Dominion Energy®

Application, Appendix, DEQ Supplement, Direct Testimony and Exhibits of Virginia Electric and Power Company

Before the State Corporation Commission of Virginia

Idylwood-Tysons 230 kV Single Circuit Underground Transmission Line, Tysons Substation Rebuild and Related Transmission Facilities

Application No. 284

Case No. PUR-2017-00143

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Volume 3 of 3

Appendix A

DOMINION ENERGY VIRGINIA

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DOMINION ENERGY VIRGINIA

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Appendix A

Overhead Route Descriptions and Analysis

Prepared by

ERM

November 2017

Idylwood-Tysons 230 kV Single Circuit Underground Transmission Line
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Overhead Route Descriptions and Analysis

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LIST OF ACRONYMS AND ABBREVIATIONS

ABPP	NPS's American Battlefield Protection Program
CBPA	Chesapeake Bay Preservation Act
CCB	Center for Conservation Biology
CIA	Central Intelligence Agency
The Company	Virginia Electric and Power Company
CS	Conservation Site
CTB	Commonwealth Transportation Board
Dominion Energy Virginia	Virginia Electric and Power
ERM	Environmental Resources Management
ESA	Endangered Species Act in 1973
FAA	Federal Aviation Administration
FWS	U.S. Fish and Wildlife Service
GIS	geographic information system
GLNHR	General Location Areas for Natural Heritage Resources
Guidelines	VDHR 2008 Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia
HOV	high occupancy vehicles
I-495	Interstate 495
I-66	Interstate 66
kV	kilovolt
MP	milepost
MWAA	Metropolitan Washington Airports Authority
NHDE	VDCR's Natural Heritage Data Explorer
NHL	National Historic Landmark
NHP	Natural Heritage Program
NLEB	Northern Long-eared Bat
Notice	Notice of Proposed Construction or Alteration
NOVA	Northern Virginia Regional Park Authority
NPS	National Park Service
NRHP	National Register of Historic Places
NVCT	Northern Virginia Conservation Trust
Part 77	14 Code of Federal Regulations Part 77
PEM	Palustrine Emergent
PFO	Palustrine Forested
Project Team	Dominion Energy and ERM
Project	Idylwood to Tysons 230 kV Transmission Line Project
RPA	Resource Protection Area
SCU	Stream Conservation Units
USGS	U.S. Geological Survey
VA 267	Virginia State Route 267
Va. Code	Code of Virginia

VAC	Virginia Administrative Code
VaFWIS	VDGIF Fish and Wildlife Information Service
V-CRIS	Virginia Cultural Resource Information System
VDCR	Virginia Department of Conservation and Recreation
VDGIF	Virginia Department of Game and Inland Fisheries
VDHR	Virginia Department of Historic Resources
VDOT	Virginia Department of Transportation
VOF	Virginia Outdoors Foundation
W&OD	Washington and Old Dominion
W&OD Park	Washington and Old Dominion Railroad Regional Park
WMATA	Washington Metro Area Transit Authority

Idylwood-Tysons 230 kV Single Circuit Underground Transmission Line
Tysons Substation Rebuild
And Related Transmission Facilities

Overhead Route Descriptions and Analysis

1.0 INTRODUCTION

This report describes the environmental review conducted by Environmental Resources Management (ERM) on behalf of Virginia Electric and Power Company (Dominion Energy Virginia or the Company) of four overhead route solutions for the proposed Idylwood to Tysons 230 kilovolt (kV) Transmission Line Project (Project). Two of these overhead routes consisted of a wreck and rebuild of existing transmission lines and the other two routes consisted of a combination of a wreck and rebuild of existing transmission lines and the construction of a new transmission line between the Idylwood and Tysons Substations. The density of existing environmental constraints along these routes, and, in particular, the lack of adequate right-of-way to construct the routes as a result of the amount of residential and commercial development in the area and concerns over route constructability led Dominion Energy Virginia to reject these routes. This appendix summarizes the routing effort and results associated with the identification and evaluation of potential overhead routes and documents why an environmentally-acceptable overhead route solution was not found practicable for the Project.

2.0 ROUTE DESCRIPTIONS

As a first step in identifying potential transmission line routes, ERM (as directed by Dominion Energy Virginia) defined a geographic study area for the Project based on Dominion Energy Virginia's transmission and service needs as described above. Generally, the study area was defined to encompass the fixed beginning and ending points for the proposed facilities (i.e., the existing substations) as well as an area broad enough to allow for the identification of reasonable alternatives that each meets the objective of the Project. Additionally, and to the extent practicable, the limits of the study area were defined by reference to easily distinguished features, such as roads or other linear features.

After developing the study area, ERM identified four preliminary overhead routes that could meet the Project objectives. Given the amount of residential and commercial development in the general area, ERM focused on developing routes that would follow existing transmission and transportation corridors in the greater Tysons area. There currently are two existing Dominion Energy Virginia transmission lines in the area that connect the Idylwood and Tysons Substations. The first route consists of Lines #2035, #2029, and #2108. The second route consists of Lines #2035, #202, and #2010. ERM considered the wreck and rebuild of these lines as well as the development of overhead routes that would consist of the wreck and rebuild of portions of these existing transmission lines in combination with segments of new transmission lines along major transportation corridors. Subsequent to identification of these preliminary routes, ERM conducted several site visits and began evaluating the routes.

Four potential overhead routes that would connect the Idylwood Substation to the Tysons Substation eventually were identified and considered (Overhead Routes). Each would require new rights-of-way to be obtained and developed even though some or all of the routes include existing transmission lines. These four routes, described below, were subjected to a more detailed evaluation to determine to what degree each of the routes could impact various sensitive resources and other constraints within the study area. Section 3 below describes the various

resources that occur along each of the routes and Section 4 discusses how the routes could impact those resources. Finally, Section 5 presents the conclusions and recommendations.

A set of aerial photo-based route maps for the Overhead Routes are contained in Attachment A. The route maps have been mile posted to a tenth of a mile and are presented at 1:6,000 scale. An overview map of all four Overhead Routes is presented as Figure 2.1-1 in Attachment B. The environmental features discussed in the text are referenced by milepost (MP) as appropriate.

2.1.1 Overhead Route 01

Overhead Route 01 is 12.9 miles long and comprises a wreck and rebuild for the entirety of the route following Dominion Energy Virginia's existing Lines #2035, #2029, and #2108.

The route would follow Dominion Energy Virginia's existing Line #2035 for about 6.3 miles to the Central Intelligence Agency (CIA) Substation. This section of the route heads north out of the Idylwood Substation and crosses Shreve Road. After crossing the Washington and Old Dominion (W&OD) Railroad Regional Park (W&OD Park), the route then turns east to parallel the park within Company's existing right-of-way. The route then heads north, crossing Virginia Lane and Virginia Avenue, then veers northwest to cross Interstate 66 (I-66) and the Washington Metro Area Transit Authority (WMATA) Orange Line. The route proceeds northeast, roughly parallel to I-66, for about 1.5 miles crossing Ruckstuhl Park, Barbour Road, the Leesburg Pike interchange, and Redd Road before crossing the WMATA West Falls Church Rail Yard. After passing the Reddfield Substation, the route veers more to the north for about 0.3 mile parallel to the Virginia State Route 267 (VA 267) until it crosses VA 267 at Idylwood Road crossing. The route heads northeast to roughly parallel Pimmit Run, crossing through Kent Gardens Greenway Stream Valley Park, Westmoreland Street, another section of Kent Gardens Greenway Stream Valley Park, and Kent Gardens Park. The route heads northward continuing to roughly parallel Pimmit Run and crossing Pimmit Run Stream Valley Park. After crossing Old Chesterbrook Road, the route veers northeast through another section of Pimmit Run Stream Valley Park, before turning north and then northeast crossing Pimmit Run three times before crossing Old Dominion Drive and another section of Pimmit Run Stream Valley Park. The route then veers east across Pimmit Run and Brookhaven Drive and into another section of Pimmit Run Stream Valley Park. The route continues northeast and then north across the Potomac School property where it then follows Potomac School Road, crosses Dolley Madison Boulevard, after which it enters National. Park Service (NPS) land associated with the George Washington Memorial Parkway and the CIA Substation. Leaving the CIA Substation, the route follows Line #2029 for 3.9 miles until reaching the Swinks Mill Substation. This section of route heads northwest then west continuing through NPS land, crossing sections of the Fairfax County-owned Langley Oaks Park and then roughly paralleling the George Washington Memorial Parkway for about 1.0 mile. As the route reaches the east side of Interstate 495 (I-495), it veers southwest crossing Live Oak Drive before turning west and crossing I-495, then continues southwest and parallel to the west side of I-495, crossing Georgetown Pike and passing by the Swinks Mill Substation. After the route continues southeast past the Swinks Mill Substation, it follows Line #2108 for the remaining 2.7 miles of the route into the Tysons Substation. This section continues to follow the west side of I-494 south crossing Old Dominion Drive and Lewinsville Road before veering west to follow the Dulles Toll Road. Heading west along the Dulles Toll Road, the route crosses the south portion of McLean Hamlet Park then crosses Spring Hill Road. About 0.1 mile west of Spring Hill Road, the route turns south to cross the Dulles Toll Road, continuing to follow Line #2108 for about 0.2 mile until terminating at the Tysons Substation.

2.1.2 Overhead Route 02

Overhead Route 02 is 6.1 miles long and comprises both wreck and rebuild (3.5 miles) where it follows Dominion Energy Virginia's existing Lines #2035 and #2108, and new build route (2.6 miles) sections where the route follows VA 267 Virginia Department of Transportation (VDOT) right-of-way.

The route would follow Dominion Energy Virginia's existing Line #2035 for about 2.3 miles starting at the Idylwood Substation until it diverges from the existing route and continues within VDOT right-of-way along VA 267. This section of the route heads north across Shreve Road, and after crossing the W&OD Park, the route turns east to parallel the park within the Company's existing right-of-way for about 0.1 mile before heading north, crossing Virginia Lane and Virginia Avenue, then veering northwest to cross I-66 and the WMATA Orange Line. The route proceeds northeast roughly parallel to I-66 for about 1.4 miles, crossing Ruckstuhl Park, Barbour Road, the Leesburg Pike interchange, and Redd Road before crossing the WMATA West Falls Church Rail Yard. After passing the Reddfield Substation, the route veers more to the north for about 0.3 mile parallel to VA 267. At the Idylwood Road crossing, the route diverges from Dominion Energy Virginia's existing route and continues to follow the west side of VA 267 north within VDOT right-of-way for about 2.6 miles. This section of the route crosses Pimmit Run and continues north, parallel with Olney Lane until crossing east over VA 267 and continuing north along the east side of VA 267. About 0.2 mile after crossing Magarity Road, the route crosses back to the east side of VA 267 and continues in a northwest direction, crossing Chainbridge Road, Dolley Madison Boulevard, and the I-495/VA 267 interchange, prior to crossing north over the Dulles Toll Road. The route then follows Line #2108 west for 1.0 mile, crossing into the south portion of McLean Hamlet Park then crosses Spring Hill Road. About 0.1 mile west of Spring Hill Road, the route turns south to cross Dulles Toll Road, continuing to follow Line #2108 for about 0.2 mile until terminating at the Tysons Substation.

2.1.3 Overhead Route 03

Overhead Route 03 is 5.2 miles long and comprises primarily new build route (3.4 miles) following I-495 within VDOT right-of-way and a wreck and rebuild (1.8 miles) where it follows Dominion Energy Virginia's existing Lines #2035, #202 and #2108.

The route would follow Dominion Energy Virginia's existing Line #2035 for about 0.2 mile out of the Idylwood Substation heading north across Shreve Road. At the W&OD Park, the route turns west to follow Line #202 parallel with the park for about 0.1 mile, crossing I-66 and the WMATA Orange Line, following the W&OD Park trail for about 0.3 mile before crossing I-495. West of I-495, the route diverges from the Line #202 right-of-way and heads north following I-495 for about 3.2 miles. Before reaching the cul-de-sac on Spring Street, the route crosses east over I-495 and heads north, straddling both VDOT right-of-way and private open space. Before reaching Idylwood Road, the route veers west to cross Idylwood Road and I-495 and continues north along the west side of I-495, primarily within VDOT right-of-way. After crossing Oak Street, the route crosses over I-495 again to continue north along the east side of I-495 straddling both VDOT and private property. Just south of where Pimmit Run crosses beneath I-495, the route veers west to cross I-495 and continue north along the west side of I-495 east of Tysons Executive Court for less than 0.1 mile before crossing back over I-495 to continue north along the east side of I-495 for less than 0.2 mile, crossing back to the west side of I-495 and continuing north across the I-495/Leesburg Pike interchange, and continuing north between I-495 to the east and Tysons One Place to the west. The route continues north on the west side of I-495 and across the Dolley Madison Boulevard Interchange. At the I-495/Dulles Toll Road

interchange, the route veers eastward across the I-495 Capital Beltway Outer Loop (while remaining west of the main stem of I-495), then immediately back west across Capital Beltway Outer Loop before extending north across Dulles Toll Road. The route then follows Line 2108 west for 1.0 mile, crossing into the south portion of McLean Hamlet Park then crosses Spring Hill Road. About 0.1 mile west of Spring Hill Road, the route turns south to cross the Dulles Toll Road, continuing to follow Line #2108 for about 0.2 mile until terminating at the Tysons Substation.

2.1.4 Overhead Route 04

Overhead Route 04 is 7.2 miles long and comprises a wreck and rebuild project for the entirety of the route following Dominion Energy Virginia's existing Lines #2035, #202, and #2010.

The route would follow Dominion Energy Virginia's existing Line #2035 for about 0.2 mile out of the Idylwood Substation heading north across Shreve Road. At the W&OD Park, the route turns west to follow Line #202 parallel with the park for about 0.1 mile crossing I-66 and the WMATA Orange Line, and the W&OD Park trail for about 4.0 miles, crossing I-495, Gallows Road, Cedar Lane, Park Street Southeast, Maple Avenue East, Church Street Northeast, and Ayr Hill Avenue Northeast. After entering Northside Park, the route veers east then northeast, following Line #2010 for about 2.9 miles to the Tysons Substation. This portion of the route crosses Piney Branch, behind residences on the west side of Rockport Road and the east side of Brenner Court, crossing McKinnley Street Northeast, and behind residences west of Wareham Court. After crossing Beulah Road, the route veers southeast and then northeast across the outer edges of Wolftrap Elementary School, before crossing Talisman Drive. The route enters Foxstone Park, crossing Wolftrap Creek and turns southeast, making multiple crossings of Wolftrap Creek before turning northeast and leaving the park. The route continues northeast crossing Foxstone Drive, then veers east across Creek Crossing Road, and behind residences on the south side of Woodnor Drive Northeast. The route begins a northeasterly trajectory as it crosses Denvonshire Drive Northeast, and behind residences on Westwood Drive Northeast and Fairway Drive Northeast, crossing Overlook Lane before veering slightly more northward to cross Old Courthouse Road, Burning Tree Drive, Westwood Drive, parallel to Tamarisk Court. The route crosses Thunderbird Court and Higdon Drive to parallel Vesper Drive before entering Old Courthouse Spring Branch Stream Valley Park and crossing Old Courthouse Spring Branch. Leaving the park, the route continues in a northeast direction, crossing between two commercial parking lots before crossing Leesburg Pike (WMATA Silver Line) and Spring Hill Road and continues between commercial properties before crossing Tyco Road and entering Tysons Substation.

2.2 STRUCTURE TYPES AND RIGHT-OF-WAY WIDTH CONSIDERATIONS

If an overhead route were to be constructed, Dominion Energy Virginia would have used single pole structures for the proposed 230 kV double circuit transmission lines. The poles would have ranged in height from 87 to 101 feet tall on average, depending on which route was constructed and subject to final engineering.

For the overhead routes, Dominion Energy Virginia would have utilized an 80-foot-wide right-of-way where a single circuit 230 kV line was planned (i.e., where new build right-of-way was planned). A 100-foot-wide right-of-way would have been utilized for all locations where double circuit 230 kV lines were planned (i.e., where wreck and rebuild along existing right-of-way was planned).

3.0 INVENTORY OF EXISTING CONDITIONS

Once ERM defined the study area, a list of routing criteria to help guide the routing process and provide a basis for comparing potential routes was developed (see Table 3-1). The routing criteria include routing constraints (e.g., sensitive environmental resources) and routing opportunities (e.g., existing corridors) as described in more detail in Section 4. ERM inventoried existing conditions, routing constraints, and routing opportunities using information obtained from publicly-available geographic information system (GIS) databases, agency websites and databases, published documents such as Fairfax County or municipal land use plans, and communication with agency and County staff, stakeholders, and elected officials. In those cases where GIS data were not available for a particular environmental resource or other feature, ERM obtained the best available hard-copy or online map and hand digitized the information needed to complete the study.

The existing conditions along each route that were identified are discussed below. Table 3-1 identifies the categories of environmental features considered in the study. Descriptive information regarding these features is provided in subsequent sections.

3.1 LAND USE

3.1.1 Land Ownership

ERM quantified information on land ownership in the Project area using publicly-available GIS databases and digital tract data obtained from the Fairfax County GIS & Mapping Department. These data indicate that the majority of the lands crossed by the routes are privately owned or existing road rights-of-way with smaller portions of federal, state, county, and municipal land, and land for which ownership is not listed. Figure 3.1.1-1 in Attachment B depicts land ownership along each route.

