Date:** 01-28-15

Geotechnical Consulting & Testing, Inc.
Dulles, VA

Client: Clark Realty
Project: Woodlawn Village

Project No: 214M-7353 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT

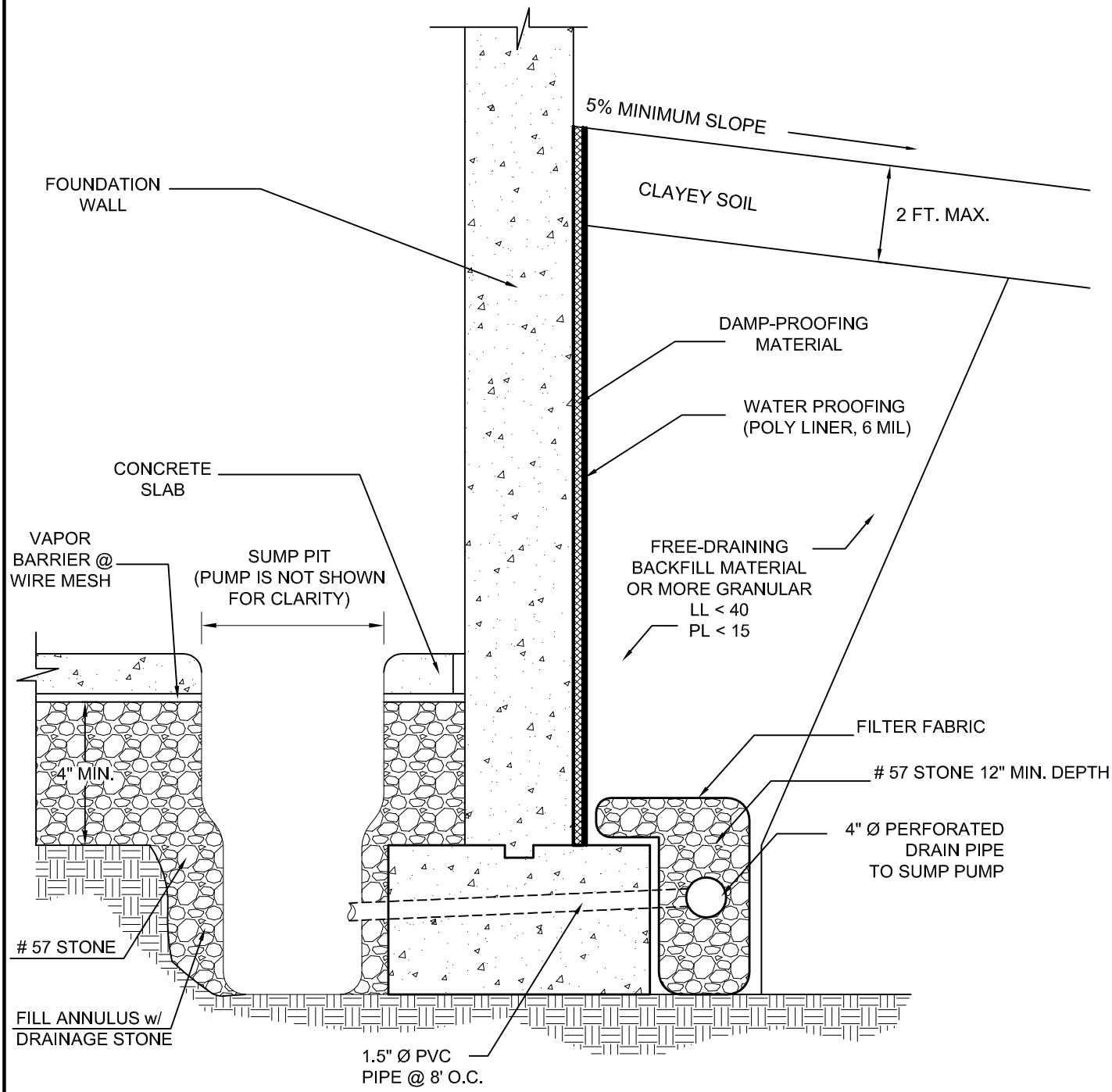


SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	B-26	S-4	8.5 - 13.5'	19.0	19	36	17	CL

Geotechnical Consulting & Testing, Inc.
Dulles, VA

Client: Clark Realty
Project: Woodlawn Village

Project No.: 214M-7353 **Figure**

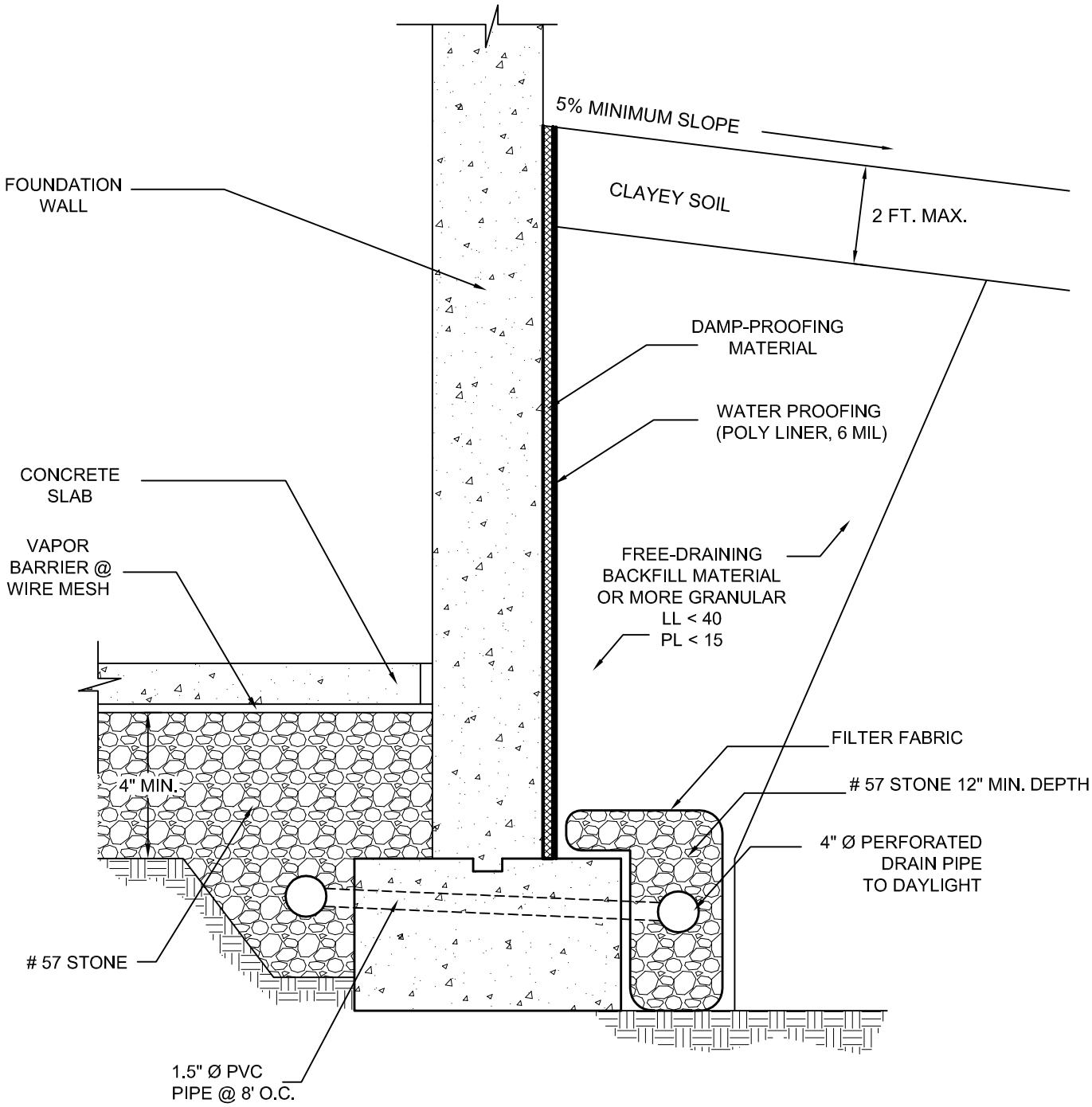


N.T.S.

[H:\Data\Public\CAD drawing\FORMAT\FORMAT2004.dwg FWDD

GEOTECHNICAL CONSULTING & TESTING, INC
4899 Prince William Parkway
Woodbridge, Virginia 22192
TEL: (703) 730-4160 FAX: (703) 337-5359
www.gctonline.net

FOUNDATION WALL DRAINAGE DETAIL (BURIED BASEMENT CONDITION)

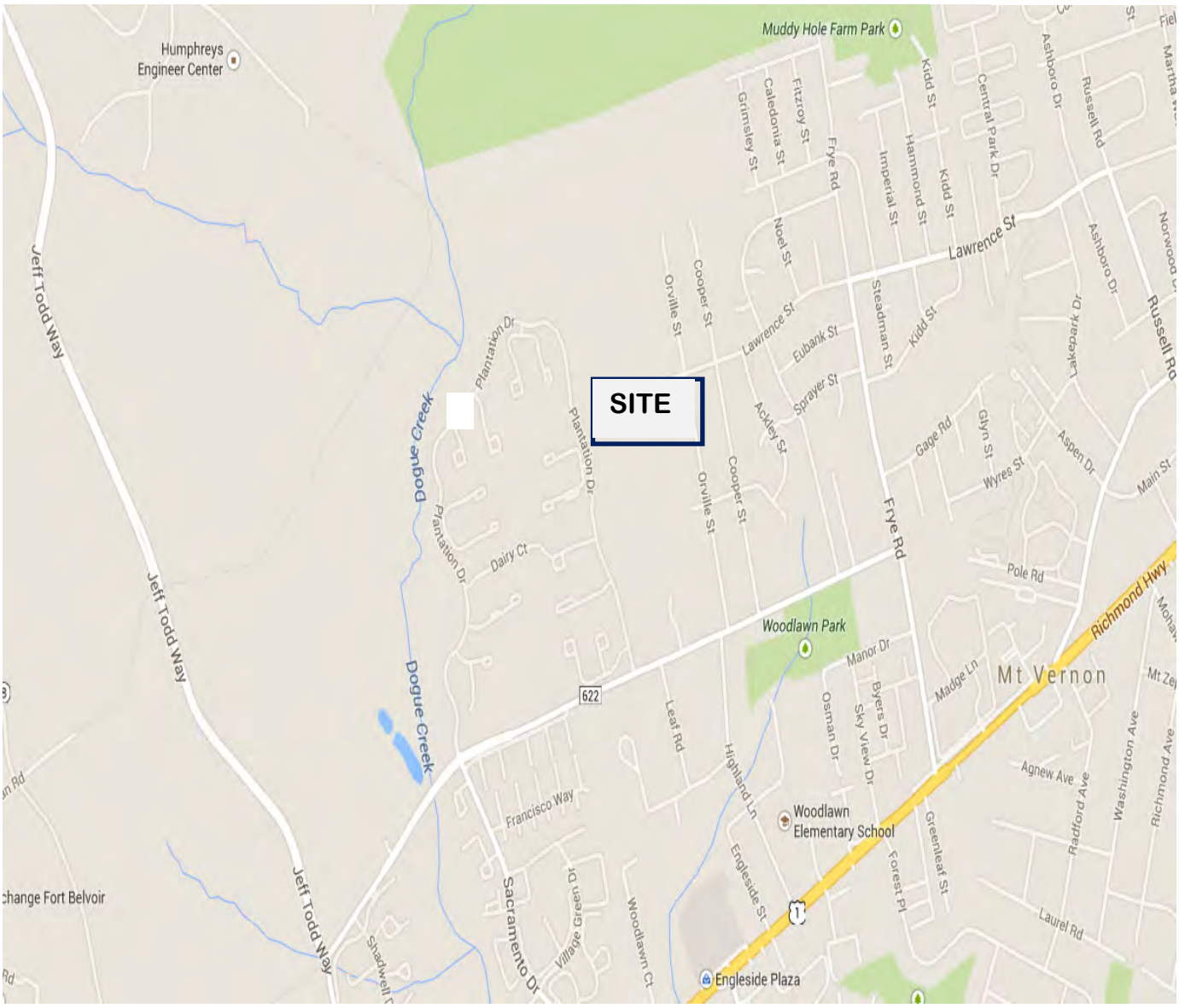


N.T.S.

[H:\Data\Public\CAD drawing\FORMAT\FORMAT2004.dwg FWDD

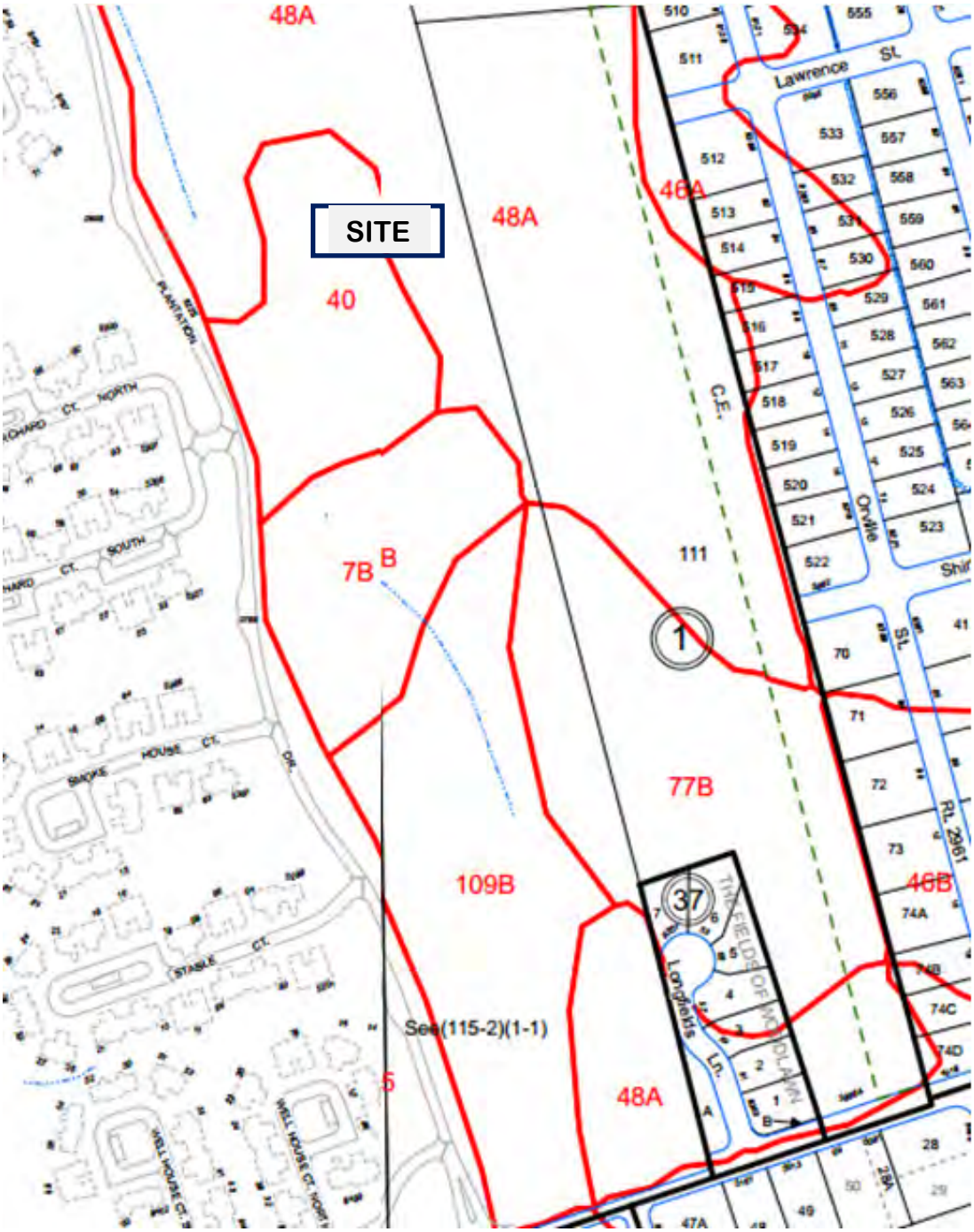
GEOTECHNICAL CONSULTING & TESTING, INC
4899 Prince William Parkway
Woodbridge, Virginia 22192
TEL: (703) 730-4160 FAX: (703) 337-5359
www.gctonline.net

FOUNDATION WALL DRAINAGE DETAIL (WALKOUT BASEMENT CONDITION)



Source: Google

GC&T **4899 Prince William Parkway** **Woodbridge, Virginia 22192** **TEL: (703) 730-4160 FAX: (703) 337-5359**	**WOODLAWN VILLAGE EAST** **Fort Belvoir, Virginia**	**PROJ. # 214M-7353**
	SITE VICINITY MAP	



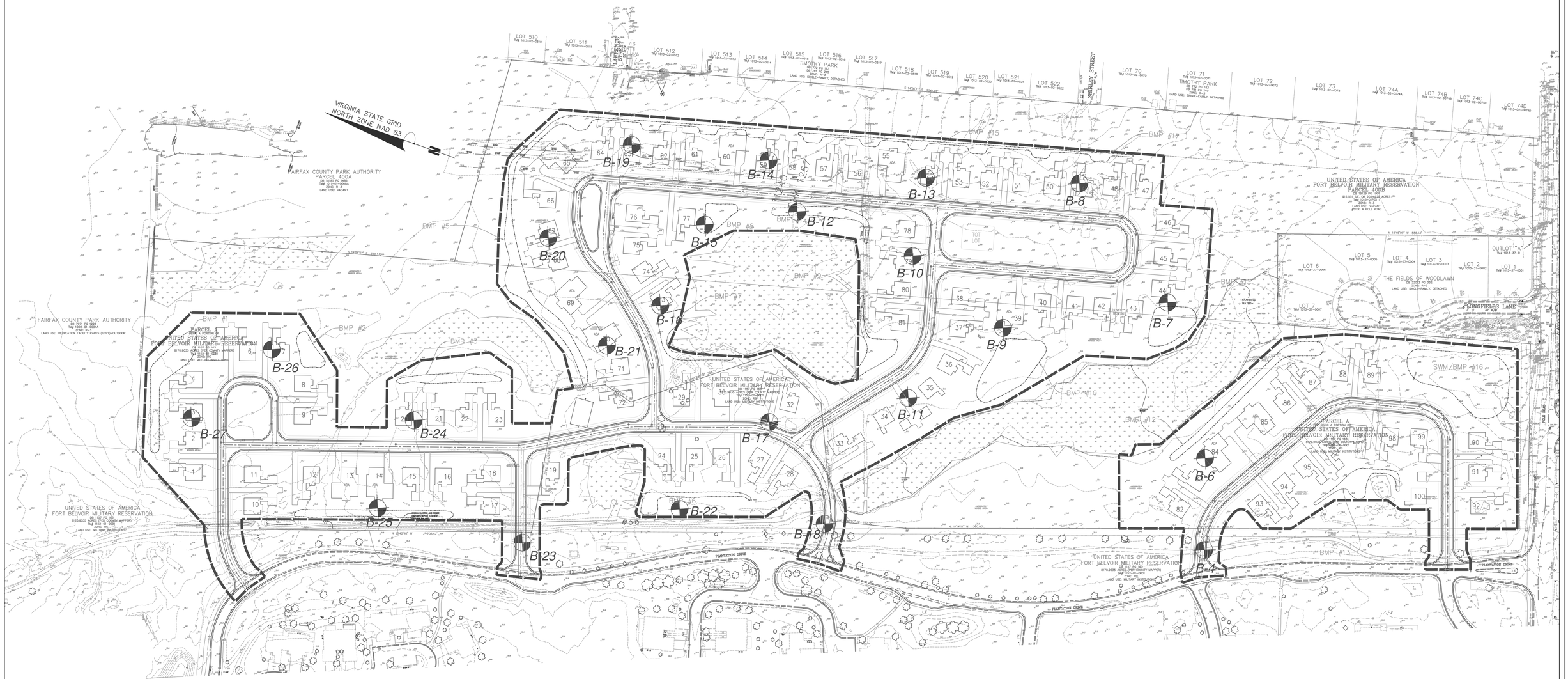
Source: *Fairfax County Mapper*

GC&T
4899 Prince William Parkway
Woodbridge, Virginia 22192
TEL: (703) 730-4160 FAX: (703) 337-5359

WOODLAWN VILLAGE EAST
Fort Belvoir, Virginia

SOIL TYPE MAP

PROJ. # 214M-7353



LEGEND

APPROXIMATE BORING LOCATION

REVISIONS	DATE

Geotechnical Consulting & Testing, Inc.

4899 Prince William Pkwy.-Woodbridge,Virginia 22192

Phone:(703)730-4160 Fax:(703)337-5359

gctonline.net

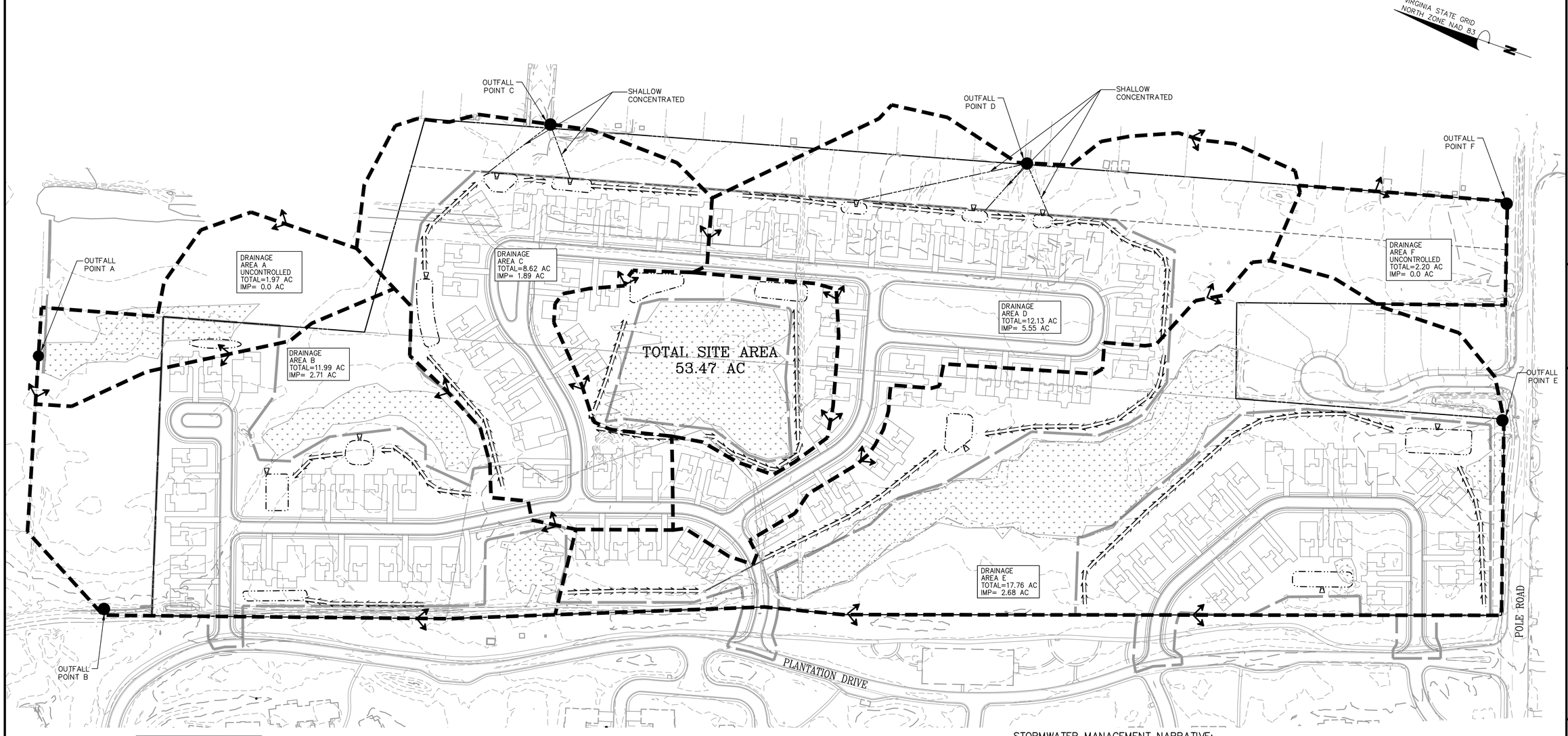
DRAWN BY: XL	DATE 01/27/15
CHECKED BY: CM	
SCALE: 1" = 100'	

OVERALL BORING LOCATION PLAN
WOODLAWN VILLAGE EAST
FORT BELVOIR, VIRGINIA

JOB NUMBER:
214M-7353

SHEET 1 OF 1 SHEET

APPENDIX B – STORMWATER CONCEPT PLAN



BIO-RETENTION SURFACE AREA	
BMP #	AREA (SF)
1	2,500
2	5,700
3	2,500
4	2,600
5	3,400
6	2,500
7	1,500
8	4,700
9	3,500
10	1,100
11	1,100
12	1,100
13	3,200
14	5,300
15	2,600

TOTAL SURFACE AREA = 43,300 SF

REQUIRED AND PROPOSED DETENTION VOLUMES		
DRAINAGE AREA	REQUIRED (CF)	PROVIDED (CF)
A	N/A	N/A
B	16,000	28,000
C	22,000	25,400
D	10,000	14,300
E	11,000	23,100
F	N/A	N/A
TOTAL =	59,000	90,800

Vf = (43,300 SF)*(4 FT)*(0.4) = 69,200 CF
Vp = (43,300 SF)*(0.5) = 21,600 CF
V = 90,800 CF

NOTE: THIS IS A CONCEPTUAL PLAN AND IS SUBJECT TO CHANGE DURING FINAL ENGINEERING.

STORMWATER MANAGEMENT NARRATIVE:

PRE-DEVELOPMENT CONDITIONS:

THE EXISTING 53.47 ACRE SITE IS CURRENTLY UNDEVELOPED LAND CONSISTING OF MODERATE TO HEAVILY WOODED AREAS. THE OVERALL TOPOGRAPHY IS GENERALLY FLAT WITH LOCALIZED WETLAND. THE ADJACENT PROPERTIES ARE HUNTLEY MEADOWS PARK TO THE NORTH, POLE ROAD TO THE SOUTH, TIMOTHY PARK DEVELOPMENT TO THE EAST AND WOODLAWN VILLAGE TO THE WEST.

POST-DEVELOPMENT CONDITIONS:

THE PROPOSED DEVELOPMENT CONSISTS OF THE CONSTRUCTION OF 102 SINGLE FAMILY HOMES WITH ASSOCIATED ROADS AND UTILITIES. THIS PLAN APPROXIMATES 12 ACRES OF IMPERVIOUS AREA GENERATED BY THE DEVELOPMENT.

STORMWATER MANAGEMENT STRATEGY:

THE PROPOSED DEVELOPMENT WILL HONOR THE NATURAL DRAINAGE DIVIDES AND THE 6 EXISTING OUTFALL LOCATIONS. THE ADDITIONAL IMPERVIOUS AREA WILL BE MITIGATED BY THE CONSTRUCTION OF BMP FACILITIES. THESE BMP FACILITIES HAVE BEEN SHOWN ACCORDING TO THE CURRENT VIRGINIA STORMWATER METHODOLOGY AND REQUIREMENTS AND THE TECHNICAL GUIDANCE ON IMPLEMENTING THE STORMWATER RUNOFF REQUIREMENTS UNDER SECTION 438 OF THE ENERGY INDEPENDENCE AND SECURITY ACT (EISA). THE 95% PERCENTILE STORM OF 1.7 INCHES HAS BEEN USED IN THE CALCULATIONS AND 73,180 CF VOLUME OF TREATMENT FOR IMPERVIOUS SURFACE IS REQUIRED. THE STATE WATER QUALITY REQUIREMENT IS TO PROVIDE 20.32 LBS/YEAR OF PHOSPORUS REMOVAL.

THE PROPOSED BMPS FOR THE SITE ARE ROOFTOP DISCONNECT TO SOILS C AND D, BIO-RETENTION FACILITIES LEVEL 2 PER SPECIFICATION NO. 9, AND GRASS SWALES PER SPECIFICATION NO. 3 FROM THE 2013 BMP STANDARDS & SPECIFICATIONS. ALL BIO-RETENTION FACILITIES HAVE 4 FEET OF FILTER MATERIAL AND WILL REQUIRE AN UNDERDRAIN IF INFILTRATION RATE OF 1/2 IN/HR IS NOT MET. THESE BMP MEASURES WILL PROVIDE 22.16 LBS OF PHOSPORUS REMOVAL. THEREFORE WATER QUALITY WILL BE MET. THESE MEASURES WERE SELECTED DUE TO THE TOPOGRAPHY OF THE SITE. CONSERVATION BUFFERS AND WETLAND AREAS. NATURAL DRAINAGE AREAS WILL BE MAINTAINED TO PROVIDE ADEQUATE RUNOFF TO THE WETLAND AREAS.

THIS STORMWATER MANAGEMENT CONCEPT PLAN GENERALLY AGREES WITH THE CURRENT STORMWATER MANAGEMENT REGULATIONS AND WILL NOT ADVERSELY IMPACT DOWNSTREAM PROPERTIES OR THE DOWNSTREAM RECEIVING CHANNELS. THE CURRENT REGULATIONS REQUIRE AN ENERGY BALANCE OF A 1 (ONE) YEAR CHANNEL FLOW WHICH WILL REQUIRE 59,000 CF OF DETENTION. THE EISA WILL REQUIRE 73,180 CF OF TREATMENT. THE SWMP/BMP WILL PROVIDE AT LEAST 90,800 CF. DETAILED STORMWATER MANAGEMENT CALCULATIONS AND OUTFALL ANALYSIS IN ACCORDANCE WITH CURRENT STORMWATER MANAGEMENT REGULATIONS WILL BE PROVIDED WITH FINAL ENGINEERING.

LEGEND

- PROPERTY LINE
- PROPOSED DRAINAGE DIVIDE
- PROPOSED BMP FACILITY
- PROPOSED GRASS SWALE
- PROPOSED BMP OUTLET

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

Bowman Consulting Group, Ltd.
14020 Thunderbolt Place
Suite 300
Chantilly, Virginia 20151

Phone: (703) 464-1000
Fax: (703) 461-9720
www.bowmanconsulting.com

STORMWATER CONCEPT PLAN

FORT BELVOIR
WOODLAWN VILLAGE EAST

MOUNT VERNON MAGISTERIAL DISTRICT FAIRFAX COUNTY, VIRGINIA

COUNTY PROJECT NUMBER

PLAN STATUS	
03/24/14	ISSUE TO CLIENT
05/01/14	ISSUE TO CLIENT
03/17/15	ISSUE TO CLIENT
04/23/15	ISSUE TO CLIENT
07/10/15	ISSUE TO CLIENT

DATE	DESCRIPTION

CA DESIGN	CL DRAWN	SL CHKD

SCALE H: 1"=100'
V: N/A

JOB No. 2742-01-011

DATE: JULY, 2015

FILE No. 2742-D-CP-011

SHEET 1 OF 11

Cad file name : P:\2742 - Fort Belvoir\2742-01-011 (ENG) - Playground\Engineering\Engineering Plans\Woodlawn Village East\2742-D-CP-011-DDP.dwg

SECTION 2: PERFORMANCE

Table 3.1. Summary of Stormwater Functions Provided by Grass Channels [1]

Stormwater Function	HSG Soils A and B		HSG Soils C and D	
	No CA [2]	With CA	No CA	With CA
Annual Runoff Volume Reduction (RR)	20%	None [3]	10%	20%
Total Phosphorus (TP) EMC Reduction[4] by BMP Treatment Process	15%		15%	
Total Phosphorus (TP) Mass Load Removal	32%		24% (no CA) to 32% (with CA)	
Total Nitrogen (TN) EMC Reduction[4] by BMP Treatment Process	20%		20%	
Total Nitrogen (TN) Mass Load Removal	36%		28% (no CA) to 36% (with CA)	
Channel & Flood Protection	**Partial.** • Use VRRM Compliance spreadsheet to calculate a Curve Number (CN) adjustment[5]; ***OR*** • Design extra storage in the stone underdrain layer and peak rate control structure (optional, as needed) to accommodate detention of larger storm volumes.			

[1] CWP and CSN (2008) and CWP (2007).
[2] CA= Compost Amended Soils, see Stormwater Design Specification No. 4.
[3] Compost amendments are generally not applicable for A and B soils, although it may be advisable to incorporate them on mass-graded and/or excavated soils to maintain runoff reduction rates. In these cases, the 30% runoff reduction rate may be claimed, regardless of the pre-construction HSG.
[4] Change in event mean concentration (EMC) through the practice. Actual nutrient mass load removed is the product of the pollutant removal rate and the runoff volume reduction rate (see Table 1 in the *Introduction to the New Virginia Stormwater Design Specifications*).
[5] NRCS TR-55 Runoff Equations 2-1 thru 2-5 and Figure 2-1 can be used to compute a curve number

Leadership in Energy and Environmental Design (LEED®). The LEED® point credit system designed by the U.S. Green Building Council (USGBC) and implemented by the Green Building Certification Institute (GBCI) awards points related to site design and stormwater management. Several categories of points are potentially available for new development and redevelopment projects. **Chapter 6** of the 2013 *Virginia Stormwater Management Handbook* (2nd Edition) provides a more thorough discussion of the site planning process and design considerations as related to Environmental Site Design and potential LEED credits. However, the Virginia Department of Conservation and Recreation (DCR) is not affiliated with the USGBC or GBCI and any information on applicable points provided here is based only on basic compatibility. **Designers should research and verify scoring criteria and applicability of points as related to the specific project being considered through USGBC LEED resources.**

Table 3.2. Potential LEED® Credits for Grass Channels [1]

Credit Category	Credit No.	Credit Description
Sustainable Sites	SS5.2	Site Development: Maximize Open Space
Sustainable Sites	SS6.1	Stormwater Design: Quantity Control
Sustainable Sites	SS6.2	Stormwater Design: Quality Control

[1] Actual site design and/or BMP configuration may not qualify for the credits listed. Alternatively, the project may actually qualify for credits not listed here. Designers should consult with a LEED AP.

SECTION 3: DESIGN TABLE

Grass channels only have *one* level of design, and must meet the minimum criteria outlined in **Table 3.2** to qualify for the indicated level of runoff reduction.

Table 3.2. Grass Channel Design Guidance

Design Criteria
The bottom width of the channel should be set to maintain the peak flow rate for the 1-inch storm design treatment volume (Tv)[1] at less than 4 inches in depth and ≤ 1 ft/s velocity.
The channel side-slopes should be 3H:1V or flatter.
The maximum total contributing drainage area to any individual grass channel is 5 acres.
The longitudinal slope of the channel should be no greater than 4%. (Check dams may be used to reduce the effective slope in order to meet the limiting velocity requirements.)
The dimensions of the channel should ensure that flow velocity is non-erosive during the 2-year and 10-year design storm events and the 10-year design flow is contained within the channel (minimum of 0.3 feet of freeboard).

[1]The design of grass channels should consider the entire Tv of the contributing drainage area (rather than the TvBMP which would reflect a decrease in Tv based on upstream runoff reduction practices) in order to ensure non-erosive conveyance during all design storm conditions.

SECTION 4: TYPICAL DETAILS

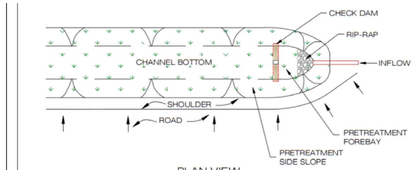


Figure 3.1. Grass Channel – Typical Plan, Profile and Section

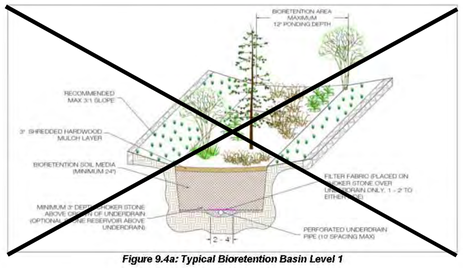


Figure 9.4a: Typical Bioretention Basin Level 1

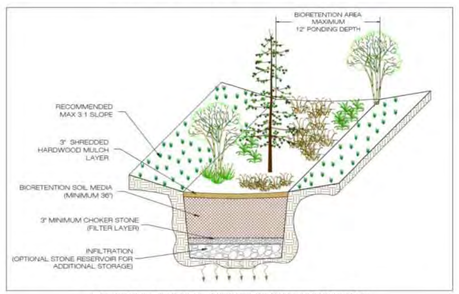


Figure 9.4b: Typical Bioretention Basin Level 2: Infiltration

Table 9.4. Bioretention Filter and Basin Design Criteria

Level 1 Design (RR 40 TP: 25)	Level 2 Design (RR: 80 TP: 50)
Sizing (**Section 6.1**): Tv_{BMP} = [(1.0)(Rv)(A) / 12] + any remaining volume from upstream BMP Surface Area (sq. ft.) = Tv_{BMP} / Storage Depth [1]	Sizing (**Section 6.1**): Tv_{BMP} = [(1.25)(Rv)(A) / 12] + any remaining volume from upstream BMP Surface Area (sq. ft.) = Tv_{BMP} /Storage Depth [1]
Recommended maximum contributing drainage area = 2.5 acres, or with local approval up to 5 acres and a maximum of 50% impervious	
Maximum Ponding Depth = 6 to 12 inches [2]	Maximum Ponding Depth = 6 to 12 inches [2]
Filter Media Depth minimum = 24 inches; recommended maximum = 48 inches	Filter Media Depth minimum = 36 inches; recommended maximum = 48 inches
Media & Surface Cover (**Section 6.6**) = supplied by vendor; tested for acceptable hydraulic conductivity (or permeability) and phosphorus content	
Sub-soil Testing (**Section 6.2**): not needed if an underdrain is used; Min infiltration rate > 1/2 inch/hour in order to remove the underdrain requirement.	Sub-soil Testing (**Section 6.2**): one soil profile and two infiltration tests per facility (up to 2,500 ft² of filter surface); Min infiltration rate > 1/2 inch/hour in order to remove the underdrain requirement.
Underdrain (**Section 6.7**) = Schedule 40 PVC with clean-outs	Underdrain & Underground Storage Layer (**Section 6.7**) = Schedule 40 PVC with clean outs, and a minimum 12-inch stone sump below the invert; ***OR***, none, if soil infiltration requirements are met (**Section 6.2**)
Inflow: sheetflow, curb cuts, trench drains, concentrated flow, or the equivalent	
Geometry (**Section 6.3**): Length of shortest flow path/Overall length = 0.8; ***OR***, other design methods used to prevent short-circuiting; one-cell design (not including the pre-treatment cell).	Geometry (**Section 6.3**): Length of shortest flow path/Overall length = 0.8; ***OR***, other design methods used to prevent short-circuiting; a two-cell design (not including the pretreatment cell).
Pre-treatment (**Section 6.4**): a pretreatment cell, grass filter strip, gravel diaphragm, gravel flow spreader, or another approved (manufactured) pre-treatment structure.	Pre-treatment (**Section 6.4**): a pretreatment cell *plus* one of the following: a grass filter strip, gravel diaphragm, gravel flow spreader, or another approved (manufactured) pre-treatment structure.
Conveyance & Overflow (**Section 6.5**)	Conveyance & Overflow (**Section 6.5**)
Planting Plan (**Section 6.8**): a planting template to include turf, herbaceous vegetation, shrubs, and/or trees to achieve surface area coverage of at least 75% within 2 years.	Planting Plan (**Section 6.8**): a planting template to include turf, herbaceous vegetation, shrubs, and/or trees to achieve surface area coverage of at least 90% within 2 years. If using turf, must combine with other types of vegetation.
Building Setbacks [3] (**Section 5**): 10 feet if down-gradient from building or level (coastal plain); 50 feet if up-gradient. (Refer to additional setback criteria in **Section 5**)	
Deeded Maintenance O&M Plan (**Section 8**)	

[1] Storage depth is the sum of the porosity (n) of the soil media and gravel layers multiplied by their respective depths, plus the surface ponding depth. (**Section 6.1**).
[2] A ponding depth of 6 inches is preferred. Ponding depths greater than 6 inches will require a specific planting plan to ensure appropriate plant selection (**Section 6.8**).
[3] These are recommendations for simple building foundations. If an in-ground basement or other special conditions exist, the design should be reviewed by a licensed engineer. Also, a special footing or drainage design may be used to justify a reduction of the setbacks noted above.

SECTION 3: TYPICAL DETAILS

NOTE: THIS IS A CONCEPTUAL PLAN AND IS SUBJECT TO CHANGE DURING FINAL ENGINEERING.

Bowman
CONSULTING
Bowman Consulting Group, Ltd.
14020 Thunderbolt Place
Suite 300
Chantilly, Virginia 20151
Phone: (703) 464-1000
Fax: (703) 461-9720
www.bowmanconsulting.com

STORMWATER CONCEPT PLAN DETAILS
FORT BELVOIR
WOODLAWN VILLAGE EAST
FAIRFAX COUNTY, VIRGINIA
MOUNT VERNON MAGISTERIAL DISTRICT

COUNTY PROJECT NUMBER

PLAN STATUS	
03/24/14	ISSUE TO CLIENT
05/01/14	ISSUE TO CLIENT
03/17/15	ISSUE TO CLIENT

DATE	DESCRIPTION

ARV	CDL	REW
DESIGN	DRAWN	CHKD

SCALE H: N/A V: N/A
JOB No. 2742-01-011
DATE: MARCH 2015
FILE No. 2742-D-CP-011
SHEET 2 OF 4

Cad file name : P:\2742 - Fort Belvoir\2742-01-011 (ENG) - Playground\Engineering\Engineering Plans\Woodlawn Village East\2742-D-CP-011-DDP.dwg

Virginia Runoff Reduction Method New Development Worksheet -- v2.7 Revised April 2013

Site Data

Project Name: Woodlawn Village East

Date: 4/30/2014

data input cells
calculation cells
constant values

1. Post-Development Project & Land Cover Information

Constants

Annual Rainfall (inches)	43
Target Rainfall Event (inches)	1.70
Phosphorus EMC (mg/L)	0.26
Nitrogen EMC (mg/L)	1.86
Target Phosphorus Target Load (lb/acre/yr)	0.41
Pj	0.90

Land Cover (acres)

	A soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested land	0.00	0.00	0.00	20.37	20.37
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed	0.00	0.00	0.00	23.67	23.67
Impervious Cover (acres)	0.00	0.00	0.00	12.84	12.84
				Total	56.88

Rv Coefficients

	A soils	B Soils	C Soils	D Soils
Forest/Open Space	0.02	0.03	0.04	0.05
Managed Turf	0.15	0.20	0.22	0.25
Impervious Cover	0.95	0.95	0.95	0.95

Land Cover Summary

Forest/Open Space Cover (acres)	20.37
Weighted Rv(forest)	0.05
% Forest	36%
Managed Turf Cover (acres)	23.67
Weighted Rv(turf)	0.25
% Managed Turf	42%
Impervious Cover (acres)	12.84
Rv(impervious)	0.95
% Impervious	23%
Total Site Area (acres)	56.88
Site Rv	0.34
Post-Development Treatment Volume (acre-ft)	2.71
Post-Development Treatment Volume (cubic feet)	118,076
Post_Development Load (TP) (lb/yr)	43.64
Post_Development Load (TN) (lb/yr)	312.19
Total Load (TP) Reduction Required (lb/yr)	20.32

Site Results

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	D.A. F	AREA CHECK
IMPERVIOUS COVER	0.00	2.71	1.89	5.55	2.68	0.00	OK.
IMPERVIOUS COVER TREATED	0.00	1.68	1.45	1.09	2.68	0.00	OK.
TURF AREA	0.00	5.95	6.20	4.58	6.93	0.00	OK.
TURF AREA TREATED	0.00	3.76	4.15	4.09	6.92	0.00	OK.
AREA CHECK	OK.	OK.	OK.	OK.	OK.	OK.	

Phosphorus

TOTAL TREATMENT VOLUME (cf)	118,076
TOTAL PHOSPHORUS LOAD REDUCTION REQUIRED (LB/YEAR)	20.32
RUNOFF REDUCTION (cf)	53455
PHOSPHORUS LOAD REDUCTION ACHIEVED (LB/YR)	22.16
ADJUSTED POST-DEVELOPMENT PHOSPHORUS LOAD (TP) (lb/yr)	21.47
REMAINING PHOSPHORUS LOAD REDUCTION (LB/YR) NEEDED	CONGRATULATIONS!! YOU EXCEEDED THE TARGET REDUCTION BY 1.8 LB/YEAR!!

Nitrogen (for information purposes)

TOTAL TREATMENT VOLUME (cf)	118,076
RUNOFF REDUCTION (cf)	53455
NITROGEN LOAD REDUCTION ACHIEVED (LB/YR)	183.92
ADJUSTED POST-DEVELOPMENT NITROGEN LOAD (TN) (lb/yr)	128.27

	1-year storm	2-year storm	10-year storm
Target Rainfall Event (in)	2.70	3.20	5.20

Drainage Area A	
Drainage Area (acres)	3.15
Runoff Reduction Volume (cf)	0
Drainage Area B	
Drainage Area (acres)	13.28
Runoff Reduction Volume (cf)	12,904
Drainage Area C	
Drainage Area (acres)	9.95
Runoff Reduction Volume (cf)	12,326
Drainage Area D	
Drainage Area (acres)	13.82
Runoff Reduction Volume (cf)	10,414
Drainage Area E	
Drainage Area (acres)	16.24
Runoff Reduction Volume (cf)	17,811
Drainage Area F	
Drainage Area (acres)	2.20
Runoff Reduction Volume (cf)	0

Based on the use of Runoff Reduction practices in the selected drainage areas, the spreadsheet calculates an adjusted $RV_{Developed}$ and adjusted Curve Number.

Drainage Area A

		A soils	B Soils	C Soils	D Soils
Forest/Open Space -- undisturbed, protected forest/open space or reforested land	Area (acres)	0.00	0.00	0.00	3.15
	CN	30	55	70	77
Managed Turf -- disturbed, graded for yards or other turf to be mowed/managed	Area (acres)	0.00	0.00	0.00	0.00
	CN	39	61	74	80
Impervious Cover	Area (acres)	0.00	0.00	0.00	0.00
	CN	98	98	98	98
				Weighted CN	S
				77	2.99

	1-year storm	2-year storm	10-year storm
$RV_{Developed}$ (in) with no Runoff Reduction	0.87	1.21	2.79
$RV_{Developed}$ (in) with Runoff Reduction	0.87	1.21	2.79
Adjusted CN	77	77	77

Drainage Area B

		A soils	B Soils	C Soils	D Soils
Forest/Open Space -- undisturbed, protected forest/open space or reforested land	Area (acres)	0.00	0.00	0.00	4.62
	CN	30	55	70	77
Managed Turf -- disturbed, graded for yards or other turf to be mowed/managed	Area (acres)	0.00	0.00	0.00	5.95
	CN	39	61	74	80
Impervious Cover	Area (acres)	0.00	0.00	0.00	2.71
	CN	98	98	98	98
				Weighted CN	S
				83	2.05

	1-year storm	2-year storm	10-year storm
$RV_{Developed}$ (in) with no Runoff Reduction	1.21	1.61	3.36
$RV_{Developed}$ (in) with Runoff Reduction	0.94	1.34	3.09
Adjusted CN	78	79	80

Drainage Area C

		A soils	B Soils	C Soils	D Soils
Forest/Open Space -- undisturbed, protected forest/open space or reforested land	Area (acres)	0.00	0.00	0.00	1.85
	CN	30	55	70	77
Managed Turf -- disturbed, graded for yards or other turf to be mowed/managed	Area (acres)	0.00	0.00	0.00	6.20
	CN	39	61	74	80
Impervious Cover	Area (acres)	0.00	0.00	0.00	1.89
	CN	98	98	98	98
				Weighted CN	S
				83	2.05

	1-year storm	2-year storm	10-year storm
$RV_{Developed}$ (in) with no Runoff Reduction	1.21	1.61	3.36
$RV_{Developed}$ (in) with Runoff Reduction	0.67	1.27	3.01
Adjusted CN	77	78	79

Drainage Area D

		A soils	B Soils	C Soils	D Soils
Forest/Open Space -- undisturbed, protected forest/open space or reforested land	Area (acres)	0.00	0.00	0.00	3.69
	CN	30	55	70	77
Managed Turf -- disturbed, graded for yards or other turf to be mowed/managed	Area (acres)	0.00	0.00	0.00	4.58
	CN	39	61	74	80
Impervious Cover	Area (acres)	0.00	0.00	0.00	5.55
	CN	98	98	98	98
				Weighted CN	S
				86	1.63

	1-year storm	2-year storm	10-year storm
$RV_{Developed}$ (in) with no Runoff Reduction	1.41	1.84	3.65
$RV_{Developed}$ (in) with Runoff Reduction	1.20	1.63	3.45
Adjusted CN	83	83	84

Drainage Area E

		A soils	B Soils	C Soils	D Soils
Forest/Open Space -- undisturbed, protected forest/open space or reforested land	Area (acres)	0.00	0.00	0.00	6.63
	CN	30	55	70	77
Managed Turf -- disturbed, graded for yards or other turf to be mowed/managed	Area (acres)	0.00	0.00	0.00	6.93
	CN	39	61	74	80
Impervious Cover	Area (acres)	0.00	0.00	0.00	2.68
	CN	98	98	98	98
				Weighted CN	S
				82	2.20

	1-year storm	2-year storm	10-year storm
$RV_{Developed}$ (in) with no Runoff Reduction	1.15	1.54	3.26
$RV_{Developed}$ (in) with Runoff Reduction	0.85	1.24	2.96
Adjusted CN	76	77	79

Drainage Area F

		A soils	B Soils	C Soils	D Soils
Forest/Open Space -- undisturbed, protected forest/open space or reforested land	Area (acres)	0.00	0.00	0.00	2.20
	CN	30	55	70	77
Managed Turf -- disturbed, graded for yards or other turf to be mowed/managed	Area (acres)	0.00	0.00	0.00	0.00
	CN	39	61	74	80
Impervious Cover	Area (acres)	0.00	0.00	0.00	0.00
	CN	98	98	98	98
				Weighted CN	S
				77	2.99

	1-year storm	2-year storm	10-year storm
$RV_{Developed}$ (in) with no Runoff Reduction	0.87	1.21	2.79
$RV_{Developed}$ (in) with Runoff Reduction	0.87	1.21	2.79
Adjusted CN	77	77	77

NOTE: THIS IS A CONCEPTUAL PLAN AND IS SUBJECT TO CHANGE DURING FINAL ENGINEERING.

Bowman
CONSULTING

Bowman Consulting Group, Ltd.
14020 Thunderbolt Place
Suite 300
Chantilly, Virginia 20151

Phone: (703) 464-1000
Fax: (703) 481-9720
www.bowmanconsulting.com

STORMWATER CALCULATIONS (1 OF 2)

FORT BELVOIR
WOODLAWN VILLAGE EAST

MOUNT VERNON MAGISTERIAL DISTRICT
FAIRFAX COUNTY, VIRGINIA

COUNTY PROJECT NUMBER

PLAN STATUS

03/24/14	ISSUE TO CLIENT
05/01/14	ISSUE TO CLIENT
03/17/15	ISSUE TO CLIENT

DATE	DESCRIPTION

ARV	CDL	REW
DESIGN	DRAWN	CHKD

SCALE H: N/A V: N/A

JOB No. 2742-01-011

DATE: MARCH 2015

FILE No. 2742-D-CP-011

SHEET 3 OF 4

Cad file name : P:\2742 - Fort Belvoir\2742-01-011 (ENG) - Playground\Engineering\Engineering Plans\Woodlawn Village East\2742-D-CP-011-DDP.dwg

Virginia Runoff Reduction Method New Development Worksheet -- v2.7 Revised April 2013

Update Summary Sheet

Print

Site Data Summary

Total Rainfall = 43 inches

Site Land Cover Summary

	A Soils	B Soils	C Soils	D Soils	Total	% of Total
Forest (acres)	0.00	0.00	0.00	20.37	20.37	*35.81*
Turf (acres)	0.00	0.00	0.00	23.67	23.67	*41.61*
Impervious (acres)	0.00	0.00	0.00	12.84	12.84	*22.57*
					56.88	*100.00*

Site Rv	0.34
Post Development Treatment Volume (ft3)	118076
Post Development TP Load (lb/yr)	43.64
Post Development TN Load (lb/yr)	312.19
Total TP Load Reduction Required (lb/yr)	20.32

Total Runoff Volume Reduction (ft^3)	53455
Total TP Load Reduction Achieved (lb/yr)	22
Total TN Load Reduction Achieved (lb/yr)	183.92
Adjusted Post Development TP Load (lb/yr)	21.47
Remaining Phosphorous Load Reduction (Lb/yr) Required	0.00

Drainage Area Summary

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	Total
Forest (acres)	3.15	4.62	1.85	3.69	6.63	*19.93*
Turf (acres)	0.00	5.95	6.20	4.58	6.93	*23.67*
Impervious (acres)	0.00	2.71	1.89	5.55	2.68	*12.83*
						56.43

Drainage Area Compliance Summary

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	Total
TP Load Red. (lb/yr)	0.00	5.35	5.10	4.33	7.39	*22.16*
TN Load Red. (lb/yr)	0.00	41.33	39.36	33.54	69.69	*183.92*

Drainage Area A Summary

Land Cover Summary

	A Soils	B Soils	C Soils	D Soils	Total	% of Total
Forest (acres)	0.00	0.00	0.00	3.15	3.15	*100.00*
Turf (acres)	0.00	0.00	0.00	0.00	0.00	*0.00*
Impervious (acres)	0.00	0.00	0.00	0.00	0.00	*0.00*
					3.15	

BMP Selections

Practice	Credit Area (acres)		Downstream Practice

Total Impervious Cover Treated (acres)	0.00
Total Turf Area Treated (acres)	0.00
Total TP Load Reduction Achieved in D.A. A (lb/yr)	0.00
Total TN Load Reduction Achieved in D.A. A (lb/yr)	0.00

Drainage Area B Summary

Land Cover Summary

	A Soils	B Soils	C Soils	D Soils	Total	% of Total
Forest (acres)	0.00	0.00	0.00	4.62	4.62	*146.52*
Turf (acres)	0.00	0.00	0.00	5.95	5.95	*189.02*
Impervious (acres)	0.00	0.00	0.00	2.71	2.71	*85.99*
					13.28	

BMP Selections

Practice	Credit Area (acres)		Downstream Practice
2.b. Simple Disconnection to C/D Soils (Spec #1)	impervious acres disconnected	0.27	4.b. Grass Channel C/D Soils
4.b. Grass Channel C/D Soils (Spec #3)	Impervious:	1.41	6.b. Bioretention #2
	Turf (Pervious):	3.76	6.b. Bioretention #2
6.b. Bioretention #2 (Spec #9)	Impervious:	0	
	Turf (Pervious):	0	

Total Impervious Cover Treated (acres)	1.68
Total Turf Area Treated (acres)	3.76
Total TP Load Reduction Achieved in D.A. A (lb/yr)	5.35
Total TN Load Reduction Achieved in D.A. A (lb/yr)	41.33

Drainage Area C Summary

Land Cover Summary

	A Soils	B Soils	C Soils	D Soils	Total	% of Total
Forest (acres)	0.00	0.00	0.00	1.85	1.85	*58.76*
Turf (acres)	0.00	0.00	0.00	6.20	6.20	*196.98*
Impervious (acres)	0.00	0.00	0.00	1.89	1.89	*60.03*
					9.95	

BMP Selections

Practice	Credit Area (acres)		Downstream Practice
2.b. Simple Disconnection to C/D Soils (Spec #1)	impervious acres disconnected	0.4	4.b. Grass Channel C/D Soils
4.b. Grass Channel C/D Soils (Spec #3)	Impervious:	1.05	6.b. Bioretention #2
	Turf (Pervious):	4.15	6.b. Bioretention #2
6.b. Bioretention #2 (Spec #9)	Impervious:	0	
	Turf (Pervious):	0	

Total Impervious Cover Treated (acres)	1.45
Total Turf Area Treated (acres)	4.15
Total TP Load Reduction Achieved in D.A. A (lb/yr)	5.10
Total TN Load Reduction Achieved in D.A. A (lb/yr)	39.36

Drainage Area D Summary

Land Cover Summary

	A Soils	B Soils	C Soils	D Soils	Total	% of Total
Forest (acres)	0.00	0.00	0.00	3.69	3.69	*117.04*
Turf (acres)	0.00	0.00	0.00	4.58	4.58	*145.35*
Impervious (acres)	0.00	0.00	0.00	5.55	5.55	*176.29*
					13.82	

BMP Selections

Practice	Credit Area (acres)		Downstream Practice
4.b. Grass Channel C/D Soils (Spec #3)	Impervious:	1.09	6.b. Bioretention #2
	Turf (Pervious):	4.09	6.b. Bioretention #2
6.b. Bioretention #2 (Spec #9)	Impervious:	0	
	Turf (Pervious):	0	

Total Impervious Cover Treated (acres)	1.09
Total Turf Area Treated (acres)	4.09
Total TP Load Reduction Achieved in D.A. A (lb/yr)	4.33
Total TN Load Reduction Achieved in D.A. A (lb/yr)	33.54

Drainage Area E Summary

Land Cover Summary

	A Soils	B Soils	C Soils	D Soils	Total	% of Total
Forest (acres)	0.00	0.00	0.00	6.63	6.63	*210.51*
Turf (acres)	0.00	0.00	0.00	6.93	6.93	*220.00*
Impervious (acres)	0.00	0.00	0.00	2.68	2.68	*85.08*
					16.24	

BMP Selections

Practice	Credit Area (acres)		Downstream Practice
4.b. Grass Channel C/D Soils (Spec #3)	Impervious:	1.34	9.b. Sheetflow to Conservation Area with C/D Soils
	Turf (Pervious):	3.46	9.b. Sheetflow to Conservation Area with C/D Soils
6.b. Bioretention #2 (Spec #9)	Impervious:	1.34	
	Turf (Pervious):	3.46	
9.b. Sheetflow to Conservation Area with C/D Soils (Spec #2)	Impervious:	0	
	Turf (Pervious):	0	

Total Impervious Cover Treated (acres)	2.68
Total Turf Area Treated (acres)	6.92
Total TP Load Reduction Achieved in D.A. A (lb/yr)	7.39
Total TN Load Reduction Achieved in D.A. A (lb/yr)	69.69

Channel and Flood Protection

	Weighted CN	1-year storm Adjusted CN	2-year storm Adjusted CN	10-year storm Adjusted CN
Target Rainfall Event (in)		2.70	3.20	5.20
D.A. A CN	77	77	77	77
D.A. B CN	83	78	79	80
D.A. C CN	83	77	78	79
D.A. D CN	86	83	83	84
D.A. E CN	82	76	77	79

NOTE: THIS IS A CONCEPTUAL PLAN AND IS SUBJECT TO CHANGE DURING FINAL ENGINEERING.

Bowman CONSULTING

Bowman Consulting Group, Ltd.
14020 Thunderbolt Place
Suite 300
Chantilly, Virginia 20151
Phone: (703) 464-1000
Fax: (703) 481-9720
www.bowmanconsulting.com

STORMWATER CALCULATIONS (2 OF 2)

FORT BELVOIR
WOODLAWN VILLAGE EAST

MOUNT VERNON MAGISTERIAL DISTRICT FAIRFAX COUNTY, VIRGINIA

COUNTY PROJECT NUMBER

PLAN STATUS	
03/24/14	ISSUE TO CLIENT
05/01/14	ISSUE TO CLIENT
03/17/15	ISSUE TO CLIENT

DATE	DESCRIPTION

ARV	CDL	REW
DESIGN	DRAWN	CHKD

SCALE H: N/A V: N/A

JOB No. 2742-01-011

DATE: MARCH 2015

FILE No. 2742-D-CP-011

SHEET 4 OF 4

Cad file name : P:\2742 - Fort Belvoir\2742-01-011 (ENG) - Playground\Engineering\Engineering Plans\Woodlawn Village East\2742-D-CP-011-DDP.dwg

APPENDIX C – WETLAND SURVEY

Woodlawn Village

Fairfax County, Virginia

WSSI #9528.14

Waters of the U.S. (Including Wetlands) Delineation and Resource Protection Area Evaluation

March 18, 2014
Revised October 17, 2014

Prepared for:
Fort Belvoir Residential Communities, LLC
5201 Patrick Road
Fort Belvoir, VA 22060

Prepared by:

5300 Wellington Branch Drive, Suite 100
Gainesville, Virginia 20155
Tel: 703-679-5600 Email: contactus@wetlandstudies.com
www.wetlandstudies.com

Waters of the U.S. (Including Wetlands) Delineation And Resource Protection Area (RPA) Evaluation

Woodlawn Village (±57 acres) WSSI #9528.14

Introduction

Wetland Studies and Solutions, Inc. (WSSI) has determined the boundaries of the jurisdictional wetlands and other waters of the U.S. (i.e., streams and ponds) on the referenced site. Additionally, potential Resource Protection Area (RPA) core components on and within 100 feet of the site were evaluated to determine if RPA is present on the project site. As discussed in this report, jurisdictional wetlands and other waters of the U.S. are present on the site. These waters of the U.S. include palustrine forested and palustrine emergent wetlands some of which drain via a ditch towards Dogue Creek. Others have no jurisdictional connection, but ultimately drain to Dogue Creek as well. There are also isolated wetlands present on the site. RPA is not present on the site. Our findings are depicted (as a surveyed map) on the Waters of the U.S. Delineation Map (Attachment I) and are discussed briefly below. This report has been revised to include an additional data point and photograph requested by the U.S. Army Corps of Engineers during an October 16, 2014 site visit.

Project Location

The site is located north of Pole Road (Route 622), between Plantation Drive and Orville Street at Fort Belvoir in Fairfax County, Virginia. Exhibit 1 is a vicinity map that depicts the approximate boundaries of the site and its general location.

Methodology

This wetland delineation was performed pursuant to the "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1 (1987 Manual) and subsequent guidance, and modified by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region*, Version 2.0 dated November 2010. The Routine On-Site Wetland Determination Method for more than 5 acres was used, with multiple transects performed as depicted on Attachment I. Field work was performed by Benjamin N. Rosner, PWS, PWD, CE, CT[1], Alison Robinson, W.P.I.T., PWD, CT[2], Jessica M. Campo, W.P.I.T., CT[3], and Matthew S. Johnson, W.P.I.T, CAE, CT[4] on February 28, and March 10, 2014.

Prior to conducting field work, relevant background information was reviewed, including site topography, the Mount Vernon, VA-MD and Fort Belvoir, VA-MD 1983 USGS quadrangle

---

1 *Professional Wetland Scientist #0001766, Society of Wetlands Scientists Certification Program, Inc. VA Certified Professional Wetland Delineator #3402-000080. Ecological Society of America, Certified Ecologist; North American Benthological Society (NABS) Certified Level 1 Taxonomist: All Taxa.*

2 *Wetland Professional In Training, Society of Wetlands Scientists Certification Program, Inc.; VA Certified Professional Wetland Delineator #3402-000147. North American Benthological Society (NABS) Certified Level 1 Taxonomist: All Taxa.*

3 *Wetland Professional In Training, Society of Wetlands Scientists Certification Program, Inc.; Society of Freshwater Science Certified Family Level Taxonomist: All Taxa.*

4 *Wetland Professional In Training, Society of Wetlands Scientists Certification Program, Inc.; Ecological Society of America, Certified Associated Ecologist; Society of Freshwater Science Certified Family Level Taxonomist: All Taxa.*

(Exhibit 2) and Digital National Wetlands Inventory (Exhibit 3, downloaded September 2013) maps, SSURGO Soils Map data (Exhibit 4), the Fairfax County Resource Protection Area (RPA) Map (Exhibit 5a) and the Fort Belvoir RPA Map (Exhibit 5b), and the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map, Panel 51059C0385E and Panel 51059C0405E (Effective 9/17/2010; Exhibit 6). Aerial photographs of the site, including a Fall 2008 natural color photograph from Aerials Express (Exhibit 7), a March 2013 natural color photograph from Virginia Base Mapping Program (VBMP) (Exhibit 8), and a March 2013 color infrared photograph from VBMP (Exhibit 9), were also examined to investigate whether signatures indicative of wetlands are found on the site and to document recent land use changes in the vicinity of the project site.

Portions of the Woodlawn Village site overlap the boundaries of projects previously investigated by WSSI as described below.

- The boundaries of jurisdictional wetlands and other waters of the U.S. within the western half of the Woodlawn Village site were previously delineated and surveyed by WSSI, as depicted in the August 2003 report titled "Fort Belvoir RCI- Woodlawn East". This report was never submitted to the Corps of Engineers and no Jurisdictional Determination was obtained.

- The boundaries of jurisdictional wetlands and other waters of the U.S. within the eastern half of the Woodlawn Village site were previously delineated and surveyed by WSSI, as described in the July 24, 1998 report titled "Wetlands Investigation, Edgewood Road". A Jurisdictional Determination (98-B140) was issued on October 1, 1998, that has since expired.

- The parcel located between southern portions of the site north of Pole Road was previously delineated in a report titled "Waters of the U.S. (Including Wetlands) Delineation and Resource Protection Area Evaluation-Pole Road Site" dated September 16, 2005. A Jurisdictional Determination (05-R2808) was issued on October 31, 2005, and has since expired.

- The site located to the west of the study area was delineated and surveyed by WSSI as described in the April 22, 2009 report titled "Waters of the U.S. (Including Wetlands) Delineation and Resource Protection Area (RPA) Evaluation, Woodlawn Village-Fort Belvoir." A Jurisdictional Determination (NAB-2009-01270-M30) was issued on May 11, 2010.

- Approximately 50 acres of the Woodlawn Village site was previously delineated and surveyed by WSSI as described in the November 2, 2010 report titled "Waters of the U.S. (Including Wetlands) Delineation and Resource Protection Area Evaluation, Woodlawn East – Berman Tract." This report was never submitted to the Corps of Engineers and no Jurisdictional Determination was obtained.

WSSI reviewed the information for these studies prior to conducting our field delineation work. Although the areas within the site were previously delineated by WSSI, it was necessary to redelineate the entire site because jurisdictional determinations had either expired or were not obtained and because the COE now requires that the 1987 Manual Supplement: Atlantic and Gulf Coastal Plain Manual (dated November 2010) be used for all delineations within this region. Therefore, WSSI redelineated the area to ensure compliance with the supplement.

Observations of vegetation, soils and hydrology were recorded at representative locations in the wetlands and adjacent non-wetland areas to determine the wetland boundaries. Routine Wetland Determination data forms describing representative plant communities, hydrology indicators, and soil characteristics are included as Exhibit 10. Photographs of the data point locations, representative wetland and non-wetland communities, and other existing site conditions are included in Exhibit 11. The surveyed locations of delineated wetlands, other waters of the U.S., data sites, and the approximate locations of photographs are depicted on Attachment I.

Waters of the U.S. Delineation Findings

In WSSI's opinion, jurisdictional wetlands are present on this site. These jurisdictional waters of the U.S. include palustrine forested and palustrine emergent wetlands. As evidenced in the enclosed data points, the majority of the site is dominated by a hydrophytic vegetative community. Thus, the majority of wetland determination decisions for the site were based on the presence/absence of indicators of wetland hydrology and hydric soils. Given the time of year, hydrology indicators were very strong within the wetlands (standing water), and generally weaker (no standing water, only soil saturation) in the upland areas.

In WSSI's opinion, the PFO wetlands delineated with the K/L and O/P flag series are isolated water bodies. Based on decisions in the U.S. Court of Appeals for the Fourth Circuit[5] and the U.S. Supreme Court[6] and related guidance issued by the U.S. Army Corps of Engineers (COE) on May 29, 1998[7], the COE is not regulating isolated water bodies at the present time, unless the COE determines that there is a connection with interstate commerce or that the isolated water body is adjacent to a jurisdictional water of the U.S. At the time of the jurisdictional determination site visit, WSSI will ask the COE to concur that these isolated wetlands are not jurisdictional under the Clean Water Act. Note that all isolated water bodies, regardless of whether they are considered jurisdictional under the Clean Water Act, are regulated by Virginia's Department of Environmental Quality (DEQ).

The wetland delineated with the G/H flag series in the north-central portion of the site is connected to downslope wetlands by a ditch. In WSSI's opinion, this ditch is non-jurisdictional, because it lacks the characteristics of a stream or wetland, as evidenced by Data Point 3. In accordance with decisions in the Fourth Circuit Court[8] and the COE's internal guidance, man-made ditches that convey water between jurisdictional wetlands or other waters of the U.S. (i.e., streams or ponds) are generally regulated as jurisdictional waters of the U.S. only if they possess the characteristics of a stream or wetland and if the ditch discharge eventually flows into traditional, navigable waters.

Resource Protection Area Evaluation

Based on WSSI's field work, the limits of the field-verified RPA on the site are similar to those depicted on the Fairfax County RPA Map (Exhibit 5a). However, they are significantly less than those depicted on the Fort Belvoir RPA Map (Exhibit 5b). According to Section 118-1-

---

5 *United States v. James J. Wilson, 133F.3rd 251, Fourth Circuit Court of Appeals.*

6 *121 Supreme Court 675 (2001) in Solid Waste Agency of North Cook County (SWANCC) v. U.S. Army Corps of Engineers.*

7 *Guidance for Corps and EPA Field Offices Regarding Clean Water Act Section 404 Jurisdiction Over Isolated Waters in Light of United States v. James J. Wilson, issued May 28, 1998.*

8 *United States v. Deaton (332 F.3rd 698, 4th Circuit, June 12, 2003) and Treacy v. Newdunn (344 F.3rd. 407 (4th Circuit, September 10, 2003).*

7(b) of the Fairfax County Chesapeake Bay Preservation Ordinance[9], an RPA includes the following:

1. *A tidal wetland;*
2. *A tidal shore;*
3. *A water body with perennial flow;*
4. *A non-tidal wetland connected by surface flow and contiguous to a tidal wetland or water body with perennial flow;*
5. *A buffer area as follows:*
   - *(i) Any land within a major floodplain; and*
   - *(ii) Any land within 100 feet of a feature listed in Sections 118-1-7(b)1-4 above.*

The full buffer area shall be designated as the landward component of the RPA notwithstanding the presence of permitted uses, encroachments, and permitted vegetation clearing in compliance with Article 3. Designation of the components listed in Sections 118-1-7(b)(1)-(4) shall not be subject to modification unless based on reliable, site specific information as provided for in Section 118-1-9.

No tidal wetlands, tidal shores, or water bodies with perennial flow are present on or within 100 feet of the site. Wetlands are present on the site, however, they are not "connected by surface flow and contiguous to a tidal wetland or water body with perennial flow."

The wetland delineated with the E/F flag series in the northwestern portion of the site, drains off-site via a narrow wetland swale[10]. Based on guidance from Chesapeake Bay Local Assistance dated June 18, 2007 and revised December 10, 2007, narrow wetland swales are not RPA core components. Therefore, the wetland present on the northwestern portion of the site is not an RPA core component.

Summary

In WSSI's opinion, jurisdictional wetlands and other waters of the U.S are present within the study area, based on our site observations, as described above and depicted on Attachment I. In our opinion, RPA is not present on the site.

The waters of the U.S. on the site (i.e., the wetlands) are regulated by Sections 401 and 404 of the Clean Water Act and by state wetlands laws and cannot be disturbed without the appropriate permits. Such permits may include permits from local agencies, as well as the U.S. Army Corps of Engineers and the Virginia Department of Environmental Quality, depending upon the extent and type of impacts.

Limitations

This study is based on examination of the vegetation, soils and hydrology and available reference documents. Field indicators can change with variations in hydrology and other factors.

---

[9] *As amended by the Board of Supervisors (BOS) on July 7, 2003, effective November 18, 2003 and as amended through May 21, 2007.*

[10] *"Non-tidal wetlands existing solely within a defined bed and bank of an intermittent or ephemeral stream, or other non-perennial conveyance" are not generally considered a component of the RPA pursuant to the Chesapeake Bay Local Assistance Department June 18, 2007 (revised December 10, 2007)"Resource Protection Areas: Non-tidal Wetlands, Guidance on the Chesapeake Bay Preservation Area Designation and Management Regulations."*

Therefore, our conclusions may vary significantly from future observation by others. This report assesses the potential for wetlands at the site at the time of our review and does not address conditions at a given time in the future.

Our review and report have been prepared in accordance with generally accepted guidelines for the conduct of a survey for potential wetlands. We make no other warranties, either expressed or implied, and our report is not a recommendation to buy, sell or develop the property.

We offer no opinion and do not purport to opine on the possible application of various building codes, zoning ordinances, other land use or platting regulations, environmental or health laws and other similar statutes, laws, ordinances, code and regulations affecting the possible use and occupancy of the Property for the purpose for which it is being used, except as specifically provided above.

The foregoing opinions are based on applicable laws, ordinances, and regulations in effect as of the date hereof and should not be construed to be an opinion as to the matters set out herein should such laws, ordinances or regulations be modified, repealed or amended.

This report does not constitute a jurisdictional determination of waters of the U.S. since such determinations must be verified by the U.S. Army Corps of Engineers or the Natural Resources Conservation Service (as applicable), and are subject to review by the U.S. Environmental Protection Agency. This report does not constitute a stream characterization determination; nor does it constitute a Resource Protection Area determination since such determinations must be verified by Fort Belvoir Directorate of Public Works – Environmental and Natural Resources Division.

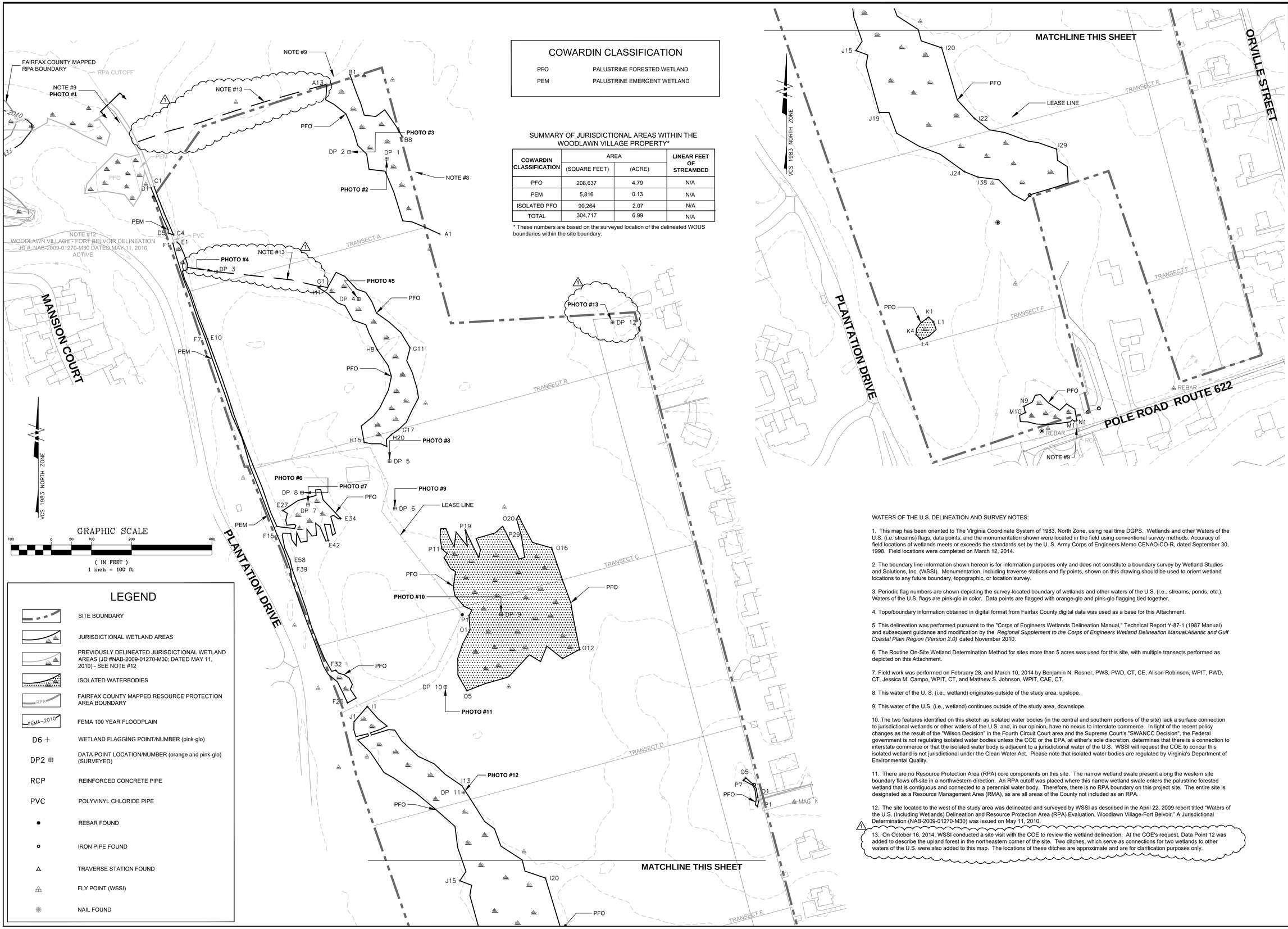
WETLAND STUDIES AND SOLUTIONS, INC.

Benjamin N. Rosner, PWS, PWD, CE, CT
Senior Associate Environmental Scientist

Mark Headly, PWS, PWD, LEED®AP
Operations Manger

L:\09000s\9528.14\Admin\05-ENVR\Delin\Delin Rpt.docx

Attachment I



COWARDIN CLASSIFICATION

PFO	PALUSTRINE FORESTED WETLAND
PEM	PALUSTRINE EMERGENT WETLAND

SUMMARY OF JURISDICTIONAL AREAS WITHIN THE WOODLAWN VILLAGE PROPERTY*

COWARDIN CLASSIFICATION	AREA (SQUARE FEET)	AREA (ACRE)	LINEAR FEET OF STREAMBED
PFO	208,637	4.79	N/A
PEM	5,816	0.13	N/A
ISOLATED PFO	90,264	2.07	N/A
TOTAL	304,717	6.99	N/A

* These numbers are based on the surveyed location of the delineated WOUS boundaries within the site boundary.

LEGEND

- SITE BOUNDARY
- JURISDICTIONAL WETLAND AREAS
- PREVIOUSLY DELINEATED JURISDICTIONAL WETLAND AREAS (JD #NAB-2009-01270-M30; DATED MAY 11, 2010) - SEE NOTE #12
- ISOLATED WATERBODIES
- FAIRFAX COUNTY MAPPED RESOURCE PROTECTION AREA BOUNDARY
- FEMA 100 YEAR FLOODPLAIN
- D6 + WETLAND FLAGGING POINT/NUMBER (pink-glo)
- DP2 ⊞ DATA POINT LOCATION/NUMBER (orange and pink-glo) (SURVEYED)
- RCP REINFORCED CONCRETE PIPE
- PVC POLYVINYL CHLORIDE PIPE
- ● REBAR FOUND
- ○ IRON PIPE FOUND
- △ TRAVERSE STATION FOUND
- ⧋ FLY POINT (WSSI)
- ⊛ NAIL FOUND

WATERS OF THE U.S. DELINEATION AND SURVEY NOTES:

1. This map has been oriented to The Virginia Coordinate System of 1983, North Zone, using real time DGPS. Wetlands and other Waters of the U.S. (i.e. streams) flags, data points, and the monumentation shown were located in the field using conventional survey methods. Accuracy of field locations of wetlands meets or exceeds the standards set by the U. S. Army Corps of Engineers Memo CENAO-CO-R, dated September 30, 1998. Field locations were completed on March 12, 2014.

2. The boundary line information shown hereon is for information purposes only and does not constitute a boundary survey by Wetland Studies and Solutions, Inc. (WSSI). Monumentation, including traverse stations and fly points, shown on this drawing should be used to orient wetland locations to any future boundary, topographic, or location survey.

3. Periodic flag numbers are shown depicting the survey-located boundary of wetlands and other waters of the U.S. (i.e., streams, ponds, etc.). Waters of the U.S. flags are pink-glo in color. Data points are flagged with orange-glo and pink-glo flagging tied together.

4. Topo/boundary information obtained in digital format from Fairfax County digital data was used as a base for this Attachment.

5. This delineation was performed pursuant to the "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1 (1987 Manual) and subsequent guidance and modification by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual:Atlantic and Gulf Coastal Plain Region (Version 2.0)* dated November 2010.

6. The Routine On-Site Wetland Determination Method for sites more than 5 acres was used for this site, with multiple transects performed as depicted on this Attachment.

7. Field work was performed on February 28, and March 10, 2014 by Benjamin N. Rosner, PWS, PWD, CT, CE, Alison Robinson, WPIT, PWD, CT, Jessica M. Campo, WPIT, CT, and Matthew S. Johnson, WPIT, CAE, CT.

8. This water of the U. S. (i.e., wetland) originates outside of the study area, upslope.

9. This water of the U.S. (i.e., wetland) continues outside of the study area, downslope.

10. The two features identified on this sketch as isolated water bodies (in the central and southern portions of the site) lack a surface connection to jurisdictional wetlands or other waters of the U.S. and, in our opinion, have no nexus to interstate commerce. In light of the recent policy changes as the result of the "Wilson Decision" in the Fourth Circuit Court area and the Supreme Court's "SWANCC Decision", the Federal government is not regulating isolated water bodies unless the COE or the EPA, at either's sole discretion, determines that there is a connection to interstate commerce or that the isolated water body is adjacent to a jurisdictional water of the U.S. WSSI will request the COE to concur this isolated wetland is not jurisdictional under the Clean Water Act. Please note that isolated water bodies are regulated by Virginia's Department of Environmental Quality.

11. There are no Resource Protection Area (RPA) core components on this site. The narrow wetland swale present along the western site boundary flows off-site in a northwestern direction. An RPA cutoff was placed where this narrow wetland swale enters the palustrine forested wetland that is contiguous and connected to a perennial water body. Therefore, there is no RPA boundary on this project site. The entire site is designated as a Resource Management Area (RMA), as are all areas of the County not included as an RPA.

12. The site located to the west of the study area was delineated and surveyed by WSSI as described in the April 22, 2009 report titled "Waters of the U.S. (Including Wetlands) Delineation and Resource Protection Area (RPA) Evaluation, Woodlawn Village-Fort Belvoir." A Jurisdictional Determination (NAB-2009-01270-M30) was issued on May 11, 2010.

1 13. On October 16, 2014, WSSI conducted a site visit with the COE to review the wetland delineation. At the COE's request, Data Point 12 was added to describe the upland forest in the northeastern corner of the site. Two ditches, which serve as connections for two wetlands to other waters of the U.S. were also added to this map. The locations of these ditches are approximate and are for clarification purposes only.