Overhead Route 01 crosses multiple parcels owned by Fairfax County, including those owned by Fairfax County Park Authority and by the Board of Supervisors. These parcels are primarily associated with Ruckstuhl Park, Kent Gardens Greenway Stream Valley Park, Kent Gardens Park, Pimmit Run Stream Valley Park, Langley Oaks Park, Scott's Run Nature Preserve, Timberly Park, and McLean Hamlet Park. The route also crosses multiple parcels that are federally owned and associated with Langley and Turkey Run Park. One parcel owned by the Northern Virginia Conservation Trust, one by the Commonwealth of Virginia, and one owned by Northern Virginia Regional Park Authority (NOVA) Parks (the W&OD Park) are also crossed. The parcel owned by the Commonwealth of Virginia is located northeast of the route's crossing of Idylwood Road and is crossed by the centerline for less than 10 feet. The right-of-way of Overhead Route 01 crosses one parcel owned by Fairfax County Water Authority, located near MP 5.8 just south of Dolley Madison Boulevard (VA 123). Overhead Route 01 also crosses a few parcels owned by WMATA, one located near MP 1.0 and one between MPs 1.5 and 1.6. Additionally, Overhead Route 01 crosses multiple roads owned by VDOT and Metropolitan Washington Airports Authority (MWAA).

TABLE 3-1

Idylwood-Tysons 230 kV Underground Transmission Line Project
Routing Constraints and Opportunities Considered in the Study Area

Constraint Type	Description
LAND USE CONSTRAINTS	
Land Ownership	• Federal, state, and local government lands • Private lands
Recreational Areas	• National, state, county, or municipal parks in the project vicinity • Federal, state, county, or municipal managed recreation areas crossed • Golf courses • Recreation trails (biking, hiking, birding, wildlife)
Existing land Use and Land Cover	• Existing subdivisions • Land cover types (e.g., forest, agricultural, developed) • Residences, churches, schools, cemeteries
Land Use Planning and Zoning	• Zoning Districts
Planned Developments	• Planned or Proposed Residential, Commercial, or Industrial Developments
Conservation Lands	• Virginia Outdoors Foundation and Virginia Department of Conservation and Recreation conservation land and easements • Fairfax County protected open space • Other conservation lands
Transportation	• Road and railroad crossings
ENVIRONMENTAL CONSTRAINTS	
Surface Waters	• Wetlands • Waterbodies
Land Cover	• Forested Lands
Protected or Managed Areas	• Resource Protection Areas
Protected Species	• Stream Conservation Units • Natural Heritage Resources • Threatened and Endangered Species • Bald Eagles
Vegetation	• Vegetation Characteristics • Virginia Department of Forestry medium and high priority forests
VISUAL CONSTRAINTS	
Visually Sensitive Areas	• Viewsheds to and from Visually Sensitive Areas
CULTURAL RESOURCES CONSTRAINTS	
Historic Properties	• Sites Listed in or Eligible for Listing in the National Register of Historic Places
Other Cultural Resource Sites	• Archaeological Sites • Historical or Architectural Sites • Prehistoric and Historic Sensitivity Areas • Battlefields • Virginia Department of Historic Resources Protect Easements
GEOLOGICAL CONSTRAINTS	
Mineral Resources	• Mines or Mining Areas
ENGINEERING CONSTRAINTS	
Length	• Length of Routes
Existing Electric Facilities	• Transmission or Distribution Lines
Greenfield Construction	• New Corridor (i.e., not adjacent to existing corridor)
ROUTING OPPORTUNITIES	
Land Use Planning	• Designated Utility Corridors
Existing Electric Facilities	• Transmission or Distribution Lines
Other Utilities	• Pipelines
Transportation Infrastructure	• Roads or Railroads

Overhead Route 02 crosses multiple parcels owned by Fairfax County, including those owned by Fairfax County Park Authority and by the Board of Supervisors. These parcels are primarily associated with Ruckstuhl Park and McLean Hamlet Park. One parcel owned by NOVA Parks, associated with the W&OD Park, is also crossed. Overhead Route 02 also crosses the same parcels owned by the WMATA as discussed above for Overhead Route 01. Additionally, Overhead Route 02 crosses multiple roads owned by VDOT and MWAA.

Overhead Route 03 crosses one parcel owned by the Fairfax County Board of Supervisors, two by Fairfax County Park Authority, and multiple by NOVA Parks. The Fairfax County Park Authority crossings are associated with McLean Hamlet Park. Overhead Route 03 is located within the NOVA Parks owned W&OD Park for about 0.4 mile. The Board of Supervisors-owned parcel is located near MP 5.0, just north of VA 267. Additionally, Overhead Route 03 crosses multiple roads owned by VDOT and MWAA.

Overhead Route 04 crosses three parcels owned by the Fairfax County Board of Supervisors, multiple parcels owned by Fairfax County Park Authority, one by the Fairfax County School Board (associated with Wolftrap Elementary School), four owned by NOVA Parks associated with the W&OD Park, and multiple parcels owned by the Town of Vienna. The Board of Supervisor parcels are located between MPs 6.5 and 6.8 along the existing right-of-way, south of Spring Hill Road near MP 6.9, and north of Spring Hill Road associated with the Tysons Fire Station. The Fairfax County Park Authority parcels are associated with Eudora Park, Waverly Park, Foxstone Park, and Old Courthouse Spring Branch Stream Valley Park. The Town of Vienna owned parcels are crossed between MPs 4.3 and 4.4. Additionally, Overhead Route 04 crosses multiple roads owned by VDOT.

3.1.2 Recreation Areas

ERM identified recreation areas through review of digital data sets and maps, U.S. Geological Survey (USGS) topographic quadrangles, recent digital aerial photography, and the Fairfax County website. This review identified a variety of recreation areas either crossed or located within 0.25 mile of routes. These are described below (ordered alphabetically) and shown on Figures 3.1.2-1a and b in Attachment B. In addition to the recreation areas discussed below, Fairfax County has a database of swimming pools located within the County. The majority of these pools are private pools associated with apartment complexes and hotels. Table 3.1.2-1 lists the swimming pools, excluding those associated with hotels, located within 0.25 mile of the routes. None of the swimming pools are directly crossed by any of the routes.

TABLE 3.1.2-1

Idylwood-Tysons 230 kV Underground Transmission Line Project
Fairfax County Swimming Pools Located within 0.25 mile of Overhead Routes

Pool Name	Overhead Routes within 0.25 mile
Cardinal Hill Swimming Pool	Overhead Route 04
Church Street Swimming Pool	Overhead Route 04
Dolley Madison Swimming Pool	Overhead Route 03
Fountains of McLean Swimming Pool	Overhead Routes 01, 02, 03
Gates of McLean Swimming Pool	Overhead Routes 02 and 03
Hamptons of McLean Swimming Pool	Overhead Route 01
Idylwood Towers Swimming Pool	Overhead Routes 01 and 02
Idylwood Village West Swimming Pool	Overhead Route 03
Kent Gardens Club Swimming Pool	Overhead Route 01
Langley Community Swimming Pool	Overhead Route 01
McLean Hills Condo Swimming Pool	Overhead Route 03
Park Terrace Condominiums Swimming Pool	Overhead Route 04
Potomac School Swimming Pool	Overhead Route 01
Regency at McLean Swimming Pool	Overhead Route 03
Regency Sport and Health Swimming Pool	Overhead Route 03
Renaissance Swimming Pool	Overhead Route 03
Reserve at Tysons Corner 1 Swimming Pool	Overhead Route 03
Reserve at Tysons Corner 2 Swimming Pool	Overhead Route 03
Tuckahoe Recreation Center Swimming Pool	Overhead Route 02
Tysons Glen Swimming Pool	Overhead Route 03
Westerlies Swimming Pool	Overhead Route 02
Wein Private Day School Swimming Pool	Overhead Route 04

Alfred Odrick Home Site

The Alfred Odrick Home Site is located off Lewinsville Road, near the intersection with Hardinson Lane. This recreation area is a cultural resources park operated by the Fairfax County Park Authority. This site was dedicated on May 1, 2010 and named in honor of Alfred Odrick, a freed slave, who purchased the property and built his family home there. The remains of his home were discovered while preparing the lot for a housing development (Fairfax County, 2015a). The Alfred Odrick Home Site is located within 0.25 mile of Overhead Routes 01, 02, and 03.

Bryn Mawr Park

Bryn Mawr Park is an approximately 5-acre park located at the end of Laughlin Avenue, and along Tennyson Drive (Fairfax County, 2011). It is classified as a local park. Park amenities include a small play area with two swings and a see-saw as well as a shaded walking path lined with benches. Bryn Mawr Park is located within 0.25 mile of Overhead Route 01.

Cardinal Hill Swim and Racquet Club

The Cardinal Hill Swim and Racquet Club is located on Westerholme Way in Vienna. This private recreation area serves 600 homes in the residential areas on Vienna. Club facilities include a bath house, large main pool with a dive well and two diving boards, water slide, intermediate pool, and baby pool. Additional facilities include seven lighted tennis courts, snack bar, and a sand volleyball court. This recreation area is located within 0.25 mile of Overhead Route 04.

Churchill Road Park

The Churchill Road Park is a 12-acre park, located at the end of Thrasher Road. The park has a small amphitheater, a swing set, and multiple hiking trails (Fairfax County, 2011). There is also a large grassy area, and swing set. It is located next to the Churchill Road Elementary School and near the Cooper Intermediate School Site Park. Churchill Road Park is located within 0.25 mile of Overhead Route 01.

Clemyjontri Park

Clemyjontri Park is located between Georgetown Pike and Dolley Madison Boulevard, near the intersection with Dunaway Drive. Founded in 2006, Clemyjontri Park is designed to be accessible to all children, regardless of physical or developmental disabilities. It is a 2-acre playground, with four unique play spaces, each designed to engage different parts of the brain and aid in development of children. The park also has a Liberty Swing, which is a specially-designed swing that allows children in wheelchairs to have the opportunity to use a swing. Additionally, the park has a carousel that sits at ground level to ensure accessibility to all users (Fairfax County, 2015a). Clemyjontri Park is located within 0.25 mile of Overhead Route 01.

Cooper Intermediate School Recreation Area

Cooper Intermediate School is a Fairfax County public school, located off of Balls Hill Road, just south of the intersection with Georgetown Pike. The recreation area located on the school site has four tennis courts, a baseball field, and a track which surrounds an athletic field. Cooper Intermediate School Recreation Area is located within 0.25 mile of Overhead Route 01.

Dolley Madison Estates Park

Dolley Madison Estates Park is located off of Potomac School Road. It is a forested park approximately 3.8 acres in size and is located near the Potomac School (Fairfax County, 2017). Dolley Madison Estates Park is located within 0.25 mile of Overhead Route 01.

Dunn Loring Park

Dunn Loring Park is a Fairfax County park located off of Gallows Road near the intersection of Revatom Court (Fairfax, 2015a). There is a playground with multiple swing sets and a play structure, as well as basketball courts and tennis courts. The entire park is surrounded by walking paths. Additionally, there is a covered picnic area with four tables and two grills. Dunn Loring Park is located within 0.25 mile of Overhead Route 04.

Eudora Park

Eudora Park is located off of Labrador Lane, near the intersection of Prelude Drive. Piney Branch runs through this mostly undeveloped park. There are a few walking paths available to recreational users. Eudora Park is located within 0.25 mile of Overhead Route 04.

Falstaff Park

Falstaff Park is a Fairfax County park located off of Falstaff Road, near the intersection of Desdemona Court. The part has two play structures and two different-sized swing sets to accommodate children of all sizes. There are also hiking trails located around the park.

Additionally, there is a covered eating area with picnic tables and benches available for use. Falstaff Park is located within 0.25 mile of Overhead Routes 01, 02, and 03.

George C. Marshall High School/Mary Ellen Middle School

George C. Marshall High School/Mary Ellen Middle School are Fairfax County public schools located off at Leesburg Pike at the intersection of George C. Marshall Drive. The campus has multiple athletic fields including a football fields, track and field area, multi-use sports field, as well as separate softball and baseball fields. George C. Marshall High School/Mary Ellen Middle School is located is located within 0.25 mile of Overhead Route 03.

Glyndon Park

Glyndon Park is located off of Glyndon Street Northeast, near the intersection with Ayr Hill Avenue Northeast. Glyndon Park is about 11 acres and contains open space, a walking trail, a playground and picnic pavilions available for rent (Town of Vienna, 2017). The park also has a baseball field, a basketball court, and two lit tennis courts available for use by visitors of the park. Much of the park is shaded by existing tree canopy. Glyndon Park is located within 0.25 mile of Overhead Route 04.

Great Falls Loop – Virginia Birding and Wildlife Trail

The Virginia Birding and Wildlife Trail network consists of over 600 viewing sites for bird and wildlife viewing in the Commonwealth. The Great Falls Loop of the Virginia Birding and Wildlife Trail begins west Washington D.C, following the Potomac River, continuing northwest along the George Washington Memorial Parkway through the Project study area. The trail follows the Potomac River upstream through the Great Falls National Park, to the northernmost site at Riverbend Park. Following I-495, the loop travels through several habitats, ranging from extensive forests to narrow riparian corridors. The Great Falls Loop Trail generally follows major roadways leading to viewing sites however there are no viewing sites in the study area. All of the Overhead Routes cross the Great Falls Loop upon crossing I-495 in the vicinity of Idylwood and Dunn Loring.

Hamlet Swim Club

The Hamlet Swim Club is a private club located at the end of Dunsinane Court near the intersection of Birnam Wood Drive. There are five tennis courts on site, three of which are open year-round, dependent upon the weather. The club has an eight lane, 25-meter pool, with an attached diving well with diving boards, that is open from Memorial Day through Labor Day. There is also a shallow pool available for younger children, as well as tables, lounge chairs, and grills along the pool deck that are available for use by the guests. The club is also used by Hamlet Swim Team, Hamlet Dive Team, and the Hamlet Tennis team for practice and competition. Hamlet Swim Club is located within 0.25 mile of Overhead Routes 01, 02, and 03.

Highlands Swim and Tennis Club

Highlands Swim and Tennis Club is a private athletic club located at the end of Bryan Branch Road. The club has two 25-meter pools, as well as an infant pool, available for club members. There are also four tennis courts on site which are lighted and have wind screens. There are private and group swim, dive, and tennis lessons available to members of the club. Aside from

the recreation areas, there are also two decks and a large lawn available for private events. Highlands Swim and Tennis Club is located within 0.25 mile of Overhead Route 01.

Idylwood Park

Idylwood Park is a Fairfax County park located off of I-66, near the intersection of Virginia Lane. Idylwood Park has a softball field, a baseball field, two tennis courts, a soccer field, walking trail, as well as a playground with a swing set. Idylwood Park is located within 0.25 mile of Overhead Routes 01, 02, 03, and 04.

Jefferson District Park

The Jefferson District Park is a Fairfax County park located off of Lee Highway near the intersection of Hyson Lane. The Jefferson District Golf Course, a nine hole course open year round, is located at this park. Additionally, Jefferson Falls Mini-Golf is located at this park. Aside from golf courses, the park has tennis courts, basketball courts, and a playground available for visitors. The tennis courts and basketball courts are open year round until 11 pm. The children's playground is heavily shaded and has a play structure with a slide (Fairfax County, 2015a). Jefferson District Park is located within 0.25 mile of Overhead Routes 01, 02, 03, and 04.

Kent Gardens Greenway Stream Valley Park

Kent Gardens Greenway Stream Valley Park is an approximately 22-acre Fairfax County park, running along the Pimmit Run Stream, located off of Westmoreland Street at the intersection of Sommerville Drive (Fairfax County, 2011). The park has a walking trail available for use to visitors of the park. It is classified as a resource-based park, meaning the park is designed to support the surrounding natural resources. Kent Gardens Greenway Stream Valley Park is located within 0.25 mile of Overhead Route 02, and is crossed by Overhead Route 01.

Kent Gardens Park

Kent Gardens Park is an approximately 26-acre Fairfax County park located off of Beverly Avenue, near the intersection of Youngblood Street (Fairfax County, 2011). The park has hiking trails and a small play area with swings. It is classified as a local park, meaning it is designed for the surrounding neighborhoods to use. Kent Gardens Park is crossed by Overhead Route 01.

Kirby Park

Kirby Park is a Fairfax County park located off of Kirby Road. The park is surrounded by trees and has a small walking path that leads to the McLean Little League baseball field complex. There is no parking specifically designated for the park; however, there is street parking available in the surrounding neighborhoods. Kirby Park is located within 0.25 mile of Overhead Route 01.

Langley Fork Park

Langley Fork Park is an approximately 53-acre park located on federally-owned land off of Georgetown Pike near the intersection of Colonial Farm Road. The park is managed by Fairfax County Park Authority through an agreement with the NPS. This park has a baseball field, softball field, two basketball courts, and two large grass fields available for use. Aside from these sports fields, there is a tree-covered area with a walking path. In 2013, there was a proposal to update the master plan to acquire more land to meet the needs of the growing

community (Fairfax County, 2015a). Langley Fork Park is located within 0.25 mile of Overhead Route 01.

Langley Oaks Park

Langley Oaks Park is an approximately 100-acre Fairfax County park located off of Ridge Drive, near the intersection of Anna Maria Court. It is classified as a resource-based park, meaning the park is designed to support the surrounding natural resources (Fairfax County, 2011). It is shaded and has walking paths for recreational use. Langley Oaks Park is crossed by Overhead Route 01.

Lewinsville Center

The Lewinsville Center is a community center located off of Great Falls Street, near the intersection of Vistas Lane. It is currently under development to house a brand-new senior center and child care center for the community. Aside from these two centers, there will also be senior residence building created during this development. The work is occurring in three phases, with the final phase planned to begin in fall 2018 (Fairfax County, 2015a). Lewinsville Center is located within 0.25 mile of Overhead Route 02.

Lisle Park

Lisle Park is an approximately 1-acre Fairfax County park located off of Leesburg Pike, near the intersection of Lisle Ave (Fairfax County, 2011). This park has a small play structure and a basketball hoop for visitors to use. There is a small entrance path located between two homes, and the park itself is surrounded by several houses. Lisle Park is located within 0.25 mile of Overhead Route 03.

McLean Little League Park

McLean Little League Park is a baseball/softball field complex located off of Westmoreland Street, near the intersection of Somerville Drive. This park is owned by McLean Little League, Incorporated. It has four fields and multiple batting cages available for use. McLean Little League Park is crossed by Overhead Route 01.

Mount Royal Park

Mount Royal Park is a 3-acre Fairfax County park located off of Idylwood Road, near the intersection of Idylwood Court (Fairfax County, 2011). It is a shaded park covered with trees, and has walking path going through it. Mount Royal Park is located within 0.25 mile of Overhead Routes 01 and 02.

Northside Park

Northside Park is located off of Glyndon Street NE, near the intersection with Mill Street NE. The park is a nature park about 26 acres in size with hiking paths (Town of Vienna, 2017). Piney Branch runs through the park, providing habitat for various types of wildlife. Among other visitors, the park is used by joggers, hikers, and dog-walkers. Northside Park is crossed by Overhead Route 04.

Old Courthouse Spring Branch Stream Valley Park

Old Courthouse Spring Branch Stream Valley Park is a Fairfax County park located off of Palm Springs Drive, near the intersection of Doral Court. The park is about 33 acres and is an ecologically-sensitive area. The park is crossed by Overhead Route 04.

Olney Park

Olney Park is an approximately 12-acre Fairfax County park located off of Friden Drive, near the intersection of Pimmit Drive (Fairfax County, 2015a). The park has two little league fields, one basketball court, and two tennis courts available for use by visitors. There is also a playground with three slides and a variety of different climbing structures at this park. Additionally, there is a shelter that can be reserved with eight picnic tables and a grill included in the rental rate. Onley Park is located within 0.25 mile of Overhead Route 02.

Pimmit Run Stream Valley Park

Pimmit Run Stream Valley Park is a Fairfax County park located off of Great Falls Street near the intersection of Lemon Road. There are two park areas named Pimmit Run Stream Valley Park, both of which are located along the Pimmit Run Stream. The larger park is about 82 acres, and the smaller is approximately 17 acres. Both parks are designated as resource-based, meaning they are designed to support the surrounding natural resources. Multiple trails are available in both areas of the park (Fairfax County, 2011). Pimmit Run Stream Valley Park is located within 0.25 mile of Overhead Route 02, and is crossed in seven locations by Overhead Route 01.

Potomac Hills Park

Potomac Hills Park is an approximately 10-acre Fairfax County park located between Kinyon Place, Hardy Drive and Layman Street. It is divided into three pieces with a trail connecting them. The park is classified as a local park, meaning it is designed for the surrounding neighborhoods to use (Fairfax County, 2011). Potomac Hills Park is located within 0.25 mile of Overhead Route 01.

Potomac School

The Potomac School is a private K-12 school located off of Potomac School Road. The school has a variety of recreation areas, ranging from sports fields to playgrounds. There is a track and field area that has a six-lane running track as well as a multi-use sports turf field, which is used for football, field hockey, soccer, and lacrosse. Separate baseball and softball fields as well as a grass field, four squash courts, and eight tennis courts are also located on site. The school also has a playground with various play structures and swings for use. Additionally, the campus itself contains wooded areas with running trails (Potomac School, 2017). Potomac School is crossed by Overhead Route 01.

Raglan Road Park

Raglan Road Park is located off of Raglan Road. This Fairfax County park is densely forested, but has a small grassy field for playing. Raglan Road Park is located within 0.25 mile of Overhead Route 04.

Rotonda Condominiums

The Rotonda Condominiums, located off of International Drive, include a private recreational area for use by residents of the condominiums. There is an outdoor pool and spa and indoor pool and sauna available for use. Additionally, there are outdoor basketball courts, tennis courts, and soccer fields available for use by the residents, as well as a sand volleyball court and a putting green. There is a fitness trail on the property for residents, as well as outdoor exercise equipment available for use. An off-leash dog park is also located on site. Rotonda Condominiums is located within 0.25 mile of all of the overhead routes.

Ruckstuhl Park

Ruckstuhl Park is an approximately 7-acre Fairfax County park located off of Idylwood Road near the intersection of Dunford Drive. The master plan for this park, which was approved in October of 2015, is to have a walking trail around the entire park, a picnic area, a nature playground and education area, an open play area, and a cultural interpretation spot, as well as parking (Fairfax County, 2015a). Ruckstuhl Park is crossed by Overhead Routes 01 and 02.

Salona Park

Salona Park is an approximately 50-acre historic property located off of Dolley Madison Boulevard, at the intersection of Buchanan Street. In 2010, a draft master plan was developed and presented to the public, and a task force was formed to develop recommendations for development of the site. In 2013, the task force presented their recommendations, but the site has yet to be developed (Fairfax County, 2015a). Salona Park is located within 0.25 mile of Overhead Route 01.

Scott's Run Nature Preserve

Scott's Run Nature Preserve is an over 375-acre Fairfax County nature preserve located off of Georgetown Pike, near the intersection of Swinks Mill Road. It has eight different hiking trails for visitors of the park to use. The preserve is part of the Potomac Gorge, a unique biological ecosystem, which contains many rare plants and animals. On occasion, the Park Authority will host nature programs here, including wildflower walks, bird watching programs, and watershed education programs. The trails of the park are maintained by the Potomac Appalachian Trails Club, as well as other groups working to keep invasive species out of the park (Fairfax County, 2015a). Scott's Run Nature Preserve is crossed by Overhead Route 01.

South Railroad Street Park

South Railroad Street Park is located off of Railroad Street, near the intersection of 4th Place. A large play structure with multiple slides, monkey bars and a climbing wall are available on site. There are also picnic tables and a walking path for visitors of the park to enjoy. South Railroad Street Park is located within 0.25 mile of Overhead Route 03.

Spring Hill Elementary

Spring Hill Elementary School is a Fairfax County public school located off of Lewinsville Road, near the intersection of Spring Hill Road. Recreational facilities associated with the school include basketball courts and playgrounds. Aside from the school playground, there are multiple

sports fields located at the school with soccer nets. Spring Hill Elementary is located within 0.25 mile of Overhead Routes 01, 02, and 03.

Timberly Park

Timberly Park is an approximately 23-acre Fairfax County park located off of Swinks Mill Road, near the intersection of Old Dominion Drive (Fairfax County, 2011). The park is forested and is classified as a local park, meaning it is designed for the surrounding neighborhoods to use. Timberly Park is crossed by Overhead Route 01.

Turkey Run Park

Turkey Run Park is a national park located off of the George Washington Memorial National Parkway. The park is known for wildlife and wildflowers throughout the seasons. The park offers picnic tables, water fountains, and restrooms to visitors. There are walking and bike riding trails located within the park (NPS, 2015). Turkey Run Park is crossed by Overhead Route 01.

Tysons Corner Center Pedestrian/Bike Trail

The Tysons Mall Pedestrian/Bike Trail is a privately-maintained paved trail located on the east side of Tysons Corner Center mall between Tysons One Place and I-495. The trail starts near Fashion Boulevard and extends north for about 0.1 mile. Overhead Route 03 would be located within this trail.

Tysons Woods Park

Tysons Woods Park is a Fairfax County park located off of Malraux Drive, near the intersection of Richelieu Drive. The park has two play structures and a swing set on site. The park also has a shaded walking path for visitors to enjoy. Tysons Woods Park is located within 0.25 mile of Overhead Route 04.

Vienna Community Center

Vienna Community Center is located off of Park Street Southeast, near the intersection with Dominion Road Southeast. The Vienna Community Center is currently under construction, with plans to open in fall of 2017 (Town of Vienna, 2017). The renovation includes the addition of a full-size gymnasium, as well as the renovation of the existing auditorium, multi-purpose room, storage room, classrooms, and lobby. The community hosts a variety of classes, ranging from sports lessons to performing arts classes to standing art and fitness classes. The Vienna Community Center is crossed by Overhead Route 04.

Vienna Town Green

Vienna Town Green is located off of Church Street Northeast, near the intersection with Mill Street NE. The Vienna Town Green is about 2 acres in size and has a large grassy area, a plaza, and a water fountain on site (Town of Vienna, 2017). The town green also has an amphitheater and hosts free concerts throughout the year. Additionally, the town green is available for rent. The Vienna Town Green is crossed by Overhead Route 04.

Washington and Old Dominion Railroad Regional Park

W&OD Park is located along the former roadbed of the Washington & Old Dominion Railroad. The park runs approximately 45 miles from Shirlington to Purcellville, including a paved trail designed for walking, hiking, and biking, which is also lined with playgrounds that are open to the public. A gravel equestrian trail runs adjacent to the paved trail for about 32 miles (NOVA Parks, 2017). All of the overhead routes would either cross or run within the W&OD Park for varying distances.

Waters and Caffi Fields

Waters and Caffi Fields are located off of Cherry Street Southeast, near the intersection with Center Street S. There are three grass softball fields with stands and an astro-turf multi-sport field at the site, which is used for both baseball and football. Additionally, there are picnic tables located around the fields available to recreational users. The site is located next to the Vienna Community Center and Vienna Elementary School. Waters and Caffi Fields are crossed by Overhead Route 04.

Waverly Park

Waverly Park is located off of Ridge Lane, near the intersection with Foxstone Drive. The park includes a basketball court and a playground available for use to visitors. Additionally, there are walking paths throughout the park for visitors to enjoy. Waverly Park is crossed by Overhead Route 04.

Westwood Golf Course

Westwood Golf Course is located off of Maple Avenue East, near the intersection with Mashie Drive Southeast. Westwood Golf Course is an 18-hole, par 71 course with a driving range and putting green (Westwood Country Club, 2014). The golf course is located on the ground of the Westwood Country Club in Vienna, Virginia. The current course was opened in the spring of 2013, after going through a two-year renovation. Westwood Golf Course is located within 0.25 mile of Overhead Route 04.

Wildwood Park and Trail

Wildwood Park and Trail are located off of Mashie Drive Southeast, near the intersection with Echols Street Southeast. Wolftrap Creek runs through the park and a walking trail runs along it. Wildwood Park is located within 0.25 mile of Overhead Route 04.

Wolftrap Stream Valley Park

Wolftrap Stream Valley Park is located off of Old Courthouse Road, near the intersection with Proffit Road. Wolftrap Creek runs through the park and there are walking trails for visitors to enjoy. Wolftrap Stream Valley Park is located within 0.25 mile of Overhead Route 04.

3.1.3 Airports

Airports are important considerations in routing and building new overhead electric transmission lines because of the potential for transmission line structures to affect airspace in and around

these facilities. A summary of the airports in the vicinity of the Project area and the airspace regulations that could have an impact on the Project are provided below.

Airports Near Overhead Routes

ERM reviewed the Federal Aviation Administration's (FAA) website to identify public use airports, airports operated by a federal agency or the U.S. Department of Defense, airports or heliports with at least one FAA-approved instrument approach procedure, and public use or military airports under construction (FAA, 2017). Based on this review, there are two airports and four heliports located within 10.0 miles of the overhead Project facilities. Table 3.1.3-1 lists these airports and heliports including site type, location identifier, distance and direction from the Project, and maximum runway length and width.

TABLE 3.1.3-1

Idylwood-Tysons 230 kV Underground Transmission Line Project
Airports and Heliports Located in the Vicinity of the Project

Airport/Heliport Name	Site Type	Location Identifier	Approximate Distance and Direction From Project Facility (miles)	Maximum Runway Length/Width (feet)
Washington Dulles International Airport	Public Airport	IAD	10 W	11,500 x 150
Ronald Reagan Washington National Airport	Public Airport	DCA	8.6 SE	7,170 x 150
South Capitol Street	Public Heliport	09W	9.5 W	60 x 60
Walter Reed National Medical Center	Private Heliport	60 MD	6.4 NE	60 x 60
Pentagon AHP	Private Heliport	JPN	7.2 SE	82 x 82
Washington Hospital Center	Private Heliport	DC08	8.4 E	100 x 100

Federal Aviation Regulations

The FAA is responsible for overseeing air transportation in the United States. The FAA focuses on air transportation safety, including the enforcement of safety standards for aircraft manufacturing, operation, and maintenance. The FAA also manages air traffic in the United States and evaluates physical objects that may affect the safety of aeronautical operations through an obstruction evaluation. The prime objective of the FAA in conducting an obstruction evaluation is to ensure the safety of air navigation and the efficient utilization of navigable airspace by aircraft.

The regulations that govern objects that may affect navigable airspace are codified at 14 Code of Federal Regulations Part 77 (Part 77). On July 21, 2010, the FAA amended Part 77. Following are the major changes in the final rule:

1. The final rule provides for an FAA Determination of Hazard or Determination of No Hazard to become effective 40 days after the date of issuance.

2. The final rule stipulates that a Determination of No Hazard to air navigation will expire 18 months after the effective date of the determination, or on the date the proposed construction or alteration is abandoned. Also, the final rule specifies that a Determination of Hazard to Air Navigation does not expire.

3. The final rule expands the requirements for notice to be sent to the FAA for proposed construction or alteration of structures on or near private use airports that have an instrument approach procedure.

A summary of the final rule as it relates to the Project is provided below.

Civil Airport Imaginary Surfaces

Civil airport imaginary surfaces have been established with relation to each airport and to each runway. The imaginary surfaces were developed to prevent existing or proposed objects from extending from the ground into navigable airspace. Following is a description of the civil imaginary surfaces:

- Horizontal surface: A horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of specified radii from the center of each end of the primary surface of each runway and connecting the adjacent arcs by lines tangent to those arcs.

- Conical surface: A surface extending outward and upward from the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

- Primary surface: A surface longitudinally centered on a runway. The primary surface extends 200 feet beyond the end of each runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline.

- Approach Surface: A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end (e.g., precision instrument approach, visual approach).

- Transitional Surface: These surfaces extend outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces. Transitional surfaces for those portions of the precision approach surface that project through and beyond the limits of the conical surface extend a distance of 5,000 feet measured horizontally from the edge of the approach surface and at right angles to the runway centerline.

FAA Notice Requirements and Timing

Dominion Energy Virginia evaluated the Part 77 civil airport imaginary surfaces and determined that the heights of the overhead structures will not exceed the obstacle clearance surfaces described above.

The requirements for filing with the FAA for structures vary based on a number of factors, including: height; proximity to an airport; location; and frequencies emitted from the structure. A notice must be filed with the FAA if:

- Any construction or alteration is more than 200 feet above ground level at its site.

- Any construction or alteration exceeds an imaginary surface extending outward and upward at the following slope:
    - 25 to 1 for a horizontal distance of 5,000 feet from the nearest point of the nearest landing and takeoff area of each heliport;
    - 50 to 1 for a horizontal distance of 10,000 feet from the nearest point of the nearest runway that is no more than 3,200 feet in actual length; and
    - 100 to 1 for a horizontal distance of 20,000 feet from the nearest point of the nearest runway that is more than 3,200 feet in actual length.
- If requested by the FAA.

Construction or alteration of any structure that meets the notification requirements set forth above must submit a FAA Form 7460-1, Notice of Proposed Construction or Alteration (Notice) to the FAA Regional office having jurisdiction over the area within which the construction or alteration will be located or submitted electronically via the FAA website. The information that needs to be provided with the Notice includes the coordinates, site elevation, and structure height above ground level for each pole/structure and the height of construction equipment, such as cranes.

Dominion Energy Virginia completed an initial screening of the Overhead Routes using the FAA's Notice Criteria Tool. Based on the initial screening, the routes are in close proximity to a navigational facility and may impact the assurance of navigation signal reception. Because the Overhead Routes were rejected, Dominion Energy Virginia will not be filing a Notice for structures and cranes for any of these routes.

State and Local Regulations

Commonwealth of Virginia Aviation Regulations

Section 5.1-25.1 of the Code of Virginia (Va. Code or Code) establishes that it is unlawful for a person to erect any structure which penetrates into or through any licensed airport's clear zone, approach zone, imaginary surface, obstruction clearance surface, obstruction clearance zone, or surface or zone as described in regulations of the Virginia Department of Aviation or the FAA, without first securing a permit for its erection from the Virginia Aviation Board. However, it also states that this requirement does not apply to any structure to be erected in a county, city, or town which has an ordinance regulating the height of such structures to prevent the penetration of zones and surfaces provided for in Federal Aviation Regulation Part 77 and Rule 19 of the Virginia Department of Aviation.

Local Airport Regulations

Code §§ 15.2-2280, 15.2-2282, 15.2-2293, and 15.2-2294 give local jurisdictions the power to establish and regulate zoning districts, make airspace subject to their zoning ordinance, and establish airport safety zoning. Following is a summary of the zoning regulations for Fairfax County.