Wetland Studies and Solutions, Inc.
5300 Wellington Branch Drive • Suite 100
Gainesville, Virginia 20155
Phone: 703-679-5600 • Fax: 703-679-5601
www.wetlandstudies.com

ATTACHMENT I:
WATERS OF THE U.S. (INCLUDING WETLANDS) DELINEATION AND RESOURCE PROTECTION AREA EVALUATION MAP

Prepared For: Fort Belvoir Residential Communities, LLC

Woodlawn Village
Fairfax County, Virginia

REVISIONS

No.	Date	Description	Rev. By	App. By
1	10/17/14	Revisions per COE site visit	BNR	MH

SCALE: 1" = 100' C.I.: 2'

DATE: March 18, 2014

Horizontal Datum: VCS NAD 83

Vertical Datum: NGVD 29

Boundary and Topo Source: Fairfax County Digital Data

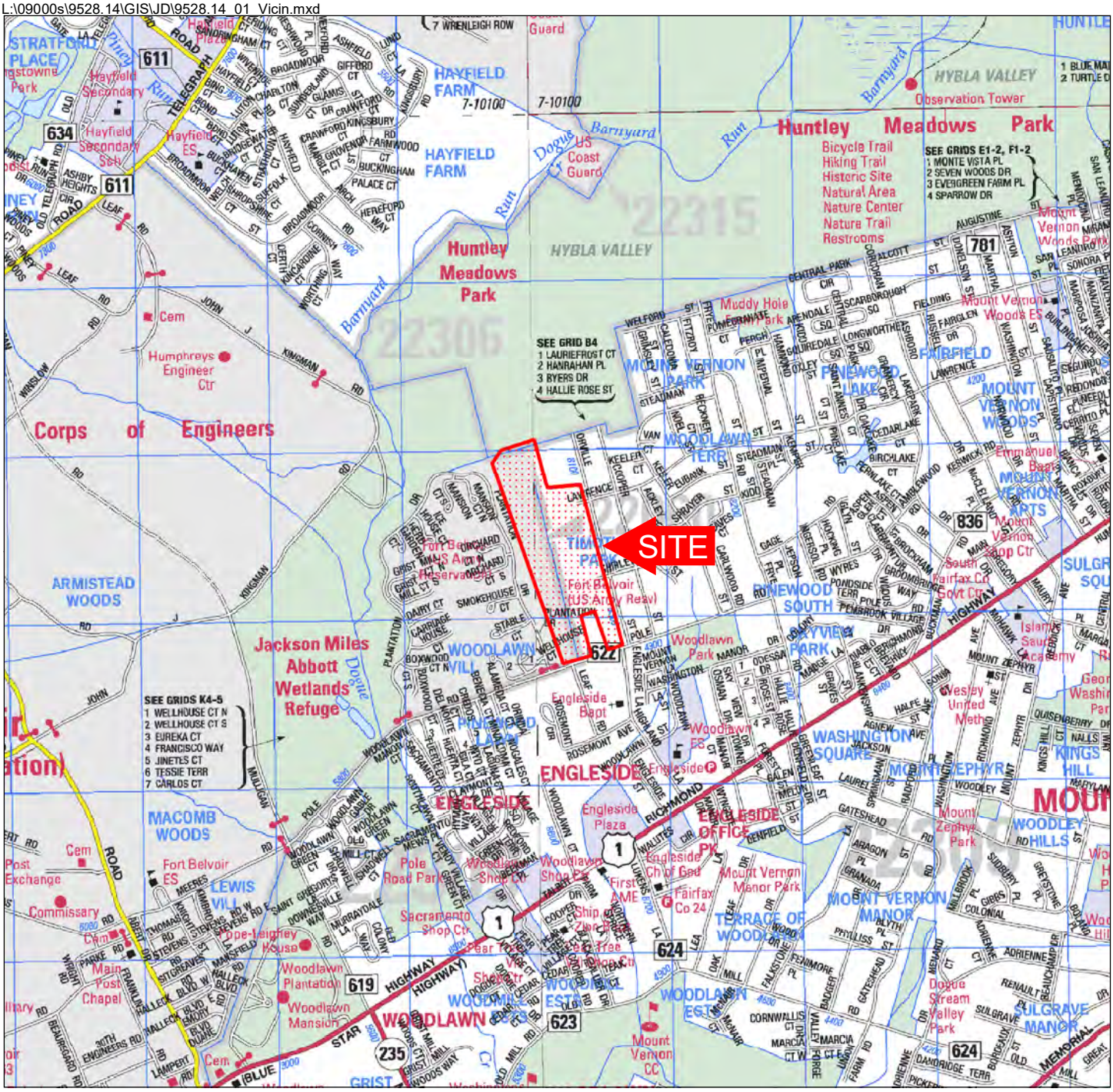
Design	Draft	Approved
MSJ	JMC	MH

Sheet # 1 of 1

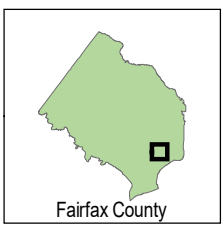
Computer File Name:
I:\900s\923.1C.02\DGN\SVR
20140313_Delin.dwg

Exhibit 1

L:\09000s\9528.14\GIS\JD\9528.14_01_Vicin.mxd



Vicinity Map
Woodlawn Village
WSSI #9528.14
Original Scale: 1" = 2000'



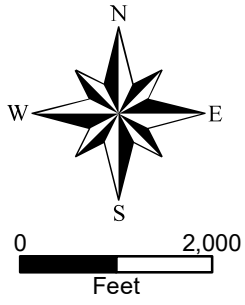
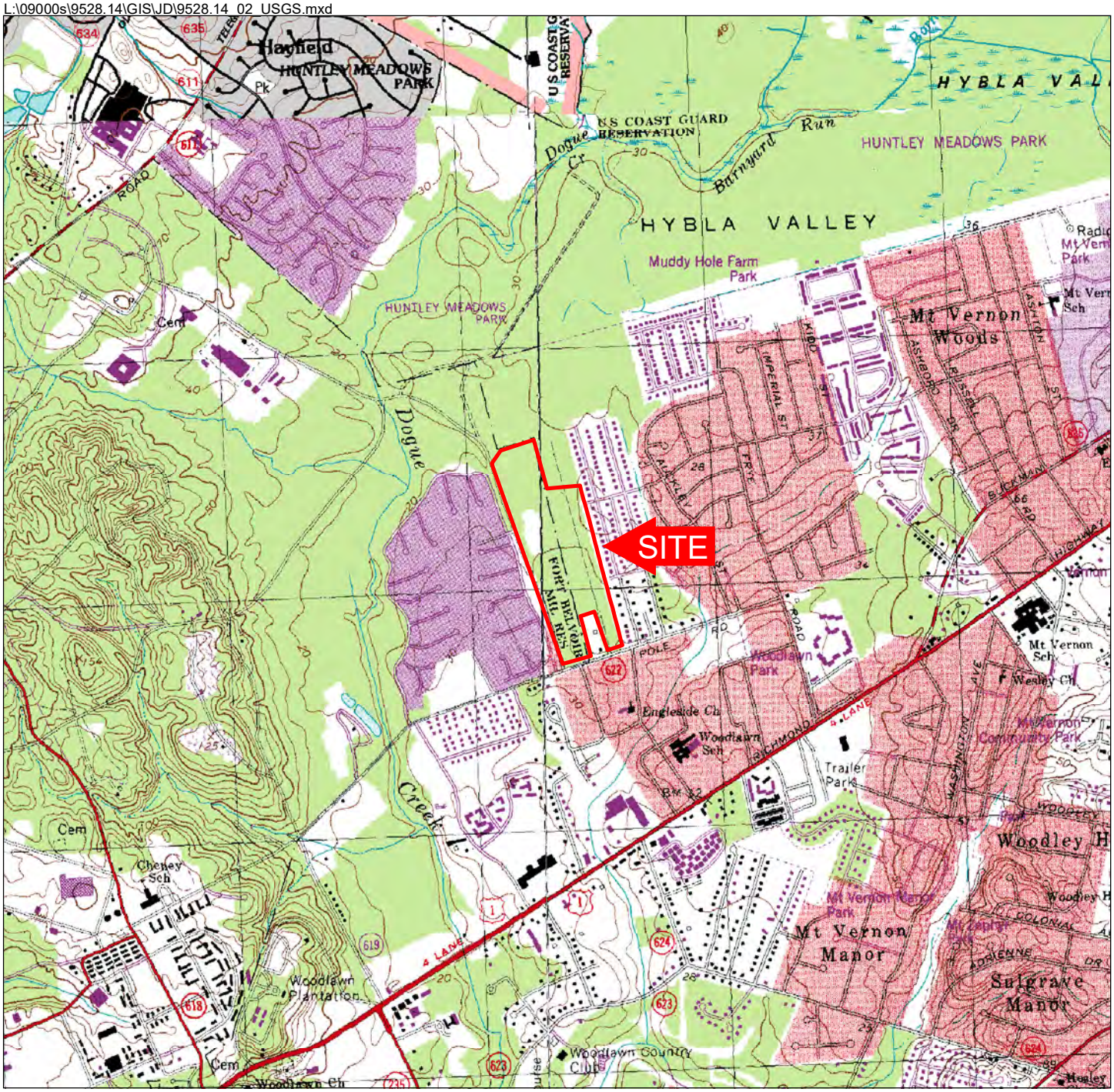


Exhibit 2

L:\09000s\9528.14\GIS\JD\9528.14_02_USGS.mxd



USGS Quad Maps
Mount Vernon, VA-MD 1983 & Fort Belvoir, VA-MD 1983
Woodlawn Village
WSSI #9528.14
Original Scale: 1" = 2000'

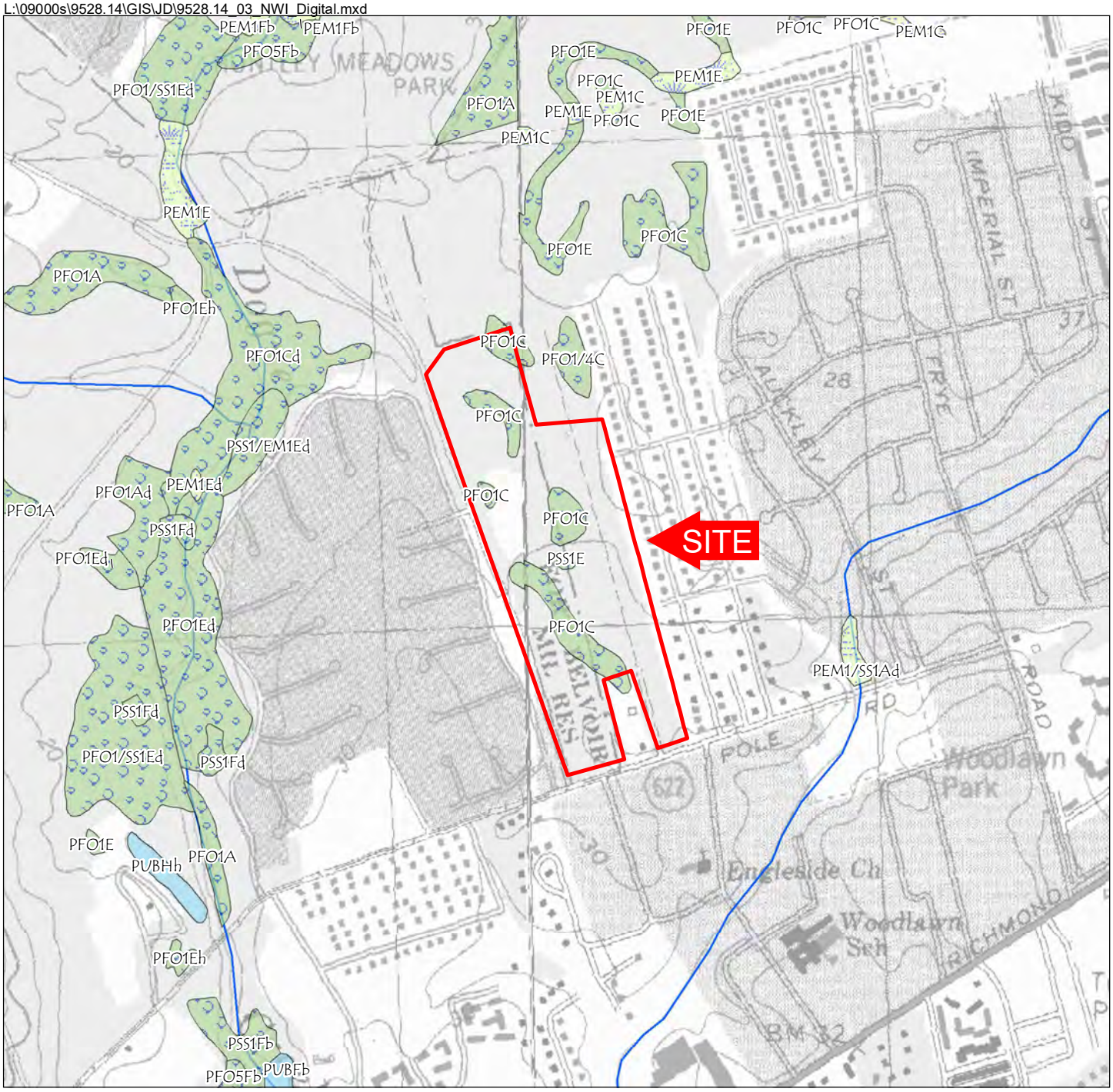
N
W E
S

0 2,000
Feet

Latitude: 38°44'01" N
Longitude: 77°07'25" W
Hydrologic Unit Code (HUC): 020700100306
Stream Class: III
Name of Watershed: Dogue Creek
COE Region: Atlantic and Gulf Coastal Plain

Exhibit 3

L:\09000s\9528.14\GIS\JD\9528.14_03_NWI_Digital.mxd



Digital National Wetlands Inventory Map
Woodlawn Village
WSSI #9528.14
Original Scale: 1" = 1000'

Wetland Type

- Open Water
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Other Wetland

Download Date: September 2013
Source: http://www.fws.gov/wetlands/Data/State-Downloads.html

N
W E
S

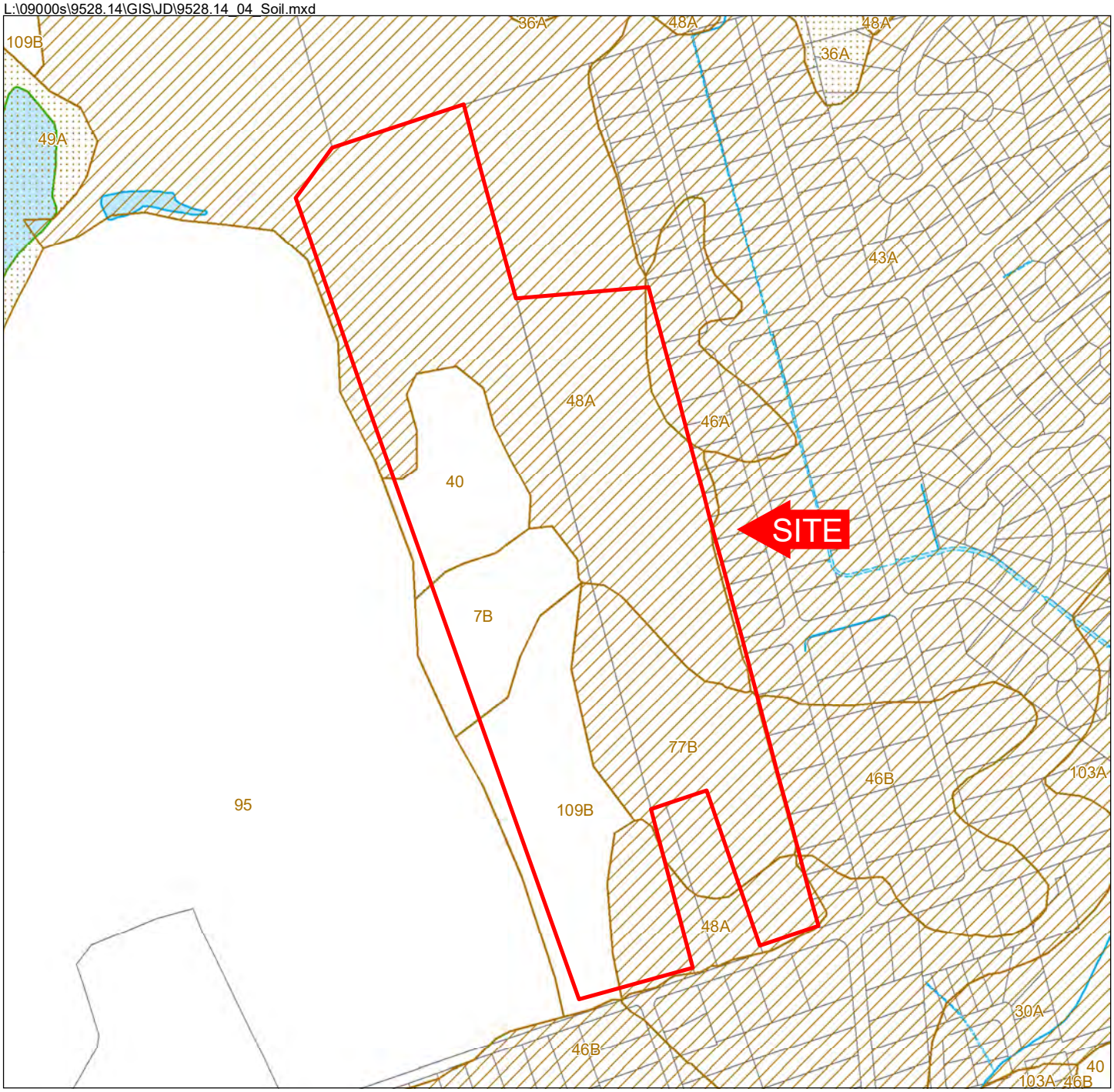
0 1,000
Feet

Wetland Studies and Solutions, Inc.

Exhibit 3

Exhibit 4

L:\09000s\9528.14\GIS\JD\9528.14_04_Soil.mxd



Soils Map
SSURGO Soils Data
Woodlawn Village
WSSI #9528.14
Original Scale: 1" = 500'

N
W
E
S
0
500
Feet

Hydric Soils
Soils with Hydric Inclusions
Non-hydric Soils

Source: Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database

Wetland Studies and Solutions, Inc.

Exhibit 4

Mapped Soils Report for Woodlawn Village

Project Number: 9528.14

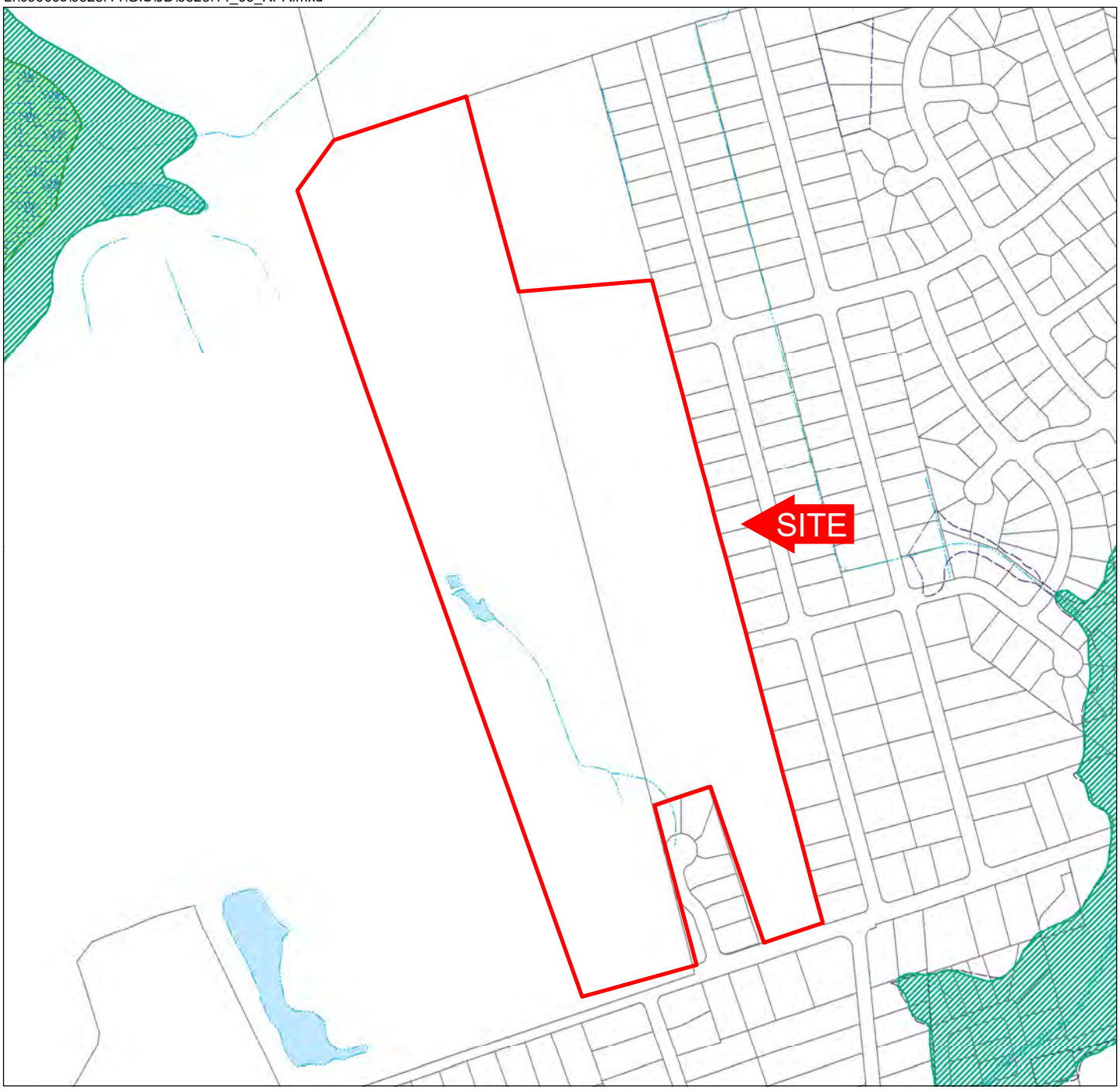
Applicant / Owner: Fort Belvoir Residential Communities, LLC

County: Fairfax, VA

Map Symbol	Map Unit Name	Taxonomy	Drainage Class	Hydric National List	Hydric Local List	Hydric Inclusions
7B	Beltsville silt loam, 2-7% slopes	Typic Fragiudults	moderately well	NO	NO	NO
40	Grist Mill sandy loam, 0-25% slopes	Typic Udorthents	well	NO	NO	NO
43A	Grist Mill-Gunston complex, 0-2% slopes	Typic Udorthents	well	NO	NO	YES
46A	Grist Mill-Mattapex complex, 0-2% slopes	Typic Udorthents	well	NO	NO	YES
46B	Grist Mill-Mattapex complex, 2-7% slopes	Typic Udorthents	well	NO	NO	YES
48A	Gunston silt loam, 0-2% slopes	Aeric Paleaquults	smwt poorly	NO	NO	YES
77B	Mattapex loam, 2-7% slopes	Aquic Hapludults	moderately well	NO	NO	YES
109B	Woodstown sandy loam, 2-7% slopes	Aquic Hapludults	moderately well	NO	NO	NO

Exhibit 5

L:\09000s\9528.14\GIS\JD\9528.14_05_RPA.mxd



Resource Protection Area (RPA) Map
Fairfax County Digital Data
Woodlawn Village
WSSI #9528.14
Original Scale: 1" = 500'

N
W E
S

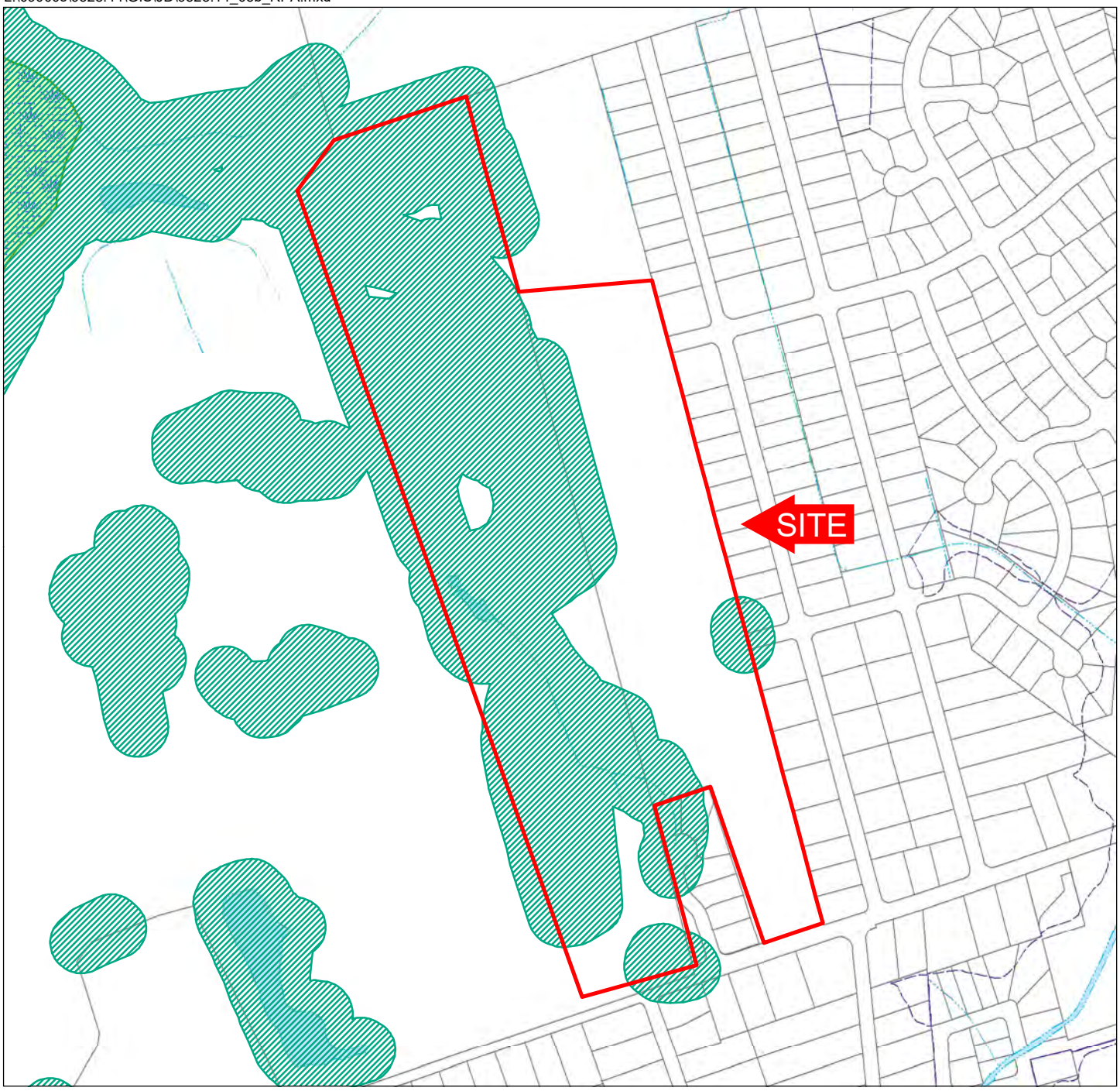
0 500
Feet

Resource Protection Areas (RPA)
- 1993 RPA
- 2003 RPA
- 2003 and 2005 Revisions to RPA
- Resource Management Areas (RMAs)
- Pipes, Culverts
- Fairfax County Floodplain 2013

Wetland Studies and Solutions, Inc.

Exhibit 5a

L:\09000s\9528.14\GIS\JD\9528.14_05b_RPA.mxd



Resource Protection Area (RPA) Map
Fort Belvoir Digital Data
Woodlawn Village
WSSI #9528.14
Original Scale: 1" = 500'

N
W E
S

0 500
Feet

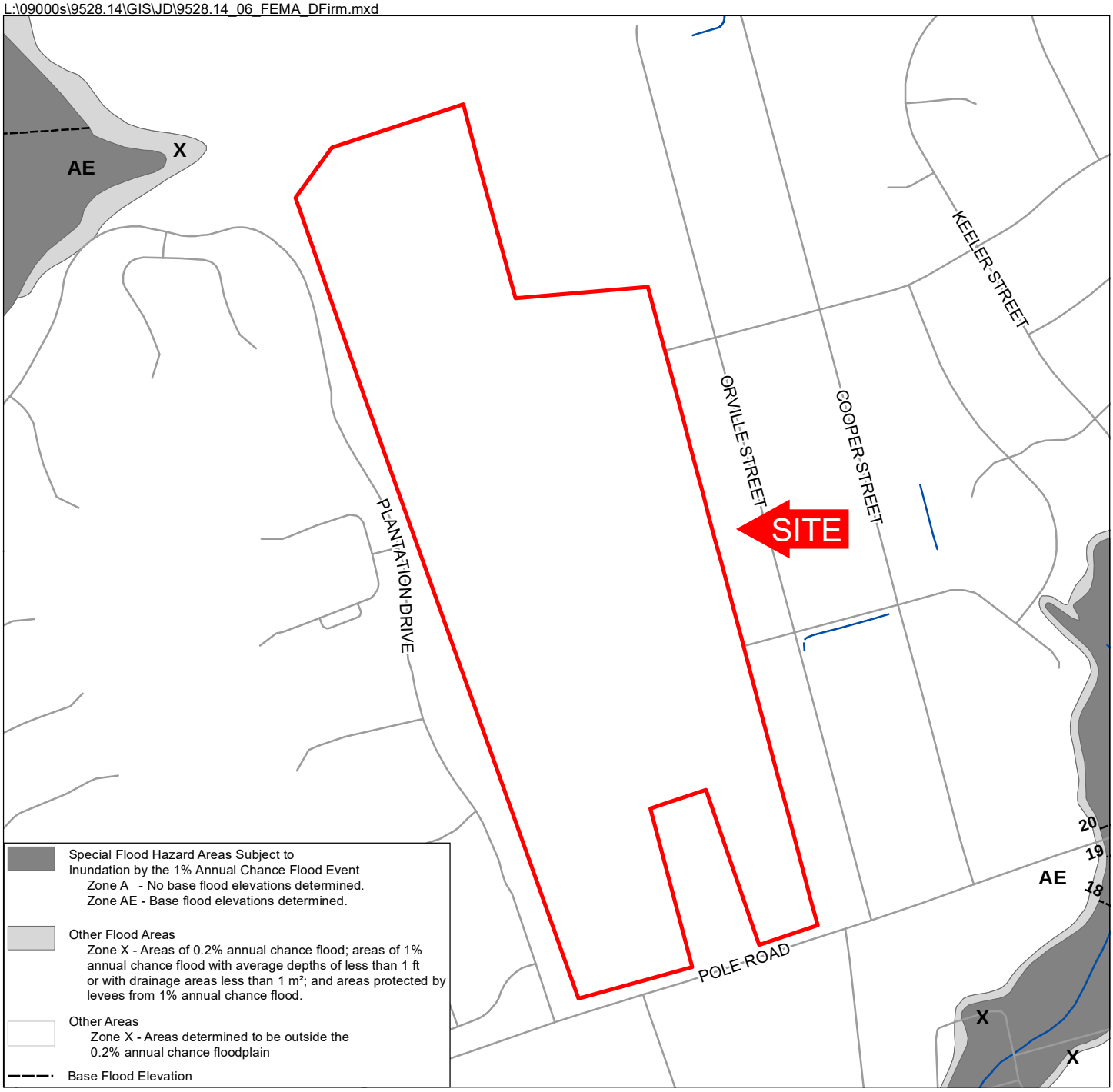
Resource Protection Area

Wetland Studies and Solutions, Inc.

Exhibit 5b

Exhibit 6

L:\09000s\9528.14\GIS\JD\9528.14_06_FEMA_DFirm.mxd



FEMA Digital Flood Insurance Rate Map
Panel 51059C0385E Effective 9/17/2010
Panel 51059C0405E Effective 9/17/2010
Woodlawn Village
WSSI #9528.14
Original Scale: 1" = 500'

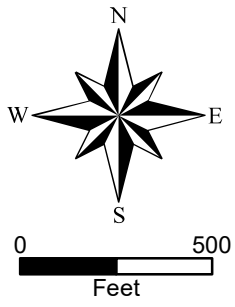
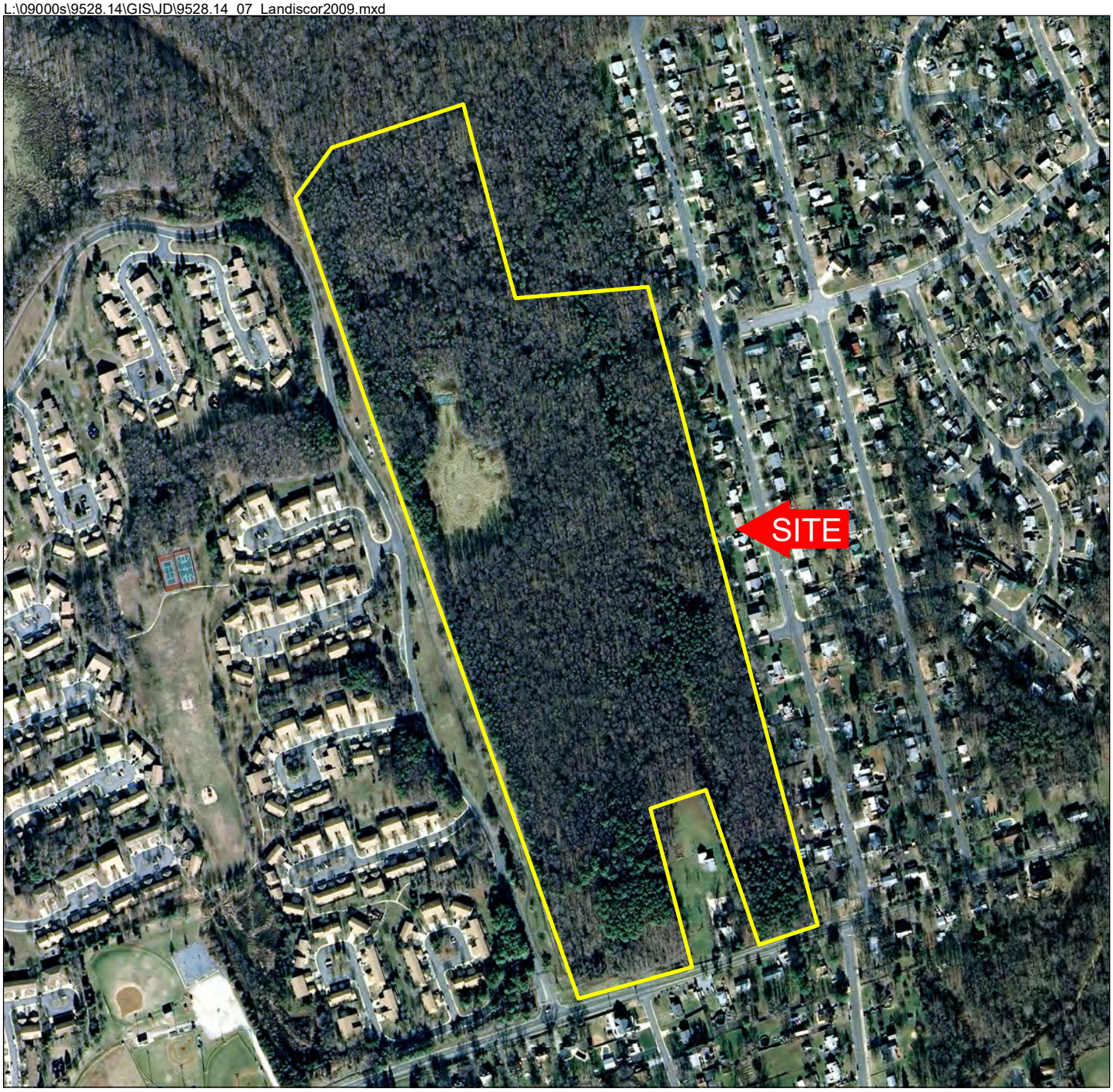


Exhibit 7

L:\09000s\9528.14\GIS\JD\9528.14_07_Landiscor2009.mxd



Fall 2008 Natural Color Imagery
Woodlawn Village
WSSI #9528.14
Original Scale: 1" = 500'

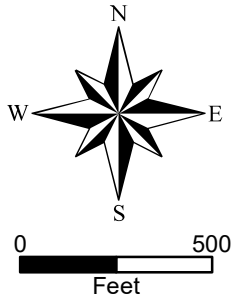


Photo Source: Aerials Express

Exhibit 8

L:\09000s\9528.14\GIS\JD\9528.14_08_Aerometric2012.mxd

March 2013 Natural Color Imagery
Woodlawn Village
WSSI #9528.14
Original Scale: 1" = 500'

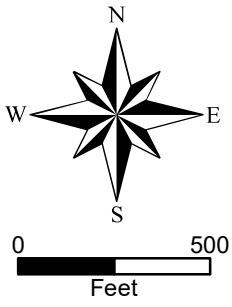


Photo Source: Virginia Base Mapping Program (VBMP)

Exhibit 9

L:\09000s\9528.14\GIS\JD\9528.14_09_DOQQ.mxd

March 2013 Color Infrared Imagery
Woodlawn Village
WSSI #9528.14
Original Scale: 1" = 500'

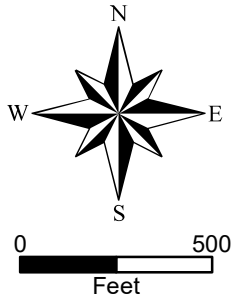


Photo Source: Virginia Base Mapping Program (VBMP)

Exhibit 10

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Woodlawn Village City/County: Fairfax Sampling Date 2 /28/2014

Applicant/Owner: Fort Belvoir Residential Communities, LLC State: VA Sampling Point: 1

Investigator(s): BNR, JMC, ABR Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2%

Subregion (LRR or MLRA): 149A Lat: 38°44'01" Long: 77°07'25" Datum: NAD 83

Soil Map Unit Name: 48A - Gunston silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks)

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:

All of the three wetland parameters were satisfied at this data point, which characterizes the palustrine forested wetland in the northern portion of the site.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum Moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 1" over 60%

Water Table Present? Yes ☑ No ☐ Depth (inches): 1"

Saturation Present? Yes ☑ No ☐ Depth (inches): 0"

(includes capillary fringe)

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants. Sampling Point: 1

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	80	☑	FAC
2. *Acer rubrum*	20	☐	FAC
3. *Quercus palustris*	15	☐	FACW
4.			
5.			
6.			
7.			
8.			
	115	= Total Cover	
50% of total cover: 57.5	20% of total cover:	23	

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1. *Liquidambar styraciflua*	25	☑	FAC
2. *Acer rubrum*	20	☑	FAC
3. *Ulmus americana*	10	☐	FAC
4. *Vaccinium corymbosum*	5	☐	FACW
5.			
6.			
7.			
8.			
	60	= Total Cover	
50% of total cover: 30	20% of total cover:	12	

Herb Stratum (Plot size: 5' Radius)			
1. *Smilax rotundifolia*	15	☑	FAC
2. *Liquidambar styraciflua*	10	☑	FAC
3. *Lonicera japonica*	10	☑	FAC
4. *Cinna arundinacea*	5	☐	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40	= Total Cover	
50% of total cover: 20	20% of total cover:	8	

Woody Vine Stratum (Plot size: 30' Radius)			
1. *Toxicodendron radicans*	15	☑	FAC
2. *Lonicera japonica*	5	☑	FAC
3.			
4.			
5.			
	20	= Total Cover	
50% of total cover: 10	20% of total cover:	4	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

Nomenclature and indicators from The National Wetland Plant List: 2013 wetland ratings

SOIL Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR3/1	100			N/A	N/A	Silt Loam	
2-6	5Y6/1	80	10YR5/6	20	C	M	Clay Loam	
6-13	10YR5/1	85	10YR4/6	15	C	M	Clay Loam	
13-16	10YR5/1	80	10YR5/8	20	C	M	Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise notes.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U**
- ☐ Thin Dark Suface (S9) **(LRR S, T, U**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P,S,T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (Inches):

Hydric Soil Present? Yes ☑ **No** ☐

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Woodlawn Village City/County: Fairfax Sampling Date 2 /28/2014

Applicant/Owner: Fort Belvoir Residential Communities, LLC State: VA Sampling Point: 2

Investigator(s): BNR, JMC, ABR Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Flat Area Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR or MLRA): 149A Lat: 38°44'01" Long: 77°07'25" Datum: NAD 83

Soil Map Unit Name: 48A - Gunston silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks)

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:

Only two of the three wetland parameters were satisfied at this data point, which characterizes the upland forest in the northern portion of the site.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum Moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): <1" over 2%

Water Table Present? Yes ☑ No ☐ Depth (inches): 6"

Saturation Present? Yes ☑ No ☐ Depth (inches): 10"

(includes capillary fringe)

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants. Sampling Point: 2

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	40	☑	FAC
2. *Acer rubrum*	15	☑	FAC
3. *Quercus phellos*	5	☐	FACW
4.			
5.			
6.			
7.			
8.			
	60 = Total Cover		
50% of total cover: 30	20% of total cover: 12		

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1. *Liquidambar styraciflua*	15	☑	FAC
2. *Acer rubrum*	10	☑	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		

Herb Stratum (Plot size: 5' Radius)			
1. *Cinna arundinacea*	45	☑	FACW
2. *Smilax rotundifolia*	5	☐	FAC
3. *Lonicera japonica*	2	☐	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	52 = Total Cover		
50% of total cover: 26	20% of total cover: 10.4		

Woody Vine Stratum (Plot size: 30' Radius)			
1. *Smilax rotundifolia*	2	☑	FAC
2.			
3.			
4.			
5.			
	2 = Total Cover		
50% of total cover: 1	20% of total cover: 0.4		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

Nomenclature and indicators from The National Wetland Plant List: 2013 wetland ratings

SOIL Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5Y4/3	80	2.5Y5/4	20	C	M	Silt Loam	
2-10	2.5Y5/4	80	2.5Y4/2	15	D	M	Silty Clay Loam	
			10YR4/4	5	C	M		
10-16	2.5Y5/6	85	2.5Y4/2	10	D	M	Clay	
			10YR4/6	5	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise notes.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U**
- ☐ Thin Dark Suface (S9) **(LRR S, T, U**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P,S,T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (Inches): _____

Hydric Soil Present? Yes ☐ **No** ☑

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Woodlawn Village City/County: Fairfax Sampling Date 2 /28/2014

Applicant/Owner: Fort Belvoir Residential Communities, LLC State: VA Sampling Point: 3

Investigator(s): BNR, JMC, ABR Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Flat Area Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR or MLRA): 149A Lat: 38°44'01" Long: 77°07'25" Datum: NAD 83

Soil Map Unit Name: 48A - Gunston silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks)

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:

Sample limited to ditch

Only two of the three wetland parameters were satisfied at this data point, which characterizes the non-wetland ditch between a palustrine forested wetland and the wetland ditch along the western site boundary of the site. This ditch also lacks the characteristics of a stream, thus it is not a jurisdictional WOUS

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☑ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum Moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ☑	No ☐	Depth (inches): 2" over 90%
Water Table Present?	Yes ☐	No ☑	Depth (inches): >16"
Saturation Present? (includes capillary fringe)	Yes ☐	No ☑	Depth (inches): >16"

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants. Sampling Point: 3

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	10	☑	FAC
2. *Acer rubrum*	10	☑	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Herb Stratum (Plot size: 5' Radius)			
1. *Cinna arundinacea*	15	☑	FACW
2. *Lonicera japonica*	10	☑	FAC
3. *Celastrus orbiculatus*	5	☐	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	30 = Total Cover		
50% of total cover: 15	20% of total cover: 6		

Woody Vine Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

Nomenclature and indicators from The National Wetland Plant List: 2013 wetland ratings; No Sapling/Shrub or Woody Vine strata species were present at this data point.

SOIL Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(Inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	2.5Y5/3	90	10YR4/6	10	C	M	Clay Loam	
10-16	2.5Y5/3	85	10YR4/6	10	C	M	Clay Loam	
			10YR5/1	5	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise notes.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U**
- ☐ Thin Dark Suface (S9) **(LRR S, T, U**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P,S,T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (Inches): _____

Hydric Soil Present? Yes ☐ **No** ☑

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Woodlawn Village City/County: Fairfax Sampling Date 2 /28/2014

Applicant/Owner: Fort Belvoir Residential Communities, LLC State: VA Sampling Point: 4

Investigator(s): BNR, JMC, ABR Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2%

Subregion (LRR or MLRA): 149A Lat: 38°44'01" Long: 77°07'25" Datum: NAD 83

Soil Map Unit Name: 48A - Gunston silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks)

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:

All of the three wetland parameters were satisfied at this data point, which characterizes the palustrine forested wetland in the northern portion of the site.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum Moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ☑	No ☐	Depth (inches): 3" over 40%
Water Table Present?	Yes ☑	No ☐	Depth (inches): 1"
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): 14"

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants. Sampling Point: 4

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus palustris*	50	☑	FACW
2. *Quercus rubra*	40	☑	FACU
3. *Acer rubrum*	30	☑	FAC
4. *Ulmus americana*	10	☐	FAC
5. *Liquidambar styraciflua*	10	☐	FAC
6.			
7.			
8.			
	140 = Total Cover		
50% of total cover: 70	20% of total cover: 28		

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1. *Ulmus americana*	25	☑	FAC
2. *Acer rubrum*	15	☑	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	40 = Total Cover		
50% of total cover: 20	20% of total cover: 8		

Herb Stratum (Plot size: 5' Radius)			
1. *Cinna arundinacea*	60	☑	FACW
2. *Smilax rotundifolia*	5	☐	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	65 = Total Cover		
50% of total cover: 32.5	20% of total cover: 13		

Woody Vine Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

Nomenclature and indicators from The National Wetland Plant List: 2013 wetland ratings; No Woody Vine strata was present at this data point.

SOIL Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR2/1	100			N/A	N/A	Silt Loam	Many fine roots
3-8	10YR5/1	80	10YR5/8	20	C	M	Silty Clay Loam	
8-14	10YR5/3	85	10YR5/6	10	C	M	Silty Clay Loam	
			10YR2/1	5	D	M	Silty Clay Loam	
14-16	10YR4/1	85	10YR5/8	15	C	M	Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise notes.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U**
- ☐ Thin Dark Suface (S9) **(LRR S, T, U**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P,S,T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (Inches):

Hydric Soil Present? Yes ☑ **No** ☐

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Woodlawn Village City/County: Fairfax Sampling Date 2 /28/2014

Applicant/Owner: Fort Belvoir Residential Communities, LLC State: VA Sampling Point: 5

Investigator(s): BNR, JMC, ABR Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Flat Area Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR or MLRA): 149A Lat: 38°44'01" Long: 77°07'25" Datum: NAD 83

Soil Map Unit Name: 48A - Grist Mill sandy loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks)

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:

Only two of the three wetland parameters were satisfied at this data point, which characterizes the upland forest in the central portion of the site.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum Moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 5" over 10%

Water Table Present? Yes ☑ No ☐ Depth (inches): 3"

Saturation Present? Yes ☑ No ☐ Depth (inches): 4"

(includes capillary fringe)

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants. Sampling Point: 5

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pinus virginiana*	30	☑	UPL
2. *Liquidambar styraciflua*	25	☑	FAC
3. *Acer rubrum*	15	☑	FAC
4. *Carpinus caroliniana*	10	☐	FAC
5. *Quercus palustris*	10	☐	FACW
6.			
7.			
8.			
	90 = Total Cover		
50% of total cover: 45	20% of total cover: 18		

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1. *Vaccinium corymbosum*	35	☑	FACW
2. *Acer rubrum*	15	☑	FAC
3. *Quercus phellos*	15	☑	FACW
4. *Liquidambar styraciflua*	10	☐	FAC
5. *Quercus palustris*	5	☐	FACW
6.			
7.			
8.			
	80 = Total Cover		
50% of total cover: 40	20% of total cover: 16		

Herb Stratum (Plot size: 5' Radius)			
1. *Cinna arundinacea*	45	☑	FACW
2. *Smilax rotundifolia*	10	☐	FAC
3. *Juncus effusus*	5	☐	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	60 = Total Cover		
50% of total cover: 30	20% of total cover: 12		

Woody Vine Stratum (Plot size: 30' Radius)			
1. *Smilax rotundifolia*	5	☑	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 87.5% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:		(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

Nomenclature and indicators from The National Wetland Plant List: 2013 wetland ratings

SOIL Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR2/2	100			N/A	N/A	Silt Loam	
1-3	2.5Y5/3	90	10YR4/6	10	C	M	Silty Clay Loam	
3-16	2.5Y5/4	95	2.5Y5/3	5	D	M	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise notes.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U**
- ☐ Thin Dark Suface (S9) **(LRR S, T, U**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P,S,T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (Inches): _____

Hydric Soil Present? Yes ☐ **No** ☑

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Woodlawn Village City/County: Fairfax Sampling Date 2 /28/2014

Applicant/Owner: Fort Belvoir Residential Communities, LLC State: VA Sampling Point: 6

Investigator(s): BNR, JMC, ABR Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Flat Area Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR or MLRA): 149A Lat: 38°44'01" Long: 77°07'25" Datum: NAD 83

Soil Map Unit Name: 48A - Gunston silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks)

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:

Only two of the three wetland parameters were satisfied at this data point, which characterizes the upland forest in the central portion of the site.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☑ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum Moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 2"over 40%

Water Table Present? Yes ☐ No ☑ Depth (inches): >16"

Saturation Present? Yes ☐ No ☑ Depth (inches): >16"

(includes capillary fringe)

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants. Sampling Point: 6

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	60	☑	FAC
2. *Liriodendron tulipifera*	10	☐	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	70 = Total Cover		
50% of total cover: 35	20% of total cover: 14		

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1. *Liquidambar styraciflua*	30	☑	FAC
2. *Ilex opaca*	15	☑	FAC
3. *Acer rubrum*	15	☑	FAC
4. *Ulmus americana*	5	☐	FAC
5.			
6.			
7.			
8.			
	65 = Total Cover		
50% of total cover: 32.5	20% of total cover: 13		

Herb Stratum (Plot size: 5' Radius)			
1. *Cinna arundinacea*	40	☑	FACW
2. *Smilax rotundifolia*	15	☑	FAC
3. *Lonicera japonica*	5	☐	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	60 = Total Cover		
50% of total cover: 30	20% of total cover: 12		

Woody Vine Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

Nomenclature and indicators from The National Wetland Plant List: 2013 wetland ratings; No Woody Vine strata was present at this data point.

SOIL Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR3/2	100			N/A	N/A	Silt Loam	
2-10	2.5Y5/3	85	10YR5/6	15	C	M	Clay Loam	
10-16	10YR5/6	70	2.5Y5/3	20	D	M	Clay Loam	
			10YR2/1	10	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise notes.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U**
- ☐ Thin Dark Suface (S9) **(LRR S, T, U**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P,S,T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (Inches): _____

Hydric Soil Present? Yes ☐ **No** ☑

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Woodlawn Village City/County: Fairfax Sampling Date 3 /10/2014

Applicant/Owner: Fort Belvoir Residential Communities, LLC State: VA Sampling Point: 7

Investigator(s): BNR, JMC, MSJ Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-25%

Subregion (LRR or MLRA): 149A Lat: 38°44'01" Long: 77°07'25" Datum: NAD 83

Soil Map Unit Name: 40 -Grist Mill sandy loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks)

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:

All of the three wetland parameters were satisfied at this data point, which characterizes the palustrine forested wetland in the west-central portion of the site.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☑ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☑ Sphagnum Moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 1" over 90%

Water Table Present? Yes ☑ No ☐ Depth (inches): 0"

Saturation Present? Yes ☑ No ☐ Depth (inches): 0"

(includes capillary fringe)

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants. Sampling Point: 7

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	40	☑	FAC
2. *Acer rubrum*	30	☑	FAC
3. *Quercus palustris*	30	☑	FACW
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1. *Acer rubrum*	10	☑	FAC
2. *Vaccinium corymbosum*	10	☑	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		

Herb Stratum (Plot size: 5' Radius)			
1. *Cinna arundinacea*	40	☑	FACW
2. *Pinus virginiana*	2	☐	UPL
3. *Liquidambar styraciflua*	2	☐	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	44 = Total Cover		
50% of total cover: 22	20% of total cover: 8.8		

Woody Vine Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

Nomenclature and indicators from The National Wetland Plant List: 2013 wetland ratings; NI species are not used in the Dominance Test Calculation; No Woody Vine strata was present at this data point.

SOIL Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR4/2	95	10YR4/6	5	C	M	Silt Loam	
2-18	2.5Y5/2	90	10YR4/6	10	C	M	Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise notes.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U**
- ☐ Thin Dark Suface (S9) **(LRR S, T, U**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P,S,T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (Inches):

Hydric Soil Present? Yes ☑ **No** ☐

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Woodlawn Village City/County: Fairfax Sampling Date 3 /10/2014

Applicant/Owner: Fort Belvoir Residential Communities, LLC State: VA Sampling Point: 8

Investigator(s): BNR, JMC, MSJ Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Flat Area Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR or MLRA): 149A Lat: 38°44'01" Long: 77°07'25" Datum: NAD 83

Soil Map Unit Name: 40 - Grist Mill sandy loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks)

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:

Only two of the three wetland parameters were satisfied at this data point, which characterizes the upland forest in the west-central portion of the site.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum Moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches):
Water Table Present?	Yes ☑	No ☐	Depth (inches): 10"
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): 6"

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants. Sampling Point: 8

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	30	☑	FAC
2. *Ulmus americana*	10	☑	FAC
3. *Quercus phellos*	10	☑	FACW
4. *Pinus virginiana*	5	☐	UPL
5.			
6.			
7.			
8.			
	55 = Total Cover		
50% of total cover: 27.5	20% of total cover: 11		

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1. *Liquidambar styraciflua*	10	☑	FAC
2. *Quercus alba*	10	☑	FACU
3. *Ilex opaca*	5	☑	FAC
4.			
5.			
6.			
7.			
8.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		

Herb Stratum (Plot size: 5' Radius)			
1. *Cinna arundinacea*	25	☑	FACW
2. *Smilax rotundifolia*	15	☑	FAC
3. *Lonicera japonica*	2	☐	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	42 = Total Cover		
50% of total cover: 21	20% of total cover: 8.4		

Woody Vine Stratum (Plot size: 30' Radius)			
1. *Celastrus orbiculatus*	5	☑	FACU
2.			
3.			
4.			
5.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 77.8% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:		(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

Nomenclature and indicators from The National Wetland Plant List: 2013 wetland ratings; NI species are not used in the Dominance Test Calculation

SOIL Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR3/2	100			N/A	N/A	Silt Loam	
1-16	10YR5/3	95	10YR4/6	5	C	M	Silty Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise notes.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U**
- ☐ Thin Dark Suface (S9) **(LRR S, T, U**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P,S,T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (Inches):

Hydric Soil Present? Yes ☐ **No** ☑

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Woodlawn Village City/County: Fairfax Sampling Date 3 /10/2014

Applicant/Owner: Fort Belvoir Residential Communities, LLC State: VA Sampling Point: 9

Investigator(s): BNR, JMC, MSJ Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2%

Subregion (LRR or MLRA): 149A Lat: 38°44'01" Long: 77°07'25" Datum: NAD 83

Soil Map Unit Name: 48A - Gunston silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks)

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:

All of the three wetland parameters were satisfied at this data point, which characterizes the isolated palustrine forested wetland in the central portion of the site.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☑ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum Moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 3" over 90%

Water Table Present? Yes ☑ No ☐ Depth (inches): 0"

Saturation Present? Yes ☑ No ☐ Depth (inches): 0"

(includes capillary fringe)

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Buttressed tree roots

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants. Sampling Point: 9

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus phellos*	40	☑	FACW
2. *Liquidambar styraciflua*	30	☑	FAC
3. *Acer rubrum*	10	☐	FAC
4. *Quercus palustris*	10	☐	FACW
5.			
6.			
7.			
8.			
	90 = Total Cover		
50% of total cover: 45	20% of total cover: 18		

Sapling/Shrub Stratum (Plot size: 15' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	5	☐	FAC
2. *Ilex opaca*	5	☑	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		

Herb Stratum (Plot size: 5' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Cinna arundinacea*	25	☑	FACW
2. *Smilax rotundifolia*	15	☑	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40 = Total Cover		
50% of total cover: 20	20% of total cover: 8		

Woody Vine Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

Nomenclature and indicators from The National Wetland Plant List: 2013 wetland ratings; No Woody Vine strata was present at this data point.

SOIL Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR3/2	95	10YR4/6	5	C	M	Silt Loam	
2-8	2.5Y6/2	85	10YR4/6	15	C	M	Silt Loam	
8-16	2.5Y5/3	85	10YR4/6	15	C	M	Silty Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise notes.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U**
- ☐ Thin Dark Suface (S9) **(LRR S, T, U**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P,S,T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (Inches):

Hydric Soil Present? Yes ☑ **No** ☐

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Woodlawn Village City/County: Fairfax Sampling Date 3 /10/2014

Applicant/Owner: Fort Belvoir Residential Communities, LLC State: VA Sampling Point: 10

Investigator(s): BNR, JMC, MSJ Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Flat Area Local relief (concave, convex, none): None Slope (%): 2-7%

Subregion (LRR or MLRA): 149A Lat: 38°44'01" Long: 77°07'25" Datum: NAD 83

Soil Map Unit Name: 7B - Beltsville silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks)

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:

Only two of the three wetland parameters were satisfied at this data point, which characterizes the upland forest in the central portion of the site.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☑ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum Moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 1"

Water Table Present? Yes ☑ No ☐ Depth (inches): 0"

Saturation Present? Yes ☑ No ☐ Depth (inches): 0"

(includes capillary fringe)

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants. Sampling Point: 10

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	40	☑	FAC
2. *Acer rubrum*	30	☑	FAC
3. *Quercus phellos*	20	☑	FACW
4.			
5.			
6.			
7.			
8.			
	90 = Total Cover		
50% of total cover: 45	20% of total cover: 18		

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1. *Acer rubrum*	15	☑	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		

Herb Stratum (Plot size: 5' Radius)			
1. *Cinna arundinacea*	80	☑	FACW
2. *Smilax rotundifolia*	15	☑	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		
50% of total cover: 47.5	20% of total cover: 19		

Woody Vine Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

Nomenclature and indicators from The National Wetland Plant List: 2013 wetland ratings; No Woody Vine strata was present at this data point.

SOIL Sampling Point: 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR3/2	100			N/A	N/A	Silt Loam	
1-10	2.5Y5/3	90	10YR4/6	10	C	M	Silt Loam	
10-16	2.5Y5/4	95	10YR5/4	5	C	M	Silty Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise notes.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U**
- ☐ Thin Dark Suface (S9) **(LRR S, T, U**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P,S,T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (Inches): _____

Hydric Soil Present? Yes ☐ **No** ☑

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Woodlawn Village City/County: Fairfax Sampling Date 3 /10/2014

Applicant/Owner: Fort Belvoir Residential Communities, LLC State: VA Sampling Point: 11

Investigator(s): BNR, JMC, MSJ Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2-7%

Subregion (LRR or MLRA): 149A Lat: 38°44'01" Long: 77°07'25" Datum: NAD 83

Soil Map Unit Name: 109B - Woodstown sandy loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks)

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:

All of the three wetland parameters were satisfied at this data point, which characterizes the palustrine forested wetland in the southern portion of the site.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☑ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum Moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): <12"over90%

Water Table Present? Yes ☑ No ☐ Depth (inches): 0"

Saturation Present? Yes ☑ No ☐ Depth (inches): 0"

(includes capillary fringe)

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Buttressed tree roots

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants. Sampling Point: 11

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	60	☑	FAC
2. *Acer rubrum*	30	☑	FAC
3. *Quercus phellos*	20	☑	FACW
4. *Quercus palustris*	15	☐	FACW
5.			
6.			
7.			
8.			
	125 = Total Cover		
50% of total cover: 62.5	20% of total cover: 25		

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Herb Stratum (Plot size: 5' Radius)			
1. *Smilax glauca*	40	☑	FAC
2. *Cinna arundinacea*	40	☑	FACW
3. *Allium vineale*	5	☐	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85 = Total Cover		
50% of total cover: 42.5	20% of total cover: 17		

Woody Vine Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

Nomenclature and indicators from The National Wetland Plant List: 2013 wetland ratings; No Sapling/Shrub or Woody Vine strata species were present at this data point.

SOIL Sampling Point: 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR4/2	100			N/A	N/A	Silt Loam	
1-10	2.5Y5/2	80	10YR3/6	20	C	M	Silty Clay Loam	
10-16	2.5Y5/4	90	10YR4/6	10	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise notes.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U**
- ☐ Thin Dark Suface (S9) **(LRR S, T, U**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P,S,T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (Inches):

Hydric Soil Present? Yes ☑ **No** ☐

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: Woodlawn Village City/County: Fairfax Sampling Date 10/16/2014

Applicant/Owner: Fort Belvoir Residential Communities, LLC State: VA Sampling Point: 12

Investigator(s): BNR Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Flat Area Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR or MLRA): 149A Lat: 38°44'01" Long: 77°07'25" Datum: NAD 83

Soil Map Unit Name: Gunston Silt Loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks)

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐ , Soil ☐ , or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:

Only two of the three wetland parameters are satisfied at this data point, which characterizes the upland forest in the northeastern corner of the site.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☑ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum Moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): None

Water Table Present? Yes ☐ No ☑ Depth (inches): >16

Saturation Present? Yes ☐ No ☑ Depth (inches): >16

(includes capillary fringe)

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) - Use scientific names of plants. Sampling Point: 12

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	30	☑	FAC
2. *Acer rubrum*	20	☑	FAC
3. *Quercus phellos*	20	☑	FACW
4. *Quercus palustris*	15	☐	FACW
5.			
6.			
7.			
8.			
	85 = Total Cover		
50% of total cover: 42.5	20% of total cover: 17		

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1. *Acer rubrum*	15	☑	FAC
2. *Nyssa sylvatica*	10	☑	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	25 = Total Cover		
50% of total cover: 12.5	20% of total cover: 5		

Herb Stratum (Plot size: 5' Radius)			
1. *Cinna arundinacea*	30	☑	FACW
2. *Microstegium vimineum*	15	☑	FAC
3. *Campsis radicans*	5	☐	FAC
4. *Ilex opaca*	5	☐	FAC
5. *Lonicera japonica*	5	☐	FAC
6. *Smilax glauca*	5	☐	FAC
7. *Liquidambar styraciflua*	5	☐	FAC
8.			
9.			
10.			
11.			
12.			
	70 = Total Cover		
50% of total cover: 35	20% of total cover: 14		

Woody Vine Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

Nomenclature and indicators from The National Wetland Plant List: 2013 wetland ratings; NI species are not used in the Dominance Test Calculation

SOIL Sampling Point: 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR4/3	90	10YR4/6	10	C	M	Silt Loam	
3-10	2.5Y5/3	90	10YR4/6	10	C	M	Silt Loam	
10-16	2.5Y6/4	95	2.5Y5/6	5	C	M	Silty Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise notes.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U**
- ☐ Thin Dark Suface (S9) **(LRR S, T, U**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P,S,T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (Inches):

Hydric Soil Present? Yes ☐ **No** ☑

Remarks:

Exhibit 11

EXHIBIT 11
SITE PHOTOGRAPHS
WOODLAWN VILLAGE
WSSI #9528.14

1. **Looking southeast at the palustrine emergent wetland ditch along the western site boundary. This narrow ditch appears to support only intermittent flow, therefore this wetland, and the connected wetlands upslope of it are not RPA components.**

2. **Looking north at Data Point 1, which characterizes the palustrine forested wetland in the northern portion of the site.**

EXHIBIT 11
SITE PHOTOGRAPHS
WOODLAWN VILLAGE
WSSI #9528.14

3. **Looking west at Data Point 2, which characterizes the upland forest in the northern portion of the site.**

4. **Looking southeast at Data Point 3, which characterizes the non-wetland ditch between a palustrine forested wetland and the wetland ditch along the western site boundary. This ditch also lacks the characteristics of a stream, thus it is not a jurisdictional WOUS.**

EXHIBIT 11
SITE PHOTOGRAPHS
WOODLAWN VILLAGE
WSSI #9528.14

5. Looking southeast at Data Point 4, which characterizes the palustrine forested wetland in the northern portion of the site.

6. Looking west at Data Point 8, which characterizes the upland forest in the west-central portion of the site.

EXHIBIT 11
SITE PHOTOGRAPHS
WOODLAWN VILLAGE
WSSI #9528.14

7. Looking south at Data Point 7, which characterizes the palustrine forested wetland in the west-central portion of the site.

8. Looking south at Data Point 5, which characterizes the upland forest upslope of the wetland described by Data Point 4.

EXHIBIT 11
SITE PHOTOGRAPHS
WOODLAWN VILLAGE
WSSI #9528.14

9. Looking south at Data Point 6, which characterizes the upland forest northwest of the isolated wetland described by Data Point 9.

10. Looking south at Data Point 9, which characterizes the isolated palustrine forested wetland in the central portion of the site.

EXHIBIT 11
SITE PHOTOGRAPHS
WOODLAWN VILLAGE
WSSI #9528.14

11. Looking north at Data Point 10, which characterizes the upland forest between the wetlands described by Data Points 9 and 11.

12. Looking southwest at Data Point 11, which characterizes the palustrine forested wetland in the southern portion of the site.

APPENDIX D – JURISDICTIONAL DETERMINATION

November 21, 2014

Mr. Michael Jiang
Fort Belvoir Residential Communities, LLC
5201 Patrick Road
Fort Belvoir, VA 22060

Via Email: michael.jiang@clarkrealty.com

Re: Jurisdictional Determination (#NAB-2014-01949)
Woodlawn Village – Berman Tract
Fort Belvoir, VA
WSSI #9528.14

Dear Mr. Jiang:

Enclosed is a copy of the U.S. Army Corps of Engineers' Jurisdictional Determination (JD) (#NAB-2014-01949) confirming the wetland delineation submitted by Wetland Studies and Solutions, Inc. This JD is valid for a period of five years from the date that it was issued (November 18, 2014).

Please note that this JD is only the U.S. Army Corps of Engineers verification of the wetland delineation and does not constitute authorization to impact any waters of the U.S. on the site. WSSI can provide you with a proposal to prepare a permit application; please let me know if you would like a proposal.

If you have any questions, please contact me (brosner@wetlandstudies.com; 703-679-5647).

Sincerely,

WETLAND STUDIES AND SOLUTIONS, INC.

Benjamin N. Rosner, PWS, PWD, CE, CT
Senior Associate Environmental Scientist

Enclosure

L:\09000s\9528.14\Admin\05-ENVR\Delin\JD\JDletter.docx

5300 Wellington Branch Drive • Suite 100 • Gainesville, VA 20155 • Phone 703.679.5647 • Fax 703.679.5601
brosner@wetlandstudies.com • www.wetlandstudies.com

DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1715
BALTIMORE, MD 21203-1715

NOV 18 2014

Operations Division

Fort Belvoir Residential
Communities, LLC
5201 Patrick Road
Fort Belvoir, Virginia 22060

Gentlemen:

This is in response to a letter dated March 18, 2014, sent on your behalf from Wetland Studies and Solutions, Inc. requesting a jurisdictional determination (JD) and verification of the delineation of waters of the United States, including jurisdictional wetlands, on the Woodlawn Village. Your project has been assigned the file name, NAB-2014-01949 (WOODLAWN VILLAGE/FORT BELVOIR/JD).

We have reviewed and concur with the Waters of The U.S. (Including Wetlands) Delineation and Resource Protection Area Evaluation, dated March 18, 2014 and prepared by Wetland Studies and Solutions, Inc. for the approximately 50 acre site. In addition, a field inspection was conducted on October 17, 2014. This inspection indicated that the delineation of waters of the United States, including jurisdictional wetlands within the "Area of Review" on the enclosed drawing dated March 18, 2014, is accurate with the changes noted on the enclosed plans last revised on October 17, 2014. Those areas indicated as waters of the United States, including jurisdictional wetlands, are regulated by this office pursuant to Section 10 of the Rivers and Harbors Act of 1899 and/or Section 404 of the Clean Water Act. Enclosed is a document that outlines the basis of our determination of jurisdiction over these areas.

This letter contains an approved jurisdictional determination for your subject site. This approved jurisdictional determination is valid for five years from the date of this letter unless new information warrants revision of the determination before the expiration date, or a District Engineer has identified, after public notice and comment, that specific geographic areas with rapidly changing environmental conditions merit re-verification on a more frequent basis. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and request for Appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the North Atlantic Division Office at the following address:

Mr. Michael G. Vissichelli
Administrative Appeals Review Officer
North Atlantic Division, Corps of Engineers
Fort Hamilton Military Community

General Lee Avenue Building 301
Brooklyn, NY 11252-6700

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit a RFA form, it must be received at the above address by JAN 18 2013 . It is not necessary to submit an RFA form to the Division office if you do not object to the determination in this letter.

Please be advised that various development activities, within waters of the United States, including jurisdictional wetlands may be regulated by the Corps. Wetlands and other waters under the jurisdiction of the Virginia Department of Environmental Quality (DEQ) may also be located on the parcel. You may contact the DEQ at (804) 698-4000 for information regarding jurisdiction and permitting requirements.

You are reminded that any grading or filling of waters of the United States, including jurisdictional wetlands, is subject to Department of the Army authorization. State and local authorizations may also be required to conduct activities in these locations. In addition, the Interstate Land Sales Full Disclosure Act may require that prospective buyers be made aware, by the seller, of the Federal authority over any waters of the United States, including wetlands, being purchased.

In future correspondence and permit applications regarding this parcel, please include the file number located in the first paragraph of this letter.

A copy of this letter is being furnished to the Virginia Department of Environmental Quality and WSSI for informational purposes. If you have any questions concerning this matter, please call Mrs. Erica Schmidt of this office at (410) 962-6029.

Sincerely,

Kathy B. Anderson
Chief, Maryland Section Southern

Enclosures

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): NOV 18 2014

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: CENAB-OP-RMS (WOODLAWN VILLAGE/FORT BELVOIR/JD) 2014-01949

PROJECT LOCATION AND BACKGROUND INFORMATION: WetlandAB is located on the northern portion of the site and contuines offsite into Park land. The wetland has a shallow swale which provides connection to an RPW. Wetland GH is located in the north west portion of the site and flows through a shallow swale to an RPW. Neither of the swales were identified as a wetland or a waters of the United States. The tributary offsite is an unnamed tributary to Dogue Creek. Dogue Creek is an RPW which becomes a TNW below MT Vernon Memorial Highway.

State: Virginia County/parish/borough: Fairfax City: Fort Belvoir
Center coordinates of site (lat/long in degree decimal format): Lat. N 38.733747°, Long. W77.123933°
Name of nearest waterbody: Dogue Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Dogue Creek
Name of watershed or Hydrologic Unit Code (HUC): 02070010

☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☐ Office (Desk) Determination. Date:
☒ Field Determination. Date(s): 16 October 2014

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
      ☐ TNWs, including territorial seas
      ☐ Wetlands adjacent to TNWs
      ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
      ☐ Non-RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      ☒ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      ☐ Impoundments of jurisdictional waters
      ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
      Non-wetland waters: linear feet: width (ft) and/or acres.
      Wetlands: 1.93 acres.

   c. **Limits (boundaries) of jurisdiction** based on: **1987 Delineation Manual**
      Elevation of established OHWM (if known):

2. **Non-regulated waters/wetlands (check if applicable):**[3]

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

☒ **Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.**
Explain: Wetland PO is a large 2 acre wetland located within the middle of the projects site. It is bordered by and upland asphalt basketball court with associated parking to the west, a man made berm to the south, and upland forested area to the north and east. The topography indicated that the wetland would drain towards the north however there was no evidence of overland sheet flow from the wetland. The wetland was most likely part of the larger wetland complex that runs along the fence line before the basketball court and parking lot were built. In addition, the manipulation of the site from past farming practices, land use, and surrounding development has altered the flow of the wetland. The wetland did not have standing water but the upper layers of the soil were moist, which was not seen throughout the site. The Fourth Circuit Court's "Wilson's Decision" determined that isolated waters and wetlands were not federally regulated and because of this decision wetland PO is not a federally regulated wetland.
Wetland KL is a small 0.07 acre wetland located within the southern portion of the site surrounded by upland forest. It is located within a depressional area. There was no observed surface connection that would indicate that this wetland was connected with Waters of the US. This wetland has most likely formed from disturbance of the site from previous activities that occurred onsite.
Wetland IJ is the large wetland (2.18 acres) that stretches from the southern portion of the property to the western portion and located within an upland forest. The wetland indicated on the NWI maps and state and local wetland maps. The topography indicates that the wetland flows/moves towards the north and there appears to be an overland sheet flows; however, this connection is through unregulated uplands to the abutting wetland of the unnamed tributary to Dogue Creek. This wetland is isolated, and based on the Fourth Circuit Court's "Wilson's Decision" determined that isolated waters and wetlands were not federally regulated and because of this decision wetland IJ is not a federally regulated wetland.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   Identify TNW:

   Summarize rationale supporting determination:

2. **Wetland adjacent to TNW**
   Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   (i) **General Area Conditions:**

---

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

Watershed size: Pick List
Drainage area: Pick List
Average annual rainfall: inches
Average annual snowfall: inches

(ii) Physical Characteristics:

(a) Relationship with TNW:

☐ Tributary flows directly into TNW.
☐ Tributary flows through Pick List tributaries before entering TNW.

Project waters are Pick List river miles from TNW.
Project waters are Pick List river miles from RPW.
Project waters are Pick List aerial (straight) miles from TNW.
Project waters are Pick List aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain: .

Identify flow route to TNW[5]: .
Tributary stream order, if known: .

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
Average width: feet
Average depth: feet
Average side slopes: Pick List.

Primary tributary substrate composition (check all that apply):

☐ Silts	☐ Sands	☐ Concrete
☐ Cobbles	☐ Gravel	☐ Muck
☐ Bedrock	☐ Vegetation. Type/% cover:	
☐ Other. Explain: .		

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: Pick List
Tributary gradient (approximate average slope): %

(c) Flow:

Tributary provides for: Pick List
Estimate average number of flow events in review area/year: Pick List
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: Pick List. Characteristics: .

Subsurface flow: Pick List. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):

☐ clear, natural line impressed on the bank	☐ the presence of litter and debris
☐ changes in the character of soil	☐ destruction of terrestrial vegetation
☐ shelving	☐ the presence of wrack line
☐ vegetation matted down, bent, or absent	☐ sediment sorting
☐ leaf litter disturbed or washed away	☐ scour
☐ sediment deposition	☐ multiple observed or predicted flow events
☐ water staining	☐ abrupt change in plant community
☐ other (list):	

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.
[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

☐ Discontinuous OHWM.[7] Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

■ High Tide Line indicated by:
- ☐ oil or scum line along shore objects
- ☐ fine shell or debris deposits (foreshore)
- ☐ physical markings/characteristics
- ☐ tidal gauges
- ☐ other (list):

■ Mean High Water Mark indicated by:
- ☐ survey to available datum;
- ☐ physical markings;
- ☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .

Identify specific pollutants, if known: .

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☐ Riparian corridor. Characteristics (type, average width): .
- ☐ Wetland fringe. Characteristics: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size :1.93 acres

Wetland type. Explain: PFO.

Wetland quality. Explain: The quality is moderate. The wetlands are located within the forested area. The site is bordered by two large residential developments and a wildlife refuge. The wetlands were of better quality then the wetlands located adjacent to the roads.

Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:

Flow is: [redacted]. Explain: The wetland has ground water influence. The wetlands had indications of flow through the swale that connected them to waters of the United States. .

Surface flow is: [redacted]

Characteristics: .

Subsurface flow: [redacted]. Explain findings: .

- ☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

- ☐ Directly abutting
- ☒ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain: .
  - ☐ Ecological connection. Explain: .
  - ☒ Separated by berm/barrier. Explain: The wetlands flow from the wetlands through unregulated conveyances before connecting to regulated waters of the United States.

(d) Proximity (Relationship) to TNW

Project wetlands are [redacted] river miles from TNW.

Project waters are [redacted] aerial (straight) miles from TNW.

Flow is from: [redacted]

Estimate approximate location of wetland as within the [redacted] floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: The wetland water color was clear and odorless. There was minor inundation in the

[7]Ibid.

wetland during the time of site review. The watershed is mostly residential development. There is a large wildlife refuge north and west of the site.

Identify specific pollutants, if known: .

(iii) Biological Characteristics. Wetland supports (check all that apply):

☒ Riparian buffer. Characteristics (type, average width): The wetlands are located within a forested area between two large residential developments. The site is bordered by the north by the wetland refuge and park land which continues onsite.

☐ Vegetation type/percent cover. Explain: .

☒ Habitat for:

☐ Federally Listed species. Explain findings: .

☐ Fish/spawn areas. Explain findings: .

☐ Other environmentally-sensitive species. Explain findings: .

☒ Aquatic/wildlife diversity. Explain findings: The site provides habitat for terrestrial animals such as deer, rabbits and birds as well as aquatic animals such as amphibians.

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: 1

Approximately (1.93) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
No	1.30	No	0.63

Summarize overall biological, chemical and physical functions being performed: The wetlands provide flood storage, trapping and filtering of pollutants from the road, habitat for wildlife, and WQ improvements.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: The wetlands are located within the forested portion of the site close to the park land to the north. They collect water and runoff from the adjacent uplands. These wetlands flow through unregulated swales into an unnamed tributary of Dogue Creek. The wetland provides flood storage, trapping and filtering of pollutants before entering into an RPW. The proximity to Dogue Creek, an RPW, and the location of the wetlands would have a significant nexus with a TNW. Also, the overall function that these wetlands and the other adjacent wetlands perform could provide a significant effect on Dogue Creek.

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

   Provide estimates for jurisdictional waters in the review area (check all that apply):
   - ☐ Tributary waters: linear feet width (ft).
   - ☐ Other non-wetland waters: acres.
     Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
   - ☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional waters within the review area (check all that apply):
   - ☐ Tributary waters: linear feet width (ft).
   - ☐ Other non-wetland waters: acres.
     Identify type(s) of waters: .

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
   - ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
     - ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .
     - ☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
   - ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

   Provide acreage estimates for jurisdictional wetlands in the review area: **1.93** acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**

[8]See Footnote # 3.

☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.**[9]
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☒ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
☒ Other: (explain, if not covered above): Wetland IJ is the large wetland that stretches from the southern portion of the property to the western portion and located within an upland forest. The wetland indicated on the NWI maps and state and local wetland maps. The topography indicated that the wetland flows towards the north and overland sheet flows to the abutting wetland of the unnamed tributary to Dogue Creek. The wetland has apparent overland sheet patterns but the wetland flows into another PEM wetland on the outside of the fence. The Supreme Court's Decision in the Rapanos Case states that wetlands cannot be connected through wetlands. Due to this decision wetland IJ is not a federally regulated wetland.

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

---

[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] **Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.***

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Maps and plans submitted by the Consultant on 12 June 2014 and revised on 17 October 2014.
- ☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☒ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps: .
- ☐ Corps navigable waters' study: .
- ☐ U.S. Geological Survey Hydrologic Atlas: .
  - ☐ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☒ U.S. Geological Survey map(s). Cite scale & quad name: Mount Vernon, VA-MD 1983 & Fort Belvoir, VA-MD 1983
- ☒ USDA Natural Resources Conservation Service Soil Survey. Citation: SSURGO Soils Data
- ☒ National wetlands inventory map(s). Cite name: Digital National Wetland Inventory Map Accessed September 2013
- ☒ State/Local wetland inventory map(s): Resource Protection Area Map Fairfax County Digital Data
- ☒ FEMA/FIRM maps: FEMA Digital Flood Insurance Rate Map, Panel 51059C0385E& 51059C0405E.
- ☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- ☒ Photographs: ☒ Aerial (Name & Date):Fall 2008, March 2013, March 2013 Color Infrared.
  or ☒ Other (Name & Date):Photos taken onsite during delineation.
- ☐ Previous determination(s). File no. and date of response letter: .
- ☐ Applicable/supporting case law: .
- ☐ Applicable/supporting scientific literature: .
- ☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: .

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): NOV 18 2014

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: CENAB-OP-RMS (WOODLAWN VILLAGE/FORT BELVOIR/JD) 2014-01949

PROJECT LOCATION AND BACKGROUND INFORMATION: Wetland M/N is located on the southern portion of the site adjacent to Pole Road and a residential development which is still under construction. The wetland flows into a culvert and under Pole Road and discharges into Dogue Creek. Dogue Creek is an RPW which becomes a TNW below MT Vernon Memorial Highway.

State: Virginia County/parish/borough: Fairfax City: Fort Belvoir
Center coordinates of site (lat/long in degree decimal format): Lat. N 38.733747°, Long. W77.123933°
Name of nearest waterbody: Dogue Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Dogue Creek
Name of watershed or Hydrologic Unit Code (HUC): 02070010

☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☒ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☒ Office (Desk) Determination. Date:
☒ Field Determination. Date(s): 16 October 2014

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

☒ Waters subject to the ebb and flow of the tide.
☒ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
      ☒ TNWs, including territorial seas
      ☒ Wetlands adjacent to TNWs
      ☒ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
      ☒ Non-RPWs that flow directly or indirectly into TNWs
      ☒ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      ☒ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
      ☒ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      ☒ Impoundments of jurisdictional waters
      ☒ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
      Non-wetland waters: linear feet: width (ft) and/or acres.
      Wetlands: 0.275 acres.

   c. **Limits (boundaries) of jurisdiction** based on: **1987 Delineation Manual**
      Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   ☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
   Explain: .

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   Identify TNW:

   Summarize rationale supporting determination:

2. **Wetland adjacent to TNW**
   Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   (i) **General Area Conditions:**
   Watershed size: [redacted]
   Drainage area: [redacted]
   Average annual rainfall: inches
   Average annual snowfall: inches

   (ii) **Physical Characteristics:**
   (a) Relationship with TNW:
   ☐ Tributary flows directly into TNW.
   ☐ Tributary flows through [redacted] tributaries before entering TNW.

   Project waters are [redacted] river miles from TNW.
   Project waters are [redacted] river miles from RPW.
   Project waters are [redacted] aerial (straight) miles from TNW.
   Project waters are [redacted] aerial (straight) miles from RPW.
   Project waters cross or serve as state boundaries. Explain:

   Identify flow route to TNW[5]:
   Tributary stream order, if known:

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
Average width: feet
Average depth: feet
Average side slopes: Pick List.

Primary tributary substrate composition (check all that apply):

☐ Silts	☐ Sands	☐ Concrete
☐ Cobbles	☐ Gravel	☐ Muck
☐ Bedrock	☐ Vegetation. Type/% cover:	
☐ Other. Explain: .		

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: Pick List
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for: Pick List
Estimate average number of flow events in review area/year: Pick List
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: Pick List. Characteristics: .

Subsurface flow: Pick List. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):

☐ clear, natural line impressed on the bank	☐ the presence of litter and debris
☐ changes in the character of soil	☐ destruction of terrestrial vegetation
☐ shelving	☐ the presence of wrack line
☐ vegetation matted down, bent, or absent	☐ sediment sorting
☐ leaf litter disturbed or washed away	☐ scour
☐ sediment deposition	☐ multiple observed or predicted flow events
☐ water staining	☐ abrupt change in plant community
☐ other (list):	

☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

■ High Tide Line indicated by:	■ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects	☐ survey to available datum;
☐ fine shell or debris deposits (foreshore)	☐ physical markings;
☐ physical markings/characteristics	☐ vegetation lines/changes in vegetation types.
☐ tidal gauges	
☐ other (list):	

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: .

(iv) Biological Characteristics. Channel supports (check all that apply):
☐ Riparian corridor. Characteristics (type, average width): .

---

[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7]Ibid.

☐ Wetland fringe. Characteristics:
☐ Habitat for:
☐ Federally Listed species. Explain findings:
☐ Fish/spawn areas. Explain findings:
☐ Other environmentally-sensitive species. Explain findings:
☐ Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size :0.275 acres

Wetland type. Explain: PFO.

Wetland quality. Explain: The quality is moderate. The wetland is located adjacent to a road and drains through a culvert that discharges downstream into Dogue Creek. The wetland is located within a forested area and near a newly constructed residential complex.

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:

Flow is: [redacted]. Explain: The wetland is ground water fed and has flow year round from the wetland through the culvert under the road and discharges downstream into Dogue Creek.

Surface flow is: [redacted]

Characteristics:

Subsurface flow: [redacted]. Explain findings:

☐ Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

☐ Directly abutting

☒ Not directly abutting

☐ Discrete wetland hydrologic connection. Explain:

☐ Ecological connection. Explain:

☒ Separated by berm/barrier. Explain: The wetland flows through a culvert and under the road and discharges into Dogue Creek downstream..

(d) Proximity (Relationship) to TNW

Project wetlands are [redacted] river miles from TNW.

Project waters are [redacted] aerial (straight) miles from TNW.

Flow is from: [redacted]

Estimate approximate location of wetland as within the [redacted] floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: The wetland water color was clear and odorless. There was a small oil film on the surface. The watershed is mostly residential development. There is a large wildlife refuge north and west of the site.

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

☒ Riparian buffer. Characteristics (type, average width): The wetland is located within a forested area between two large residential developments. The site is bordered by the north by the wetland refuge and park land which continues onsite.

☐ Vegetation type/percent cover. Explain:

☒ Habitat for:

☐ Federally Listed species. Explain findings:

☐ Fish/spawn areas. Explain findings:

☐ Other environmentally-sensitive species. Explain findings:

☒ Aquatic/wildlife diversity. Explain findings: The site provides habitat for terrestrial animals such as deer, rabbits and birds as well as aquatic animals such as amphibians.

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: [redacted]

Approximately (0.275) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
No	0.275		

Summarize overall biological, chemical and physical functions being performed: The wetland provide flood storage, trapping and filtering of pollutants from the road, habitat for wildlife, and WQ improvements.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: The wetland is located adjacent to the road and residential development. It collects water and runoff from the adjacent road. These wetlands empty into a culvert and discharged downstream into Dogue Creek. The wetland provides flood storage, trapping and filtering of pollutants before entering into an RPW. The proximity to Dogue Creek, an RPW, and the location of the wetland the wetland would have a significant nexus with a TNW. Also, the overall function that these wetlands and the other adjacent wetlands perform could provide a significant effect on Dogue Creek.

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .

☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
☒ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: **0.275** acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.

---

[8]See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] **Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.***

☒ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☒ which are or could be used for industrial purposes by industries in interstate commerce.
☒ Interstate isolated waters. Explain: .
☒ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☒ Tributary waters: linear feet width (ft).
☒ Other non-wetland waters: acres.
Identify type(s) of waters: .
☒ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☒ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☒ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☒ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
☒ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☒ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☒ Lakes/ponds: acres.
☒ Other non-wetland waters: acres. List type of aquatic resource: .
☒ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☒ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☒ Lakes/ponds: acres.
☒ Other non-wetland waters: acres. List type of aquatic resource: .
☒ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Maps and plans submitted by the Consultant on 12 June 2014 and revised on 17 October 2014.
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☒ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☒ Data sheets prepared by the Corps: .
☒ Corps navigable waters' study: .
☒ U.S. Geological Survey Hydrologic Atlas: .
☐ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☒ U.S. Geological Survey map(s). Cite scale & quad name: Mount Vernon, VA-MD 1983 & Fort Belvoir, VA-MD 1983
☒ USDA Natural Resources Conservation Service Soil Survey. Citation: SSURGO Soils Data
☒ National wetlands inventory map(s). Cite name: Digital National Wetland Inventory Map Accessed September 2013
☒ State/Local wetland inventory map(s): Resource Protection Area Map Fairfax County Digital Data.
☒ FEMA/FIRM maps: FEMA Digital Flood Insurance Rate Map, Panel 51059C0385E& 51059C0405E.
☒ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date):Fall 2008, March 2013, March 2013 Color Infrared.
or ☒ Other (Name & Date):Photos taken onsite during delineation.
☒ Previous determination(s). File no. and date of response letter: .
☒ Applicable/supporting case law: .
☒ Applicable/supporting scientific literature: .

■ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD:

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): NOV 18 2014

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: CENAB-OP-RMS (WOODLAWN VILLAGE/FORT BELVOIR/JD) 2014-01949

PROJECT LOCATION AND BACKGROUND INFORMATION: Wetland Shirley Rd is located on theeastern portion of the site adjacent to Shirley Road and a residential development. The wetland flows into a culvert and under Shirley Road where it collects other curb and guter water and discharges into Dogue Creek. Dogue Creek is an RPW which becomes a TNW below MT Vernon Memorial Highway.

State: Virginia County/parish/borough: Fairfax City: Fort Belvoir
Center coordinates of site (lat/long in degree decimal format): Lat. N 38.733747°, Long. W77.123933°
Name of nearest waterbody: Dogue Creek

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Dogue Creek
Name of watershed or Hydrologic Unit Code (HUC): 02070010

☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☐ Office (Desk) Determination. Date:
☒ Field Determination. Date(s): 16 October 2014

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain: .

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
      ☐ TNWs, including territorial seas
      ☐ Wetlands adjacent to TNWs
      ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
      ☐ Non-RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      ☒ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      ☐ Impoundments of jurisdictional waters
      ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
      Non-wetland waters: linear feet: width (ft) and/or acres.
      Wetlands: 0.01 acres.

   c. **Limits (boundaries) of jurisdiction** based on: 1987 Delineation Manual
      Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
   Explain: .

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   Identify TNW:

   Summarize rationale supporting determination:

2. **Wetland adjacent to TNW**
   Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   (i) General Area Conditions:
   Watershed size: Pick List
   Drainage area: Pick List
   Average annual rainfall: inches
   Average annual snowfall: inches

   (ii) Physical Characteristics:
   (a) Relationship with TNW:
   ☐ Tributary flows directly into TNW.
   ☐ Tributary flows through Pick List tributaries before entering TNW.

   Project waters are Pick List river miles from TNW.
   Project waters are Pick List river miles from RPW.
   Project waters are Pick List aerial (straight) miles from TNW.
   Project waters are Pick List aerial (straight) miles from RPW.
   Project waters cross or serve as state boundaries. Explain:

   Identify flow route to TNW[5]:
   Tributary stream order, if known:

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) General Tributary Characteristics (check all that apply):

Tributary is:
- ☐ Natural
- ☐ Artificial (man-made). Explain:
- ☐ Manipulated (man-altered). Explain:

Tributary properties with respect to top of bank (estimate):
- Average width: feet
- Average depth: feet
- Average side slopes: Pick List.

Primary tributary substrate composition (check all that apply):
- ☐ Silts
- ☐ Sands
- ☐ Concrete
- ☐ Cobbles
- ☐ Gravel
- ☐ Muck
- ☐ Bedrock
- ☐ Vegetation. Type/% cover:
- ☐ Other. Explain:

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain:
Presence of run/riffle/pool complexes. Explain:
Tributary geometry: Pick List
Tributary gradient (approximate average slope): %

(c) Flow:

Tributary provides for: Pick List
Estimate average number of flow events in review area/year: Pick List
Describe flow regime:
Other information on duration and volume:

Surface flow is: Pick List. Characteristics:

Subsurface flow: Pick List. Explain findings:
- ☐ Dye (or other) test performed:

Tributary has (check all that apply):
- ☐ Bed and banks
- ☐ OHWM[6] (check all indicators that apply):
  - ☐ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☐ vegetation matted down, bent, or absent
  - ☐ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☐ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community
- ☐ Discontinuous OHWM.[7] Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
- ■ High Tide Line indicated by:
  - ☐ oil or scum line along shore objects
  - ☐ fine shell or debris deposits (foreshore)
  - ☐ physical markings/characteristics
  - ☐ tidal gauges
  - ☐ other (list):
- ■ Mean High Water Mark indicated by:
  - ☐ survey to available datum;
  - ☐ physical markings;
  - ☐ vegetation lines/changes in vegetation types.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain:
Identify specific pollutants, if known:

(iv) Biological Characteristics. Channel supports (check all that apply):
- ☐ Riparian corridor. Characteristics (type, average width):

---

[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7]Ibid.

☐ Wetland fringe. Characteristics:
☐ Habitat for:
☐ Federally Listed species. Explain findings:
☐ Fish/spawn areas. Explain findings:
☐ Other environmentally-sensitive species. Explain findings:
☐ Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size :0.01 acres

Wetland type. Explain: PFO.

Wetland quality. Explain: The quality is moderate. The wetland is located adjacent to a road and drains through a culvert that discharges downstream into Dogue Creek. The wetland is located within a forested area.

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:

Flow is: [redacted]. Explain: The wetland has ground water influence during times of higher water tables and the wetland flowsthrough the culvert under the road and discharges downstream into Dogue Creek.

Surface flow is: [redacted]

Characteristics:

Subsurface flow: [redacted]. Explain findings:

☐ Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

☐ Directly abutting

☒ Not directly abutting

☐ Discrete wetland hydrologic connection. Explain:

☐ Ecological connection. Explain:

☒ Separated by berm/barrier. Explain: The wetland flows through a culvert and under the road and discharges into Dogue Creek downstream..

(d) Proximity (Relationship) to TNW

Project wetlands are [redacted] river miles from TNW.

Project waters are [redacted] aerial (straight) miles from TNW.

Flow is from: [redacted]

Estimate approximate location of wetland as within the [redacted] floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: The wetland water color was clear and odorless. There was little to no standing water in the wetland during the time of site review. The watershed is mostly residential development. There is a large wildlife refuge north and west of the site.

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

☒ Riparian buffer. Characteristics (type, average width): The wetland is located within a forested area between two large residential developments. The site is bordered by the north by the wetland refuge and park land which continues onsite.

☐ Vegetation type/percent cover. Explain:

☒ Habitat for:

☐ Federally Listed species. Explain findings:

☐ Fish/spawn areas. Explain findings:

☐ Other environmentally-sensitive species. Explain findings:

☒ Aquatic/wildlife diversity. Explain findings: The site provides habitat for terrestrial animals such as deer, rabbits and birds as well as aquatic animals such as amphibians.

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: [redacted]

Approximately (0.01) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
No	0.01		

Summarize overall biological, chemical and physical functions being performed: The wetland provide flood storage, trapping and filtering of pollutants from the road, habitat for wildlife, and WQ improvements.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: The wetland is located adjacent to the road and residential development. It collects water and runoff from the adjacent road. These wetlands empty into a culvert and discharged downstream into Dogue Creek. The wetland provides flood storage, trapping and filtering of pollutants before entering into an RPW. The proximity to Dogue Creek, an RPW, and the location of the wetland the wetland would have a significant nexus with a TNW. Also, the overall function that these wetlands and the other adjacent wetlands perform could provide a significant effect on Dogue Creek.

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .

☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
☒ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: **0.01** acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.

---

[8]See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] **Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.***

☒ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☒ which are or could be used for industrial purposes by industries in interstate commerce.
☒ Interstate isolated waters. Explain: .
☒ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☒ Tributary waters: linear feet width (ft).
☒ Other non-wetland waters: acres.
Identify type(s) of waters: .
☒ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☒ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☒ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☒ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
☒ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☒ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☒ Lakes/ponds: acres.
☒ Other non-wetland waters: acres. List type of aquatic resource: .
☒ Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☒ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☒ Lakes/ponds: acres.
☒ Other non-wetland waters: acres. List type of aquatic resource: .
☒ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Maps and plans submitted by the Consultant on 12 June 2014 and revised on 17 October 2014.
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☒ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☒ Data sheets prepared by the Corps: .
☒ Corps navigable waters' study: .
☒ U.S. Geological Survey Hydrologic Atlas: .
☐ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☒ U.S. Geological Survey map(s). Cite scale & quad name: Mount Vernon, VA-MD 1983 & Fort Belvoir, VA-MD 1983
☒ USDA Natural Resources Conservation Service Soil Survey. Citation: SSURGO Soils Data
☒ National wetlands inventory map(s). Cite name: Digital National Wetland Inventory Map Accessed September 2013
☒ State/Local wetland inventory map(s): Resource Protection Area Map Fairfax County Digital Data.
☒ FEMA/FIRM maps: FEMA Digital Flood Insurance Rate Map, Panel 51059C0385E& 51059C0405E.
☒ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date):Fall 2008, March 2013, March 2013 Color Infrared.
or ☒ Other (Name & Date):Photos taken onsite during delineation.
☒ Previous determination(s). File no. and date of response letter: .
☒ Applicable/supporting case law: .
☒ Applicable/supporting scientific literature: .

☒ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD:

Applicant: Woodlawn Village	File Number: 2014-01949	Date NOV 18 2014
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
X	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

[redacted]

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the Baltimore District Engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations (JD) associated with the permit.

- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the Baltimore District Engineer. Your objections must be received by the Baltimore District Engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the Baltimore District Engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the Baltimore District Engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the Baltimore District Engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the North Atlantic Division Engineer, ATTN: CENAD-PD-PSD-O, Fort Hamilton Military Community, Building 301, General Lee Avenue, Brooklyn, NY 11252-6700. This form must be received by the North Atlantic Division Engineer within 60 days of the date of this notice with a copy furnished to the Baltimore District Engineer.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the North Atlantic Division Engineer, ATTN: CENAD-PD-PSD-O, Fort Hamilton Military Community, Building 301, General Lee Avenue, Brooklyn, NY 11252-6700. This form must be received by the North Atlantic Division Engineer within 60 days of the date of this notice with a copy furnished to the Baltimore District Engineer.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the North Atlantic Division Engineer, ATTN: CENAD-PD-PSD-O, Fort Hamilton Military Community, Building 301, General Lee Avenue, Brooklyn, NY 11252-6700. This form must be received by the North Atlantic Division Engineer within 60 days of the date of this notice with a copy furnished to the Baltimore District Engineer.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II [illegible] PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION

If you have questions regarding this decision and/or the appeal process you may contact:

Ms. Sandy Zelen
U.S. Army Corps of Engineers, Baltimore District
ATTN: CENAB-OP-R
Regulatory Branch, Baltimore District
Baltimore, MD 21203-1715
(410) 962-6028 or 3670

If you only have questions regarding the appeal process you may also contact:
Mr. James W. Haggerty
Administrative Appeals Review Officer
North Atlantic Division, Corps of Engineers Fort Hamilton
General Lee Avenue , Military Community Bldg. 301
Brooklyn, NY 11252-6700
Telephone: (718) 765-7163
Email: James.W.Haggerty@usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
Signature of appellant or agent.		

APPENDIX E – FLOODPLAIN INVESTIGATION

M E M O R A N D U M

To: Fort Belvoir Residential Communities, LLC

From: Michael S. Marsala, P.E., C.F.M

Date: March 13, 2014

Re: Woodlawn East – Berman Tract_Floodplain Investigative Summary

---

The Woodlawn East – Berman Tract is located on the north side of Pole Road (Route 622) between the Woodlawn Village community to the west, the Timothy Park community to the east and Huntley Meadows Park to the north (refer to Vicinity Map attached as Exhibit 1). The property sits upon a topographic high point such that the site drains in four different directions. The largest sub-drainage area of approximately 26 acres concentrates flow to the southern boundary to a storm drainage system along Pole Road. Two sub-watersheds drain east to drainage systems within the Timothy Park community. The final sub-watershed drains to the northeast with flow entering a small tributary to Dogue Creek through the Huntley Meadows Park. A Drainage Area Map is provided as Exhibit 2.

Per the Fairfax County Zoning Ordinance,

> *Floodplains shall include all areas of the County which are designated as a floodplain by the Federal Emergency Management Agency, by the United States Geological Survey, or by Fairfax County.*

During the 1960's and 1970's, a cooperative agreement between the United States Geological Survey (USGS) and Fairfax County resulted in USGS performing floodplain studies for many streams throughout the county. In addition, several other floodplain studies were performed by Massey Engineers Consultants (Massey) for the county. Fairfax County adopted most of those USGS and Massey floodplain studies, many of which are still the effective floodplain data used for regulatory purposes today. Appendix A of the Fairfax County Code lists such USGS and Massey studies adopted by the county. The unnamed tributaries within the subject site are not among those adopted floodplains studies by either USGS or Massey.

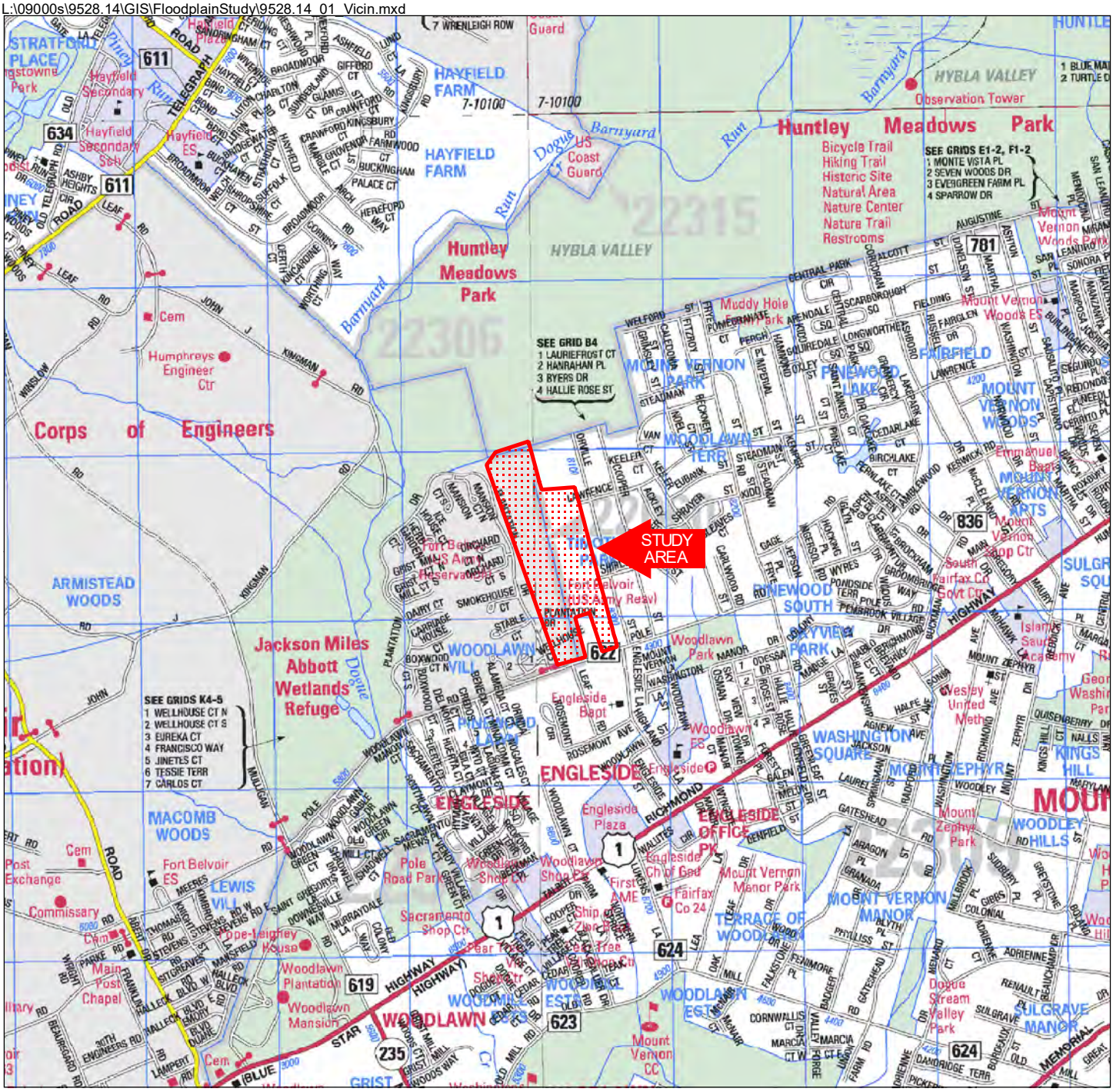
A review of the Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRMs) for Fairfax County, dated September 17, 2010, indicate that there are no floodplains designated by the Federal Emergency Management Agency (FEMA) on this parcel. A FEMA Map depicting effective FEMA FIRM data is provided as Exhibit 3. The nearest FEMA floodplain is mapped along Dogue Creek, which is a detailed studied stream with Base Flood Elevations (BFE's) provided. The BFE nearest the site, at the northwest corner of the property, is elevation 25 feet. The lowest elevation on the site, based on Fort Belvoir digital 2-ft contour interval topography, is at approximately 28 feet. Based on this best available data, the floodplain of Dogue Creek does not extend upstream onto the subject site. All elevation data is referenced to the North American Vertical Datum of 1929 (NGVD29).

Also per the Fairfax County Zoning Ordinance, floodplain regulations apply to those floodplains which have a drainage area greater than 70 acres. A minor floodplain is defined as having a drainage area of greater than 70 acres and less than 360 acres while a major floodplain is defined as having a drainage area of at least 360 acres. Since all of the sub-drainage areas on the subject site are less than 70 acres, none of these drainageways are considered to have floodplains by Fairfax County.

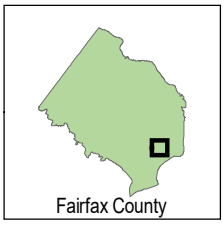
In conclusion, there are no floodplains on the subject parcel to which Fairfax County or FEMA floodplain regulations apply.

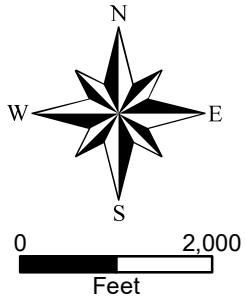
L:\09000s\9528.14\Admin\04-ENGR\02-Narratives\2014-03-13_Woodlawn East - Berman Tract_FPL Investigation.docx

L:\09000s\9528.14\GIS\FloodplainStudy\9528.14_01_Vicin.mxd

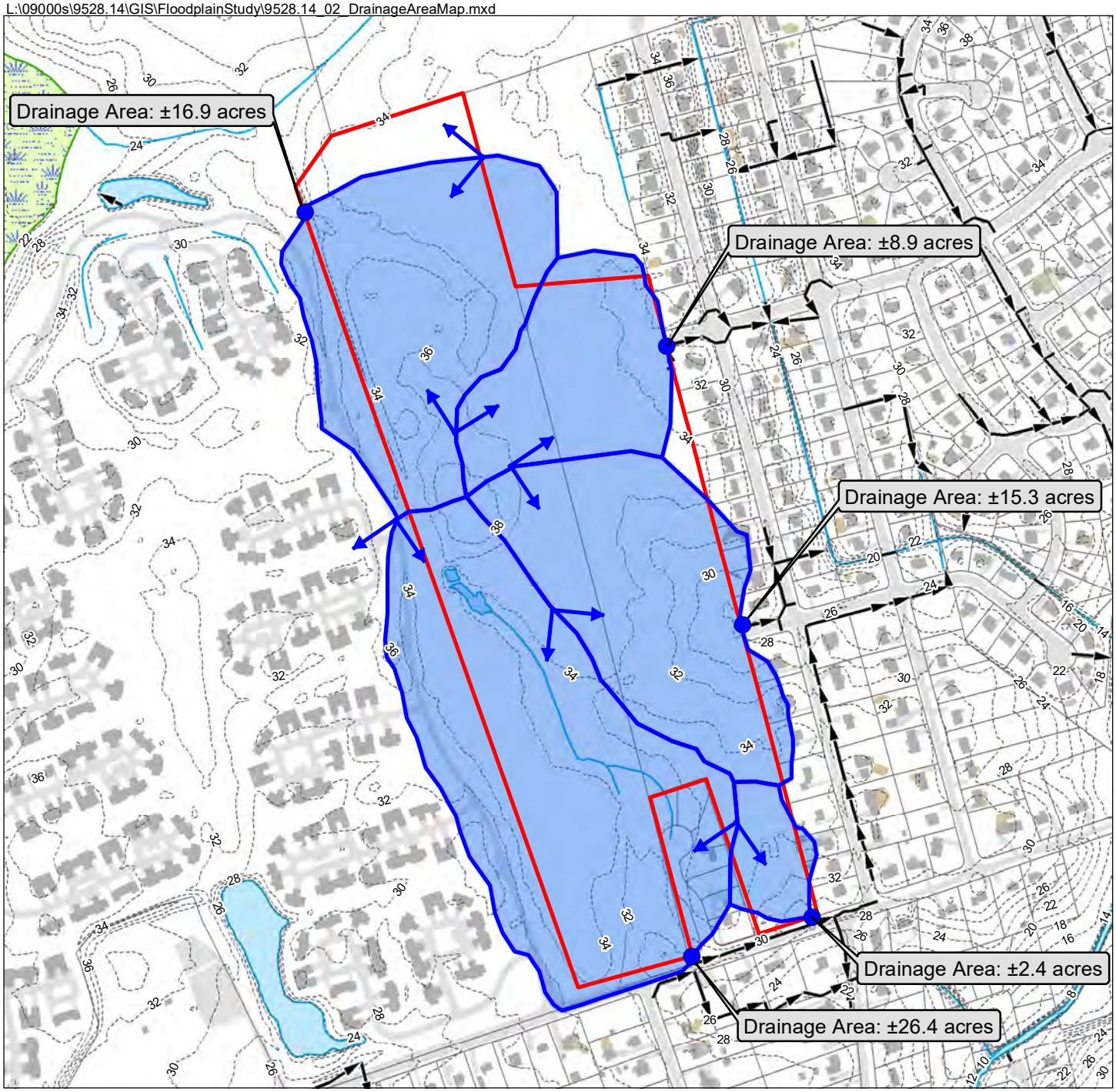


Vicinity Map
Woodlawn East – Berman Tract
WSSI #9528.14
Original Scale: 1" = 2000'





L:\09000s\9528.14\GIS\FloodplainStudy\9528.14_02_DrainageAreaMap.mxd



Study Area
Drainage Areas: ±69.9 total acres
2' Topography
NGVD 29
Stream
Ditch
Dam
Water
Pavement
Stormwater Network

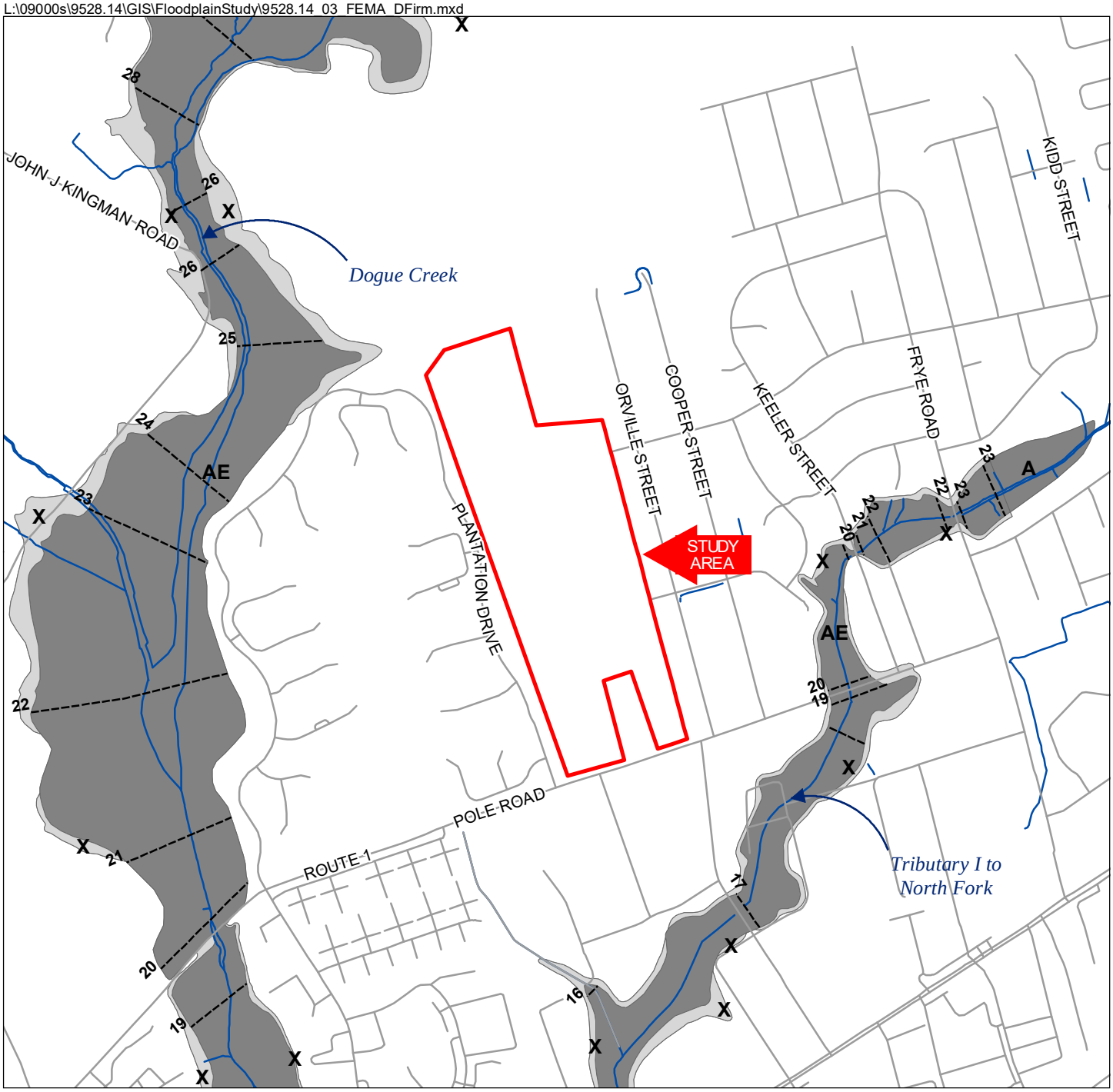
Drainage Area Map
Fairfax County Digital Data
Woodlawn East – Berman Tract
WSSI #9528.14
Original Scale: 1 " = 500 '

N
W
E
S
0
500
Feet

Wetland Studies and Solutions, Inc.

Exhibit 2

L:\09000s\9528.14\GIS\FloodplainStudy\9528.14_03_FEMA_DFirm.mxd



FEMA Digital Flood Insurance Rate Map
Panel 51059C0385E Effective 9/17/2010
Panel 51059C0405E Effective 9/17/2010
Woodlawn East – Berman Tract
WSSI #9528.14
Original Scale: 1" = 1000'

Special Flood Hazard Areas Subject to Inundation by the 1% Annual Chance Flood Event
Zone A - No base flood elevations determined.
Zone AE - Base flood elevations determined.

Other Flood Areas
Zone X - Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 ft or with drainage areas less than 1 m²; and areas protected by levees from 1% annual chance flood.

Other Areas
Zone X - Areas determined to be outside the 0.2% annual chance floodplain

Base Flood Elevation

N
W E
S

0 1,000
Feet

Wetland Studies and Solutions, Inc.

Exhibit 3

APPENDIX F: CZMA CONSISTENCY DETERMINATION

Coastal Zone Management Act (CZMA) Consistency Determination
Proposed Change to the Residential Communities Initiative Project
Army Garrison Fort Belvoir

This document serves to demonstrate to the Commonwealth of Virginia consistency with CZMA section 307(c)(1) and 15 CFR Part 930, sub-part C for the implementation of additional activities of the Residential Communities Initiative (RCI) at Fort Belvoir. The information provided in this Consistency Determination is provided pursuant to the Coastal Zone Management Act implementing regulations at 15 CFR Part 930. The proposed additional RCI activities constitute a federal action within the coastal zone of Fairfax County that has reasonably foreseeable effects.

The applicable policies and project effects are outlined in Table 1.

Proposed Action

A full description of the additional RCI activities (referred to as the Proposed Action) is provided in the attached Draft Supplemental Environmental Assessment (SEA). For ease, we provide a brief description here. Under the Proposed Action the Army would lease the Berman Tract (Figure 2-1) to Fort Belvoir Residential Communities, LLC. The Berman Tract, the Woodlawn East parcel, and a portion of a neighboring parcel would be developed as family housing and related amenities under the RCI Ground Lease. The Woodlawn East/Berman Tract (the 'Site') to be developed combines the Woodlawn East parcel (31 acres) and a portion of Parcel 'E' (5 acres) in the current Ground Lease, and the Berman Tract parcel (21 acres) to be added to the Ground Lease (Figure 1). Combined, the Woodlawn East/Berman Tract is 57 acres and situated on Fort Belvoir's North Post adjacent to an existing family neighborhood. After development, Woodlawn East/Berman Tract is projected to accommodate approximately 100 housing units - including handicap accessible units - recreation areas, and related facilities (Figure 1). The final number of housing units to be constructed within the parcel may vary based upon the needs of the project and any parcel-specific development opportunities and constraints. The wetlands map is included as Figure 2.

Figure 1. Woodlawn East/Berman Tract Location (ESRI, 2010)

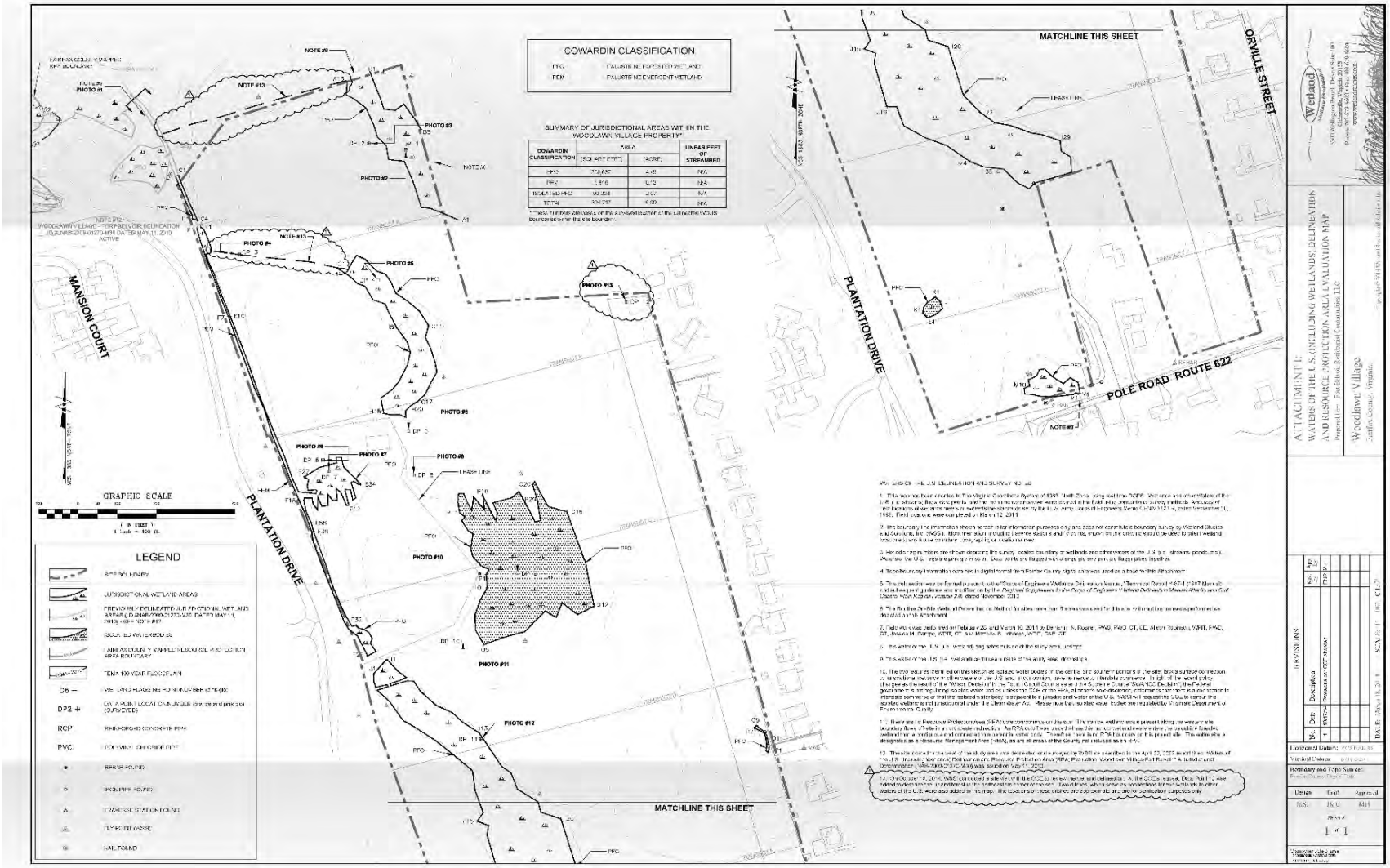


Figure 2. Wetlands in Woodlawn East/Berman Tract (WSSI, 2014b)

Table 1. Proposed Action Effects to Virginia's Coastal Resources Management Program Policies

Applicable Enforceable Policy	Effects of the Federally Proposed Action
Fisheries Management The program stresses the conservation and enhancement of finfish and shellfish resources and the promotion of commercial and recreational fisheries to maximize food production and recreational opportunities. This program is administered by the Virginia Marine Resources Commission (VMRC) (Virginia Administrative Code (VAC) §28.2-200 to §28.2-713) and the Virginia Department of Game and Inland Fisheries (VDGIF) (VAC §29.1-100 to §29.1-570). The State Tributyltin (TBT) Regulatory Program has been added to the Fisheries Management program. The General Assembly amended the Virginia Pesticide Use and Application Act as it related to the possession, sale, or use of marine antifoulant paints containing TBT. The use of TBT in boat paint constitutes a serious threat to important marine animal species. The TBT program monitors boating activities and boat painting activities to ensure compliance with TBT regulations promulgated pursuant to the amendment. The VMRC, VDGIF, and Virginia Department of Agriculture and Consumer Services (VDACS) share enforcement responsibilities (VAC §3.1-249.59 to §3.1-249.62).	**NO EFFECT** The proposed action would not involve building, dumping, or otherwise trespassing on or over, encroaching on, taking or using any material from the beds of the bays, ocean, rivers, streams, or creeks within Virginia. Streams will not be impacted by this project. The proposed action would not have a reasonably foreseeable effect on fish spawning, nursery, or feeding grounds, and therefore none on fisheries management. No paints containing TBT will be used under this proposed action.
Subaqueous Lands Management The management program for subaqueous lands establishes conditions for granting or denying permits to use state-owned bottomlands based on considerations of potential effects on marine and fisheries resources, wetlands, adjacent or nearby properties, anticipated public and private benefits, and water quality standards established by the Virginia Department of Environmental Quality (VDEQ), Water Division. The program is administered by VMRC (VAC §28.2-1200 to §28.2-1213).	**NO EFFECT** No subaqueous land use is proposed under this action. This project involves no encroachments in, on, or over state-owned submerged lands.

Wetlands Management The purpose of the wetlands management program is to preserve tidal wetlands, prevent their despoliation, and accommodate economic development in a manner consistent with wetlands preservation. (i) The tidal wetlands program is administered by VMRC (VAC §28.2-1301 through §28.2-1320). (ii) The Virginia Water Protection Permit program administered by VDEQ includes protection of wetlands—both tidal and non-tidal. This program is authorized by VAC §62.1-44.15.5 and the Water Quality Certification requirements of Section 401 of the Clean Water Act of 1972.	**MINOR EFFECT** The proposed action would not affect any tidal wetlands at Fort Belvoir. Disturbance of non-tidal wetlands would occur, and the proposed action would apply for a Virginia Water Protection (VWP) permit for the disturbance, and perform any mitigation measure as required by the permit to minimize effects. An anticipated total of 0.44 acres of wetland will be impacted by this project – 0.40 acres of palustrine forested wetland and 0.04 acres of palustrine emergent wetland. Wetland impacts will require permits from the USACE and the Virginia DEQ. A wetland map is included as Figure 2 above.
Dunes Management Dune protection is carried out pursuant to The Coastal Primary Sand Dune Protection Act and is intended to prevent destruction or alteration of primary dunes. This program is administered by VMRC (VAC §28.2-1400 through §28.2-1420).	**NO EFFECT** No permanent alteration of or construction upon any coastal primary sand dune will take place under the proposed action.
Non-point Source Pollution Control Virginia's Erosion and Sediment Control Law requires soil-disturbing projects to be designed to reduce soil erosion and to decrease inputs of chemical nutrients and sediments to the Chesapeake Bay, its tributaries, and other rivers and waters of the Commonwealth. This program is administered by the Virginia Department of Conservation and Recreation (VDCR) (VAC §10.1-560 et seq.).	**MINOR EFFECT** The proposed action would require a substantial amount of ground disturbance and an increase in impervious surfaces for housing construction that may increase erosion and sediment and pollutant run-off. Effect would be minimized to the extent possible through compliance with the installation's Storm Water Pollution Prevention Plan (SWPPP) and Virginia Pollutant Discharge Elimination System (VPDES) Municipal Sanitary Storm Sewer Systems (MS4) permit requirements. Construction would be using erosion, sediment control, and post-construction best management practices (BMPs) as outlined in the stormwater management plan.

Point Source Pollution Control The point source program is administered by the State Water Control Board pursuant to VAC §62.1-44.15. Point source pollution control is accomplished through the implementation of the National Pollutant Discharge Elimination System (NPDES) permit program established pursuant to Section 402 of the federal Clean Water Act and administered in Virginia as the VPDES permit program.	**MINOR EFFECT** Stormwater discharged through conveyances, such as separate storm sewers, ditches, channels or other conveyances are considered point sources under the Clean Water Act (CWA), and subject to regulation through the National Pollutant Discharge Elimination System (NPDES) permit program. Fort Belvoir's MS4 permit requires the contractor to comply with the installations' permit prior to construction activities. This includes implementing the BMPs as described in the Non-Point Source section and submitting a sediment and erosion control plan to DPW-ENRD when more than 1 acre of ground is disturbed.
Shoreline Sanitation The purpose of this program is to regulate the installation of septic tanks, set standards concerning soil types suitable for septic tanks, and specify minimum distances that tanks must be placed away from streams, rivers, and other waters of the Commonwealth. This program is administered by the Virginia Department of Health (VAC §32.1-164 through §32.1-165).	**NO EFFECT** Fort Belvoir relies on its sanitary sewer system and does not employ septic systems.
Air Pollution Control The program implements the federal Clean Air Act to provide a legally enforceable State Implementation Plan (SIP) for the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). This program is administered by the State Air Pollution Control Board (VAC §10-1.1300).	**NO EFFECT** Implementation of the Proposed Action would not increase the number of units covered under the 2003 consistency determination for the RCI at Fort Belvoir. Therefore, no additional impacts to air quality are expected.
Coastal Lands Management This state–local cooperative program is administered by the Department of Conservation and Recreation's Division of Chesapeake Bay Local Assistance and 84 localities in Tidewater, Virginia, to regulate activities in Chesapeake Bay Resource Management Areas and RPAs in the 84 localities in Virginia's coastal zone. The program was established pursuant to the Chesapeake Bay Preservation Act, Virginia Code §10.1-2100 through §10.1-2114, and Chesapeake Bay Preservation Area Designation and Management Regulations, Virginia Administrative Code (VAC) 9 VAC 10-20-10 et seq.	**NO EFFECT** A wetland survey was performed in March 2014 and found there to be no Resource Protection Areas within the Proposed Action site.

Summary of Findings (Consistency Determination)

Based upon the information, data, and analysis, as contained in the SEA, Fort Belvoir finds that the proposed action is consistent to the maximum extent practicable with the enforceable policies of the Virginia Coastal Resources Management Program. The applicable policies and project effects are outlined in Table 1. Pursuant to 15 CFR section 930.41, the Virginia Coastal Resources Management Program has 60 days from the receipt of this document in which to concur with or object to this Consistency Determination, or to request an extension under 15CFR section 930.41(b). Virginia's concurrence will be presumed if its response is not received by Fort Belvoir on the 60th day from receipt of this determination, unless a request for extension is granted. The Commonwealth's response should be sent to Mr. Felix M. Mariani, Fort Belvoir Directorate of Public Works - Environmental and Natural Resources Division, 9430 Jackson Loop, Fort Belvoir, Virginia 22060-5116.

For Joseph Jr. Parker, Deputy

Michelle D. Mitchell
Colonel, U.S. Army
Commanding

APPENDIX G – PLANT COMMUNITIES

PLANT COMMUNITIES ON FORT BELVOIR

Oak Mesic - Ericad (Heath Family) Forests

Oak/ericad forests are upland forests of gravelly ridges and dry slopes, generally located at the tops of hills and bluffs and along steep, well-drained slopes. The overstory is dominated by chestnut oak (*Quercus prinus*), with a mixture of northern red oak (*Quercus rubra*), white oak (*Quercus alba*), and scarlet oak (*Quercus coccinea*). At Fort Belvoir, vegetation in the understory varies between two topographically different types. Arid plateaus are generally composed of chestnut oak and white oak with huckleberry (*Gaylussacia baccata*) and tall deer berry (Vaccinium stamineum) in the understory. Cooler, northerly-facing steep slopes are dominated by chestnut oak, and the understory generally consists of mountain laurel (*Kalmia latifolia*) (Paciulli, Simmons and Associates, Ltd., 1998).

Tulip Poplar Mesic - Mixed Hardwood Forest

Tulip poplar mixed hardwood forests are upland forests of moist fertile ravine slopes an ravine bottoms. At Fort Belvoir, they are found in habitats similar to beech mixed oak forest, but are more common on more gradual slopes and ravine bottoms. Tulip poplar (*Liriodendron tulipifera*) trees are dominant within this vegetation community type, but American beech, white oak, and northern red oak are also mixed. Understory species are similar to that of beech mixed oak forests and consist of flowering dogwood, American beech, and red maple shrubs (Paciulli, Simmons and Associates, Ltd., 1998). A tulip popular mixed hardwood forest community just west of the mouth of Accotink Creek, within the Accotink Bay Wildlife Refuge, has been identified as a significant community of its type due to its age and extent. This community type is common in Virginia; however, mature examples are rare (Hobson, 1996).

Mixed Pine Hardwood Forests

Mixed pine hardwood forests consist of transitional forests between early successional pine and climax hardwood types. Vegetation is a variable mix of pines, oaks, and other hardwoods. At Fort Belvoir, mixed pine hardwood forests were identified where hardwoods and pine trees appeared to be evenly distributed or where neither hardwoods nor pines appeared to be more than 70% dominant. Virginia pine is the dominant pine in mixed pine hardwood forests, although some stands mixed with loblolly pine exist. Dominant hardwoods in mixed pine hardwood forests are variable, but can be generalized based on topography and their position bordering mapped hardwoods. For example, mixed pine hardwood forests mapped at the tops of dry ridges and bordered by oak/ericad forest are likely to have chestnut oak or scarlet oak as the dominant hardwood in the mix. Lowland areas tend to have tulip poplar and red maple mixed with Virginia pine. Upland areas tend to be mixed with white oak and chestnut oak (Paciulli, Simmons and Associates, Ltd., 1998).

Virginia Pine Forests

Virginia pine forests consist of early successional forest of old fields or other land clearings dominated by Virginia pine (greater than 70% dominance). Virginia pines are most abundant and

occur naturally compared to forests of loblolly pine and white pine, which most likely have been introduced by plantings in former clearings (Paciulli, Simmons and Associates, Ltd., 1998).

Loblolly Pine Forest

Small portions of the installation have been planted in loblolly pine. The loblolly pine forests at Fort Belvoir are usually planted and often appear in rows. Native stands are not prevalent at Fort Belvoir (Paciulli, Simmons and Associates, Ltd., 1998).

Old Field Grasslands

In the Mid-Atlantic region, old field grasslands generally are abandoned fields and clearings that are still in early successional stages. At Fort Belvoir, they generally consist of unimproved open fields or areas that are infrequently mowed. Old field grasslands occur in areas previously cleared for landfills, farming, and training. Approximately 190 acres of grasslands and potential grasslands have been identified at Fort Belvoir. They range in size from less than one-half acre to more than 20 acres (PaciuIli, Simmons and Associates, Ltd., 1996). Old field grasslands do not include grounds such as golf course roughs since they tend to be landscaped and mowed occasionally. Dominant vegetation consists of a variable mix of grasses and wildflowers (forbs). Characteristic species are *broomsedge (Andropogon virginicus)*, tall fescue (*Festuca elatior*), and bushclover (*Lespedeza cunneata*). These areas are valuable for providing habitat for song birds, ground nesting birds, and small mammals, which provide food sources for wildlife such as fox and birds of-prey (Paciulli, Simmons and Associates, Ltd., 1998).

APPENDIX H – WILDLIFE

TABLE E-1
Wildlife Expected or Known to Occur at Fort Belvoir

Common Name	Scientific Name
Mammals	
Northern short-tailed shrew	*Blarina brevicauda*
Smokey shrew	*Sorex fumeus*
Pygmy shrew	*Sorex hoyi*
Southeastern shrew	*Sorex longirostris*
Star-nosed mole	*Condylura cristata*
Eastern mole	*Scalopus aquaticus*
White-footed mouse	*Peromyscus leucopus*
Deer mouse	*Peromyscus maniculatus*
House mouse	*Mus musculus*
Jumping mouse	*Zapus hudsonius*
Meadow vole	*Microtus pennsylvanicus*
Woodland vole	*Microtus pinetorum*
Least shrew	*Cryptotis parva*
Marsh rice rat	*Oryzomys palustris*
Big brown bat	*Eptesicus fuscus*
Little brown bat	*Myotis lucifugus*
Hoary bat	*Lasiurus cinereus*
Indiana bat	*Myotis sodalis*
Small-footed bat	*Myotis leibii*
Evening bat	*Nycticeius humeralis*
Red bat	*Lasiurus borealis*
Silver-haired bat	*Lasionycteris noctivagans*
Eastern pipistrelle	*Pipistrellus subflavus*
Keen's Myotis	*Myotis keenii*
Beaver	*Castor canadensis*
Muskrat	*Ondatra zibethicus*
Long tailed weasel	*Mustela frenata*
Opossum	*Didelphis virginiana*
Woodchuck	*Marmota monax*
Common striped skunk	*Mephitis mephitis*
Raccoon	*Procyon lotor*

TABLE E-1
Wildlife Expected or Known to Occur at Fort Belvoir

Common Name	Scientific Name
Eastern cottontail	*Sylvilagus floridanus*
Mink	*Mustela vison*
Eastern gray squirrel	*Sciurus carolinensis*
Flying squirrel	*Glaucomys volans*
Eastern chipmunk	*Tamias striatus*
River otter	*Lutra canadensis*
Norway rat	*Rattus norvegicus*
Whitetail deer	*Odocoileus virginianus*
Bobcat	*Lynx rufus*
Gray fox	*Urocyon cinereoargenteus*
Red fox	*Vulpes vulpes*
Coyote	*Canis latrans*
Birds	
Brown creeper	*Certhia familiaris*
Long-billed marsh wren	*Cistothorus palustris*
Sedge wren	*Cistothorus platensis*
Carolina wren	*Thryothorus ludovicianus*
House wren	*Troglodytes aedon*
Winter wren	*Troglodytes troglodytes*
Blue-gray gnatcatcher	*Polioptila caerulea*
Golden-crowned kinglet	*Regulus satrapa*
Ruby-crowned kinglet	*Regulus calendula*
Veery	*Catharus fuscescens*
Hermit thrush	*Catharus guttatus*
Gray-cheeked thrush	*Catharus minimus*
Swainson's thrush	*Catharus ustulatus*
Wood thrush	*Hylocichla mustelina*
Eastern bluebird	*Sialia sialis*
American robin	*Turdus migratorius*
Gray catbird	*Dumetella carolinensis*
Northern mockingbird	*Mimus polyglottos*
Brown thrasher	*Toxostoma rufum*

TABLE E-1
Wildlife Expected or Known to Occur at Fort Belvoir

Common Name	Scientific Name
Cedar waxwing	*Bombycilla cedrorum*
Loggerhead shrike	*Lanius ludovicianus*
European Starling	*Sturnus vulgaris*
Red-eyed vireo	*Vireo olivaceus*
Yellow-throated vireo	*Vireo flavifrons*
Warbling vireo	*Vireo gilvus*
White-eyed vireo	*Vireo griseus*
Philadelphia vireo	*Vireo philadelphicus*
Solitary vireo	*Vireo solitarius*
Bay-breasted warbler	*Dendroica castanea*
Cerulean warbler	*Dendroica cerulea*
Yellow-rumped warbler	*Dendroica coronata*
Prairie warbler	*Dendroica discolor*
Yellow-throated warbler	*Dendroica dominica*
Blackburnian warbler	*Dendroica fusca*
Magnolia warbler	*Dendroica magnolia*
Palm warbler	*Dendroica palmarum*
Chesnut-sided warbler	*Dendroica pensylvanica*
Yellow warbler	*Dendroica petechia*
Pine warbler	*Dendroica pinus*
Blackpoll warbler	*Dendroica striata*
Cape May warbler	*Dendroica tigrina*
Black-throated green warbler	*Dendroica virens*
Black-throated blue warbler	*Dendroica caerulescens*
Common yellowthroat	*Geothlypis trichas*
Worm-eating warbler	*Helmitheros vermivorus*
Yellow-breasted chat	*Icteria virens*
Black and white warbler	*Mniotilta varia*
Connecticut warbler	*Oporornis agilis*
Kentucky warbler	*Oporornis formosus*
Mourning warbler	*Oporornis philadelphia*
Northern parula warbler	*Parula americana*

TABLE E-1
Wildlife Expected or Known to Occur at Fort Belvoir

Common Name	Scientific Name
Prothonotary warbler	*Protonotaria citrea*
Ovenbird	*Seiurus aurocapillus*
Louisiana waterthrush	*Seiurus motacilla*
Northern waterthrush	*Seiurus noveboracensis*
American redstart	*Setophaga ruticilla*
Orange-crowned warbler	*Vermivora celata*
Golden-winged warbler	*Vermivora chrysoptera*
Tennessee warbler	*Vermivora peregrina*
Blue-winged warbler	*Vermivora pinus*
Nashville warbler	*Vermivora ruficapilla*
Canada warbler	*Wilsonia candensis*
Hooded warbler	*Wilsonia citrina*
Wilson's warbler	*Wilsonia pusilla*
Scarlet tanager	*Piranga olivacea*
Summer tanager	*Piranga rubra*
Northern cardinal	*Cardinalis cardinalis*
Evening grosbeak	*Hesperiphona vespertina*
Blue grosbeak	*Guiraca caerulea*
Indigo bunting	*Passerina cyanea*
Rose-breasted grosbeak	*Pheucticus ludovicianus*
White-throated sparrow	*Zonotrichia albicollis*
Dark-eyed junco	*Junco hyemalis*
Swamp sparrow	*Melospiza georgiana*
Lincoln's sparrow	*Melospiza lincolnii*
Song sparrow	*Melospiza melodia*
House sparrow	*Passer domesticus*
Savannah sparrow	*Passerculus sandwichensis*
Fox sparrow	*Passerella iliaca*
Eastern towhee	*Pipilo erythrophthalmus*
Vesper sparrow	*Pooecetes gramineus*
American tree sparrow	*Spizella arborea*
Chipping sparrow	*Spizella passerina*

TABLE E-1
Wildlife Expected or Known to Occur at Fort Belvoir

Common Name	Scientific Name
Field sparrow	*Spizella pusilla*
White-crowned sparrow	*Zonotrichia leucophrys*
Red-winged blackbird	*Agelaius phoeniceus*
Bobolink	*Dolichonyx oryzivorus*
Rusty blackbird	*Euphagus carolinus*
Northern oriole	*Icterus galbula*
Orchard oriole	*Icterus spurius*
Brown-headed cowbird	*Molothrus ater*
Common grackle	*Quiscalus quiscula*
Eastern meadowlark	*Sturnella magna*
Pine siskin	*Carduelis pinus*
House finch	*Carpodacus mexicanus*
Purple finch	*Carpodacus purpureus*
Red crossbill	*Loxia curvirostra*
White-winged crossbill	*Loxia leucoptera*
American goldfinch	*Carduelis tristis*
Semipalmated plover	*Charadrius semipalmatus*
Killdeer	*Charadrius vociferus*
Spotted sandpiper	*Actitis macularia*
Dunlin	*Calidris alpina*
Pectoral sandpiper	*Calidris melanotos*
Least sandpiper	*Calidris minutilla*
Semipalmated sandpiper	*Calidris pusilla*
Western sandpiper	*Calidris mauri*
Common snipe	*Capella gallinago*
American woodcock	*Philohela minor*
Lesser yellowlegs	*Tringa flavipes*
Greater yellowlegs	*Tringa melanoleuca*
Solitary sandpiper	*Tringa solitaria*
Black tern	*Chlidonias niger*
Herring gull	*Larus argentatus*
Laughing gull	*Larus atricilla*

TABLE E-1
Wildlife Expected or Known to Occur at Fort Belvoir

Common Name	Scientific Name
Ring-billed gull	*Larus delawarensis*
Lesser black-backed gull	*Larus fuscus*
Greater black-backed gull	*Larus marinus*
Bonaparte's gull	*Larus philadelphia*
Least tern	*Sterna albifrons*
Caspian tern	*Sterna caspia*
Forster's tern	*Sterna forsteri*
Common tern	*Sterna hirundo*
Common bobwhite	*Colinus virginianus*
Wild turkey	*Meleagris gallopavo*
Turkey vulture	*Cathartes aura*
Black vulture	*Coragyps atratus*
Cooper's hawk	*Accipiter cooperii*
Sharp-shinned hawk	*Accipiter striatus*
Red-tailed hawk	*Buteo jamaicensis*
Rough-legged hawk	*Buteo lagopus*
Red-shouldered hawk	*Buteo lineatus*
Broad-winged hawk	*Buteo platypterus*
Northern Harrier	*Circus cyaneus*
Bald eagle	*Haliaeetus leucocephalus*
Osprey	*Pandion haliaetus*
Merlin (Pigeon hawk)	*Falco columbarius*
Peregrine falcon	*Falco peregrinus*
American kestrel	*Falco sparverius*
Great-horned owl	*Bubo virginianus*
Common screech owl	*Otus asio*
Barred owl	*Strix varia*
Barn owl	*Tyto alba*
Rock dove	*Columba livia*
Mourning dove	*Zenaida macroura*
Yellow-billed cuckoo	*Coccyzus americanus*
Black-billed cuckoo	*Coccyzus erythropthalmus*

TABLE E-1
Wildlife Expected or Known to Occur at Fort Belvoir

Common Name	Scientific Name
Chuck-will's-widow	*Caprimulgus carolinensis*
Whip-poor-will	*Caprimulgus vociferus*
Common nighthawk	*Chordeiles minor*
Chimney swift	*Chaetura pelagica*
Ruby-throated hummingbird	*Archilochus colubris*
Belted kingfisher	*Megaceryle alcyon*
Red-bellied woodpecker	*Melanerpes carolinus*
Common flicker	*Colaptes auratus*
Pileated woodpecker	*Dryocopus pileatus*
Red-headed woodpecker	*Melanerpes erythrocephalus*
Downy woodpecker	*Picoides pubescens*
Hairy woodpecker	*Picoides villosus*
Yellow-bellied sapsucker	*Sphyrapicus varius*
Olive-sided flycatcher	*Nuttallornis borealis*
Eastern wood pewee	*Contopus virens*
Alder flycatcher	*Empidonax alnorum*
Yellow-bellied flycatcher	*Empidonax flaviventris*
Least flycatcher	*Empidonax minimus*
Willow flycatcher	*Empidonax traillii*
Acadian flycatcher	*Empidonax virescens*
Great crested flycatcher	*Myiarchus crinitus*
Eastern phoebe	*Sayornis phoebe*
Eastern kingbird	*Tyrannus tyrannus*
Water pipit	*Anthus spinoletta*
Horned lark	*Eremophila alpestris*
Cliff swallow	*Petrochelidon pyrrhonota*
Barn swallow	*Hirundo rustica*
Purple martin	*Progne subis*
Bank swallow	*Riparia riparia*
Rough-winged swallow	*Stelgidopteryx ruficollis*
Tree swallow	*Iridoprocne bicolor*
Common crow	*Corvus brachyrhynchos*

TABLE E-1
Wildlife Expected or Known to Occur at Fort Belvoir

Common Name	Scientific Name
Fish crow	*Corvus ossifragus*
Blue jay	*Cyanocitta cristata*
Black-capped chickadee	*Parus atricapillus*
Tufted titmouse	*Parus bicolor*
Carolina chickadee	*Parus carolinensis*
Red-breasted nuthatch	*Sitta canadensis*
White-breasted nuthatch	*Sitta carolinensis*
Common loon	*Gavia immer*
Red-throated loon	*Gavia stellata*
Horned grebe	*Podiceps auritus*
Red-necked grebe	*Podiceps grisegena*
Pied-billed grebe	*Podilymbus podiceps*
Double-crested cormorant	*Phalacrocorax auritus*
American bittern	*Botaurus lentiginosus*
Great egret	*Casmerodius albus*
Snowy egret	*Egretta thula*
Least bittern	*Ixobrychus exilis*
Great blue heron	*Ardea herodias*
Green heron	*Butorides striatus*
Little blue heron	*Florida caerulea*
Black-crowned night heron	*Nycticorax nycticorax*
Yellow crowned night heron	*Nyctanassa violacea*
Canada goose	*Branta canadensis*
Snow goose	*Chen caerulescens*
Tundra swan	*Cygnus columbianus*
Wood duck	*Aix sponsa*
Pintail	*Anas acuta*
American wigeon	*Anas americana*
Northern shoveler	*Anas clypeata*
Green-winged teal	*Anas crecca*
Blue-winged teal	*Anas discors*
Mallard	*Anas platyrhynchos*

TABLE E-1
Wildlife Expected or Known to Occur at Fort Belvoir

Common Name	Scientific Name
Black duck	*Anas rubripes*
Gadwall	*Anas strepera*
Lesser scaup	*Aythya affinis*
Redhead	*Aythya americana*
Ring-necked duck	*Aythya collaris*
Greater scaup	*Aythya marila*
Canvasback	Aythya valisineria
Bufflehead	Bucephala albeola
Common goldeneye	*Bucephala albeola*
Oldsquaw	*Clangula hyemalis*
Hooded merganser	*Lophodytes cucullatus*
White-winged scoter	*Melanitta deglandi*
Surf scoter	*Melanitta perspicillata*
Common merganser	*Mergus merganser*
Red-breasted merganser	*Mergus serrator*
Ruddy duck	*Oxyura jamaicensis*
American coot	*Fulica americana*
Common moorhen	*Gallinula chloropus*
Sora	*Porzana carolina*
King rail	*Rallus elegans*
Virginia rail	*Rallus limicola*
Fish	
American brook lamprey	*Lampetra appendix*
Longnose gar	*Lepisosteus osseus*
Bowfin	*Amia calva*
American eel	*Anguilla rostrata*
Blueback herring	*Alosa aestivalis*
Alewife	*Alosa pseudoharengus*
Gizzard shad	*Dorosoma cepedianum*
Rainbow trout	*Oncorhynchus mykiss*
Bay anchovy	*Anchoa mitchilli*
Goldfish	*Carassius auratus*

TABLE E-1
Wildlife Expected or Known to Occur at Fort Belvoir

Common Name	Scientific Name
Rosyside dace	*Clinostomus funduloides*
Satinfin shiner	*Cyprinella analostana*
Spotfin shiner	*Cyprinella spilopterus*
Common carp	*Cyprinus carpio*
Cutlips minnow	*Exoglossum maxillingua*
Common shiner	*Luxilus cornutus*
Eastern silvery minnow	*Hybognathus regius*
River chub	*Nocomis micropogon*
Golden shiner	*Notemigonus crysoleucas*
Bridle shiner	*Notropis bifrenatus*
Spottail shiner	*Notropis hudsonius*
Swallowtail shiner	*Notropis procne*
Blacknose dace	*Rhinichthys atratulus*
Longnose dace	*Rhinichthys cataractae*
Creek chub	*Semotilus atromaculatus*
Fallfish	*Semotilus corporalis*
Quillback	*Carpoides cyprinus*
White sucker	*Catostomus commersoni*
Creek chubsucker	*Erimyzon oblongus*
Northern hog sucker	*Hypentelium nigricans*
Shorthead redhorse	*Moxostoma macrolepidotum*
Yellow bullhead	*Ameiurus natalis*
Brown bullhead	*Ictalurus nebulosus*
Channel catfish	*Ictalurus punctatus*
White catfish	*Ameiurus catus*
Atlantic needlefish	*Strongylura marina*
Eastern mudminnow	*Umbra pygmaea*
Banded killifish	*Fundulus diaphanus*
Mummichog	*Fundulus heteroclitus*
Eastern mosquitofish	*Gambusia holbrooki*
Mosquitofish	*Gambusia affinis*
Inland silverside	*Menidia beryllina*

TABLE E-1
Wildlife Expected or Known to Occur at Fort Belvoir

Common Name	Scientific Name
White perch	*Morone americana*
Striped bass	*Morone saxatilis*
Bluespotted sunfish	*Enneacanthus gloriosus*
Red breasted sunfish	*Lepomis auritus*
Green sunfish	*Lepomis cyanellus*
Pumpkinseed	*Lepomis gibbosus*
Redear sunfish	*Lepomis microlophus*
Bluegill	*Lepomis macrochirus*
Warmouth	*Leponis gulosus*
Longear sunfish	*Lepomis megalotis*
White crappie	*Pomoxis annularis*
Black crappie	*Pomoxis nigromaculatus*
Smallmouth bass	*Micropterus dolomieu*
Largemouth bass	*Micropterus salmoides*
Tessellated darter	*Etheostoma olmstedi*
Spot	*Leiostomus xanthurus*
Hogchoker	*Trinectes maculatus*
Amphibians	
Northern cricket frog	*Acris c crepitans*
Green treefrog	*Hyla cinera*
Cope's gray treefrog	*Hyla v. chrysoscelis*
Gray treefrog	*Hyla versicolor*
Northern spring peeper	*Hyla c. crucifier*
Upland chorus frog	*Pseudacris triseriata*
Green frog	*Rana c. clamitans*
Bullfrog	*Rana catesbeiana*
Pickerel frog	*Rana palustris*
Wood frog	*Rana sylvatica*
Southern leopard frog	*Rana u. utricularia*
American toad	*Bufo a. americanus*
Woodhouse's toad	*Bufo woodhousii*
Eastern spadefoot	*Scaphiopus h. holbrookii*

TABLE E-1
Wildlife Expected or Known to Occur at Fort Belvoir

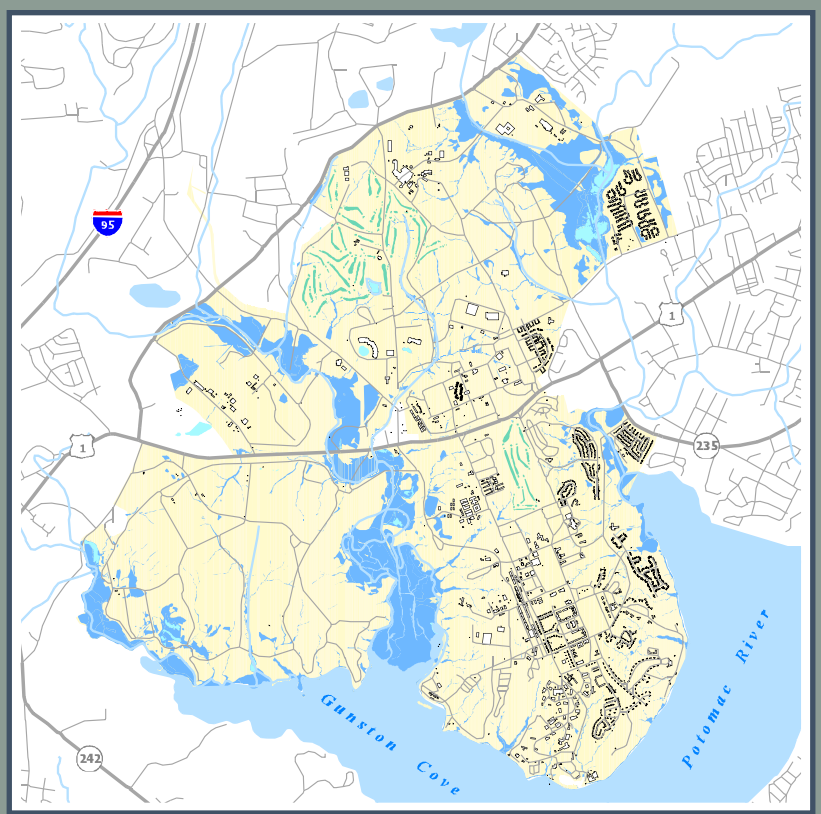
Common Name	Scientific Name
Jefferson's salamander	*Ambystoma jeffersonianum*
Spotted salamander	*Ambystoma maculatum*
Marbled salamander	*Ambystoma opacum*
Northern dusky salamander	*Desmognathus f. fuscus*
Northern two-lined salamander	*Eurycea b. bislineata*
Three-lined salamander	*Eurycea guttolineata*
Longtail salamander	*Eurycea longicauda*
Four-toed salamander	*Hemidactylum scutatum*
Red-spotted newt	*Notophthalmus v. viridescens*
Red back salamander	*Plethodon cinereus*
White-spotted salamander	*Plethodon punctatus*
Eastern mud salamander	*Pseudotriton m. montanus*
Northern red salamander	*Pseudotriton r. ruber*
Reptiles	
River cooter	*Pseudemys concinna*
Eastern box turtle	*Terrapene c. carolina*
Eastern mud turtle	*Kinosternon s. subrubrum*
Painted turtle	*Chrysemys picta*
Common snapping turtle	*Chelydra s. serpentina*
Red bellied turtle	*Chrysemys rubriventris*
Spotted turtle	*Clemmys guttata*
Wood turtle	*Clemmys insculpta*
Eastern musk turtle	*Sternotherus odoratus*
Pond slider turtle	*Trachemys scripta*
Timber rattlesnake	*Crotalus horridus*
Northern copperhead	*Agkistrodon contortrix mokasen*
Eastern worm snake	*Carphophis a. amoenus*
Northern black racer	*Coluber c. constrictor*
Northern ringneck snake	*Diadolphis punctatus*
Corn snake	*Elaphe g. guttata*
Black rat snake	*Elaphe o. obsoleta*
Eastern hognose snake	*Heterodon platyrhinos*

TABLE E-1
Wildlife Expected or Known to Occur at Fort Belvoir

Common Name	Scientific Name
Eastern kingsnake	*Lampropeltis g. getulus*
Milksnake	*Lampropeltis triangulum*
Mole Kingsnake	*Lampropeltis calligaster*
Northern water snake	*Nerodia s. sipedon*
Eastern rough green snake	*Opheodrys a. aestivus*
Queen snake	*Regina septemvittata*
Northern brown snake	*Storeria d. dekayi*
Northern redbelly snake	*Storeria o. occipitomaculata*
Eastern ribbon snake	*Thamnophis s. sauritis*
Eastern garter snake	*Thamnophis s. sirtalis*
Smooth earth snake	*Virginia v. valeriae*
Five-lined skink	*Eumeces fasciatus*
Broad-headed skink	*Eumeces laticeps*
Northern fence lizard	*Sceloporus undulatus hyacinthinus*
Ground skink	*Scincella lateralis*

APPENDIX I – PROGRAMMATIC AGREEMENT

Programmatic Agreement
between
US Army Garrison Fort Belvoir
and the
Virginia State Historic Preservation Officer
for the
Privatization of Family Housing at
Fort Belvoir, Virginia



Department of the Army
US Army Garrison Fort Belvoir
Directorate of Public Works and Logistics
9430 Jackson Loop, Ste. 100
Fort Belvoir, Virginia 22060-5516

August 2003

PROGRAMMATIC AGREEMENT

BETWEEN

FORT BELVOIR, VIRGINIA
AND THE
VIRGINIA STATE HISTORIC PRESERVATION OFFICER

FOR THE

PRIVATIZATION OF FAMILY HOUSING AT
FORT BELVOIR, VIRGINIA

WHEREAS, Fort Belvoir, pursuant to the Military Housing Privatization Initiative (P.L. 104-106, 110 Stat. 544, Title XXVIII, Subtitle A, Section 2801), which amends 10 U.S.C. 169 by addition of a new subchapter, IV—Alternative Authority for Acquisition and Improvement of Military Housing, has determined to privatize family housing at Fort Belvoir, Virginia, through the Residential Communities Initiative (RCI) (Undertaking); and

WHEREAS, under RCI, Fort Belvoir Residential Communities, LLC (Partnership) will implement the privatization of current family housing and ancillary facilities at Fort Belvoir; and

WHEREAS, the Partnership will be a separate legal entity known as a Limited Liability Company that will be formed after Congressional review of the Fort Belvoir RCI project, at closing, expected to be December 1, 2003. The partners of the Partnership will be the Department of the Army, acting through the Garrison Commander of Fort Belvoir, and Clark Pinnacle Family Communities, LLC; and

WHEREAS, the Partnership will be granted a ground lease of the existing Fort Belvoir housing areas and new construction areas and the stipulations of this Programmatic Agreement will be made an exhibit to the ground lease so that the stipulations become an integral part of the ground lease; and

WHEREAS, the privatization of the housing at Fort Belvoir will result in the transfer of a long-term interest in the construction, demolition, renovation, rehabilitation, operation, and maintenance of housing and other ancillary facilities at Fort Belvoir largely independent of direct government control, but intended for the use of soldiers and their families; and

WHEREAS, Fort Belvoir has determined that implementation of the Undertaking has the potential to adversely affect properties eligible for listing in the National Register of Historic Places (NRHP) and has consulted with the Virginia State Historic Preservation Officer (SHPO) in accordance with sections 106 and 111 of the National Historic Preservation Act (the Act), as amended, (16 U.S.C. 470 et. seq.) and the implementing regulations found at 36 CFR Part 800 (2001); and

WHEREAS, Fort Belvoir has invited the Advisory Council on Historic Preservation (Council) to participate in the resolution of adverse effects to properties eligible for listing in the NRHP pursuant to 36 CFR 800.6(a)(1) and the Council has declined to participate as a consulting party; and

WHEREAS, the Area of Potential Effect (APE) for the RCI program at Fort Belvoir includes approximately 530 acres of existing Fort Belvoir housing areas, approximately 80 acres of land for new construction, and approximately 26 acres of land to be used as temporary construction staging areas, all areas that will be directly impacted by the undertaking (Attachment A); and

WHEREAS, the APE also includes the buildings and grounds of the Alexandria Friends Meeting House near the intersection of Route 1 and Woodlawn Road, the buildings and grounds of Woodlawn Plantation near the intersection of Route 1 and Route 235, and the buildings and grounds of George Washington's Grist Mill near the intersection of Mount Vernon Road and Route 235 (Attachments M-O); and

WHEREAS, Fort Belvoir has conducted an inventory of historic properties identifying, within the APE, historic buildings, structures and features comprising the Fort Belvoir Historic District (the District), eligible for listing in the NRHP and listed in the Virginia Landmarks Register(Attachment A); and

WHEREAS, Fort Belvoir has completed NRHP eligibility determinations for historic housing assets outside the District in accordance with Section 110(a)(2) of the Act and determined said assets eligible for listing in the NRHP, and the SHPO has concurred with these determinations (Attachment B); and

WHEREAS, Fort Belvoir anticipates that the Undertaking will result in substantial alteration and demolition of some of the historic properties eligible for the NRHP which are listed and depicted in Attachments A and B; and

WHEREAS, Fort Belvoir will complete a survey of cultural landscape features in consultation with the SHPO within six months of the transfer of long-term interest in housing and other ancillary facilities at Fort Belvoir to the Partnership as noted in Stipulation I.C; and

WHEREAS, all Capehart and Wherry-Era housing on Fort Belvoir (Attachment C), is covered by an Army-wide Program Comment by the Council and there are no further preservation or consultation requirements for the housing or ancillary structures in these areas pursuant to 36 CFR Part 800; and

WHEREAS, Fort Belvoir has identified the Fairfax County Certified Local Government, the Alexandria Friends Meeting - Religious Society of Friends, and the National Trust for Historic Preservation as consulting parties pursuant to 36 CFR 800.2, and has afforded these parties the opportunity to review and comment on the Undertaking and draft language for an agreement document, and has incorporated the recommendations of these parties into this Agreement; and

WHEREAS, the Partnership has been provided the opportunity to review and comment on the draft language for an agreement document and have been invited to concur with the agreement document pursuant to 36 CFR 800.6(c)(3); and

WHEREAS, as defined in 36 CFR 800.16(m), no federally recognized Indian tribes with historic ties to the Fort Belvoir area currently exist for consultation on the Undertaking pursuant to 36 CFR 800.2; and

WHEREAS, Fort Belvoir has notified the Virginia Council on Indians, the state agency charged with the responsibility of representing the interests of the Native American community in the Commonwealth and the eight state-recognized tribes of this agreement, and has invited their comments; and

WHEREAS, Fort Belvoir has provided the public an opportunity to comment on this Undertaking through the Section 106 process and has considered their comments and recommendations in preparing this Agreement; and,

NOW THEREFORE, Fort Belvoir and the SHPO agree that the Undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the Undertaking on historic properties.

STIPULATIONS

Fort Belvoir will ensure that the following measures are carried out:

I. APPLICABILITY, BASELINE INFORMATION, AND PROFESSIONAL QUALIFICATIONS STANDARDS

A. Based on analysis of the residential infrastructure, Fort Belvoir has determined in consultation with the SHPO that existing residential buildings, structures, objects, districts or landscapes affected by the Undertaking listed in Attachment A and B are now NRHP-eligible under NRHP criteria.

B. Fort Belvoir will conduct a survey of buildings, structures, and landscapes on Fort Belvoir property that have reached fifty years of age since the previous survey, occurring at five-year intervals, in accordance with Section 110 of the Act. The survey will be conducted in consultation with the SHPO and in accordance with *The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* [48 FR 44720-44726], as revised. Any new NRHP-eligible properties administered or affected by the Partnership that are recognized through this process and concurred to by the SHPO will be subject to the provisions of this Agreement. This stipulation does not limit any other evaluation and possible nomination that may occur at the discretion of the Partnership, as long as the nomination includes only units administered by the Partnership, and the Partnership coordinates with the Fort Belvoir Installation Cultural Resources Manager (hereafter, Fort Belvoir Installation Cultural Resources Manager, or CRM) in the preparation of the nomination. Before any survey, finding or report regarding properties administered or affected by the Partnership is presented to the SHPO, Fort

Belvoir will present it to the Partnership and permit the Partnership to perform its own analysis and survey to determine if it concurs. In the event of disagreement, the decision of the Installation Management Agency - Northeast Regional Office (IMA - NERO) Cultural Resource Manager will prevail. In the even of disagreement between Fort Belvoir and the SHPO, a formal determination of eligibility will be requested of the Keeper of the National Register of Historic Places in accordance with 36 CFR 63.

C. Fort Belvoir will complete a survey of cultural landscape features within six months of the transfer of long-term interest in the construction, demolition, renovation, rehabilitation, operation, and maintenance of housing and other ancillary facilities at Fort Belvoir to the Partnership. Fort Belvoir will provide the results of the survey to the Partnership. Any additional NRHP-eligible properties recognized through this process concurred to by the SHPO and administered or affected by the Partnership will be subject to the provisions of this Agreement. Disputes concerning the eligibility of historic resources between the Partnership and Fort Belvoir or between Fort Belvoir and the SHPO will be resolved in accordance with stipulation I.B.

D. Fort Belvoir will require the Partnership to document existing interior and exterior conditions at all NRHP-eligible structures, buildings, and landscapes in the historic housing areas within three years of execution of this Agreement. Fort Belvoir will provide the documentation to the signatories of this Agreement in a format that will remain functional throughout the term of this Agreement, including archival still photographs. Fort Belvoir will supplement the documentation to maintain accuracy and record modifications to historic properties. One copy of the documentation and any supplemental materials, as they are developed, shall be provided to the SHPO. This documentation will serve as a reference throughout the term of this Agreement. Standards for this documentation are included in Attachment L.

E. The SHPO may, at any time, request Fort Belvoir provide an NRHP eligibility evaluation of a property administered or affected by the Partnership. Fort Belvoir shall coordinate with the Partnership and provide the requested NRHP eligibility evaluation to the SHPO within 60 days of receipt of the request.

F. Fort Belvoir CRM, in consultation with the Alexandria Friends Meeting - Religious Society of Friends and the Partnership, will determine a viewshed boundary from the Alexandria Friends Meeting House to adjacent Fort Belvoir land after the execution of this agreement. The viewshed boundary will used to supplement consultation requirements as described in Stipulation IV.D.5, below.

G. For the purposes of this Agreement, Fort Belvoir environmental staff will, at a minimum, consist of an individual (Fort Belvoir CRM) who will serve as the point of contact with the SHPO and the Council. Fort Belvoir CRM will have access to Qualified Staff. For the purposes of this Agreement, “Qualified Staff” is defined as an individual who meets 36 CFR 61, Appendix A, Professional Qualification Standards. Qualified Staff will have professional qualifications, training, and experience relevant to the technical requirements of a given undertaking. For example: Architectural Historians or Historical Architects will be utilized to survey historic buildings, while Archaeologists or Anthropologists will be utilized to perform archaeological investigations.

H. For the purposes of this Agreement, the Partnership staff will, including consultants, have access to an individual who meets Qualified Staff requirements. The Partnership's qualified staff will coordinate the preparation, development and review of rehabilitation plans, proposed projects and work requirements that affect historic properties. The Partnership's qualified staff will act on behalf of the Partnership and participate in consultations between Fort Belvoir CRM and the SHPO concerning plans, projects, and work requirements as listed above.

II. CONVEYANCE ACTIVITIES

A. Fort Belvoir will convey long-term interests in family housing units and ancillary improvements to the Partnership by real estate instrument. To ensure that the ground lease shall contain such terms and conditions as necessary and appropriate to meet the requirements of Sections 106 and 111 of the Act to provide for adequate consideration and treatment of historic properties that may be affected by the RCI program, this Programmatic Agreement in its entirety shall be incorporated into and made part of the ground lease.

B. Before execution of any conveyance or finalization of the ground lease for the Undertaking, Fort Belvoir shall provide the Partnership access to all previously compiled information on any historic properties within the APE to guide the Partnership in the management and use of the properties (Attachment D). Fort Belvoir shall indicate that historic properties are subject to alternate and more stringent management requirements pursuant to Stipulation IV.

C. Renewal or any modifications to the ground lease shall be subject to consultation among the signatories to determine whether such renewal or modifications constitute a new federal undertaking subject to provisions of the Act.

III. IMPACTS OF THE UNDERTAKING

A. Description of Impacts to Historic Properties

1. After execution of the Ground Lease, the Partnership will undertake the following actions:

a) Demolish 56 NRHP-eligible housing resources (Attachment E).

b) Construct detached garages adjacent to 155 remaining (144 residential, 11 garages) NRHP-eligible housing resources in Belvoir Village (Attachment F); Park Village (Attachment G); Gerber Village (Attachment H); and Jadwin Loop Village and 21st Street Houses (Attachment I).

c) Construct additions to, and reconfigure the interiors of, NRHP-eligible housing resources in Park (two) (Attachment G) and Gerber Villages (70) (Attachment H), and to resources located along 21st Street (six) (Attachment I).

d) Reconfigure the interiors of NRHP-eligible housing resources in Jadwin (five) (Attachment I) and Belvoir Villages (61) (Attachment F).

e) Construct new infill housing in, and adjacent to, the District and all NRHP-eligible historic housing areas in Belvoir Village (Attachment F); Park

Village (Attachment G); Gerber Village (Attachment H); Jadwin Loop Village and 21st Street (Attachment I); and Rossell Village (Attachment J).

B. Minimization of Impacts to Historic Properties

1. Conceptual Designs for the Treatment of Historic Properties

a) Attachments F through J reflect conceptual designs for construction and rehabilitation in, and adjacent to, the District and NRHP-eligible resources. The SHPO has reviewed these designs and concurs that they conform to the *Secretary of the Interior's Standards for the Treatment of Historic Properties, with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings and Guidelines for the Treatment of Cultural Landscapes* (Treatment Standards) and serve to lessen the impacts to historic properties. Specifically, the guidelines for the rehabilitation of historic properties will be used as the basis for all actions and undertakings with the potential to affect historic properties (hereafter referred to as Treatment Standards for Rehabilitation).

b) Fort Belvoir will require the Partnership to continue consultation with Fort Belvoir CRM and the SHPO to finalize and implement these conceptual designs in accordance with Stipulation IV.C, below.

2. Retention of NRHP-eligible Properties

a) Sixty-one single-family residential buildings in Belvoir Village constructed between 1934 and 1935 will be retained and rehabilitated in accordance with the Treatment Standards for Rehabilitation.

b) Sixty-four single family residential buildings, six duplex residential buildings, and six garages in Gerber Village constructed between 1931 and 1934 will be retained and rehabilitated in accordance with the Treatment Standards for Rehabilitation.

c) Five residential townhouse buildings and five garages in Jadwin Village constructed between 1939-1940 will be retained and rehabilitated in accordance with the Treatment Standards for Rehabilitation.

d) Six "Straight type" frame buildings along 21st Street (numbers 436-441), constructed in 1920-1921 and determined NRHP eligible in 2003 will be retained and rehabilitated in accordance with the Treatment Standards for Rehabilitation as examples of a previously-abundant property type on the installation.

e) Two "L-shaped" frame buildings in Park Village (numbers 490 and 491), constructed in 1920-1921 and determined NRHP eligible in 2003 will be retained and rehabilitated in accordance with the Treatment Standards for Rehabilitation as examples of a previously-abundant property type on the installation.

3. Alternatives to Demolition

a)Fort Belvoir will encourage the Partnership to pursue some/all of the following options to assist in mitigating the adverse effects of the Undertaking:

i) Relocation of Historic Properties
ii) Historic Architectural Salvage
iii) Non-historic Material Salvage

b) If one or more of the above options are chosen by the Partnership, Fort Belvoir CRM will assist the Partnership in preparing plans to market the properties for relocation or salvage to historic preservation organizations, architectural review committees, museums and the public.

c) Any plans to market the properties for relocation or salvage to historic preservation organizations, architectural review committees, museums and the public will be finalized in consultation with the SHPO.

4. Documentation of Historic Resources

a) Fort Belvoir will require the Partnership to conduct documentary efforts to a Historic American Buildings Survey (HABS) standard as stipulated in consultation with the SHPO and NPS Regional Coordinator in the NPS Northeast Region Philadelphia Support Office to assist in minimizing the impacts (demolition, alternatives to demolition, constructing additions and reconfiguring interiors) to historic housing neighborhoods and the District. Documentation will be undertaken on one of each type of historic resource to be affected, including its setting and surrounding landscape features prior to relocation, salvage, demolition, or alteration.

b) Multi-media Presentation on the History of Army Family Housing at Fort Belvoir

i) Fort Belvoir will require the Partnership to prepare an Internet-ready, multi-media presentation on the history of Army family housing at Fort Belvoir within two years of the execution of this Agreement. The presentation shall include sections on World War I, World War II, Cold War-era (Capehart-Wherry) and post-Cold War-era Army family housing neighborhoods at Fort Belvoir. The Partnership will coordinate with Fort Belvoir CRM and the SHPO in developing the scope of work for preparing the presentation.

c) A copy of the completed HABS documentation and multi-media presentation will be made available to the parties of this agreement and the public. Each of the parties to this agreement may duplicate and distribute the presentation in any way, but no party may sell the presentation for profit. The public will have access to the information at local libraries and archives, to include the Fairfax County Public Library System and the Department of Historic Resources Archives in Richmond. HABS documentation accepted by the NPS will also be available in the American Memory collection at the Library of Congress in Washington, DC.

d) In order to disseminate information about the history of Fort Belvoir to the widest public audience possible, Fort Belvoir and the Partnership will explore other media outlets for the multi-media presentation, including but not limited to:

i) Fort Belvoir web page
ii) Clark-Pinnacle web page
iii) Fort Belvoir, local, and regional television stations
iv) Local and regional museums
v) Other local and regional organizations with a demonstrated interest in the history of Fort Belvoir

IV. HISTORIC PROPERTY MANAGEMENT

A. Fort Belvoir will require the Partnership to conform to the management standards and guidelines for treatment of historic properties and cultural landscapes established by the Treatment Standards for Rehabilitation as outlined in Stipulation III.B.1.a.

B. Fort Belvoir will require the Partnership to consider the *Neighborhood Design Guidelines for Army Capehart and Wherry Family Housing* in finalizing all treatment strategies and plans involving Capehart-Wherry resources on the installation.

C. The Partnership will provide residents of historic properties with information regarding restrictions, conditions and stipulations for their respective home and will endeavor to ensure that the residents comply with the additional restrictions, stipulations and conditions.

D. Project Review and Consultation: Fort Belvoir CRM will review the activities of the Partnership and the activities of the property management agent, Clark Pinnacle Family Communities, LLC, using the review process specified in C.1 through 6, below. Fort Belvoir CRM will be responsible for creating and keeping a record of each project review. The documentary record of each project review will be maintained in Fort Belvoir environmental archives.

1. The Partnership will submit to Fort Belvoir CRM all proposed projects. Fort Belvoir CRM will review the project and plans and respond to the Partnership within 20 working days with a determination regarding the potential for an adverse effect on historic properties. If a determination of No Adverse Effect is made by-Fort Belvoir CRM, the project may proceed as planned.

2. The SHPO may at any time request to review and comment on a project submitted to Fort Belvoir CRM, pursuant to Stipulation IV.C.1 above, if it has reason to believe that a historic property may be adversely affected by a proposed undertaking.

3. If the Fort Belvoir CRM makes a determination of Adverse Effect, alterations to the project plans will be recommended to avoid or minimize the adverse effect. These recommendations will be made in accordance with the Treatment Standards for Rehabilitation noted in Stipulation III.B.1.a with the goal of minimizing the project to a

determination of Conditional No Adverse Effect, to be forwarded to the SHPO for review and concurrence.

4. If the Partnership does not accept these recommendations, Fort Belvoir will initiate the process to resolve the adverse effect pursuant to 36 CFR 800.6.

5. Fort Belvoir will require the Partnership to submit to Fort Belvoir CRM all proposed RCI projects adjacent to or within the viewshed of historic properties adjacent to the installation boundary, including projects such as Lewis Heights Village (Attachment K) that may impact the viewshed of the properties 5.a through c below in the Fairfax County Woodlawn Historic Overlay District. The Fort Belvoir CRM will provide representatives of the properties an opportunity to review and comment on such projects. The Fort Belvoir CRM will take the comments into consideration in determining if the project will have an adverse effect to the property. In the event of an adverse effect to an historic property, Fort Belvoir will initiate the process to resolve the adverse effect pursuant to 36 CFR 800.6.

a) Woodlawn, a National Historic Landmark, National Trust for Historic Preservation house museum and anchor property within the Fairfax County Woodlawn Historic Overlay District adopted by the Fairfax County Board of Supervisors (Attachment M);

b) Alexandria Friends Meeting – Religious Society of Friends, a NRHP-eligible 19th century meetinghouse and cemetery surrounded by Fort Belvoir at the southwest corner of Woodlawn Road and Lampert Road and within the Fairfax County Woodlawn Historic Overlay District (Attachment N); and

c) George Washington Grist Mill, a NRHP-eligible, recreated, 18th century-style gristmill located within the Mount Vernon Estate and Gardens property and within the Fairfax County Woodlawn Historic Overlay District (Attachment O).

6. In order to expedite project review for undertakings within the historic district, the Partnership will adhere to the Treatment Standards for Rehabilitation noted in Stipulation III.B.1.a. Certain actions listed in Stipulation V: Exempt Activities, are exempt from the project review process outlined in C.1 through 4, above.

7. In the case of an emergency, the Partnership will perform those actions necessary for the protection of the historic properties with on-site monitoring by Qualified Staff. The Partnership is not required to consult with Fort Belvoir in advance of emergency actions affecting historic properties. Where possible, such emergency measures will be undertaken in a manner that is consistent with the Treatment Standards. The Partnership will notify Fort Belvoir CRM, who will notify the SHPO, following execution of all emergency measures affecting historic properties. This emergency provision is limited to undertakings initiated within 30 days of the emergency. If the response to emergency conditions requires no ground lease modification, the Partnership must act in conformance with the terms of this Agreement previously reviewed by the SHPO and there is no new federal undertaking as defined in this Agreement.

E. Fort Belvoir will report to the SHPO and the Council on the status of the Fort Belvoir historic housing properties using a report prepared by the Partnership and Fort Belvoir CRM annually in the month to be agreed upon by the SHPO, the Partnership, and Fort Belvoir. This report will include information on the current condition of the historic properties, actions taken by the Partnership to maintain the properties in accordance with the Treatment Standards, and descriptions of unanticipated problems that could affect the integrity or upkeep of the historic properties, or any other activities or policies that affect or may affect the historic properties, including the documentation of Fort Belvoir CRM project reviews carried out under Stipulation IV.C, above.

F. Tax Credits

1. Fort Belvoir shall encourage the Partnership to explore federal and state historic preservation tax credit benefits via the established application process, which, for federal tax credits, requires listing of the District on the NRHP, and for state tax credits, requires listing or a determination of eligibility for listing in the Virginia Landmark Register.

2. In the event that the Partnership determines to seek the historic preservation tax credits, the proposed project will, upon receipt of approved Part II certification from NPS, be exempted from Stipulation IV.C above. Fort Belvoir will coordinate the application process in conjunction with the Partnership, SHPO and NPS before the start of rehabilitation projects involving historic buildings.

V. EXEMPT ACTIVITIES

A. The following activities will be carried out consistent with the Treatment Standards for Rehabilitation and Fort Belvoir CRM may determine them to be exempt from SHPO consultations:

1. General operation and maintenance, and new construction outside the historic district, provided such construction is not visible from the District and NRHP-eligible properties listed in Attachment B and those noted in Stipulation IV.C.4.

2. General operation of, and routine and cyclical maintenance to, NRHP-eligible properties.

3. Temporary installation of facilities to provide access to NRHP-eligible properties by disabled persons provided these changes make no permanent modification to NRHP-eligible architectural or cultural landscape elements.

4. Any change to the mechanical, electrical, or plumbing systems, basement, or attic spaces of historic properties, as long as such change does not affect any significant exterior or interior historic character-defining elements in other rooms of the quarters.

B. Activities not listed above shall be completed as directed in Stipulation IV.C, above. The replacement of existing doors and windows is not exempt and must be reviewed using the process outlined in Stipulation IV.C, above.

C. In the event that the parties to this Agreement concur in writing that additional exemptions are appropriate, such exemptions may be enacted in accordance with Stipulation IV.C.6 of this Agreement.

VI. ARCHAEOLOGICAL RESOURCES

A. Prior to any new construction on previously developed land, Fort Belvoir will determine the need for an archaeological survey in consultation with the SHPO in accordance with 36 CFR 800.3. If a survey is recommended, Fort Belvoir CRM will undertake a survey of the APE sufficient to determine the NRHP-eligibility of archeological resources in accordance with Section 36 CFR 800.4. Fort Belvoir will require the Partnership to reimburse Fort Belvoir for the cost of the survey.

B. If the Fort Belvoir CRM determines that NRHP-eligible archeological resources identified in the survey conducted pursuant to Stipulation VI.A will be affected by the undertaking as defined by 36 CFR 800.5, Fort Belvoir CRM will continue consultation in accordance with 36 CFR 800.6 to determine how to avoid or resolve an adverse effect on the property.

C. In the event of discovery of archeological materials during any of its activities, the Partnership shall immediately stop work in the area of discovery and notify the Fort Belvoir CRM. The Partnership shall ensure that no unauthorized personnel have access to the site and no further damage is done to the discovery until Fort Belvoir has complied with 36 CFR 800.13(b) and any other legal requirements. Failure to report such finds shall be interpreted as willful destruction of archaeological properties on federal land.

D. Human remains and associated funerary objects encountered during the course of actions taken as a result of this agreement shall be treated in the manner consistent with the provisions of the Native American Graves Protection and Repatriation Act (25 U.S.C. Sec. 3001 et seq.) and any other applicable laws as agreed upon in consultation with the SHPO. Information copies of any notifications made under NAGPRA shall be provided to the SHPO.

E. Fort Belvoir will ensure that archaeological artifacts recovered from archaeological investigations or unexpected discoveries will be stored in a curatorial repository that meets federal standards stipulated in 36 CFR 79, *The Curation of Federally-Owned and Administered Archaeological Collections.*

VII. CONSULTATION WITH FEDERALLY RECOGNIZED INDIAN TRIBES

No federally recognized Indian tribes with historic ties to the Fort Belvoir area currently exist for consultation on the Undertaking pursuant to 36 CFR 800.2. Should a tribe receive formal Federal recognition as defined in 36 CFR 800.16(m), said tribe interested in developing

consultation procedures for projects resulting from the RCI may consult with Fort Belvoir to develop such procedures pursuant to 36 CFR 800.2(c)(2)(ii)(E).

VIII. FISCAL REQUIREMENTS AND SOURCES

The stipulations of this Agreement are subject to the provisions of the Anti-Deficiency Act and nothing in this Agreement shall be construed to require the Army or Fort Belvoir to violate the terms of the Act. If compliance with the Anti-Deficiency Act alters or impairs Fort Belvoir's ability to implement the stipulations of this Agreement, Fort Belvoir will consult in accordance with the dispute resolution and amendment stipulations as specified in Stipulations IX and X, below.

IX. DISPUTE RESOLUTION

A. Should the SHPO, the Council, a federally recognized Indian tribe affected by implementation of RCI at Fort Belvoir, or a member of the public, object within 30 days to any plans or other documents provided by Fort Belvoir or others for review pursuant to this Agreement, Fort Belvoir will consult with the objecting party to resolve the objection. If Fort Belvoir determines it cannot resolve the objection, Fort Belvoir shall forward to the Council all dispute-relevant documentation and a recommended course of action. Within 30 days after receipt of documentation, the Council will either:

1. Provide Fort Belvoir with recommendations, which Fort Belvoir will take into account in reaching a final decision regarding the dispute; or

2. Notify Fort Belvoir that it will or will not comment pursuant to 36 CFR 800.7(c). Fort Belvoir will take into account any comment the Council provides in response to such request and do so in accordance with 36 CFR 800.7(c)(4) with reference to the subject of the dispute.

B. Any recommendation or comment that the Council provides pertains only to the subject of the dispute. Fort Belvoir's responsibility to carry out all other actions under this Agreement, other than those disputed, will not change.

X. AMENDMENT AND TERMINATION

A. If a change occurs in the Undertaking that creates new circumstances that Fort Belvoir must address, or, if Fort Belvoir is unable to carry out the terms of this Agreement, any party to this Agreement may request an amendment in accordance with 36 CFR Part 800.6(c)(7).

B. Should the parties to this Agreement not agree on an amendment or in the event of Fort Belvoir's failure to comply with the stipulations of this Agreement prior to execution of a Ground Lease, this Agreement shall be terminated. In such an event, Fort Belvoir may elect not to execute a ground lease that has the potential to adversely affect historic properties until applicable stipulations of the Agreement are met or until it obtains alternative documentation from the Council that it has met the requirements of the Act.

XI. EFFECTIVE DATE, END DATE, APPLICABILITY

A. This Programmatic Agreement is effective on the date that the Partnership is formed and takes effect. Fort Belvoir will comply with all terms and stipulations from that date forward.

B. This Programmatic Agreement will be incorporated into the ground lease as an exhibit and will become an integral part of the ground lease. The Programmatic Agreement will become applicable to Fort Belvoir Residential Communities, LLC after the Partnership is formed and upon the execution of the Ground Lease. The ground lease is expected to be a 50-year lease, with an option to renew that lease for 25 more years upon mutual agreement between the parties.

C. This Agreement will be in effect so long as the ground lease is in effect, unless previously terminated under the provisions of Stipulation X, above. If the parties to the ground lease agree to extend the ground lease, the parties to this Agreement will consult on the need to renew or amend this Agreement at the same time as the ground lease is being considered for renewal.

Execution of this Programmatic Agreement and implementation of its terms evidence that Fort Belvoir has afforded the Council an opportunity to comment on the Undertaking to privatize family housing at Fort Belvoir, and its effects on historic properties, and that Fort Belvoir has taken into account the effects of the Undertaking on historic properties.

FORT BELVOIR, VIRGINIA
By:

for Thomas W. Williams
Colonel, U.S. Army
Garrison Commander

Date: 13 Aug 03

VIRGINIA STATE HISTORIC PRESERVATION OFFICER
By:

Kathleen Kilpatrick
State Historic Preservation Officer

Date: 13 Aug 03

CONCUR: CLARK PINNACLE BELVOIR LLC

Clark Pinnacle Belvoir LLC has reviewed the above terms and stipulations of this Programmatic Agreement. We acknowledge that the terms and stipulations will become a part of the ground lease and that they will become binding on Fort Belvoir Residential Communities, LLC, a limited liability corporation that Clark Pinnacle Belvoir LLC and the Army will form after the RCI project at Fort Belvoir is approved by Congress.