Fairfax County

Airports are regulated as a special exception in the Fairfax County Zoning Ordinance. Special exceptions include uses that can have an undue impact upon or be incompatible with other land uses. Special exceptions allow for standards and regulations to be modified in the interest of sound development and to mitigate conflicting or otherwise incompatible land uses. Airports may be allowed to locate within given designated zoning districts under the controls, limitations, and regulations of a special exception. Special exceptions are under the approval authority of the Fairfax County Board of Supervisors.

The Zoning Ordinance lists airports as a Category 4 Special Exemption Use which includes other types of transportation facilities such as heliports, rail transit facilities, and bus stations. Airports are permitted by right through a development plan in the Planned Residential Community District and are allowed by special exception in the R-E (Residential Estate) and R-1 (Residential District, One Dwelling Unit/Acre) Districts. The Zoning Ordinance provides standards for Category 4 uses in the Article 9-404.

3.1.4 Existing Land Use and Land Cover

Existing land cover within the Project area was identified using the National Land Cover Database data layer. Existing land cover for each route is depicted on Figure 3.1.4-1 in Attachment B and quantified in Table 4-1.

ERM identified buildings (including dwellings) within 500 feet of each route through review of various digital data sets and maps, USGS topographic quadrangles, and current aerial photography. Features found within 500 feet of the Overhead Routes include churches, cemeteries, and schools, as well as other public, residential, commercial, and industrial buildings.

Residences were identified within 500, 200, and 100 feet of the route centerlines as well as residences within 60 feet of the edge of new or expanded right-of-way and dwellings located within the right-of-way. The development of new or expanded right-of-way within 60 feet of a residence would invoke the provisions of Va. Code § 56-49. The number of residences and their proximity to each route are provided in Table 4-1 and are categorized by whether the residences are within proximity of the existing right-of-way or the new/expanded permanent right-of-way. Table 4-1 also quantifies the number of outbuildings, industrial/commercial/public buildings, and mutli-family residential buildings located in the existing right-of-way and expanded/new right-of-way.

Overhead Route 01

There is one church and three schools located within 500 feet of the Overhead Route 01 centerline. The Shrevewood Elementary School property is located 500 feet southeast of Overhead Route 01 at MP 0.3 at the corner of Shreve Road and Fairwood Lane. School facilities are located further than 500 feet. Between MPs 4.9 and MP 5.4, the route crosses The Potomac School grounds, located on Potomac School Road. At MP 9.6, the route passes within 450 feet of Oakcrest School, a Catholic primary school, and Holy Trinity Church which is part of the parochial school. Oakcrest School is located near the intersection of Balls Hill Road and Holyrood Drive.

Overhead Route 01 crosses primarily open space, forest land, and developed land. The existing right-of-way follows several linear parks and greenways through Pimmit Hills, McLean, and NPS lands surrounding the CIA headquarters at Langley. The surrounding areas are primarily low-to medium-density residential. Between MPs 11.5 and 12.8, Overhead Route 01 follows the north side of VA 267, terminating at the commercial mixed-use development area of Tysons.

Overhead Route 02

There is one school located within 500 feet of Overhead Route 02. Shrevewood Elementary School property is located 500 feet southeast of Overhead Route 02 at MP 0.3 at the corner of Shreve Road and Fairwood Lane. School facilities are located further than 500 feet from the centerline.

Overhead Route 02 crosses primarily developed land and open space. The right-of-way follows I-66 and VA 267 through residential and commercial areas of Idylwood and Pimmit Hills. The surrounding areas are primarily low-to medium-density residential abutting limited access roads. Between MPs 3.7 and 6.1, Overhead Route 02 follows VA 267, terminating at the commercial mixed-use development area of Tysons.

Overhead Route 03

There is one church and one school located within 500 feet of Overhead Route 03. At MP 1.2, the route passes 200 feet east of the Church in Dunn Loring which is located near the intersection of Morgan Lane and Oak Street. At MP 1.6, Overhead Route 03 crosses the western edge of the George C. Marshall High School/Mary Ellen Middle School property. School facilities are located more than 500 feet from the centerline.

Overhead Route 03 crosses primarily developed land and open space. The right-of-way follows the I-495 corridor and VA 267 through residential and commercial areas of Idylwood, Dunn Loring and Tysons. The surrounding areas are primarily low-to medium-density residential abutting limited access roads from MP 0.0 to MP 2.2. Between MPs 2.3 and 5.2, the route enters the commercial mixed-use development area of Tysons.

Overhead Route 04

There are three churches and two schools located within 500 feet of Overhead Route 04. At MP 1.0, the route passes 260 feet north of the Vietnamese Alliance Church and 380 feet north of Dunn Loring Community Church, both located along Gallows Road and Bright Meadows Lane. At MP 1.6, the route passes 80 feet north of Grace Presbyterian Church on Cedar Lane in Dunn Loring. At MP 3.2, Overhead Route 04 passes 170 feet to the northeast of Vienna Elementary School. Between MPs 4.9 and 5.1 the right-of-way crosses the southern edge of the Wolftrap Elementary School grounds with school facilities located within 50 feet of the centerline.

Overhead Route 04 crosses primarily developed land and open space. The right-of-way follows the W&OD Park corridor from MP 0.2 to MP 4.2, abutting primarily low-to medium-density residential land in Dunn Loring and Vienna. At MP 4.3, the route turns northeast passing through residential neighborhoods before transitioning to commercial mixed-use developments in Tysons.

3.1.5 Existing and Planned Developments

ERM obtained information on planned future developments through publicly-available data on county websites, and consultations with county and city planning officials and other stakeholders. Planned developments located within 0.25 mile of a route are described below, listed in alphabetical order. Unless otherwise noted, information on these planned developments was found in the Tysons 2016-2017 Progress Report on the Implementation of the Comprehensive Plan (Fairfax County, 2017a). These planned developments are also depicted on Figure 3.1.5-1 of Attachment B.

1690 Old Meadow Road

The 1690 Old Meadow Road development is a mixed-use development currently under review located between Dolley Madison Boulevard and Old Meadow Road. The development site currently has a two-story office building located on it, which would be demolished and replaced with a new single office tower with first floor retail. The development is estimated to add over 800 employees to the building. This development is located within 0.25 mile of Overhead Route 03.

7915 Jones Branch Drive

The 7915 Jones Branch Drive development is an approximately 5.8-acre mixed-use development located on the west side of Jones Branch Drive north of the intersection with Westpark Drive. The rezoning application for this site has been approved and the building was listed as under construction in the Tysons 2016-2017 Progress Report. The building will be between five and seven stories, adding up to 400 residential units with retail on the ground level. The rezoning application included on-and off-site park improvements. This development is located within 0.25 mile of Overhead Route 03.

Arbor Row

The Arbor Row Planned Development is an approved development located along Westpark Drive and Tysons Boulevard. The site area is 19.4 acres and is divided into six sections to incorporate office, hotel, residential, and retail space. Aside from adding these buildings, the development of this project will improve Westpark Drive and Westbranch Drive by adding bike lanes and street parking. Building E, a residential building, has been developed and is leasing space. The development is located within 0.25 mile of Overhead Route 03.

Capital One

The Capital One development area is the current site of the Capital One office campus, which has been approved for redevelopment. The development site is located on the east side of I-495 between the highway and Chain Bridge Road (VA 123). The approved development includes the addition of 11 buildings (while maintaining the existing buildings) including a hotel, retail, and residential uses added. Park improvements are also included with on-site parks and small athletic fields. The County recently approved an amendment to the original application which adds a 125,000-square-foot conference and performing arts center, a grocery store, and a proposed increase to building heights. The Capital One development is within 0.25 mile of Overhead Routes 02 and 03.

Anderson Park (The Commons)

Anderson Park is an approved development at the current site of The Commons, a 13 low-rise garden apartment building complex. The redevelopment will replace the existing residential structures with seven new high-rise residential buildings. Building 1 (The Kingston) is currently under construction. The approved plan also includes over nine acres of parkland including a full-size and lit athletic field. Transportation improvements as part of the development include the extension of Colshire Meadow Drive to Anderson Road and improvements to the Old Chain Bridge Road/Anderson Road/Colshire Meadow Drive intersection. As part of the development Anderson Park would be located on the east side of Anderson Road, containing two play areas, two dog parks, and four sports courts. The Anderson Park development is located within 0.25 mile of Overhead Route 02.

The Evolution

The Evolution planned development would be located along Leesburg Pike between Spring Hill Road and Westpark Drive and is currently under review. The site currently contains a seven-story commercial building which would be demolished to make way for 1,400 Workforce Dwelling Units. Current plans include parks and greenspaces as well as the creation of a new road (State Street) as well as the extension of an existing road (Broad Street). The development is located within 0.25 mile of Overhead Route 04.

Dominion Square

Dominion Square has two locations currently under review for development, totaling 19.6 acres in site size. One location is off of Leesburg Pike, near the intersection of Spring Hill Road. The other is also located off of Leesburg Pike, just past the intersection of Spring Hill Road. The proposed development for these sites involves rezoning 12 structures to allow a mix of office buildings, residential, and hotel uses. These sites are currently developed with car dealerships. Additionally, there are transportation improvements proposed, including the extension of Boone Boulevard. Both sites are located within 0.25 mile of Overhead Route 04 and one of the sites is crossed by Overhead Route 04.

The Highland District

The Highland District is an approved 16.7-acre mixed-used development located on either side of Old Meadow Road just north of Scott's Run. The site is currently developed with five office buildings and a surface parking lot. The approved development would remove these buildings and replace them will either five or six new buildings consisting of residential, retail, and office uses. Transportation improvements include improvements to Old Meadow Road and local grid street connections. Eight on-and off-site parks have been proposed as part of the development. This development will add nearly 3,000 residents to the area. The Highland District development is located within 0.25 mile of Overhead Routes 02 and 03.

The Mile

The Mile is a planned 38.8-acre mixed-use development located between Westpark Drive and Jones Branch Road. This development is currently under review and comprises 13 mixed-use buildings slated for office, retail, residential, hotel, and storage use. Discussions about public facilities, recreation areas, building standards, and stormwater management goals are still ongoing for this development. The plans identify the proposed development as accommodating

over 5,000 new residents and 2,500 employees. The development is located within 0.25 mile of Overhead Alternatives 01, 02, and 03.

Scott's Run Station North

Scott's Run Station North is an approved mixed-use development located north of Dolley Madison Boulevard and east of Scott's Crossing Road. The development site is currently an off-street parking area for Metrorail commuters. The development includes high-density, transit-oriented mixed-use development, including offices and residential with first floor retail. Transportation improvements are also included for the realignment of a future toll road ramp. Approved open spaces include a variety of small plazas. The development is located within 0.25 mile of Overhead Routes 02 and 03.

Scott's Run Station South

Scott's Run Station South is an approved mixed-use development located across multiple parcels south of Dolley Madison Boulevard on either side of Colshire Drive. The development consists of higher-density, transit-oriented, mixed-use development, including a hotel, residential and retail uses across 17 multi-story buildings. Transportation improvements are also included in the development plans, as well as on-site parks located both on-grade and on top of buildings. Construction of portions of this development has been completed. The development also includes improvements and restoration to portions of Scott's Run Stream Valley Park. The applicant has committed to constructing an off-site athletic field to be located on Old Meadow Road as well as a new fire station. The fire station will be constructed by 2020. These off-site developments are located adjacent to the Highland District development discussed above. The development is within 0.25 mile of Overhead Routes 02 and 03.

Spring Hill Station

Spring Hill Station is made up of four different project locations, totaling about 24 acres, all of which are approved for development in the Tysons Comprehensive Plan. Two of the sites are located along Tyco Road, just off of Leesburg Pike. The other two are located off of Spring Hill Road, at the intersection with Leesburg Pike. Seventeen buildings are proposed, including uses for office, residential, hotel, neighborhood serving retail, and a new fire station. All of the parcels are located within 0.25 mile of Overhead Routes 01, 02, and 03. Overhead Route 04 crosses one of the parcels and is located within 0.25 of the other land associated with the development.

Sunburst at Spring Hill Metro

Sunburst at Spring Hill Metro is located off of Leesburg Pike, at the intersection with Spring Hill Road. As of 2017, the project was under review in the Tysons Comprehensive Plan. The site area is about 4 acres and is currently developed with a two-story motel and restaurant. Three rezoning options are proposed in the application, two residential buildings and two office buildings, three residential buildings, or two residential buildings and one office building. The proposed project area is crossed by Overhead Route 04.

Towers Crescent

Towers Crescent is an approved development located off of Towers Crescent Drive. The project site is about 18 acres and will add residential space to the project area. Towers Crescent aims

to add three residential towers, which may include ground floor retail. The planned development is crossed by Overhead Route 03.

Tysons Corner Center

Tysons Corner Center is an approved development located along International Drive near the intersection with Tysons Corner Court. The site is about 79 acres in size and will update the area surrounding the mall by adding office, residential, and hotel use to the area. Phase 1 construction, including the Tysons Tower office building, a 28-story residential building, a Hyatt Regency hotel, and existing retail sites, has been completed. It is crossed by Overhead Route 03.

Tysons Overlook

The Tysons Overlook development is a 6.1-acre site approved for an office development. The development is located just east of Jones Branch Drive, west of I-495, and north of Jones Branch Connector. Current approved plans include three options for development, including a single office tower, two office towers, or one office tower and one hotel tower. Plans estimate the developments increasing employees to 1,510 from the current number of 950. Tysons Overlook is crossed by a very small portion the right-of-way of Overhead Route 03 and is within 0.25 mile of Overhead Routes 01 and 02.

Tysons Technology Center

The Tysons Technology Center is an approved development located east of Kidwell Drive and north of Sciences Applications Court. The site is already developed with two office buildings and the approved plan will include the construction of a full-size athletic field. The field will measure 180-feet-wide by 360-feet-deep. Other onsite facilities will include two bleachers, bicycle racks, LED lighting, and a 789-space parking garage to be shared with the existing neighboring office buildings. The field is planned to be open between 8 a.m. and 11 p.m. Tysons land use plan recommends one full-size athletic field for every 4.5 million square feet of new development. The field will meet the athletic needs created by The Boro and Westpark Plaza. Construction and an opening date will depend on construction progress of these two other developments. Overhead Route 03 crosses a small portion of the planned development.

Tysons West Promenade

Tysons West Promenade is an approved development located off of Westwood Center Drive, near the intersection of Cornerside Boulevard. The site spans over 16 acres, and is currently developed. The proposal for redevelopment will add three buildings, with residential and office uses and ground floor retail. The existing buildings, a hotel/conference center and a retail space, will not be modified. It is located within 0.25 mile of Overhead Route 03 and Overhead Route 04.

The View

The View is mixed-use development currently under review located at the corner of Leesburg Pike and Spring Hill Road. The development site currently is occupied by a low-rise office building and car dealerships with service areas. The planned development proposes five buildings including a 615-foot tall tower which will have a hotel, retail, and condos. The remaining buildings will house a performing arts center, residential, retail, office space, and a

civic plaza. The development is crossed by Overhead Route 04 and within 0.25 mile of Overhead Routes 01, 02, and 03.

3.1.6 Land Use Planning and Zoning

The Code requires every governing body within the state to adopt a plan, called a Comprehensive Plan, to provide guidance for land planning decisions within the territory of its jurisdiction. The Comprehensive Plan identifies and describes the location, character, and extent of existing, proposed, or anticipated land uses, and identifies facilities (e.g., roads, housing, utilities, an libraries) needed to serve current and future residents. Zoning, which is a power granted to governing bodies to regulate land uses, is a tool used by land managers to implement the objectives of the Comprehensive Plan by defining standards for development and permissible uses within different land use categories. Comprehensive Plans are updated every five years to make adjustments for actual or projected changes in land use conditions or needs. Zoning ordinances may be modified by land managers or governing bodies or through requests from residents or businesses to change zoning designations or approve new uses.

Fairfax County has adopted a Comprehensive Plan, Policy Plan, and Zoning Ordinance which guides land use planning and development in the County. ERM obtained GIS data sets for zoning districts from Fairfax County. The Comprehensive Plan is required by state law to be used as a guide in decision-making about the built and natural environment by Fairfax County's Board of Supervisors and other agencies, such as the Planning Commission. The Plan consists of several components. The Policy Plan outlines the objectives, policies, and guidelines to guide planning and development review considerations toward implementing Fairfax County goals. The goals address the future development pattern of Fairfax County, and protection of natural and cultural resources for present and future generations. The four Area Plans (Area I, Area II, Area III, and Area IV) identify key elements for implementing the Policy Plan's goals and objectives at the more detailed Planning District and Community Planning Sector levels.

Because Fairfax County encompasses over 400 square miles with over one million residents living in several densely population urban centers and suburban communities, the Comprehensive Plan and Policy Plan are structured to provide policy direction both broadly and discretely using subcomponent Area Plans, Planning Districts, Community Planning Sectors and Special Planning Areas. Area Plans contain detailed recommendations for land use, transportation, housing, the environment, heritage resources, public facilities and parks and recreation. These recommendations refine the guidance provided in the Policy Plan and were developed within the framework of the County's Concept for Future Development. Each Area Plan is subdivided into Planning Districts, which, in turn, are subdivided into Community Planning Sectors, the smallest geographical components of the Plan.