Clark Pinnacle Belvoir LLC

By: Clark Realty Capital, L.L.C., Manager

By: _____ Date: 18 AUG 2003
Douglas R. Sandor, Manager

Attachment A:

RCI APE and NRHP-Eligible Resources Within the Established Fort Belvoir Historic District

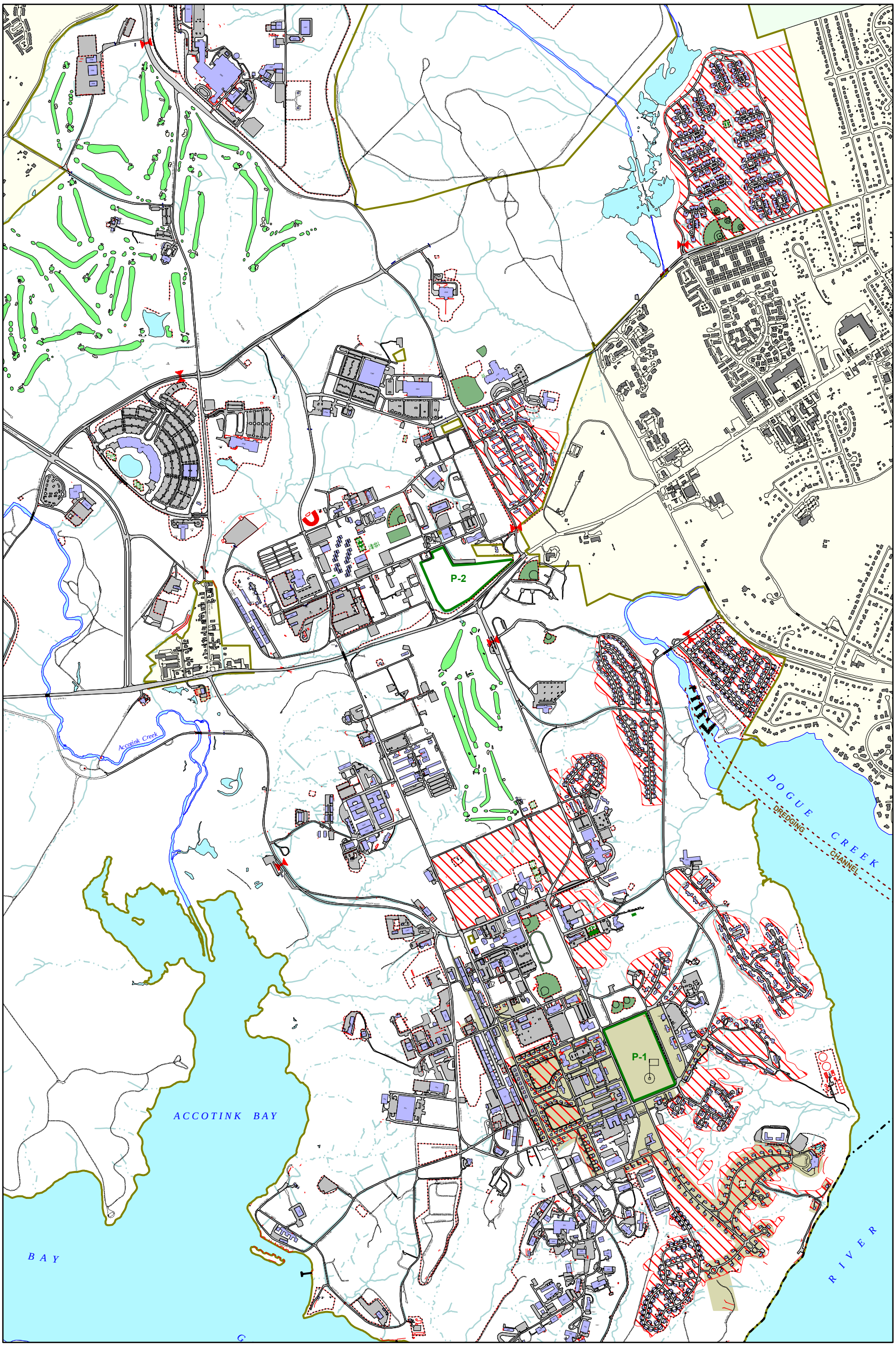
Attachment A: RCI APE and NRHP-eligible resources within the established Fort Belvoir Historic District

Number	Use	Date	DHR Number	Village
00001	FAMILY HOUSING	1935	029-0209-0001	BELVOIR
00002	FAMILY HOUSING	1935	029-0209-0002	BELVOIR
00003	FAMILY HOUSING	1935	029-0209-0003	BELVOIR
00004	FAMILY HOUSING	1935	029-0209-0004	BELVOIR
00005	FAMILY HOUSING	1935	029-0209-0005	BELVOIR
00006	FAMILY HOUSING	1935	029-0209-0006	BELVOIR
00007	FAMILY HOUSING	1935	029-0209-0007	BELVOIR
00008	FAMILY HOUSING	1935	029-0209-0009	BELVOIR
00009	FAMILY HOUSING	1935	029-0209-0010	BELVOIR
00010	FAMILY HOUSING	1935	029-0209-0011	BELVOIR
00011	FAMILY HOUSING	1935	029-0209-0012	BELVOIR
00012	FAMILY HOUSING	1935	029-0209-0013	BELVOIR
00013	FAMILY HOUSING	1935	029-0209-0014	BELVOIR
00014	FAMILY HOUSING	1935	029-0209-0015	BELVOIR
00015	FAMILY HOUSING	1935	029-0209-0016	BELVOIR
00016	FAMILY HOUSING	1935	029-0209-0019	BELVOIR
00017	FAMILY HOUSING	1935	029-0209-0020	BELVOIR
00018	FAMILY HOUSING	1935	029-0209-0021	BELVOIR
00019	FAMILY HOUSING	1935	029-0209-0022	BELVOIR
00021	FAMILY HOUSING	1935	029-0209-0024	BELVOIR
00022	FAMILY HOUSING	1935	029-0209-0025	BELVOIR
00023	FAMILY HOUSING	1935	029-0209-0026	BELVOIR
00024	FAMILY HOUSING	1934	029-0209-0027	BELVOIR
00025	FAMILY HOUSING	1935	029-0209-0028	BELVOIR
00026	FAMILY HOUSING	1934	029-0209-0029	BELVOIR
00027	FAMILY HOUSING	1935	029-0209-0030	BELVOIR
00028	FAMILY HOUSING	1934	029-0209-0031	BELVOIR
00029	FAMILY HOUSING	1934	029-0209-0032	BELVOIR
00030	FAMILY HOUSING	1935	029-0209-0033	BELVOIR
00031	FAMILY HOUSING	1934	029-0209-0034	BELVOIR
00032	FAMILY HOUSING	1934	029-0209-0035	BELVOIR
00033	FAMILY HOUSING	1934	029-0209-0036	BELVOIR
00034	FAMILY HOUSING	1934	029-0209-0038	BELVOIR
00035	FAMILY HOUSING	1934	029-0209-0039	BELVOIR
00036	FAMILY HOUSING	1934	029-0209-0040	BELVOIR
00037	FAMILY HOUSING	1934	029-0209-0041	BELVOIR
00038	FAMILY HOUSING	1934	029-0209-0042	BELVOIR
00039	FAMILY HOUSING	1934	029-0209-0043	BELVOIR
00040	FAMILY HOUSING	1934	029-0209-0044	BELVOIR
00041	FAMILY HOUSING	1934	029-0209-0045	BELVOIR
00042	FAMILY HOUSING	1934	029-0209-0046	BELVOIR
00043	FAMILY HOUSING	1934	029-0209-0047	BELVOIR
00044	FAMILY HOUSING	1934	029-0209-0048	BELVOIR
00045	FAMILY HOUSING	1934	029-0209-0049	BELVOIR
00046	FAMILY HOUSING	1934	029-0209-0050	BELVOIR
00047	FAMILY HOUSING	1934	029-0209-0051	BELVOIR

00048	FAMILY HOUSING	1934	029-0209-0052	BELVOIR
00049	FAMILY HOUSING	1934	029-0209-0053	BELVOIR
00050	FAMILY HOUSING	1934	029-0209-0054	BELVOIR
00051	FAMILY HOUSING	1934	029-0209-0055	BELVOIR
00052	FAMILY HOUSING	1935	029-0209-0057	BELVOIR
00053	FAMILY HOUSING	1934	029-0209-0058	BELVOIR
00054	FAMILY HOUSING	1934	029-0209-0059	BELVOIR
00055	FAMILY HOUSING	1934	029-0209-0060	BELVOIR
00056	FAMILY HOUSING	1934	029-0209-0061	BELVOIR
00057	FAMILY HOUSING	1934	029-0209-0062	BELVOIR
00058	FAMILY HOUSING	1934	029-0209-0063	BELVOIR
00059	FAMILY HOUSING	1934	029-0209-0064	BELVOIR
00060	FAMILY HOUSING	1934	029-0209-0065	BELVOIR
00067	FAMILY HOUSING	1950	029-0209-0066	BELVOIR
00068	FAMILY HOUSING	1950	029-0209-0067	BELVOIR
00101	FAMILY HOUSING	1930	029-0209-0070	GERBER
00102	FAMILY HOUSING	1930	029-0209-0071	GERBER
00103	FAMILY HOUSING	1930	029-0209-0072	GERBER
00104	FAMILY HOUSING	1930	029-0209-0073	GERBER
00105	FAMILY HOUSING	1930	029-0209-0074	GERBER
00106	FAMILY HOUSING	1930	029-0209-0075	GERBER
00107	FAMILY HOUSING	1930	029-0209-0076	GERBER
00108	FAMILY HOUSING	1930	029-0209-0077	GERBER
00109	FAMILY HOUSING	1930	029-0209-0078	GERBER
00110	FAMILY HOUSING	1930	029-0209-0079	GERBER
00111	FAMILY HOUSING	1930	029-0209-0081	GERBER
00112	FAMILY HOUSING	1930	029-0209-0082	GERBER
00114	FAMILY HOUSING	1931	029-0209-0083	GERBER
00115	FAMILY HOUSING	1930	029-0209-0084	GERBER
00116	FAMILY HOUSING	1930	029-0209-0085	GERBER
00117	FAMILY HOUSING	1930	029-0209-0086	GERBER
00118	FAMILY HOUSING	1930	029-0209-0087	GERBER
00119	FAMILY HOUSING	1930	029-0209-0088	GERBER
00120	FAMILY HOUSING	1930	029-0209-0089	GERBER
00121	FAMILY HOUSING	1930	029-0209-0091	GERBER
00122	FAMILY HOUSING	1930	029-0209-0092	GERBER
00123	FAMILY HOUSING	1930	029-0209-0093	GERBER
00124	FAMILY HOUSING	1930	029-0209-0094	GERBER
00125	FAMILY HOUSING	1930	029-0209-0095	GERBER
00126	FAMILY HOUSING	1931	029-0209-0096	GERBER
00127	FAMILY HOUSING	1930	029-0209-0097	GERBER
00128	FAMILY HOUSING	1931	029-0209-0098	GERBER
00129	FAMILY HOUSING	1931	029-0209-0099	GERBER
00130	FAMILY HOUSING	1931	029-0209-0100	GERBER
00131	FAMILY HOUSING	1931	029-0209-0101	GERBER
00132	FAMILY HOUSING	1931	029-0209-0102	GERBER
00133	FAMILY HOUSING	1931	029-0209-0103	GERBER
00134	FAMILY HOUSING	1931	029-0209-0104	GERBER
00135	FAMILY HOUSING	1931	029-0209-0105	GERBER
00136	FAMILY HOUSING	1931	029-0209-0106	GERBER

00137	FAMILY HOUSING	1931	029-0209-0108	GERBER
00138	FAMILY HOUSING	1931	029-0209-0109	GERBER
00139	FAMILY HOUSING	1931	029-0209-0110	GERBER
00140	FAMILY HOUSING	1931	029-0209-0111	GERBER
00141	FAMILY HOUSING	1931	029-0209-0112	GERBER
00142	FAMILY HOUSING	1931	029-0209-0113	GERBER
00143	FAMILY HOUSING	1931	029-0209-0114	GERBER
00144	FAMILY HOUSING	1931	029-0209-0115	GERBER
00145	FAMILY HOUSING	1931	029-0209-0116	GERBER
00146	FAMILY HOUSING	1931	029-0209-0117	GERBER
00147	FAMILY HOUSING	1931	029-0209-0118	GERBER
00148	FAMILY HOUSING	1931	029-0209-0119	GERBER
00149	FAMILY HOUSING	1931	029-0209-0120	GERBER
00150	FAMILY HOUSING	1931	029-0209-0121	GERBER
00151	FAMILY HOUSING	1931	029-0209-0122	GERBER
00152	FAMILY HOUSING	1931	029-0209-0123	GERBER
00153	FAMILY HOUSING	1931	029-0209-0124	GERBER
00155	FAMILY HOUSING	1931	029-0209-0125	GERBER
00157	FAMILY HOUSING	1931	029-0209-0126	GERBER
00159	FAMILY HOUSING	1931	029-0209-0128	GERBER
00161	FAMILY HOUSING	1931	029-0209-0129	GERBER
00162	FAMILY HOUSING	1934	029-0209-0130	GERBER
00163	FAMILY HOUSING	1931	029-0209-0131	GERBER
00164	FAMILY HOUSING	1934	029-0209-0132	GERBER
00165	FAMILY HOUSING	1931	029-0209-0133	GERBER
00166	FAMILY HOUSING	1939	029-0209-0134	GERBER
00167	FAMILY HOUSING	1939	029-0209-0135	GERBER
00168	FAMILY HOUSING	1939	029-0209-0136	GERBER
00169	FAMILY HOUSING	1939	029-0209-0137	GERBER
00170	FAMILY HOUSING	1939	029-0209-0138	GERBER
00171	FAMILY HOUSING	1939	029-0209-0139	GERBER
00173	DETACHED GARAGE	1940	029-0209-0140	GERBER
00174	DETACHED GARAGE	1940	029-0209-0141	GERBER
00175	DETACHED GARAGE	1940	029-0209-0142	GERBER
00176	DETACHED GARAGE	1940	029-0209-0143	GERBER
00177	DETACHED GARAGE	1940	029-0209-0144	GERBER
00178	DETACHED GARAGE	1940	029-0209-0145	GERBER
00436	FAMILY HOUSING	1921	029-0209-0179	21st ST
00437	FAMILY HOUSING	1921	029-0209-0180	21st ST
00438	FAMILY HOUSING	1921	029-0209-0181	21st ST
00439	FAMILY HOUSING	1921	029-0209-0182	21st ST
00440	FAMILY HOUSING	1921	029-0209-0183	21st ST
00441	FAMILY HOUSING	1921	029-0209-0184	21st ST
00500	FAMILY HOUSING	1934	029-0209-0187	GERBER
00501	FAMILY HOUSING	1934	029-0209-0189	GERBER
00502	FAMILY HOUSING	1934	029-0209-0190	GERBER
00503	FAMILY HOUSING	1934	029-0209-0191	GERBER

See map following this page.



LEGEND

RCI AREA OF POTENTIAL AFFECT

FORT BELVOIR HISTORIC DISTRICT

ATTACHMENT A: RCI AREA OF POTENTIAL AFFECT AND NRHP - ELIGIBLE RESOURCES WITHIN THE ESTABLISHED FORT BELVOIR HISTORIC DISTRICT

N

PERFORMANCE GROUP INCORPORATED

Attachment B:

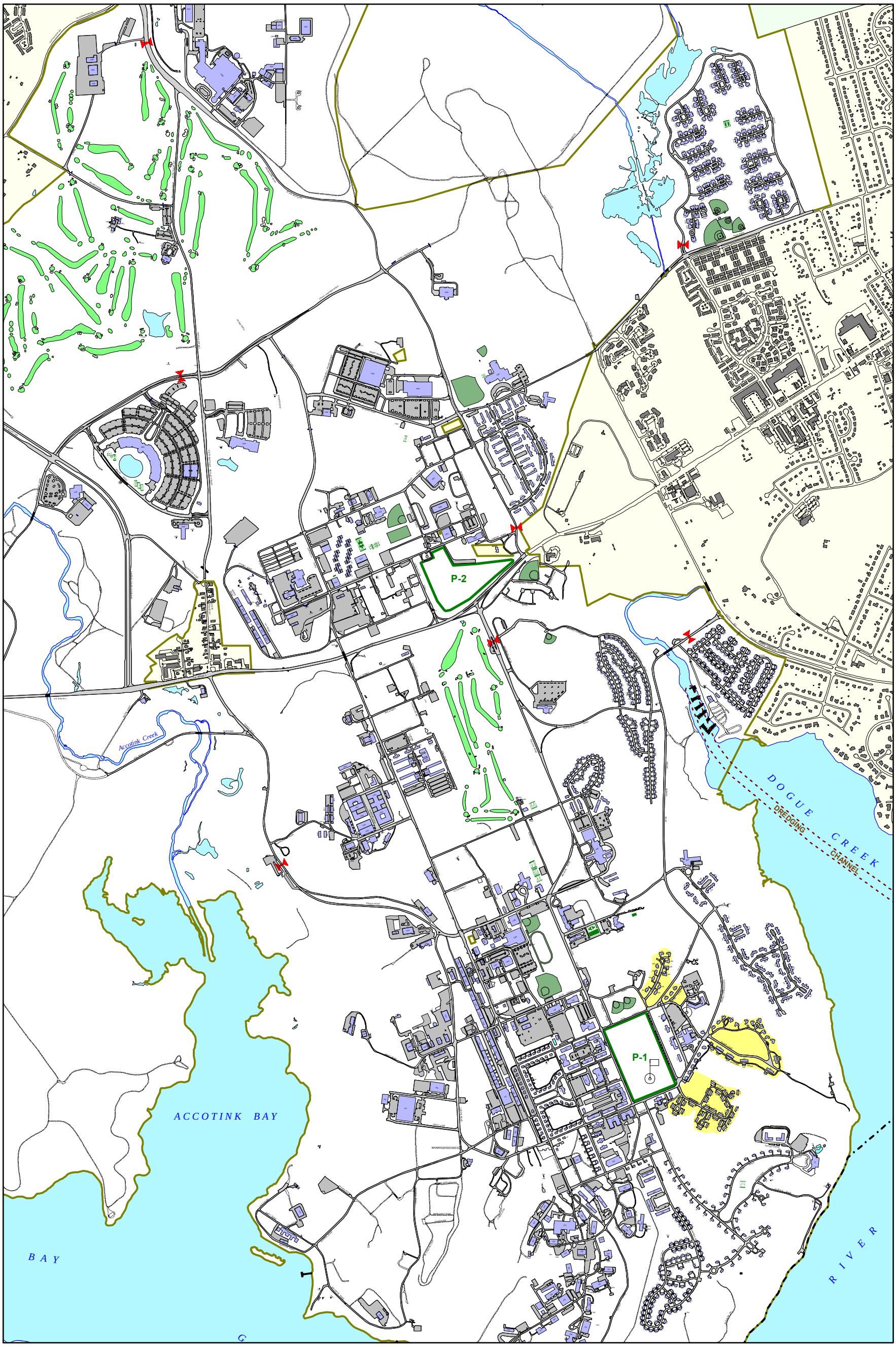
NRHP-Eligible Resources Not Within the District Boundary but Listed as Contributing to the District

Attachment B: NRHP-eligible resources not within the District boundary but listed as contributing to the District.

Number	Use	Date	DHR Number	Village
00442	FAMILY HOUSING	1921	029-0209-0276	JADWIN
00443	DETACHED GARAGE	1940	029-0209-0185	JADWIN
00444	DETACHED GARAGE	1940	029-0209-0185	JADWIN
00445	DETACHED GARAGE	1940	029-0209-0185	JADWIN
00446	DETACHED GARAGE	1940	029-0209-0185	JADWIN
00451	FAMILY HOUSING	1939	029-0209-0247	JADWIN
00452	FAMILY HOUSING	1939	029-0209-0248	JADWIN
00453	FAMILY HOUSING	1939	029-0209-0249	JADWIN
00454	FAMILY HOUSING	1939	029-0209-0250	JADWIN
00455	FAMILY HOUSING	1939	029-0209-0251	JADWIN
00457	FAMILY HOUSING	1920	029-0209-0277	JADWIN
00458	FAMILY HOUSING	1920	029-0209-0278	JADWIN
00459	FAMILY HOUSING	1920	029-0209-0279	JADWIN
00460	FAMILY HOUSING	1920	029-0209-0280	JADWIN
00461	FAMILY HOUSING	1920	029-0209-0281	JADWIN
00462	FAMILY HOUSING	1920	029-0209-0282	JADWIN
00463	FAMILY HOUSING	1920	029-0209-0283	JADWIN
00464	FAMILY HOUSING	1920	029-0209-0284	JADWIN
00465	FAMILY HOUSING	1920	029-0209-0285	JADWIN
00466	FAMILY HOUSING	1921	029-0209-0286	JADWIN
00467	FAMILY HOUSING	1921	029-0209-0287	JADWIN
00468	FAMILY HOUSING	1921	029-0209-0288	JADWIN
00469	FAMILY HOUSING	1921	029-0209-0289	JADWIN
00479	FAMILY HOUSING	1921	029-0209-0290	SNOW
00480	FAMILY HOUSING	1921	029-0209-0291	SNOW
00481	FAMILY HOUSING	1921	029-0209-0292	SNOW
00483	FAMILY HOUSING	1921	029-0209-0293	PARK
00484	FAMILY HOUSING	1921	029-0209-0294	PARK
00487	FAMILY HOUSING	1920	029-0209-0295	PARK
00488	FAMILY HOUSING	1920	029-0209-0296	PARK
00489	FAMILY HOUSING	1920	029-0209-0297	PARK
00490	FAMILY HOUSING	1920	029-0209-0298	PARK
00491	FAMILY HOUSING	1920	029-0209-0299	PARK
00492	FAMILY HOUSING	1921	029-0209-0300	PARK
00493	FAMILY HOUSING	1921	029-0209-0301	PARK
00494	FAMILY HOUSING	1921	029-0209-0302	PARK
00496	FAMILY HOUSING	1921	029-0209-0303	PARK
00401	FAMILY HOUSING	1947	029-0209-0304	ROSSELL
00402	FAMILY HOUSING	1947	029-0209-0305	ROSSELL
00403	FAMILY HOUSING	1947	029-0209-0306	ROSSELL
00404	FAMILY HOUSING	1947	029-0209-0307	ROSSELL
00405	FAMILY HOUSING	1947	029-0209-0308	ROSSELL
00406	FAMILY HOUSING	1947	029-0209-0222	ROSSELL
00407	FAMILY HOUSING	1947	029-0209-0223	ROSSELL
00408	FAMILY HOUSING	1947	029-0209-0224	ROSSELL
00409	FAMILY HOUSING	1947	029-0209-0225	ROSSELL

00410	FAMILY HOUSING	1947	029-0209-0226	ROSSELL
00411	FAMILY HOUSING	1947	029-0209-0227	ROSSELL
00412	FAMILY HOUSING	1947	029-0209-0228	ROSSELL
00413	FAMILY HOUSING	1947	029-0209-0229	ROSSELL
00414	FAMILY HOUSING	1947	029-0209-0230	ROSSELL
00415	FAMILY HOUSING	1947	029-0209-0231	ROSSELL
00416	FAMILY HOUSING	1947	029-0209-0232	ROSSELL
00417	FAMILY HOUSING	1947	029-0209-0233	ROSSELL
00418	FAMILY HOUSING	1948	029-0209-0234	ROSSELL
00419	FAMILY HOUSING	1948	029-0209-0235	ROSSELL
00421	FAMILY HOUSING	1948	029-0209-0236	ROSSELL
00423	FAMILY HOUSING	1948	029-0209-0237	ROSSELL
00424	FAMILY HOUSING	1948	029-0209-0238	ROSSELL
00425	FAMILY HOUSING	1948	029-0209-0239	ROSSELL
00426	FAMILY HOUSING	1948	029-0209-0240	ROSSELL
00427	FAMILY HOUSING	1948	029-0209-0241	ROSSELL
00428	FAMILY HOUSING	1948	029-0209-0242	ROSSELL
00429	FAMILY HOUSING	1948	029-0209-0243	ROSSELL
00430	FAMILY HOUSING	1948	029-0209-0244	ROSSELL
00431	FAMILY HOUSING	1948	029-0209-0245	ROSSELL
00432	FAMILY HOUSING	1948	029-0209-0246	ROSSELL

Also see map following this page.



LEGEND

FORT BELVOIR HISTORIC DISTRICT

NRHP - ELIGIBLE RESOURCES NOT WITHIN THE FORT BELVOIR HISTORIC DISTRICT, BUT LISTED AS CONTRIBUTING TO THE DISTRICT

ATTACHMENT B: HOUSING RESOURCES ELIGIBLE FOR LISTING IN THE NRHP, BUT NOT INSIDE THE HISTORIC DISTRICT

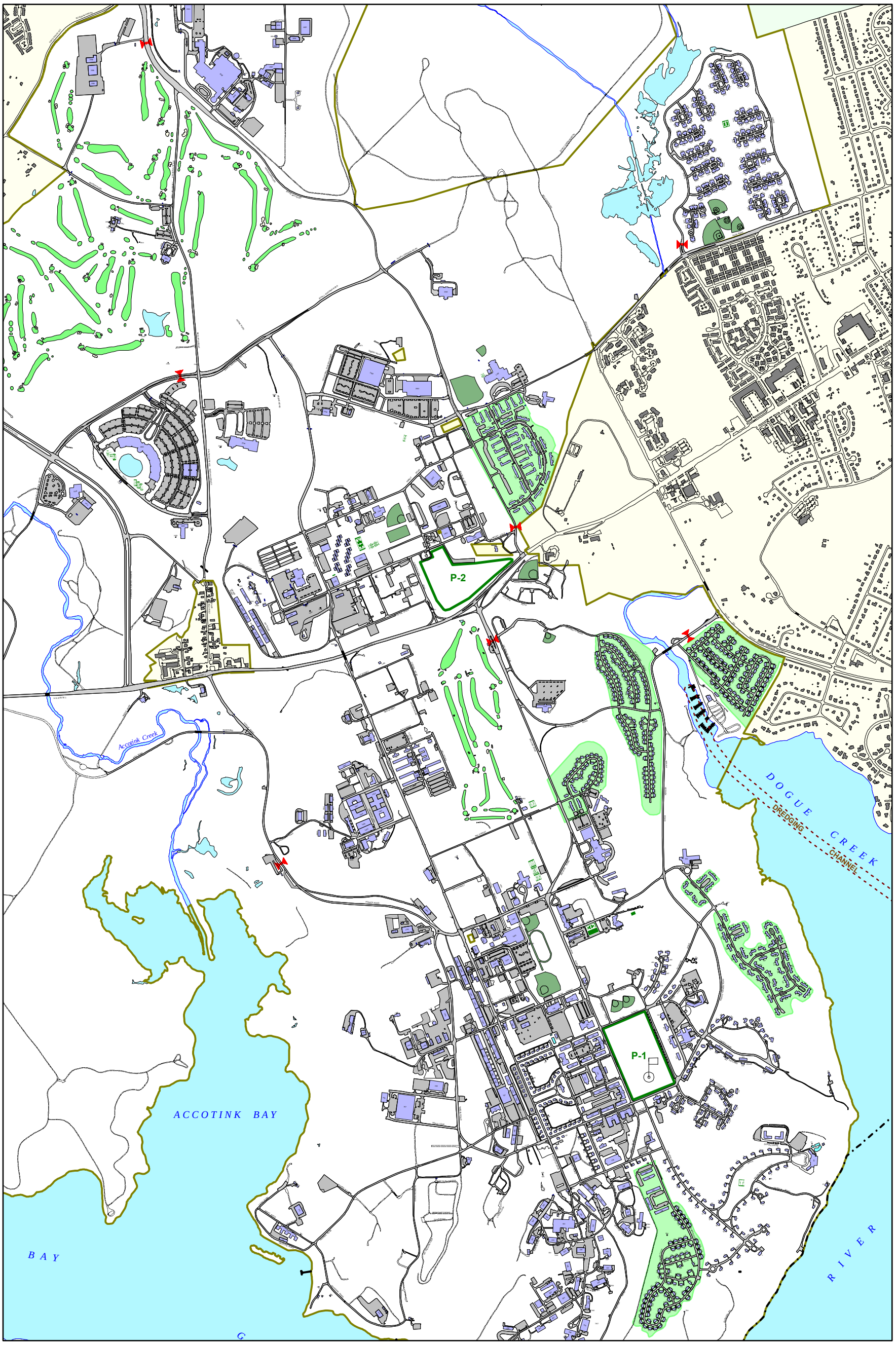
N

PERFORMANCE GROUP

Attachment C:

Capehart-Wherry-Era Historic Architectural Resources Not Subject to this Agreement or the Section 106 Process

Archaeological Resources Within this Footprint are Subject to the Terms of this Agreement as per Stipulation VI, Archaeological Resources



LEGEND

CAPEHART - WHERRY ERA HOUSING (1949-1962)

ATTACHMENT C: CAPEHART - WHERRY ERA HISTORIC RESOURCES NOT SUBJECT TO THIS AGREEMENT OR THE SECTION 106 PROCESS

N

PERFORMANCE GROUP INCORPORATED

Attachment D:

Bibliography of Completed Cultural Resources Surveys, Management Summaries, Guidebooks and Studies at ENRD

Table 2: Archeological Studies Undertaken at U. S. Army Garrison Fort Belvoir, Virginia: 1970-1999

Date	Authors	Title	Summary/Comments
ND	Chatelain, Edward and Michael Johnson	*I-95 to Rt. 1 By-Pass Corridor*	Early version of Springfield By-Pass project. Pedestsrian reconnaissance of two alternative routes, both running through Fort Belvoir. NB: Fort Belvoir denied aaccess for this survey.
1976	Shott, George G.	*Belvoir Manor Archeological Study*	Phase II investigations of major dependencies at Belvoir Manor site, including brick clamps and infrastructure features such as drainage and cooling shafts. MA Thesis (GWU) also extant.
1977	Gardner, William M., and Kurt W. Carr	*An Archaeological Reconnaissance of a Proposed Railroad Spur Line at Fort Belvoir, Va.*	Pedestrian reconnaissance of a 15,000 ft x 60 ft right-of-way through northern sections of Fort Belvoir's training areas. One heavily disturbed mixed-component historic/prehistoric site found.
1977	Gardner, William M., Dennis Curry, and Kurt Carr	*Archaeological Reconnaissance of 90 Acres at the Fort Belvoir Family Housing Project, Fort Belvoir, Virginia*	Pedestrian reconnaissance of Woodlawn Family Housing Area. No sites recorded; area heavily disturbed and swampy.
1979	Chatelain, Edward, and Michael Johnson	*Preliminary Cultural Resource Reconnaissance of the Proposed Widening of Route 1 from Little Hunting Creek to Belvoir Road*	No sites identified within boundaries of Fort Belvoir
1982	Karell Archaeological Associates	*Springfield Bypass and Extension, Fairfax County, Virginia: Technical Report: Phase I Cultural Resources Investigations*	Pedestrian reconnaissance and judgemental sub-surface testing with extreme souther segment of expressway route through Fort Belvoir. Four sites recommended for Phase II testing. EIS for USDOT/VDOT and earlier drafts also extant. DHR concurred with recommended testing.
1982	Karell Archeological Associates	*Springfield Bypass and Extension, Fairfax County, Virginia: Technical Report: Phase II Cultural Resource Investigations*	Intensive investigations of three prehistoric sites and one historic military training trench complex. Prehistoric sites mitigated under MOA between VDHR and VDOT.
1983	Israel, Stephen	*Archeological Reconnaissance: Triplett Homestead Site and Family Cemetery, Round Hill, Fort Belvoir, Fairfax County, Virginia*	Excavation of two .75 x 5 m test trenches revealed 20th century debris in association with modern poured concrete foundation Report recommended further Phase I testing north of Leaf Road (Present HECSA property).
1984	Johnson, Michael	*Fort Belvoir Life Care Community*	Pedestrian reconnaissance and judgmental shovel/trowel testing of retirement facility site identified military trenches; one prehistoric site; one 20th century domestic scatter; old roadbeds. Further work recommended for Sites 220-222 and new site.
Date	**Authors**	**Title**	**Summary/Comments**
1984	LeeDecker, Charles,	*Cultural Resource Survey and*	Presents results of Phase I survey of environmentally

	Charles Cheek, Amy Friedlander, Teresa Ossim	*Evaluation at Fort Belvoir, Virginia*	defined "quadrats" and "required areas" on post, including Engineer Proving Ground. Classifies all archeological sites; offers recommendations for futher work
1986	Henry, Susan L.	*Archeological Survey of the INSCOM Facility at Fort Belvoir, Virginia*	Letter report. Recommends Phase II evaluation of Site #109-1H2 if project design will disturb. DHR concurs (12/9/86)
1986	Johnson, Michael	*Expansion of Lower Potomac Pollution Control Plant*	Letter report. DHR concurs on No Effect determination (10/30/86)
1986	Johnson, Michael	*Mason Run Storm Drainage Improvements*	Letter report. DHR concurs on No Effect deetermination (6/20/86)
1986	Johnson, Michael	*Phase I Study of Rappel Tower Site*	Letter report. DHR concurs on No Further Work (5/21/86)
1987	DeCicco, Gabriel	*Phase I Archeological Reconnaissance of Proposed Construction Site of the HQ USACE*	Phase I survey found no cultural materials; recommended no further work.
1987	Henry, Susan L.	*Phase I Archeological Survey for the Historical Center and Museum, Humphreys Engineer Center, Fort Belvoir, Virginia*	Letter report. No historic materials; recommends monitoring of site development for prehistoric resources.
1988	Polk, Harding	*Disturbance Map Development: Fort Belvoir Historic Preservation Plan*	Visual inspection supplemented with archival data to identify disturbed areas at installation; limited sub-surface testing to ground-truth conclusions. Disturbance map included. Combined with later Phase I reconnaissance (MAAR 1990-1992)
1988	Johnson, Michael	*A Preliminary Archeological Reconnaissance of the Fort Belvoir Shoreline, Fairfax County, Virginia*	Visual inspection of navigationally accessible portions of installation shoreline; identified 57 sites; recommended preventive maintenance and treatment of threatenedsites; offered preliminary National Register assessments
1988	Ralph, MaryAnna, Jerome D. Traver, Kenneth O. Baumgardt	*A Preservation Plan for Fort Belvoir, Virginia*	Draft report only; completes RP3 process for installation (Aten 1980)
1988	Neumann, Thomas, et al.	*Phase I Archeological Survey of 262 Acres at Fort Belvoir, Virginia*	Phase I survey, including archival research and shovel testing, of proposed Defense CEETA facility site on Woodlawn Road. Identified 14 new sites; 3 previously recorded sites. Offered recommedations for further work. DHR recommends Phase II evaluation of 4 sites (11/6/87)
1989	Traver, Jerome, and Harding Polk	*Phase II Archeological Investigations of 9 Previously Identified Sites at Fort Belvoir, Virginia*	Describes Sites FX13, 672, 683, 1095, 1327, 1328, 1329, 1621 and 1622. Site 1328 at Castle Club potentially Nreligible
1989	Walker, Joan M. And William Gardner	*Phase I Archeological Survey, Telegraph Woods Sanitary Sewer Line, Fort Belvoir*	No sites identified in project corridor along western branch of Dogue Creek
1989	Stevens, J. S., and Joseph Balicki	*Archeological Investigations for the Proposed Location of the U. S. Army Corps of Engineers Headquarters to the Humphreys Engineer Center, Fort Belvoir*	Survey of HEC Site B documented one previously identified site (FX708 [not eligible]) and a late l9th-early 20th century domestic site [not eligible]. No other cultural resources within 120 acre survey area.
Date	**Authors**	**Title**	**Summary/Comments**
1989	McLearen, Douglas, and Luke Boyd	*Phase I Cultural Resources Survey of Proposed Improvements to Route 618, Fort Belvoir, Fairfax County, Virginia*	Surface reconnaissance and shovel testing of low visibility areas. VDOT project.

1990	Thomas, Ronald, MaryAnna Ralph, and Evelyn Tidlow	*A Plan for Preservation and Interpretation of the Fairfax Ruins and Grave Site at Fort Belvoir, Fairfax County, Virginia*	Assesses previous work undertaken at Belvoir Manor site; recommends further testing of five areas (the White House, the brick clamp, the 1812 gun emplacements; gardens and woods southwest of house site)
1990	Ryder, Robin, Katherine Hanbury, and Luke Boyd	*Phase II Archeological, Architectural, and Historical Investigations of Three Sites Located Along Route 618 in Fairfax County, Virginia*	Evaluates Sites FX1589 (19^{th}-20^{th} century domestic site); FX1210 (Woodlawn Methodist Cemetery); and Friends' Meeting House. Last two eligible for NR listing; could not determine eligibility of FX1589. VDOT project.
1991	Traver, Jerome, and Harding Polk	*Phase II Investigations of Twelve Archeological Sites (44FX13, 672, 683, 1275, 327, 1328, 1329, 1621, 1622, 1654, 1655, and 1656)*	Concludes that sites 1327-1328, grouped as one due to their location on the same parcel (Castle Club), are National Register eligible. Recommends avoidance or data recovery.
1992	R. Christopher Goodwin & Associates, Inc.	*Phase I Archeological Investigation of the Proposed Alternative 4 ("East") Gunston Road Extension, Fort Belvoir, Fairfax County, Virginia*	No intact features or cultural materials within right-of-way; no sites identified. No further work recommended. DHR concurred on "No Effect" (5/22/1992)
1992	Blanton, Dennis, and Donald Linebaugh	*Phase I Cultural Resource Survey of a New Alignment of the Proposed Route 613 Project, Fairfax County, Virgiia*	Survey of realignment of Beulah Road/Telegraph Road intersection. No new sites identified; all previously identified sites lie outside project area. VDOT project.
1992	Polk, Harding, Jerome Traver and Ronald Thomas	*A Phase I Survey of Fort Belvoir, Virginia (2 vols.)*	166 previously unidentified sites recorded, ranging from Archaic period through historic and military eras. At completion of this survey, Belvoir had 301 identified sites. **DHR certified completion of Phase I survey (7/14/94)**
1992	Miller, Orloff	*Phase IA Literature Search for Submerged Cultural Resources in Tompkins Basin, For Belvoir Military Reservation, Fairfax County, Virginia*	Study considered proposed dredge area in Accotink Bay; concluded that no prehistoric or significant historic resources were present. Noted WWII UXO in area. DHR concurs (7/12/94)
1992	Polk, Harding, Ronald Thomas, and Jerome Traver	*Phase I Investigations of Various Development Sites and Training Areas, Fort Belvoir, Virginia*	Continuation of 1992 Phase I installation-wide survey. At completion of this survey, Belvoir had 301 identified sites. **DHR certified completion of Phase I survey (7/14/94)**
1993 (Revised)	MAAR Associates, Inc.	*Phase II Archaeological Investigations at the Belvoir Ruins and Garden Sites, Fort Belvoir, Fairfax County, Virginia*	Limited Phase II testing to assess condition of previously excavated outbuildings and identify additional resources in untested areas. Identified "kitchen garden" area.
1993	Hill, Phillip, Ruth Overbeck, Kim Snyder and William Gardner	*Phase II Archeological Investigations at 44FX673, 1495, 1678, and 1784, Fort Belvoir, Fairfax County, Virginia*	Mid-l8th to 20^{th} century sites on proposed golf course expansion. Site 44FX1678 assessed as National Register eligible, and mitigation recommended. DHR does not concur; says "No effect" (4/22/95)
1993	Hill, Phillip, and William Gardner	*Phase II Archeological Investigations at 44FX1497 and 44FX 1913, Fort Belvoir, Fairfax County, Virginia*	Both sites have no integrity and are not Register eligible. DHR concurs (8/26/93)
Date	**Authors**	**Title**	**Summary/Comments**
1993	Galke, Laura and J. S. Stevens	*Archeological Investigations, US Army Garrison Fort Belvoir: Sites 44FX1907 and 1908 and Pohick Loop Handicap Access Trail*	Extended Phase I testing showed FX1907 to be not significant; Phase II evaluation of FX1908 revealed Register-eligible stratified Early - Middle Woodland site. DHR concurred (9/29/93)

1994	James River Institute for Archeology	*Archeological Investigations: U.S. Army Garrison Fort Belvoir, Site 44FX4, Belvoir Manor*	Continued research into National Register site. Studied garden outbuildings, unidentified structures, landscape features
1994	Williams, Martha and Ellen St. Onge	*Phase II Investigations of Site 44FX619 and 44FX 1942, Cheney School Outgrant Project, Fairfax County, Virginia*	Expanded Phase I and Phase II testing showed FX619 to be disturbed. FX1942 is early 20th century African-American farmstead, assessed as National Register eligible. DHR does not concur on eligibility (10/11/94)
1995	Schwermer, Anne	*The Barnes/Owsley Site (44FX1326): Documentary Research and Phase II Survey*	Intensive Phase I located l8th century component, but no l7th century component. Recommended further testing
1996	Simons, Michael and John Clarke	*Phase II Archeological Investigations at Five Sites (44FX12, FX1305, FX1309, FX1314, FX1317), US Army Garrison Fort Belvoir, Virginia*	Sites FX12, 1305, 1309 and 1314 are National Register eligible shoreline sites. Site FX1317 has been destroyed.
1996	Feidel, Stuart, Elizabeth O'Brien, and Dana Heck	*Phase II Archeological and Historical Investigations, US Army Garrison Fort Belvoir: Sites 44FX635, 1333, 1677, and 1505*	Prehistoric sites 635 and 1333 assessed as not Register eligible; Sites 1677 and 1505, World War II military trainng trenches, were recommended as National Register eligible
1996	Simons, Michael and Martha Williams	*Phase II Investigations of Sites 44FX1340, 1344, 1672, 1674, 1925, and 1926, US Army Garrison, Fort Belvoir, Virginia*	National Register eligible sites include historic component of 44FX1340 and Late Archaic-Early Woodlandsite FX1925; all others not eligible.
1997	Fahey, Augustine	*GIS Data Development for Archeological Sites for US Army Garrison Fort Belvoir, Fairfas County, Virginia*	Develops project planning aid that depicts spatial distsribution of archeological sites and links informational fields for each site
1997	Melhuish, Geoffrey and Martha Williams	*National Register Evaluation of the Triplett, Lacey's Hill and Woodlawn United Methodist Cemeteries, Fort Belvoir, Fairfax County, Virginia*	Cemeteries evaluated as archeological and architecctural sites. None is individually eligible; Woodlawn and Lacey's Hill may contribute to a future Woodlawn African-American Historic District.
1997	Simons, Michael	*Phase II Archeological Investigation of 44FX1898 and Site Delineation of 44FX1935, US Army Garrison, Fort Belvoir, Fairfax County, Virginia*	FX1898 assessed as not eligible; FX1935 is out of Area of Effect. Phase II evaluation recommended for new, potentially eligible military training trenches.
1999	Simons, Michael	*Phase I Investigations of Telegraph Road Widening Project*	Letter report only for support of EIS. No cultural resoures located in Area of Effect
1999	Parsons Engineering, Inc.	Phase III Investigations of Sites 1326/1327, Castle Club, Fort Belvoir, Virginia	In progress

Table 3: Architectural Studies Completed for U.S. Army Garrison, Fort Belvoir, Virginia

Date	Authors	Report Title	Summary/Contents
1983	Friedlander, Amy	*Senior Officers' Housing Historic District, National Register of Historic Places Nomination*	The Senior Officers' Housing area contains 59 2 ½ story brick Colonial Revival style houses lining curvilinear streets. The study assessed the district as significant under Criterion A on the basis of its architecture. This district later was included in the Fort Belvoir Historic District nomination.
1984	LeeDecker, Charles, Charles Cheek, Amy Friedlander, and Teresa Ossim	*Cultural Resource Survey and Evaluation at Fort Belvoir, Virginia*	Inventoried and evaluated approximately 200 built resources constructed 1917 - 1957 and classified them into 4 categories. The buildings were organized by property type and compiled on 36 Historic American Building Survey/Historic American Engineering Record (HABS/HAER) inventory cards.
1988	Thomas, Ronald, MaryAnna Ralph, Kenneth Baumgardt	*An Overview of the Cultural Contexts of Fort Belvoir*	Presents an overview of the installation's 20th century military history with an examination of archival sources and a literature review.
1990	Ralph, MaryAnna, Jerome Traver, and Kenneth Baumgardt	*A Preservation Plan for Fort Belvoir, Virginia*	Contains a reconnaissance level survey of all buildings and structures built at Fort Belvoir prior to 1946. Resulted in the preparation of a revised National Register nomination for the Fort Belvoir Historic District, plus nominations for the US Army Package Power Reactor and the Camp Humphreys Pump Station and Filter Building.
1992	Friedlander, Amy, Barbara Engel, Sheryl Hack, Kenneth Baumgardt, and Sandra DeChard	*Camp A.A. Humphreys Pump Station and Filter Building: National Register of Historic Places Nomination*	The pump station and water filtration plant (Buildings 1400) is Fort Belvoir's oldest permanent structure, and one of the few remaining vestiges of Camp Humphreys. The single-story pump station was added in 1936. The buildings are significant because they illustrate the development of support facilities at World War I cantonments, and for technological advances in drinking water purification.
1992	Friedlander, Amy, Sheryl Hack, and Judith Rosentel	*U.S. Army Package Power Reactor: National Register of Historic Places Nomination*	Built in 1957 the U.S. Army Package (Nuclear) Power Reactor possesses exceptional significance as the Army's prototype nuclear generating plant (Criteria A and G). The reactor complex includes a 30-acre fenced area that encloses the SM-1 Plant (Building 372) and support buildings.

Date	Authors	Report Title	Summary/Contents
1992	Hack, Sheryl and Lauren Archibald	*Fort Belvoir Historic District: National Register of Historic Places Nomination.*	The Fort Belvoir Historic District includes the administrative and residential core of the Post, including the Parade Ground and associated landscape features. Significant for its Colonial Revival architecture and community planning.
1993	Woolpert, Inc.	*Real Property Master Plan, Fort Belvoir, Long-Range Component*	Contains operational information and long-term planning data useful for cultural resource managers and planners
1993	Hanbury, Evans, Newill, Vlatta and Company	*Historic Components Guidebook Series*	Developed in response to the Stewardship Standards adopted by MDW for preserving and rehabilitating historic family quarters, these guidebooks identify historically significant architectural elements and specify compatible materials for family quarters at Fort Belvoir. They also outline procedures to be followed during preservation or maintenance work.
1995	Harnsberger, Douglas and Sandra Hubbard	*Thermo-Con House: National Register of Historic Places Nomination*	Designed by the industrial architectural firm of Albert Kahn and Associates, Inc. and built in 11949, this building was found to possess exceptional significance under Criterion C for its unique method of construction. The house is the only structure of its kind constructed by the Army COE.
1995	Harnsberger & Associates, P.C.	*Fort Belvoir Historic Building Survey*	Presents an architectural survey of 33 non-residential historic buildings to document existing conditions sand provide specific preservation and maintenance recommendations. The conditions assessment survey examined the interior and exterior of each building, including plumbing, mechanical, and electrical systems. The report presents general information on each building; discusses its principal building materials, character-defining features and building alterations; summarizes existing conditions; and recommends prioritized repair and rehabilitation strategies.
1996	Gilmore, Lance	*Camp A.A. Humphreys Pump Station and Filter Building: National Register of Historic Places Nomination*	This nomination contains a revised architectural description, statement of significance.
1996	Harnsberger, Douglas and Sandra Hubbard	*Fort Belvoir Historic District: National Register of Historic Places Nomination.*	This revised district nomination includes 196 contributing and 11 non-contributing buildings. The nomination contains expanded architectural descriptions, statement of significance, and boundary justification sections.

Date	Authors	Report Title	Summary/Contents
1996	Harnsberger, Douglas and Sandra Hubbard	*U. S. Army Package Power Reactor: National Register of Historic Places Nomination*	The revised nomination includes several contributing buildings
1996	Harnsberger & Associates, Architects	*Fort Belvoir Historic Buildings Survey Addendum for Buildings Between 1945 and 1950*	Architectural survey of 45 buildings and structures constructed between 1945 and 1950. Three buildings were designated as "contributing" to the Fort Belvoir Historic District; three structures associated with Cold War activities were identified as contributing to the U. S. Army Package Power Reactor Multiple Property; the remaining 39 buildings were evaluated as "non-contributing" resources that lacked integrity or association with important themes. All information was recorded on IPS forms.
1998	Dames & Moore	*Environmental Assessment, Thermo-Con House (Building 172) Rehabilitation, Fort Belvoir, Virginia*	Provided archival research and analysis of environmental impacts associated with rehabilitating this structure. Report concluded that the rehabilitation would not adversely affect the quality of the human environment and did not require preparation of an EIS.

Attachment E:

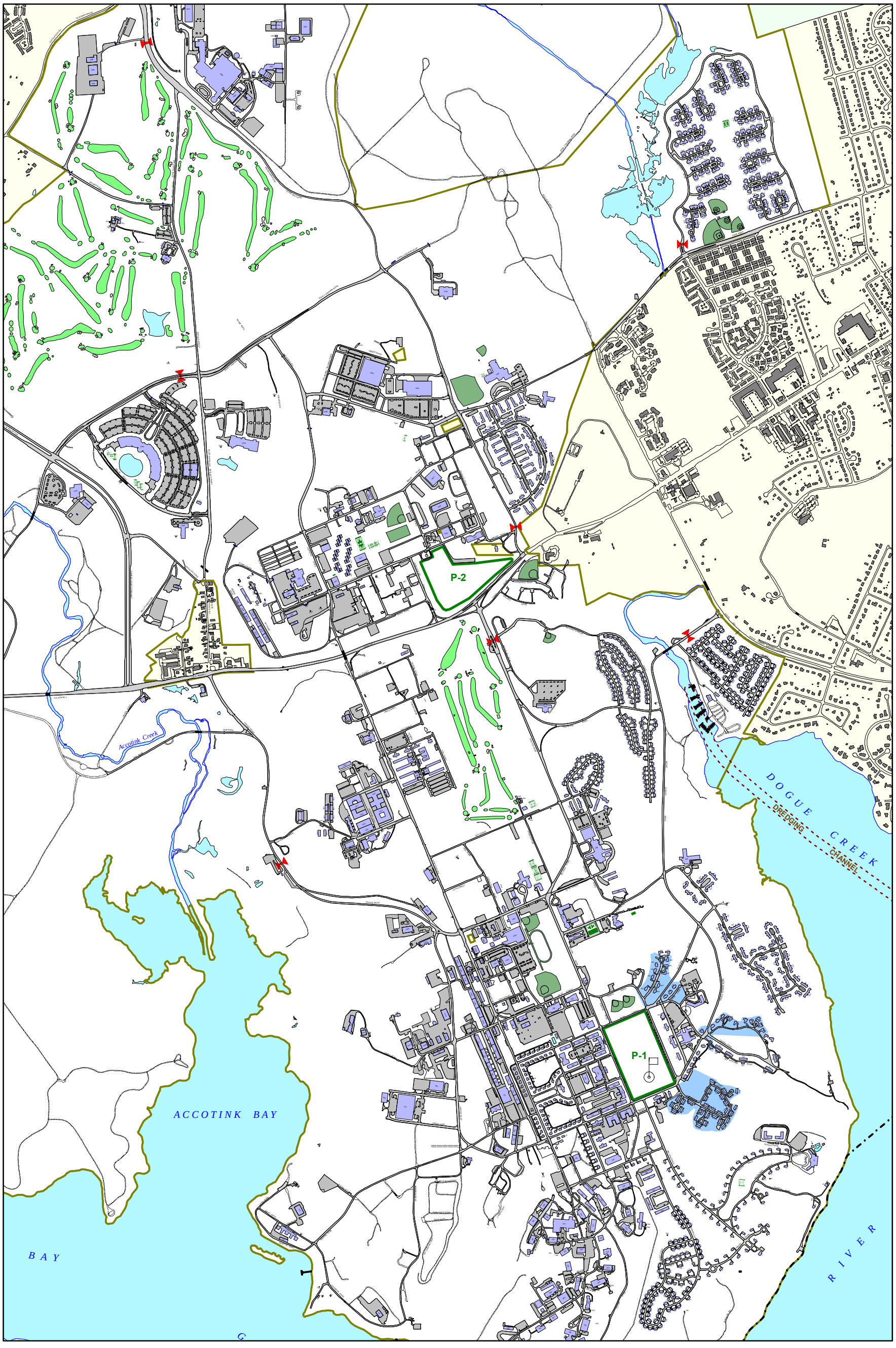
56 NRHP-Eligible Housing Resources to be Demolished

Attachment E: 56 NRHP-eligible housing resources to be demolished.

Number	Use	Date	DHR Number	Village
00442	FAMILY HOUSING	1921	029-0209-0276	JADWIN
00457	FAMILY HOUSING	1920	029-0209-0277	JADWIN
00458	FAMILY HOUSING	1920	029-0209-0278	JADWIN
00459	FAMILY HOUSING	1920	029-0209-0279	JADWIN
00460	FAMILY HOUSING	1920	029-0209-0280	JADWIN
00461	FAMILY HOUSING	1920	029-0209-0281	JADWIN
00462	FAMILY HOUSING	1920	029-0209-0282	JADWIN
00463	FAMILY HOUSING	1920	029-0209-0283	JADWIN
00464	FAMILY HOUSING	1920	029-0209-0284	JADWIN
00465	FAMILY HOUSING	1920	029-0209-0285	JADWIN
00466	FAMILY HOUSING	1921	029-0209-0286	JADWIN
00467	FAMILY HOUSING	1921	029-0209-0287	JADWIN
00468	FAMILY HOUSING	1921	029-0209-0288	JADWIN
00469	FAMILY HOUSING	1921	029-0209-0289	JADWIN
00479	FAMILY HOUSING	1921	029-0209-0290	SNOW
00480	FAMILY HOUSING	1921	029-0209-0291	SNOW
00481	FAMILY HOUSING	1921	029-0209-0292	SNOW
00483	FAMILY HOUSING	1921	029-0209-0293	PARK
00484	FAMILY HOUSING	1921	029-0209-0294	PARK
00487	FAMILY HOUSING	1920	029-0209-0295	PARK
00488	FAMILY HOUSING	1920	029-0209-0296	PARK
00489	FAMILY HOUSING	1920	029-0209-0297	PARK
00492	FAMILY HOUSING	1921	029-0209-0300	PARK
00493	FAMILY HOUSING	1921	029-0209-0301	PARK
00494	FAMILY HOUSING	1921	029-0209-0302	PARK
00496	FAMILY HOUSING	1921	029-0209-0303	PARK
00401	FAMILY HOUSING	1947	029-0209-0304	ROSSELL
00402	FAMILY HOUSING	1947	029-0209-0305	ROSSELL
00403	FAMILY HOUSING	1947	029-0209-0306	ROSSELL
00404	FAMILY HOUSING	1947	029-0209-0307	ROSSELL
00405	FAMILY HOUSING	1947	029-0209-0308	ROSSELL
00406	FAMILY HOUSING	1947	029-0209-0222	ROSSELL
00407	FAMILY HOUSING	1947	029-0209-0223	ROSSELL
00408	FAMILY HOUSING	1947	029-0209-0224	ROSSELL
00409	FAMILY HOUSING	1947	029-0209-0225	ROSSELL
00410	FAMILY HOUSING	1947	029-0209-0226	ROSSELL
00411	FAMILY HOUSING	1947	029-0209-0227	ROSSELL
00412	FAMILY HOUSING	1947	029-0209-0228	ROSSELL
00413	FAMILY HOUSING	1947	029-0209-0229	ROSSELL
00414	FAMILY HOUSING	1947	029-0209-0230	ROSSELL
00415	FAMILY HOUSING	1947	029-0209-0231	ROSSELL
00416	FAMILY HOUSING	1947	029-0209-0232	ROSSELL
00417	FAMILY HOUSING	1947	029-0209-0233	ROSSELL
00418	FAMILY HOUSING	1948	029-0209-0234	ROSSELL
00419	FAMILY HOUSING	1948	029-0209-0235	ROSSELL
00421	FAMILY HOUSING	1948	029-0209-0236	ROSSELL
00423	FAMILY HOUSING	1948	029-0209-0237	ROSSELL

00424	FAMILY HOUSING	1948	029-0209-0238	ROSSELL
00425	FAMILY HOUSING	1948	029-0209-0239	ROSSELL
00426	FAMILY HOUSING	1948	029-0209-0240	ROSSELL
00427	FAMILY HOUSING	1948	029-0209-0241	ROSSELL
00428	FAMILY HOUSING	1948	029-0209-0242	ROSSELL
00429	FAMILY HOUSING	1948	029-0209-0243	ROSSELL
00430	FAMILY HOUSING	1948	029-0209-0244	ROSSELL
00431	FAMILY HOUSING	1948	029-0209-0245	ROSSELL
00432	FAMILY HOUSING	1948	029-0209-0246	ROSSELL

Also see map following this page.



LEGEND

TO BE DEMOLISHED

ATTACHMENT E: 56 NRHP - ELIGIBLE HOUSING RESOURCES TO BE DEMOLISHED

N

PERFORMANCE GROUP INCORPORATED

Attachment F:

Belvoir Village Plans

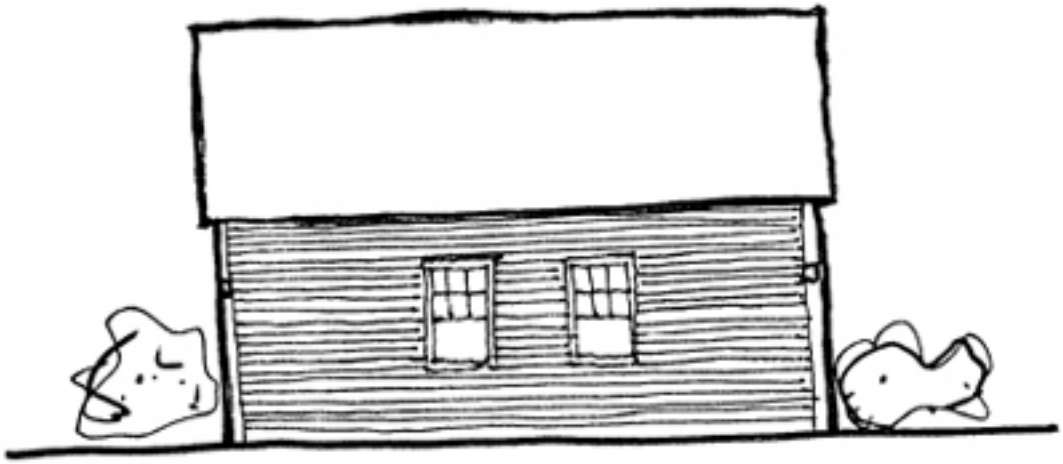
Conceptual Site Plan

 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

ARMY RESIDENTIAL COMMUNITIES INITIATIVE
CLARK PINNACLE FAMILY COMMUNITIES·LLC

BELVOIR VILLAGE

Conceptual drawing showing detached garages in Belvoir Village



BELVOIR VILLAGE

BV.G

07.29.08

RKtects

BELVOIR VILLAGE

BV. 2

3/26/03

FRONT ELEVATION

RKtodts

BELVOIR VILLAGE

BY: Ba

3/26/03

FRONT ELEVATION

RK+ASS

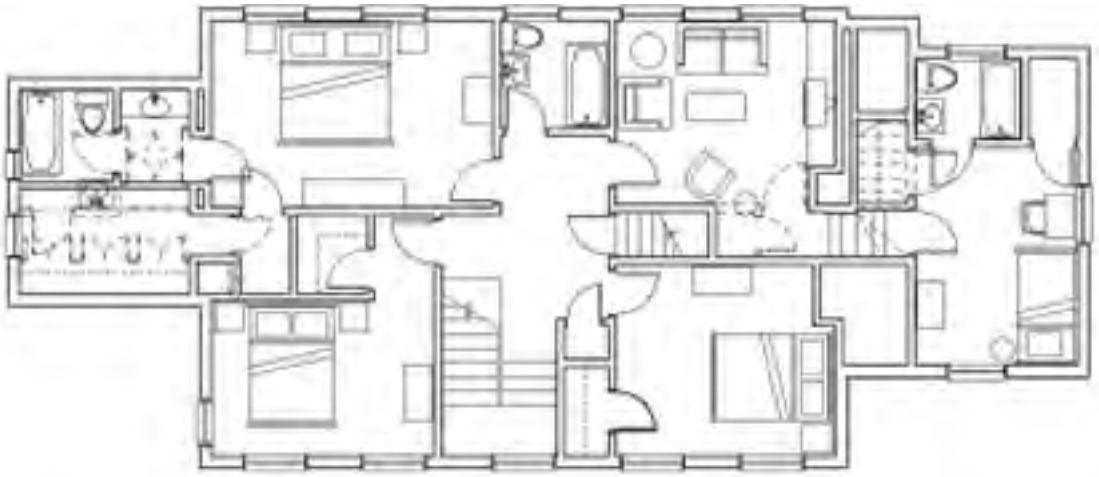
BELVOIR VILLAGE

BV-3b

3/26/03

FRONT ELEVATION

RICHARDS



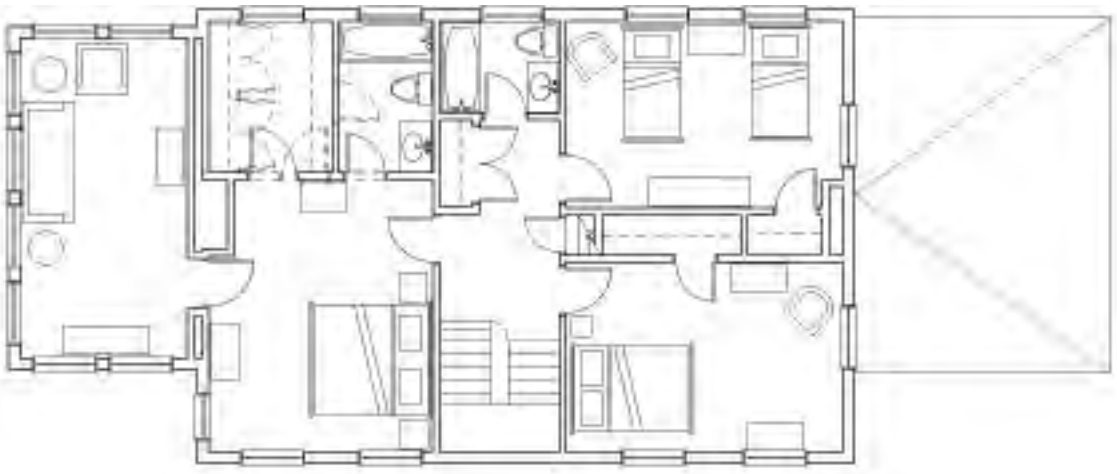
SECOND FLOOR

FIRST FLOOR

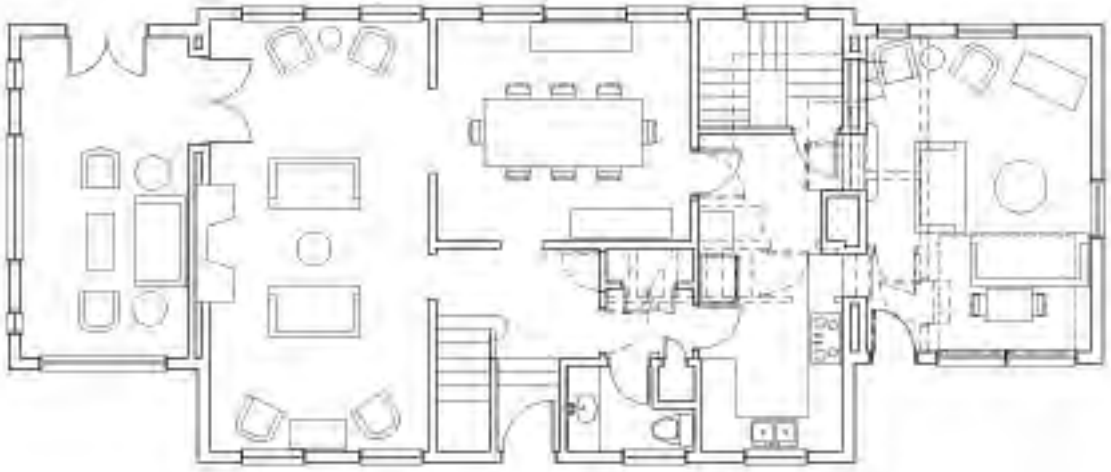
RKTECTS
ARCHITECTURE
PLANNING
HISTORIC
PRESERVATION
The RKtecta Studio, Inc.

BELVOIR VILLAGE UNIT BV2

4 BEDROOM + DEN - 2570 HSF
FORT BELVOIR RCI HISTORIC VILLAGES



SECOND FLOOR



FIRST FLOOR

RKTECTS
ARCHITECTURE
PLANNING
HISTORIC
PRESERVATION
The RKtects Studio, Inc.

BELVOIR VILLAGE UNIT BV3a

3 BEDROOM + DEN - 2300 HSF

FORT BELVOIR RCI HISTORIC VILLAGES

SECOND FLOOR

FIRST FLOOR

RKTECTS
ARCHITECTURE
PLANNING
HISTORIC
PRESERVATION
The RKtects Studio, Inc.

BELVOIR VILLAGE UNIT BV4

3 BEDROOM - 1625 HSF

FORT BELVOIR RCI HISTORIC VILLAGES

 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

BELVOIR VILLAGE INFILL STREETSCAPE

 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

UNIT O

BELVOIR VILLAGE INFILL JULY 28, 2003

ARMY RESIDENTIAL COMMUNITIES INITIATIVE
CLARK PINNACLE FAMILY COMMUNITIES·LLC

FORT BELVOIR FAMILY HOUSING

Attachment G:

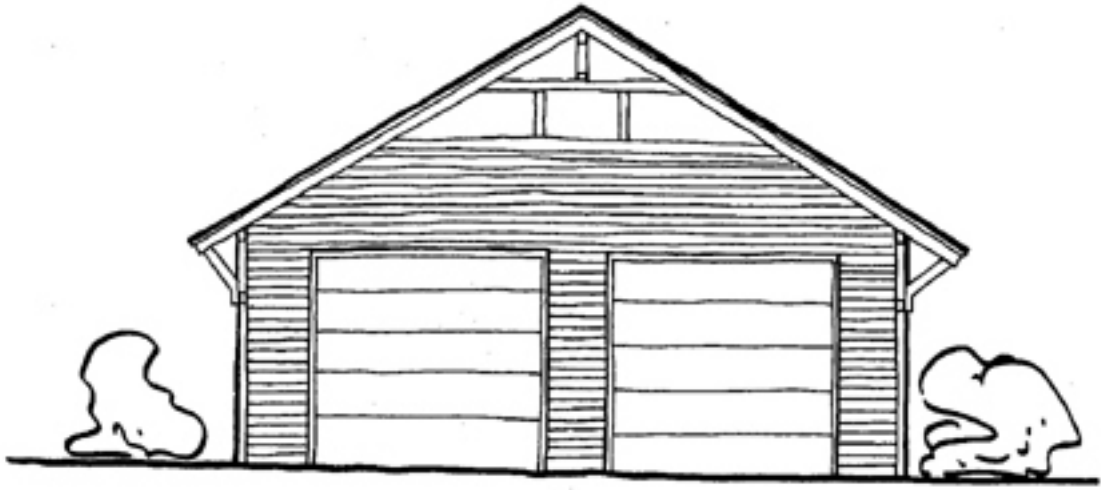
Park Village Plans

Conceptual Site Plan

 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

ARMY RESIDENTIAL COMMUNITIES INITIATIVE
CLARK PINNACLE FAMILY COMMUNITIES·LLC

PARK VILLAGE

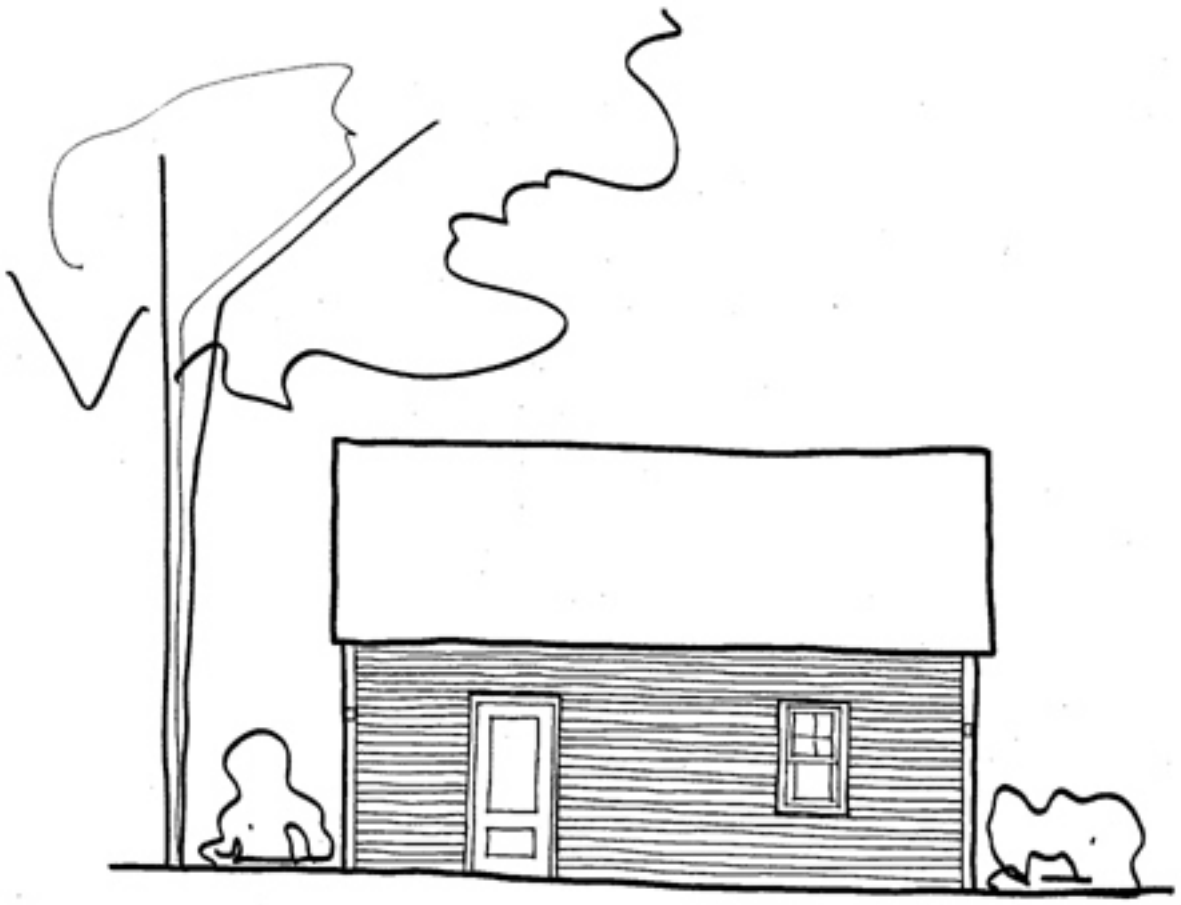


PARK VILLAGE

PV1-G

RKtects

07.29.03

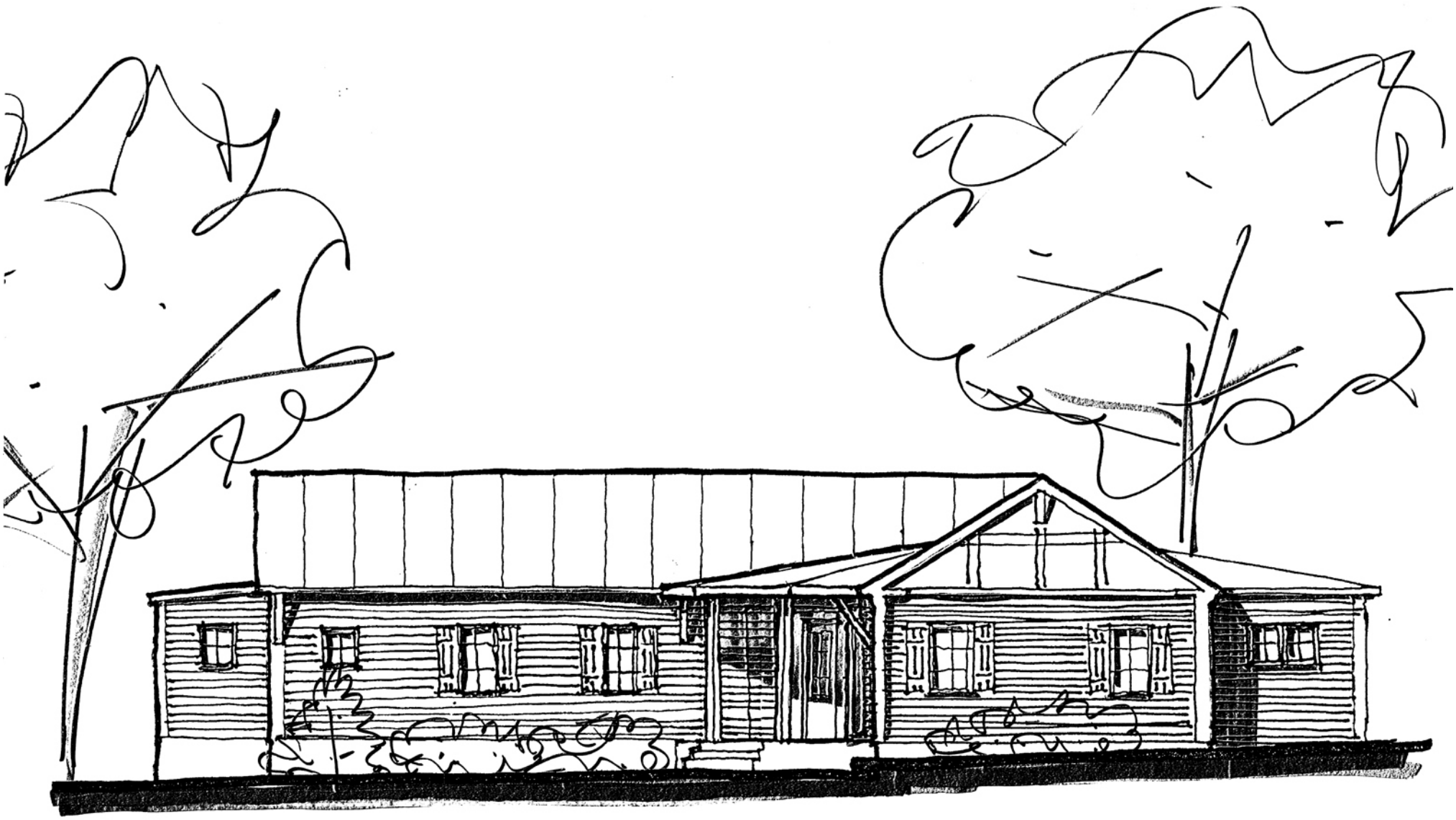


PARK VILLAGE

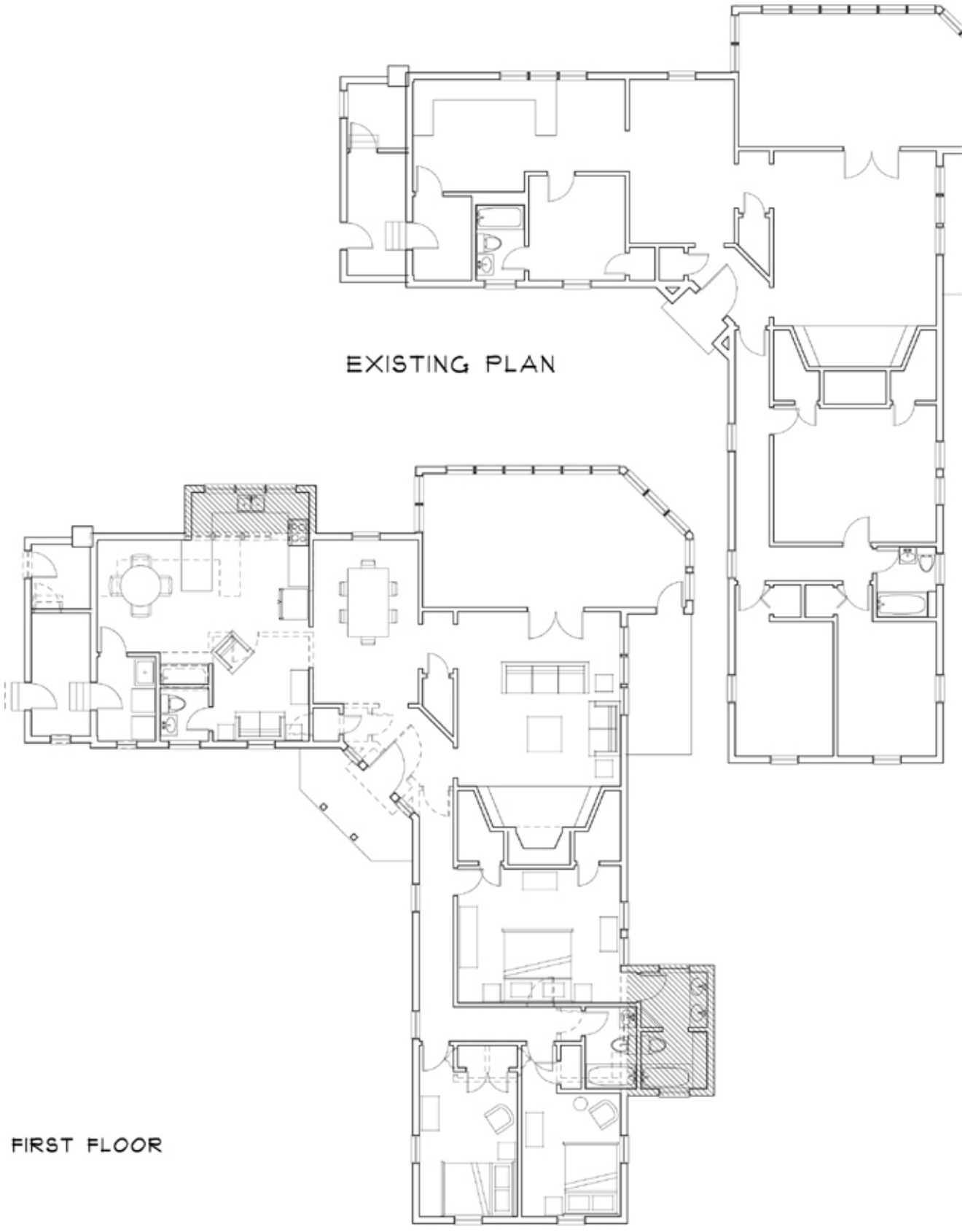
RKtects

PV · NEW · G

07. 29 . 03



Park Village, PV-1, Elevation



EXISTING PLAN

FIRST FLOOR

RKTECTS
ARCHITECTURE
PLANNING
HISTORIC
PRESERVATION
The RKtects Studio, Inc.

PARK VILLAGE UNIT PVI

3 BEDROOM + DEN - 2075 HSF

FORT BELVOIR RCI HISTORIC VILLAGES

PARK VILLAGE

RV.NEW.4

RKtects

7.12.03

Attachment H:

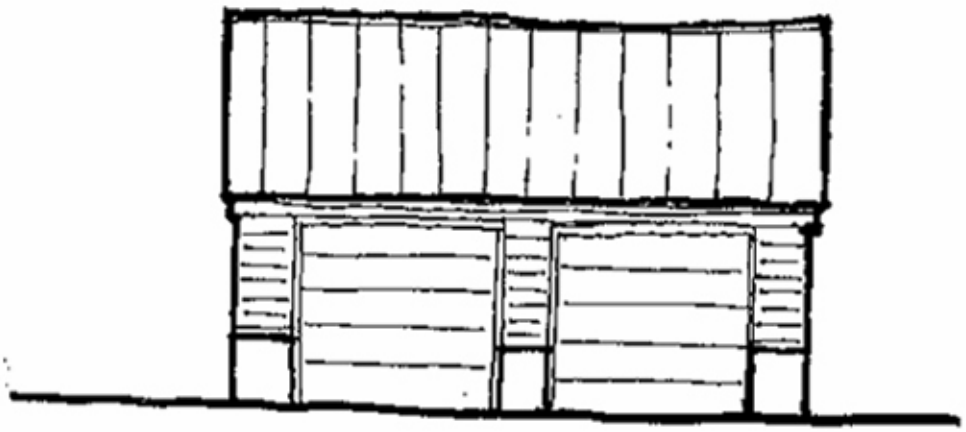
Gerber Village Plans

Conceptual Site Plan

 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

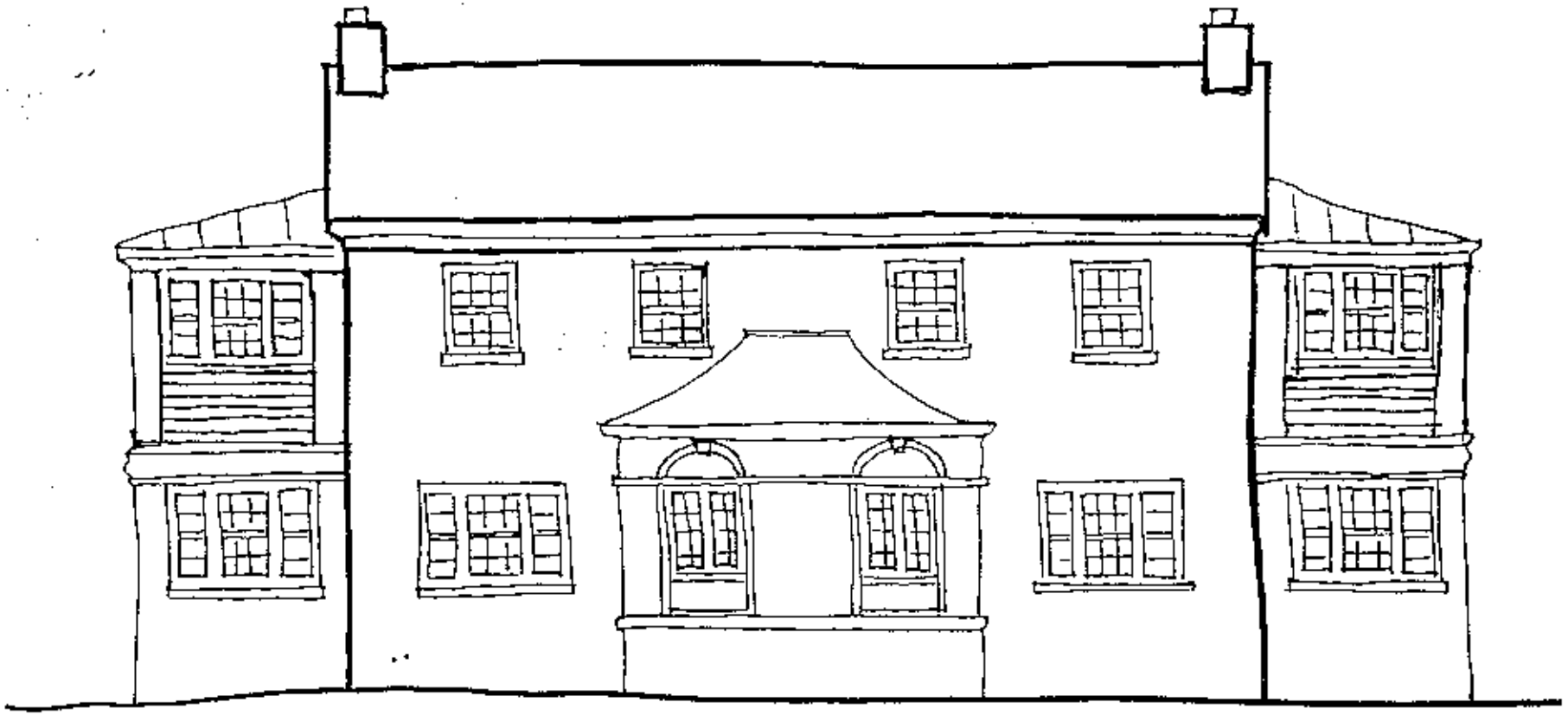
ARMY RESIDENTIAL COMMUNITIES INITIATIVE
CLARK PINNACLE FAMILY COMMUNITIES·LLC

GERBER VILLAGE



GERBER VILLAGE GV·NEW·G1

3|26|03 GARAGE ELEVATION RKtects



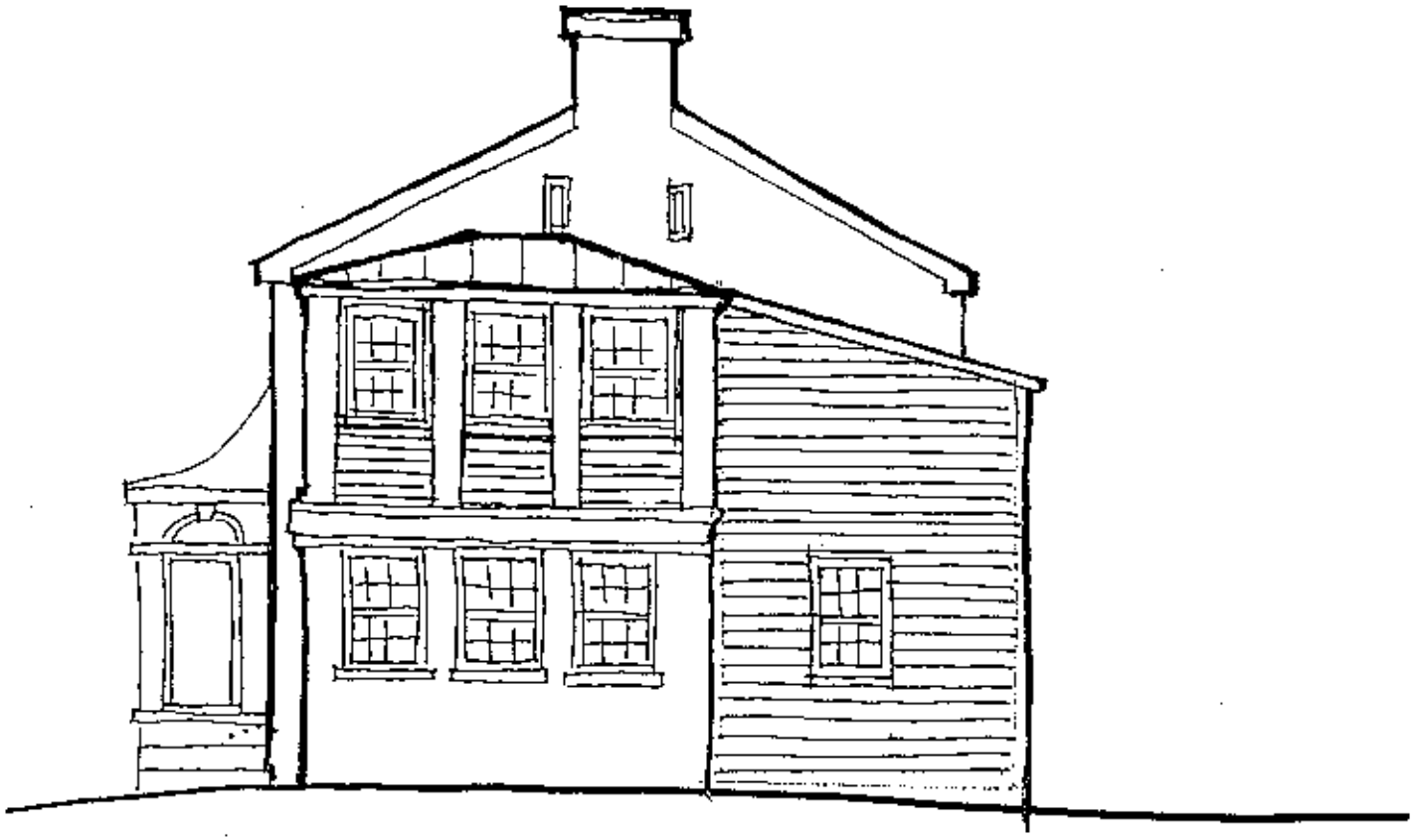
GERBER VILLAGE

GV·1

3/26/03

FRONT ELEVATION

RKtects



GERBER VILLAGE

GV·1

3/26/03

SIDE ELEVATION

RKtects

GERBER VILLAGE

GV-2A

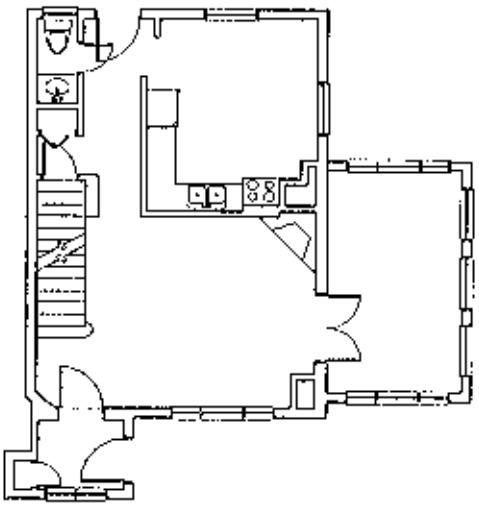
3|26|03

REAR ELEVATION

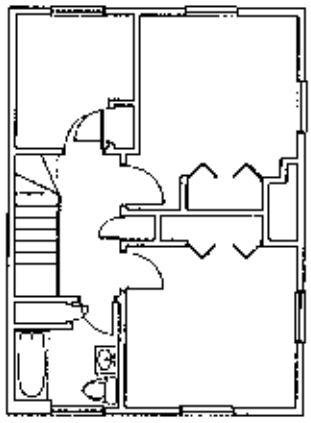
RKtects

GERBER VILLAGE GV-2B

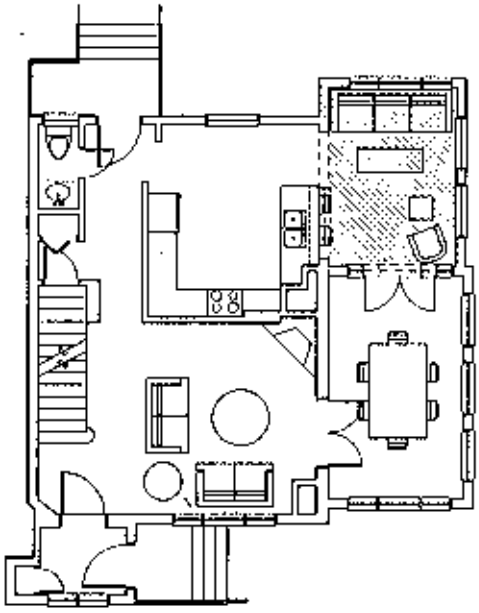
3/26/03 REAR ELEVATION RK-tects



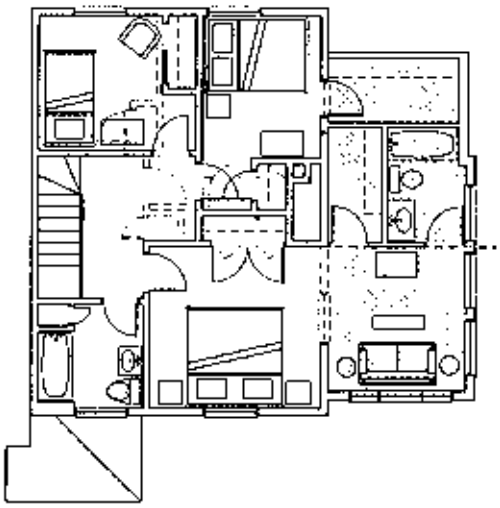
EXISTING FIRST FLOOR PLAN



EXISTING SECOND FLOOR



FIRST FLOOR



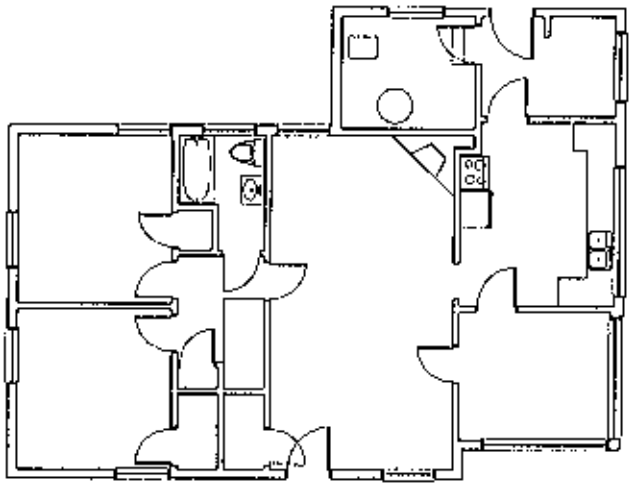
SECOND FLOOR

RKTECTS
ARCHITECTURE
PLANNING
HISTORIC
PRESERVATION
The RKtects Studio, Inc.

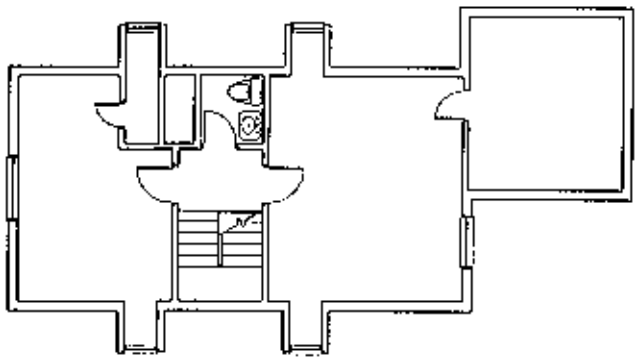
GERBER VILLAGE UNIT GVI

3 BEDROOM - 1675 HSF

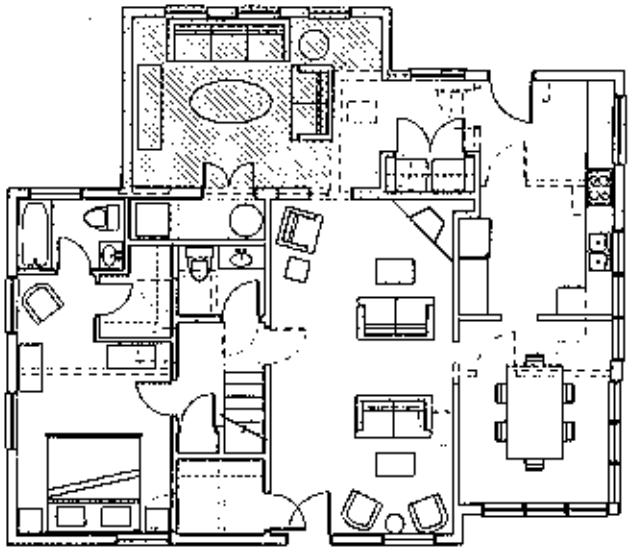
FORT BELVOIR RCI HISTORIC VILLAGES



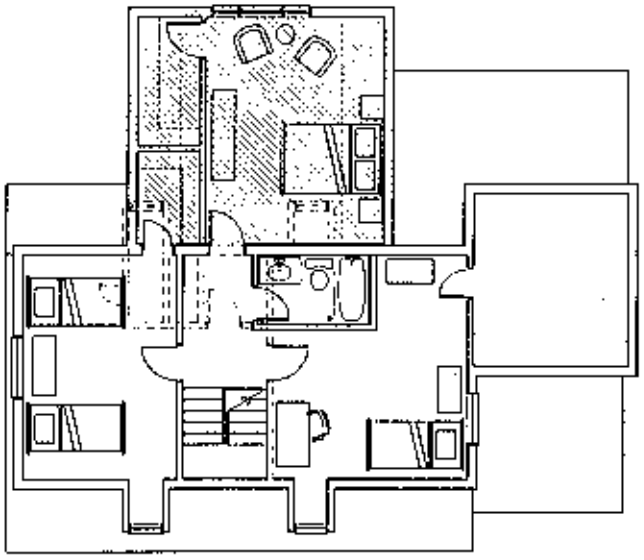
EXISTING FIRST FLOOR PLAN



EXISTING SECOND FLOOR PLAN



FIRST FLOOR

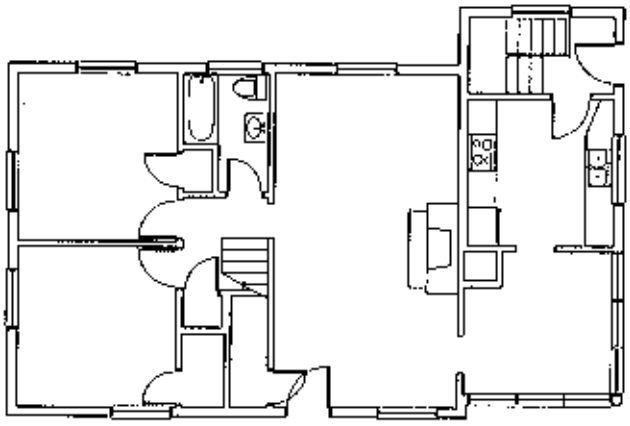


SECOND FLOOR

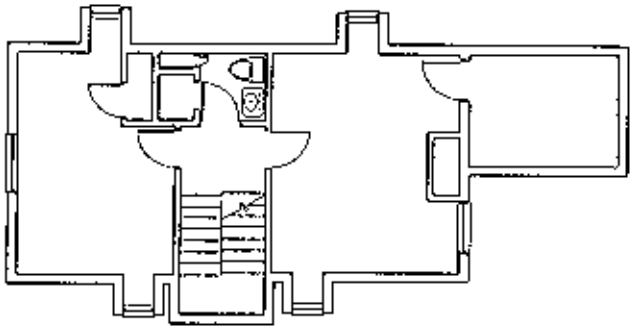
RKTECTS
ARCHITECTURE
PLANNING
HISTORIC
PRESERVATION
The RKtects Studio, Inc.

GERBER VILLAGE UNIT GV2a

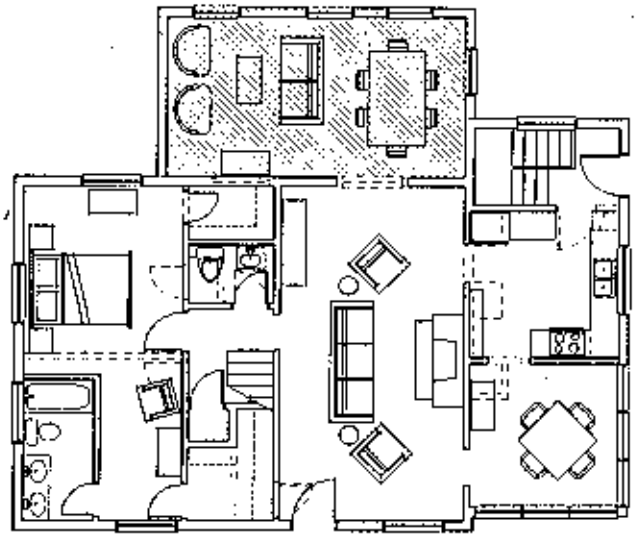
3 BEDROOM + DEN- 2245 HSF
FORT BELVOIR RCI HISTORIC VILLAGES



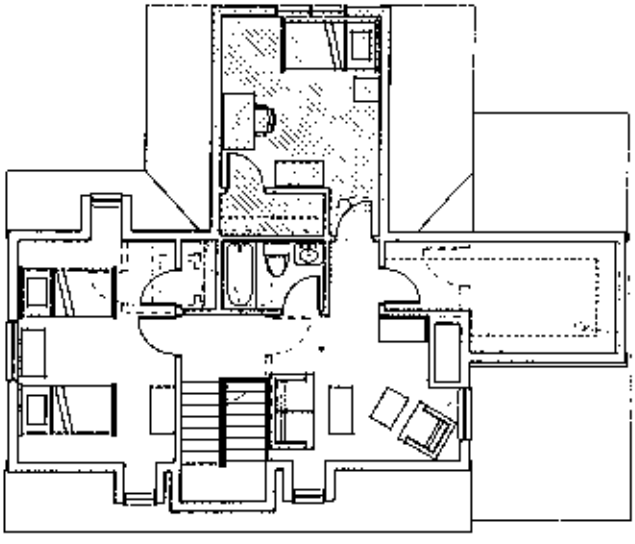
EXISTING FIRST FLOOR PLAN



EXISTING SECOND FLOOR PLAN



FIRST FLOOR



SECOND FLOOR

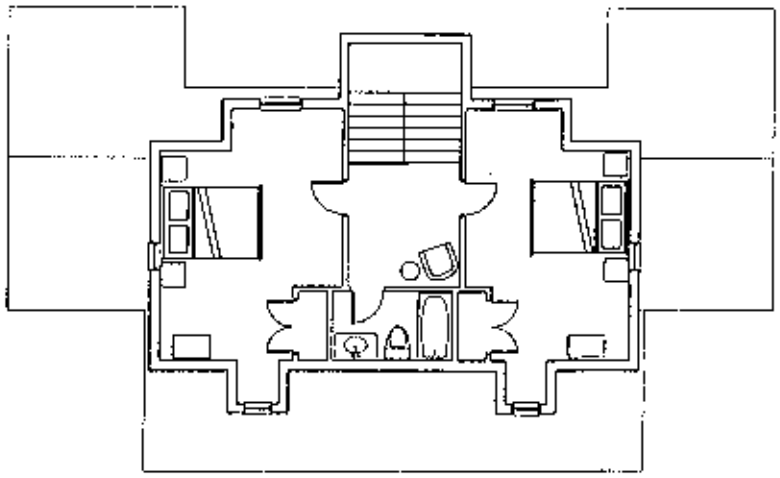
RKTECTS
ARCHITECTURE
PLANNING
HISTORIC
PRESERVATION
The RKtects Studio, Inc.

GERBER VILLAGE UNIT GV2b

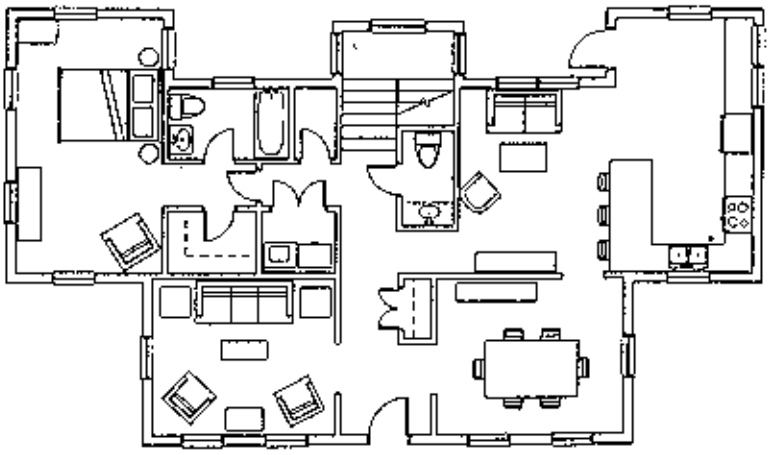
3 BEDROOM + DEN – 2025 HSF
FORT BELVOIR RCI HISTORIC VILLAGES

GERBER VILLAGE GV·NEW·1

3/26/03 FRONT ELEVATION RICKETTS



SECOND FLOOR



FIRST FLOOR

RKTECTS
ARCHITECTURE
PLANNING
HISTORIC
PRESERVATION
The RKtects Studio, Inc.

GERBER VILLAGE UNIT GV NEW 1

3 BEDROOM + DEN - 1740 HSF

FORT BELVOIR RCI HISTORIC VILLAGES

GERBER VILLAGE STREETSCAPE

5|6|03

RKtects

Attachment I:

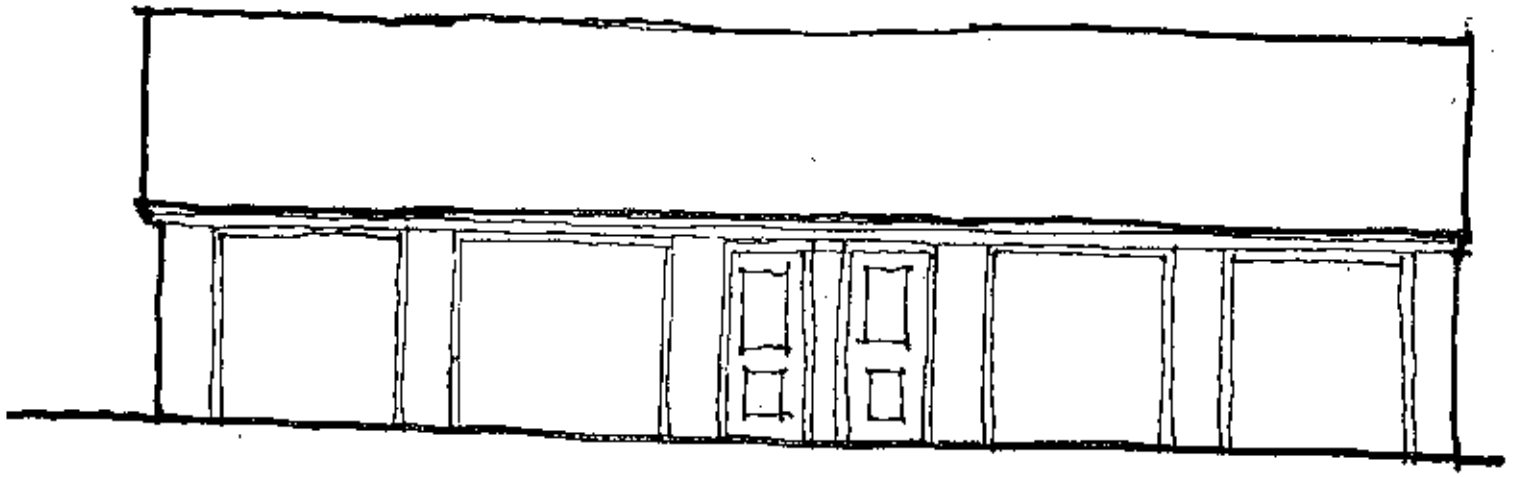
Jadwin Loop Village
and 21st Street Houses Plans

Conceptual Site Plan

 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

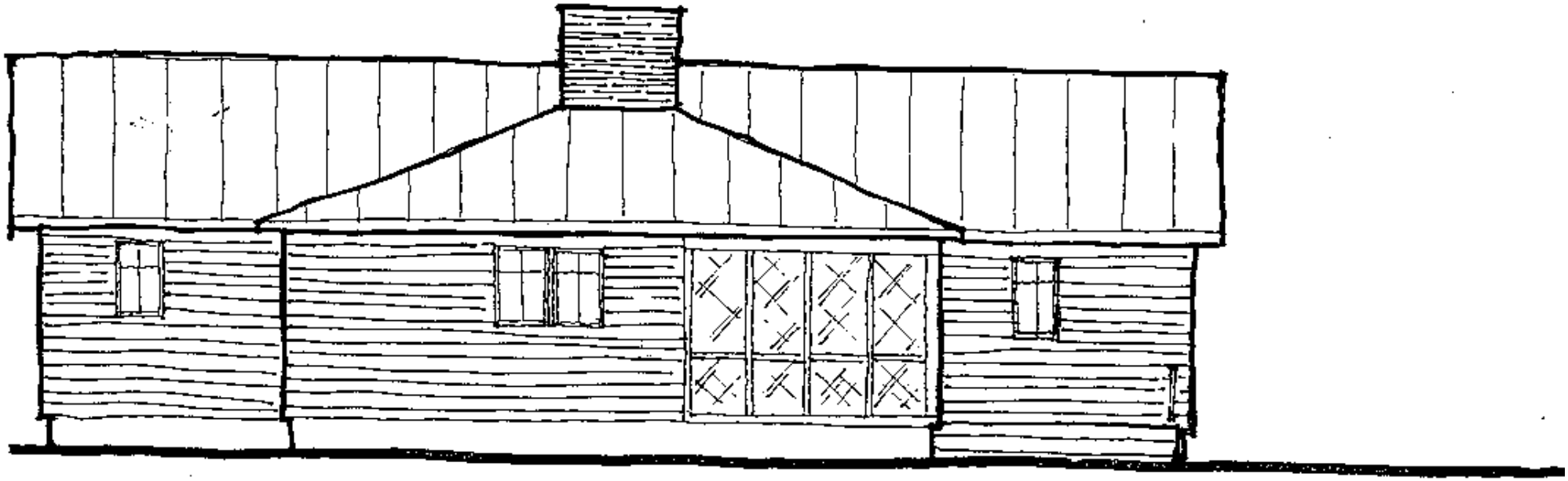
ARMY RESIDENTIAL COMMUNITIES INITIATIVE
CLARK PINNACLE FAMILY COMMUNITIES·LLC

JADWIN LOOP



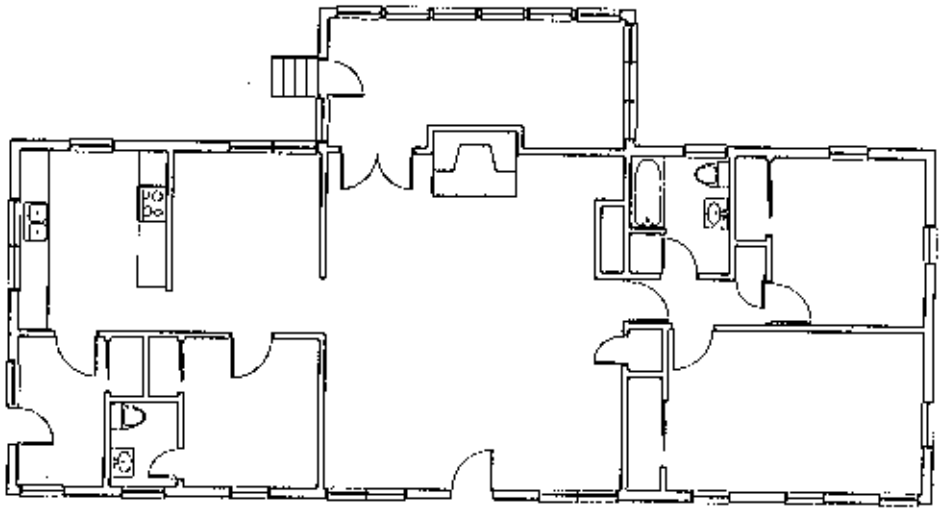
JADWIN LOOP JL·G1

3|24|03 GARAGE ELEVATION RKtects

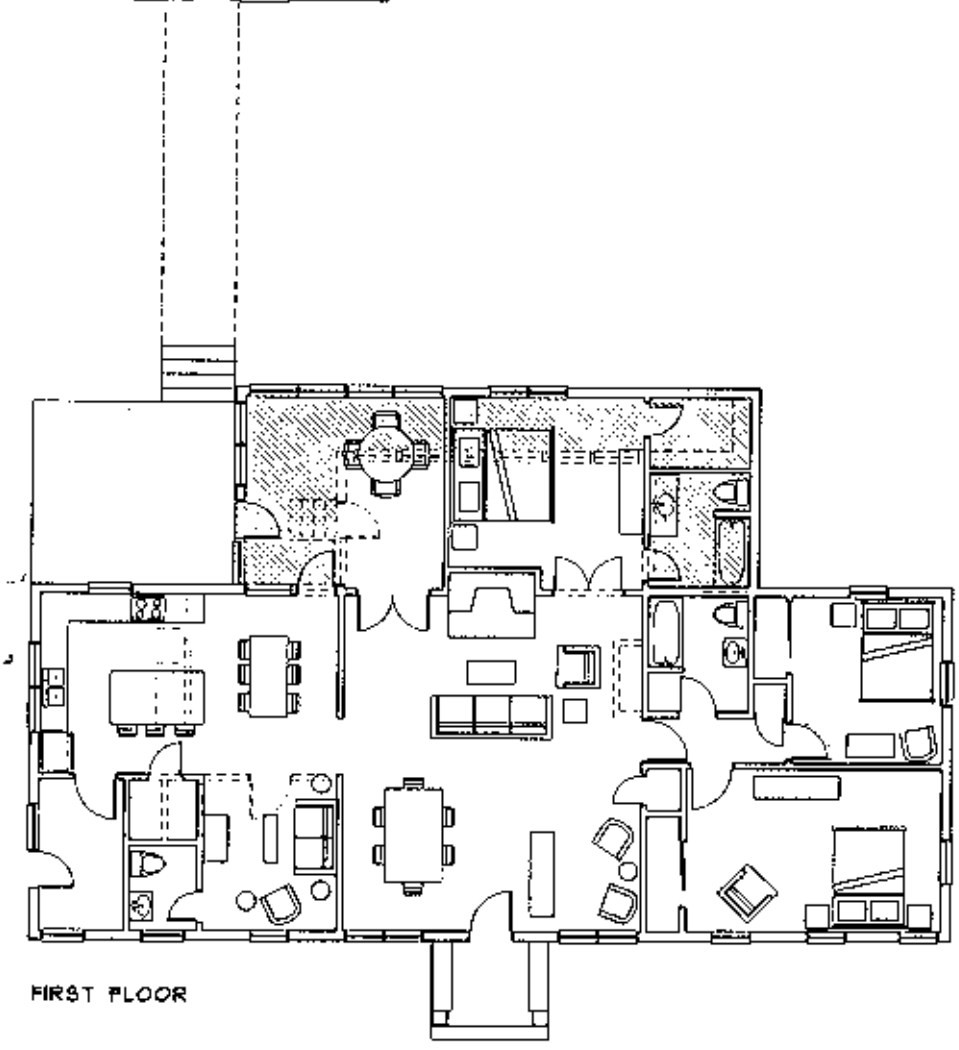


JADWIN LOOP (PARK VILLAGE) JL·2

3|26|08 REAR ELEVATION RKtects



EXISTING FIRST FLOOR PLAN

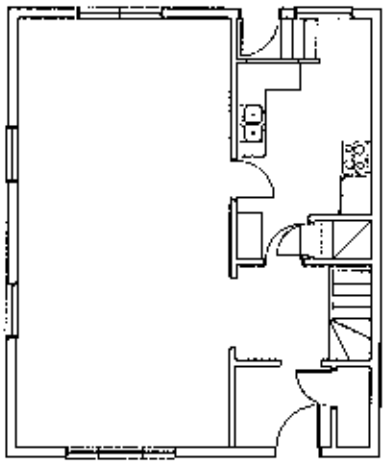


FIRST FLOOR

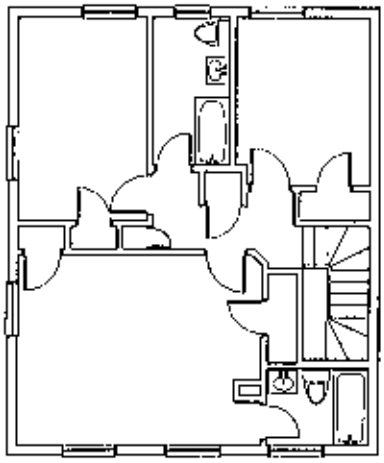
RKTECTS
ARCHITECTURE
PLANNING
HISTORIC
PRESERVATION
The RKtects Studio, Inc.

JADWIN LOOP UNIT JL 2

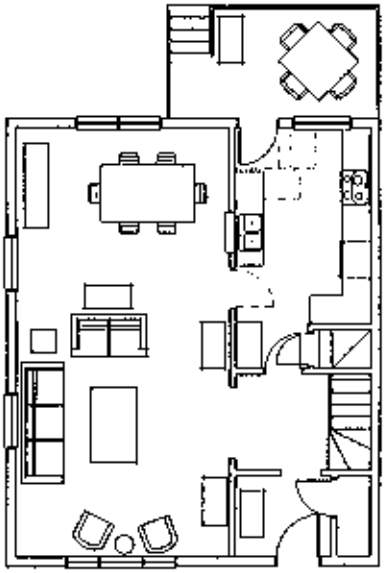
3 BEDROOM + DEN - 1835 HSF
FORT BELVOIR RCI HISTORIC VILLAGES



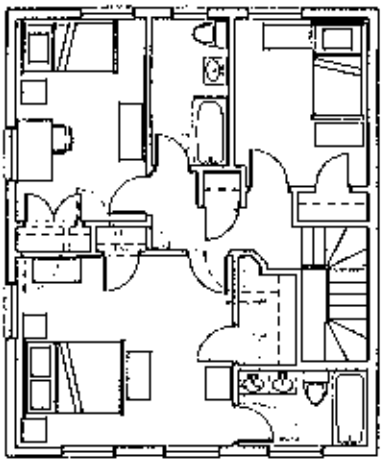
EXISTING FIRST FLOOR



EXISTING SECOND FLOOR



FIRST FLOOR



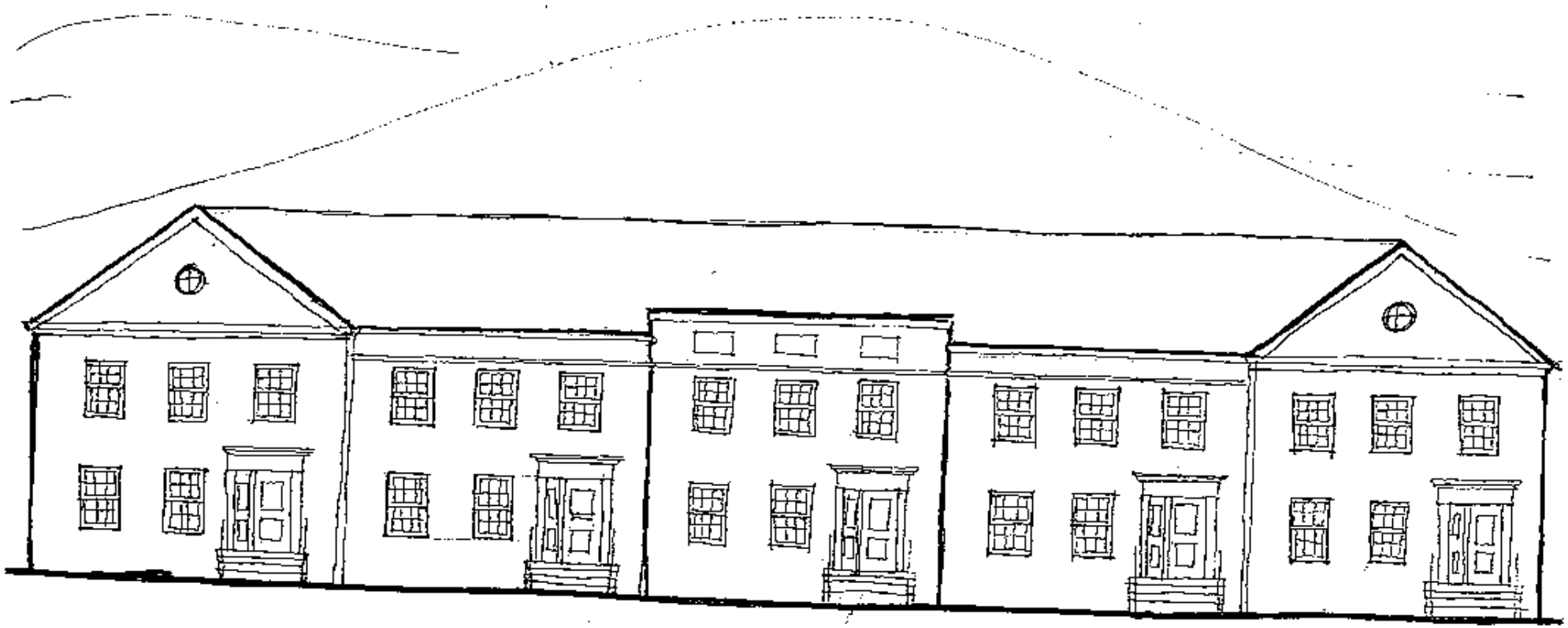
SECOND FLOOR

RKTECTS
ARCHITECTURE
PLANNING
HISTORIC
PRESERVATION
The RKtects Studio, Inc.

JADWIN LOOP UNIT JL IA

3 BEDROOM - 1475 HSF

FORT BELVOIR RCI HISTORIC VILLAGES



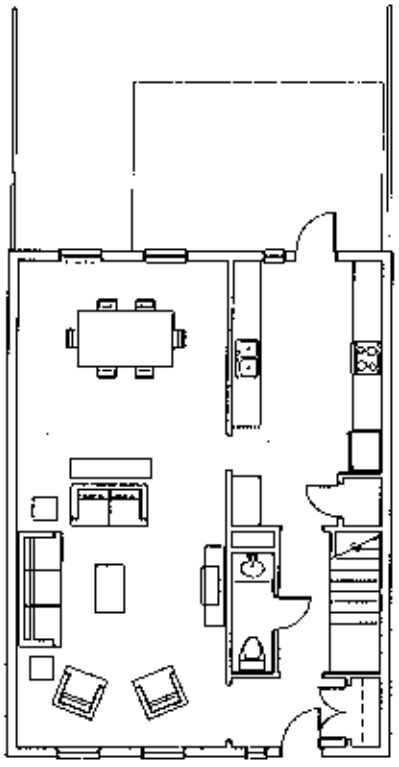
JADWIN LOOP

3/24/03

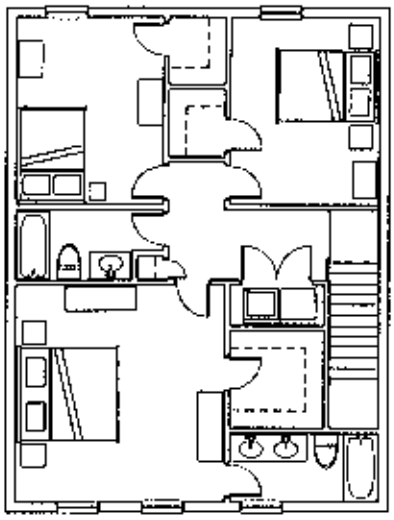
5-PLEX FRONT ELEVATION

JL-NEW-1

RKtects.



FIRST FLOOR



SECOND FLOOR

RKTECTS
ARCHITECTURE
PLANNING
HISTORIC
PRESERVATION
The RKtects Studio, Inc.

JADWIN LOOP UNIT JL-NEW

3 BEDROOM - 1140 HSF

FORT BELVOIR RCI HISTORIC VILLAGES

Attachment J:

Rossell Loop Village Plans

Conceptual Site Plan

 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

ARMY RESIDENTIAL COMMUNITIES INITIATIVE
CLARK PINNACLE FAMILY COMMUNITIES·LLC

ROSSELL LOOP

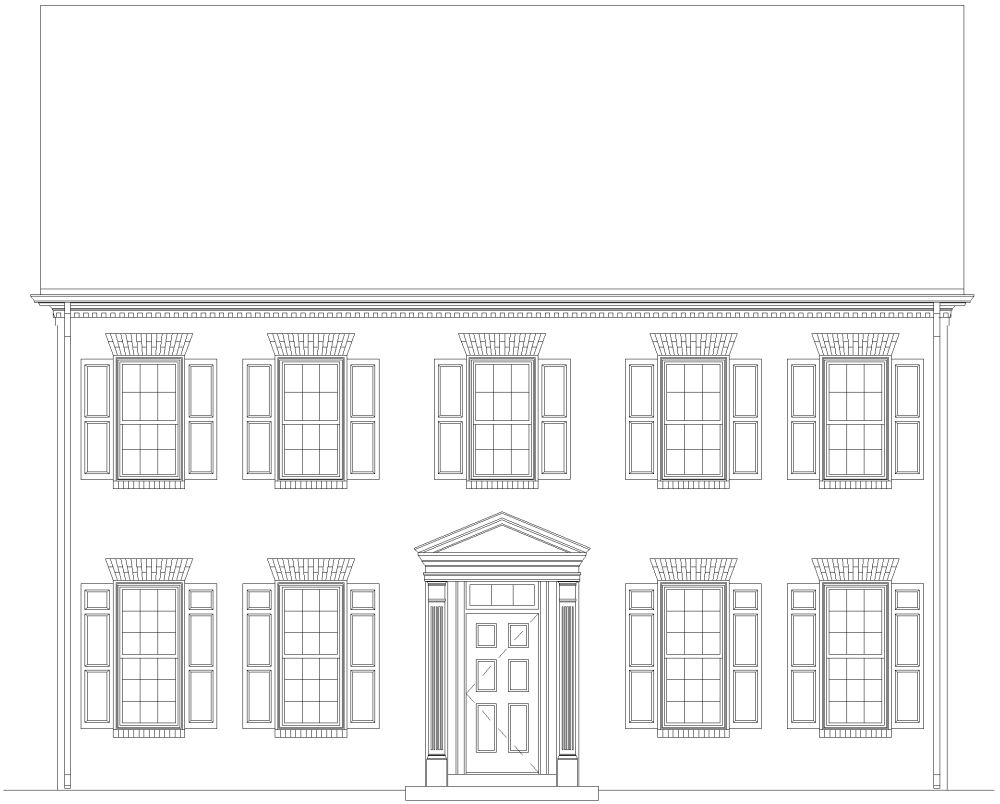
 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

UNIT G

ROSSELL LOOP JULY 28, 2003

ARMY RESIDENTIAL COMMUNITIES INITIATIVE
CLARK PINNACLE FAMILY COMMUNITIES·LLC

FORT BELVOIR FAMILY HOUSING



 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

UNIT J

LEWIS HEIGHTS/ROSSELL LOOP JULY 28, 2003

ARMY RESIDENTIAL COMMUNITIES INITIATIVE
CLARK PINNACLE FAMILY COMMUNITIES·LLC

FORT BELVOIR FAMILY HOUSING

 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

UNIT K

ROSSELL LOOP JULY 28, 2003

ARMY RESIDENTIAL COMMUNITIES INITIATIVE
CLARK PINNACLE FAMILY COMMUNITIES·LLC

FORT BELVOIR FAMILY HOUSING

 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

UNIT L & M

ROSSELL LOOP

JULY 28, 2003

ARMY RESIDENTIAL COMMUNITIES INITIATIVE
CLARK PINNACLE FAMILY COMMUNITIES·LLC

FORT BELVOIR FAMILY HOUSING

 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

UNIT N

ROSSELL LOOP JULY 28, 2003

ARMY RESIDENTIAL COMMUNITIES INITIATIVE
CLARK PINNACLE FAMILY COMMUNITIES·LLC

FORT BELVOIR FAMILY HOUSING

 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

UNIT P

ROSSELL LOOP JULY 28, 2003

ARMY RESIDENTIAL COMMUNITIES INITIATIVE
CLARK PINNACLE FAMILY COMMUNITIES·LLC

FORT BELVOIR FAMILY HOUSING

 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

UNIT R

ROSSELL LOOP

JULY 28, 2003

ARMY RESIDENTIAL COMMUNITIES INITIATIVE
CLARK PINNACLE FAMILY COMMUNITIES·LLC

FORT BELVOIR FAMILY HOUSING

Attachment K:

Lewis Heights Village Plans

Conceptual Site Plan

 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

ARMY RESIDENTIAL COMMUNITIES INITIATIVE
CLARK PINNACLE FAMILY COMMUNITIES·LLC

LEWIS HEIGHTS

 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

UNIT A

LEWIS HEIGHTS JULY 28, 2003

ARMY RESIDENTIAL COMMUNITIES INITIATIVE
CLARK PINNACLE FAMILY COMMUNITIES·LLC

FORT BELVOIR FAMILY HOUSING

 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

UNIT B

LEWIS HEIGHTS JULY 28, 2003

ARMY RESIDENTIAL COMMUNITIES INITIATIVE
CLARK PINNACLE FAMILY COMMUNITIES·LLC

FORT BELVOIR FAMILY HOUSING

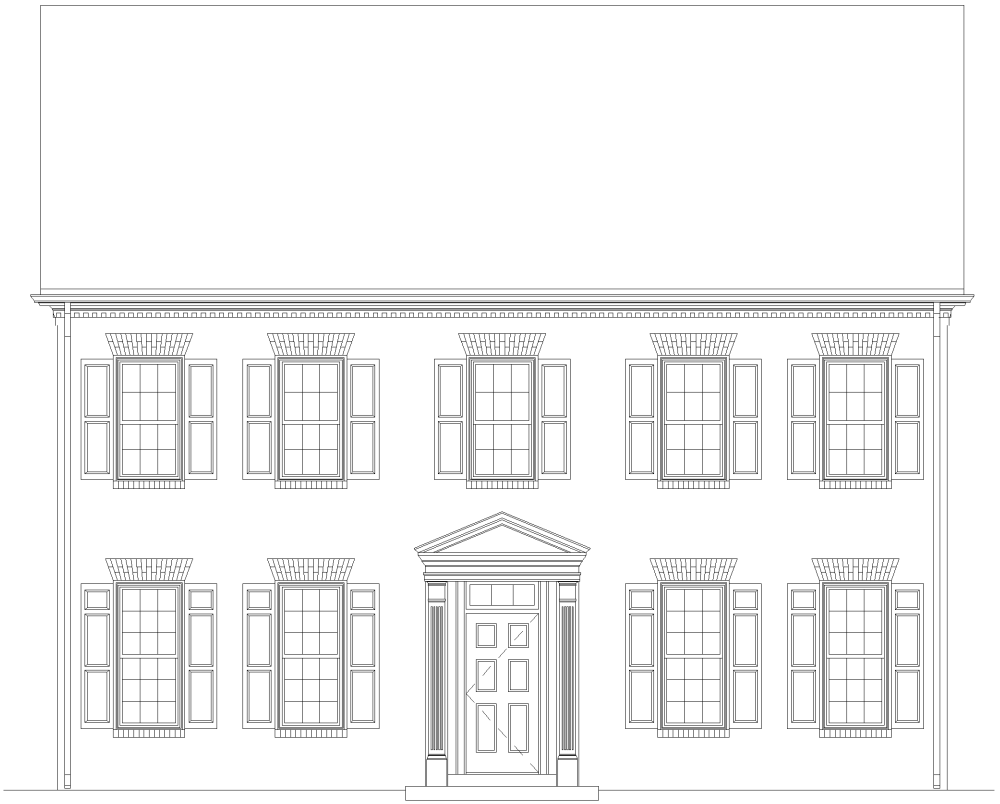
 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

UNIT H & I

LEWIS HEIGHTS JULY 28, 2003

ARMY RESIDENTIAL COMMUNITIES INITIATIVE
CLARK PINNACLE FAMILY COMMUNITIES·LLC

FORT BELVOIR FAMILY HOUSING



 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

UNIT J

LEWIS HEIGHTS/ROSSELL LOOP JULY 28, 2003

ARMY RESIDENTIAL COMMUNITIES INITIATIVE
CLARK PINNACLE FAMILY COMMUNITIES·LLC

FORT BELVOIR FAMILY HOUSING

 | 1300 Spring Street, 4th Floor, Silver Spring, Maryland 20910 301.588.4800

UNIT Q

LEWIS HEIGHTS JULY 28, 2003

ARMY RESIDENTIAL COMMUNITIES INITIATIVE
CLARK PINNACLE FAMILY COMMUNITIES·LLC

FORT BELVOIR FAMILY HOUSING

Attachment L:

Documentation Standards: Guidance for Existing Conditions Documentation-Historic American Buildings Survey (HABS) Standards

Guidance for Existing Conditions Documentation

Documentation will be prepared on 155 buildings (144 residential, 11 garage) to be retained and rehabilitated by the Partnership as per this Agreement. The documentation will serve as a baseline, existing conditions status for all 155 buildings. The documentation will be used as a reference and guide for the Army and the Partnership, and serve to protect the interests of both parties.

The Documentation will contain representative views of the interior and exterior of every building to be retained. At a minimum, one view of each side of the building will be taken, for a minimum total of four exterior views of each building. Interior views will be taken for each room; the number of views necessary to provide photographic coverage of the entire room will be determined on a case by case basis. A minimum of one photograph for each room will be taken. All views will be in sharp focus and be well-lit to identify and distinguish detail in the photograph. Multi-unit buildings will be treated as one building for exterior photos, and as individual units for interior photos.

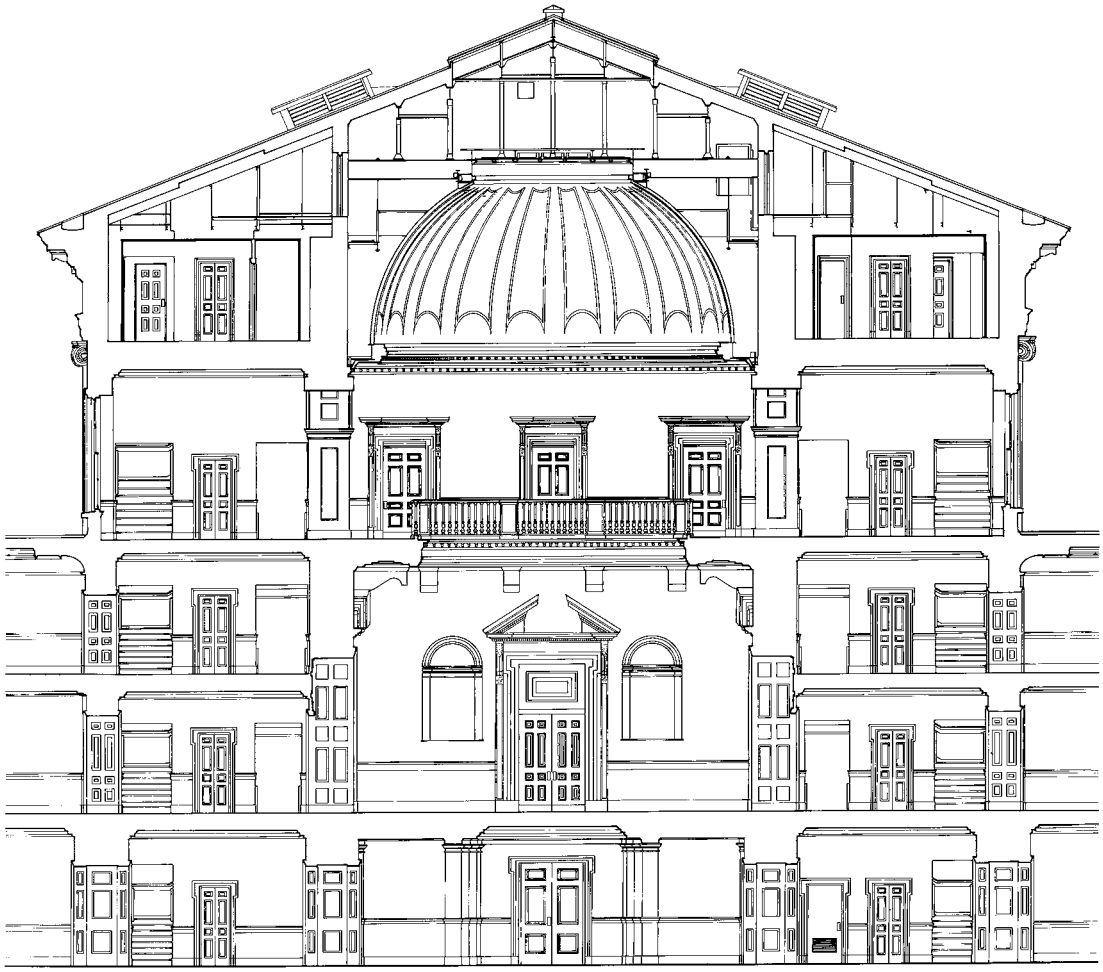
Documentation will be undertaken using 35mm format black and white film of 200 ASA or less. Chromogenic black and white film and/or any black and white film that utilizes a C-41 development process will not be accepted. Black and white prints will be a minimum of 4x6 inches in size, and need not be archival quality (resin-coated paper will suffice). Prints will be labeled with a soft lead pencil on the reverse of the image. Label data will include negative roll number, frame number, building number, date photo was taken, and a short descriptive statement, such as "Kitchen view east" or "front of building 19, view south." Negatives will be processed and stored in an archival manner.

Digital photographs, while desired, are not required for this project. Digital photographs may be presented as a supplement to the requirements for the documentation but will not be accepted in lieu of black and white 35mm prints and negatives as described above.

The documentation will be provided in a referenced book or catalog for easy access to representative views and information for each building. Prints will be presented in archival quality photo pages. Three copies of the documentation in print form will be completed by the Partnership: one for the Partnership, one for the Fort Belvoir CRM, and one for the SHPO office. One set of negatives processed and stored in an archival manner will be provided to the Fort Belvoir CRM.

Secretary of the Interior's Standards and Guidelines for Architectural and Engineering Documentation

HABS/HAER STANDARDS



Historic American Buildings Survey/
Historic American Engineering Record
Cultural Resources Program
U.S. Department of the Interior
National Park Service
Washington, D.C. 20013-7127

On the cover: Virginia State Capitol section drawing, drawn by Gerhard Pfundner, 1989.
Back Cover: Troy Gas Light Co. Gasholder House, in Troy, New York, drawn by Eric DeLony.

Acknowledgements: These standards were compiled and reissued in 1990, by Caroline H. Russell and the staff of the HABS/HAER Division. Thanks to Ronald M. Greenberg who reviewed the manuscript and to all the staff involved in the production.

SECRETARY OF THE INTERIOR'S STANDARDS AND GUIDELINES FOR ARCHITECTURAL AND ENGINEERING DOCUMENTATION: HABS/HAER STANDARDS

Originally published in the **Federal Register**, Vol. 48, No. 190,
(Thursday, September 29, 1983), pp. 44730-34.

Historic American Buildings Survey/
Historic American Engineering Record
Cultural Resources Program
National Park Service
U.S. Department of the Interior
Washington, D.C. 20013-7127

1990

Secretary of the Interior	Manuel Lujan, Jr.
Asst. Secretary, Fish & Wildlife & Parks	Constance Harriman
Director of the National Park Service	James M. Ridenour
Deputy Director	Herbert S. Cables, Jr.
Assoc. Director for Cultural Resources	Jerry L. Rogers
Deputy Assoc. Director for Cultural Resources	Rowland T. Bowers
Chief, HABS/HAER Division	Robert J. Kapsch
Acting Deputy Chief, HABS/HAER Division	John A. Burns
Chief, HAER	Eric N. DeLony
Principal Architect, HABS	Paul D. Dolinsky
Senior Historian, HABS	Allison K. Hoagland

The Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) a division of the National Park Service is responsible for documenting the historic buildings, sites, structures, and objects of this country by producing measured drawings, large format photographs, and written histories. The Library of Congress, Prints and Photographs Division is the repository for these documents. The American Institute of Architects, the American Society of Civil Engineers, and the other founding engineering societies provide technical guidance. The regional offices of the National Park Service in Philadelphia, Atlanta, Denver, San Francisco, and Anchorage administer the mitigation documentation program.

Preface

This booklet contains the Secretary of the Interior's Standards for Architectural and Engineering Documentation as published in the *Federal Register* on September 29, 1983 - commonly known as the HABS/HAER Standards for the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) program of the National Park Service.

These performance standards are intended to define the products acceptable for inclusion in the HABS/HAER collections within the Library of Congress.

Those products include:

- Measured Drawings
- Large Format Photographs
- Written Data

These standards are as originally published in the *Federal Register* on September 29, 1983 except that the Recommended Sources of Technical Information and Annotated Bibliography contained in the notice of 1983 have been updated to reflect current availability of publications and other printed materials. These standards are not intended to be used alone but in conjunction with guidelines and other publications listed in the bibliography included here.

These standards will be used to produce for the following reasons, documentation that meets HABS/HAER standards:

- In preparing mitigation documentation in accordance with the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 et seq.).
- In preparing documentation to be donated to the HABS/HAER collection.
- In preparing documentation as part of a HABS/HAER recording project.

Additional information concerning the HABS/HAER program is available by writing the Chief, HABS/HAER Division, National Park Service, P.O. Box 37127, Washington, D.C. 20013-7127.

Robert J. Kapsch
Chief
Historic American Buildings Survey/
Historic American Engineering Record
National Park Service

SECRETARY OF THE INTERIOR'S STANDARDS
for
ARCHITECTURAL AND ENGINEERING DOCUMENTATION[1]

These standards concern the development of documentation for historic buildings, sites, structures, and objects. This documentation, which usually consists of measured drawings, photographs, and written data, provides important information on a property's significance for use by scholars, researchers, preservationists, architects, engineers, and others interested in preserving and understanding historic properties. Documentation permits accurate repair or reconstruction of parts of a property, records existing conditions for easements, or may preserve information about a property that is to be demolished.

These standards are intended for use in developing documentation to be included in the Historic American Building Survey (HABS) and the Historic American Engineering Record (HAER) Collections in the Library of Congress. HABS/HAER in the National Park Service, have defined specific requirements for meeting these Standards for their collections. The HABS/HAER requirements include information important to development of documentation for other purposes such as State or local archives.

Standard I. Documentation Shall Adequately Explicate and Illustrate What is Significant or Valuable About the Historic Building, Site, Structure or Object Being Documented.

The historic significance of the building, site, structure or object identified in the evaluation process should be conveyed by the drawings, photographs and other materials that comprise documentation. The historical, architectural, engineering or cultural values of the property together with the purpose of the documentation activity determine the level and methods of documentation. Documentation prepared for submission to the Library of Congress must meet the HABS/HAER Guidelines.

Standard II. Documentation Shall be Prepared Accurately From Reliable Sources With Limitations Clearly Stated to Permit Independent Verification of the Information.

The purpose of documentation is to preserve an accurate record of historic properties that can be used in research and other preservation activities. To serve these purposes, the documentation must include information that permits assessment of its reliability.

Standard III. Documentation Shall be Prepared on Materials That are Readily Reproducible, Durable and in Standard Sizes.

The size and quality of documentation materials are important factors in the preservation of information for future use. Selection of materials should be based on the length of time expected for storage, the anticipated frequency of use and a size convenient for storage.

Standard IV. Documentation Shall be Clearly and Concisely Produced.

In order for documentation to be useful for future research, written materials must be legible and understandable, and graphic materials must contain scale information and location references.

---

[1] *Federal Register*, Vol. 48, No. 190, Thursday, September 29, 1983, pp. 44730-44731.

SECRETARY OF THE INTERIOR'S GUIDELINES
for
ARCHITECTURAL AND ENGINEERING DOCUMENTATION[2]

Introduction

These Guidelines link the Standards for Architectural and Engineering Documentation with more specific guidance and technical information. They describe one approach to meeting the Standards for Architectural Engineering Documentation. Agencies, organizations or individuals proposing to approach documentation differently may wish to review their approaches with the National Park Service.

The Guidelines are organized as follows:

Definitions

These definitions are used in conjunction with these Guidelines:

- Architectural Data Form-a one page HABS form intended to provide identifying information for accompanying HABS documentation.

- Documentation-measured drawings, photographs, histories, inventory cards or other media that depict historic buildings, sites, structures or objects.

- Field Photography-photography other than large-format photography, intended for the purpose of producing documentation, usually 35mm.

- Field Records-notes of measurements taken, field photographs and other recorded information intended for the purpose of producing documentation.

[2] *Federal Register*, Vol. 48, No. 190, Thursday, September 29, 1983, pp.44731-34.

- Inventory Card-a one page form which includes written data, a sketched site plan and a 35mm contact print drymounted on the form. The negative with a separate contact sheet and index should be included with the inventory card.

- Large Format Photographs-photographs taken of historic buildings, sites, structures or objects where the negative is a 4 X 5", 5 X 7" or 8 X 10" size and where the photograph is taken with appropriate means to correct perspective distortion.

- Measured Drawings-drawings produced on HABS or HAER formats depicting existing conditions or other relevant features of historic buildings, sites, structures or objects. Measured drawings are usually produced in ink on archivally stable material, such as mylar.

- Photocopy-A photograph, with large-format negative, of a photograph or drawing.

- Select Existing Drawings-drawings of historic buildings, sites, structures or objects, whether original construction or later alteration drawings that portray or depict the historic value or significance.

- Sketch Plan-a floor plan, generally not to exact scale although often drawn from measurements, where the features are shown in proper relation and proportion to one another.

Goal of Documentation

The Historic American Buildings Survey (HABS) and Historic American Engineering Record (HAER) are the national historical architectural and engineering documentation programs of the National Park Service that promote documentation incorporated into the HABS/HAER collections in the Library of Congress. The goal of the collections is to provide architects, engineers, scholars, and interested members of the public with comprehensive documentation of buildings, sites, structures and objects significant in American history and the growth and development of the built environment.

The HABS/HAER Collections: HABS/HAER documentation usually consists of measured drawings, photographs and written data that provide a detailed record which reflects a property's significance. Measured drawings and properly executed photographs act as a form of insurance against fires and natural disasters by permitting the repair and, if necessary, reconstruction of historic structures damaged by such disasters. Documentation is used to provide the basis for enforcing preservation easement. In addition, documentation is often the last means of preservation of a property; when a property is to be demolished, its documentation provides future researchers access to valuable information that otherwise would be lost.

HABS/HAER documentation is developed in a number of ways. First and most usually, the National Park Service employs summer teams of student architects, engineers, historians, and architectural historians to develop HABS/HAER documentation, under the supervision of National Park Service professionals. Second, the National Park Service produces HABS/HAER documentation in conjunction with restoration or other preservation treatment, of historic buildings managed by the National Park Service. Third, Federal agencies, pursuant to Section 110(b) of the National Historic Preservation Act, as amended, record those historic

properties to be demolished or substantially altered as a result of agency action or assisted action (referred to as mitigation projects). Fourth, individuals and organizations prepare documentation to HABS/HAER standards and donate that documentation to the HABS/HAER collections. For each of these programs, different Documentation Levels will be set.

The standards describe the fundamental principals of HABS/HAER documentation. They are supplemented by other material describing more specific guidelines, such as line weights for drawings, preferred techniques for architectural photography, and formats for written data. This technical information is found in the HABS/HAER Procedures Manual.

These guidelines include important information about developing documentation for State or local archives. The State Historic Preservation Officer or the State library should be consulted regarding archival requirements if the documentation will become part of their collections. In establishing archives, the important questions of durability and reproducibility should be considered in relation to the purposes of the collection.

Documentation prepared for the purpose of inclusion in the HABS/HAER collections must meet the requirements below. The HABS/HAER office of the National Park Service retains the right to refuse to accept documentation for inclusion in the HABS/HAER collections when that documentation does not meet HABS/HAER requirements, as specified below.

Standard I: Content

1. Requirement: *Documentation shall adequately explicate and illustrate what is significant or valuable about the historic building, site, structure or object being documented.*

2. Criteria: Documentation shall meet one of the following documentation levels to be considered adequate for inclusion in the HABS/HAER collections.

a. Documentation Level I;
   (1) Drawings: a full set of measured drawings depicting existing or historic conditions.
   (2) Photographs: photographs with large-format negatives of exterior and interior views; photocopies with large-format negatives of select existing drawings or historic views where available.
   (3) Written data: History and description.

b. Documentation Level II;
   (1) Drawings: select existing drawings, where available, should be photographed with large-format negatives or photographically reproduced on mylar.
   (2) Photographs: photographs with large-format negatives of exterior and interior views, or historic views, where available.
   (3) Written data: history and description.

c. Documentation Level III;
   (1) Drawings: sketch plan.
   (2) Photographs: photographs with large-format negatives of exterior and interior views.
   (3) Written data: architectural data form.

d. Documentation Level IV: HABS/HAER inventory card.

3. Test: Inspection of the documentation by HABS/HAER staff.

4. Commentary: The HABS/HAER office retains the right to refuse to accept any documentation on buildings, sites, structures or objects lacking historical significance. Generally, buildings, sites, structures or objects must be listed in, or eligible for listing in the National Register of Historic Places to be considered for inclusion in the HABS/HAER collections.

The kind and amount of documentation should be appropriate to the nature and significance of the buildings, site, structure or object being documented. For example, Documentation Level I would be inappropriate for a building that is a minor element of a historic district, notable only for streetscape context and scale. A full set of measured drawings for such a minor building would be expensive and would add little, if any, information to the HABS/HAER collections. Large format photography [Documentation Level III] would usually be adequate to record the significance of this type of building.

Similarly, the aspect of the property that is being documented should reflect the nature and significance of the building, site, structure or object being documented. For example, measured drawings of Dankmar Adler and Louis Sullivan's Auditorium Building in Chicago should indicate not only facades, floor plans and sections, but also the innovative structural and mechanical systems that were incorporated in that building. Large format photography of Gunston Hall in Fairfax County, Virginia, to take another example, should clearly show William Buckland's hand-carved moldings in the Palladian Room, as well as other views.

HABS/HAER documentation is usually in the form of measured drawings, photographs, written data. While the criteria in this section have addressed only these media, documentation need not be limited to them. Other media, such as films of industrial processes, can and have been used to document historic buildings, sites, structures or objects. If other media are to be used, the HABS/HAER office should be contacted before recording.

The actual selection of the appropriate documentation level will vary, as discussed above. For mitigation documentation projects, this level will be selected by the National Park Service Regional Office and communicated to the agency responsible for completing the documentation. Generally, Level I documentation is required for nationally significant buildings and structures, defined as National Historic Landmarks and the primary historic units of the National Park Service.

On occasion, factors other than significance will dictate the selection of another level of documentation. For example, if a rehabilitation of a property is planned, the owner may wish to have a full set of as-built drawings, even though the significance may indicate Level II documentation.

HABS Level I measured drawings usually depict existing conditions through the use of a site plan, floor plans, elevations, sections and construction details. HAER Level I measured drawings will frequently depict original conditions where adequate historical material exists, so as to illustrate manufacturing or engineering processes.

Level II documentation differs from Level I by substituting copies of existing drawings, either original or alteration drawings, for recently executed measured drawings. If this is done, the drawings must meet HABS/HAER requirements outlined below. While existing drawings are rarely as suitable as-built drawings, they are adequate in many cases for documentation purposes. Only when the desirability of having as-built drawings is clear are Level I measured drawings required in addition to existing drawings. If existing drawings are housed in an accessible collection and cared for archivally, their reproduction for HABS/HAER may not be necessary. In other cases, Level I measured drawings are required in the absence of existing drawings.

Level III documentation requires a sketch plan if it helps to explain the structure. The architectural data form should supplement the photographs by explaining what is not readily visible.

Level IV documentation consists of completed HABS/HAER inventory cards. This level of documentation, unlike the other three levels, is rarely considered adequate documentation for the HABS/HAER collections but is undertaken to identify historic resources in a given area prior to additional, more comprehensive documentation.

Standard II: Quality

1. Requirement: *HABS and HAER documentation shall be prepared accurately from reliable sources with limitations clearly stated to permit independent verification of information.*

2. Criteria: For all levels of documentation, the following quality standards shall be met:

a. Measured drawings: Measured drawings shall be produced from recorded, accurate measurements. Portions of the building that were not accessible for measurement should not be drawn on the measured drawings but clearly labeled as not accessible or drawn from available construction drawings and other sources and so identified. No part of the measured drawings shall be produced from hypothesis or non-measurement related activities. Documentation Level I measured drawings shall be accompanied by a set of field notebooks in which the measurements were first recorded. Other drawings prepared for Documentation Levels II and III, shall include a statement describing where the original drawings are located.

b. Large format photographs: Large format photographs shall clearly depict the appearance of the property and areas of significance of the recorded building, site, structure or object. Each view shall be perspective-corrected and fully captioned.

c. Written history: Written history and description for Documentation Levels I and II shall be based on primary sources to the greatest extent possible. For Levels III and IV, secondary sources may provide adequate information; if not, primary research will be necessary. A frank assessment of the reliability and limitations of sources shall be included. Within the written history, statements shall be footnoted as to their sources, where appropriate. The written data shall include a methodology section specifying name of researcher, date of research, sources searched, and limitations of the project.

3. Test: Inspection of the documentation by HABS/HAER staff.

4. Commentary: The reliability of the HABS/HAER collections depends on documentation of high quality. Quality is not something that can be easily prescribed or quantified, but it derives from a process in which thoroughness and accuracy play a large part. The principle of independent verification of HABS/HAER documentation is critical to the HABS/HAER collections.

Standard III: Materials

1. Requirement: *HABS and HAER documentation shall be prepared on materials that are readily reproducible for ease of access; durable for long storage; and in standard sizes for ease of handling.*

2. Criteria: For all levels of documentation, the following material standards shall be met:

a. Measured Drawings:
Readily Reproducible: Ink on translucent material.
Durable: Ink on archivally stable materials.
Standard Sizes: Two sizes: 19 X 24" or 24 X 36".

b. Large Format Photographs:
Readily Reproducible: Prints shall accompany all negatives.
Durable: Photography must be archivally processed and stored. Negatives are required on safety film only. Resin-coated paper is not accepted. Color photography is not acceptable.
Standard Sizes: Three sizes: 4 X 5", 5 X 7", 8 X 10".

c. Written History and Description:
Readily Reproducible: Clean copy for xeroxing.
Durable: Archival bond required.
Standard Sizes: 8½ X 11".

d. Field Records:
Readily Reproducible: Field notebooks may be xeroxed. Photo identification sheet will accompany 35 mm negatives and contact sheets.
Durable: No requirement
Standard Sizes: Only requirement is that they can be made to fit into a 9½ X 12" archival folding file.

3. Test: Inspection of the documentation by HABS/HAER staff.

4. Commentary: All HABS/HAER records are intended for reproduction; some 20,000 HABS/HAER records are reproduced each year by the Library of Congress. Although field records are not intended for quality reproduction, it is intended that they be used to supplement the formal documentation. The basic durability performance standard for HABS/HAER records is 500 years. Ink on mylar is believed to meet this standard, while color photography, for example, does not. Field records do not meet this archival standard, but are maintain in the HABS/HAER collections as a courtesy to the collection user.

Standard IV: Preservation

1. Requirement: *HABS and HAER documentation shall be clearly and concisely produced.*

2. Criteria: For levels of documentation as indicated below, the following standards for presentation will be used:

a. Measured Drawings: Level I measured drawings will be lettered mechanically (i.e., Leroy or similar) or in a handprinted equivalent style. Adequate dimensions shall be included on all sheets. Level III sketch plans should be neat and orderly.

b. Large format photographs: Level I photographs shall include duplicate photographs that include a scale. Level II and III photographs shall include, at a minimum, at least one photograph with a scale, usually of the principal facade.

c. Written history and description: Data shall be typewritten on bond, following accepted rules of grammar.

3. Test: Inspection of the documentation by HABS/HAER staff.

Architectural and Engineering Documentation Prepared for Other Purposes

Where a preservation planning process is in use, architectural and engineering documentation, like other treatment activities, are undertaken to achieve the goals identified by the preservation planning process. Documentation is deliberately selected as a treatment for properties evaluated as a significant, and the development of the documentation program for a property follows from the planning objectives.

Documentation efforts focus on the significant characteristics of the property, as defined in the previously completed evaluation. The selection of a level of documentation and the documentation techniques (measured drawings, photography, etc.) is based on the significance of the property and the management needs for which the documentation is being performed. For example, the kind and level of documentation required to record a historic property for easement purposes may be less detailed than that required as mitigation prior to destruction of the property. In the former case, essential documentation might be limited to the portions of the property controlled by the easement, for example, exterior facades; while in the latter case, significant interior architectural features and non-visible structural details would also be documented.

The principles and content of the HABS/HAER criteria may be used for guidance in creating documentation requirements for other archives. Levels of documentation and the durability and sizes of documentation may vary depending on the intended use and the repository. Accuracy of documentation should be controlled by assessing the reliability of all sources and making that assessment available in the archival record; by describing the limitations of the information available from research and physical examination of the property and by retaining the primary data (field measurements and notebooks) from which the archival record was produced. Usefulness of the documentation products depends on preparing the documentation on durable materials that are able to withstand handling and reproduction, and in sizes that can be stored and reproduced without damage.

Recommended Sources of Technical Information and Annotated Bibliography[3]

Recording Historic Structures is available through AIA Press, request publication #ISBN 1-55835-018-7 (hardcover - $26.95) or #ISBN 1-55835-021-7 (softcover - $19.95), plus $3.00 shipping charge, and D.C. or Maryland sales tax, if applicable. AIA Order Department, 9 Jay Gould Court, P.O. Box 753, Waldorf, Maryland 20601.

Recording Historic Structures. John A. Burns, editor. Washington, D.C.: The AIA Press, 1989.

With over 200 photographs, drawings, illustrations, a bibliography, and an index, this handbook discusses each aspect of the documentation of historic structures, using examples from the HABS/HAER collection.

The following printed materials are available by writing to: HABS/HAER - National Park Service, P.O. Box 37127, Washington, D.C. 20013-7127. Please send check or money order made out to the U.S. Treasury, to cover the cost of reproduction and handling. Availability and price accurate as of June 1, 1990.

Guidelines for Recording Historic Ships. Richard K. Anderson, Jr. Washington, D.C.: Historic American Buildings Survey/Historic American Engineering Record, National Park Service, 1988. Free, limited quantity.

This document marks the revival of the 1930's Historic American Merchant Marine Survey and provides the definitive guide to maritime recording.

HABS Field Instructions for Measured Drawings. Washington, D.C.: Historic American Buildings Survey/Historic American Engineering Record, National Park Service, 1981. $5.00

Gives procedures for producing measured drawings of historic buildings to HABS/HAER standards.

HABS Historian's Procedures Manual. Washington, D.C.: Historic American Buildings Survey/Historic American Engineering Record, National Park Service, 1983. $2.00

Provides guidelines for producing written data on historic buildings to HABS/HAER standards.

HAER Field Instructions. Washington, D.C.: Historic American Buildings Survey/ Historic American Engineering Record, National Park Service, 1981. $5.00

Provides guidelines for documenting to HABS/HAER standards, historic engineering and industrial sites and structures with measured drawings and written data.

[3]The original recommended sources of technical information contained in the *Federal Register* notice of September 29, 1983 have been omitted since most are out of print and/or superceded. The above recommended sources of technical information represent information available and current as of 1990.

Specifications for the Production of Photographs. Washington, D.C.: Historic American Buildings Survey/Historic American Engineering Record, National Park Service, 1984. $2.00

Provides criteria for the production of large format photographs for acceptance to the HABS/HAER collection.

Transmitting Documentation to HABS/HAER WASO. Washington, D.C.: Historic American Buildings Survey/Historic American Engineering Record, National Park Service, 1985. $2.00

Provides transmittal procedures and archival requirements of documentation for acceptance to the HABS/HAER collection.

Industrial Eye is available from (request publication #ISBN 0-89133-124-7): Decatur House Museum Shop, 1600 H Street, NW, Washington, D.C. 20006. Please enclose a check or money order made out to the National Trust for $34.95 plus $3.00 for postage and handling.

Industrial Eye. Photographs by Jet Lowe from the Historic American Engineering Record. Washington, D.C.: National Trust for Historic Preservation, 1987.

Photographs of the county's engineering and industrial landmarks, illustrating the use of large format photography to document historic engineering works and interpret industrial processes. All photographs meet HABS/HAER standards.

A Record in Detail is available for $34.95 plus $2.50 postage and handling from: University of Missouri Press, 200 Lewis Hall, Columbia, Missouri 65211.

A Record in Detail: The Architectural Photographs of Jack E. Boucher. Columbia: University of Missouri Press, 1988.

A selection of the works of HABS photographer Jack E. Boucher, demonstrating the effective use of large format photography to record historic buildings. All photographs meet HABS/HAER standards.

Architectural Graphic Standards, Eighth Edition. American Institute of Architects. New York: John Wiley & Sons, Inc., 1988.

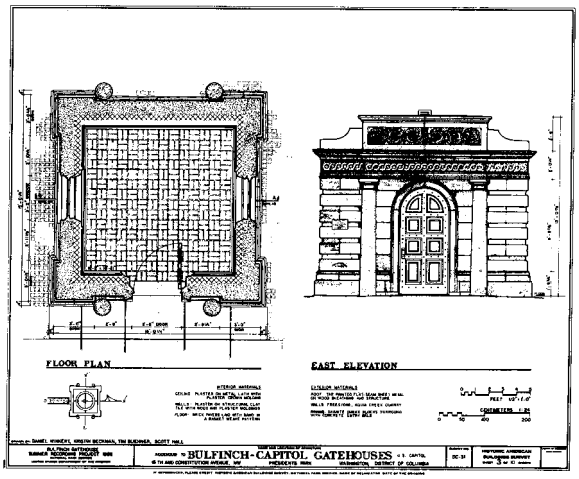
The standard reference for architectural information, this edition is the first to have a chapter on historic preservation, including four pages on HABS.

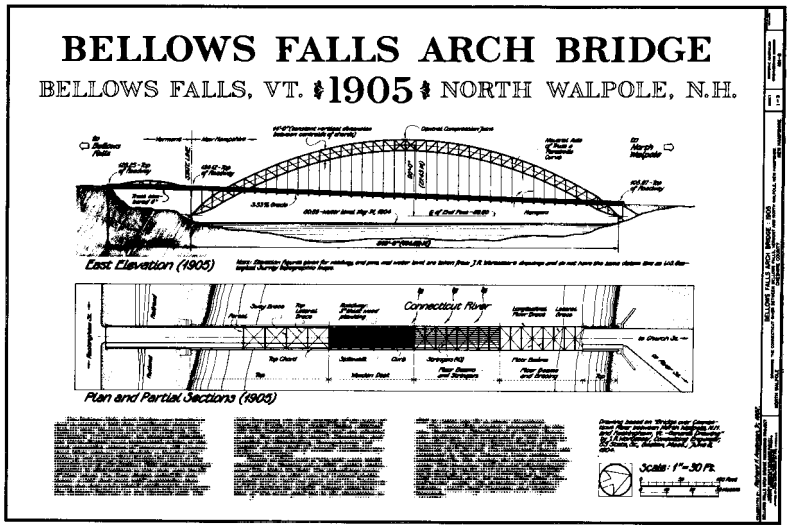
For further information about HABS/HAER contact:

Historic American Buildings Survey/
Historic American Engineering Record
National Park Service
P.O. Box 37127
Washington, D.C. 20013-7127

Appendices

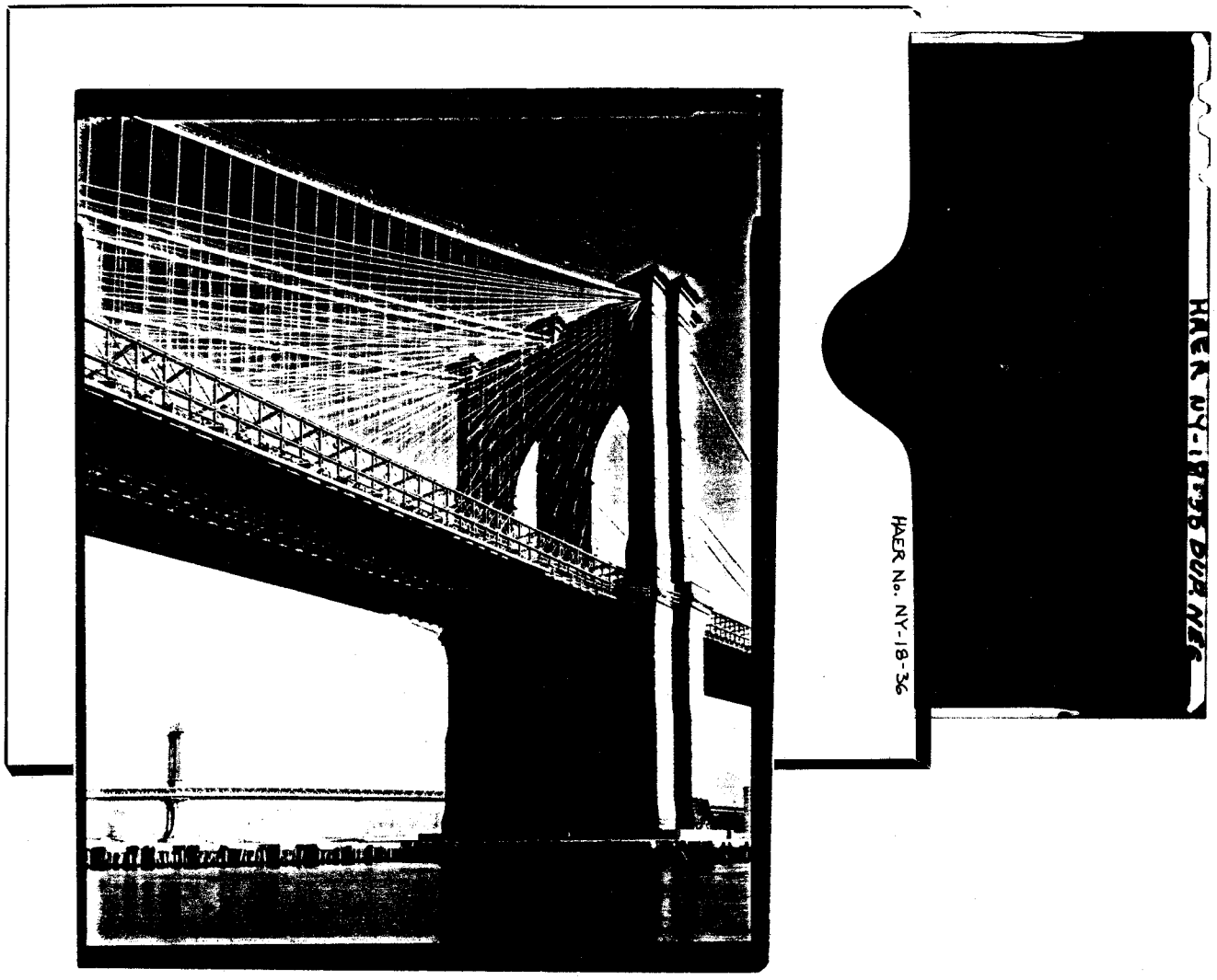
Appendix A





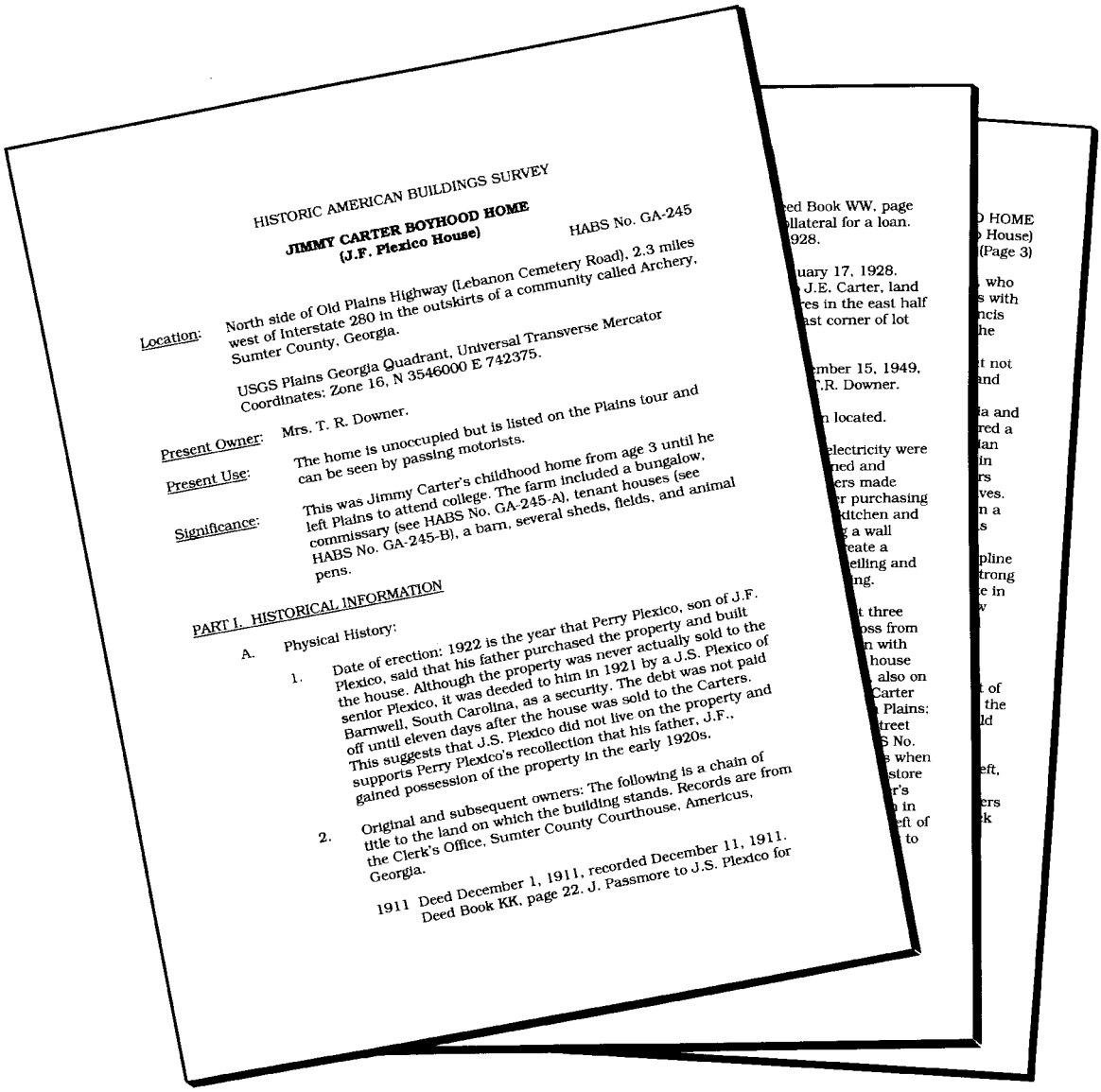
Measured Drawings:

Measured drawings shall be produced from recorded, accurate measurements. Portions of the building that were not accessible for measurement should not be drawn on the measured drawing but clearly labeled as not accessible or drawn from available construction drawings and other sources and so identified. Since measured drawings must be readily reproducible and durable, HABS/HAER standards call for ink on translucent and archivally stable materials, such as mylar. As illustrated in the reductions above, drawings are produced in two standard sizes, 19 X 24" and 24 X 36".



Large Format Photographs:

HABS/HAER standards require that large format (cameras that produce 4 X 5", 5 X 7", or 8 X 10" negatives) photographic documentation be done with black and white film. A print must accompany each negative. The negatives and contact prints are archivally treated and the contact paper is fiber-based instead of resin-coated (RC). The paper and negatives must have had sufficiently long washings in water in order to remove all processing chemicals.



HISTORIC AMERICAN BUILDINGS SURVEY

JIMMY CARTER BOYHOOD HOME
(J.F. Plexico House) HABS No. GA-245

Location: North side of Old Plains Highway (Lebanon Cemetery Road), 2.3 miles west of Interstate 280 in the outskirts of a community called Archery, Sumter County, Georgia.

USGS Plains Georgia Quadrant, Universal Transverse Mercator Coordinates; Zone 16, N 3546000 E 742375.

Present Owner: Mrs. T. R. Downer.

Present Use: The home is unoccupied but is listed on the Plains tour and can be seen by passing motorists.

Significance: This was Jimmy Carter's childhood home from age 3 until he left Plains to attend college. The farm included a bungalow, commissary (see HABS No. GA-245-A), tenant houses (see HABS No. GA-245-B), a barn, several sheds, fields, and animal pens.

PART I. HISTORICAL INFORMATION

A. Physical History:

1. Date of erection: 1922 is the year that Perry Plexico, son of J.F. Plexico, said that his father purchased the property and built the house. Although the property was never actually sold to the senior Plexico, it was deeded to him in 1921 by a J.S. Plexico of Barnwell, South Carolina, as a security. The debt was not paid off until eleven days after the house was sold to the Carters. This suggests that J.S. Plexico did not live on the property and supports Perry Plexico's recollection that his father, J.F., gained possession of the property in the early 1920s.

2. Original and subsequent owners: The following is a chain of title to the land on which the building stands. Records are from the Clerk's Office, Sumter County Courthouse, Americus, Georgia.

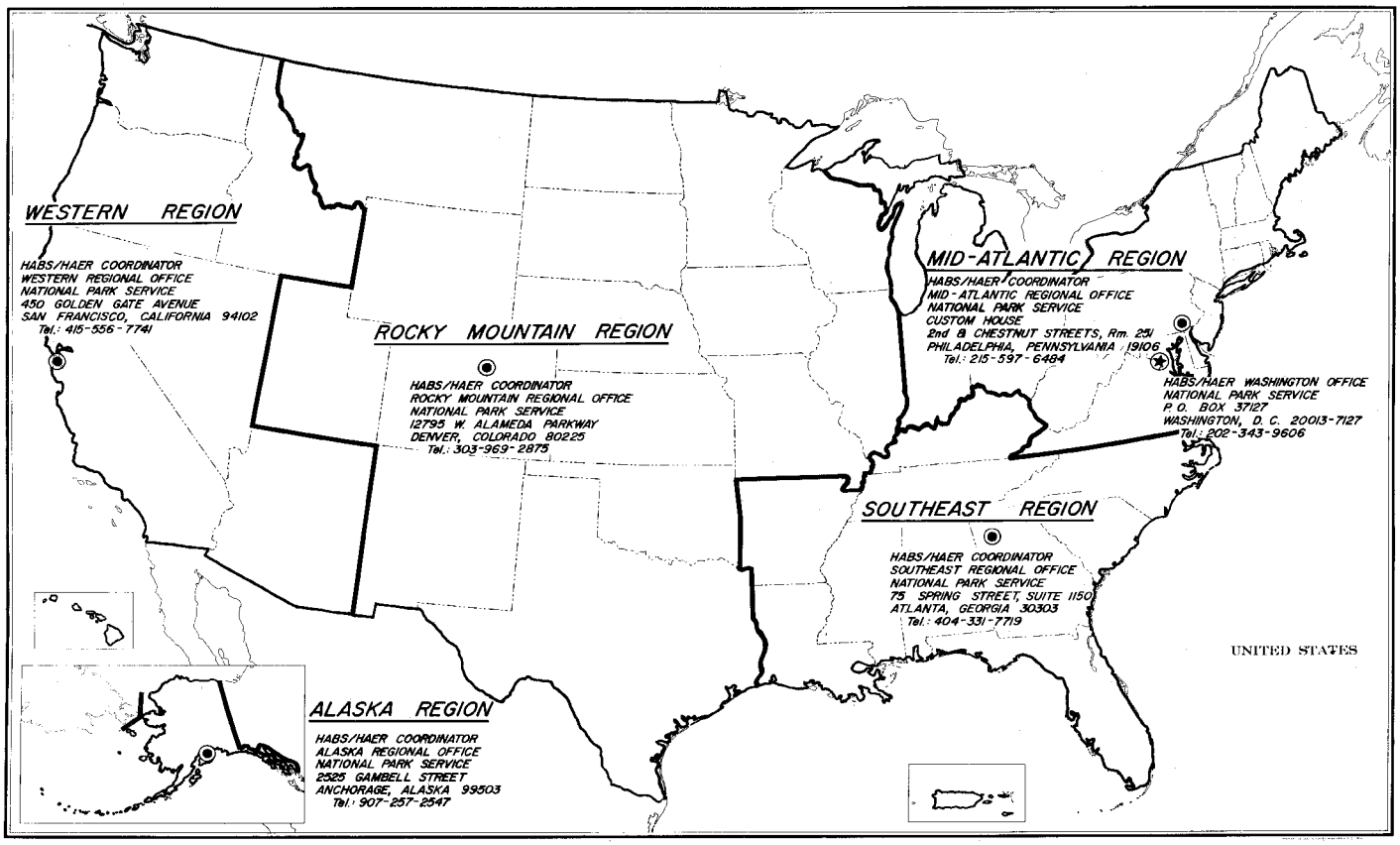
1911 Deed December 1, 1911, recorded December 11, 1911. Deed Book KK, page 22. J. Passmore to J.S. Plexico for

Written History and Description:

Written history and description are based on primary sources to the greatest extent possible and should include an assessment of the reliability and limitations of the sources. Within the written history, statements shall be footnoted as to their sources, where appropriate. The written data shall include a methodology section specifying the name of the researcher, date of research, sources researched, and limitations of the project. The histories will be submitted on 8½ X 11" archival bond.

MITIGATIVE DOCUMENTATION PROGRAM

Under the provisions of the amended National Historic Preservation Act, Federal agencies are required to produce documentation to HABS/HAER standards on buildings, structures, sites, and objects that are listed in or eligible for listing in the National Register of Historic Places and that are threatened with demolition or substantial alteration by projects with Federal involvement. The five National Park Service regional offices charged with external historic preservation responsibilities administer the HABS/HAER mitigative documentation program. The actual work is usually conducted by contractors and supervised by the responsible Federal agency. The documentation produced is reviewed by the regional coordinator and transmitted to the HABS/HAER Washington office for inclusion in the HABS/HAER collections at the Library of Congress.



SUMMARY

PERFORMANCE STANDARDS OF THE HISTORIC AMERICAN BUILDINGS SURVEY/HISTORIC AMERICAN ENGINEERING RECORD (HABS/HAER)

(SECRETARY OF THE INTERIOR'S STANDARDS FOR ARCHITECTURAL AND ENGINEERING DOCUMENTATION, *FEDERAL REGISTER*, SEPTEMBER 29, 1983, PP. 44730-44734)

STANDARDS	I. CONTENT	II. QUALITY	III. MATERIALS	IV. PRESENTATION
REQUIREMENTS	"DOCUMENTATION SHALL ADEQUATELY EXPLICATE AND ILLUSTRATE WHAT IS SIGNIFICANT OR VALUABLE ABOUT THE HISTORIC BUILDING, SITE STRUCTURE OR OBJECT BEING DOCUMENTED."	"HABS AND HAER DOCUMENTATION SHALL BE PREPARED ACCURATELY, FROM RELIABLE SOURCES WITH LIMITATIONS CLEARLY STATED TO PERMIT INDEPENDENT VERIFICATION OF INFORMATION."	"HABS AND HAER DOCUMENTATION SHALL BE PREPARED ON MATERIALS THAT ARE READILY REPRODUCIBLE FOR EASE OF ACCESS; DURABLE FOR LONG STORAGE; AND IN STANDARD SIZES FOR EASE OF HANDLING."	"HABS AND HAER DOCUMENTATION SHALL BE CLEARLY AND CONCISELY PRODUCED."

CRITERIA \ LEVEL	I	II	III	IV
A. MEASURED DRAWING	FULL SET OF MEAS. DWGS.	SEE PHOTOS BELOW	SKETCH PLAN	INVEN-TORY CARD
B. PHOTOGRAPHS	LARGE FORMAT PHOTOGRAPHS EXTERIOR & INTERIOR LARGE FORMAT PHOTOCOPIES: — SELECT EXISTING DWGS — SELECT HISTORIC VIEWS			35mm B&W
C. WRITTEN DATA	HISTORY AND DESCRIPTION IN NARRATIVE OR OUTLINE FORMAT	ONE PAGE SUM-MARY		INVEN-TORY CARD
D. OTHER	OTHER MEDIA CAN AND HAVE BEEN USED. CONTACT HABS/HAER OFFICE BEFORE EMPLOYING A MEDIA OTHER THAN THOSE SPECIFIED ABOVE.			