The Zoning Ordinance of Fairfax County, Virginia, regulates zoning in Fairfax County. It is intended to promote the health, safety and general welfare of the public and to implement the adopted Comprehensive Plan for the orderly and controlled development of the County. It is administered by the Fairfax County Department of Planning & Zoning. The Zoning Ordinance establishes zoning districts separating residential, commercial, and industrial land uses. Each of these broad land use designations contain specific zoning districts that reflect the existing or desired intensity of use or residential density for a given district. The Residential District regulations, for example, encompass a wide variety of residential districts that span low-density rural agricultural districts to residential districts containing 30 dwelling units per acre. Similarly, the Commercial District regulations differentiate commercial development intensity from low-rise offices to large-scale regional retail centers. Figure 3.1.6-1 in Attachment B shows the zoning categories within the study area. To simplify the descriptions of zoning districts crossed by the

routes, the broadest zoning district groups described in the Zoning Ordinance are used: Residential, Commercial, Planned Units, and Industrial.

Overhead Route 01 crosses land predominantly zoned as Residential. From Idylwood Substation, the route crosses Residential land for the first 0.5 mile. After crossing I-66, the route crosses about 0.1 mile of land zoned as Planned Units. Continuing northeast the route then covers another 0.5 mile of Residential land. The approximately 0.3-mile crossing of the interchange of I-66 and Leesburg Pike (VA-7) is not classified by a zoning category by the County. After completing this highway crossing, the route continues northeast for 0.6 mile across Residential land, 0.4 mile of uncategorized land associated with VA 267 crossing, and another 6.8 miles of Residential land with a few small unclassified gaps associated with Great Falls Street, Westmoreland Street, Old Chesterbrook Road, and Old Dominion Drive. Heading southwest, the route then crosses about 0.1 mile of uncategorized land associated with the I-495 crossing, 0.3 mile of Residential land, and less than 0.1 mile of unclassified land associated with the crossing on Georgetown Pike. Continuing southwest, the route crosses about 0.2 mile of Planned Units land, and 0.5 mile of Residential land before crossing less than 0.1 mile of unclassified land associated with Old Dominion Drive. The route then continues on the west side of I-495, crossing another 1.0 mile of Residential land before turning west and crossing another 0.6 mile of Residential land. The route then crosses less than 0.1 mile of uncategorized land associated with VA 267, less than 0.1 mile of residential land, and less than 0.1 mile of Planned Units land. The route then crosses 0.4 mile of Residential land, and heads south across the VA 267 for 0.1 mile of unclassified land. Heading south into the Tysons Substation, the route then crosses less than 0.1 mile of Industrial land, 0.1 mile of Commercial land, and ends on a parcel zoned as Industrial.

Overhead Route 02 crosses land predominantly zoned as Residential and uncategorized land associated with road rights-of-way. From Idylwood Substation, the route crosses Residential land for the first 0.5 mile. After crossing I-66, the route crosses about 0.1 mile of land zoned as Planned Units. Continuing northeast, the route then then covers another 0.5 mile of Residential land. The approximately 0.3-mile crossing of the interchange of I-66 and Leesburg Pike (VA-7) is not classified by a zoning category by the County. After completing this highway crossing, the route continues northeast for 0.6 mile across Residential land. The route then follows the west side of VA 267 and is located within the uncategorized road right-of-way for 2.1 miles. The route crosses the I-495 and VA 267 interchange and continues on land zoned as Residential for another 1.0 mile with a small (less than 0.1 mile) crossing of Commercial land. After crossing less than 0.1 mile of uncategorized land associated with VA 267, less than 0.1 mile of land zoned as residential, and less than 0.1 mile of land zoned as Planned Units, the route continues west for 0.4 mile of Residential land, and heads south across VA 267 for 0.1 mile of unclassified land. Heading south into the Tysons Substation, the route then crosses less than 0.1 mile of Industrial land, 0.1 mile of Commercial land, and ends on a parcel zoned as Industrial.

Overhead Route 03 crosses land predominantly zoned as Residential and uncategorized land associated with road rights-of-way. From Idylwood Substation, the route crosses Residential land for the first 1.0 mile. The route then crosses Idylwood Road (SR 695) and predominantly stays within the uncategorized I-495 road right-of-way for the next 0.4 mile, with short crossings of Planned Units and Residential land scattered throughout. Back on the east side of I-495, the route crosses about 0.2 mile of Planned Units land, 0.1 mile of I-495 road right-of-way, another 0.1 mile of Planned Units land on the west side of the highway before making another less than 0.1 mile highway crossing. The route crosses about 0.2 mile of Commercial land on the east side of the highway, another 0.1 mile highway crossing, and less than 0.1 mile of Industrial land on the west side of I-495. Continuing north, the route then stays within the uncategorized road

right-of-way for another 0.4 mile before crossing 0.3 mile of Planned Units land, and another 0.4 mile of uncategorized land associated with the I-495 and VA 123 interchange. For the next 0.5 mile, the route jumps in and out of Commercial and uncategorized land. Before crossing the VA 267, the route crosses 0.1 mile of Residential land and 0.1 mile of Commercial land. Heading north and then west, the route crosses about 0.7 mile of Residential land. After crossing less than 0.1 mile of uncategorized land associated with VA 267, less than 0.1 mile of land zoned as residential, and less than 0.1 mile of land zoned as Planned Units, the route continues west for 0.4 mile of Residential land, and heads south across the VA 267for 0.1 mile of unclassified land. Heading south into the Tysons Substation, the route then crosses less than 0.1 mile of Industrial land, 0.1 mile of Commercial land, and ends on a parcel zoned as Industrial.

Overhead Route 04 crosses land predominantly zoned as Residential and Commercial. From Idylwood Substation, the route crosses Residential land for the first approximately 4.3 miles. The route then heads north and crosses about 0.1 mile of land classified as Other. The route continues to head north, crossing 1.7 miles of Residential land. The route then crosses Old Courthouse Road for less than 0.1 mile of uncategorized land. The route continues heading north, crossing approximately 0.7 mile of Residential land before crossing Leesburg Pike and Spring Hill Road for less than 0.1 mile of unclassified land. The route then crosses about 0.1 mile of Industrial land, before crossing another 0.1 mile of Other land, then crosses Tyco Road for less than 0.1 mile of uncategorized land. Heading northeast into the Tysons Substation, the route then crosses less than 0.1 mile of land zoned as Commercial, and ends on a parcel zoned as Residential.

ERM reviewed Fairfax County zoning ordinances and Comprehensive Plans for Fairfax County to identify potential conflicts with zoning and the proposed Project. As indicated below, Fairfax County requires a special exception for certain utilities, but exempts transmission lines approved by the Virginia State Corporation Commission pursuant to Va. Code § 56-46.1 F.

Select land use classifications and zoning districts nonetheless were considered routing constraints in this study due to the potential for a transmission line to conflict with existing or planned land uses. These include areas zoned or planned for residential developments or areas designated for preservation as parkland or open space.

3.1.7 Conservation Easements

The Virginia Open-Space Land Act provides for the creation of open-space easements by public bodies as a means of preserving open space or significant natural, cultural, and recreational resources on public or private lands. Most easements created under the Act are held by the Virginia Outdoors Foundation (VOF), but any state agency is authorized to create and hold an open-space easement. The Virginia Conservation Easement Act similarly provides for the creation of conservation easements on public or private lands but under the auspices of charitable organizations (such as conservation trusts) rather than public agencies. In both cases, easements are designed to preserve and protect open space or other resources in perpetuity. Easements negotiated with private landowners allow the lands to remain in private ownership but with protections imposed to limit or restrict land uses on the property. Figure 3.1.7-1 in Attachment B shows conservation easements located within 0.25 mile of the Overhead Routes.

Virginia Outdoors Foundation

The VOF is Virginia's leader in land conservation, protecting over 675,000 acres across the state. The VOF was created under the Virginia Open-Space Land Act, which provides for the creation of open-space easements by public bodies as a means of preserving open space or significant natural, cultural, and recreational resources on public or private lands. Most easements created under the Act are held by the VOF, but any state agency is authorized to create and hold an open-space easement (VOF, 2015). There are currently no VOF easements that would be crossed by any of the routes. The closest VOF easement is located about 1.0 mile east of Overhead Route 01.

Northern Virginia Conservation Trust

The Northern Virginia Conservation Trust (NVCT) is a nonprofit organization that helps permanently conserve land by working with landowners who voluntarily agree to legal restrictions to conserve their lands. The NVCT follows the national standards and practices of the Land Trust Alliance and is accredited by the Land Trust Accreditation Commission. The NVCT was founded in 1994 and has preserved almost 600 acres in Northern Virginia through easements and land acquisition. There is only one NVCT easement that would be crossed by any of the routes and it is associated with Ruckstuhl Park. This area would be crossed by Overhead Routes 01 and 02.

Agricultural and Forestal Districts

The Virginia Agricultural and Forestal Districts Act provides for the creation of conservation districts (Commonwealth of Virginia, 1997). These districts are designed to conserve, protect, and encourage the development and improvement of a locality's agricultural and forested lands for the production of food and other products, while also conserving and protecting land as valued natural and ecological resources. These districts are voluntary agreements between landowners and the locality, and offer benefits to landowners when they agree to keep their land in its current use for between 4 and 10 years. A district must contain at least 200 acres. Fairfax County has developed Agricultural and Forestal Districts (Fairfax County, 2015b); however, none would be crossed by any of the routes.

Fairfax County Easements

ERM obtained publically available information from Fairfax County on various easement types located within the Project area. The Fairfax County Open Space/Historic Preservation Easement Program allows property owners to protect open space, historic resources, scenic vistas, and sensitive natural areas on their property, allowing these resources to stay in private ownership. Fairfax County has entered into a public-private partnership with the Northern Virginia Conservation Trust, a private non-profit land trust also eligible for holding easements. This partnership does not prevent property owners from putting easements on their properties from other qualified easement holding entities such as county or regional authorities and agencies, as well as local, state, or national non-profit land trusts.

The Fairfax County easement data included a variety of easement types that were not specific to standard conservation easements. Fairfax County Planning Department indicated that it would be necessary to review the individual deeds associated with the easements to determine what restrictions may apply. Dominion Energy Virginia is in the process of reviewing the deeds for all parcels crossed that have Fairfax County easements on them to determine whether any

restrictions exist on that parcel. In addition to conservation easements, the following easement types have been identified:

- Stormwater conservation/Stormwater Management Access;
- Floodplain and Storm Drainage;
- Detention Pond Access;
- Floodplain;
- Building Restriction;
- Storm Drainage;
- Storm Sewer;
- Natural Drainage Easement;
- Pedestrian Bridge;
- Sight Distance;
- Signal Equipment; and
- Restrictive Planting.

Dominion Energy Virginia will continue to work with the Fairfax County to determine what, if any, restrictions apply to these various types of easements.

3.1.8 Other Conservation Lands

ERM obtained information on other conservation lands through review of a digital dataset obtained from the Virginia Department of Conservation and Recreation (VDCR). The dataset identifies "lands of conservation and recreational interest" in Virginia, including federal, state, local, and privately-owned lands. The majority of the VDCR conservation areas that are located in the Project area are associated with Fairfax County parks, which are discussed in more detail in Section 3.1.2. Table 3.1.8-1 and Figure 3.1.8-1 in Attachment B show these areas and which routes cross any of the lands.

TABLE 3.1.8-1

Idylwood-Tysons 230 kV Underground Transmission Line Project
Other Conservation Lands Crossed by the Overhead Routes

Conservation Area	Routes Crossed
W&OD Trail	All Overhead Routes
Ruckstuhl Park	Overhead Routes 01 and 02
Kent Gardens Greenway Stream Valley	Overhead Route 01
Pimmit Run Stream Valley Park	Overhead Route 01
Kent Gardens City Park	Overhead Route 01
George Washington Memorial Parkway	Overhead Route 01
Langley Oaks City Park	Overhead Route 01
Scott's Run Nature Preserve	Overhead Route 01
Scott's Run Stream Valley Park	Overhead Route 01
Timberly City Park	Overhead Route 01
McLean Hamlet Park	Overhead Routes 01,02, and 03
NOVA Parcel Park	Overhead Routes 01 and 02

3.1.9 Transportation

3.1.9.1 Virginia Department of Transportation Regulations

All routes presented in this report require crossings of rights-of-way under VDOT jurisdiction. The VDOT rights-of-way crossed are limited access highways which VDOT defines as: a highway especially designed for through traffic over which abutters have no easement or right of light, air, or access by reason of the fact that their property abuts upon such limited access highway. Typically limited access highways are separated from abutting property by sound barriers and/or treed buffers, and are accessed through ramps to accommodate high volume through traffic. Limited access highways are regulated under the General Rules and Regulations of the Commonwealth Transportation Board (24 VAC 30-151-760).

The Rules and Regulations provide that no work shall be performed on real property under the ownership, control, or jurisdiction of VDOT until written permission has been obtained from VDOT. Real property includes, but is not limited to, the right-of-way of any highway in the state highways system. Written permission is granted either by permit or a state-authorized contract let by VDOT.

Utility construction is regulated specifically in Rules in Regulation in *24 VAC 30-151-310 - Utility installations within limited access highways.* The provisions of this section are provided below and have been used to produce viable routing options for the Project.

24 VAC 30-151-310. Utility installations within limited access highways.

Utility installations on all limited access highways shall comply with the following provisions:

1. Requests for all utility installations within limited access right-of-way shall be reviewed and, if appropriate, be approved by the Commonwealth Transportation Commissioner prior to permit issuance. *(Authority delegated by the Commissioner to the Chief Engineer)*

2. New utilities will not be permitted to be installed parallel to the roadway longitudinally within the controlled or limited access right-of-way lines of any highway, except that in special cases or under resource sharing agreements such installations may be permitted under strictly controlled conditions and then only with approval from the Commonwealth Transportation Commissioner. *(Authority delegated by the Commissioner to the Chief Engineer)* However, in each such case the utility owner must show the following:

    a. That the installation will not adversely affect the safety, design, construction, operation, maintenance or stability of the highway.

    b. That the accommodation will not interfere with or impair the present use or future expansion of the highway.

    c. That any alternative location would be contrary to the public interest. This determination would include an evaluation of the direct and indirect environmental and economic effects that would result from the disapproval of the use of such right-of-way for the accommodation of such utility.

d. In no case will parallel installations within limited access right-of-way be permitted that involve tree removal or severe tree trimming.

3. Overhead and underground utilities may be installed within limited access right-of-way by a utility company under an agreement that provides for a shared resource arrangement subject to VDOT's need for the shared resource.

4. All authorized longitudinal utility installations within limited access right-of-way, excluding communication tower facilities, shall be located in a utility area established along the outer edge of the right-of-way. Special exceptions must be approved by the Commonwealth Transportation Commissioner. *(Authority delegated by the Commissioner to the Chief Engineer)*

5. Authorized overhead utility installations within limited access right-of-way shall maintain a minimum of 21 feet of vertical clearance.

6. Authorized underground utility installations within limited access right-of-way shall have a minimum of 36 inches of cover.

7. Service connections to adjacent properties shall not be permitted from authorized utility installations within limited access right-of-way.

8. Overhead crossings shall be located on a line that is perpendicular to the highway alignment.

9. A utility access control line will be established between the proposed utility installation, the through lanes, and ramps.

The Commonwealth Transportation Board (CTB) regulates and funds transportation projects in Virginia. The CTB is a 17-member board appointed by the governor and oversees all VDOT projects. CTB has authority over routing transportation infrastructure, making traffic regulations, and administering funds in the Transportation Trust Fund. The Transform I-66 Outside the Beltway project is an example of a major CTB project that is underway within the study area. A discussion of planned transportation projects is provided in Section 3.1.9.3.

3.1.9.2 Metropolitan Washington Airports Authority

Overhead Routes 01, 02, and 03 cross the Dulles Toll Road, which is operated by MWAA. MWAA is a public body, created with the consent of Congress by the District of Columbia Regional Airports Authority Act of 1985, as amended, and Va. Code §§ 5.1-152 to 5.1-178, as amended. The purpose of this entity is to plan, provide and actively manage access to the aviation system serving the region. MWAA is governed by a 17-member Board of Directors. The Board establishes policy and provides direction for management. Members of the Board are appointed by the Governors of Virginia and Maryland, the Mayor of Washington, D.C., and the President of the United States.

The Dulles Toll Road (Virginia Route 267) is an eight-lane, 14-mile highway in Northern Virginia. The eastern end of the Dulles Toll Road directly connects to the Capital Beltway (I-495) and connects to I-66 via the Dulles Connector Road (east of the Capital Beltway). The Toll Road is located in the Dulles Corridor, which also carries the Dulles Toll Road and is the location of the Dulles Corridor Metrorail Project.

The Dulles Toll Road is located within the VA 267 VDOT right-of-way. Utility construction is thereby regulated by the provisions of *24 VAC 30-151-310 - Utility installations within limited access highways,* as referenced above.

3.1.9.3 Planned Transportation Projects

ERM reviewed the Tysons 2016-2017 Progress Report on the Implementation of the Comprehensive Plan as well as Fairfax County Department of Transportation Capital Projects data to determine if there were any planned transportation projects within the study area. A description of the projects identified is provided in Table 3.1.9.3-1.