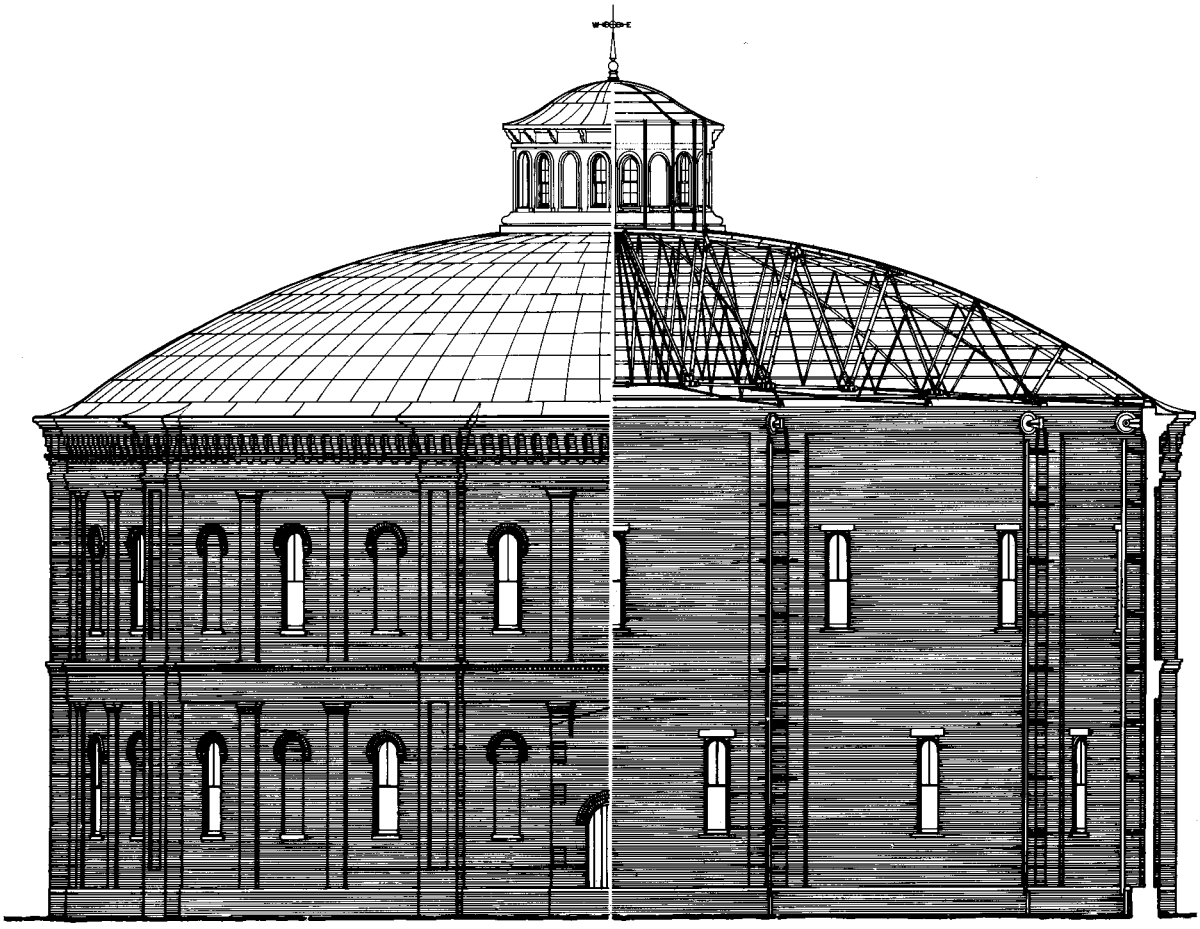
CRITERIA \ LEVEL	I	II	III	IV
A. MEASURED DRAWING	MEASURED DRAWINGS ARE TO BE PRODUCED FROM RECORDED, ACCURATE MEASUREMENTS. THOSE PORTIONS DRAWN FROM EXISTING DRAWINGS OR OTHER SOURCES SHOULD BE SO IDENTIFIED AND SOURCES LISTED.			
B. PHOTOGRAPHS	PHOTOGRAPHS SHALL CLEARLY DEPICT THE APPEARANCE OF THE PROPERTY AND AREAS OF SIGNIFICANCE. ALL VIEWS ARE TO BE PERSPECTIVE-CORRECTED AND FULLY CAPTIONED.			
C. WRITTEN DATA	BASED ON PRIMARY SOURCES	SECONDARY SOURCES MAY PROVIDE ADEQUATE INFORMATION		
	INCLUDE: — METHODOLOGY — NAME OF RESEARCH & DATE OF RESEARCH — SOURCES — FRANK ASSESSMENT OF SOURCES AND THEIR LIMITATIONS			
D. OTHER				

CRITERIA \ LEVEL	I	II	III	IV
A. MEASURED DRAWING	INK ON TRANS-LUCENT MATERIAL	8×10" PHOTO-COPY	INK ON BOND PAPER	INK ON INVENTORY CARD
	INK ON ARCHIVALLY STABLE MATERIAL			
	19×24" OR 24×36"	8×10" PHOTO-COPY	8½×11"	INVEN-TORY CARD
B. PHOTOGRAPHS	PRINTS SHALL ACCOMPANY ALL NEGATIVES			
	MUST BE ARCHIVALLY PROCESSED, NO R/C PAPER			
	4×5" OR 5×7" OR 8×10"			35mm FILM
C. WRITTEN DATA	CLEAN COPY FOR XEROXING			
	ARCHIVAL BOND REQUIRED			
	8½×11"			
D. OTHER				

CRITERIA \ LEVEL	I	II	III	IV
A. MEASURED DRAWING	ADEQUATE DIMENSIONS ON ALL SHEETS			
	MECH. LETTER-ING OR EQUIVA-LENT		SKETCH PLANS SHALL BE NEAT AND ORDERLY	
B. PHOTOGRAPHS	DUPLI-CATE PHOTOS WITH A SCALE STICK	MIN. OF ONE PHOTO WITH A SCALE (PRINCIPAL FACADE)		
C. WRITTEN DATA	TYPEWRITTEN ON BOND			TYPED ON INVEN-TORY CARD
D. OTHER				

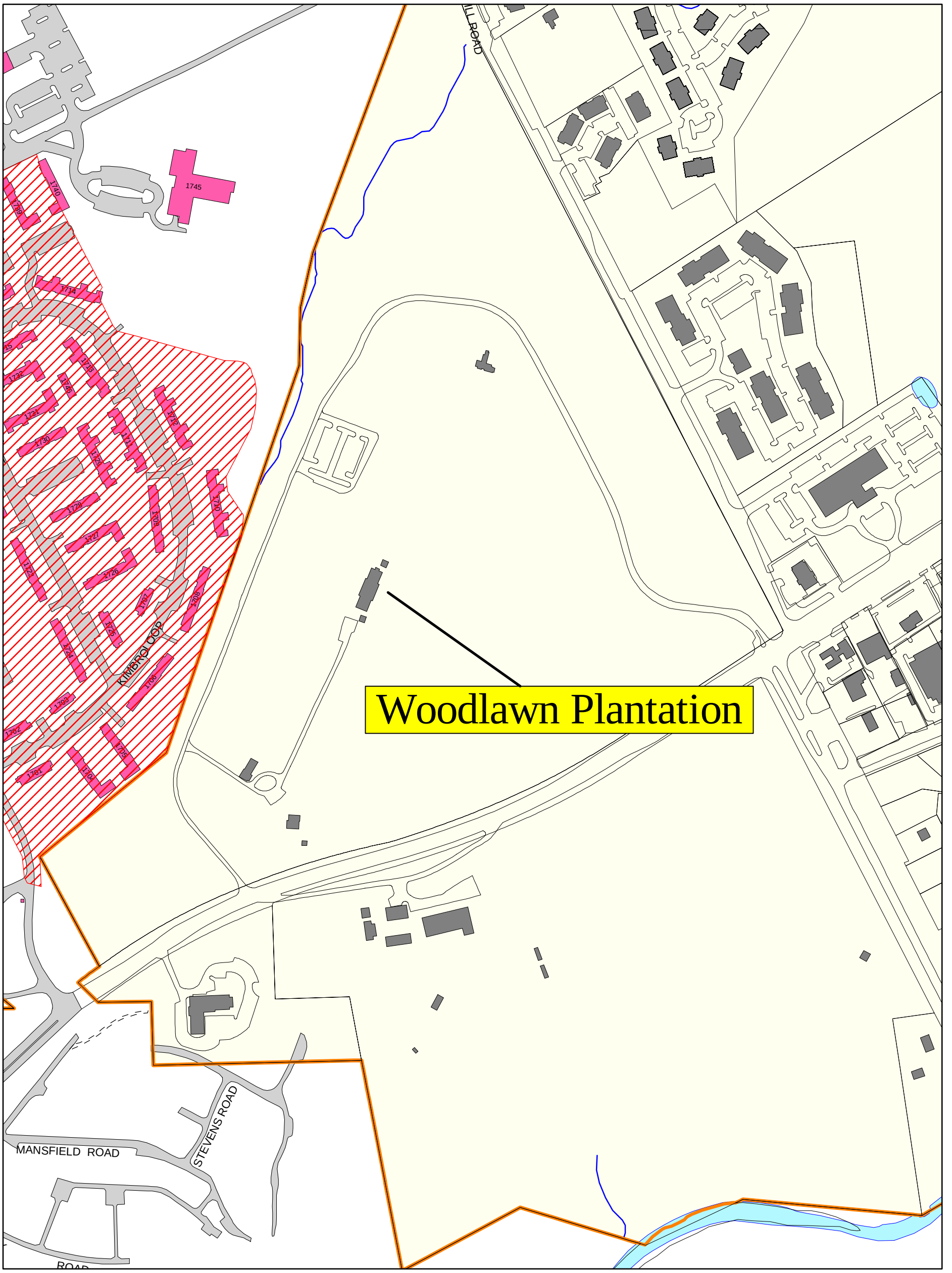
TESTS	INSPECTION BY HABS/HAER OFFICE STAFF. DOCUMENTATION NOT MEETING HABS/HAER STANDARDS WILL BE REFUSED.
COMMENTARIES	KIND AND AMOUNT OF DOCUMENTATION SHOULD BE APPROPRIATE TO THE NATURE, AND SIGNIFICANCE OF THE BUILDING, SITE, STRUCTURE OR OBJECT BEING DOCUMENTED.
	THE PRINCIPLE OF INDEPENDENT VERIFICATION IS CRITICAL IN ASSURING HIGH QUALITY OF HABS/HAER MATERIALS.
	BASIC DURABILITY PERFORMANCE STANDARD IS 500 YEARS.
	HABS/HAER ARE MOST WIDELY USED OF SPECIAL COLLECTIONS AT THE LIBRARY OF CONGRESS.

Robert J. Kapsch - from the Association for Preservation Technology *Bulletin* Vol. XXII No. 1/2 1990, p.32.



Attachment M:

Woodlawn, a National Historic Landmark, National Trust for Historic Preservation House Museum and Anchor Property Within the Woodlawn Historic Overlay District Adopted by the Fairfax County Board of Supervisors



LEGEND

- RCI AREA OF POTENTIAL AFFECT
- FORT BELVOIR HISTORIC DISTRICT
- FORT BELVOIR BOUNDARY

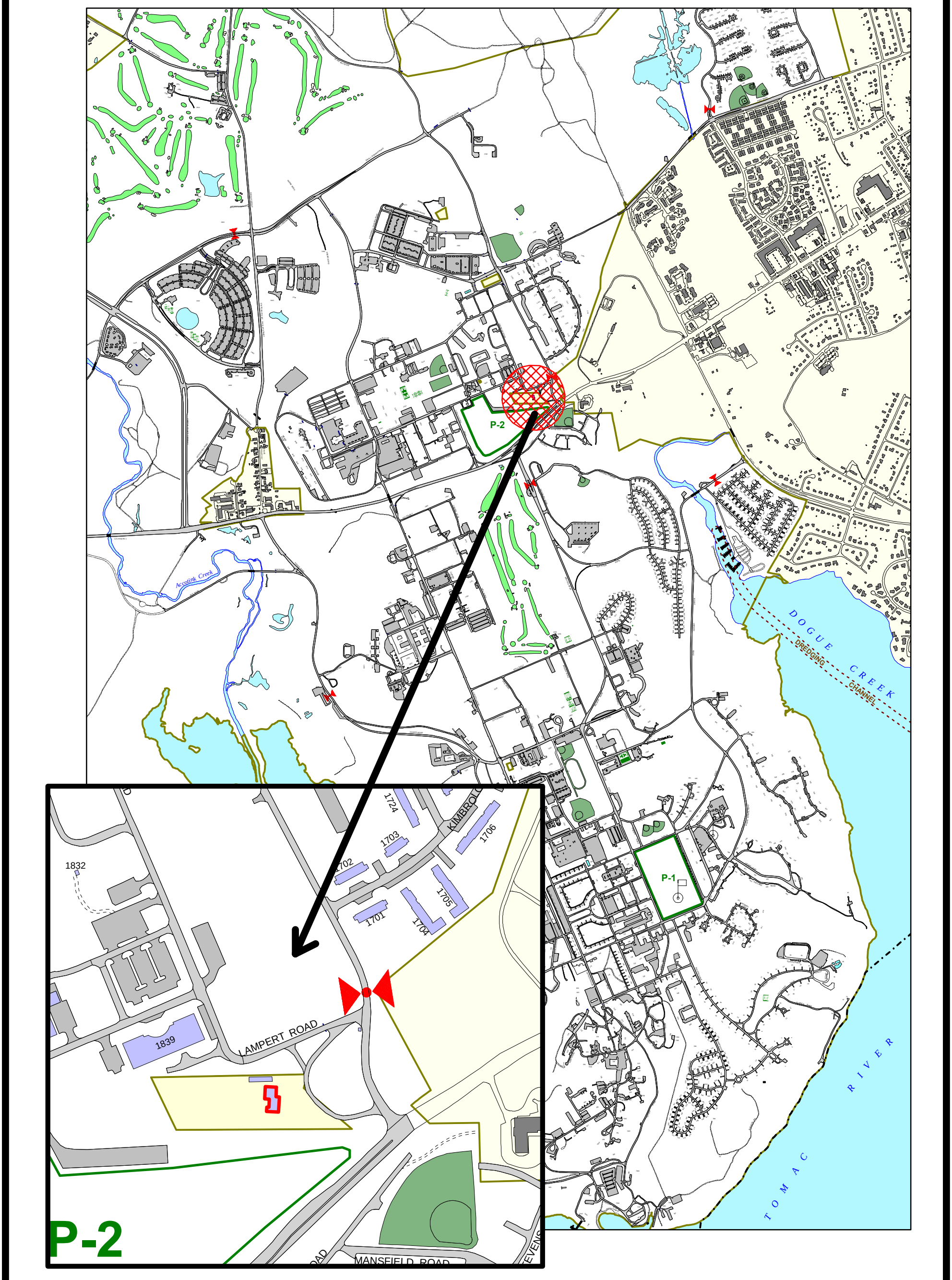
ATTACHMENT M:WOODLAWN, A NATIONAL HISTORIC LANDMARK, NATIONAL TRUST FOR HISTORIC PRE-SERVATION HOUSE MUSEUM AND ANCHOR PROPERTY WITHIN THE WOODLAWN HISTORIC OVERLAY DISTRICT ADOPTED BY THE FAIRFAX COUNTY BOARD OF SUPERVISORS.

N

PERFORMANCE GROUP

Attachment N:

Alexandria Friends Meeting, a NRHP-Eligible 19th-century Meetinghouse and Cemetery Surrounded by Fort Belvoir at the Southwest Corner of Woodlawn Road and Lampert Road and Within the Fairfax County Woodlawn Historic Overlay District



ATTACHMENT N: ALEXANDRIA FRIENDS MEETING, A NRHP - ELIGIBLE 19th CENTURY MEETING HOUSE AND CEMETERY SURROUNDED BY FORT BELVOIR AND WITHIN THE FAIRFAX COUNTY HISTORIC OVER-LAY DISTRICT

N

PERFORMANCE GROUP INCORPORATED
www.pgi-va.com

Attachment O:

George Washington Grist Mill, a NRHP-Eligible, Recreated, 18th-century-style Gristmill Located Within the Mount Vernon Estate and Gardens Property Within the Fairfax County Woodlawn Historic Overlay District

Woodlawn Plantation

Grist Mill

ROUTE 235

MOUNTVERNON MEMORIAL H

POTOMAC

DELAWARE ROAD

RAPPAHANNOCK ROAD

YORK RD

JAMES ROAD

HUDSON ROAD

SHENANDOAH ROAD

STATESMAN ROAD

FARMER ROAD

GTON ROAD

LEGEND

RCI AREA OF POTENTIAL AFFECT

FORT BELVOIR HISTORIC DISTRICT

FORT BELVOIR BOUNDARY

N

PERFORMANCE GROUP

ATTACHMENT O: GEORGE WASHINGTON GRIST MILL, A NRHP-ELIGIBLE, RECREATED, 18th CENTURY-STYLE GRISTMILL LOCATED WITHIN THE MOUNT VERNON ESTATE AND GARDENS PROPERTY, AND THE FAIRFAX COUNTY WOODLAWN HISTORIC OVERLAY DISTRICT.

APPENDIX J – Berman Tract Historic Properties Consultation Package

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

Directorate of Public Works

SUBJECT: Section 106 Consultation, Fort Belvoir Residential Communities Ground Lease Amendment, Berman Tract, Fort Belvoir, Virginia

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

Dear Mr. Holma:

Fort Belvoir proposes to amend the Fort Belvoir Residential Communities (FBRC) Ground Lease to include a 21 acre parcel of land, known as the Berman Tract, east of Woodlawn Village and the Woodlawn East parcel. The proposed undertaking involves the transfer of the Berman Tract to FBRC, and the Area of Potential Effect (APE) is the Berman Tract (map enclosed). The proposed lands covered under the ground lease amendment and future undertakings on those lands such as the construction of family housing will be subject to the stipulations set forth under the existing *Programmatic Agreement between Fort Belvoir, Virginia and the Virginia State Historic Preservation Officer for the Privatization of Family Housing at Fort Belvoir, Virginia* (PA). Therefore Fort Belvoir proposes to amend the current PA to include the Berman tract as well as other lands that have been leased to FBRC since the execution of the PA (VHDR File #s: 2011-0986 and 2014-1064). A draft PA amendment is enclosed for your review and comment.

Fort Belvoir has undertaken historic resource identification efforts within and adjacent to the APE. No historic architectural resources were identified within the proposed lease parcel. Archaeological studies conducted within the Berman Tract and Woodlawn East parcels have shown no archaeological resources present that are eligible for listing on the National Register of Historic Places (VDHR File #'s: 2005-0111 and 2015-0198).

Fort Belvoir has determined that no historic properties will be affected by the proposed FBRC Ground Lease Amendment for the Berman Tract as outlined above [36 CFR § 800.4]. Please provide comment on our determination of no historic properties affected in accordance with 36 CFR § 800.4(d). Please also provide comment on the draft PA amendment in accordance with Stipulation X of the PA and 36 CFR Part

800.6(c)(7). If we do not receive your comments within the required 30 days, we will assume no comment and proceed with the land transfer as planned. After 30 days, we will also assume no comment on the draft PA amendment and will send a final PA amendment for Virginia State Historic Preservation Officer signature. We look forward to working with you on this PA amendment.

Point of contact is Ms. Alison Talbot, Cultural Resources Manager, at 703-806-3759.

Sincerely,

Bill Sanders
Director

Enclosures

US Army Garrison Fort Belvoir

Section 106 Consultation, Fort Belvoir Residential Communities Ground Lease Amendment, Berman Tract, Fort Belvoir, Virginia.

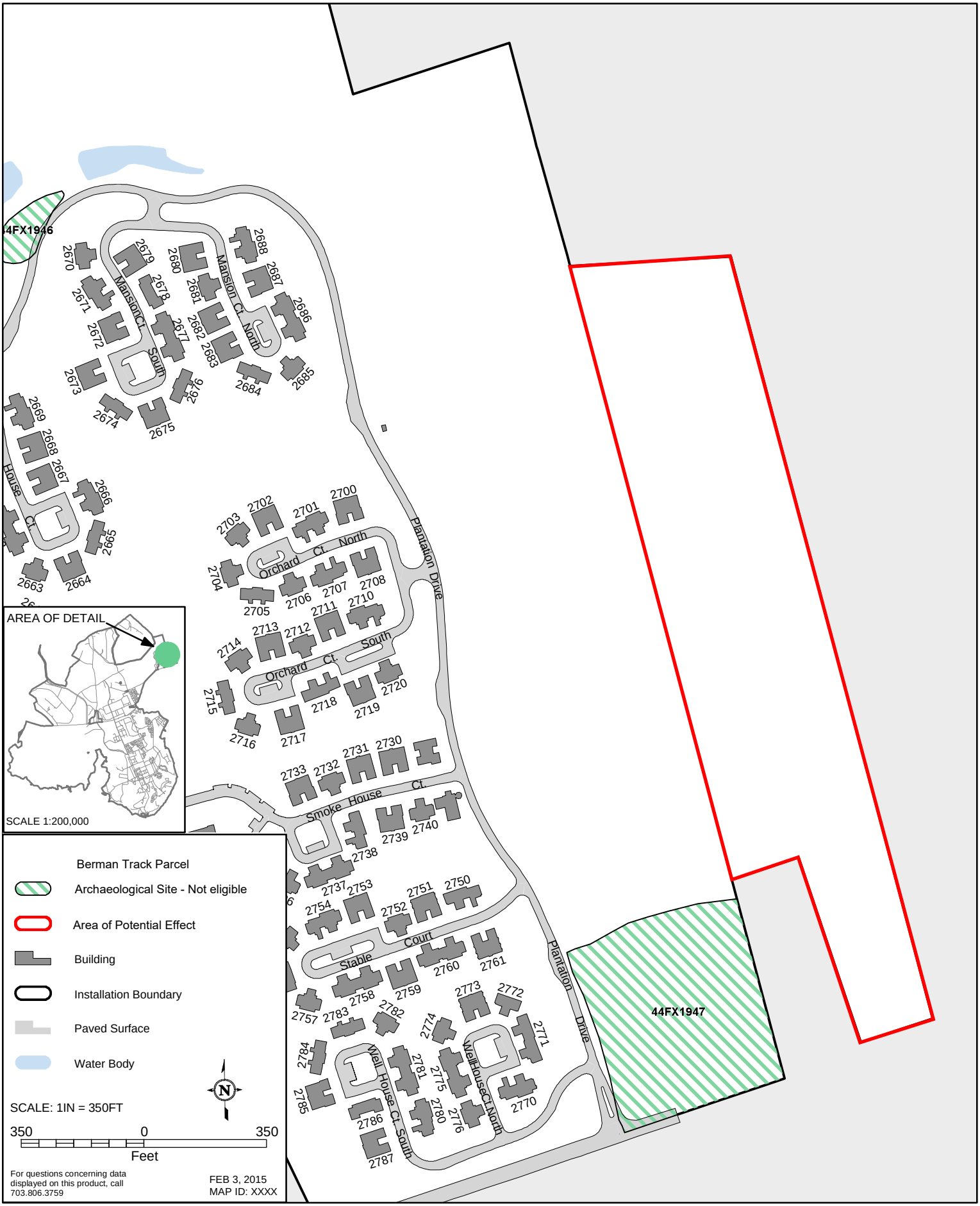
VDHR File #: 2015-0594

VDHR has reviewed the above referenced project and concurs with the Army's determination of No Historic Properties Affected.

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

22 June 15
Date

Fort Belvoir - Area of Potential Effect - FBRC Woodlawn East Development



APPENDIX K – ENVIRONMENTAL CONDITION OF PROPERTY

Draft

Environmental Condition of Property Report for the Woodlawn East-Berman Tract Parcel at Fort Belvoir, Virginia

Prepared for

United States Army Corps of Engineers, Norfolk District

and

Fort Belvoir Residential Communities Initiative

With Technical Assistance from

InDepth Corporation
Midlothian, Virginia

March 2014

This page was intentionally left blank.

.

TABLE OF CONTENTS

APPENDICES

EXECUTIVE SUMMARY

This Environmental Condition of Property (ECP) Report addresses one 52.41-acre parcel of undeveloped land at Fort Belvoir, Virginia that is proposed for military family housing as part of the Military Housing Privatization Initiative. The parcel, commonly referred to as the Woodlawn East/Berman Tract, includes the 20.95-acre parcel Berman Tract portion proposed for lease to Fort Belvoir Residential Communities, LLC (FBRC) and the adjacent 31.46-acre Woodlawn East parcel, which is currently leased by FBRC. The Woodlawn East and Berman Tract Parcels (together the "Subject Property") will be developed for military family housing. The Subject Property is located in the northeast portion of the North Main Post area of Ft. Belvoir.

Department of Defense (DoD) policy and Army Regulation 200-1 require that the environmental condition of property be determined before any real property may be sold, leased, transferred, or acquired. The Army can use the ECP report in decision-making associated with future real property transactions. This ECP report was prepared to meet DoD requirements of property suitability to transfer under Title 40, Code of Federal Regulations (CFR), Part 373.1 and US Army regulation (AR) 200-1, and in accordance with American Society for Testing and Materials (ASTM) *Standard Practice for Conducting Environmental Baseline Surveys*, and *Phase I Environmental Site Assessment Process* (ASTM D6008-05 and E1527-13).

The objective of this ECP report is to document the environmental conditions of the Subject Property in support of real estate decisions, to determine the risk of exposure to any environmental contaminants by the property recipients, and to inform grantees of environmental conditions, restrictions, and land use controls associated with the real property. The ECP summarizes readily available, factual, environmentally relevant information obtained during record/document searches, site visits, and interviews.

Visual Site Inspection (VSI) of the subject property was performed on March 10, 2014. The VSIs included a physical walk of the entire property and the perimeter with visual inspection of the grounds for observable environmental impacts. A "fence line" visual survey of adjacent properties was also conducted.

Interviews were performed with Fort Belvoir Directorate of Public Works – Environmental and Natural Resource Division (DPW-ENRD) personnel that were knowledgeable of the property and its historical and current use and environmental conditions, via in-person interviews, telephone, and electronic correspondence. Interviews also addressed historical and current environmental conditions at adjacent and nearby properties.

Environmental concerns identified on or adjacent to the Subject Property were used to determine the ECP classification for the land area. Based on results of Military Munitions Response Program (MMRP) investigations, the Woodlawn East portion of the Subject Property has been classified as **Category 6/Red** – areas where a release, disposal, and/or migration of hazardous substances has occurred, but required actions to protect human health and the environment have not yet been implemented. The Berman Tract portion of the Subject Property has been classified **Category 7/Gray** - areas that are not evaluated or require additional evaluation, due to the absence of MMRP assessment of this portion of the Subject Property.

Table ES-1 summarizes the environmental condition of the Subject Property by land area.

Table ES-1
Summary of Proposed ECP Rating, Woodlawn East/Berman Tract

Parcel Name	Environmental Condition of Property
Berman Tract portion	7/Gray
Woodlawn East portion	6/Red

Notes: The environmental condition of property definitions are derived from the (CERFA) Guidance and the DoD BRAC Plan Guidebook. Department of Defense ECP Classification codes:

Category 1. (WHITE)—areas where no release or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas). However, the area may have been used to store hazardous substances or petroleum products.

Category 2. (BLUE)—areas where only a release or disposal of petroleum products and/or their derivatives has occurred (including migration of petroleum products from adjacent areas).

Category 3. (LIGHT GREEN)—areas where a release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.

Category 4. (DARK GREEN)—areas where a release, disposal, and/or migration of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.

Category 5 (YELLOW)—areas where a release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions to protect human health and the environment are underway, but all required remedial actions have not yet taken place.

Category 6. (RED)—areas where a release, disposal, and/or migration of hazardous substances has occurred, but required actions to protect human health and the environment have not yet been implemented.

Category 7. (GRAY)—areas that are not evaluated or require additional evaluation.

1.0 INTRODUCTION

1.1 Introduction and Background

This Environmental Condition of Property (ECP) Report was prepared for a long-term property lease from the US Army to Fort Belvoir Residential Communities, LLC (FBRC) of a 20.95-acre parcel of land (the Berman Tract) at Fort Belvoir, Virginia and the adjacent 31.46-acre parcel (Woodlawn East) that will also be developed and is currently leased by FBRC. The Woodlawn East and Berman Tract Parcels (together the "Subject Property") are located at the northeast area of North Main Post at Ft. Belvoir. The Woodlawn East-Berman Tract Parcel will be developed by FBRC for military family housing by means of a Long-Term Lease.

This ECP was prepared to meet the Department of Defense (DoD) requirements of property suitability to transfer under Title 40, Code of Federal Regulations (CFR), Part 373.1 and US Army Regulation (AR) 200-1.

The objective of this ECP report is to document the environmental conditions of the Subject Property in support of real estate decisions, to determine the risk of exposure to any environmental contaminants by the property recipients, and to inform grantees of environmental conditions, restrictions, and land use controls associated with the real property. Specifically, the primary objective is to identify and define areas where potentially hazardous and/or toxic substances, as well as petroleum, oils, and lubricants (POL), may have been stored, disposed of, or released at the investigated site.

The ECP summarizes readily available, factual, environmentally relevant information obtained during record/document searches, site visits, and interviews.

1.2 Property Description

The Subject Property, designated the Woodlawn East-Berman Tract Parcel, is entirely within the boundaries of Fort Belvoir. The Subject Property is located to the east of Plantation Drive, to the west of the Timothy Park neighborhood along Orville Street, and north of Pole Road directly adjacent to the eastern border of the Woodlawn Village neighborhood. The Subject Property consists of two parcels, Woodlawn East and the Berman Tract. Woodlawn East is currently part of the FBRC leased property, but is currently undeveloped. The Berman Tract is being

transferred by the Army to FBRC by means of a long-term lease. Both properties together will be developed with a new housing neighborhood. The two parcels total 52.41 acres. Figures depicting the Subject Property location, vicinity, and layout are included as Figures 1 through 3 in Appendix A.

1.3 ECP Organization

This ECP for the 52.41-acre Subject Property at Fort Belvoir is organized into the following sections:

Executive Summary: Provides a brief overview of the ECP and the conclusions developed during the investigation.

Section 1 – Introduction: Discuss the general purpose of the ECP and the content/structure of the report.

Section 2 – Survey Methodology: Describes the procedures and steps taken for conducting the ECP.

Section 3 – Summary of Data for Property to be Conveyed: Provides a brief history of Fort Belvoir and the environmental setting of the area. Provides information on the past, present, and future, uses of the Subject Property as well as adjacent properties. Discusses historical and present environmental conditions on the Subject Property.

Section 4 – Effect from Adjacent Parcels: Discusses historical and present environmental conditions near the Subject Property.

Section 5 – Conclusions: Discusses significant findings of the ECP and any recognized environmental conditions that may impact the property transfer.

Section 6 – Persons Consulted: Lists persons interviewed in person, by phone, and electronically during preparation of the ECP.

Section 7 – References: List documents and environmental sources reviewed during preparation of the ECP.

Section 8 – Acronyms: List of acronyms used and referenced in the ECP report.

1.4 Limitations

This ECP report documents the current physical and environmental conditions of the Subject Property selected for conveyance. To develop the report, the preparers obtained and reviewed relevant information concerning the Subject Property. The report relies on information collected from record searches, interviews, and visual inspections performed within a reasonable and practical timeframe. It is possible that unavailable or undisclosed information might indicate environmental concerns on the Subject Property that were not apparent to the preparers of this report. Although the preparers made every effort to collect and analyze accessible information, additional information that might affect the conclusions presented in this report could become available over time.

The conclusions presented in this report are professional opinions based solely on InDepth personnel's visual observations of the Subject Property and the adjacent properties, interpretation of the readily available historical information, interviews with personnel knowledgeable about the Subject Property, and other reasonably ascertainable information.

A reference list of documentation used to make the conclusions is provided in Section 7.0.

2.0 SURVEY METHODOLOGY

2.1 Approach and Rationale

A series of established procedures were followed during this ECP to obtain information detailing past and current activities that may have a potential environmental impact on or around the Subject Property.

The preparation of this ECP Report followed an established set of procedures and is designed to meet the substantive requirements of applicable standards and guidance documents. A list of the references used for the development of the ECP is included in Section 7.0 of this document.

To determine the presence or absence of environmental conditions at the properties, the following procedures were performed:

Record Review: Reasonably ascertainable records were obtained relating to hazardous substances, petroleum products, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and the Resource Conservation and Recovery Act (RCRA) in connection with the Subject Property. Documents pertaining to the Subject Property and adjacent properties were provided by the Army and were reviewed. Pertinent federal and state databases were also reviewed. An on-site file review of pertinent state environmental documents was also performed at the Virginia Department of Environmental Quality (VDEQ) office in Woodbridge, Virginia on March 19, 2014.

Visual Site Inspection: Visual site inspection (VSI) of the Subject Property was performed on March 10, 2014. Photographs taken of the Subject Property are included in Appendix B.

Interviews: Fort Belvoir Department of Public Works – Environmental and Natural Resource Division (DPW-ENRD) personnel that were knowledgeable of the property and its conditions were interviewed.

Evaluation and Report Preparation: Data gathered during the record review, site reconnaissance, and interviews was evaluated and organized into a format designed to summarize the ECP findings and state any environmental conditions with potential risks or liabilities at the property.

2.2 Record Review

Documents related to the Subject Property and surrounding properties provided by DPW-ENRD were reviewed to analyze the current environmental condition of the parcel.

In addition, consistent with the AAI standard (ASTM E1527-13) and customary and usual practice, environmental databases and governmental records (environmental records review) provided by Environmental Data Resources, Inc. (EDR) were utilized and reviewed to characterize the obvious and apparent uses of the Subject Property and surrounding properties.

2.3 Visual Site Inspection

VSI of the subject property was performed on March 10, 2014. The VSI included a physical walk of the entire property and the perimeter with visual inspection of the grounds for observable environmental impacts. Observable environmental impacts inspected for include historical dumping and landfilling on the site; any liquids, spills, staining of soils, distressed vegetation, unusual odors, storage of waste, presence refuse and/or debris, and other characteristics that might indicate a previous spill, accident, or release of potentially hazardous materials or petroleum products. Photographs of the Subject Property VSI are included in Appendix B.

2.4 Interviews

Interviews were performed with Fort Belvoir DPW-ENRD personnel that were knowledgeable of the property and its historical and current use and environmental conditions, via in person interviews, by telephone, and electronic correspondence. Interviews also addressed historical and current environmental conditions at adjacent and nearby properties.

2.5 Reconnaissance of Adjacent Properties

The preparers conducted automobile and walking tours to determine whether any activities taking place on the adjacent properties pose an environmental threat to the Subject Property. Items subject to observation included: types of business in the area, indicators of aboveground and belowground storage of chemical or petroleum products, stressed vegetation, and land use practices that might directly affect the Subject Property. Observations were made from the right-of-way and did not include access to buildings. Photographs are included in Appendix B.

2.6 Property Classification Guidelines

The following environmental categories were developed jointly by representatives from the Office of the Secretary of Defense, the Military Services, the U.S. Environmental Protection Agency (USEPA), and the California Environmental Protection Agency to describe the environmental condition of DoD property nationwide. These classifications are required by the Community Environmental Response Facilitation Act of 1992 (CERFA) and DoD during property transfer activities, and mandate the use of specific color maps for each of seven environmental condition categories. After an analysis of the available data, each parcel can be classified into one of the following seven categories:

- Category 1. (WHITE)—areas where no release or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas). However, the area may have been used to store hazardous substances or petroleum products.
- Category 2. (BLUE)—areas where only a release or disposal of petroleum products and/or their derivatives has occurred (including migration of petroleum products from adjacent areas).
- Category 3. (LIGHT GREEN)—areas where a release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.
- Category 4. (DARK GREEN)—areas where a release, disposal, and/or migration of hazardous substances has occurred, and all remedial actions necessary to protect human health and the environment have been taken.
- Category 5 (YELLOW)—areas where a release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions to protect human health and the environment are underway but all required remedial actions have not yet taken place.
- Category 6. (RED)—areas where a release, disposal, and/or migration of hazardous substances has occurred, but required actions to protect human health and the environment have not yet been implemented.
- Category 7. (GRAY)—areas that are not evaluated or require additional evaluation.

3.0 SUMMARY OF DATA FOR PROPERTY TO BE CONVEYED

3.1 Historical and Current Use

In 1912, the federal government started purchasing land that later became Fort Belvoir. Initially the land was mainly used as a summer training area for engineers stationed at Washington Barracks (Fort McNair). In 1917, the Federal government began building structures on the land and formal training at Fort Belvoir was started. The installation gained permanent status as Fort A.A. Humphreys in 1922 and was renamed Fort Belvoir in 1935. During World War II, Fort Belvoir was used as a temporary base for soldiers. Until 1988, Fort Belvoir was the Army's Engineer Training School.

Fort Belvoir is the Army's principal administrative and logistics center for the National Capital Region (NCR). Fort Belvoir is one the military installations managed and funded within the Installation Management Command (IMCOM) Atlantic Region. Fort Belvoir is home to two Army major command headquarters and elements of 10 others; 19 different agencies of the Army; 8 elements of the U.S. Army Reserve and the Army National Guard; 26 DoD agencies; a Marine Corps detachment; a U.S. Air Force activity; and an agency from the Department of the Treasury.

The Woodlawn East-Berman Tract Parcel is located to the east of Plantation Drive, to the west of the Timothy Park neighborhood along Orville Street, and north of Pole Road in the northeast corner of Fort Belvoir. Figures depicting the Subject Property location, vicinity, and layout are included as Figures 1 through 3 and the Subject Property location is depicted on the topographic map on Figure 4 in Appendix A. The Subject Property consists of 52.41 acres of wooded undeveloped land, 31.46 acres for Woodlawn East and 20.95 acres for the Berman Tract. The Subject Property was previously divided into two separate parcels, Woodlawn East and the Berman Tract. The western portion of the Subject Property (Woodlawn East) was originally included as part of the Woodlawn Village neighborhood as part of the original privatization of the housing in 2004. The Berman Tract was previously owned by the Fairfax County Park Authority and was obtained by Fort Belvoir in 2005. The Woodlawn East portion is being evaluated in this ECP based on its change in use and the Berman Tract will be added to the footprint of the privatization program and added to the FBRC long-term ground lease.

According to the 2003 Ft. Belvoir Residential Communities Initiative Environmental Baseline Study (EBS), the Woodlawn East portion of the Subject Property was a farm and forested area during the 1930s and was previously used by the Bureau of Standards as a Radio Laboratory Area (around 1950). Review of the 2012 Remedial Investigation Report for Military Munitions Response Program (MMRP) stated that the Woodlawn East Parcel and adjacent properties to the west and north were used from 1940 through 1951 to train Army engineers in the use of demolition materials and to practice demolition techniques (i.e., bridge demolition, crater charges, mine clearance, roadblock demolition). Demolition may have occurred on the surface, within steel pits, or below ground.

Review of the 2004 Berman Tract EBS indicates that the Berman Tract portion was farmland in the 1930s. In approximately 1953, at the time of construction of the adjacent Timothy Park residential neighborhood, earthwork for development of the land was begun. However, the development of the Berman Tract was abandoned prior to construction. The Berman Tract portion then became forested over time.

3.1.1 Historical Aerial Photographs

Aerial photographs for the Subject Property from 1937, 1953, 1962, 1974, 1981, 1988, 1994, 1998, 2000, 2005, 2006, 2007, 2008, 2009, 2010, 2011, and 2012 were reviewed and are included as Attachment D. It should be noted that no aerial photographs were available from 1938 to 1953 timeframe. Following is a summary from a review of the aerial photos.

1937 – The Subject Property and adjacent properties to the east, west, and south appear to be in use as agricultural land. The adjacent property to the north appears to be undeveloped wooded land. A housing structure appears to be located in the cutout area of the southern border, which is currently a residential lot. Some buildings, likely farming-related structures, appear to be present in the southeast corner of the Subject Property.

1953 – The majority of the Woodlawn East portion of the Subject Property appears to be wooded, with some roads or paths located in the northwest corner of the parcel. The Berman Tract appears to have roads cut similar to those in the adjacent Timothy Park neighborhood, which appears to be partially developed with houses and roads. The previous buildings in the southwest corner of the Subject Property are not visible. The property adjacent to the west appears to be developed with roads and some small buildings, likely from the Radio Laboratory

Area. The adjacent property to the south appears to be developed with residential structures. The adjacent property to the north remains undeveloped wooded land.

1962 – The Subject Property appears to be primarily wooded land. The adjacent property to the east, the Timothy Park neighborhood, has been developed with approximately 10 residential structures. The property adjacent to the west appears to still be cleared with roadways; however most of the small buildings are no longer present. The adjacent properties to the south and north appear unchanged.

1974 – The Subject Property appears to be fully wooded land. The adjacent property to the east, the Timothy Park neighborhood, appears to be nearly fully developed with residential structures. The property adjacent to the west appears to be mostly wooded with some roads still present. The adjacent properties to the south and north appear unchanged.

1981 – The Subject Property appears to be fully wooded land. The adjacent property to the east appears to be fully developed with residential structures. The property adjacent to the west appears to be recently developed with the Woodlawn Village neighborhood. The cutout on the western border of the Subject Property appears to have been cleared. The adjacent property to the south appears to be fully developed with residential structures. The adjacent property to the north appears unchanged.

1988 – The Subject Property and adjacent properties appear to be unchanged.

1994 – The Subject Property and adjacent properties appear to be mostly unchanged. The cutout in the western border of the Subject Property appears to have a building constructed on it, likely a property maintenance facility.

1998 – The Subject Property and adjacent properties appear to be unchanged.

2000 – The Subject Property and adjacent properties appear to be unchanged.

2005 – The Subject Property and adjacent properties appear to be unchanged.

2006 – The Subject Property and adjacent properties appear to be unchanged.

2007 – The Subject Property and adjacent properties appear to be mostly unchanged. The maintenance building on the western border appears to have been demolished.

2008 – The Subject Property and adjacent properties appear to be unchanged.

2009 – The Subject Property and adjacent properties appear to be unchanged.

2010 – The Subject Property and adjacent properties appear to be unchanged.

2011 – The Subject Property and adjacent properties appear to be unchanged.

2012 – The Subject Property and adjacent properties appear to be unchanged.

According to the *Remedial Investigation Report, Four Munition Response Sites* (Shaw, December 2012), in August 2007 an Aerial Photographic Analysis (APA) report was prepared and provided an illustration of Ft. Belvoir activities between 1943 and 1980. Portions of the Subject Property were included in the APA review and multiple locations of ground scarring, craters, and pits were identified in the 1944 aerial photograph. Also identified was a mine clearing and mine laying training area to the east and demolition training areas to the west. In 1953, the northern portion of the Munitions Response Site (MRS) previously seen to contain extensive ground scarring had been covered in dense vegetation and no longer appeared to be in use. The mine clearing and mine laying training area had receded in size and been relocated to the south. In the southwest portion of the MRS, a pond had been created. To the north of the pond, there was still ground scarring associated with a demolition training area, although it was not as extensive as those identified in 1944. By 1962, the demolition training area had been re-vegetated.

3.1.2 Historical Topographic Maps

Historic Topographic Maps for the Subject Property from 1894, 1913, 1925, 1944, 1951, 1956, 1957, 1965, 1971, 1980, 1983, and 1994 were reviewed. The following is a summary from a review of the historical topographic maps. The topographic maps are included as Appendix E.

1894 – Pole Road is depicted south of the Subject Property; however no buildings are shown.

1913 – No roads or buildings are depicted in the area of the Subject Property.

1925 – Two small buildings are depicted within or adjacent to the southern border of the Subject Property.

1944 – The Subject Property is depicted with one small building.

1951 – Two buildings are depicted in the cutout of the south border of the Subject Property. The former roads and buildings at the adjacent parcel to the west are depicted and some of the homes to the east and south are depicted.

1956 – No significant changes from 1951 are noted.

1957 – No significant changes from 1956 are noted.

1965 – More homes are depicted to the east.

1971 – More homes are depicted to the east.

1980 – More homes are depicted to the east.

1983 – The Woodlawn Village housing is depicted to the west.

1994 – The Subject Property and adjacent properties are depicted in their current configurations.

3.2 Visual Site Inspection

The VSI of the Subject Property was performed on March 10, 2014. The Subject Property is an irregular shaped parcel of 52.41 acres. The subject property is bound by Plantation Drive followed by the Woodlawn Village housing area to the west, a power easement to the northwest, the Timothy Park residential neighborhood to the east, Pole Road followed by residential housing to the south, and wooded land to the north. The southern boundary of the subject property has an area cut out that is occupied by a neighborhood of five newly constructed single-family homes along Longfields Lane.

During the site reconnaissance, the subject property was observed to be wooded land consisting of forested areas with standing water, downed trees, and several berms scattered throughout the site. According to the Berman Tract EBS, the berms were likely added to prevent stormwater runoff from the Subject Property to the Timothy Park neighborhood to the east. The longest

berm is located in the central portion and extends in an east-west direction through the majority of both parcels. Most surface drainage water was observed to flow in a southerly direction.

An area with concrete demolition debris field, approximately 1,500 square feet or greater, was observed on the west central portion of the site. A 1,000 square foot brick foundation remains from a former structure on the southwestern portion of the site. Indiscriminate waste dumping was observed on the most eastern portion of the site behind the residential housing along Orville Street.

No evidence of any present or past releases of petroleum or polychlorinated biphenyl (PCB)-containing products was observed. No stained soil or stressed vegetation was observed. No above or underground storage tanks or PCB-containing equipment was observed.

3.3 Environmental Setting

Fort Belvoir is located in southeastern Fairfax County, Virginia, approximately 12 miles southwest of Washington, DC; 10 miles from the Pentagon; and 5 miles from Alexandria, Virginia. Fort Belvoir's main entrance is just off of U.S. Route 1 and Belvoir Road, which is the main thoroughfare. Route 1 divides Fort Belvoir into areas known as North Post and South Post. The Subject Property is located in the northeastern corner of Fort Belvoir and is separated from the North Main Post area by Dogue Creek.

3.3.1 Topography

Fort Belvoir lies within the Coastal Plain Physiographic Province. The Coastal Plain Physiographic Province consists of unconsolidated sand, silt, and clay underlain by residual soil and weathered crystalline rocks. The topography of Fort Belvoir consists of two nearly level plateaus that run south-southeast towards the Potomac River, and slope steeply to lowlands that are primarily associated with the floodplains of Accotink and Dogue Creeks. Fort Belvoir ranges in elevation from approximately mean sea level along the Potomac River to 230 feet above mean sea level at the northern areas of the base (CH2M Hill, 2003). The Subject Property is generally flat with an elevation of approximately 34 feet above mean sea level. Topography in the surrounding area is generally flat.

3.3.2 Geology and Hydrology

Most of the Coastal Plain Physiographic Province deposits in the Subject Site area consist of a sequence of unconsolidated Cretaceous sediments that belong to the Potomac Group. These sediments consist of predominantly lenticular deposits of sand, silt, clay, and gravel of non-marine origin. The Potomac Group is about 600-foot (183-meter) thick beneath most of the installation. (CH2M Hill, 2003)

The area is underlain by three main groundwater aquifers: the lower Potomac, middle Potomac, and Bacons Castle Formation. The lower Potomac aquifer is the primary aquifer in eastern Fairfax County and on the installation. Water in the lower Potomac aquifer flows to the southeast. The middle Potomac aquifer consists of interfingering lenses of medium sand, silt, and clay. The middle Potomac confining unit is not present in the Fort Belvoir area. The Bacon Castle Formation is the shallowest aquifer at Fort Belvoir. The aquifers flow is localized depending on adjacent features such as streams and creeks. Depth to the water table at Fort Belvoir is typically 10 to 35 feet below land surface. (CH2M Hill, 2003)

3.3.3 Surface Water

Fort Belvoir is within the 64,000-square-mile Chesapeake Bay watershed and is along the shoreline of the Potomac River the second largest tributary to the Chesapeake Bay and several Potomac River tributary embayments. The Subject Property is northwest of Dogue Creek. According to document review and the site reconnaissance, there is no defined surface water present within the Subject Property.

3.4 Environmental Condition of the Subject Property

3.4.1 Stormwater

No underground stormwater conveyance systems were observed on the Subject Property. Stormwater appears to flow to the south at the Subject Property based upon elevation and local topography.

3.4.2 Floodplains

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for Fairfax County (Map #51059C0385E and #51059C0405E) were reviewed. The Subject Property and surrounding areas are not within a 100-year or 500-year floodplain. The FIRM depicts a 100-year flood plain, associated with Dogue Creek, approximately ⅓-mile west of the Subject Property. The Waters of the US (WOUS) Report prepared by WSSI for the Subject Property also stated that no 100-year or 500-year floodplains are present at the Subject Property.

3.4.3 Wetlands

The US Fish and Wildlife Services (USFWS) Digital Wetlands Mapper for the Subject Property and surrounding areas was reviewed. The wetlands mapper depicts "freshwater forested/shrub wetlands" within the Subject Property. According to WSSI's WOUS Report for the Subject Property, jurisdictional waters of the U.S. composed of palustrine forested and palustrine emergent wetlands are present throughout the Subject Property.

3.4.4 Threatened or Endangered Species

According to DPW-ENRD personnel, there is potential for the presence of box turtles on the Subject Property. Prior to the beginning of site work and/or construction DPW-ENRD should be consulted as to whether a habitat study or survey of the Subject Property is required. DPW-ENRD should be consulted as to how to handle box turtles present within the construction area prior to beginning work. In addition, small-whorled pogonias may be present within the Subject Property, and a small-whorled pogonia inspection should be conducted between June 1st and July 20th. No presence of other protected or endangered species such as bald eagles or peregrine falcons was reported in the EBS reports or DPW-ENRD interviews.

3.4.5 Historical and Cultural Resources

According to DPW-ENRD personnel and document review, an archaeological site (44FX1947) is located in the southwest corner of the Woodlawn East portion of the Subject Property. During construction, DPW-ENRD will flag the area and it should be avoided to prevent disturbing the site. Document review, including the Phase I Cultural Resources Inspection Report (Milner 2005) completed for the Berman Tract portion of the Subject Property, indicated no other known or suspected cultural resources within the Subject Property.

3.4.6 Storage Tanks

Based upon document review and interviews, no current or historical Underground Storage Tanks (USTs) or Aboveground Storage Tanks (ASTs) were identified at the Subject Property.

3.4.7 Asbestos Containing Materials (ACM)

No current buildings were identified on the Subject Property; therefore, potential ACM containing materials were not identified. No suspect ACM was observed during the VSI.

3.4.8 Lead-Based Paint (LBP)

No current buildings were identified on the Subject Property; therefore, potential LBP containing materials were not identified. No evidence of suspect LBP chips was observed during the VSI.

3.4.9 Polychlorinated Biphenyls

PCBs are industrial compounds that were historically used in electrical equipment such as transformers and lighting ballasts due to their non-conductivity and stability at high temperatures. PCBs are considered to be carcinogenic and, if released, persist in the environment, bioaccumulate in organisms, and become concentrated in the food chain. The disposal of PCBs is regulated by the Toxic Substances Control Act (TSCA).

No known use of pole-mounted transformers, pad-mounted transformers, or other PCB-containing equipment at the Subject Property was indicated by document review or interviews.

3.4.10 Installation Restoration Program

Based on interviews and document review with DPW-ENRD personnel, with the exception of MMRP Demolition Area - 01, there are no Installation Restoration Program (IRP) sites within or adjacent to the Subject Property.

3.4.11 Unexploded Ordnance (UXO), Discard Military Munitions (DMM), and Munitions Constituents (MC)

Demolition Area – 01 is located in the northeastern portion of Fort Belvoir Main Post and occupying approximately 312 acres. The Demolition Area – 01 includes the western half of the Subject Property (the Woodlawn East portion), the Woodlawn Village Housing, and undeveloped and unmaintained land including the Jackson Miles Abott Wetland Refuge. A depiction of the

location of Demolition Area – 01 is provided as Figure 5. The eastern half of the Subject Property (Berman Tract) is adjacent and to the east of the Demolition Area – 01 MMRP defined boundary.

According to the *Remedial Investigation Report, Four Munition Response Sites* (Shaw, December 2012) the Demolition Area 01 MRS was used from 1940 to 1951 to train Army engineers in the use of demolition materials and to practice demolition techniques (i.e., bridge demolitions). Demolitions may have occurred on the surface, within steel pits, or below ground.

Several previous investigations of the Demolition Area – 01 have been conducted. A Historical Records Review (HRR) was completed in March 2006 to compile documentation on known MMRP sites at Fort Belvoir. In August 2007, an Aerial Photographic Analysis report was prepared and provided an illustration of Ft. Belvoir activities between 1943 and 1980. For Demolition Area – 01, multiple locations of ground scarring, craters, and pits were identified in the 1944 aerial photograph. Also identified was a mine clearing and mine laying training area to the east and demolition training areas to the west. In 1953, the northern portion of the MRS previously seen to contain extensive ground scarring had been covered in dense vegetation and no longer appeared to be in use. The mine clearing and mine laying training area had receded in size and been relocated to the south. In the southwest portion of the MRS, a pond had been created. To the north of the pond, there was still ground scarring associated with a demolition training area, although it was not as extensive as those identified in 1944. By 1962, the demolition training area had been re-vegetated. A range training area was observed to overlay the MRS along the northwest boundary. No mine laying or mine clearing areas were identified, although a probable demolition bunker, probable blast/burn mark, and a berm were identified in the southeast area of the MRS (Shaw, December 2012).

A Site Inspection (SI) Report was completed in January 2008 for MMRP sites including Demolition Area – 01. In Demolition Area – 01, the SI found a single MEC item (smoke grenade with exposed filler and a compromised fuse) and a Munitions Debris (MD) item (M129 flare), in addition to several structures and possible craters. Five soil samples were collected from Demolition Area – 01 and analyzed for target analyte list (TAL) metals and explosives. Metals were not detected above the documented background range and no explosives were detected. Demolition Area – 01 was recommended for a Remedial Investigation (RI) to assess the potential for additional MEC to be present (Shaw, December 2012).

A Final Remedial Investigation Report was completed for Demolition Area – 01 in December 2012. The RI included surface reconnaissance over the entirety of the MRS to locate former range features such as craters, pits, bunkers, structures, signs, areas of high magnetic anomalies, and MEC/MD on the surface. Subsurface anomaly investigation was performed to assess the presence and nature of metallic items that could represent MEC/MD. Soil sampling was also performed at locations where MC releases may have occurred. During the RI, no MEC was found at the MRS, although MD in the form of inert training mines with inert fusing and expended illumination and smoke signaling devices were found. An intrusive subsurface investigation uncovered 60 MD items, with the majority identified within the Woodlawn East portion of the Subject Property. The RI report stated "*for portions of the MRS investigated during the RI, UXO Estimator (Version 2.2) calculated with a 90 percent confidence that there is no greater than 0.467 MEC/acre in Demolition Area – 01. It was noted in the RI that the investigation was focused on undeveloped areas of the MRS. A significant portion of Demolition Area – 01 was developed in 1980 to create the Woodlawn Village housing area. The RI stated the lack of reported MEC finds during development and in the years since supports the conclusion that the MEC density in the MRS is low*".

The RI concluded that although the amount of MEC is expected to be low, the use of high explosives (HE) is indicated in archival documentation and it is possible that training mines with intact fuzing remain at the site, as well as signal flares or smoke grenades that failed to function. Therefore, complete pathways for all receptors with access to the MRS exist. The MEC Hazard Assessment (HA) methodology resulted in a score of 760 for Demolition Area – 01. MC Sampling was conducted at the area during the RI and indicated some explosives were positively identified during off-site laboratory analysis, results were found well below screening levels, and, therefore, no source was identified and incomplete pathways exist for all receptors. The RI recommended that a feasibility study (FS) be performed for Demolition Area – 01 to evaluate remedial options associated with potential MEC.

In May 2013 an Engineering Evaluation/Cost Analysis (EE/CA) Land Use Controls was completed for various MMRP sites, including Demolition Area – 01. A Land Use Controls Alternative was evaluated. This alternative included a combination of institutional controls (land use restrictions, notation in the Installation Master Plan, dig permits) and signs for all MRSs, plus the MRS-specific measure of advisories.

In October 2013, a Final Action Memorandum (AM) was prepared to serve as the decision document for identifying interim Land Use Controls (LUCs) as the appropriate alternative for the Non-Time Critical Removal Action (NTCRA) at Fort Belvoir, Virginia. The LUCs alternative considered for Fort Belvoir involved a combination of Institutional Controls (including land use restrictions, notations in the Installation Master Plan, and dig permits) and Engineering Controls (posting signs). These LUCs measures were considered for all nine MRSs at Fort Belvoir (including Demolition Area – 01). The Army Environmental Database - Restoration (AEDB-R) provides a list of possible LUCs that includes 22 institutional controls, 4 engineering controls, and 21 land use restrictions. The list is narrowed down to include actions that address on-post MRSs only, and are short-term NTCRA options to be implemented while more permanent actions are determined.

At the current time, an FS is being finalized for Demolition Area – 01, which includes a portion of the Subject Property. The Draft-Final document indicated that "*Demolition Area – 01 has a relatively low MEC density based on the RI findings. Exposure to MEC is a human health concern, but exposure is low and can be controlled through LUCs. Based on the evaluation of National Contingency Plan (NCP) criteria, Alternative 2 (Land Use Controls), Alternative 3 (Focused MEC Removal and LUCs), and Alternative 4 (Full MEC Removal and LUCs) all provide adequate protection and are plausible to implement. They all include some level of LUCs and ongoing monitoring because none can verify that all MEC hazards are removed. The deciding factors are primarily the level of impact to wetlands and other wildlife habitat that is acceptable, the degree of disturbance to base personnel that is acceptable, and cost. The NCP statutory preference for reduction of toxicity, mobility, or volume is best achieved with Alternative 4, and to a lesser degree Alternative 3. Upon consideration of all criteria, Alternative 3 meets the Threshold Criteria and provides the most favorable combination of Balancing Criteria"*.

It should be noted that draft FS document prepared for Demolition Area -01 projected no changes in land use from current setting. The development for residential use may result in modifications to the planned remedial actions.

Based upon the prior investigations completed and future planned remediation actions for Demolition Area – 01, the Woodlawn East portion of the Subject Property is considered Category 6 – areas where a release, disposal, and/or migration of hazardous substances has occurred, but required actions to protect human health and the environment have not yet been implemented.

A review of MMRP documents indicates that the Berman Tract at the Subject Property (eastern half of parcel) has not been evaluated to date for MEC/MD due to the property boundaries defined for Demolition Area – 01. Due to the proximity of the Berman Tract directly adjacent to Demolition Area – 01, additional evaluation is recommended for this area. The absence of information on whether explosives testing and training exercises were conducted on the Berman Tract portion of the Subject Property indicate that the Berman Tract portion should be considered Category 7 - areas that are not evaluated or require additional evaluation.

4.0 EFFECTS FROM ADJACENT PROPERTY

4.1 Record Search

Environmental databases and governmental records, provided by EDR, were utilized and reviewed ("environmental records review") to characterize the obvious and apparent uses of the Subject Property and surrounding properties. In addition, in accordance with ASTM Standard E1527-13, EDRs Vapor Encroachment Application (VEC App) was used to determine whether database results for adjacent properties were likely to cause an environmental threat through vapor migration and potential encroachment to the Subject Property.

Significant and relevant findings based upon review of these documents are discussed below. A copy of the governmental records review is presented as Appendix C.

When subscribing to the government environmental database reports, the full parcel was selected as the "target property" for the report generated for this study. The environmental database search indicated that the Subject Property is on the DoD database for Fort Belvoir. The Subject Property was not listed on the other reviewed environmental databases based upon search distance. The selected search radii for the various databases conform to the requirements of ASTM E 1527-13. Fort Belvoir was identified within prescribed search radii in each of the following databases: LTANKS, ENF, SWF/LF, AIRS, RGA LF, LUST, and FINDS. The database listings were for environmental sites located throughout the installation and not necessarily within proximity of the Subject Property.

One database listing from the LUST, LTANKS, and RGA LUST databases were associated with a residence located adjacent to the eastern border of the Subject Property at 8305 Orville Street. The home was listed for a leaking heating oil UST discovered in April 1994. The case was closed in September 1994. Based on regional topography the expected groundwater flow direction is to the southeast, meaning the LUST site would be cross-gradient to the Subject Property. Based on the regulatory status, the home being cross-gradient to the Subject Property, and the likely distance of the former heating oil tank from the eastern border of the Subject Property, migration of petroleum contamination through soil, groundwater, or vapor is not expected to impact the Subject Property.

Database listings from the LUST, LTANKS, FINDS, and UST databases were associated with Woodlawn Elementary School located approximately ¼-mile southwest of the Subject Property at 8505 Highland Lane. The school was listed for two reported releases from a heating oil UST discovered in 1985 and 1991. The cases were closed in August 1994 after the UST was removed from the ground. Based on the regulatory status and the school being down-gradient from the Subject Property, it is not expected that migration of petroleum contamination through soil, groundwater, or vapor migration is likely to have occurred in a manner that would impact the Subject Property.

Three database listings for two former gas stations and an auto parts store on the 8500-block of Richmond Highway approximately ½-mile southeast of the Subject Property were listed for UST releases. The sites were listed in the LUST, LTANKS, and/or UST databases. The status for all three are listed as closed. Based on the regulatory status and the sites being down-gradient from the Subject Property it is not expected that migration of petroleum contamination through soil, groundwater, or vapor migration is likely to have occurred in a manner that would impact the Subject Property.

A former Army training facility listed as "AAA, Huntley Meadows", is located approximately ½-mile northwest of the Subject Property. The site is currently owned by Fairfax County and is listed on the FUDS database. The site was previously used by the Army in the mid-1950's. Previously buildings and concrete gun emplacements were located at the site, but were demolished by Fairfax County. The site is thought to potentially have unexploded ordnance and is fenced off. The site is currently used by Fairfax County for soil stockpiling and firewood storage. Based on the nature of the past and current use of the site, it is not expected to present a likelihood of environmental impact to the Subject Property.

Twenty unmapped (orphan) facilities were identified on the governmental environmental database record review. Unmapped facilities are identified on the governmental record because they cannot be located on a map due to inadequate address information. These facilities require additional research to be properly located relative to the Subject Property. In most instances, the additional research does not identify the exact location of an unmapped facility, but serves to eliminate its potential impact to the Subject Property due to distance, topographic gradient and/or general location (i.e., different city).

Based upon interviews and document review, nineteen of the orphan sites are associated with Fort Belvoir and are not located at or near the Subject Property. The remaining site is associated with the auto parts store on Richmond Highway discussed above.

4.2 Visual Site Inspection

Directly north of the Subject Property is undeveloped wooded land. The Timothy Park neighborhood is directly east of the Subject Property. Pole Road is directly south of the Subject Property followed by residential housing. The Woodlawn Village housing area of Fort Belvoir is located to the west of the Subject Property. No significant environmental threats from adjacent properties were observed during the visual site inspection.

4.3 Document Review

Documents associated with environmental impacts to adjacent properties and other properties near the Subject Property were reviewed to determine potential environmental impact to the Subject Property. Pertinent documents reviewed are discussed in the previous sections.

5.0 CONCLUSIONS

On the basis of the findings of this ECP report, ECP classification ratings were established for the Subject Property as defined in Section 2.6. The presence of MMRP Site Demolition Area - 01 within and adjacent to the Subject Property was the primary driver for the ECP classifications.

Based on results of the MMRP investigations, the Woodlawn East portion of the Subject Property has been classified as **Category 6/Red** – areas where a release, disposal, and/or migration of hazardous substances has occurred, but required actions to protect human health and the environment have not yet been implemented. The Berman Tract portion of the Subject Property has been classified **Category 7/Gray** - areas that are not evaluated or require additional evaluation, due to the absence of MMRP assessment of this portion of the Subject Property.

The ECP ratings are summarized in Table 5-1. The ECP Classification figure is included as Figure 6 in Appendix A.

Table 5-1
Summary of Proposed ECP Rating, Woodlawn East/Berman Tract

Parcel Name	Environmental Condition of Property
Berman Tract portion	7/Gray
Woodlawn East portion	6/Red

Land use controls are currently in place for the Subject Property until complete remedial actions occur. The MMRP RI/FS documents previously prepared for the Subject Property projected future land use as unchanged. Residential development of the Subject Property may require additional evaluation and/or regulatory concurrence.

6.0 PERSONS CONSULTED

Ms. Kelly Lease, Acting Compliance Branch Chief, US Army Garrison Fort Belvoir, Directorate of Public Works, Environmental and Natural Resources Division, 703-806-0020.

Mr. Marc Russell, NEPA, US Army Garrison Fort Belvoir, Directorate of Public Works, Environmental and Natural Resources Division, 703-806-0022.

Ms. Amy Martin, Main Post SWMU Program Manager, US Army Garrison Fort Belvoir, Directorate of Public Works, Environmental and Natural Resources Division, 703-806-0022.

Mr. Christopher Daniel, Cultural Resources, US Army Garrison Fort Belvoir, Directorate of Public Works, Environmental and Natural Resources Division, 703-806-3759.

Ms. Denee Cremeans, UXO, US Army Garrison Fort Belvoir, Directorate of Public Works, Environmental and Natural Resources Division, 703-806- 0627.

Mr. Vijay Ivatury, Asbestos, Lead, and Mold Program Manager, US Army Garrison Fort Belvoir, Directorate of Public Works, Environmental and Natural Resources Division, 703-806-0061.

Ms. Dorothy Keough, Natural Resources Branch Chief, US Army Garrison Fort Belvoir, Directorate of Public Works, Environmental and Natural Resources Division, 703-806-0049.

Ms. Sybille Vega, Wetlands and Habitat Program Manager, US Army Garrison Fort Belvoir, Directorate of Public Works, Environmental and Natural Resources Division, 703-806-0048.

7.0 REFERENCES

7.1 Guidance Documents

American Society for Testing and Materials (ASTM) E 1527-13. Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. 2013.

ASTM D 6008-96(2005). Standard Practice for Conducting Environmental Baseline Surveys. 2005.

ASTM D5746-98(2010) Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities. 2010.

7.2 Record Review

Environmental Baseline Survey of the Army Residential Communities Initiative (RCI) Properties at Fort Belvoir, Virginia. CH2MHill, 2003.

Final Phase I Environmental Site Assessment, Fort Belvoir Community Housing, Fort Belvoir, Virginia. The SI Group, 2003.

Environmental Baseline Survey Fairfax County Park Authority Parcel, Fairfax County, Virginia, Fort Belvoir ENRD. Dewberry, November 2011.

Waters of the U.S. (Including Wetlands) Delineation and Resource Protection Area Evaluation, Woodlawn Village, Fairfax County, Virginia. WSSI, March 2014.

Phase I Investigation Woodlawn Village Land Exchange (Parcel 1011 01 0009), Fort Belvoir, VA, Fairfax County, VA. John Milner Associates, Inc, March 2005.

Final Site Investigation Report, Fort Belvoir, Fairfax County, Virginia. Malcom Pirnie, Inc., January 2008.

Final Action Memorandum Land Use Controls, Fort Belvoir, Military Munitions Response Program. URS & ARCADIS/Malcolm Pirnie, October 2013.

Draft Final Non-Time Critical Removal Action Land Use Control Plan, Fort Belvoir, Military Munitions Response Program. URS & ARCADIS/Malcolm Pirnie, May 2013.

Final Engineering Evaluation/Cost Analysis (EE/CA) Land Use Controls, Fort Belvoir, Military Munitions Response Program. URS & ARCADIS/Malcolm Pirnie, May 2013.

Final Remedial Investigation Report for Four Munitions Response Sites, Fort Belvoir, Demolition Area-01, Demolition Area-USACE TD, Grenade Court, Booby Trap Site. Shaw Environmental, Inc., December 2012.

Draft Feasibility Study Report for Five Munition Response Sites, T-16 Training Area, Demolition Area-01, Demolition Area-USACE TD, Grenade Court, Booby Trap Site, Fort

Belvoir, Virginia, Military Munitions Response Program. CB&I Federal Services, October 2013.

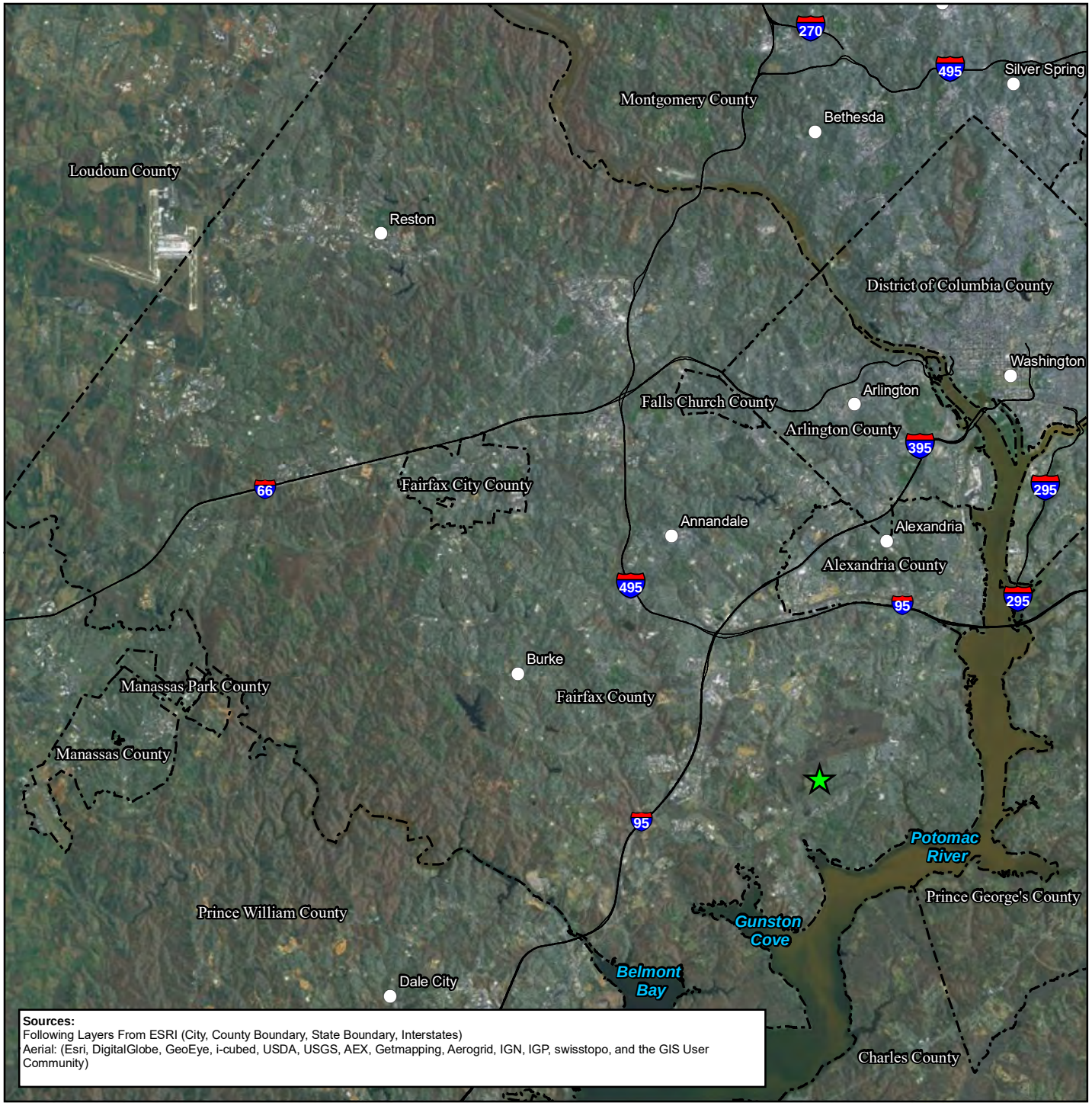
8.0 ACCRONYMS

ACM	Asbestos Containing Materials
AAI	All Appropriate Inquiries Rule 40 CFR Part 312
AEDB-R	Army Environmental Database-Restoration
AM	Action Memorandum
APA	Aerial Photograph Analysis
AR	Army regulation
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERFA	Community Environmental Response Facilitation Act of 1992
CFR	Code of Federal Regulations
DoD	Department of Defense
DMM	Discard Military Munitions
DPW-ENRD	Environmental and Natural Resource Division
ECP	Environmental Condition of Property
EDR	Environmental Data Resources, Inc.
EE/CA	Engineering Evaluation/Cost Assessment
FBRC	Fort Belvoir Residential Communities
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FS	Feasibility Study
HA	Hazard Assessment
HE	High Explosive
HRR	Historic Record Review
IMCOM	Installation Management Command
IRP	Installation Restoration Program
LBP	Lead-based paint
LUC	Land Use Controls
MC	Munitions Constituents
MD	Munitions Debris
MMRP	Military Munitions Response Program

MRS	Munitions Response Site
NCP	National Contingency Plan
NCR	National Capital Region
NTCRA	Non-Time Critical Removal Action
PCB	Polychlorinated biphenyl
POL	petroleum, oils, and lubricants
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
SI	Site Inspection
TAL	Target Analyte List
TSCA	Toxic Substances Control Act
USEPA	United States Environmental Protection Agency
USFWS	United States Fishing and Wildlife Services
UST	Underground Storage Tank
UXO	Unexploded Ordnances
VDEQ	Virginia Department of Environmental Quality
VEC App	Vapor Encroachment Application
VSI	Visual Site Inspection
WOUS	Waters of the United States

APPENDIX A

Figures



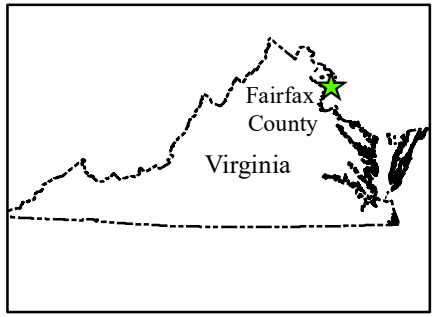
Sources:
Following Layers From ESRI (City, County Boundary, State Boundary, Interstates)
Aerial: (Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community)

ECP Phase 1
Woodlawn East - Berman Tract
Fort Belvoir
Figure 1
Site Location Map

Legend

- Subject Property Location
- City
- County Boundary
- Interstate

Abbreviations:
ECP: Environmental Condition of Property



N

0 2 4 6 Miles

PROJECTION: NAD 1983 StatePlane Virginia South FIPS 4502 Feet Units: Foot US

DESIGNED BY: RC	FIGURE: Figure 1		
DRAWN BY: RC	SCALE: As Shown	PROJ NO: 14009 Woodlawn	
CHECKED BY: SM	DATE: 3/26/2014		
SUBMITTED BY: JF	FILE: Figure1		

Document Path: C:\GIS\Projects\Ft_Belvoir\14009_Woodlawn\MXDS\Figure1.mxd, 3/26/2014

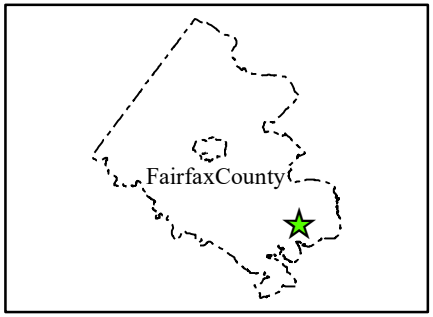
DRAFT

ECP Phase 1
Woodlawn East - Berman Tract
Fort Belvoir
Figure 2
Site Vicinity Map

Legend

- Approximate Subject Boundary
- Highway

Abbreviations:
ECP: Environmental Condition of Property



N

0 1,000 2,000 3,000 Feet

PROJECTION: NAD 1983 StatePlane Virginia South FIPS 4502 Feet Units: Foot US

DESIGNED BY: RC	FIGURE: Figure 2		
DRAWN BY: RC	SCALE: As Shown	PROJ NO: 14009 Woodlawn	
CHECKED BY: SM	DATE: 3/26/2014		
SUBMITTED BY: JF	FILE: Figure2		

Sources:
Following Layers From ESRI (Streets);
Aerial: (Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community)

Document Path: C:\GIS\Projects\Ft_Belvoir\14009_Woodlawn\MXDS\Figure2.mxd, 3/26/2014

DRAFT

Sources:
Following Layers From ESRI (Streets);
Aerial: (Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community)

ECP Phase 1
Woodlawn East - Berman Tract
Fort Belvoir
Figure 3
Site Layout Map

Legend

- Approximate Subject Property
- Street

Abbreviations:
ECP: Environmental Condition of Property

N

0 320 640 960 Feet

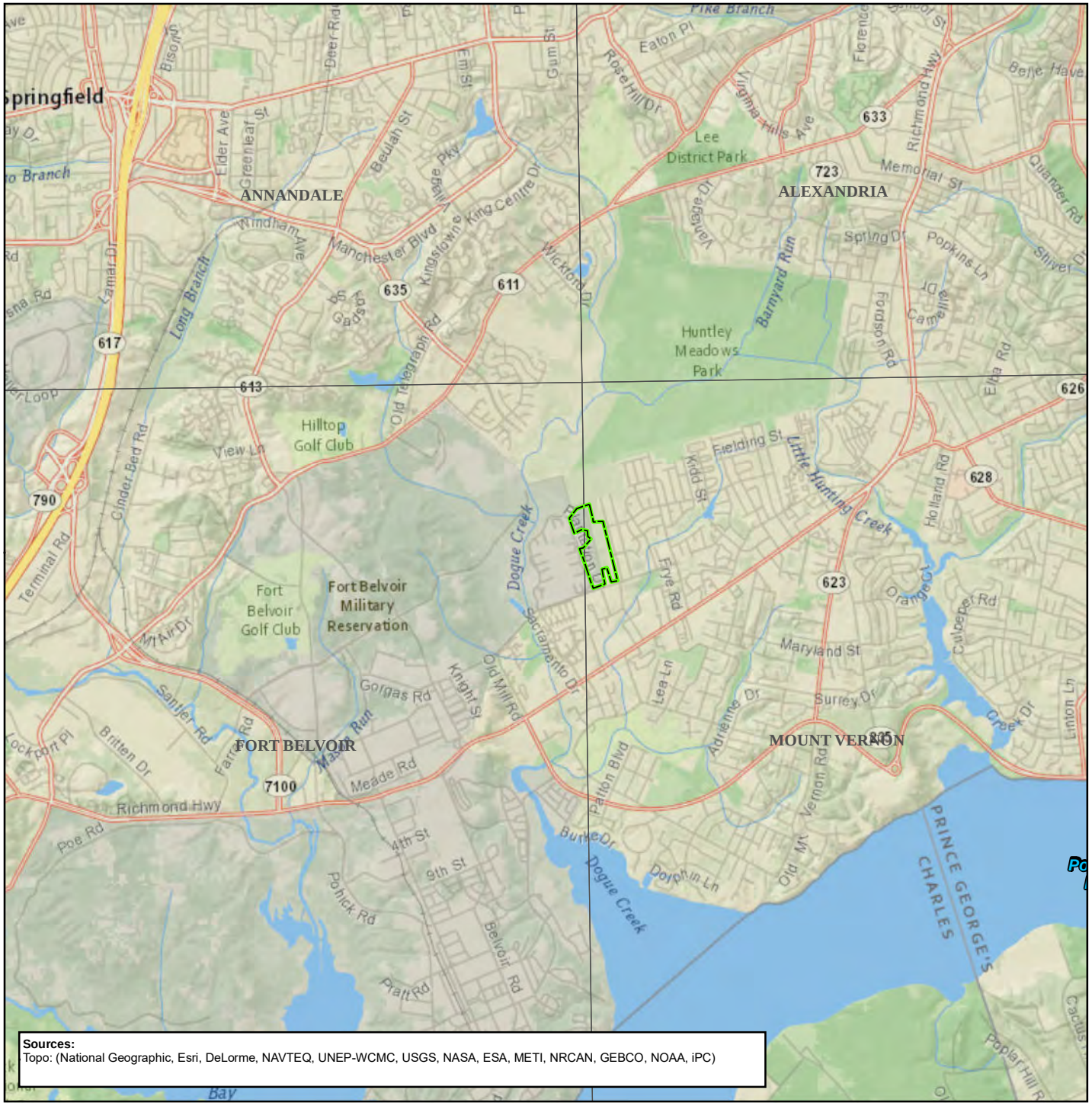
PROJECTION: NAD 1983 StatePlane Virginia South FIPS 4502 Feet Units: Foot US

DESIGNED BY: RC	FIGURE: Figure 3		
DRAWN BY: RC	SCALE: As Shown	PROJ NO: 14009 Woodlawn	
CHECKED BY: SM	DATE: 3/26/2014		
SUBMITTED BY: JF	FILE: Figure3		

Document Path: C:\GIS\Projects\Ft_Belvoir\14009_Woodlawn\MXDS\Figure3.mxd, 3/26/2014

DRAFT

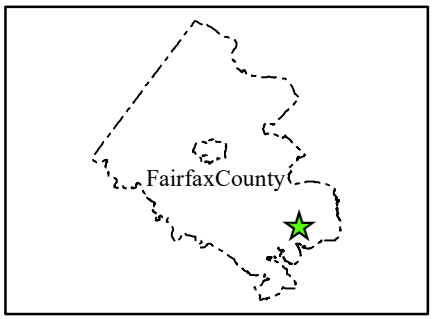
ECP Phase 1
Woodlawn East - Berman Tract
Fort Belvoir
Figure 4
Topographic Map



Legend

- Approximate Subject Boundary
- USGS 7.5 Minute Quadrangle Boundary

Abbreviations:
ECP: Environmental Condition of Property



N

0 820 1,640 2,460 Meters

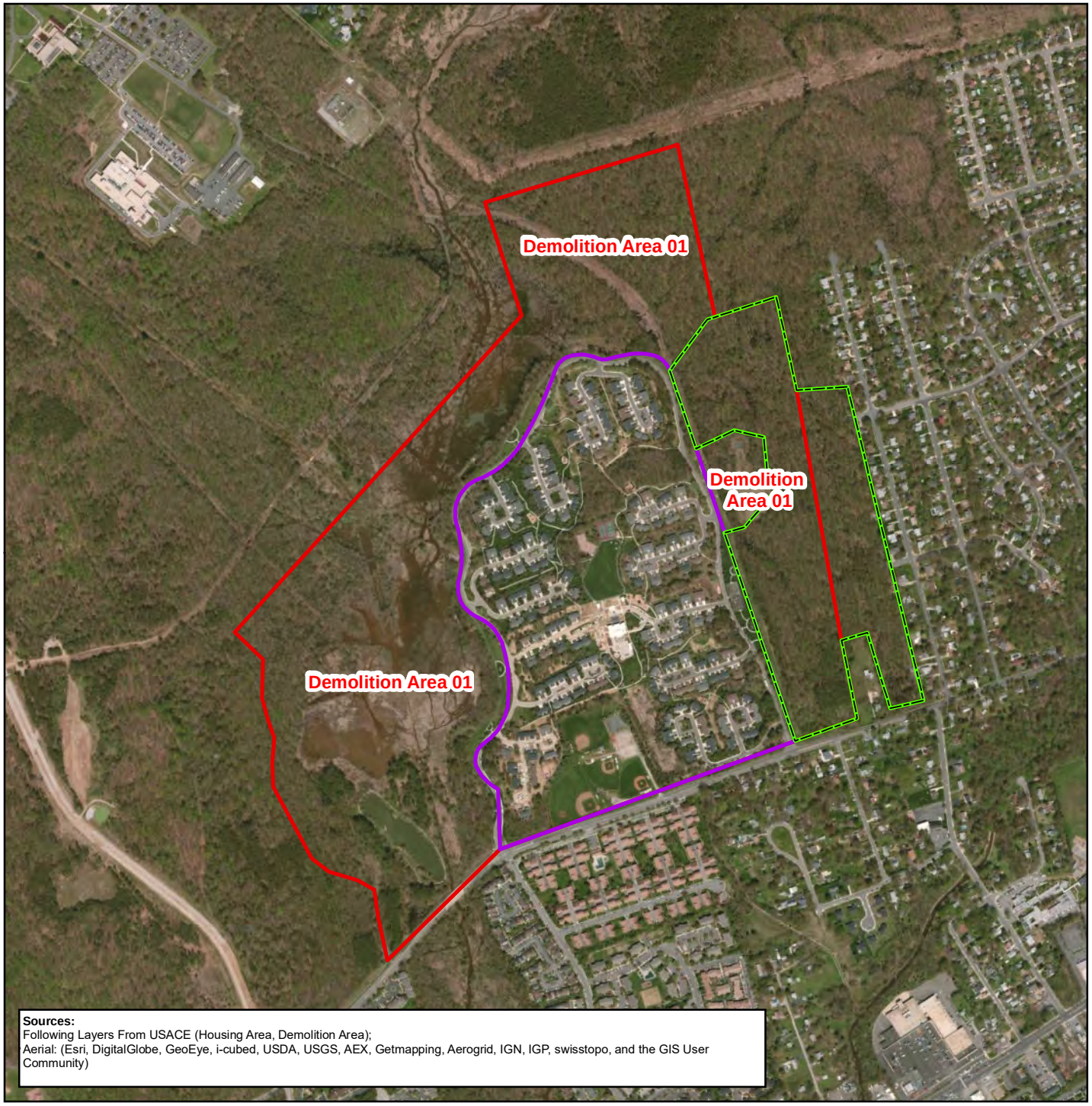
PROJECTION: NAD 1983 StatePlane Virginia South FIPS 4502 Feet Units: Foot US

DESIGNED BY: RC	FIGURE: Figure 4		
DRAWN BY: RC	SCALE: As Shown	PROJ NO: 14009 Woodlawn	
CHECKED BY: SM	DATE: 3/26/2014		
SUBMITTED BY: JF	FILE: Figure4		

Sources:
Topo: (National Geographic, Esri, DeLorme, NAVTEQ, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, iPC)

Document Path: C:\GIS\Projects\Ft_Belvoir\14009_Woodlawn\MXDS\Figure4.mxd, 3/26/2014

DRAFT



Sources:
Following Layers From USACE (Housing Area, Demolition Area);
Aerial: (Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community)

ECP Phase 1
Woodlawn East - Berman Tract
Fort Belvoir
Figure 5
Demolition Area 01

Legend

- Approximate Subject Boundary
- Approximate Housing Area Boundary
- Approximate Site Boundary/ Demolition Area 01

Abbreviations:
ECP: Environmental Condition of Property

N

0 525 1,050 1,575 Feet

PROJECTION: NAD 1983 StatePlane Virginia South FIPS 4502 Feet Units: Foot US

DESIGNED BY: RC	FIGURE: Figure 5		
DRAWN BY: RC	SCALE: As Shown	PROJ NO: 14009 Woodlawn	
CHECKED BY: SM	DATE: 3/26/2014		
SUBMITTED BY: JF	FILE: Figure5		

Document Path: C:\GIS\Projects\Ft_Belvoir\14009_Woodlawn\MXDS\Figure5.mxd, 3/26/2014

DRAFT

Sources:
Following Layers From ESRI (Streets);
Aerial: (Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community)

ECP Phase 1
Woodlawn East - Berman Tract
Fort Belvoir
Figure 6
ECP Classification

Legend

- Approximate Subject Property Boundary

ECP Classification

- Category 6
- Category 7
- Street

Abbreviations:
ECP: Environmental Condition of Property

N

0 320 640 960 Feet

PROJECTION: NAD 1983 StatePlane Virginia South FIPS 4502 Feet Units: Foot US

DESIGNED BY: RC	FIGURE: Figure 6		
DRAWN BY: RC	SCALE: As Shown	PROJ NO: 14009 Woodlawn	
CHECKED BY: SM	DATE: 3/26/2014		
SUBMITTED BY: JF	FILE: Figure6		

Document Path: C:\GIS\Projects\Ft_Belvoir\14009_Woodlawn\MXDS\Figure6.mxd, 3/26/2014

DRAFT

APPENDIX B

Photographs

SITE PHOTOGRAPHS

PROJECT NAME AND LOCATION	INSPECTION DATE
Woodlawn East / Berman Tract ECP	March 10, 2014

Photograph 1

Concrete structure located on the southern portion of the Woodlawn East tract approximately 200 feet north of Pole Road.

Photograph 2

Concrete structure with ceramic casing located on the southern portion of the Woodlawn East tract.

SITE PHOTOGRAPHS

PROJECT NAME AND LOCATION	INSPECTION DATE
Woodlawn East / Berman Tract ECP	March 10, 2014

Photograph 3

Brick foundation structure approximately 1,000 square feet located on the southern portion of the Woodlawn East tract.

Photograph 4

Top view of brick foundation structure.

SITE PHOTOGRAPHS

PROJECT NAME AND LOCATION	INSPECTION DATE
Woodlawn East / Berman Tract ECP	March 10, 2014

Photograph 5

View of a berm running west to east on the southern portion of the Woodlawn East tract.

Photograph 6

View of waste debris on the southern portion of the Woodlawn East tract along Plantation Drive.

SITE PHOTOGRAPHS

PROJECT NAME AND LOCATION	INSPECTION DATE
Woodlawn East / Berman Tract ECP	March 10, 2014

Photograph 7

View of concrete debris on the Woodlawn East tract along Plantation Drive.

Photograph 8

View of disgarded metal debris on the Woodlawn East tract along Plantation Drive.

SITE PHOTOGRAPHS

PROJECT NAME AND LOCATION	INSPECTION DATE
Woodlawn East / Berman Tract ECP	March 10, 2014

Photograph 9

View of berm along the central portion of the Woodlawn East tract.

Photograph 10

View of berm along the central portion of the Woodlawn East tract.

SITE PHOTOGRAPHS

PROJECT NAME AND LOCATION	INSPECTION DATE
Woodlawn East / Berman Tract ECP	March 10, 2014

Photograph 11

View of berm along the central portion of the Woodlawn East tract.

Photograph 12

View of concrete debris on the central portion Woodlawn East tract.

SITE PHOTOGRAPHS

PROJECT NAME AND LOCATION	INSPECTION DATE
Woodlawn East / Berman Tract ECP	March 10, 2014

Photograph 13

View of ponded water and berm on the northern portion of the Woodlawn East tract.

Photograph 14

View of metal rod encased in concrete on the northern portion of the Woodlawn East tract.

SITE PHOTOGRAPHS

PROJECT NAME AND LOCATION	INSPECTION DATE
Woodlawn East / Berman Tract ECP	March 10, 2014

Photograph 15

View from the northern portion of the Woodlawn East tract looking north.

Photograph 16

View of concrete boxes on the northern portion of the Woodlawn East tract.

SITE PHOTOGRAPHS

PROJECT NAME AND LOCATION	INSPECTION DATE
Woodlawn East / Berman Tract ECP	March 10, 2014

Photograph 17

View of dumping debris on the central portion of the Berman tract.

Photograph 18

View of the adjoining properties to the east: intersection of Orville Street and Shirley Street.

SITE PHOTOGRAPHS

PROJECT NAME AND LOCATION	INSPECTION DATE
Woodlawn East / Berman Tract ECP	March 10, 2014

Photograph 19

View of Longfields Lane looking toward Pole Road.

Photograph 20

View of the adjoining property to the west: Plantation Drive.

APPENDIX C

Environmental Database Search Report

Woodlawn East - Berman Tract
5601-5615 POLE RD
Fort Belvoir, VA 22060

Inquiry Number: 3866681.2s
February 27, 2014

The EDR Radius Map™ Report with GeoCheck®

EDR® Environmental Data Resources Inc

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

5601-5615 POLE RD
FORT BELVOIR, VA 22060

COORDINATES

Latitude (North):	38.7322000 - 38° 43' 55.92''
Longitude (West):	77.1233000 - 77° 7' 23.88''
Universal Tranverse Mercator:	Zone 18
UTM X (Meters):	315434.7
UTM Y (Meters):	4288992.0
Elevation:	34 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	38077-F1 MOUNT VERNON, VA MD
Most Recent Revision:	1983
West Map:	38077-F2 FORT BELVOIR, VA MD
Most Recent Revision:	1983

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	2011, 2012
Source:	USDA

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL---------- National Priority List

EXECUTIVE SUMMARY

Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

CERCLIS ---------- Comprehensive Environmental Response, Compensation, and Liability Information System
FEDERAL FACILITY ---------- Federal Facility Site Information listing

Federal CERCLIS NFRAP site List

CERC-NFRAP ---------- CERCLIS No Further Remedial Action Planned

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROL ---------- Sites with Institutional Controls
LUCIS ---------- Land Use Control Information System

Federal ERNS list

ERNS ---------- Emergency Response Notification System

State- and tribal - equivalent CERCLIS

SHWS ---------- This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ---------- Solid Waste Management Facilities

State and tribal leaking storage tank lists

INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

UST ---------- Registered Petroleum Storage Tanks

AST ---------- Registered Petroleum Storage Tanks
INDIAN UST ---------- Underground Storage Tanks on Indian Land
FEMA UST ---------- Underground Storage Tank Listing

State and tribal voluntary cleanup sites

INDIAN VCP ---------- Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS ---------- Brownfields Site Specific Assessments

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ---------- A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9 ---------- Torres Martinez Reservation Illegal Dump Site Locations
ODI ---------- Open Dump Inventory
INDIAN ODI ---------- Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL ---------- Clandestine Drug Labs
US HIST CDL ---------- National Clandestine Laboratory Register

Local Land Records

LIENS 2 ---------- CERCLA Lien Information

Records of Emergency Release Reports

HMIRS ---------- Hazardous Materials Information Reporting System
SPILLS ---------- Prep/Spills Database Listing
SPILLS 90 ---------- SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR ---------- RCRA - Non Generators
DOT OPS ---------- Incident and Accident Data
CONSENT ---------- Superfund (CERCLA) Consent Decrees
ROD ---------- Records Of Decision
UMTRA ---------- Uranium Mill Tailings Sites
US MINES ---------- Mines Master Index File
TRIS ---------- Toxic Chemical Release Inventory System
TSCA ---------- Toxic Substances Control Act
FTTS ---------- FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS ---------- FIFRA/TSCA Tracking System Administrative Case Listing
SSTS ---------- Section 7 Tracking Systems
ICIS ---------- Integrated Compliance Information System

PADS PCB Activity Database System
MLTS Material Licensing Tracking System
RADINFO Radiation Information Database
FINDS Facility Index System/Facility Registry System
RAATS RCRA Administrative Action Tracking System
RMP Risk Management Plans
UIC Underground Injection Control Wells
DRYCLEANERS Drycleaner List
ENF Enforcement Actions Data
NPDES Comprehensive Environmental Data System
AIRS Permitted Airs Facility List
TIER 2 Tier 2 Information Listing
INDIAN RESERV Indian Reservations
SCRD DRYCLEANERS State Coalition for Remediation of Drycleaners Listing
2020 COR ACTION 2020 Corrective Action Program List
LEAD SMELTERS Lead Smelter Sites
US AIRS Aerometric Information Retrieval System Facility Subsystem
PRP Potentially Responsible Parties
COAL ASH DOE Steam-Electric Plant Operation Data
COAL ASH Coal Ash Disposal Sites
Financial Assurance Financial Assurance Information Listing
US FIN ASSUR Financial Assurance Information
COAL ASH EPA Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER PCB Transformer Registration Database
EPA WATCH LIST EPA WATCH LIST

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP EDR Proprietary Manufactured Gas Plants
EDR US Hist Auto Stat EDR Exclusive Historic Gas Stations
EDR US Hist Cleaners EDR Exclusive Historic Dry Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF Recovered Government Archive Solid Waste Facilities List
RGA LUST Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

STANDARD ENVIRONMENTAL RECORDS

State and tribal leaking storage tank lists

LUST: The Leaking Underground Storage Tank Database.

A review of the LUST list, as provided by EDR, and dated 05/18/2004 has revealed that there are 4 LUST sites within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported Facility Status: Closed	***8305 ORVILLE STREET***	***ENE 0 - 1/8 (0.038 mi.)***	***1***	***7***
WOODLAWN ELEMENTARYSCHOOL (FFX Facility Status: Closed	8505 HIGHLAND LANE	SSE 1/4 - 1/2 (0.278 mi.)	A2	7
WOODLAWN ELEMENTARY SCHOOL (FF Facility Status: Closed	8505 HIGHLAND LANE	SSE 1/4 - 1/2 (0.278 mi.)	A3	8
SHELL (ABANDONED) Facility Status: Closed	***8540 RICHMOND HIGHWAY***	***SE 1/4 - 1/2 (0.460 mi.)***	***B5***	***10***

LTANKS: The Leaking Tanks Database contains current Leaking petroleum tanks. The data comes from the Department of Environmental Quality.

A review of the LTANKS list, as provided by EDR, and dated 12/02/2013 has revealed that there are 5 LTANKS sites within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported Facility Status: Closed	***8305 ORVILLE STREET***	***ENE 0 - 1/8 (0.038 mi.)***	***1***	***7***
WOODLAWN ELEMENTARY SCHOOL Facility Status: Closed	***8505 HIGHLAND DRIVE***	***SSE 1/4 - 1/2 (0.278 mi.)***	***A4***	***8***
SHELL (ABANDONED) Facility Status: Closed	***8540 RICHMOND HIGHWAY***	***SE 1/4 - 1/2 (0.460 mi.)***	***B5***	***10***
DORANS AUTOMOTIVE Facility Status: Closed	***8541 RICHMOND HWY***	***SE 1/4 - 1/2 (0.466 mi.)***	***B7***	***12***
HOMES OIL STATION 7 FORMER Facility Status: Closed	8539 RICHMOND HWY	SE 1/4 - 1/2 (0.467 mi.)	B8	13

State and tribal institutional control / engineering control registries

ENG CONTROLS: A listing of sites with Engineering Controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

A review of the ENG CONTROLS list, as provided by EDR, and dated 12/30/2013 has revealed that there is 1 ENG CONTROLS site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
SKYVIEW PARK NORTH	*8524 RICHMOND HIGHWAY*	*SE 1/4 - 1/2 (0.482 mi.)*	*B9*	*13*

Sites included in the Voluntary Remediation Program that have Deed Restrictions.

A review of the INST CONTROL list, as provided by EDR, and dated 12/30/2013 has revealed that there is 1 INST CONTROL site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
SKYVIEW PARK NORTH	*8524 RICHMOND HIGHWAY*	*SE 1/4 - 1/2 (0.482 mi.)*	*B9*	*13*

State and tribal voluntary cleanup sites

VCP: The Voluntary Remediation Program encourages owners of selected contaminated sites to take the initiative to conduct voluntary cleanups that meet state environmental standards. These sites are generally either open dumps or unpermitted solid waste disposal facilities. VRP sites can not be listed on the NPL, nor can they involve disposed RCRA hazardous wastes. The source of this data is the Department of Environmental Quality.

A review of the VCP list, as provided by EDR, and dated 12/30/2013 has revealed that there is 1 VCP site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
SKYVIEW PARK NORTH	*8524 RICHMOND HIGHWAY*	*SE 1/4 - 1/2 (0.482 mi.)*	*B9*	*13*

ADDITIONAL ENVIRONMENTAL RECORDS

Other Ascertainable Records

DOD: Consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

A review of the DOD list, as provided by EDR, and dated 12/31/2005 has revealed that there is 1 DOD site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
FORT BELVOIR MILITARY RESERVAT		0 - 1/8 (0.000 mi.)	0	7

FUDS: The Listing includes locations of Formerly Used Defense Sites Properties where the US Army Corps Of Engineers is actively working or will take necessary cleanup actions.

A review of the FUDS list, as provided by EDR, and dated 12/31/2011 has revealed that there is 1 FUDS site within approximately 1 mile of the target property.

EXECUTIVE SUMMARY

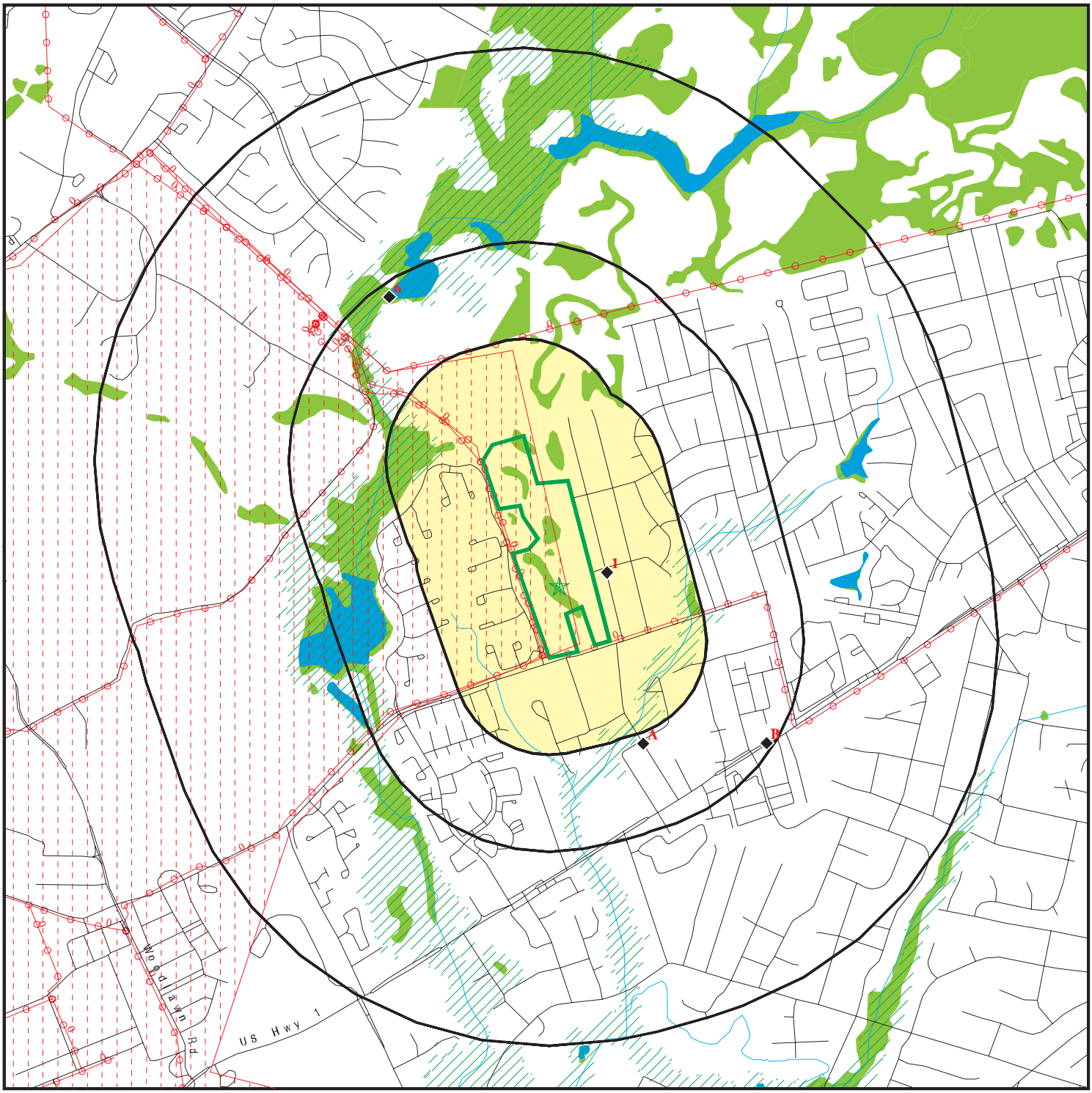
Lower Elevation	Address	Direction / Distance	Map ID	Page
AAA, HUNTLEY MEADOWS		NNW 1/4 - 1/2 (0.464 mi.)	6	11

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 20 records.

Site Name	Database(s)
FORT BELVOIR - 28 TANKS VARIOUS BU	LTANKS, ENF
US ARMY - FORT BELVOIR	SWF/LF, AIRS, RGA LF
FORT BELVOIR - DOGUE CREEK APARTME	LUST
FORT BELVOIR - DOGUE CREEK HOUSING	LUST
FORT BELVOIR - DOGUE CREEK VILLAGE	LUST
ACTION AUTOMOTIVE	LUST, LTANKS
FORT BELVOIR - BUILDING 00927	LTANKS
FORT BELVOIR - BUILDING 923	LTANKS
FORT BELVOIR - BUILDING 00911 DOGU	LTANKS
FORT BELVOIR - BUILDING 00912 DOGU	LTANKS
FORT BELVOIR - BUILDING 2462 DTRA	LTANKS
FORT BELVOIR - BUILDING 709	LTANKS
FORT BELVOIR - BUILDING 1422	LTANKS
FORT BELVOIR - BUILDING 190	LTANKS
FORT BELVOIR - BUILDING 1001	LTANKS
US ARMY - FORT BELVOIR - DC ANG BU	LTANKS
US ARMY - FORT BELVOIR - PARK VILL	LTANKS
FORT BELVOIR - HERRYFORD VILLAGE S	LTANKS
FORT BELVOIR - POL FACILITY	LTANKS
FORT BELVOIR FAMILY HOUSING - NEW	FINDS

OVERVIEW MAP - 3866681.2s



0 1/4 1/2 1 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Woodlawn East - Berman Tract	CLIENT:	Indepth Corporation
ADDRESS:	5601-5615 POLE RD Fort Belvoir VA 22060	CONTACT:	Lane Middleton
LAT/LONG:	38.7322 / 77.1233	INQUIRY #:	3866681.2s
		DATE:	February 27, 2014 3:24 pm

DETAIL MAP - 3866681.2s

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Woodlawn East - Berman Tract	CLIENT: Indepth Corporation
ADDRESS: 5601-5615 POLE RD Fort Belvoir VA 22060	CONTACT: Lane Middleton
LAT/LONG: 38.7322 / 77.1233	INQUIRY #: 3866681.2s DATE: February 27, 2014 3:25 pm

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
CERCLIS	0.500		0	0	0	NR	NR	0
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site List								
CERC-NFRAP	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
LUCIS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent CERCLIS								
SHWS	N/A		N/A	N/A	N/A	N/A	N/A	N/A
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		1	0	3	NR	NR	4
LTANKS	0.500		1	0	4	NR	NR	5
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
UST	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
FEMA UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
ENG CONTROLS	0.500		0	0	1	NR	NR	1
INST CONTROL	0.500		0	0	1	NR	NR	1
State and tribal voluntary cleanup sites								
VCP	0.500		0	0	1	NR	NR	1
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US CDL	TP		NR	NR	NR	NR	NR	0
US HIST CDL	TP		NR	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
SPILLS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
DOD	1.000		1	0	0	0	NR	1
FUDS	1.000		0	0	1	0	NR	1
CONSENT	1.000		0	0	0	0	NR	0
ROD	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
TSCA	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
ENF	TP		NR	NR	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
AIRS	TP		NR	NR	NR	NR	NR	0
TIER 2	TP		NR	NR	NR	NR	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH	0.500		0	0	0	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	1.000		0	0	0	0	NR	0
EDR US Hist Auto Stat	0.250		0	0	NR	NR	NR	0
EDR US Hist Cleaners	0.250		0	0	NR	NR	NR	0

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF	TP		NR	NR	NR	NR	NR	0
RGA LUST	TP		NR	NR	NR	NR	NR	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

N/A = This State does not maintain a SHWS list. See the Federal CERCLIS list.

DOD **FORT BELVOIR MILITARY RESERVATION** **DOD** **CUSA134225**
Region **N/A**

FORT BELVOIR MILITARY RES (County), VA

< 1/8
1 ft.

DOD:
Feature 1: Army DOD
Feature 2: Not reported
Feature 3: Not reported
URL: Not reported
Name 1: Fort Belvoir Military Reservation
Name 2: Not reported
Name 3: Not reported
State: VA
DOD Site: Yes
Tile name: VAFAIRFAX

---

1 **LUST** **S104159301**
ENE **8305 ORVILLE STREET** **LTANKS** **N/A**
< 1/8 **ALEXANDRIA, VA** **RGA LUST**
0.038 mi.
200 ft.

Relative:
Lower

Actual:
24 ft.

LUST REG NO:
Region: NO
Facility ID: 3900580
Status: Closed
Tank Size: 0
Product: Not reported
Release Date: 04/12/1994
Closed Date: 9/16/1994
Case Type: Article 11
Case Officer: Bill Von Till
Pollution Complaint #: 94-3377
Permit Number: 0
Priority: -

LTANKS:
Region: NVRO
CEDS Facility Id: 200000185782
Case Status: Closed
Pollution Complaint #: 19943377
Reported: 04/12/1994

RGA LUST:
2001 BAHR, JANET M PROPERTY 8305 ORVILLE STREET

A2 **WOODLAWN ELEMENTARYSCHOOL (FFXC)** **LUST** **S105982841**
SSE **8505 HIGHLAND LANE** **N/A**
1/4-1/2 **FAIRFAX, VA 22309**
0.278 mi.
1468 ft. **Site 1 of 3 in cluster A**

Relative:
Lower

Actual:
18 ft.

LUST REG NO:
Region: NO
Facility ID: 3023881
Status: Closed

WOODLAWN ELEMENTARYSCHOOL (FFXC) (Continued) **S105982841**

Tank Size: 10,000
Product: heating oil
Release Date: 01/23/1985
Closed Date: 8/5/1994
Case Type: Article 11
Case Officer: Randy Chapman
Pollution Complaint #: 85-0375
Permit Number: 0
Priority: -

A3 **WOODLAWN ELEMENTARY SCHOOL (FFXC)** **LUST** **S105983097**
SSE **8505 HIGHLAND LANE** **N/A**
1/4-1/2 **FAIRFAX, VA 22309**
0.278 mi.
1468 ft. **Site 2 of 3 in cluster A**

Relative:
Lower

Actual:
18 ft.

LUST REG NO:
Region: NO
Facility ID: 3023881
Status: **Closed**
Tank Size: 0
Product: Not reported
Release Date: 02/26/1991
Closed Date: 8/30/1994
Case Type: Article 9
Case Officer: Randy Chapman
Pollution Complaint #: 91-1234
Permit Number: 0
Priority: -

A4 **WOODLAWN ELEMENTARY SCHOOL** **FINDS** **1004607832**
SSE **8505 HIGHLAND DRIVE** **LTANKS** **N/A**
1/4-1/2 **ALEXANDRIA, VA** **UST**
0.278 mi.
1468 ft. **Site 3 of 3 in cluster A**

Relative:
Lower

Actual:
18 ft.

FINDS:

Registry ID: 110001891926

Environmental Interest/Information System
AFS (Aerometric Information Retrieval System (AIRS) Facility Subsystem) replaces the former Compliance Data System (CDS), the National Emission Data System (NEDS), and the Storage and Retrieval of Aerometric Data (SAROAD). AIRS is the national repository for information concerning airborne pollution in the United States. AFS is used to track emissions and compliance data from industrial plants. AFS data are utilized by states to prepare State Implementation Plans to comply with regulatory programs and by EPA as an input for the estimation of total national emissions. AFS is undergoing a major redesign to support facility operating permits required under Title V of the Clean Air Act.

CEDS (Virginia - Comprehensive Environmental Data System) is the Department of Environmental Quality's (DEQ) electronic data system for maintaining databases on sources of pollutants in all media.

WOODLAWN ELEMENTARY SCHOOL (Continued) **1004607832**

LTANKS:

Region:	NVRO
CEDS Facility Id:	200000080458
Case Status:	**Closed**
Pollution Complaint #:	19911234
Reported:	02/26/1991

Region:	NVRO
CEDS Facility Id:	200000080458
Case Status:	**Closed**
Pollution Complaint #:	19850375
Reported:	01/23/1985

UST:

Facility:

Facility Id:	3023881
Facility Type:	LOCAL
CEDS Facility ID:	200000080458

Owner:

Owner Id:	37293
Owner Name:	Fairfax County Public Schools
Owner Address:	5025 Sideburn Rd
Owner Address2:	Not reported
Owner City, State, Zip:	Fairfax, VA 22032
UST Status:	Not reported
AST Status:	Not reported
Federally Regulated:	Yes
Tank Number:	1
Tank Capacity:	10000
Tank Contents:	HEATING OIL
Tank Status:	**REM FROM GRD**
Tank Type:	UST

Tank Material:

Install Date:	01-JAN-1962
Tank Materials: Bare Steel	Yes
Tank Materials: Cath Protect Steel	No
Tank Materials: Epoxy Steel	No
Tank Materials: Fiberglass	No
Tank Materials: Concrete	No
Tank Materials: Composite	No
Tank Materials: Double Walled	No
Tank Materials: Lined Interior	No
Tank Materials: Excav Liner	No
Tank Materials: Insulated Tank Jacket	No
Tank Materials: Repaired	No
Tank Materials: Unknown	No
Tank Materials: Other	No
Tank Materials: Other Note	Not reported

Release Detection:

Tank Release Detection: Leak Deferred	No
Tank Release Detection: Manual Gauge	No

WOODLAWN ELEMENTARY SCHOOL (Continued) **1004607832**

Tank Release Detection: Auto Gauge	No
Tank Release Detection:Tank Tightness	No
Tank Release Detection: Vapor Monitor	No
Tank Release Detection: Inventory	No
Tank Release Detection: Stat Invent Recon	No
Tank Release Detection: Spill Install	No
Tank Release Detection: Overfill Install	No
Tank Release Detection: Groundwater	No
Tank Release Detection: Int Sec Containment	No
Tank Release Detection: Int Double Walled	No
Tank Release Detection: Other Method	No
Tank Release Detection: Other Note	Not reported
Pipe Release Detection: Leak Deferred	Not reported
Pipe Release Detection: Autoleak	No
Pipe Release Detection: Line Tightness	No
Pipe Release Detection: Stat Invent Recon	No
Pipe Release Detection: Groundwater	No
Pipe Release Detection: Int Sec Containment	No
Pipe Release Det: Interior Double Walled	No
Pipe Release Detection: Other Method	No
Pipe Release Detection: Other Note	Not reported

Pipe Type:	UNKNOWN
Pipe Materials: Bare Steel	Yes
Pipe Materials: Galvanized Steel	No
Pipe Materials: Copper	No
Pipe Materials: Fiberglass	No
Pipe Materials: Cath Protect	No
Pipe Materials: Double Walled	No
Pipe Materials: Sec Containment	No
Pipe Materials: Repaired	No
Pipe Materials: Unknown	No
Pipe Materials: Other	No
Pipe Materials: Other Note	Not reported

B5 **SHELL (ABANDONED)** **LUST S105983736**
SE **8540 RICHMOND HIGHWAY** **LTANKS N/A**
1/4-1/2 **FAIRFAX, VA 22309**
0.460 mi.
2430 ft. **Site 1 of 4 in cluster B**

Relative:
Lower

Actual:
29 ft.

LUST REG NO:

Region:	NO
Facility ID:	3014318
Status:	**Closed**
Tank Size:	4,000
Product:	gasoline
Release Date:	03/10/1998
Closed Date:	3/17/1998
Case Type:	Article 9
Case Officer:	Bill Von Till
Pollution Complaint #:	98-3693
Permit Number:	Not reported
Priority:	Not reported

LTANKS:

SHELL (ABANDONED) (Continued) **S105983736**

Region: NVRO
CEDS Facility Id: 200000074683
Case Status: **Closed**
Pollution Complaint #: 19983693
Reported: 03/10/1998

---

6 **AAA, HUNTLEY MEADOWS** **FUDS** **1007211813**
NNW **N/A**
1/4-1/2 **HYBLA VALLEY, VA**
0.464 mi.
2450 ft.

Relative:
Lower

Actual:
18 ft.

FUDS:
Federal Facility ID: VA9799F1645
FUDS #: C03VA0170
INST ID: 59361
Facility Name: AAA, HUNTLEY MEADOWS
City: HYBLA VALLEY
State: VA
EPA Region: 03
County: FAIRFAX
Congressional District: 08
US Army District: Baltimore District (NAB)
Fiscal Year: 2011
Telephone: 410-962-2809
NPL Status: Not Listed
RAB: Not reported
CTC: 185
Current Owner: LOCAL GOVT
Current Prog: Not reported
Future Prog: Not reported
Description: Huntley Meadows is a 5.40-acre property located in Hybla Valley, Fairfax County, Virginia. The site was developed with several buildings, concrete walkways, concrete gun emplacements, a road and drainage structures. The County has demolished the buildings. The site retains the Army security fence and is not open to the general public. This property is known or suspected to contain military munitions and explosives of concern (e.g., unexploded ordnance) and therefore may present an explosive hazard. It is now owned by Fairfax County and used to stockpile fill dirt and firewood with no public access allowed.
The United States Army acquired the use of 5.40 acres through a use permit from the Department of Commerce dated 23 December 1953, in Hybla Valley, Fairfax County. The site was developed with several buildings, concrete walkways, concrete gun emplacements, a road and drainage structures. On 15 July 1958, the permit was terminated and the site transferred to GSA. GSA accepted custody and control of the site on 6 April 1967 and subsequently conveyed the site to Fairfax County for park and recreational purposes (a portion of Huntley Meadows Park). The County has demolished the buildings. The site retains the Army security fence and is not open to the general public.
Not reported

B7 **DORANS AUTOMOTIVE** **LTANKS** **U003883685**
SE **8541 RICHMOND HWY** **UST** **N/A**
1/4-1/2 **ALEXANDRIA, VA 22309**
0.466 mi.
2458 ft. **Site 2 of 4 in cluster B**

Relative:
Lower

Actual:
30 ft.

LTANKS:
Region: NVRO
CEDS Facility Id: 200000078865
Case Status: **Closed**
Pollution Complaint #: 20043095
Reported: 10/17/2003

UST:

Facility:
Facility Id: 3038682
Facility Type: COMMERCIAL
CEDS Facility ID: 200000078865

Owner:
Owner Id: 41106
Owner Name: Edward P. Doran, Jr.
Owner Address: 8541 Richmond Hwy
Owner Address2: Not reported
Owner City, State, Zip: Alexandria, VA 22309
UST Status: Reg
AST Status: N/A

Federally Regulated: Yes

Tank Number: R1
Tank Capacity: 4000
Tank Contents: GASOLINE
Tank Status: **REM FROM GRD**
Tank Type: UST

Tank Number: R2
Tank Capacity: 2000
Tank Contents: GASOLINE
Tank Status: **REM FROM GRD**
Tank Type: UST

Tank Number: R3
Tank Capacity: 2000
Tank Contents: GASOLINE
Tank Status: **REM FROM GRD**
Tank Type: UST

Tank Number: R4
Tank Capacity: 1000
Tank Contents: GASOLINE
Tank Status: **REM FROM GRD**
Tank Type: UST

Tank Number: R5

DORANS AUTOMOTIVE (Continued) **U003883685**

Tank Capacity: 1000
Tank Contents: GASOLINE
Tank Status: **REM FROM GRD**
Tank Type: UST

B8 **HOMES OIL STATION 7 FORMER** **LTANKS** **S108247650**
SE **8539 RICHMOND HWY** **N/A**
1/4-1/2 **ALEXANDRIA, VA 22309**
0.467 mi.
2467 ft. **Site 3 of 4 in cluster B**

Relative:
Lower

Actual:
30 ft.

LTANKS:
Region: NVRO
CEDS Facility Id: 200000077501
Case Status: **Closed**
Pollution Complaint #: 20073100
Reported: 11/01/2006

B9 **SKYVIEW PARK NORTH** **ENG CONTROLS** **S103819989**
SE **8524 RICHMOND HIGHWAY** **INST CONTROL** **N/A**
1/4-1/2 **ALEXANDRIA, VA 22309** **VCP**
0.482 mi.
2546 ft. **Site 4 of 4 in cluster B**

Relative:
Lower

Actual:
32 ft.

ENG CONTROLS:
Facility ID: VRP00332
Corrective Action Desc: Groundwater Use RestrictionVapor Mitigation SystemsOff-Site County Health Dept. Letter
Other Condition of Issuance: True
Notes: Site was formerly part of the Skyview site. Owners are seperating out the less impacted area with the hopes of speeding up the acquisition of a Certificate.1/10/03-Spoke w/ J. Lund. Discussed schedule. They are planning on sending in SCR/RA on 1/20/03. Giving us 6 weeks to review. 30 days public comment. 30 days to work on Certificate. Completion date set for about Apr. 30. Max value of perc at 464 ppb. Have soil gas and indoor air samples. Also construction plans will include vapor barriers and vapor mitigation system because of radon.1/30/03 - Received Risk Assessment for North Parcel on January 30, 2003.2/12/03 - Gave Risk Assessment to DEQ Risk Assessors for review.3/13/03 - Spoke w/ Bruce Gould regarding schedule. He is selling homes to Ryland and Ryan Homes (2 companies). Would like Certificate by mid-April, which is projected time that individual buyers will be involved. There is some flexibility though.3/18/03-Reviewed Risk Assessment and Site Characterization Report.4/22/03-Revised Public notice.4/23/03-E-mailed informal review of draft response to 3/18/03 review letter.8/6/03 - Certificate Issued.10/16/03 - responded to a concerned citizen and a potential property purchaser of a townhome at Skyview Park by supplying him with a copy of the certificate and RA and follow-up response to comments document.10/29/03 - Certificate recorded.

INST CONTROL:
Facility ID: VRP00332
Corrective Action Desc: Groundwater Use RestrictionVapor Mitigation SystemsOff-Site County Health Dept. Letter
Ground Water Use Restriction: True

SKYVIEW PARK NORTH (Continued) **S103819989**

Res. Use Restriction: False
Excavattion Restruction: False
Other Condition of Issuance: True
Notes: Site was formerly part of the Skyview site. Owners are seperating out the less impacted area with the hopes of speeding up the acquisition of a Certificate.1/10/03-Spoke w/ J. Lund. Discussed schedule. They are planning on sending in SCR/RA on 1/20/03. Giving us 6 weeks to review. 30 days public comment. 30 days to work on Certificate. Completion date set for about Apr. 30. Max value of perc at 464 ppb. Have soil gas and indoor air samples. Also construction plans will include vapor barriers and vapor mitigation system because of radon.1/30/03 - Received Risk Assessment for North Parcel on January 30, 2003.2/12/03 - Gave Risk Assessment to DEQ Risk Assessors for review.3/13/03 - Spoke w/ Bruce Gould regarding schedule. He is selling homes to Ryland and Ryan Homes (2 companies). Would like Certificate by mid-April, which is projected time that individual buyers will be involved. There is some flexibility though.3/18/03-Reviewed Risk Assessment and Site Characterization Report.4/22/03-Revised Public notice.4/23/03-E-mailed informal review of draft response to 3/18/03 review letter.8/6/03 - Certificate Issued.10/16/03 - responded to a concerned citizen and a potential property purchaser of a townhome at Skyview Park by supplying him with a copy of the certificate and RA and follow-up response to comments document.10/29/03 - Certificate recorded.

VRP:
Facility ID: VRP00314
Site Status: Terminated
Site Status 2: Await RP Action
DEQ Region: Northern
Sizs in Acres: 14.0000
Site Type: Dry Cleaner
Corrective Action Desc: Not reported
Owner Name: The Peterson Companies
Owner Contact: Bruce Gould
Owner Address: 12500 Fair Lakes Circle, Suite 400, Fairfax, VA 22033
Owner Phone: Not reported
Operator Name: Not reported
Operator Owner: Not reported
Operator Phone: Not reported
Participant Name: Not reported
Relationship to Site: Not reported
Participant Contact: Jon Thillman
Participant Phone: Not reported
Participant Title: Not reported
Participant Affiliation: Landmark Communities
Participant Address: 5252 Cherokee Avenue, Suite 303
Participant City,St,Zip: Alexandria, VA 23312
Additional Parts: Not reported
Participation Notes: Delayed, because of lack of authorization letters from multiple sellers. In 9/06, they requested a meeting. We requested updated report 10/16. Visited site on 12/01/06 & discussed next activities.
Participant Rep/Contractor: Jeffrey Lund
Participant Rep/Contractor Phone: Not reported
Participant Rep/Contractor Title: Not reported
Participant Rep/Contractor Affiliation: Engineering Consulting Services, LTD
Participant Rep/Contractor Address: 14026 Thunderbolt Plaza, Suite 100

SKYVIEW PARK NORTH (Continued) **S103819989**

Participant Rep/Contractor City,St,Zip:	Chantilly, VA 20152-3232
Metal Contaminants Present in Soil:	Not reported
Organic Contaminants Present in Soil:	Not reported
Metal Contaminants Present in GW:	Not reported
Organic Contaminants Present GW:	PCE, TCE
DEQ Staff Case Manager's Initials:	GJG
Cleanup Standards:	Not reported
No Further VRP Action Date:	Not reported
Date Participant Notified of NFA:	Not reported
Certification Date:	Not reported
Deed Received Date:	Not reported
Terms of NFA Determination:	Not reported
Date VRP Eligibility Declared by Participant:	02/25/2002
Date VRP Eligibility Determined by DEQ Region:	04/12/2002
Dt Office Of Waste Permitting Verified Site Eligblty:	Not reported
Date VRP Eligibility Determined by VRP:	04/29/2002
Date Signed Agreement Submitted By Participant:	Not reported
Date Agreement Executed by DEQ:	Not reported
Registration Fee Amount Submitted by Participant:	1000
Date Registration Fee Submitted by Participant:	05/24/2002
Site Characterization Document Number:	Not reported
DEQ Concurrence with Site Characterization Date:	Not reported
Remedial Action Work Plan Document Number:	Not reported
DEQ Concurs with Remedial Action Work Plan Date:	Not reported
Completion Report Document Number:	Not reported
DEQ Concurrs with Completion Report Date:	Not reported
Submittal Date for Document Number 1:	06/20/2002
Title of Submitted Document Number 1:	SCR/RA
Submittal Date for Document Number 2:	03/17/2004
Title of Submitted Document Number 2:	Risk Assessment
Submittal Date for Document Number 3:	05/14/2004
Title of Submitted Document Number 3:	CAP
Submittal Date for Document Number 4:	12/28/2007
Title of Submitted Document Number 4:	RAP
Submittal Date for Document Number 5:	Not reported
Title of Submitted Document Number 5:	Not reported
Submittal Date for Document Number 6:	Not reported
Title of Submitted Document Number 6:	Not reported
Submittal Date for Document Number 7:	Not reported
Title of Submitted Document Number 7:	Not reported
Submittal Date for Document Number 8:	Not reported
Title of Submitted Document Number 8:	Not reported
DEQ Response Incident ID Number:	Not reported
EPA CERCLIS ID:	Not reported
EPA RCRA ID NUMBER:	Not reported
DEQ Pollution Complaint Number:	Not reported
Latest Action Relative To Site:	Requested an updated information regarding remediation activities status.
Latest Action Relative To Site Date:	06/07/2010
Next VRP Step Needed Relating To Site:	Not reported
Pending Since:	Not reported
Date Next Step Should Be Completed:	Not reported
Lat/Long:	0 / 0
Brownfield Tax Incentive:	Not reported
Ground Water Use Restriction:	False
Res. User Restriction:	False
Excavattion Restruction:	False

SKYVIEW PARK NORTH (Continued) **S103819989**

Unrestricted:	False
Other Condition of Issuance:	False
GPS Lat:	38.726866000000001
GPS Long:	-77.113422999999997
GPS Desc:	Not reported
Notes:	12/03/2012- Uable to make contact with participant. Site terminated due to inactvity 9/8/2008 Requested an updated information regarding remediation activities status.4-3-09, Site visit by GJG and KLG8/28/02 - Meeting in CO regarding site and timing of review activities.AEB mailed letter w/ RA comments on 11/15/02.KLG forwarded application for the North parcel to Region on 11/15/02.In 8/21/03 e-mail J. Lund said next sampling would occur in early to mid Sept. '03.10/1/03 - Received and approved of rough work plan for further deliniation of the plume. They want to use HRC to remediate. The owner is now in a hurry to develop a portion of the property to be included w/ Skyview North. They are to begin grading on 10/15/03 and complete between Feb. and April 2004. They wanted to possibly further sub-divide the site to expedite the process. We told them it was a bad idea.11/05/03 - Received FAX of latest sampling rounds. Results encouraging. They will install 3 sets of soil gas wells. Sample them in conjuncture with gw wells. Do risk assessment. Use HRC.4/23/04 - AEB sent his comments on the risk assessment via email. J Lund responded that they are addressed in the CAP.On Oct. 16, 2006, Moe called the consultant and requested an update. We received a request for a meeting. Moe and Kevin visited the site on Dec. 01, 2006, July 18, 2007: VRP staff requested, by a letter, updated information regarding remediation activities.VRP staff received a letter with attachments dated December 28, 2007. The consultant proposed additional remediation (carbon source and zero valent iron injection). Jan. 24, 2008: VRPstaff mailed a letter, indicating that the proposed remediation was effective at other site and have no objection/comments.
Facility ID:	VRP00198
Site Status:	Terminated
Site Status 2:	Await RP Action
DEQ Region:	Northern
Sizs in Acres:	Not reported
Site Type:	Dry Cleaner
Corrective Action Desc:	Not reported
Owner Name:	L&M Associates
Owner Contact:	Not reported
Owner Address:	Not reported
Owner Phone:	Not reported
Operator Name:	Not reported
Operator Owner:	Not reported
Operator Phone:	Not reported
Participant Name:	L&M Associates
Relationship to Site:	Not reported
Participant Contact:	Mr. Marc Leepson
Participant Phone:	Not reported
Participant Title:	Not reported
Participant Affiliation:	L&M Associates
Participant Address:	P.O. Box 1889
Participant City,St,Zip:	Middleburg, VA 20118
Additional Parts:	Not reported
Participation Notes:	Not reported

SKYVIEW PARK NORTH (Continued) **S103819989**

Participant Rep/Contractor:	Jeff Lund
Participant Rep/Contractor Phone:	703-810-1210
Participant Rep/Contractor Title:	Environmental Scientist
Participant Rep/Contractor Affiliation:	ECS Inc.
Participant Rep/Contractor Address:	14206 Thunderbolt Place, Suite 100
Participant Rep/Contractor City,St,Zip:	Chantilly, VA 20151
Metal Contaminants Present in Soil:	Not reported
Organic Contaminants Present in Soil:	PERC spill suspected
Metal Contaminants Present in GW:	Not reported
Organic Contaminants Present GW:	Not reported
DEQ Staff Case Manager's Initials:	AEB
Cleanup Standards:	Not reported
No Further VRP Action Date:	Not reported
Date Participant Notified of NFA:	Not reported
Certification Date:	Not reported
Deed Received Date:	Not reported
Terms of NFA Determination:	Not reported
Date VRP Eligibility Declared by Participant:	03/31/1997
Date VRP Eligibility Determined by DEQ Region:	05/16/1997
Dt Office Of Waste Permitting Verified Site Eligblty:	Not reported
Date VRP Eligibility Determined by VRP:	05/20/1997
Date Signed Agreement Submitted By Participant:	Not reported
Date Agreement Executed by DEQ:	Not reported
Registration Fee Amount Submitted by Participant:	19.50
Date Registration Fee Submitted by Participant:	08/15/1997
Site Characterization Document Number:	2, 3, 4
DEQ Concurrence with Site Characterization Date:	Not reported
Remedial Action Work Plan Document Number:	Not reported
DEQ Concurs with Remedial Action Work Plan Date:	Not reported
Completion Report Document Number:	Not reported
DEQ Concurrs with Completion Report Date:	Not reported
Submittal Date for Document Number 1:	05/20/1997
Title of Submitted Document Number 1:	Limited Phase II ESA-Belvoir Park and Shop --{dated 09 13 96}
Submittal Date for Document Number 2:	05/20/1997
Title of Submitted Document Number 2:	Site Characterization Report (dated 1/10/97)
Submittal Date for Document Number 3:	04/21/1998
Title of Submitted Document Number 3:	Well Installation and Sampling (dated 4/16/98)
Submittal Date for Document Number 4:	12/15/1998
Title of Submitted Document Number 4:	Summary of Environmental Sampling and Risk Assessment
Submittal Date for Document Number 5:	Not reported
Title of Submitted Document Number 5:	Not reported
Submittal Date for Document Number 6:	Not reported
Title of Submitted Document Number 6:	Not reported
Submittal Date for Document Number 7:	Not reported
Title of Submitted Document Number 7:	Not reported
Submittal Date for Document Number 8:	Not reported
Title of Submitted Document Number 8:	Not reported
DEQ Response Incident ID Number:	Not reported
EPA CERCLIS ID:	Not reported
EPA RCRA ID NUMBER:	Not reported
DEQ Pollution Complaint Number:	Not reported
Latest Action Relative To Site:	Identified deficiencies in SCR.
Latest Action Relative To Site Date:	05/18/1998
Next VRP Step Needed Relating To Site:	Review Risk Assessment
Pending Since:	12/18/1998
Date Next Step Should Be Completed:	01/18/1999
Lat/Long:	39 / 77

SKYVIEW PARK NORTH (Continued) **S103819989**

Brownfield Tax Incentive:	Not reported
Ground Water Use Restriction:	Not reported
Res. User Restriction:	Not reported
Excavattion Restruction:	Not reported
Unrestricted:	Not reported
Other Condition of Issuance:	Not reported
GPS Lat:	Not reported
GPS Long:	Not reported
GPS Desc:	Not reported
Notes:	PERC leak at shopping center, some previous petroleum contamination from LUST, closure in February 1997 on leaking tank.7/1/97--no agreement, regulations promulgated 6/26/97. Site must participate under regulations, including public notice. 04/20/98 - Transfer case manager to CLH. AEB project officer 2/20/02.Terminated and transferred to Skyview Park - VRP00314
Facility ID:	VRP00332
Site Status:	Certificate Issued
Site Status 2:	Certificate Recorded
DEQ Region:	Northern
Sizs in Acres:	12.0000
Site Type:	Dry Cleaner
Corrective Action Desc:	Groundwater Use RestrictionVapor Mitigation SystemsOff-Site County Health Dept. Letter
Owner Name:	The Peterson Companies
Owner Contact:	Bruce Gould
Owner Address:	Peterson Companies, 12500 Fairlakes Circle, Suite 400, Fairfax, VA 22033
Owner Phone:	703.631.7550
Operator Name:	Not reported
Operator Owner:	Not reported
Operator Phone:	Not reported
Participant Name:	John H. Thillmann
Relationship to Site:	Not reported
Participant Contact:	Not reported
Participant Phone:	703.658.5200
Participant Title:	Vice President Land Development & Planning
Participant Affiliation:	Landmark Communities
Participant Address:	5252 Cherokee Avenue Suite 303
Participant City,St,Zip:	Alexandria, VA 22312
Additional Parts:	Not reported
Participation Notes:	Application forwarded to region on 11/15/02.
Participant Rep/Contractor:	Jeffrey Lund
Participant Rep/Contractor Phone:	Not reported
Participant Rep/Contractor Title:	Not reported
Participant Rep/Contractor Affiliation:	Engineering Consulting Services, LTD
Participant Rep/Contractor Address:	14026 Thunderbolt Plaza, Suite 100
Participant Rep/Contractor City,St,Zip:	Chantilly, VA 20152-3232
Metal Contaminants Present in Soil:	Not reported
Organic Contaminants Present in Soil:	Not reported
Metal Contaminants Present in GW:	Not reported
Organic Contaminants Present GW:	Not reported
DEQ Staff Case Manager's Initials:	AEB
Cleanup Standards:	Not reported
No Further VRP Action Date:	Not reported
Date Participant Notified of NFA:	Not reported
Certification Date:	08/06/2003

SKYVIEW PARK NORTH (Continued) **S103819989**

Deed Received Date:	10/29/2003
Terms of NFA Determination:	Not reported
Date VRP Eligibility Declared by Participant:	11/13/2002
Date VRP Eligibility Determined by DEQ Region:	12/12/2002
Dt Office Of Waste Permitting Verified Site Eligblty:	Not reported
Date VRP Eligibility Determined by VRP:	12/31/2002
Date Signed Agreement Submitted By Participant:	Not reported
Date Agreement Executed by DEQ:	Not reported
Registration Fee Amount Submitted by Participant:	500
Date Registration Fee Submitted by Participant:	01/13/2003
Site Characterization Document Number:	Not reported
DEQ Concurrence with Site Characterization Date:	Not reported
Remedial Action Work Plan Document Number:	Not reported
DEQ Concurs with Remedial Action Work Plan Date:	Not reported
Completion Report Document Number:	Not reported
DEQ Concurrs with Completion Report Date:	Not reported
Submittal Date for Document Number 1:	Not reported
Title of Submitted Document Number 1:	Not reported
Submittal Date for Document Number 2:	Not reported
Title of Submitted Document Number 2:	Not reported
Submittal Date for Document Number 3:	Not reported
Title of Submitted Document Number 3:	Not reported
Submittal Date for Document Number 4:	Not reported
Title of Submitted Document Number 4:	Not reported
Submittal Date for Document Number 5:	Not reported
Title of Submitted Document Number 5:	Not reported
Submittal Date for Document Number 6:	Not reported
Title of Submitted Document Number 6:	Not reported
Submittal Date for Document Number 7:	Not reported
Title of Submitted Document Number 7:	Not reported
Submittal Date for Document Number 8:	Not reported
Title of Submitted Document Number 8:	Not reported
DEQ Response Incident ID Number:	Not reported
EPA CERCLIS ID:	Not reported
EPA RCRA ID NUMBER:	Not reported
DEQ Pollution Complaint Number:	Not reported
Latest Action Relative To Site:	Certificate Recorded
Latest Action Relative To Site Date:	10/29/2003
Next VRP Step Needed Relating To Site:	Not reported
Pending Since:	Not reported
Date Next Step Should Be Completed:	Not reported
Lat/Long:	0 / 0
Brownfield Tax Incentive:	Not reported
Ground Water Use Restriction:	True
Res. User Restriction:	False
Excavattion Restruction:	False
Unrestricted:	False
Other Condition of Issuance:	True
GPS Lat:	Not reported
GPS Long:	Not reported
GPS Desc:	Not reported

Notes: Site was formerly part of the Skyview site. Owners are seperating out the less impacted area with the hopes of speeding up the acquisition of a Certificate.1/10/03-Spoke w/ J. Lund. Discussed schedule. They are planning on sending in SCR/RA on 1/20/03. Giving us 6 weeks to review. 30 days public comment. 30 days to work on Certificate. Completion date set for about Apr. 30. Max value of perc at 464 ppb.

SKYVIEW PARK NORTH (Continued) **S103819989**

Have soil gas and indoor air samples. Also construction plans will include vapor barriers and vapor mitigation system because of radon.1/30/03 - Received Risk Assessment for North Parcel on January 30, 2003.2/12/03 - Gave Risk Assessment to DEQ Risk Assessors for review.3/13/03 - Spoke w/ Bruce Gould regarding schedule. He is selling homes to Ryland and Ryan Homes (2 companies). Would like Certificate by mid-April, which is projected time that individual buyers will be involved. There is some flexibility though.3/18/03-Reviewed Risk Assessment and Site Characterization Report.4/22/03-Revised Public notice.4/23/03-E-mailed informal review of draft response to 3/18/03 review letter.8/6/03 - Certificate Issued.10/16/03 - responded to a concerned citizen and a potential property purchaser of a townhome at Skyview Park by supplying him with a copy of the certificate and RA and follow-up response to comments document.10/29/03 - Certificate recorded.

Count: 20 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
FAIRFAX	S105983680	FORT BELVOIR - DOGUE CREEK APARTME	BUILDING 00900	22060	LUST
FAIRFAX	S105983654	FORT BELVOIR - DOGUE CREEK HOUSING	BUILDING 00919 ADJACENT TO	22060	LUST
FAIRFAX	S105983549	FORT BELVOIR - DOGUE CREEK VILLAGE	BUILDING 00900	22060	LUST
FAIRFAX	S105983814	ACTION AUTOMOTIVE	8150 RICHMOND HIGHWAY	22309	LUST, LTANKS
FORT BELVOIR	1008168236	FORT BELVOIR FAMILY HOUSING - NEW	GUNSTON RD		FINDS
FORT BELVOIR	S108992426	FORT BELVOIR - BUILDING 00927	TELEGRAPH RD AND POTOMAC RIVER	22060	LTANKS
FORT BELVOIR	S108992425	FORT BELVOIR - BUILDING 923	TELEGRAPH RD AND POTOMAC RIVER	22060	LTANKS
FORT BELVOIR	S108992419	FORT BELVOIR - BUILDING 00911 DOGU	TELEGRAPH RD AND POTOMAC RIVER	22060	LTANKS
FORT BELVOIR	S108992418	FORT BELVOIR - BUILDING 00912 DOGU	TELEGRAPH RD AND POTOMAC RIVER	22060	LTANKS
FORT BELVOIR	S108992417	FORT BELVOIR - BUILDING 2462 DTRA	TELEGRAPH RD AND POTOMAC RIVER	22060	LTANKS
FORT BELVOIR	S108992416	FORT BELVOIR - BUILDING 709	TELEGRAPH RD AND POTOMAC RIVER	22060	LTANKS
FORT BELVOIR	S108992411	FORT BELVOIR - BUILDING 1422	TELEGRAPH RD AND POTOMAC RIVER	22060	LTANKS
FORT BELVOIR	S108992400	FORT BELVOIR - BUILDING 190	TELEGRAPH RD AND POTOMAC RIVER	22060	LTANKS
FORT BELVOIR	S108992388	FORT BELVOIR - BUILDING 1001	TELEGRAPH RD AND POTOMAC RIVER	22060	LTANKS
FORT BELVOIR	S108992344	US ARMY - FORT BELVOIR - DC ANG BU	TELEGRAPH RD AND POTOMAC RIVER	22060	LTANKS
FORT BELVOIR	S108514851	US ARMY - FORT BELVOIR - PARK VILL	TELEGRAPH RD AND POTOMAC RIVER	22060	LTANKS
FORT BELVOIR	S106707214	FORT BELVOIR - HERRYFORD VILLAGE S	TELEGRAPH RD AND POTOMAC RIVER	22060	LTANKS
FORT BELVOIR	S105462954	FORT BELVOIR - POL FACILITY	TELEGRAPH RD AND POTOMAC RIVER	22060	LTANKS
FORT BELVOIR	S105462909	FORT BELVOIR - 28 TANKS VARIOUS BU	TELEGRAPH RD AND POTOMAC RIVER	22060	LTANKS, ENF
FORT BELVOIR	1008164312	US ARMY - FORT BELVOIR	TELEGRAPH RD AND POTOMAC RIVER	22060	SWF/LF, AIRS, RGA LF

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 78

Source: EPA
Telephone: N/A
Last EDR Contact: 01/21/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 78

Source: EPA
Telephone: N/A
Last EDR Contact: 01/09/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 78

Source: EPA
Telephone: N/A
Last EDR Contact: 01/09/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Quarterly

Federal CERCLIS list

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 94

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 11/11/2013
Next Scheduled EDR Contact: 03/10/2014
Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 05/31/2013
Date Data Arrived at EDR: 07/08/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 151

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 01/10/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Varies

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 94

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 11/11/2013
Next Scheduled EDR Contact: 03/10/2014
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 01/02/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 01/02/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 01/02/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 01/02/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 01/02/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Varies

Federal institutional controls / engineering controls registries

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 12/17/2013
Date Data Arrived at EDR: 01/14/2014
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 14

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 12/09/2013
Next Scheduled EDR Contact: 03/24/2014
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 12/17/2013
Date Data Arrived at EDR: 01/14/2014
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 14

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 12/09/2013
Next Scheduled EDR Contact: 03/24/2014
Data Release Frequency: Varies

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 11/20/2013
Date Data Arrived at EDR: 11/21/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 95

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/14/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/30/2013
Date Data Arrived at EDR: 10/01/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 66

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 02/07/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Annually

State- and tribal - equivalent CERCLIS

SHWS: This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: Department of Environmental Quality
Telephone: 804-698-4236
Last EDR Contact: 12/18/2013
Next Scheduled EDR Contact: 04/07/2014
Data Release Frequency: N/A

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: Solid Waste Management Facilities

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 09/12/2013
Date Data Arrived at EDR: 09/13/2013
Date Made Active in Reports: 11/11/2013
Number of Days to Update: 59

Source: Department of Environmental Quality
Telephone: 804-698-4238
Last EDR Contact: 12/09/2013
Next Scheduled EDR Contact: 03/24/2014
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST REG TD: Leaking Underground Storage Tank Sites

Leaking underground storage tank site locations. Includes: counties of Accomack, Isle of Wight, James City, Northampton, Southampton, York; cities of Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, Williamsburg.

Date of Government Version: 06/30/2013
Date Data Arrived at EDR: 07/05/2013
Date Made Active in Reports: 09/16/2013
Number of Days to Update: 73

Source: Department of Environmental Quality Tidewater Regional Office
Telephone: trofoia@deq.vir
Last EDR Contact: 12/26/2013
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Quarterly

LUST REG WC: Leaking Underground Storage Tank List

Leaking underground storage tank site locations. Includes: counties of Alleghany, Bedford, Botetourt, Craig, Floyd, Franklin, Giles, Henry, Montgomery, Patrick, Pulaski, Roanoke; cities of Bedford, Clifton Forge, Covington, Martinsville, Radford, Roanoke, Salem.

Date of Government Version: 09/09/2013
Date Data Arrived at EDR: 09/11/2013
Date Made Active in Reports: 11/11/2013
Number of Days to Update: 61

Source: Department of Environmental Quality West Central Regional Office
Telephone: 540-562-6700
Last EDR Contact: 12/02/2013
Next Scheduled EDR Contact: 03/17/2014
Data Release Frequency: No Update Planned

LUST REG NO: Leaking Underground Storage Tank Tracking Database

Leaking underground storage tank site locations. Includes: counties of Arlington, Caroline, Culpeper, Fairfax, Fauquier, King George, Loudoun, Louisa, Madison, Orange, Prince William, Rappahannock, Spotsylvania, Stafford; cities of Alexandria, Fairfax, Falls Church, Fredericksburg, Manassas, Manassas Park.

Date of Government Version: 05/18/2004
Date Data Arrived at EDR: 05/22/2004
Date Made Active in Reports: 07/09/2004
Number of Days to Update: 48

Source: Department of Environmental Quality Northern Regional Office
Telephone: 703-583-3800
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG SW: Leaking Underground Storage Tank Database

Leaking underground storage tank site locations. Includes: counties of Bland, Buchanan, Carroll, Dickenson, Grayson, Lee, Russell, Scott, Smyth, Tazewell, Washington, Wise, Wythe; cities of Bristol, Galax, Norton.

Date of Government Version: 07/15/2013
Date Data Arrived at EDR: 07/18/2013
Date Made Active in Reports: 09/16/2013
Number of Days to Update: 60

Source: Department of Environmental Quality Southwest Regional Office
Telephone: 276-676-4800
Last EDR Contact: 01/13/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: No Update Planned

LUST REG VA: Leaking Underground Storage Tank List

Leaking underground storage tank site locations. Includes: counties of Albemarle, Augusta, Bath, Clarke, Fluvanna, Frederick, Greene, Highland, Nelson, Page, Rockbridge, Rockingham, Shenandoah, Warren; cities of Buena Vista, Charlottesville, Harrisonburg, Lexington, Staunton, Waynesboro, Winchester.

Date of Government Version: 12/06/2011
Date Data Arrived at EDR: 12/08/2011
Date Made Active in Reports: 01/16/2012
Number of Days to Update: 39

Source: Department of Environmental Quality Valley Regional Office
Telephone: 540-574-7800
Last EDR Contact: 12/02/2013
Next Scheduled EDR Contact: 03/17/2014
Data Release Frequency: No Update Planned

LUST REG SC: Leaking Underground Storage Tanks

Leaking underground storage tank site locations. Includes: counties of Amherst, Appomattox, Buckingham, Campbell, Charlotte, Cumberland, Halifax, Lunenburg, Mecklenburg, Nottoway, Pittsylvania, Prince Deward; cities of Danville, Lynchburg.

Date of Government Version: 09/06/2013
Date Data Arrived at EDR: 09/06/2013
Date Made Active in Reports: 09/17/2013
Number of Days to Update: 11

Source: Department of Environmental Quality, South Central Region
Telephone: 434-582-5120
Last EDR Contact: 12/02/2013
Next Scheduled EDR Contact: 03/17/2014
Data Release Frequency: Semi-Annually

LUST REG PD: Leaking Underground Storage Tank Sites

Leaking underground storage tank site locaitons. Includes: counties of Amelia, Brunswick, Charles City, Chesterfield, Dinwiddie, Essex, Gloucester, Goochland, Greensville, Hanover, Henrico, King and Queen, King William, Lancaster, Mathews, Middlesex, New Kent, Northumberland, Powhatan, Prince George, Richmond, Surry, Sussex, Westmoreland; cities of Colonial Heights, Emporia, Hopewell, Petersburg.

Date of Government Version: 12/02/2013
Date Data Arrived at EDR: 12/06/2013
Date Made Active in Reports: 01/20/2014
Number of Days to Update: 45

Source: Department of Environmental Quality Piedmont Regional Office
Telephone: 804-527-5020
Last EDR Contact: 12/02/2013
Next Scheduled EDR Contact: 03/17/2014
Data Release Frequency: Quarterly

LTANKS: Leaking Petroleum Storage Tanks

Includes releases of petroleum from underground storage tanks and aboveground storage tanks.

Date of Government Version: 12/02/2013
Date Data Arrived at EDR: 12/06/2013
Date Made Active in Reports: 01/20/2014
Number of Days to Update: 45

Source: Department of Environmental Quality
Telephone: 804-698-4010
Last EDR Contact: 12/06/2013
Next Scheduled EDR Contact: 03/17/2014
Data Release Frequency: Quarterly

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 11/06/2013
Date Data Arrived at EDR: 11/07/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 29

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 08/27/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 08/27/2013
Date Data Arrived at EDR: 08/27/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 66
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 09/12/2011
Date Data Arrived at EDR: 09/13/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 59
Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 11/21/2013
Date Data Arrived at EDR: 11/26/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 90
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Semi-Annually

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 02/01/2013
Date Data Arrived at EDR: 05/01/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 184
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/30/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 02/13/2014
Date Data Arrived at EDR: 02/14/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 10
Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 03/01/2013
Date Data Arrived at EDR: 03/01/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 42
Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

State and tribal registered storage tank lists

UST: Registered Petroleum Storage Tanks
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 12/02/2013
Date Data Arrived at EDR: 12/06/2013
Date Made Active in Reports: 01/17/2014
Number of Days to Update: 42

Source: Department of Environmental Quality
Telephone: 804-698-4010
Last EDR Contact: 12/06/2013
Next Scheduled EDR Contact: 03/17/2014
Data Release Frequency: Semi-Annually

AST: Registered Petroleum Storage Tanks
Registered Aboveground Storage Tanks.

Date of Government Version: 12/02/2013
Date Data Arrived at EDR: 12/06/2013
Date Made Active in Reports: 01/17/2014
Number of Days to Update: 42

Source: Department of Environmental Quality
Telephone: 804-698-4010
Last EDR Contact: 12/06/2013
Next Scheduled EDR Contact: 03/17/2014
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 02/13/2014
Date Data Arrived at EDR: 02/14/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 10

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 11/21/2013
Date Data Arrived at EDR: 11/26/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 90

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Semi-Annually

INDIAN UST R1: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 02/01/2013
Date Data Arrived at EDR: 05/01/2013
Date Made Active in Reports: 01/27/2014
Number of Days to Update: 271

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/30/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/10/2011
Date Data Arrived at EDR: 05/11/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 34

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Semi-Annually

INDIAN UST R10: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 02/05/2013
Date Data Arrived at EDR: 02/06/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 65

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 02/28/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 43

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 07/29/2013
Date Data Arrived at EDR: 08/01/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 92

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 07/29/2013
Date Data Arrived at EDR: 07/30/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 129

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/13/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

ENG CONTROLS: Engineering Controls Sites Listing

A listing of sites with Engineering Controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 12/30/2013
Date Data Arrived at EDR: 01/03/2014
Date Made Active in Reports: 01/20/2014
Number of Days to Update: 17

Source: Department of Environmental Quality
Telephone: 804-698-4228
Last EDR Contact: 12/30/2013
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Quarterly

INST CONTROL: Voluntary Remediation Program Database

Sites included in the Voluntary Remediation Program database that have deed restrictions.

Date of Government Version: 12/30/2013
Date Data Arrived at EDR: 01/03/2014
Date Made Active in Reports: 01/20/2014
Number of Days to Update: 17

Source: Department of Environmental Quality
Telephone: 804-698-4228
Last EDR Contact: 12/30/2013
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Quarterly

State and tribal voluntary cleanup sites

VRP: Voluntary Remediation Program

The Voluntary Cleanup Program encourages owners of elected contaminated sites to take the initiative and conduct voluntary cleanups that meet state environmental standards.

Date of Government Version: 12/30/2013
Date Data Arrived at EDR: 01/03/2014
Date Made Active in Reports: 01/20/2014
Number of Days to Update: 17

Source: Department of Environmental Quality
Telephone: 804-698-4228
Last EDR Contact: 12/30/2013
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Quarterly

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 09/17/2013
Date Data Arrived at EDR: 10/01/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 66

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 01/03/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Brownfields Site Specific Assessments

To qualify for Brownfields Assessment, the site must meet the Federal definition of a Brownfields and should have contaminant issues that need to be addressed and a redevelopment plan supported by the local government and community. Virginia's Department of Environmental Quality performs brownfields assessments under a cooperative agreement with the U.S. Environmental Protection Agency at no cost to communities, property owners or, prospective purchasers. The assessment is an evaluation of environmental impacts caused by previous site uses similar to a Phase II Environmental Assessment.

Date of Government Version: 07/30/2013
Date Data Arrived at EDR: 08/02/2013
Date Made Active in Reports: 09/23/2013
Number of Days to Update: 52

Source: Department of Environmental Quality
Telephone: 804-698-4207
Last EDR Contact: 01/29/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 09/24/2013
Date Data Arrived at EDR: 09/24/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 02/25/2014
Next Scheduled EDR Contact: 04/07/2014
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 11/04/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US CDL: Clandestine Drug Labs
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 12/04/2013
Date Data Arrived at EDR: 12/10/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 65

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 12/05/2013
Next Scheduled EDR Contact: 03/17/2014
Data Release Frequency: Quarterly

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/01/2007
Date Data Arrived at EDR: 11/19/2008
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 131

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/06/2013
Date Data Arrived at EDR: 04/25/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 15

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 01/03/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 52

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 01/03/2014
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Annually

SPILLS WC: Prep Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 09/21/2009
Date Data Arrived at EDR: 09/29/2009
Date Made Active in Reports: 10/30/2009
Number of Days to Update: 31

Source: Department of Environmental Quality, West Central Region
Telephone: 540-562-6700
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

SPILLS TD: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 09/17/2009
Date Data Arrived at EDR: 09/23/2009
Date Made Active in Reports: 10/06/2009
Number of Days to Update: 13

Source: Department of Environmental Quality, Tidewater Region
Telephone: trofoia@deq.vir
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: Quarterly

SPILLS SW: Reportable Spills

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 01/21/2010
Date Data Arrived at EDR: 01/22/2010
Date Made Active in Reports: 02/16/2010
Number of Days to Update: 25

Source: Department of Environmental Quality, Southwest Region
Telephone: 276-676-4839
Last EDR Contact: 07/13/2012
Next Scheduled EDR Contact: 10/29/2012
Data Release Frequency: No Update Planned

SPILLS PD: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 10/20/2009
Date Data Arrived at EDR: 10/29/2009
Date Made Active in Reports: 12/03/2009
Number of Days to Update: 35

Source: Department of Environmental Quality, Piedmont Region
Telephone: 804-527-5020
Last EDR Contact: 02/06/2012
Next Scheduled EDR Contact: 05/21/2012
Data Release Frequency: Quarterly

SPILLS NO: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 09/23/2009
Date Data Arrived at EDR: 09/29/2009
Date Made Active in Reports: 10/30/2009
Number of Days to Update: 31

Source: Department of Environmental Quality, Northern Region
Telephone: 703-583-3864
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

SPILLS PC: Pollution Complaint Database

Pollution Complaints Database. The pollution reports contained in the PC database include the initial release reporting of Leaking Underground Storage Tanks and all other releases of petroleum to the environment as well as releases to state waters. The database is current through 12/1/93. Since that time, all spill and pollution reporting information has been collected and tracked through the DEQ regional offices.

Date of Government Version: 06/01/1996
Date Data Arrived at EDR: 10/22/1996
Date Made Active in Reports: 11/21/1996
Number of Days to Update: 30

Source: Department of Environmental Quality
Telephone: 804-698-4287
Last EDR Contact: 03/08/2010
Next Scheduled EDR Contact: 06/21/2010
Data Release Frequency: No Update Planned

SPILLS: Prep/Spills Database Listing

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment. PREP staff often work to assist local emergency responders, other state agencies, federal agencies, and responsible parties, as may be needed, to manage pollution incidents. Oil spills, fish kills, and hazardous materials spills are examples of incidents that may involve the DEQ's PREP Program.

Date of Government Version: 12/02/2013
Date Data Arrived at EDR: 12/06/2013
Date Made Active in Reports: 01/20/2014
Number of Days to Update: 45

Source: Department of Environmental Quality
Telephone: 804-698-4287
Last EDR Contact: 12/06/2013
Next Scheduled EDR Contact: 03/17/2014
Data Release Frequency: Varies

SPILLS BRL: Prep/Spills Database Listing

A listing of spills locations located in the Blue Ridge Regional area, Lynchburg.

Date of Government Version: 09/18/2009
Date Data Arrived at EDR: 09/18/2009
Date Made Active in Reports: 10/06/2009
Number of Days to Update: 18

Source: DEQ, Blue Ridge Regional Office
Telephone: 434-582-6218
Last EDR Contact: 11/28/2011
Next Scheduled EDR Contact: 03/12/2012
Data Release Frequency: Varies

SPILLS VA: PREP Database

The Department of Environmental Quality's POLLUTION RESPONSE PROGRAM, known as PREP, provides for responses to air, water, and waste pollution incidents in order to protect human health and the environment.

Date of Government Version: 08/08/2012
Date Data Arrived at EDR: 08/09/2012
Date Made Active in Reports: 10/05/2012
Number of Days to Update: 57

Source: Department of Environmental Quality, Valley Regional Office
Telephone: 540-574-7800
Last EDR Contact: 05/06/2013
Next Scheduled EDR Contact: 08/19/2013
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 09/01/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/15/2013
Number of Days to Update: 43

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: 800-438-2474
Last EDR Contact: 01/02/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 02/06/2014
Next Scheduled EDR Contact: 05/19/2014
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 01/15/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 03/13/2013
Number of Days to Update: 15

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 12/13/2013
Next Scheduled EDR Contact: 03/24/2014
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 01/24/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 31

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 12/26/2013
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 11/25/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 74

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 12/12/2013
Next Scheduled EDR Contact: 03/24/2014
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/25/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/01/2013
Date Data Arrived at EDR: 09/05/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 28

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 12/06/2013
Next Scheduled EDR Contact: 03/17/2014
Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/31/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 44

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/26/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 64

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 12/26/2013
Next Scheduled EDR Contact: 04/07/2014
Data Release Frequency: Every 4 Years

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems
Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/28/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 07/20/2011
Date Data Arrived at EDR: 11/10/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 10/09/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 06/01/2013
Date Data Arrived at EDR: 07/17/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 107

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 01/28/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 07/22/2013
Date Data Arrived at EDR: 08/02/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 91

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 12/09/2013
Next Scheduled EDR Contact: 03/24/2014
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 09/30/2013
Date Data Arrived at EDR: 10/09/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 23

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 01/10/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 03/08/2013
Date Data Arrived at EDR: 03/21/2013
Date Made Active in Reports: 07/10/2013
Number of Days to Update: 111

Source: EPA
Telephone: (215) 814-5000
Last EDR Contact: 12/10/2013
Next Scheduled EDR Contact: 03/24/2014
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 11/01/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 04/19/2013
Number of Days to Update: 52

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 11/25/2013
Next Scheduled EDR Contact: 03/10/2014
Data Release Frequency: Biennially

UIC: Underground Injection Control Wells

A listing of underground injection controls wells.

Date of Government Version: 11/18/2013
Date Data Arrived at EDR: 11/20/2013
Date Made Active in Reports: 12/09/2013
Number of Days to Update: 19

Source: Department of Mines, Minerals and Energy
Telephone: 276-415-9700
Last EDR Contact: 02/18/2014
Next Scheduled EDR Contact: 05/19/2014
Data Release Frequency: Varies

DRYCLEANERS: Drycleaner List

A listing of registered drycleaners.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 02/07/2013
Date Made Active in Reports: 03/13/2013
Number of Days to Update: 34

Source: Department of Environmental Quality
Telephone: 804-698-4407
Last EDR Contact: 01/13/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Varies

ENFORCEMENT: Enforcement Actions Data

A listing of enforcement actions.

Date of Government Version: 12/12/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 01/20/2014
Number of Days to Update: 39

Source: Department of Environmental Quality
Telephone: 804-698-4031
Last EDR Contact: 12/09/2013
Next Scheduled EDR Contact: 03/24/2014
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CEDS: Comprehensive Environmental Data System

Virginia Water Protection Permits, Virginia Pollution Discharge System (point discharge) permits and Virginia Pollution Abatement (no point discharge) permits.

Date of Government Version: 12/11/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 01/20/2014
Number of Days to Update: 39

Source: Department of Environmental Quality
Telephone: 804-698-4077
Last EDR Contact: 12/09/2013
Next Scheduled EDR Contact: 03/24/2014
Data Release Frequency: Semi-Annually

AIRS: Permitted Airs Facility List

A listing of permitted Airs facilities.

Date of Government Version: 12/06/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 01/20/2014
Number of Days to Update: 39

Source: Department of Environmental Quality
Telephone: 804-698-4000
Last EDR Contact: 12/02/2013
Next Scheduled EDR Contact: 03/17/2014
Data Release Frequency: Varies

TIER 2: Tier 2 Information Listing

A listing of facilities which store or manufacture hazardous materials and submit a chemical inventory report.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 12/21/2012
Date Made Active in Reports: 02/19/2013
Number of Days to Update: 60

Source: Department of Environmental Quality
Telephone: 804-698-4159
Last EDR Contact: 12/18/2013
Next Scheduled EDR Contact: 04/07/2014
Data Release Frequency: Annually

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 01/15/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 01/20/2014
Next Scheduled EDR Contact: 05/05/2014
Data Release Frequency: Varies

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 11/11/2011
Date Data Arrived at EDR: 05/18/2012
Date Made Active in Reports: 05/25/2012
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 02/14/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites
A listing of former lead smelter site locations.

Date of Government Version: 01/29/2013
Date Data Arrived at EDR: 02/14/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 01/03/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites
A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 04/15/2013
Date Data Arrived at EDR: 07/03/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 72

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 01/02/2014
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Quarterly

FEDLAND: Federal and Indian Lands
Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 01/15/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: N/A

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)
The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/23/2013
Date Data Arrived at EDR: 11/06/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 30

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 12/26/2013
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/23/2013
Date Data Arrived at EDR: 11/06/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 30

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 12/26/2013
Next Scheduled EDR Contact: 04/14/2014
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

COAL ASH DOE: Sleam-Electric Plan Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 01/13/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Varies

COAL ASH: Coal Ash Disposal Sites
A listing of facilities with coal ash impoundments.

Date of Government Version: 07/29/2009
Date Data Arrived at EDR: 07/31/2009
Date Made Active in Reports: 08/21/2009
Number of Days to Update: 21

Source: Department of Environmental Protection
Telephone: 804-698-4285
Last EDR Contact: 12/09/2013
Next Scheduled EDR Contact: 03/24/2014
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing
A listing of financial assurance information for underground storage tank facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 11/05/2013
Date Data Arrived at EDR: 11/08/2013
Date Made Active in Reports: 11/19/2013
Number of Days to Update: 11

Source: Department of Environmental Quality
Telephone: 804-698-4205
Last EDR Contact: 11/04/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information
All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 11/20/2013
Date Data Arrived at EDR: 12/03/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 72

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 02/14/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Quarterly

Financial Assurance 2: Financial Assurance Information listing
Solid waste financial assurance information.

Date of Government Version: 11/08/2013
Date Data Arrived at EDR: 11/15/2013
Date Made Active in Reports: 11/19/2013
Number of Days to Update: 4

Source: Department of Environmental Quality
Telephone: 804-698-4123
Last EDR Contact: 11/04/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 08/17/2010
Date Data Arrived at EDR: 01/03/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 77

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 12/13/2013
Next Scheduled EDR Contact: 03/24/2014
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 01/30/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 06/30/2013
Date Data Arrived at EDR: 08/13/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Quarterly

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR US Hist Auto Stat: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Proprietary Historic Dry Cleaners - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Auto Stat: EDR Proprietary Historic Gas Stations - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/20/2014
Number of Days to Update: 203

Source: EDR
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/15/2014
Number of Days to Update: 198

Source: EDR
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 07/30/2013
Date Data Arrived at EDR: 08/19/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 45

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 02/21/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/19/2012
Date Made Active in Reports: 08/28/2012
Number of Days to Update: 40

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 01/17/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 11/01/2013
Date Data Arrived at EDR: 11/07/2013
Date Made Active in Reports: 11/18/2013
Number of Days to Update: 11

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 02/07/2014
Next Scheduled EDR Contact: 05/19/2014
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 07/24/2013
Date Made Active in Reports: 08/19/2013
Number of Days to Update: 26

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 01/20/2014
Next Scheduled EDR Contact: 05/05/2014
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 06/21/2013
Date Made Active in Reports: 08/05/2013
Number of Days to Update: 45

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 08/09/2013
Date Made Active in Reports: 09/27/2013
Number of Days to Update: 49

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 12/11/2013
Next Scheduled EDR Contact: 03/31/2014
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: Rextag Strategies Corp.
Telephone: (281) 769-2247
U.S. Electric Transmission and Power Plants Systems Digital GIS Data

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 804-692-1900

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

STREET AND ADDRESS INFORMATION

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

WOODLAWN EAST - BERMAN TRACT
5601-5615 POLE RD
FORT BELVOIR, VA 22060

TARGET PROPERTY COORDINATES

Latitude (North):	38.7322 - 38° 43' 55.92''
Longitude (West):	77.1233 - 77° 7' 23.88''
Universal Tranverse Mercator:	Zone 18
UTM X (Meters):	315434.7
UTM Y (Meters):	4288992.0
Elevation:	34 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	38077-F1 MOUNT VERNON, VA MD
Most Recent Revision:	1983
West Map:	38077-F2 FORT BELVOIR, VA MD
Most Recent Revision:	1983

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

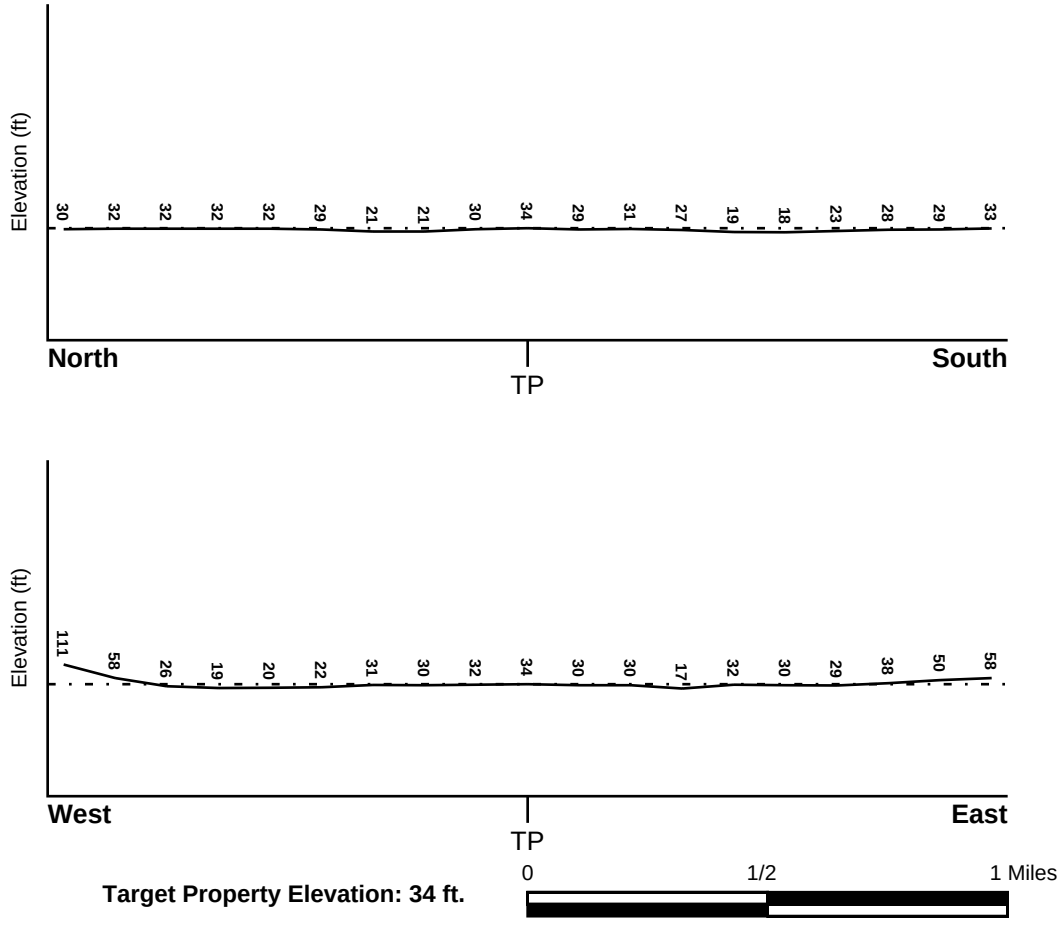
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General North

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Target Property Elevation: 34 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
FAIRFAX, VA	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 51059C - FEMA DFIRM Flood data

Additional Panels in search area: Not Reported

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
MOUNT VERNON	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era:	Mesozoic
System:	Cretaceous
Series:	Lower Cretaceous
Code:	lK *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name:	SUFFOLK
Soil Surface Texture:	fine sandy loam
Hydrologic Group:	Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.
Soil Drainage Class:	Well drained. Soils have intermediate water holding capacity. Depth to water table is more than 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel:	MODERATE
Depth to Bedrock Min:	> 60 inches
Depth to Bedrock Max:	> 60 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	11 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 6.00 Min: 2.00	Max: 6.00 Min: 3.60
2	11 inches	47 inches	sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 2.00 Min: 0.60	Max: 6.00 Min: 3.60
3	47 inches	65 inches	loamy fine sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand.	Max: 20.00 Min: 2.00	Max: 6.00 Min: 3.60

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: loamy sand
loamy fine sand
mucky - loam

Surficial Soil Types: loamy sand
loamy fine sand
mucky - loam

Shallow Soil Types: sandy loam
fine sandy loam

Deeper Soil Types: stratified
sand

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

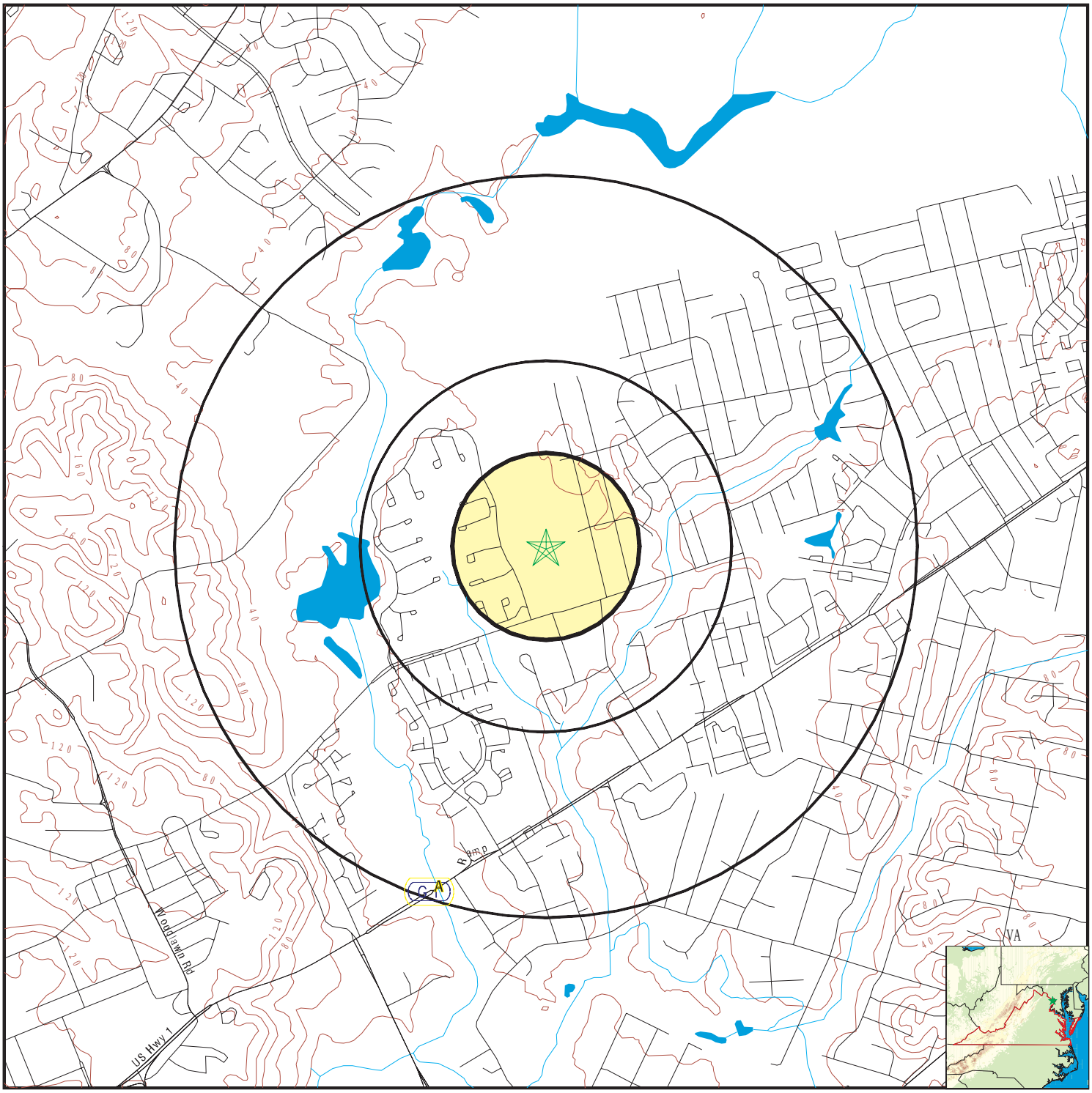
MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

PHYSICAL SETTING SOURCE MAP - 3866681.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons

0 1/4 1/2 1 Miles

- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data

N

SITE NAME:	Woodlawn East - Berman Tract	CLIENT:	Indepth Corporation
ADDRESS:	5601-5615 POLE RD Fort Belvoir VA 22060	CONTACT:	Lane Middleton
LAT/LONG:	38.7322 / 77.1233	INQUIRY #:	3866681.2s
		DATE:	February 27, 2014 3:25 pm

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation			Database	EDR ID Number
A1 **SSW** **1/2 - 1 Mile** **Lower**	Site ID: Groundwater Flow: Shallowest Water Table Depth: Deepest Water Table Depth: Average Water Table Depth: Date:	3019177 Not Reported 18.61 20.77 Not Reported 11/1994	**AQUIFLOW**	**72419**
A2 **SSW** **1/2 - 1 Mile** **Lower**	Site ID: Groundwater Flow: Shallowest Water Table Depth: Deepest Water Table Depth: Average Water Table Depth: Date:	3009988 Not Reported 21.56 27.61 Not Reported 03/1995	**AQUIFLOW**	**72480**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

EPA Region 3 Statistical Summary Readings for Zip Code: 22060

Number of sites tested: 19.