TABLE 3.1.9.3-1

Idylwood-Tysons 230 kV Underground Transmission Line Project
Transportation Projects within 0.25 mile of Overhead Routes

Project Name	Scope	Status	Nearby Route(s)
Georgetown Pike and Route 123	Upgrade existing pedestrian ramps and crosswalk at Georgetown Pike and Dolley Madison Boulevard and install walkway to Clemyjontri Park	Project Initiation	Overhead 01
I-495 Express Lanes Ped/Bike at Chain Bridge Road	Both sides from Old Meadow Road to Tysons Boulevard	Design	Crossed by Overhead 03
I-495 Express Lanes Ped/Bike at Idylwood Road (North)	North side from I-495 to Shreve Hill Road	On Hold	Near Overhead 03, 04
I-495 Express Lanes Ped/Bike at Idylwood Road (South)	South side from I-495 to Whitestone Hill Court	On Hold	Near Overhead 03
I-66 Inside the Beltway Tolling from I-495 (Capital Beltway) to U.S. Route in Rosslyn	Convert I-66 inside the Beltway into a managed express lane facility in peak directions	Construction	Crossed by all Overhead Routes
Idylwood Road Trail (TMSAMS)	Construct shared use path from Helena Drive to Idyl Lane on the south side of Idylwood Road	Project Initiation	Near Overhead 01, 02
Jones Branch Connector	Final Design for extension of Scotts Crossing Rd from Jones Branch Drive to Dolley Madison Blvd. over I-495 and the I-495 Express Lanes	Construction	Near Overhead 02, Crossed by Overhead 03
Lewinsville Road and Spring Hill Road	Partial funding for alternatives analysis to improve traffic flow and add pedestrian crosswalks	Project Initiation	Near Overhead 01, 02, and 03
Pavement Marking Plans (TMSAMS)	Install bike lanes on Margarity Road, Westmoreland Street, Madrillon Road through repavement projects	Design	Crossed by Overhead 02, near Overhead 03
Route 7 Widening from Route 123 to I-495 (Study Only)	Conceptual Design and traffic operations study to determine future cross section	Study	Crossed by Overhead 03
Vesper Court Trail (TMSAMS)	Trail from Vesper Court to Route 7 at Spring Hill Road	Design	Crossed by Overhead 04

3.1.9.4 Silver Line and Orange Line

The Silver Line, under construction by the WMATA, is a 23-mile Metrorail extension connecting the Tysons, Reston, Herndon, and Dulles Airport areas of Fairfax County to the regional Metrorail system. There are four new Silver Line stations located in the Project area: Spring Hill, Greensboro, Tysons, and McLean. The Silver Line is a multi-phased project that incorporates a number of transportation improvements and station-area planning, including pedestrian bridges and paths, bus drop-off/pickup, parking, and bicycle facilities. Overhead Route 04 crosses the Silver Line near MP 6.8 just southeast of the Spring Hill Station.

The portion of the Orange Line, an overhead Metrorail line, in the Project area is located in the center of I-66. The Orange Line is crossed by all Overhead Routes.

3.1.9.5 Road Crossings

ERM identified 57 road crossings along Overhead Route 01, of which 23 crossing are of county or local roads and 34 are of state routes/highways or U.S. highways, including on and off ramps. From Idylwood Substation to Tysons Substation these road crossings are: Shreve Road (SR 703), Virginia Lane, Virginia Avenue, I-66 East, I-66 West, Leighton Drive, Barbour Road, I-66 West Exit 64 on-ramp, I-66 East Exit 69 on-ramp, I-66 West Exit 66 A off-ramp, Leesburg Pike Road (VA 7) North, Leesburg Pike Road (VA 7) South, private road (West Falls Church Metrorail Yard), Dulles Toll Road (VA 267) East, Dulles Toll Road (VA 267) West, Idylwood Road (SR 695), Great Falls Street (SR 694), Westmoreland Street (SR 693), Somerville Drive, Old Chesterbrook Road, Old Dominion Drive (VA 309), private road crossings associated with The Potomac School, Potomac School Road, Evermay Drive, Long Meadow Road, Stoneham Lane, Chain Bridge Road (VA 123) East off-ramp, Chain Bridge Road (VA 123) East, Chain Bridge Road (VA 123) West, Georgetown Pike (SR 193) South, Georgetown Pike (SR 193) North, Georgetown Pike (SR 193) North on-ramp, unnamed road, eight private roads associated with Langley, Colonial Farm Road, Live Oak Drive, I-495 North, I-495 South, I-495 Exit 44 ramp, Georgetown Pike (VA 193), Old Dominion Drive (SR-738), Lewinsville Road (SR 694), Spring Hill Road (SR 684), Dulles Toll Road (VA 267) West on ramp, Dulles Toll Road (VA 267) West off ramp, Dulles Toll Road (VA 267) West, Dulles Toll Road (VA 267) East, Dulles Toll Road (VA 267) East on ramp, and Dulles Toll Road (VA 267) East off ramp.

ERM identified 44 road crossings along Overhead Route 02, of which 5 crossings are of county or local roads and 39 are of state routes/highways or U.S. highways including, on and off ramps. From Idylwood Substation to the Tysons Substation, these road crossings are: Shreve Road (SR 703), Virginia Lane, Virginia Avenue, I-66 East, I-66 West, Leighton Drive West, Leighton Drive, Barbour Road, I-66 West Exit 64 on-ramp, I-66 East Exit 69 on-ramp, I-66 West Exit 66 A off-ramp, Leesburg Pike Road (VA 7) North, Leesburg Pike Road (VA 7) South, private road (West Falls Church Metrorail Yard), Idylwood Road (SR-695), Dulles Toll Road (VA 267) East, Dulles Toll Road (VA 267) West, Magarity Road (CR-650), Dulles Toll Road (VA 267) West off-ramp, Dulles Toll Road (VA 267) West, Dulles Toll Road (VA 267) East, Chain Bridge Road (VA 123), Dulles Toll Road (VA 267) East Exit 19 B on-ramp, Dulles Toll Road (VA 267) East Exit 19 B off-ramp (two crossings), Dolley Madison Boulevard (VA 123) North, Dolley Madison Boulevard (VA 123) South, Dulles Toll Road (VA 267) East Exit 19 A off-ramp, Dulles Toll Road (VA 267) East Exit 19 A on-ramp, I-495 North on-ramp, I-495 North, Dulles Roll Road (VA 267) on-ramp, I-495 South off-ramp, I-495 South, I-495 South on-ramp, Dulles Roll Road (VA 267) off-ramps, Dulles Toll Road (VA 267) East, Dulles Toll Road (VA 267) West, Dulles Toll Road (VA 267) West off ramps, Spring Hill Road (SR 684), Dulles Toll Road (VA 267) West on ramp, Dulles Toll Road (VA 267) West, Dulles Toll Road (VA 267) East, and Dulles Toll Road (VA 267) East off-ramp.

ERM identified 47 road crossings along Overhead Route 03, of which 5 crossings are of county or local roads and 42 are of state routes/highways or U.S. highways, including on and off ramps. From Idylwood Substation to the Tysons Substation, these road crossings are: Shreve Road (SR 703), I-66 East, I-66 West, I-66 West Exit 64 off ramp, I-495 North, I-495 South, I-495 South Exit 49 Off-Ramp, I-495 South, I-495 North, Idylwood Road (SR 695), I-495 North, I-495 South, Oak Street, I-495 South, I-495 North, I-495 North, I-495 South, I-495 South, I-495 North, I-495 North, I-495 South, I-495 South Exit 47 B on ramp, I-495 South Exit 47 B off ramp, Leesburg Pike (VA 7) North, Leesburg Pike (VA 7) South, I-495 South Exit 47 A on ramp, I-495 South Exit 47 A off ramp, Ring Road, Tysons One Place, I-495 South Exit 46 B on ramp, I-495 South Exit 46 B off ramp, Westpark Drive, Chain Bridge Road (VA 123), I-495 South Exit 46 A off ramp, I-495 South Exit 46 A on ramp, Scotts Crossing Road, I-495 South ramps, Dulles Access Road

(VA 267) West, Dulles Access Road (VA 267) East, Dulles Toll Road (VA 267) West, Dulles Toll Road (VA 267) East, Spring Hill Road (SR 684), Dulles Toll Road (VA 267) West Exit 16 on ramp, Dulles Toll Road (VA 267) West, Dulles Toll Road (VA 267) East, and Dulles Toll Road (VA 267) East Exit 17 off ramp.

ERM identified 30 road crossings along Overhead Route 04, of which 15 are of county or local roads and 15 are of state routes/highways or U.S. highways, including on and off ramps. From the tie in at the Idylwood Substation to the Tysons Substation, these road crossings are: Shreve Road (SR 703), I-66 East, I-66 West, I-66 West Exit 64 off ramp, I-495 North, I-495 South, I-495 South Exit 49 Off-Ramp, Sandburg Street, Gallows Road (SR 650), Cedar Lane (SR 698), Park Street Southeast, Maple Avenue East, Church Street Northeast, Ayr Hill Avenue Northeast, McKinley Street Northeast, Beulah Road (SR 675), Talisman Drive, Foxstone Drive, Crossing Creek Road Northeast, Devonshire Drive Northeast, Overlook Lane Northeast, Old Courthouse Road (SR 677), Burning Tree Drive, Westwood Drive, Thunderbird Court, Higdon Drive, Vesper Street, Leesburg Pike (VA 7) North, Leesburg Pike (VA 7) South, Spring Hill Road (SR 684), and Tyco Road (SR 3880).

3.2 ENVIRONMENTAL CONSTRAINTS

ERM utilized several desktop data sources to map wetlands and waterbodies within the right-of-way corridors. These sources included USGS 7.5 minute series topographic quadrangle maps, National Wetlands Inventory maps obtained from the U.S. Fish and Wildlife Service (FWS), soils data from the Natural Resources Conservation Service Web Soil Survey, recent aerial photography, and National Hydrography Dataset stream layers. ERM did not conduct an onsite wetland delineation of wetlands or waterbodies within the study area.

3.2.1 Wetlands

A quantification of the various wetlands types crossed by each of the routes is provided in the Environmental Features Comparison Table included as Table 4-1. In addition, an overview map set illustrating the location of National Wetlands Inventory wetlands is included on Figure 3.2.1-1 in Attachment B.

Wetlands along the Overhead Route 01 are predominantly Palustrine Emergent (PEM). Wetlands crossed by the route include Palustrine Forested (PFO) and PEM wetlands scattered along the eastern portion of the route surrounding Pimmet Run. As the route moves westward, it crosses a smaller PFO wetlands including one surrounding Dead Run.

Overhead Route 02 crosses one PFO wetland just to the east of the Dulles Access Road (VA 267) and I-495 along Scott's Run.

One wetland was identified along Overhead Route 03. This ponded wetland is located just south of the Dulles Toll Road and northeast of Jones Branch Drive.

Overhead Route 04 crosses a small forested/scrub wetland within Northside Park along Piney Branch. The route then crosses two larger forested/scrub wetland complexes, one within Foxstone Park along Wolftrap Creek and a second in the Old Courthouse Spring Branch Stream Valley Park along Old Courthouse Spring Branch.

3.2.2 Waterbodies

ERM identified and mapped waterbodies in the study area using publicly-available GIS databases, USGS topographic maps (1:24,000), and recent digital aerial photography. The overhead routes cross perennial and intermittent waterbodies (rivers, streams, tributaries). No navigable waterbodies would be crossed by any of the routes.

A general location map that illustrates waterbodies that are crossed by the various routes is included as Figure 3.2.1-1 in Attachment B. Although these streams would not require a Rivers and Harbors Act Section 10 authorization, activities within and over subaqueous lands of Virginia require a permit from the Virginia Marine Resources Commission pursuant to Va. Code § 28.2-1205.

Overhead Route 01 crosses a variety of intermittent and perennial waterbodies including: 21 crossings of Pimmet Run, one crossing of Burke's Spring Branch, one crossing of Turkey Run, one crossing of Dead Run, and one crossing of Scott's Run. The largest waterbody crossing along the route is an unnamed pond located just west of the I-495 near MP 10.6 with a crossing width of about 125 feet.

Overhead Route 02 crosses a variety of intermittent and perennial waterbodies including: one crossing of Scott's Run, one crossing of Pimmet Run, and multiple crossings of tributaries to Pimmet Run and Scott's Run. The largest waterbody crossing along the route is Pimmet Run located just west of the VA 267 with a crossing width of about 50 feet.

Overhead Route 03 crosses under a variety of intermittent and perennial waterbodies including: two crossings of Holmes Run and multiple crossings of tributaries to Scott's Run. Crossing widths are expected to be minimal (approximately 5 feet) and are not visible on aerial photography.

Overhead Route 04 crosses a variety of intermittent and perennial waterbodies including: Holmes Run, Long Branch, Piney Branch, multiple crossings of Wolftrap Creek, and Old Courthouse Spring Branch. The largest waterbody crossing along the route is located where the route makes multiple crossings of Wolftrap Creek between MPs 5.2 and 5.4. The largest span is about 120 feet.

3.2.3 Resource Protection Areas

The Chesapeake Bay Preservation Act (CBPA) (Va. Code § 62.1-44.15:67 *et seq.*) establishes a program to protect and improve the quality of water of the Chesapeake Bay (Va. Code § 62.1-44.15:72 and 9 VAC 25-830-10 *et seq.*). The focus of the CBPA is to protect sensitive land areas that are adjacent to tributaries of the bay and its tributaries. Areas protected under the CBPA and designated as Resource Protection Areas (RPA) by localities are sensitive lands at or near the shoreline that have an intrinsic water quality value due to the ecological and biological processes they perform (see Va. Code §§ 62.1-44.15:68 and 62.1-195.1). RPA components include tidal wetlands, tidal shores, non-tidal wetlands connected by surface flow and contiguous to tidal wetlands or tributary streams, waterbodies with perennial flow, and a minimum 100-foot buffer landward of the other RPA components.

Fairfax County Board of Supervisors enacted a Chesapeake Bay Preservation Ordinance (Fairfax County Virginia, 1993), which regulates the kind of development that is allowed to occur in certain areas. In Fairfax County, Resource Management Areas are all areas in the County

that are not classified as RPAs. Collectively, RPAs and Resource Management Areas are Chesapeake Bay Preservation Areas and development must follow certain restrictions. Activities or facilities prohibited in RPAs include but are not limited to new developments, parking lots, filing and grading, and clearing trees. Activities or facilities permitted in RPAs (with county approval) include but are not limited to water dependent facilities (e.g., docks), replacement of existing structures to the original footprint, water wells, boardwalks or trails, public utility structures, railroads, transmission lines, flood control, stormwater management control, roads, and driveways that meet certain conditions.

ERM obtained information on RPAs in the study area from the Fairfax County Department of Information Technology (Fairfax County Virginia, 2017b). The RPAs identified in the Project area are located along Holmes Run, Pimmit Run, Wolftrap Creek, Piney Branch, Old Courthouse Spring Branch, Scott's Run, Dead Run, Turkey Run and their tributaries (Figure 3.2.3-1 in Attachment B).

Electric transmission lines that are constructed, installed, and operated in accordance with the Erosion and Sediment Control Law and Stormwater Management Act (Va. Code § 62.1-44.15:51 *et seq.* and § 62.1-44.15:24 *et seq.*), and Chapters 104 and 124 of the County Code, or an erosion and sediment control plan and stormwater management plan approved by the Office of Stormwater Quality, are exempt from the provisions of the Chesapeake Bay Preservation Ordinance. Nonetheless, RPAs were identified as constraints in this study given the potential for new facilities to impact these areas (e.g., as a result of tree clearing or filling to support tower structures in wetlands).

3.2.4 Areas of Ecological Significance

ERM reviewed the VDCR's Natural Heritage Data Explorer (NHDE) to identify areas of ecological significance within the Project area (VDCR, 2017a). As described below, the NDHE includes three components: Conservation Sites (CSs), Stream Conservation Units (SCUs), and General Location Areas for Natural Heritage Resources (GLNHRs).

1. CSs identify a planning boundary delineating the Natural Heritage Program's (NHP) best determination of the land and water area occupied by one or more natural heritage resources (exemplary natural communities and rare species) and are necessary to maintain ecological processes that will facilitate their long-term survival. The size and dimensions of a CS are based on the habitat requirements of the natural heritage resources present and the physical features of the surrounding landscape. Features taken into consideration include hydrology, slope, aspect, vegetation structure, current land uses, and potential threats from invasive species. CSs do not necessarily preclude human activities, but a site's viability may be greatly influenced by human activities. CSs may require ecological management, such as invasive species control or water management, in order to maintain or enhance their viability. Each CS is given a biodiversity significance ranking based on rarity, quality, and number of natural heritage resources it contains.

2. SCUs identify stream reaches that contain aquatic natural heritage resources, including upstream and downstream buffers and tributaries associated with the reach. SCUs are given a biodiversity significance ranking based on the rarity, quality, and number of natural heritage resources they contain. SCUs can be used to identify land management needs and protection priorities.

3. GLNHRs represent the approximate locations of documented natural heritage resource occurrences that were not incorporated into CSs, either because they are poor quality, their location was not precisely identified, or they have not been verified in over 20 years. These approximate locations, marked with a one-mile-diameter circle, are included in the initial review because they indicate areas with relatively high potential for natural heritage resource occurrences to be documented. Depending on the apparent suitability of local habitat, VDCR may recommend biological surveys when reviewing projects that intersect these locations.

The VDCR NDHE identified one CS (Potomac Gorge), one SCU (Potomac River-Yellow Falls), and six unnamed GLNHRs in the Project area. The Potomac Gorge CS is ranked B1, indicating outstanding significance, and the Potomac River-Yellow Falls SCU is ranked B3, indicating high significance. The GLNHRs are not given a biodiversity rank.