Maximum Radon Level: 5.9 pCi/L.
Minimum Radon Level: 0.4 pCi/L.

pCi/L <4	pCi/L 4-10	pCi/L 10-20	pCi/L 20-50	pCi/L 50-100	pCi/L >100
16 (84.21%)	3 (15.79%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)

Federal EPA Radon Zone for FAIRFAX County: 1

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Virginia Public Water Supplies
Source: Department of Health, Office of Water Programs
Telephone: 804-786-1756

OTHER STATE DATABASE INFORMATION

Virginia Oil and Gas Wells
Source: Department of Mines, Minerals and Energy
Telephone: 804-692-3200
A listing of oil and gas well locations

RADON

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

EPA Region 3 Statistical Summary Readings
Source: Region 3 EPA
Telephone: 215-814-2082
Radon readings for Delaware, D.C., Maryland, Pennsylvania, Virginia and West Virginia.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STREET AND ADDRESS INFORMATION

APPENDIX D

Historical Aerial Photographs

Woodlawn East - Berman Tract
5601-5615 POLE RD
Fort Belvoir, VA 22060

Inquiry Number: 3866681.8
February 28, 2014

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Date EDR Searched Historical Sources:

Aerial Photography February 28, 2014

Target Property:

5601-5615 POLE RD

Fort Belvoir, VA 22060

Year	Scale	Details	Source
1937	Aerial Photograph. Scale: 1"=500'	Panel #: 38077-F1, Mount Vernon, VA;/Flight Date: April 30, 1937	EDR
1953	Aerial Photograph. Scale: 1"=500'	Panel #: 38077-F1, Mount Vernon, VA;/Flight Date: December 17, 1953	EDR
1962	Aerial Photograph. Scale: 1"=500'	Panel #: 38077-F1, Mount Vernon, VA;/Flight Date: May 25, 1962	EDR
1974	Aerial Photograph. Scale: 1"=500'	Panel #: 38077-F1, Mount Vernon, VA;/Flight Date: February 05, 1974	EDR
1981	Aerial Photograph. Scale: 1"=500'	Panel #: 38077-F1, Mount Vernon, VA;/Flight Date: January 01, 1981	EDR
1988	Aerial Photograph. Scale: 1"=750'	Panel #: 38077-F1, Mount Vernon, VA;/Flight Date: April 20, 1988	EDR
1994	Aerial Photograph. Scale: 1"=500'	Panel #: 38077-F1, Mount Vernon, VA;/DOQQ - acquisition dates: March 17, 1994	EDR
1998	Aerial Photograph. Scale: 1"=750'	Panel #: 38077-F1, Mount Vernon, VA;/Flight Date: February 09, 1998	EDR
2000	Aerial Photograph. Scale: 1"=750'	Panel #: 38077-F1, Mount Vernon, VA;/Flight Date: March 31, 2000	EDR
2005	Aerial Photograph. Scale: 1"=500'	Panel #: 38077-F1, Mount Vernon, VA;/Flight Year: 2005	EDR
2006	Aerial Photograph. Scale: 1"=500'	Panel #: 38077-F1, Mount Vernon, VA;/Flight Year: 2006	EDR
2007	Aerial Photograph. Scale: 1"=500'	Panel #: 38077-F1, Mount Vernon, VA;/Flight Year: 2007	EDR
2008	Aerial Photograph. Scale: 1"=500'	Panel #: 38077-F1, Mount Vernon, VA;/Flight Year: 2008	EDR
2009	Aerial Photograph. Scale: 1"=500'	Panel #: 38077-F1, Mount Vernon, VA;/Flight Year: 2009	EDR
2011	Aerial Photograph. Scale: 1"=500'	Panel #: 38077-F1, Mount Vernon, VA;/Flight Year: 2011	EDR
2012	Aerial Photograph. Scale: 1"=500'	Panel #: 38077-F1, Mount Vernon, VA;/Flight Year: 2012	EDR


INQUIRY #: 3866681.8
YEAR: 1937
= 500'
N
EDR


INQUIRY #: 3866681.8
YEAR: 1953
= 500'
N
EDR


INQUIRY #: 3866681.8
YEAR: 1962
= 500'
N
EDR


INQUIRY #: 3866681.8
YEAR: 1974
= 500'
N
EDR

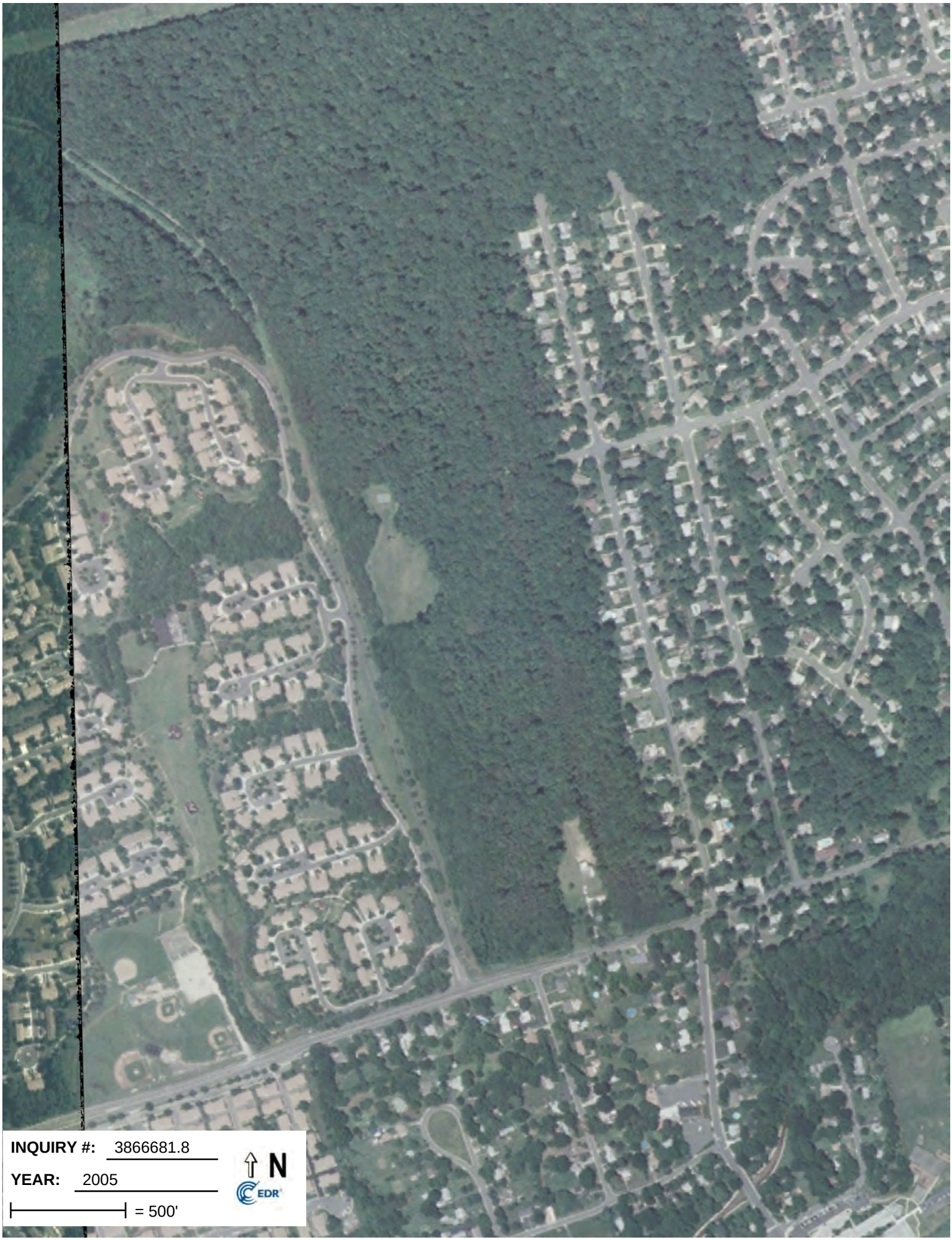

INQUIRY #: 3866681.8
YEAR: 1981
= 500'
N
EDR


INQUIRY #: 3866681.8
YEAR: 1988
= 750'
N
EDR


INQUIRY #: 3866681.8
YEAR: 1994
= 500'
N
EDR


INQUIRY #: 3866681.8
YEAR: 1998
= 750'
N
EDR


INQUIRY #: 3866681.8
YEAR: 2000
= 750'
N
EDR


INQUIRY #: 3866681.8
YEAR: 2005
= 500'
N
EDR

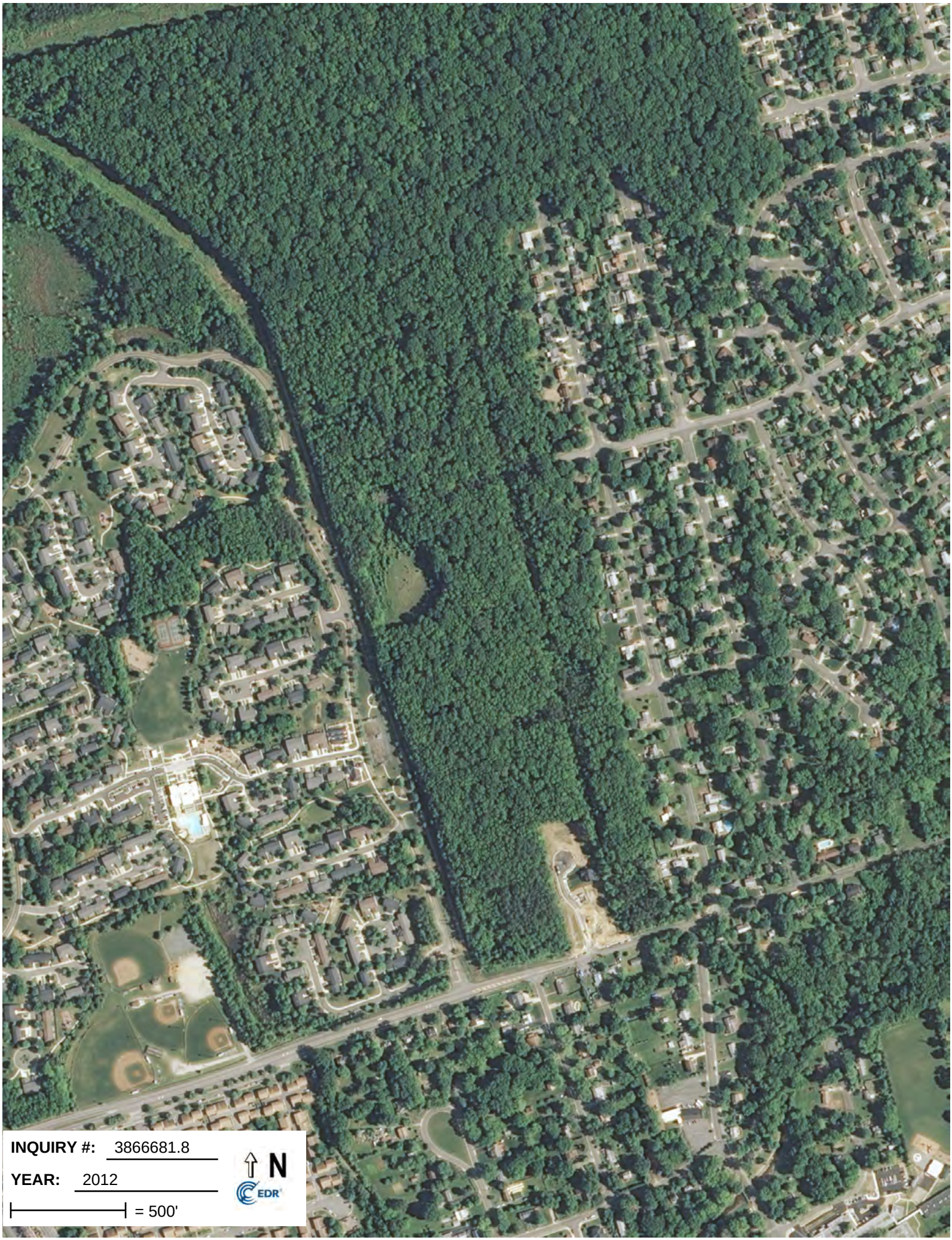

INQUIRY #: 3866681.8
YEAR: 2006
= 500'
N
EDR


INQUIRY #: 3866681.8
YEAR: 2007
= 500'
N
EDR


INQUIRY #: 3866681.8
YEAR: 2008
= 500'
N
EDR


INQUIRY #: 3866681.8
YEAR: 2009
= 500'
N
EDR


INQUIRY #: 3866681.8
YEAR: 2011
= 500'
N
EDR


INQUIRY #: 3866681.8
YEAR: 2012
= 500'
N
EDR

APPENDIX E

Historical Topographic Maps

Woodlawn East - Berman Tract
5601-5615 POLE RD
Fort Belvoir, VA 22060

Inquiry Number: 3866681.4
February 27, 2014

EDR Historical Topographic Map Report

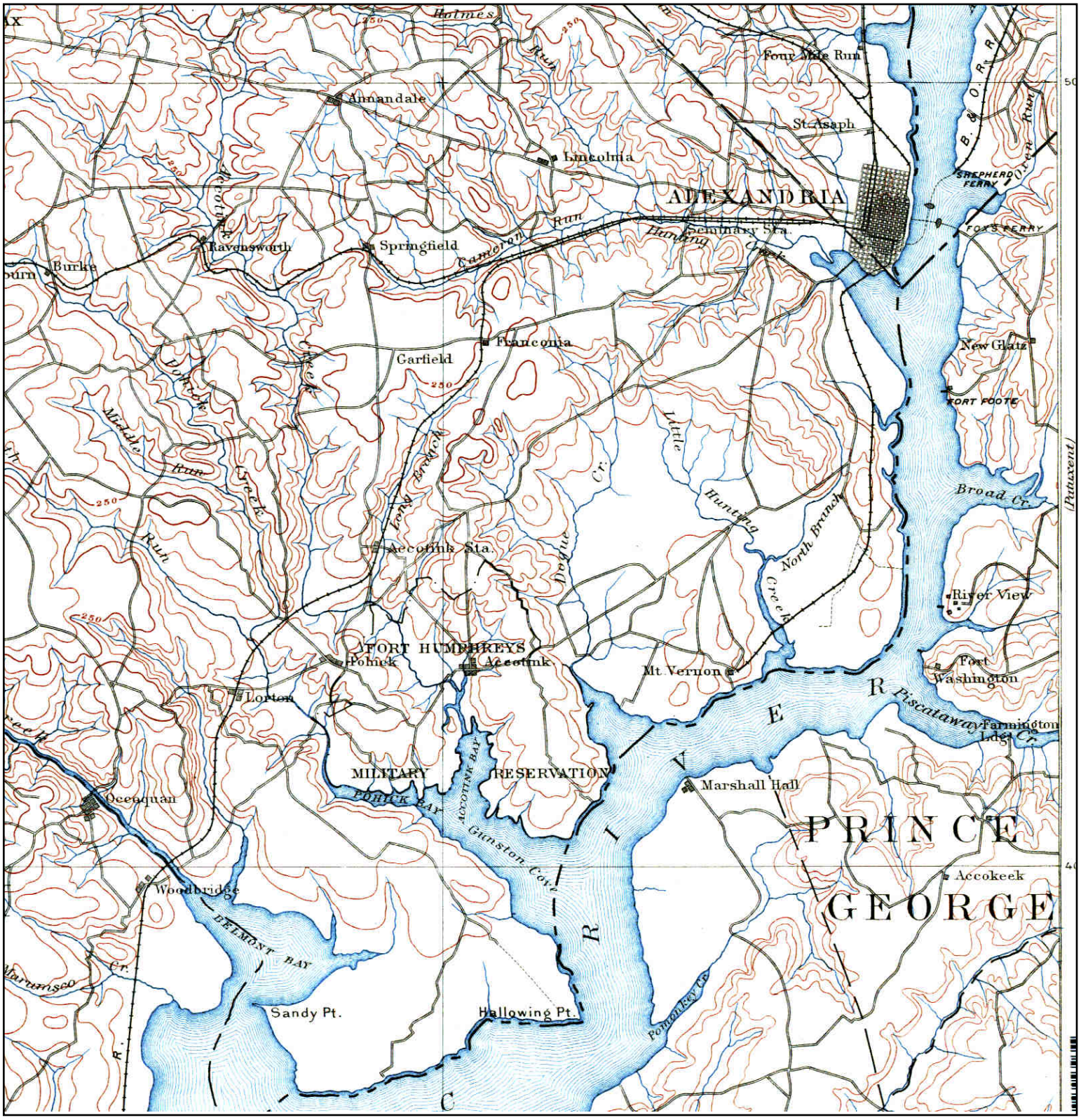
6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topographic Map Report

Environmental Data Resources, Inc.s (EDR) Historical Topographic Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topographic Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the early 1900s.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Historical Topographic Map



N	TARGET QUAD NAME: MOUNT VERNON MAP YEAR: 1894 SERIES: 30 SCALE: 1:125000	SITE NAME: Woodlawn East - Berman Tract ADDRESS: 5601-5615 POLE RD Fort Belvoir, VA 22060 LAT/LONG: 38.7322 / -77.1233	CLIENT: Indepth Corporation CONTACT: Lane Middleton INQUIRY#: 3866681.4 RESEARCH DATE: 02/27/2014

Historical Topographic Map

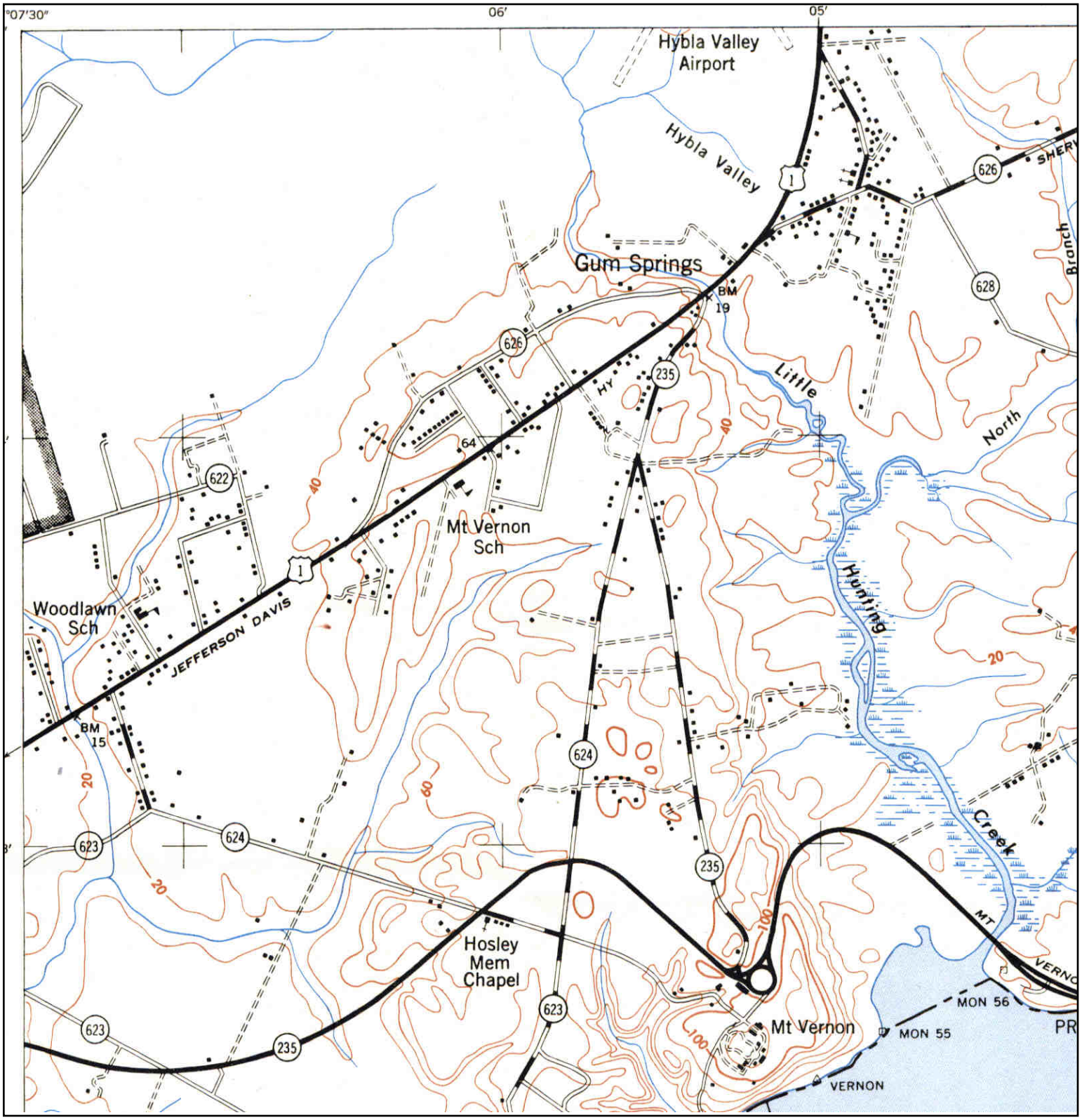
Unsurveyed Area on the Topographic Map

N	TARGET QUAD NAME: INDIAN HEAD MAP YEAR: 1913 SERIES: 15 SCALE: 1:62500	SITE NAME: Woodlawn East - Berman Tract ADDRESS: 5601-5615 POLE RD Fort Belvoir, VA 22060 LAT/LONG: 38.7322 / -77.1233	CLIENT: Indepth Corporation CONTACT: Lane Middleton INQUIRY#: 3866681.4 RESEARCH DATE: 02/27/2014

Historical Topographic Map

N	TARGET QUAD NAME: INDIAN HEAD MAP YEAR: 1925 SERIES: 15 SCALE: 1:62500	SITE NAME: Woodlawn East - Berman Tract ADDRESS: 5601-5615 POLE RD Fort Belvoir, VA 22060 LAT/LONG: 38.7322 / -77.1233	CLIENT: Indepth Corporation CONTACT: Lane Middleton INQUIRY#: 3866681.4 RESEARCH DATE: 02/27/2014

Historical Topographic Map



N	TARGET QUAD NAME: MOUNT VERNON MAP YEAR: 1944 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Woodlawn East - Berman Tract ADDRESS: 5601-5615 POLE RD Fort Belvoir, VA 22060 LAT/LONG: 38.7322 / -77.1233	CLIENT: Indepth Corporation CONTACT: Lane Middleton INQUIRY#: 3866681.4 RESEARCH DATE: 02/27/2014

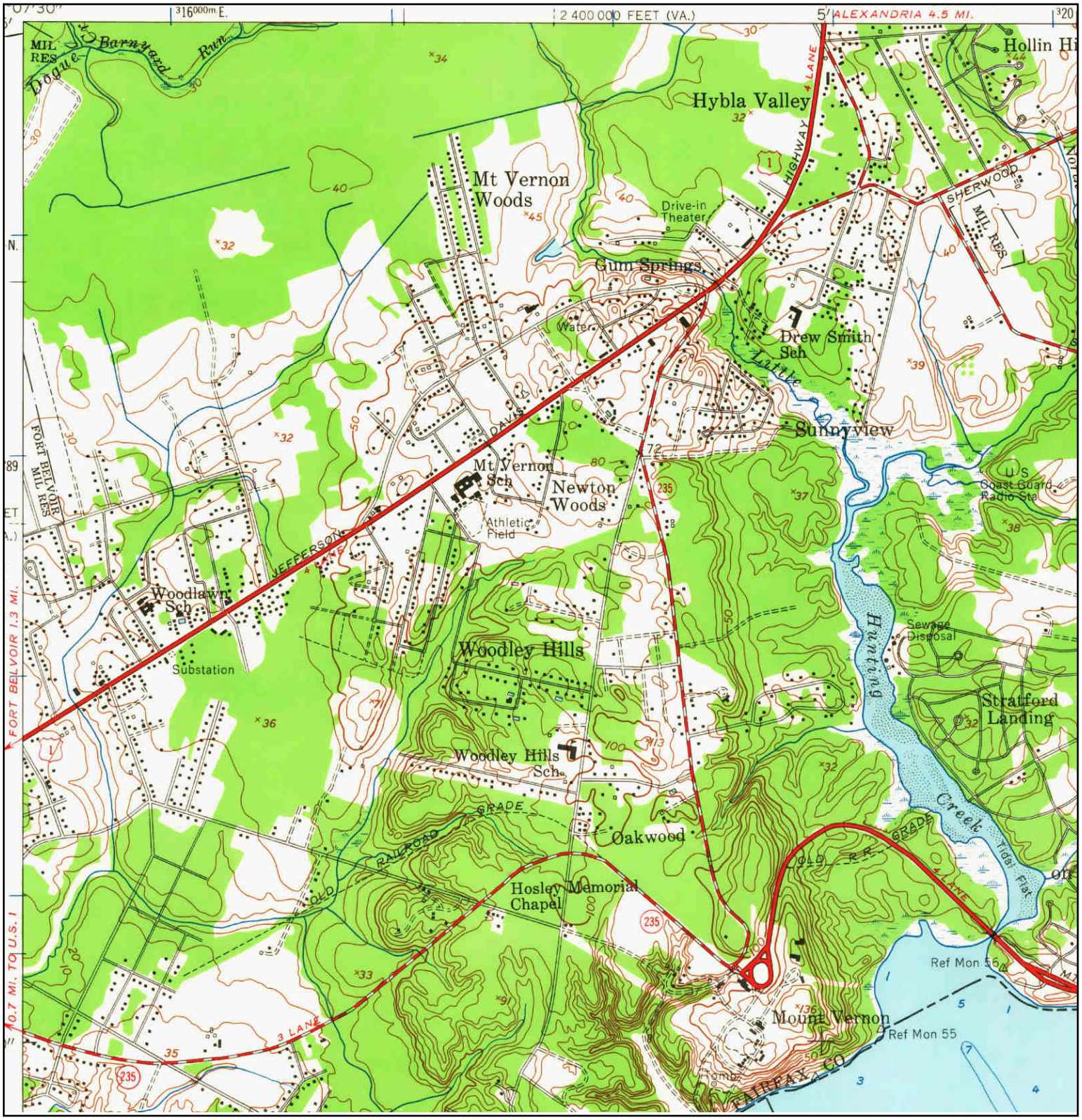
Historical Topographic Map

N	TARGET QUAD NAME: MOUNT VERNON MAP YEAR: 1951 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Woodlawn East - Berman Tract ADDRESS: 5601-5615 POLE RD Fort Belvoir, VA 22060 LAT/LONG: 38.7322 / -77.1233	CLIENT: Indepth Corporation CONTACT: Lane Middleton INQUIRY#: 3866681.4 RESEARCH DATE: 02/27/2014

Historical Topographic Map

N	TARGET QUAD NAME: INDIAN HEAD MAP YEAR: 1956 SERIES: 15 SCALE: 1:62500	SITE NAME: Woodlawn East - Berman Tract ADDRESS: 5601-5615 POLE RD Fort Belvoir, VA 22060 LAT/LONG: 38.7322 / -77.1233	CLIENT: Indepth Corporation CONTACT: Lane Middleton INQUIRY#: 3866681.4 RESEARCH DATE: 02/27/2014

Historical Topographic Map

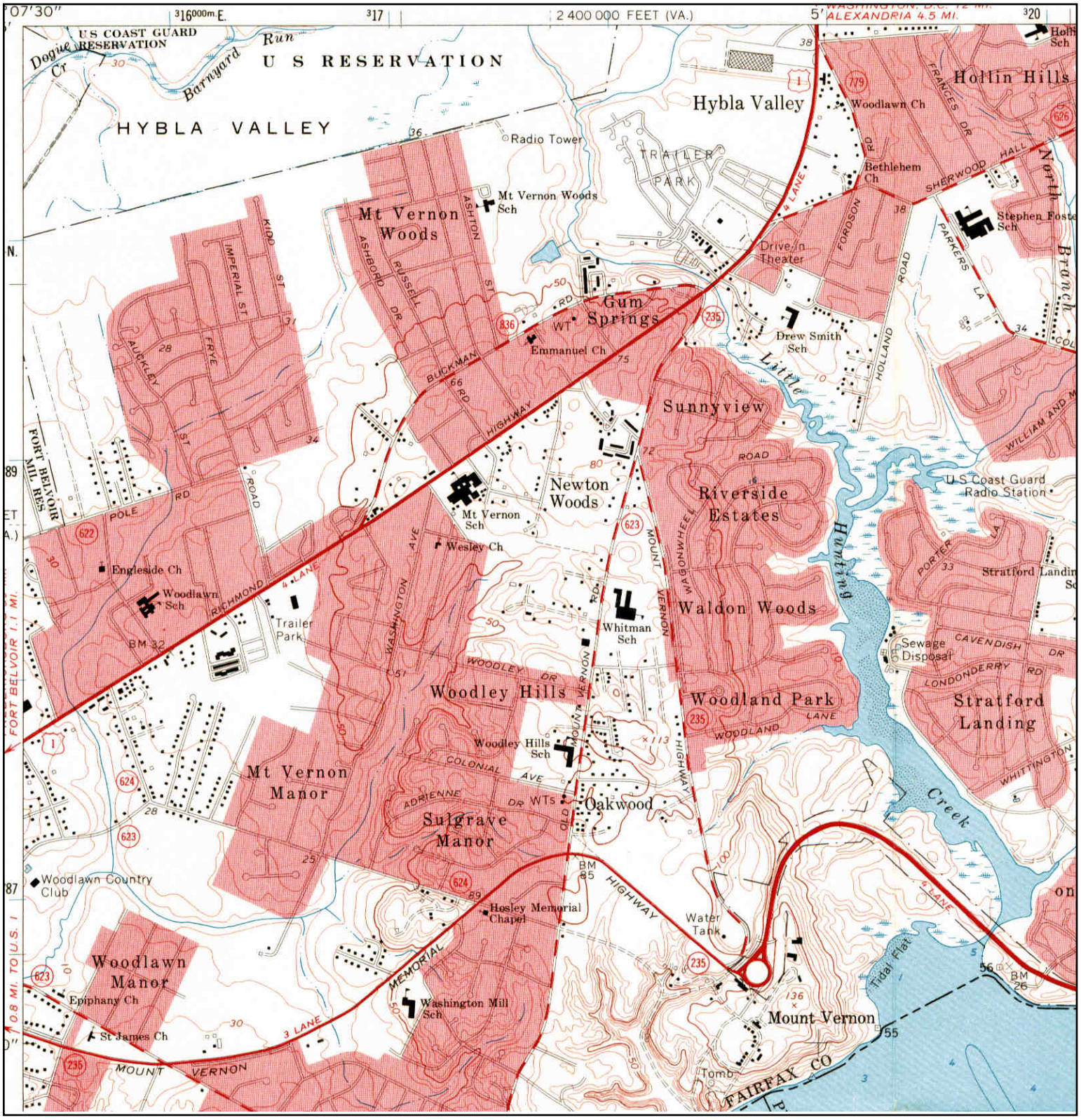


N	TARGET QUAD NAME: MOUNT VERNON MAP YEAR: 1956 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Woodlawn East - Berman Tract ADDRESS: 5601-5615 POLE RD Fort Belvoir, VA 22060 LAT/LONG: 38.7322 / -77.1233	CLIENT: Indepth Corporation CONTACT: Lane Middleton INQUIRY#: 3866681.4 RESEARCH DATE: 02/27/2014

Historical Topographic Map

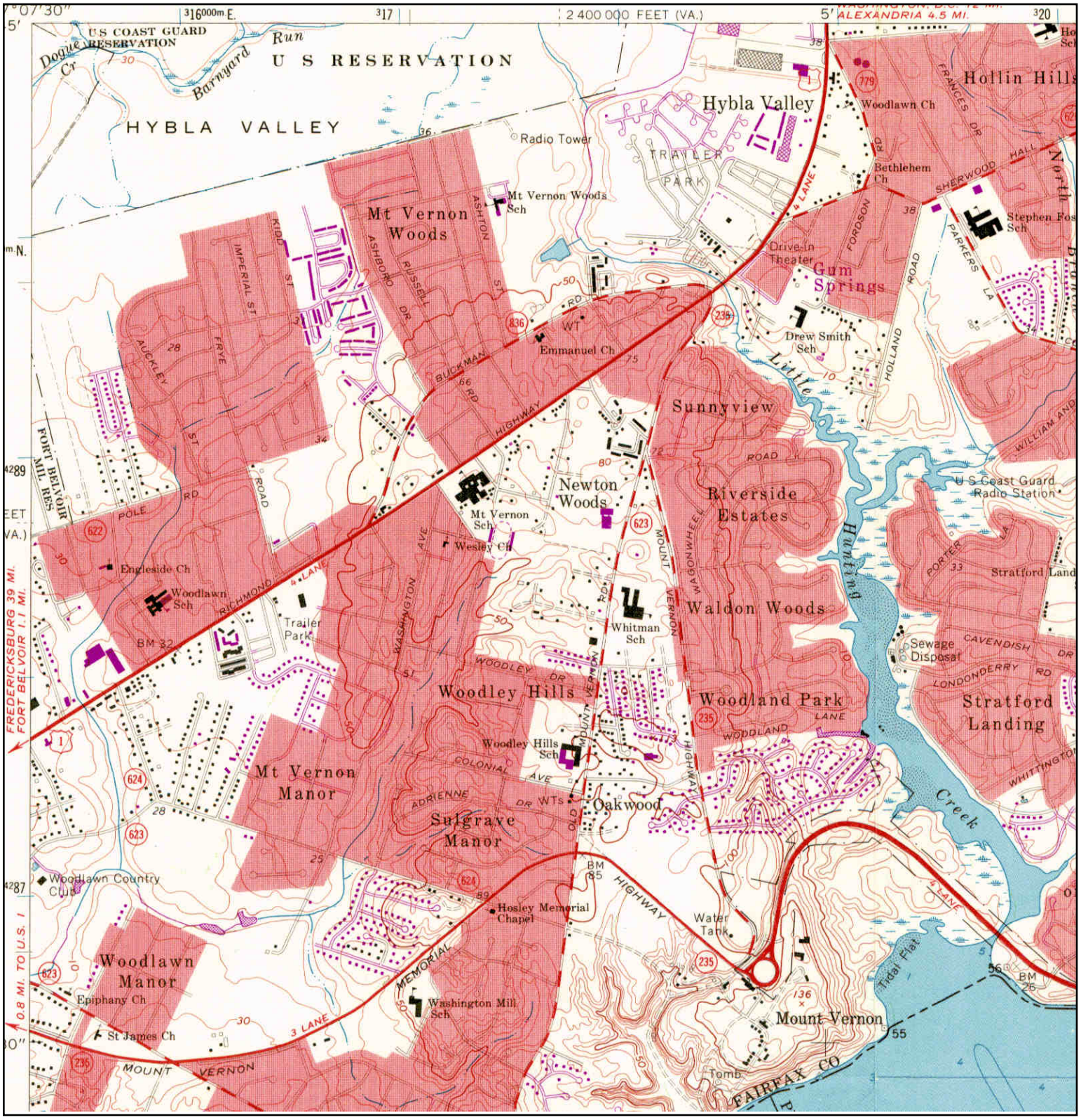
N	TARGET QUAD		SITE NAME:	Woodlawn East - Berman Tract	CLIENT: Indepth Corporation
	NAME:	INDIAN HEAD			CONTACT: Lane Middleton
	MAP YEAR:	1957	ADDRESS:	5601-5615 POLE RD Fort Belvoir, VA 22060	INQUIRY#: 3866681.4
	SERIES:	15	LAT/LONG:	38.7322 / -77.1233	RESEARCH DATE: 02/27/2014
	SCALE:	1:50000			

Historical Topographic Map



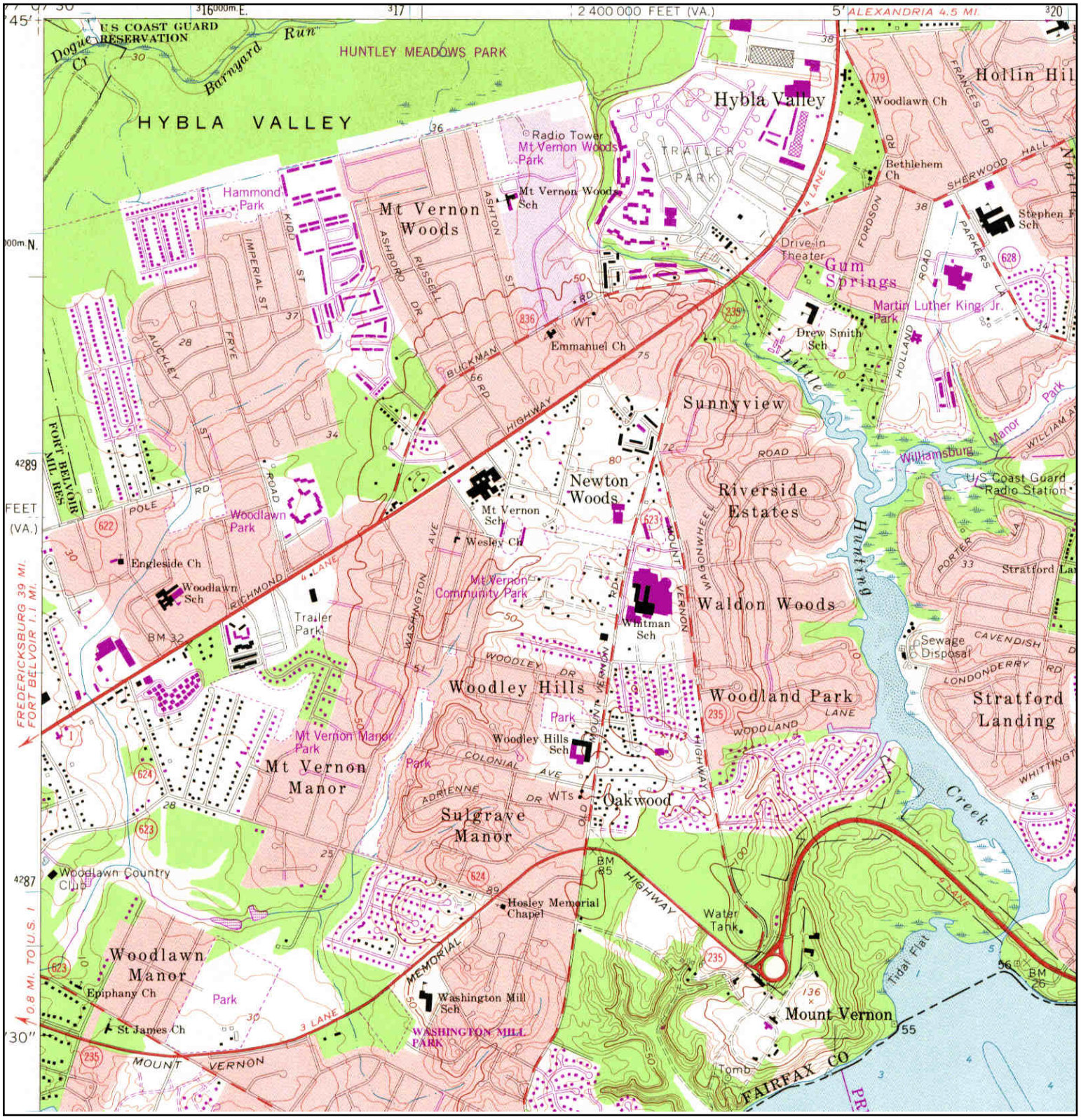
N	TARGET QUAD NAME: MOUNT VERNON MAP YEAR: 1966 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Woodlawn East - Berman Tract ADDRESS: 5601-5615 POLE RD Fort Belvoir, VA 22060 LAT/LONG: 38.7322 / -77.1233	CLIENT: Indepth Corporation CONTACT: Lane Middleton INQUIRY#: 3866681.4 RESEARCH DATE: 02/27/2014

Historical Topographic Map



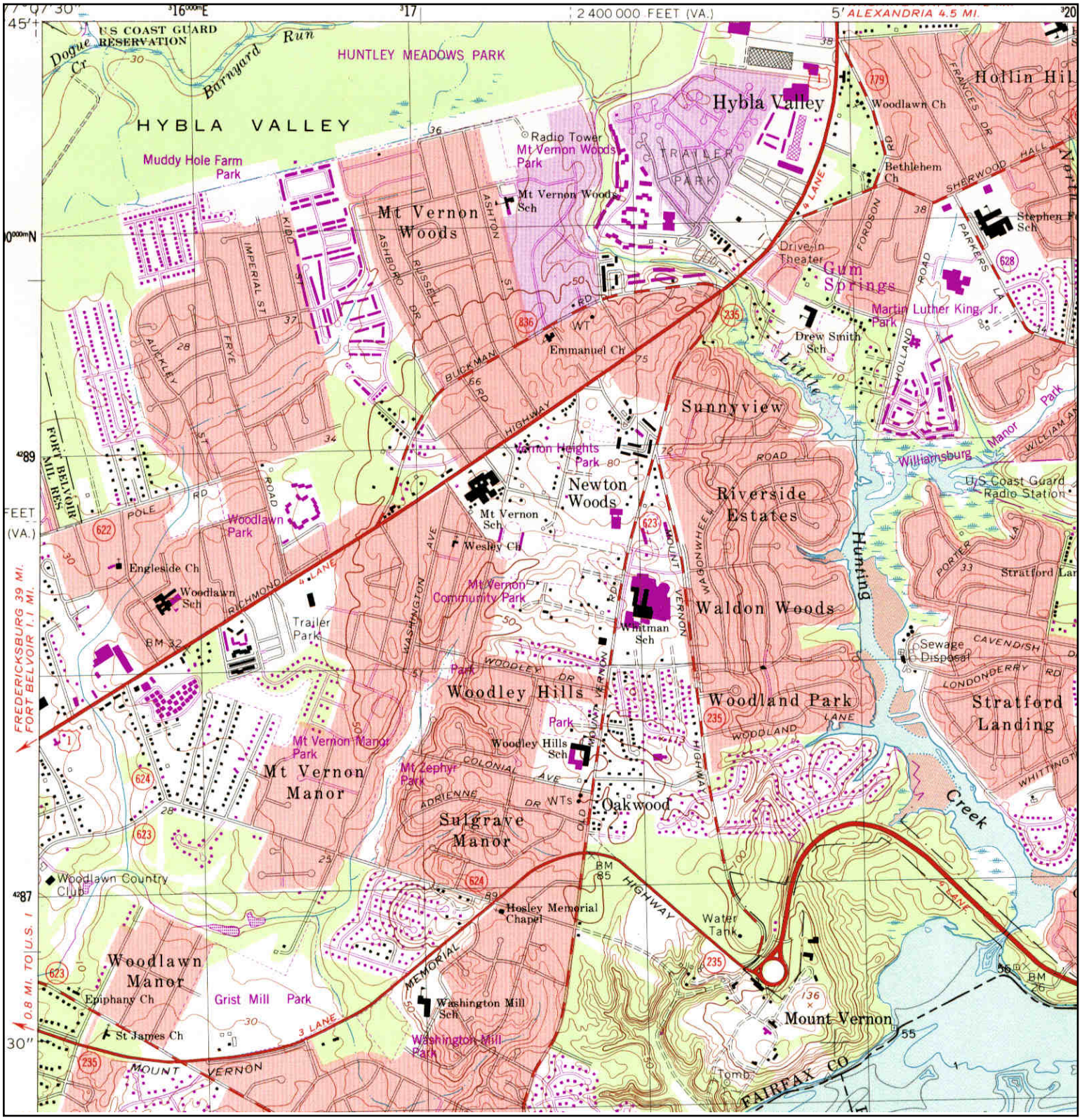
N	TARGET QUAD NAME: MOUNT VERNON MAP YEAR: 1971 PHOTOREVISED FROM :1966 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Woodlawn East - Berman Tract ADDRESS: 5601-5615 POLE RD Fort Belvoir, VA 22060 LAT/LONG: 38.7322 / -77.1233	CLIENT: Indepth Corporation CONTACT: Lane Middleton INQUIRY#: 3866681.4 RESEARCH DATE: 02/27/2014

Historical Topographic Map



N	TARGET QUAD NAME: MOUNT VERNON MAP YEAR: 1980 PHOTOREVISED FROM :1966 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Woodlawn East - Berman Tract ADDRESS: 5601-5615 POLE RD Fort Belvoir, VA 22060 LAT/LONG: 38.7322 / -77.1233	CLIENT: Indepth Corporation CONTACT: Lane Middleton INQUIRY#: 3866681.4 RESEARCH DATE: 02/27/2014

Historical Topographic Map



N	TARGET QUAD NAME: MOUNT VERNON MAP YEAR: 1983 PHOTOREVISED FROM :1966 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Woodlawn East - Berman Tract ADDRESS: 5601-5615 POLE RD Fort Belvoir, VA 22060 LAT/LONG: 38.7322 / -77.1233	CLIENT: Indepth Corporation CONTACT: Lane Middleton INQUIRY#: 3866681.4 RESEARCH DATE: 02/27/2014

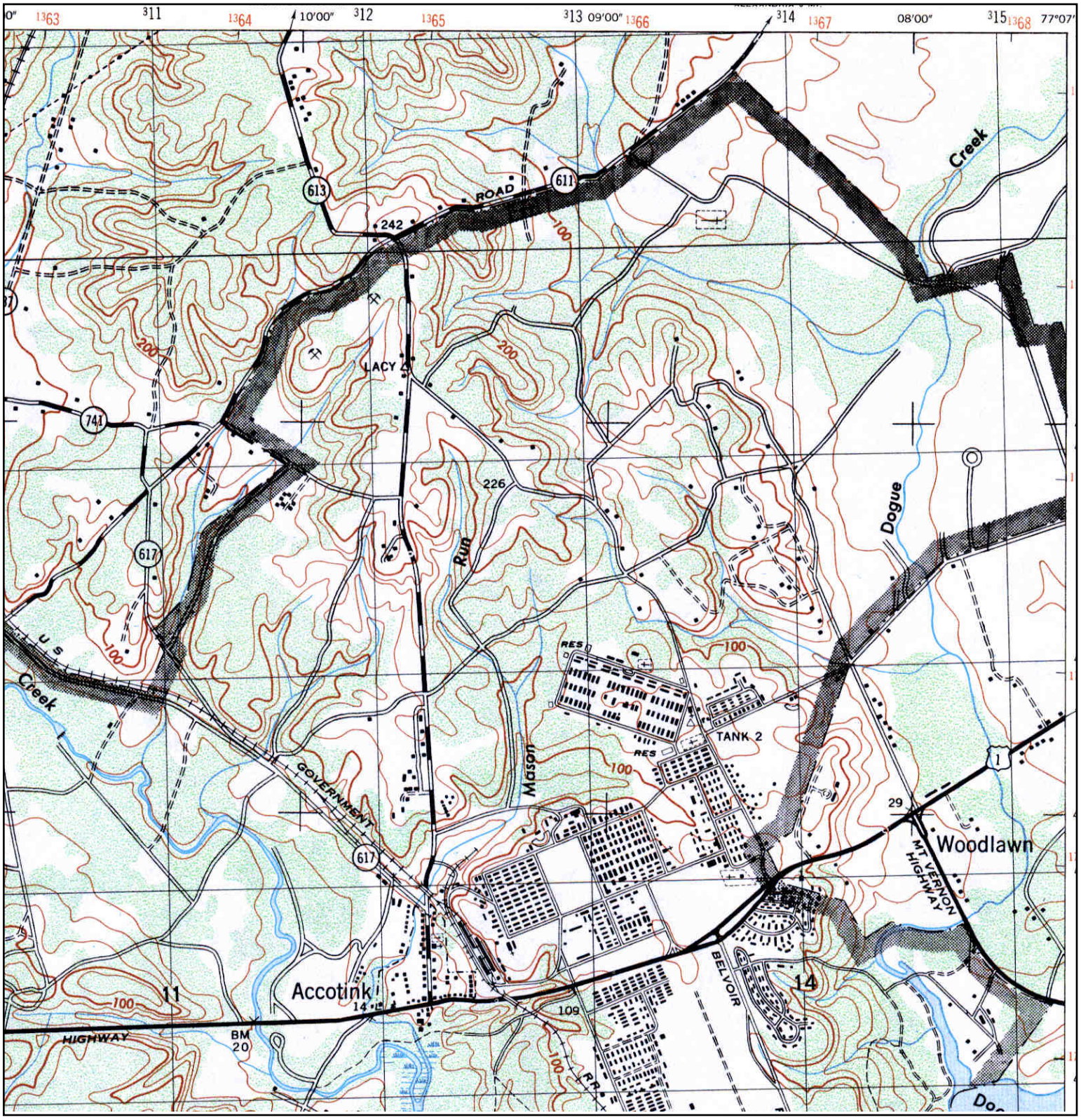
Historical Topographic Map

N	TARGET QUAD NAME: INDIAN HEAD MAP YEAR: 1994 SERIES: 15 SCALE: 1:50000	SITE NAME: Woodlawn East - Berman Tract ADDRESS: 5601-5615 POLE RD Fort Belvoir, VA 22060 LAT/LONG: 38.7322 / -77.1233	CLIENT: Indepth Corporation CONTACT: Lane Middleton INQUIRY#: 3866681.4 RESEARCH DATE: 02/27/2014

Historical Topographic Map

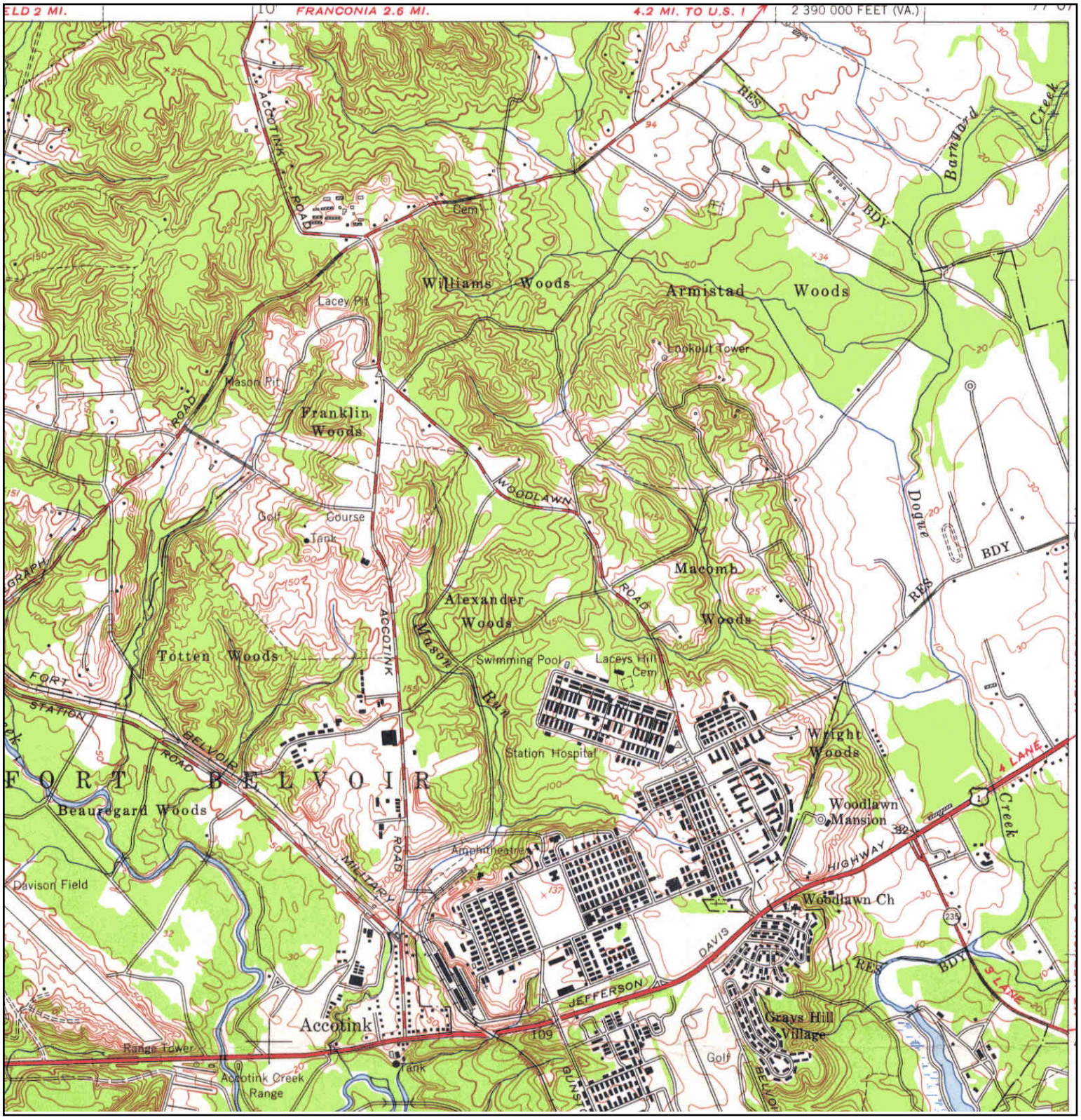
N	ADJOINING QUAD				
	NAME:	BELVOIR	SITE NAME:	Woodlawn East - Berman Tract	CLIENT: Indepth Corporation
	MAP YEAR:	1944	ADDRESS:	5601-5615 POLE RD	CONTACT: Lane Middleton
				Fort Belvoir, VA 22060	INQUIRY#: 3866681.4
	SERIES:	7.5			RESEARCH DATE: 02/27/2014
	SCALE:	1:31680	LAT/LONG:	38.7322 / -77.1233	

Historical Topographic Map



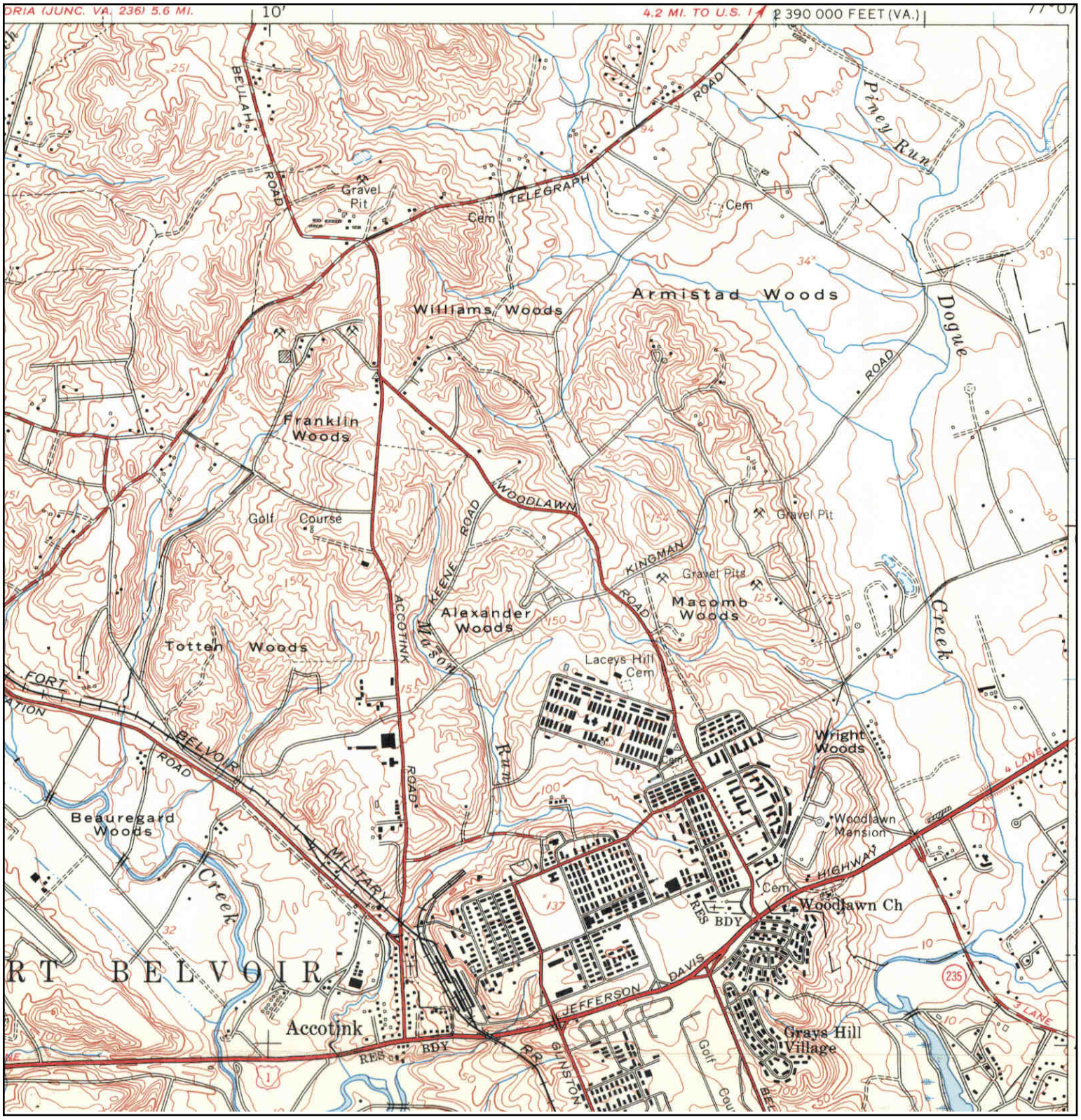
N	ADJOINING QUAD NAME: BELVOIR MAP YEAR: 1950 SERIES: 7.5 SCALE: 1:25000	SITE NAME:	Woodlawn East - Berman Tract	CLIENT:	Indepth Corporation
		ADDRESS:	5601-5615 POLE RD Fort Belvoir, VA 22060	CONTACT:	Lane Middleton
				INQUIRY#:	3866681.4
		LAT/LONG:	38.7322 / -77.1233	RESEARCH DATE:	02/27/2014

Historical Topographic Map



N	ADJOINING QUAD NAME: BELVOIR MAP YEAR: 1951 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Woodlawn East - Berman Tract ADDRESS: 5601-5615 POLE RD Fort Belvoir, VA 22060 LAT/LONG: 38.7322 / -77.1233	CLIENT: Indepth Corporation CONTACT: Lane Middleton INQUIRY#: 3866681.4 RESEARCH DATE: 02/27/2014

Historical Topographic Map

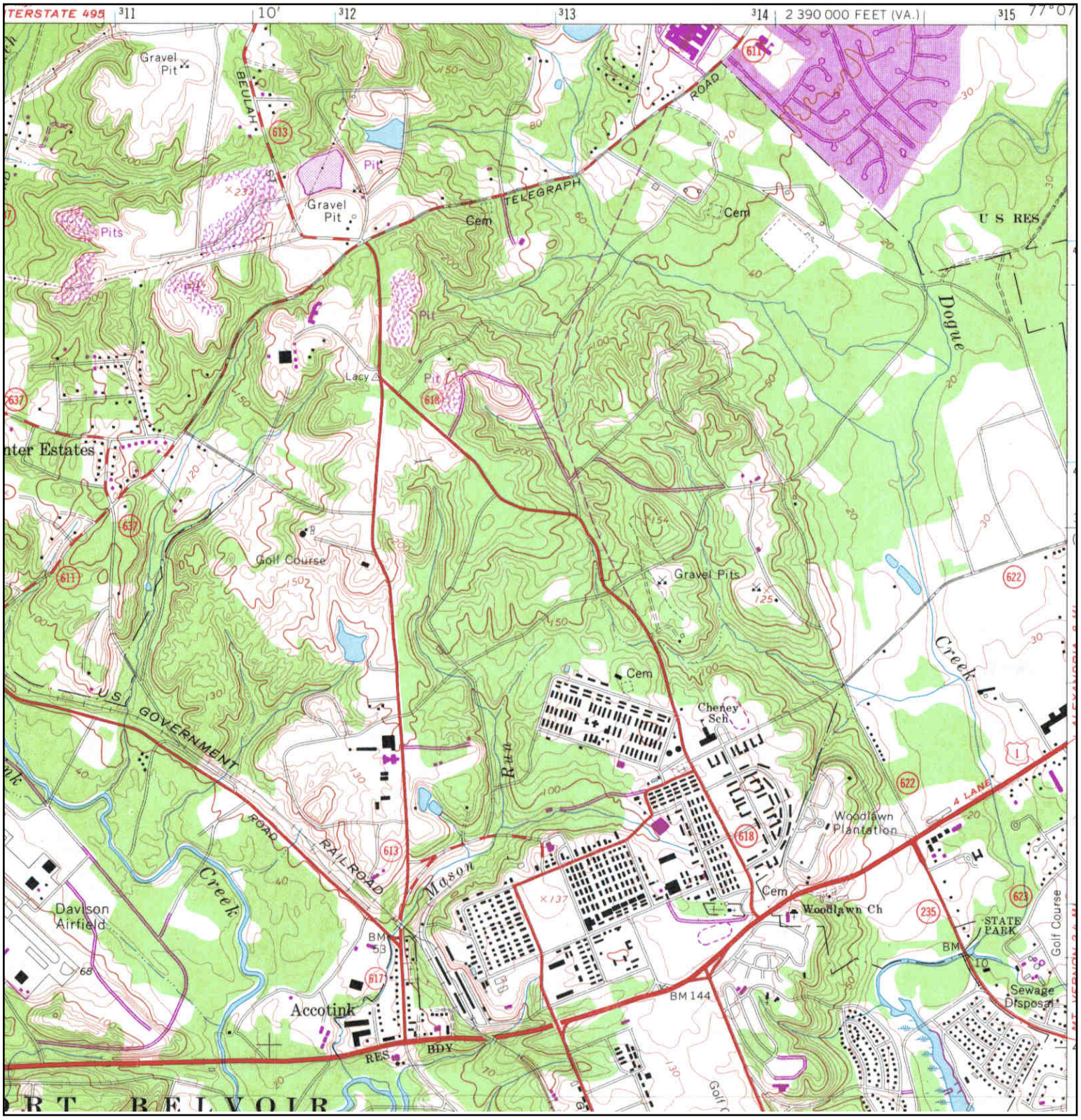


N	ADJOINING QUAD		SITE NAME:	Woodlawn East - Berman Tract	CLIENT: Indepth Corporation
	NAME:	BELVOIR			CONTACT: Lane Middleton
	MAP YEAR:	1956	ADDRESS:	5601-5615 POLE RD	INQUIRY#: 3866681.4
				Fort Belvoir, VA 22060	RESEARCH DATE: 02/27/2014
	SERIES:	7.5			
	SCALE:	1:24000	LAT/LONG:	38.7322 / -77.1233	

Historical Topographic Map

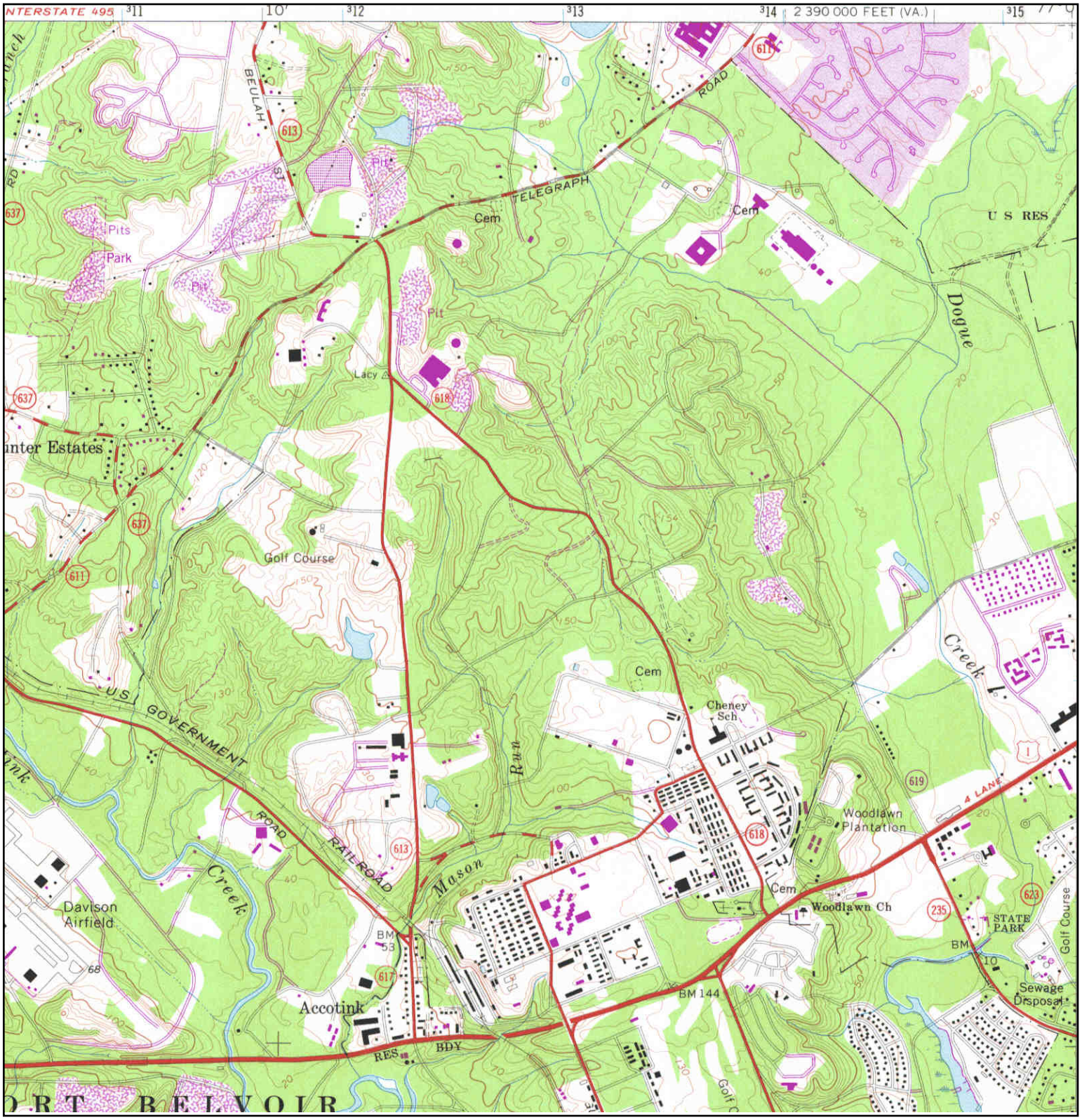
N	ADJOINING QUAD		SITE NAME:	Woodlawn East - Berman Tract	CLIENT: Indepth Corporation
	NAME:	BELVOIR			CONTACT: Lane Middleton
	MAP YEAR:	1965	ADDRESS:	5601-5615 POLE RD	INQUIRY#: 3866681.4
				Fort Belvoir, VA 22060	RESEARCH DATE: 02/27/2014
	SERIES:	7.5	LAT/LONG:	38.7322 / -77.1233	
	SCALE:	1:24000			

Historical Topographic Map



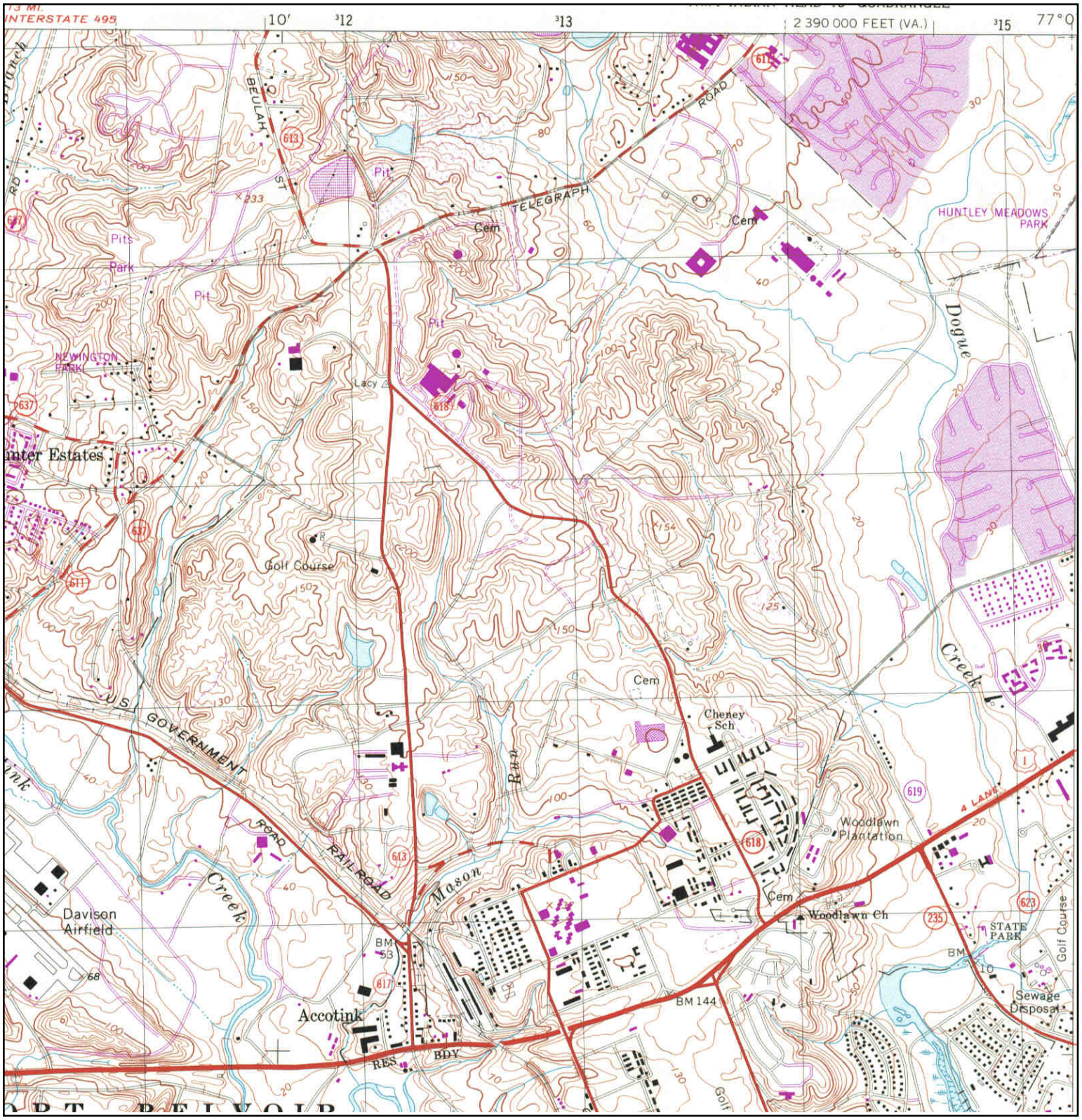
N	ADJOINING QUAD NAME: FORT BELVOIR MAP YEAR: 1971 PHOTOREVISED FROM :1965 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Woodlawn East - Berman Tract ADDRESS: 5601-5615 POLE RD Fort Belvoir, VA 22060 LAT/LONG: 38.7322 / -77.1233	CLIENT: Indepth Corporation CONTACT: Lane Middleton INQUIRY#: 3866681.4 RESEARCH DATE: 02/27/2014

Historical Topographic Map



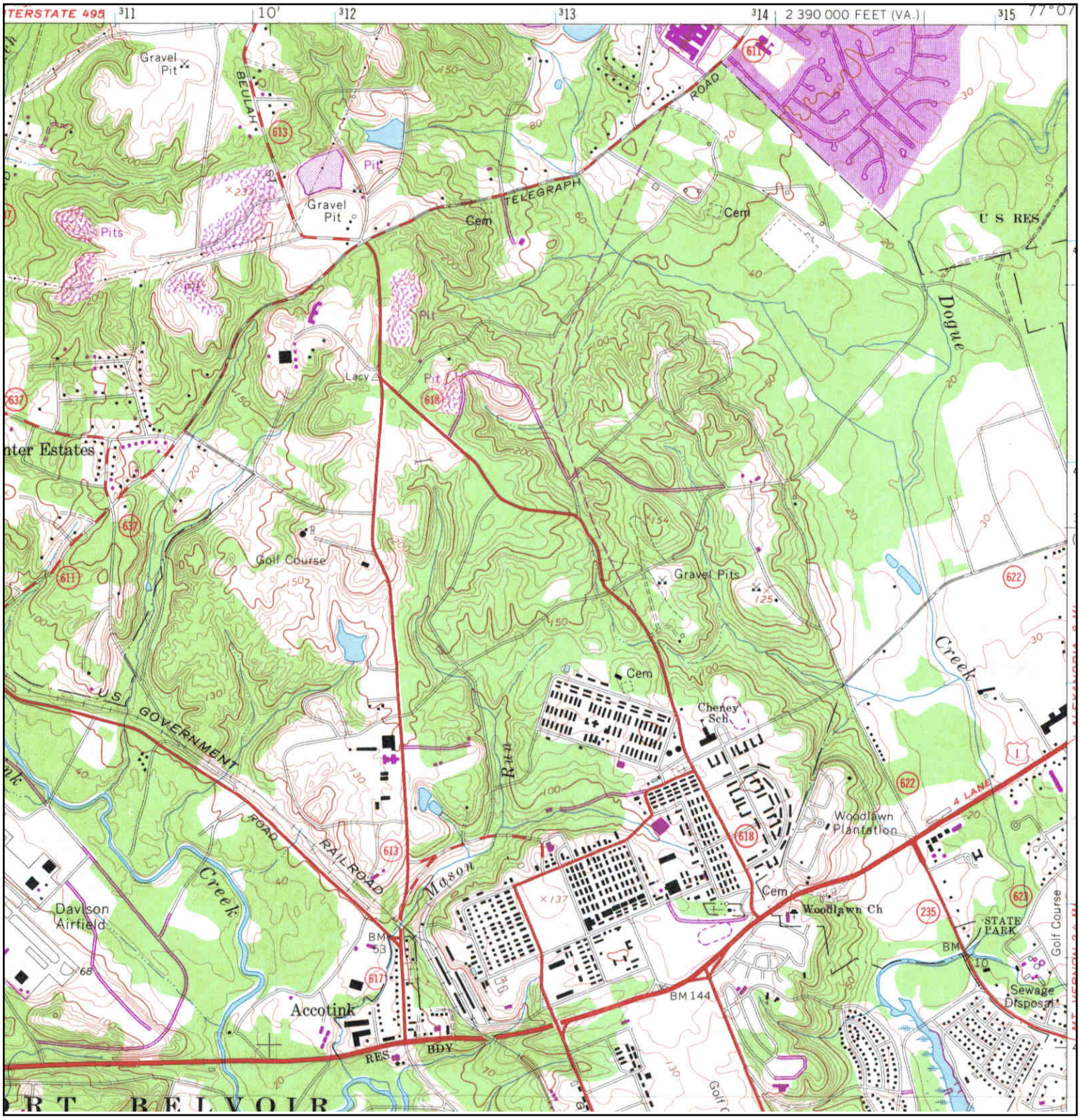
N	ADJOINING QUAD NAME: FORT BELVOIR MAP YEAR: 1980 PHOTOREVISED FROM :1965 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Woodlawn East - Berman Tract ADDRESS: 5601-5615 POLE RD Fort Belvoir, VA 22060 LAT/LONG: 38.7322 / -77.1233	CLIENT: Indepth Corporation CONTACT: Lane Middleton INQUIRY#: 3866681.4 RESEARCH DATE: 02/27/2014

Historical Topographic Map



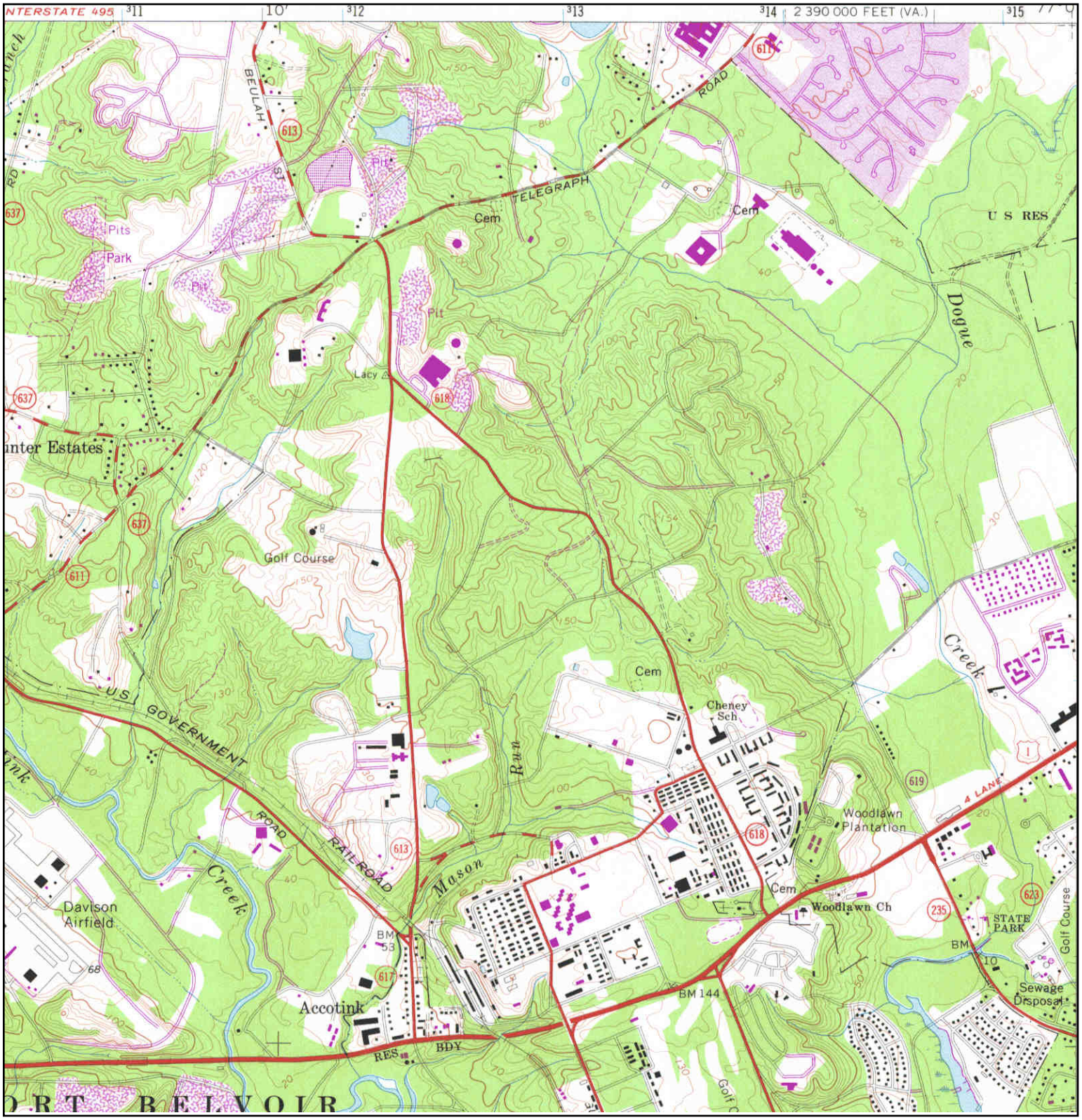
N	ADJOINING QUAD NAME: FORT BELVOIR MAP YEAR: 1983 PHOTOREVISED FROM :1965 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Woodlawn East - Berman Tract ADDRESS: 5601-5615 POLE RD Fort Belvoir, VA 22060 LAT/LONG: 38.7322 / -77.1233	CLIENT: Indepth Corporation CONTACT: Lane Middleton INQUIRY#: 3866681.4 RESEARCH DATE: 02/27/2014

Historical Topographic Map



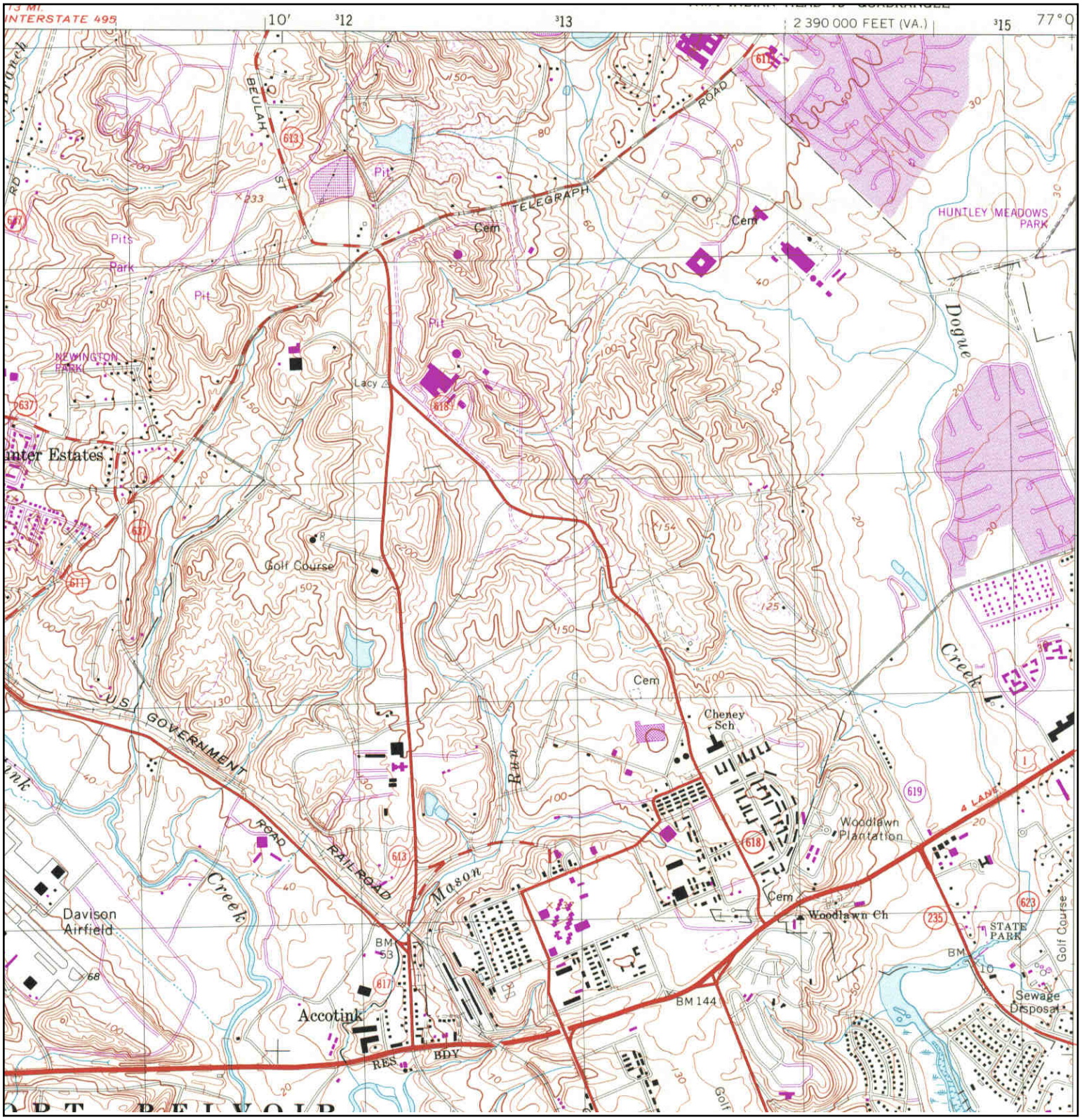
N	ADJOINING QUAD NAME: FORT BELVOIR MAP YEAR: 1971 PHOTOREVISED FROM :1965 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Woodlawn East - Berman Tract ADDRESS: 5601-5615 POLE RD Fort Belvoir, VA 22060 LAT/LONG: 38.7322 / -77.1233	CLIENT: Indepth Corporation CONTACT: Lane Middleton INQUIRY#: 3866681.4 RESEARCH DATE: 02/27/2014

Historical Topographic Map



N	ADJOINING QUAD NAME: FORT BELVOIR MAP YEAR: 1980 PHOTOREVISED FROM :1965 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Woodlawn East - Berman Tract ADDRESS: 5601-5615 POLE RD Fort Belvoir, VA 22060 LAT/LONG: 38.7322 / -77.1233	CLIENT: Indepth Corporation CONTACT: Lane Middleton INQUIRY#: 3866681.4 RESEARCH DATE: 02/27/2014

Historical Topographic Map



N	ADJOINING QUAD NAME: FORT BELVOIR MAP YEAR: 1983 PHOTOREVISED FROM :1965 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Woodlawn East - Berman Tract ADDRESS: 5601-5615 POLE RD Fort Belvoir, VA 22060 LAT/LONG: 38.7322 / -77.1233	CLIENT: Indepth Corporation CONTACT: Lane Middleton INQUIRY#: 3866681.4 RESEARCH DATE: 02/27/2014

APPENDIX L – TRAFFIC EVALUATION

WELLS + ASSOCIATES

MEMORANDUM

TO: Jason Franti
Apex Companies, LLC

FROM: Jami L. Milanovich, P.E.

RE: Traffic Evaluation for Fort Belvoir RCI – Environmental Assessment
Fort Belvoir, Fairfax County, Virginia

DATE: April 2, 2014

This memorandum presents our traffic evaluation of the proposed changes to the Environmental Assessment (EA) for the Fort Belvoir Residential Communities Initiative (RCI). The information you have provided to us indicates that two Fort Belvoir villages no longer will accommodate as much housing as was envisioned in the original EA. A portion of this housing now is planned to be constructed in one infill neighborhood on the Fort Belvoir base, as described in more detail below.

River Village currently is developed with 188 housing units but, because of revised flood plain delineation, future redevelopment of River Village will yield only 90 units (a loss of 98 units). Because this loss is greater than the loss of units assumed in the original EA, some proposed housing units need to be shifted from River Village to other areas on the base.

Dogue Creek Village currently is developed with 270 housing units; however, future redevelopment will yield only 135 units (a loss of 135 units). The original EA assumed that the number of housing units in Dogue Creek Village after the redevelopment would remain consistent with the 270 existing units. Therefore, 135 units originally planned for Dogue Creek Village need to be shifted to others areas on the base.

As a result of the revised flood plain delineation, a total of 233 units no longer are proposed in River Village and Dogue Creek Village.

Approximately 80 to 100 of the housing units that are no longer planned for River Village and Dogue Creek Village are proposed to be relocated to the Woodlawn East/Berman Tract, which is located adjacent to the existing Woodlawn Village. At this time, the location of the remaining 133 to 153 units that can no longer be built in River Village and Dogue Creek Village but that are not being replaced in the Woodlawn East/Berman Tract has not been finalized. Therefore, this memorandum does not include an evaluation of the traffic impact associated with relocating the remaining 133 to 153 units.

The 80 to 100 new housing units in the Woodlawn East/Berman Tract will be a mixture of single-family, duplex, and townhouse units; however, the exact quantity of each type of housing is unknown at this time. Therefore, to ensure a conservative analysis, all housing units were assumed to be single-family since this assumption produces the highest trip generation.

The original EA assumed that a total of 2,109 housing units could be built and occupied base-wide upon in conjunction with the Fort Belvoir RCI (based on the maximum number of potential units in each village). The latest information now shows that a total of 2,106 housing units could be built base-wide in conjunction with the redevelopment. Although there will be periods when the total number of housing units at the project may exceed 2,106 units, the number of ***occupied*** houses will not exceed 2,106 units. Excess housing units during the course of the redevelopment will be used as receiving areas to accommodate families whose units are slated for demolition. These excess housing units will enable the project to carry out necessary redevelopment while ensuring the requirement for a minimum of 2,070 units is met. Upon completion of the redevelopment, the total number of units will not exceed 2,070.

As part of this traffic evaluation, we have assessed the ***general*** impact of the elimination of some housing in River Village and Dogue Creek Village coupled with the construction of additional housing in the Woodlawn East/Berman Tract. To evaluate this impact, we utilized the Institute of Transportation Engineers' (ITE) Trip Generation manual (9th Edition). All housing units were assumed to be single family (ITE Land Use 210), as previously mentioned, and the number of dwelling units was used as the independent variable. The results of the trip generation analysis are presented in Table 1. Note that Table 1 presents the trip generation range based on the minimum (80 units) and maximum (100 units) number of units contemplated for the Woodlawn East/Berman Tract.

Table 1

Trip Generation Summary for Fort Belvoir RCI Infill Neighborhoods

Infill Neighborhood – Size	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Woodlawn East/Berman Tract: 80 – 100 units	16-20	50-60	66-80	54-66	32-39	86-105

As shown in Table 1, the additional 80 to 100 units in the Woodlawn East/Berman Tract would not generate 66 to 80 trips during the AM peak hour and 86 to 105 trips during the PM peak hours. As previously discussed, when looking at the Fort Belvoir RCI project as a whole, the units in the Woodlawn East/Berman Tract simply are replacement units for those that originally were planned for other areas. The total number of housing units now proposed (2,106 units) will remain nearly the same as that assumed in the EA (2,109 units). Therefore, the number of trips shown in Table 1 will not be new to the Fort Belvoir roadway network.

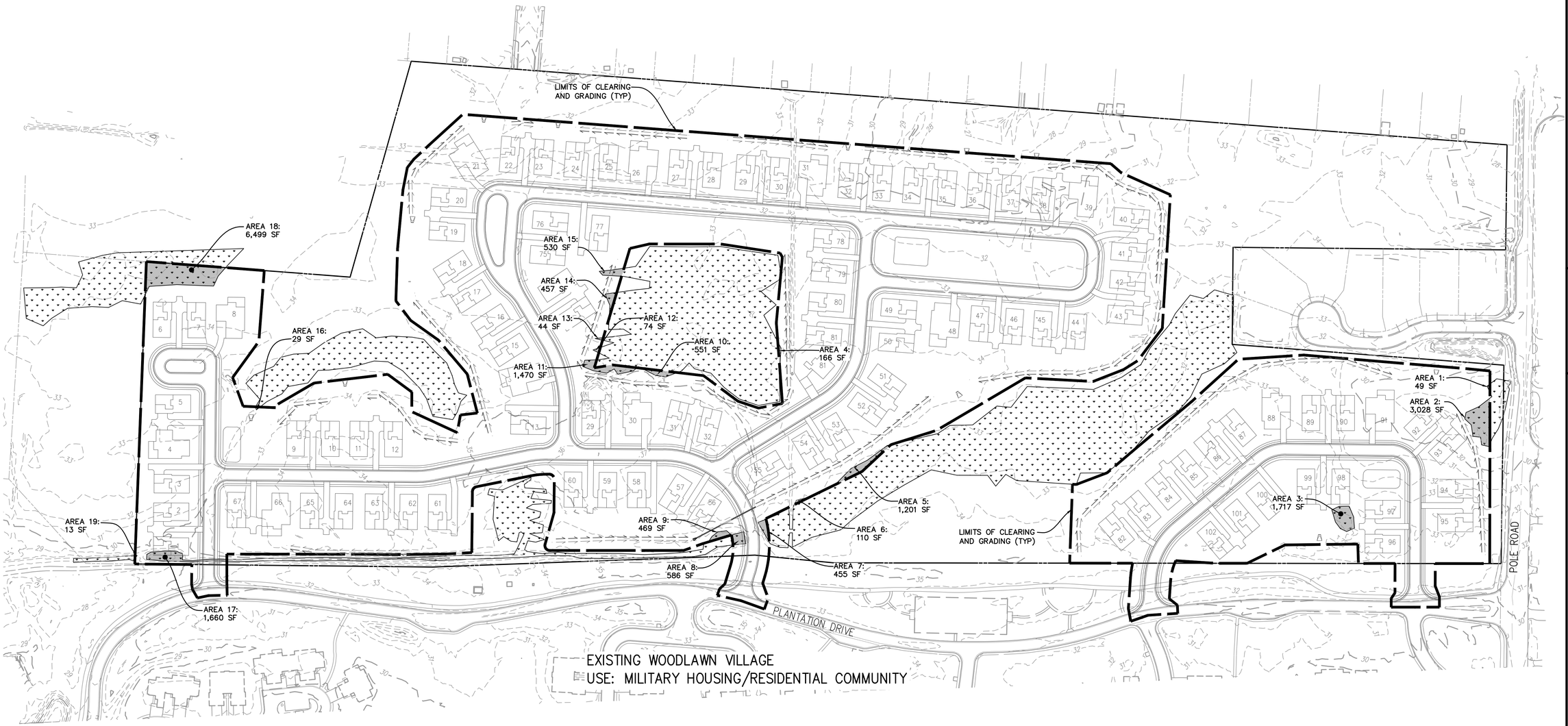
However, to evaluate whether traffic patterns to/from the infill neighborhoods will be substantially different from those that would have been assumed in the original EA, the location of the Woodlawn East/Berman Tract was compared to the location of River Village and Dogue Creek Village (i.e., where the units were planned according to the original EA).

This examination revealed that the units in the Woodlawn East/Berman Tract are proposed to be located slightly further away from the main concentration of study intersections examined in the EA. However, this infill neighborhood still will be located relatively close to River Village (i.e., they both are northeast of the majority of study intersections). Therefore, traffic to/from the west will utilize the same patterns as assumed in the original study. Traffic to/from the east, which was assumed in the EA to be 35 percent, may have slightly altered patterns to/from the Woodlawn East/Berman Tract compared to River Village. However, the number of trips projected to/from the north would not be significant (i.e., with 80 units, 35 percent of 66 AM trips and 86 PM trips equates to 23 AM trips and 30 PM trips; with 100 units, 35 percent of 80 AM trips and 105 PM trips equates to 28 AM trips and 37 PM trips).

Based on the information provided to us regarding the proposed changes to the location of housing units for the Fort Belvoir RCI and the assessments discussed herein, it is our professional judgment that the proposed changes will not substantially impact the transportation-related recommendations made in the original Environmental Assessment.

Please feel free to contact us with any questions you may have regarding this matter.

APPENDIX M – WETLAND AREAS IMPACT EXHIBIT



WETLAND AREAS TO BE IMPACTED	
AREA 1	49 SF
AREA 2	3,028 SF
AREA 3	1,717 SF
AREA 4	166 SF
AREA 5	1,201 SF
AREA 6	110 SF
AREA 7	455 SF
AREA 8	586 SF
AREA 9	469 SF
AREA 10	551 SF
AREA 11	1,470 SF
AREA 12	74 SF
AREA 13	44 SF
AREA 14	457 SF
AREA 15	530 SF
AREA 16	29 SF
AREA 17	1,660 SF
AREA 18	6,499 SF
AREA 19	13 SF

TOTAL = 19,108 SF (0.4387 AC)

WETLAND AREAS TO BE IMPACTED

VIRGINIA STATE GRID NORTH ZONE NAD 83

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

Bowman CONSULTING

Bowman Consulting Group, Ltd.
14020 Thunderbolt Place
Suite 300
Chantilly, Virginia 20151

Phone: (703) 464-1000
Fax: (703) 481-9720
www.bowmanconsulting.com

WETLAND AREAS IMPACTED EXHIBIT

FORT BELVOIR
WOODLAWN VILLAGE EAST

MOUNT VERNON MAGISTERIAL DISTRICT FAIRFAX COUNTY, VIRGINIA

COUNTY PROJECT NUMBER

PLAN STATUS	
07/10/15	UPDATED EXHIBIT

DATE	DESCRIPTION

CA	CL	SL
DESIGN	DRAWN	CHKD

SCALE H: 1"=100'
V: N/A

JOB No. 2742-01-011

DATE: JULY, 2015

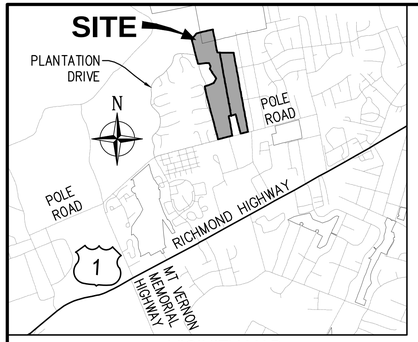
FILE No. 2742-D-CP-011

SHEET 1 OF 1

P:\2742 - Fort Belvoir\2742-01-011 (ENG) - Playground\Engineering\Exhibits\Woodlawn Village East\2015.07.06 Wetlands Exhibit\2742-01-011-WETLANDS EXHIBIT-dwg, 7/7/2015 7:29:38 AM, CDL

Cad file name : P:\2742 - Fort Belvoir\2742-01-011 (ENG) - Playground\Engineering\Exhibits\Woodlawn Village East\2015.07.06 Wetlands Exhibit\2742-01-011-WETLANDS EXHIBIT.dwg

APPENDIX N – TREE SURVEY SPECIFICATIONS



VICINITY MAP
1"=2,000'

LIMITS OF CLEARING AND GRADING (TYP)

LIMITS OF CLEARING AND GRADING (TYP)

EX TREELINE (TYP)

LIMITS OF CLEARING AND GRADING (TYP)

EX TREELINE (TYP)

POLE ROAD

PLANTATION DRIVE

EXISTING WOODLAWN VILLAGE
USE: MILITARY HOUSING/RESIDENTIAL COMMUNITY

EXISTING WOODED AREA WITHIN
LIMITS OF CLEARING AND GRADING

TOTAL=30.69 ACRES

EXISTING TREE REMOVAL CALCULATION
BASED ON 177 TREES/ACRE EXISTING

30.69 X 177= 5,432 TREES

VIRGINIA STATE GRID
NORTH ZONE NAD 83

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

Bowman CONSULTING

Bowman Consulting Group, Ltd.
14020 Thunderbolt Place
Suite 300
Chantilly, Virginia 20151

Phone: (703) 464-1000
Fax: (703) 481-9720

www.bowmanconsulting.com

OVERALL SITE PLAN-TREE CALCULATION EXHIBIT

FORT BELVOIR
WOODLAWN VILLAGE EAST

FAIRFAX COUNTY, VIRGINIA

MOUNT VERNON MAGISTERIAL DISTRICT

COUNTY PROJECT NUMBER

PLAN STATUS	
07/10/15	UPDATED EXHIBIT

DATE	DESCRIPTION	
CA DESIGN	CL DRAWN	SL CHKD

SCALE	H: 1"=100' V: N/A
JOB No.	2742-01-011
DATE:	JULY, 2015
FILE No.	2742-D-CP-011
SHEET	1 OF 1

Cad file name : P:\2742 - Fort Belvoir\2742-01-011 (ENG) - Playground\Engineering\Exhibits\Woodlawn Village East\2015.07.06 Tree Removal Calculatio2742-01-011-pbase.dwg

P:\2742 - Fort Belvoir\2742-01-011 (ENG) - Playground\Engineering\Exhibits\Woodlawn Village East\2015.07.06 Tree Removal Calculation\2742-01-011-pbase.dwg, 7/7/2015 7:28:23 AM, CDL