The Potomac Gorge CS is located in Fairfax County along the Potomac River. It is an entrenched, fall-line river valley, hardwood-dominated forest. The Potomac Gorge CS supports several globally-rare communities, two of which are endemic, two globally rare amphipods, and several globally-and state-rare plants and community elements. There is one state-listed species known from this CS. The VDCR NHP ranks this area as a B1 Outstanding Significance CS. The site is crossed by Overhead Route 01 for approximately 2.7 miles, which would be located within an existing utility corridor.

The Potomac River-Yellow Falls SCU is the stretch of Bullneck Run between Old Dominion Drive and the Potomac River. The Potomac River-Yellow Falls SCU contains riparian habitat that supports a rare aquatic plant, animal, or community. The VDCR NHP ranks this area as a B3 High Significance stream. The site is not crossed by any of the routes.

One GLNHR is located within and around Scott's Run Nature Preserve and is adjacent to the Potomac River. It is known to contain a rare but not state-or federally-listed invertebrate animal. This GLNHR is crossed by Overhead Route 01 for approximately 0.4 mile, which would be located within an existing utility corridor adjacent to I-495.

A second GLNHR is bounded by I-495 and Route 686 to the west and east, and Lewinsville Road and Old Dominion Drive to the south and north. It is the known to contain a rare but not state-or federally-listed invertebrate animal. This GLNHR is not crossed by any of the routes.

A third GLNHR follows the corridor of Scott's Run from Lewinsville Road north to the Potomac River. It is known to contain a rare but not state-or federally-listed invertebrate animal. This GLNHR is crossed by Overhead Route 01 for approximately 0.4 mile, which would be located within an existing utility corridor adjacent to I-495.

A fourth GLNHR follows the corridor of Bullneck Run from Spring Hill Park north to the Potomac River. It contains habitat that supports a rare but not state-or federally-listed invertebrate animal. This GLNHR is not crossed by any of the routes.

A fifth GLNHR is bounded by I-66 to the south and east, Leesburg Pike (Rt. 7) to the northeast, Dulles Airport Access Road (VA 267) to the north, and Hunter Mill Road to the west. It is known to contain a rare but not state-or federally-listed invertebrate animal. This GLNHR is crossed by

Overhead Route 03 for approximately 0.9 mile and Overhead Route 04 for approximately 6.3 miles.

A sixth GLNHR is centered just north of the I-66 and I-495 interchange and encompasses an approximately 0.78 square mile area, including the northern half of the Idylwood Substation. It is known to contain a rare but not state-or federally-listed vascular plant. This GLNHR is crossed by Overhead Route 01 for approximately 0.6 mile, Overhead Route 02 for approximately 0.6 mile, Overhead Route 03 for approximately 1.3 miles, and Overhead Route 04 for approximately 1.4 miles.

3.2.5 Protected Species

To protect and recover imperiled species and the ecosystems they depend on, Congress passed the Endangered Species Act in 1973 (ESA), which states that threatened and endangered plant and animal species are of aesthetic, ecological, educational, historic, and scientific value to the United States, and protection of these species and their habitats is required. The ESA is administered by both the National Oceanic and Atmospheric Administration and the FWS. It protects fish, wildlife, plants, and invertebrates that are federally listed as endangered or threatened by prohibiting the "take" of these species and the interstate or international trade, including their parts and products, unless federally permitted.

Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct." A federally-endangered species is any species that is in danger of extinction throughout all or a significant portion of its range, with exceptions for certain insect pests. A federally-threatened species is any species that is likely to become endangered in the near future throughout all or a significant portion of its range.

Virginia has adopted separate acts for protecting animals and plants in the state. The Virginia Endangered Species Act (Va. Code §§ 29.1-563 - 29.1-570) designates the Virginia Department of Game and Inland Fisheries (VDGIF) as the state agency with jurisdiction over state-listed endangered or threatened fish and wildlife. The act authorizes the Board of the VDGIF to adopt the federal list of endangered and threatened species and to identify and protect state-listed wildlife. This act prohibits by regulation the taking, transportation, processing, sale, or offer for sale of those species.

Under the Endangered Plant and Insect Species Act (2 VAC 5-320-10), the taking or possession of endangered or threatened plant and insect species is prohibited. The VDCR represents the Virginia Department of Agriculture and Consumer Services, which is responsible for state-listed plants and insects, in providing comments regarding potential effects on state-listed plant and insect species.

ERM obtained query results from the VDCR's NHDE, VDGIF Fish and Wildlife Information Service (VaFWIS), and the FWS Information for Planning and Consultation System to identify federally- and state-listed species that may occur within the study area. Digital data were obtained from the VDCR NHDE to identify locations within the study area that potentially support protected species. Query results from FWS Information for Planning and Consultation System includes species that may occur in Fairfax County (FWS, 2017). Query results from NHDE include species known to occur in Fairfax County and communities known to historically or currently contain protected species (VDCR, 2017b; VDCR, 2017a). Query results from VaFWIS include species known or likely to occur in the study area (VDGIF, 2017).

Because the various queries that indicate potential or actual occurrences of protected species in the vicinity of the Project do not specify exact occurrence locations, a summary of the federally- and state-listed species documented in the vicinity of the Project, either within Fairfax County or the study area, is presented in Table 3.2.5-1. Federal Species of Concern are summarized in Section 3.2.5.3.

The database queries identified four federally listed species: northern long-eared bat (*Myotis septentrionalis*), dwarf wedgemussel (*Alasmidonta heterodon*), yellow lance (*Elliptio lanceolata*), and small-whorled pogonia (*Isotria medeoloides*). According to the review each of these species has potential to occur in Fairfax County. The VDGIF operates a *Northern Long-eared Bat (NLEB) Winter Habitat and Roost Trees* online mapping system, which shows general locations of known NLEB hibernacula and roost trees. A review of this system did not show a hibernaculum or roost tree in Fairfax County. Yellow lance and NLEB are not legally protected by the Commonwealth of Virginia, but dwarf wedgemussel and small whorled pogonia are listed as endangered by the state.

The database queries identified nine state-listed species that may occur or are known to occur in the County or study area. The VDGIF operates a *Little Brown Bat and Tri-colored Bat Winter Habitat and Roosts Application* online mapping system, which shows general locations of known little brown bat and tri-colored bat hibernacula and roost trees. A review of this system did not show a hibernaculum or roost tree in Fairfax County. The VaFWIS search results indicated that wood turtle is known to occur in Pimmit Run, which is crossed or paralleled by Overhead Route 01 and Overhead Route 02. According to VaFWIS, wood turtle is predicted to occur in Bullneck Run, Rocky Run, and Turkey Run. Turkey Run is crossed by Overhead Route 01, and none of the routes cross Bullneck Run or Rocky Run.

The query of the VaFWIS listed six stream systems in Fairfax County that are known to contain state-listed species. Of these six stream systems, two are crossed by one or more routes. Potomac River-Nichols Run-Scott's Run is crossed by Overhead Route 01 and Overhead Route 02, and is known to contain at least one endangered species. Potomac River-Pimmit Run is crossed by Overhead Route 01 and Overhead Route 02, and is known to contain at least one endangered species. Wood turtle is known to occur in Pimmit Run.

TABLE 3.2.5-1

Idylwood-Tysons 230 kV Underground Transmission Line Project
Federal- and State-Listed Species Occurrence in the Vicinity of the Proposed Project

Common Name	Scientific Name	Federal Status	State Status	Global Rank	Habitat	Source
FEDERALLY-LISTED SPECIES						
Mammals						
Northern long-eared bat	*Myotis septentrionalis*	LT	None	G4	Generally associated with old-growth or late successional interior forests. Partially dead or decaying trees are used for breeding, summer day roosting, and foraging. Hibernation occurs primarily in caves, mines, and tunnels.	IPaC VaFWIS
Invertebrates						
Dwarf wedgemussel	*Alasmidonta heterodon*	LE	LE	G1G2	Deep quick running water on cobble, fine gravel, or on firm silt or sandy bottoms.	IPaC
Yellow lance	*Elliptio lanceolata*	PT	None	G2G3	Main channels of drainages and streams as small as one meter across with clean, coarse, medium-sized sand or gravel substrate.	IPaC
Plants						
Small whorled pogonia	*Isotria medeoloides*	LT	LE	G2	Older hardwood stands with an open understory, sometimes in stands of softwoods. Prefers acidic soils with thick layer of dead leaves, often on slopes near small streams.	IPaC NHDE
STATE-LISTED SPECIES						
Mammals						
Little brown bat	*Alasmidonta varicosa*	None	LE	G3	Roosts in caves, buildings, rocks, trees, under bridges, and in mines and tunnels. Found in all forested regions of the state.	VaFWIS
Tri-colored bat	*Perimyotis subflavus*	None	LE	G3	Typically roost in trees near forest edges during summer. Hibernate deep in caves or mines in areas with warm, stable temperatures during winter.	VaFWIS
Invertebrates						
Brook floater	*Alasmidonta varicosa*	None	LE	G3	Creeks and small rivers, found among rocks in gravel substrates and in sandy shoals, flowing-water habitats only.	NHDE VaFWIS
Appalachian springsnail	*Fontigens bottimeri*	SOC	LE	G2G3	Small freshwater springs and streams.	NHDE
Appalachian grizzled skipper	*Pyrgus centaureae Wyandot*	None	LT	G5	Semi-open slopes with sparse herbaceous vegetation and exposed rock or soil.	VaFWIS
Birds						
Peregrine falcon	*Falco peregrinus*	None	LT	G4	Tall structures, such as powerline poles, buildings, and rock ledges, in generally open landscapes.	VaFWIS
Loggerhead shrike	*Lanius ludovicianus*	None	LT	G4	Open country with scattered shrubs and trees or other tall structures for perching.	VaFWIS
Henslow's sparrow	*Ammodramus henslowii*	None	LT	G4	Open grasslands with few or no woody plants and tall dense grasses and litter layer.	VaFWIS
Reptiles						
Wood turtle	*Glyptemys insculpta*	None	LT	G3	Forested floodplains, fields, wet meadows, and farmland with a perennial stream nearby.	NHDE VaFWIS

TABLE 3.2.5-1

Idylwood-Tysons 230 kV Underground Transmission Line Project
Federal- and State-Listed Species Occurrence in the Vicinity of the Proposed Project

Common Name	Scientific Name	Federal Status	State Status	Global Rank	Habitat	Source

Federal/State Status:

LE	Listed as endangered.
LT	Listed as threatened.
PT	Proposed as threatened.
SOC	Species of Concern.

Global Rank:

G1	Critically Imperiled: At very high risk of extinction due to extreme rarity (often five or fewer populations), very steep declines, or other factors.
G2	Imperiled: At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.
G3	Vulnerable: At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4	Apparently Secure: Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5	Secure: Common; widespread, and abundant.

Source:

IPaC	U.S. Fish and Wildlife Service Information for Planning and Consultation
NHDE	Virginia Department of Conservation and Recreation Natural Heritage Data Explorer
VaFWIS	Virginia Department of Game and Inland Fisheries Virginia Fish and Wildlife Information System

3.2.5.1 Bald Eagle Management

The bald eagle is no longer federally listed under the ESA, but it is a state-listed threatened species in Virginia under the Virginia ESA and is protected under Va. Code § 29.1-521 and VDGIF regulations (4 VAC 15-30-10). The bald eagle is also protected under the federal Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The "Management of Bald Eagle Nests, Concentration Areas, and Communal Roosts in Virginia: A Guide for Landowners," issued by the VDGIF provides management practices for avoiding take of bald eagles and outlines restrictions on construction activities within defined management zones. Proposed activities that have the potential to affect bald eagles are evaluated by the VDGIF on a case-by-case basis (VDGIF, 2012).

To obtain the most current eagle nest data, ERM reviewed the Center for Conservation Biology (CCB) website (Watts and Byrd, 2013), which provides information about the Virginia bald eagle population, including the results of the CCB's annual eagle nest survey. According to the CCB database, the only known bald eagle nests within the study area are located approximately 3,700 and 3,900 feet from Overhead Route 01 along the Potomac River on the opposite side of the George Washington Memorial Parkway. The nearer nest, FF0503, was last occupied in 2016, and the farther nest, FF0903, was last occupied in 2009 and is now considered inactive. Overhead Route 01 is not located within the 330- or 660-foot management buffers of either nest.

3.2.5.2 Species of Concern and Other Documented Occurrences

A summary of the federally-listed Species of Concern occurring in the Project's counties is included in Table 3.2.5.2-2. Species of Concern typically are not afforded the same level of protection as federally- and state-listed endangered and threatened species. NatureServe, an international network of Natural Heritage Programs, assigns a Global Rank based on rarity and conservation status. Species ranked "G1" (global rank 1/critically imperiled) or "G2" (global rank

2/imperiled) are most at risk. According to NatureServe, Holsinger's groundwater planarian and Bigger's groundwater planarian are considered extirpated or possibly extirpated in Virginia.

The VDCR conducted an official review of the Project on October 6, 2017. As part of this review, the VDCR concluded that the Project as proposed would not affect any documented state-listed plants or insects, and does not cross any State Natural Area Preserves under VDCR's jurisdiction. The VDCR noted that, as described above, Pimmit Run is located in the Project study area and is known to contain the state-listed wood turtle. Pimmit Run is crossed by Overhead Route 01 and Overhead Route 02.

TABLE 3.2.5.2-1

Idylwood-Tysons 230 kV Underground Transmission Line Project
Species of Concern and Rare Species in Vicinity of Proposed Project

Common Name	Scientific Name	Federal Status	State Status	Global Rank	Habitat	Source
Invertebrates						
Appalachian springsnail	*Fontigens bottimeri*	SOC	LE	G2G3	Small freshwater springs and streams.	NHDE
Holsinger's groundwater planarian	*Sphalloplana holsingeri*	SOC	None	G1G2	Subterranean, subaquatic environments.	NHDE
Bigger's groundwater planarian	*Sphalloplana subtilis*	SOC	None	G1G2	Subterranean, subaquatic environments.	NHDE
Plants						
Torrey's mountain-mint	*Pycnanthemum torreyi*	SOC	None	G2	Dry, open habitats or upland edges, including rights-of-way and roadsides.	NHDE

Federal/State Status:
LE Listed as endangered.
LT Listed as threatened.
PT Proposed as threatened.
SOC Species of Concern.

Global Rank:
G1 Critically Imperiled: At very high risk of extinction due to extreme rarity (often five or fewer populations), very steep declines, or other factors.
G2 Imperiled: At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.
G3 Vulnerable: At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4 Apparently Secure: Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5 Secure: Common; widespread, and abundant.

Source:
IPaC U.S. Fish and Wildlife Service Information for Planning and Consultation
NHDE Virginia Department of Conservation and Recreation Natural Heritage Data Explorer
VaFWIS Virginia Department of Game and Inland Fisheries Virginia Fish and Wildlife Information System

3.2.6 Vegetation

The vegetation of the Northern Piedmont ecoregion has been severely altered by clearing as part of ongoing agricultural and silvicultural practices occurring since European settlement. Prior to the effects of European settlement, the vegetation was influenced by the practices of Native Americans. Writings from early explorers indicate that parts of the Piedmont were once open, savanna-like woodlands and grasslands. Native Americans' practices included burning the forests to drive game and keep the understory of forests clear for hunting. More recently, forests

in this area have undergone a cycle of clearing, farming, and regenerating. The fallow farmlands, if left unattended, undergo a successional regeneration process that generally results in a prevalence of early successional trees such as Virginia pine (*Pinus virginiana*) and tulip-poplar (*Liriodendron tulipifera*), which ultimately matures into oak-hickory forest (Flemming, 2004). The effect of man's influence on the landscape for centuries has resulted in a patchwork of secondary forests, pastures, and agricultural fields. The vegetation of the remaining forests occurring throughout the project area is likely now a predominant mix of pine (*Pinus* sp.) and hardwoods, including hickories (*Carya* sp.) and oaks (*Quercus* sp.).

ERM reviewed the routes using Environmental Systems Research Institute aerial imagery from July, 2016, to assess vegetative cover in the study area. Descriptions of the vegetation communities crossed by the routes are provided below.

Overhead Route 01

Moving from Idylwood Substation to Tysons Substation, Overhead Route 01 parallels an existing utility corridor maintained in an herbaceous or shrub-scrub state for approximately 1,800 feet, then crosses a residential neighborhood for approximately 750 feet. Overhead Route 01 parallels I-66, I-495, and VA 267 at various points along its route, which are bordered by vegetative cover ranging from maintained grasses to mature trees that buffer schools, businesses, and residences from the highways. The route follows an existing utility corridor within which the vegetation is maintained in an herbaceous or shrub-scrub state. This existing corridor crosses Langley Oaks Park and George Washington Memorial National Parkway for approximately 2.6 miles, which is forested. The remainder of the corridor crosses residential neighborhoods where there are varying widths of tree buffers between the houses and the corridor. Because Overhead Route 01 parallels existing roadways in developed areas and existing utility corridors, the vegetative cover along this route is limited to herbaceous and shrub-scrub communities along forest edges.

Overhead Route 02

The Overhead Route 02 route primarily parallels I-66 and VA 267. Moving from Idylwood Substation to Tysons Substation, Overhead Route 02 parallels an existing utility corridor that is located to the northwest of I-66. The utility corridor is maintained in an herbaceous or shrub-scrub state for approximately 1,800 feet, then crosses a residential neighborhood for approximately 750 feet. The majority of the route is adjacent to VA 267, which is bordered by vegetative cover ranging from maintained grasses to mature trees that buffer schools, businesses, and residences from the highway. The route crosses two forest patches for approximately 3,500 feet and one railyard. Because Overhead Route 02 parallels existing roadways in developed areas, there is minimal vegetative cover along this route.

Overhead Route 03

Overhead Route 03 primarily parallels I-495. Moving from Idylwood Substation to Tysons Substation, Overhead Route 03 parallels an existing utility corridor maintained in an herbaceous or shrub-scrub state for approximately 1,700 feet. The remainder of the route is adjacent to I-495 and VA 267, which are bordered by vegetative cover ranging from maintained grasses to mature trees that buffer schools, businesses, and residences from the highway. Because Overhead Route 03 parallels existing roadways in developed areas, there is minimal vegetative cover along this route.

Overhead Route 04

Overhead Route 04 crosses a mixture of commercial, residential, and forested land. Moving from Idylwood Substation to Tysons Substation, Overhead Route 04 parallels an existing utility corridor maintained in an herbaceous or shrub-scrub state for approximately 1,700 feet. It then follows an existing roadway for over 3.5 miles, which is bordered by mature ornamental trees that serve as a buffer between residences and roadways. The route then turns northeast and continues through a mixture of forested parks and residential neighborhoods for approximately 2.3 miles. The route utilizes an existing corridor maintained in an herbaceous or shrub-scrub state. It crosses three forested parks, Eudora Park, Northside Park, Foxstone Park, and Old Courthouse Spring Branch Stream Valley Park, for a total of 0.8 mile. Because Overhead Route 04 parallels existing roadways in developed areas and existing utility corridors, the vegetative cover along this route is limited to herbaceous and shrub-scrub communities along forest edges.

3.3 VISUAL CHARACTERISTICS

ERM identified visually sensitive-areas through review of recent digital aerial photography. These were defined as areas where an electric transmission line or tree-cleared right-of-way for the Overhead Routes would be out of character with the surrounding visual characteristics of the landscape or individual sites possessing unique scenic qualities or viewsheds. Examples of visually sensitive-areas include residential or recreational areas; historic landscapes or districts; open space; natural features; and individual sites, such as historic sites or buildings.

There are two National Scenic Byways located in the Project area. The George Washington Memorial Parkway runs along the south/west bank of the Potomac River from outside the Project area near Mount Vernon and extends north into the Project area near CIA Headquarters at Langley. The George Washington Memorial Parkway terminates at the intersection with I-495 in the Parkview Hills area north of McLean. The Old Georgetown Pike (SR 193) is a National Scenic Byway and designated Virginia State Scenic Road that originates north of Reston and terminates in the Project area at the intersection with Dolley Madison Boulevard just south of Langley Fork Park.

One recreational trail is located in the Project area. The Great Falls Loop of the Virginia Birding and Wildlife Trail runs along both the George Washington Memorial Parkway and Old Georgetown Pike and extends south along I-495 south to the intersection with Braddock Road (SR 620).

Overhead Route 01

Overhead Route 01 crosses a mixture of forested highway buffer, open space, and commercial and residential land. From MP 2.6 to 4.8, the route follows several linear parks through McLean as the route travels northeast towards Langley. The route then enters Turkey Run Park at MP 6.0, turning north, then west along the Great Falls Loop Virginia Birding and Wildlife Trail and George Washington Memorial Parkway to MP 8.7. The route follows Great Falls Loop Virginia Birding and Wildlife Trail south (along I-495) between MP 9.0 and 11.4. Overhead Route 01 would require removal of trees along several parks and forested highway buffers which could impact visually-sensitive features such as park facilities and residential neighborhoods.

Overhead Route 02

Overhead Route 02 crosses a mixture of forested highway buffer, developed land, and open space. The route generally follows forested buffers adjacent to the I-66 and VA 267 through residential land and mixed industrial and commercial development in Tysons. Overhead Route 02 crosses the Great Falls Loop Virginia Birding and Wildlife Trail at MP 4.6.

Overhead Route 03

Overhead Route 03 crosses a mixture of forested highway buffer, developed commercial and residential land, and open space. With the exception of forested buffers adjacent to the I-495 and VA 267, the views along the transmission consist of residential development and mixed industrial and commercial development in Tysons. The route has six crossings of the Great Falls Loop Virginia Birding and Wildlife Trail (I-495 section).

Overhead Route 04

Overhead Route 04 crosses primarily open space, residential land, and commercial land. The route would require removal of trees along W&OD Park between MP 0.2 and 4.2, which could impact visually-sensitive features due to the removal of the treed buffers. The route crosses residential areas between MPs 4.3 and 6.6, which could also impact visually-sensitive features due to the removal of the trees in a residential neighborhood. The route crosses the Great Falls Loop Virginia Birding and Wildlife Trail (I-495 section) at MP 0.6

3.4 CULTURAL RESOURCES CONDITIONS

Prior to elimination of the overhead routes as project alternatives, ERM collected information on cultural resources that could be impacted by each route, using the guidelines set forth by the Virginia Department of Historic Resources (VDHR) in their 2008 *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* (2008) *(Guidelines)*. In accordance with VDHR's guidelines, considered resources include National Historic Landmark (NHL) properties located within a 1.5-mile radius of the centerline of a proposed transmission line route; National Register of Historic Places (NRHP)-listed properties, NHLs, battlefields, and historic landscapes within a 1.0-mile radius of the centerline; NRHP-eligible and -listed properties, NHLs, battlefields, and historic landscapes within a 0.5-mile radius of the centerline; and all of the above qualifying architectural resources as well as archaeological sites located within the right-of-way for each route. Information on the resources in each tier was collected from the Virginia Cultural Resource Information System (V-CRIS). ERM also sought information on battlefields surveyed and assessed by the National Park Service's American Battlefield Protection Program (ABPP), however none are located in the vicinity of the originally overhead routes. Finally, information was sought on properties with VDHR easements, but none were identified in the vicinity of the originally overhead routes.

3.4.1 Archaeological Sites

Crossings of archaeological sites were considered a constraint in this study due to the potential for an electric transmission line to impact archaeological deposits in these areas (for example, due to transmission structure placement, tree clearing or heavy equipment usage within a site). Before the Overhead Routes were eliminated from the review, information was collected on the known archaeological sites in the right-of-way for each alternative. These archaeological sites are summarized in Table 3.4.1-1. None have been evaluated as to NRHP eligibility. Based on a

review of contemporary aerial photographs, some of these sites, or portions of them, have been disturbed or destroyed by modern development. However, a confident and complete assessment of the integrity of each site would require archaeological field investigations.

TABLE 3.4.1-1

Idylwood-Tysons 230 kV Underground Transmission Line Project
Archaeological Resources in Right-of-Way of Overhead Routes

Route Alternative	Site Number	Description	NRHP Status
Overhead Route 01	44FX0007	prehistoric lithic scatter	Not evaluated
	44FX0214	multicomponent prehistoric base camp (Paleoindian, Early Archaic, Middle Archaic, Late Archaic, Early Woodland, Middle Woodland)	Not evaluated
	44FX0328	prehistoric lithic quarry	Not evaluated
	44FX0347	prehistoric	Not evaluated
	44FX0378	Early Woodland camp	Not evaluated
	44FX0379	prehistoric	Not evaluated
	44FX1203	historic farmstead and cemetery (late 18th century–20th century)	Not evaluated
	44FX2279	prehistoric camp/late nineteenth century domestic site	Not evaluated
Overhead Route 02	44FX0007	prehistoric lithic scatter	Not evaluated
	44FX1203	historic farmstead and cemetery (late 18th century–20th century)	Not evaluated
	44FX2279	prehistoric camp/late nineteenth century domestic site	Not evaluated
Overhead Route 03	44FX1352	prehistoric	Not evaluated
	44FX1576	Renaissance - Sherwood: nineteenth century domestic site	Not evaluated
	44FX2279	prehistoric camp/late nineteenth century domestic site	Not evaluated
Overhead Route 04	44FX0999	historic domestic site (mid–late 19th century)	Not evaluated
	44FX2739	Lydecker's Store/Freeman House site (late 19th century)	Not evaluated

3.4.2 Historic and Architectural Sites

This section presents information on known resources in the vicinity of each overhead route before those routes were eliminated from the review. The resources are organized according to VDHR's tiered study area model. The locations of the resources relevant to each alternative are depicted in Figure 3.4.2-1 in Attachment B. Many of the same resources are relevant from one alternative to the next, since segments of routes are shared among different alternatives. Tables 3.4.2-1–3.4.2-4 list the considered resources pertinent to each route. Resources that extend from one tier into the next are only presented once in the tier nearest the route. Note that no ABPP study area, core area, or potential NRHP boundaries for battlefields are within the relevant tiers for the various options.

The considered resources that lie within the DHR tiers for Overhead Route 01 are presented in Table 3.4.2-1. DHR guidelines do not include as considered resources those properties located in the Project right-of-way, but which are not listed or determined eligible for the NRHP, or which are battlefields. However, given the higher potential severity of effects for resources within the right-of-way, it is worth noting those resources whose NRHP eligibility status has not yet been determined. For Overhead Route 01, in addition to two resources that have been determined not eligible for the NRHP (029-5470 and 029-5861), there are two residential resources currently unevaluated: 029-5107 and 029-5133. None of the resources within 1.5 miles of Overhead Route 01 contain a DHR easement.

TABLE 3.4.2-1

Idylwood-Tysons 230 kV Underground Transmission Line Project
Historic Resources in VDHR Tiers for Overhead Route 01

Buffer (miles)	Considered Resources	Resource Number	Description
1.0 to 1.5	National Historic Landmarks	–	
0.5 to 1.0	National Register Properties (Listed)	029-0035	Spring Hill Farm
0.0 to 0.5	National Register Properties (Listed)	029-0034	Salona / Smoot House
		029-0214	Langley Fork Historic District
	National Register – eligible	029-0111	Highland View
		029-5276	The Calvert House (currently Scattergood-Thorne House)
0.0 (within right-of-way)	National Register Properties (Listed)	029-0466	Falls Bridge Turnpike Road / Georgetown and Leesburg Turnpike Road / Georgetown Pike / Sugarlands Rolling Road / Washington and Leesburg Turnpike Road
		029-0228	George Washington Memorial Parkway
	National Register – eligible	053-0276	Alexandria, Loudoun and Hampshire Railroad / Washington & Old Dominion Railroad Historic District, currently maintained as Washington & Old Dominion Railroad Regional Park

The considered resources that lie within the DHR tiers for Overhead Route 02 are presented in Table 3.4.2-2. None of the resources within 1.5 miles of Overhead Route 02 contain a DHR easement. Beyond the one considered resource in the right-of-way, there are only two other historic resources within the right-of-way for Overhead Route 02, and both (029-5470 and 029-5861) have been determined not eligible for the NRHP.

TABLE 3.4.2-2

Idylwood-Tysons 230 kV Underground Transmission Line Project
Historic Resources in VDHR Tiers for Overhead Route 02

Buffer (miles)	Considered Resources	Resource Number	Description
1.0 to 1.5	National Historic Landmarks	–	
0.5 to 1.0	National Register Properties (Listed)	029-0035	Spring Hill Farm
0.0 to 0.5	National Register – eligible	029-0111	Highland View
0.0 (within right-of-way)	National Register – eligible	053-0276	Alexandria, Loudoun and Hampshire Railroad / Washington & Old Dominion Railroad Historic District, currently maintained as Washington & Old Dominion Railroad Regional Park

The considered resources that lie within the DHR tiers for Overhead Route 03 are presented in Table 3.4.2-3. None of the resources within 1.5 miles of Overhead Route 03 contain a DHR easement. Beyond the one considered resource in the right-of-way, there are only two other historic resources within the right-of-way for Overhead Route 03, one of which (029-5470) has been determined not eligible for the NRHP, and the other (029-5099) remains unevaluated.

TABLE 3.4.2-3

Idylwood-Tysons 230 kV Underground Transmission Line Project
Historic Resources in VDHR Tiers for Overhead Route 03

Buffer (miles)	Considered Resources	Resource Number	Description
1.0 to 1.5	National Historic Landmarks	–	
0.5 to 1.0	National Register Properties (Listed)	029-0035	Spring Hill Farm
0.0 to 0.5	National Register listed or eligible properties, NHLs, battlefields, historic landscapes	–	
0.0 (within right-of-way)	National Register – eligible	053-0276	Alexandria, Loudoun and Hampshire Railroad / Washington & Old Dominion Railroad Historic District, currently maintained as Washington & Old Dominion Railroad Regional Park

The considered resources that lie within the DHR tiers for Overhead Route 04 are presented in Table 3.4.2-4. None of the resources within 1.5 miles of Overhead Route 04 contain a DHR easement. Beyond the one considered resource in the right-of-way, there are four other historic resources within the right-of-way for Overhead Route 04, three of which (029-0206, 029-5470, and 153-5014) have been determined not eligible for the NRHP, and the other (153-0006) remains unevaluated.

TABLE 3.4.2-4

Idylwood-Tysons 230 kV Underground Transmission Line Project
Historic Resources in VDHR Tiers for Overhead Route 04

Buffer (miles)	Considered Resources	Resource Number	Description
1.0 to 1.5	National Historic Landmarks	–	
0.5 to 1.0	National Register Properties (Listed)	–	
0.0 to 0.5	National Register Properties (Listed)	153-0002	Freeman House Store & Museum
	National Register – eligible	153-5001	Civil War fort at current Gunnell American Legion Post 180
0.0 (within right-of-way)	National Register – eligible	053-0276	Alexandria, Loudoun and Hampshire Railroad / Washington & Old Dominion Railroad Historic District, currently maintained as Washington & Old Dominion Railroad Regional Park

3.4.3 Summary of Existing Survey Data Performed Under Section 106 or Section 110 of the National Historic Preservation Act

Some portions of the originally Overhead Routes have been subject to previous cultural resource survey coverage. Because many segments of routes are concurrent with others, many previous surveys have covered portions of multiple routes. The previous surveys relevant to the Overhead Routes are indicated in Table 3.4.3-1. The majority of the surveys were for highway projects, but investigations of individual sites and one survey for proposed construction sites at the Central Intelligence Agency facility in Langley are also included.

TABLE 3.4.3-1

Idylwood-Tysons 230 kV Underground Transmission Line Project
Cultural Resources Surveys Covering Portions of the Overhead Routes

Route				Survey	
OH 01	OH 02	OH 03	OH 04[a]	Citation	DHR Report Number
X	X	X		Barber et al. 2001	FX-358
X	X	X		Browning 1980	FX-124
X	X	X		Chatelain n.d.	FX-111
X				Chatelain and Johnson n.d.	FX-113
	X			Gardner 1978	FX-008
X				Johnson 1980a	FX-026
X	X			Johnson 1980b	FX-132
				Jolley 1987	FX-106
X	X	X		Parsons Engineering Science 1989	LD-053
X				Rickard 1986	FX-101
X				Wamsley 1984	FX-146
X	X			Williams 1977	FX-010

[a] No previous cultural resources surveys provide coverage for Overhead Route 04

3.5 GEOLOGICAL CONSTRAINTS

ERM identified mineral resource areas through review of publicly-available Virginia Department of Mines, Minerals, and Energy (2017) datasets, USGS topographic quadrangles, and recent digital aerial photographs. There are no active mineral resources identified within 0.25 mile of any of the routes. The closest mineral resource is the Turkey Run Quarry located about 0.7 mile from MP 6.8 of Overhead Route 01.

3.6 ENGINEERING CONSTRAINTS

Engineering constraints include existing and proposed right-of-way width, existing underground or overhead obstructions and utility easements within the proposed width. Due to the developed nature of the study area, locating a right of way clear of obstructions posed significant challenges. Dominion Energy Virginia maintains pole line easements along much of its existing routes in the study area. A pole line easement is an easement or right of way to construct, operate, and maintain a line of poles, wires, attachments, ground connections, accessories, and appurtenances for transmitting and distributing electric power which typically restricts the physical location of the facilities and often includes rights for the Company to clear and maintain the right-of-way as well as operate and maintain its facilities. The easement typically includes all existing wires, structures, attachments, ground connections, accessories, and appurtenances, but is not for a designated right-of-way width like a typical right-of-way. This pole line easement is typically designated as the centerline on the plat, where a line can be rebuilt and poses challenges to a rebuild project because there is a need to have a defined and widened right-of-way.

3.7 EXISTING CORRIDORS WITHIN THE PROJECT AREA

ERM identified existing corridors within the Project area through review of recent digital aerial photography, the Fairfax County Comprehensive Plan, and various publicly-available data layers. Existing corridors within the study area that were identified consist of existing electric transmission and pipeline facilities, railroad corridors, and major road corridors. These existing

corridors are described below and depicted on Figure 3.7-1 in Attachment B. The existing corridors were identified for the purpose of assessing their potential use as routing or collocation opportunities in the portions of the Project area where new or different rights-of-way would be required. These existing corridors are described below.

3.7.1 Electric Transmission Corridors

Existing electrical transmission facilities are found throughout the Project area. Dominion Energy Virginia has existing 230 kV transmission lines (Lines #2035, #2029, and #2108), which would be wrecked and rebuilt for Overhead Route 01, along the eastern side of the study area. This corridor originates at the Idylwood Substation and runs north crossing Curtis Memorial Parkway (I-66), Dulles Access Road (SR 267), Westmoreland Street (SR 693), Old Dominion Drive, Evermay Drive, Long Meadow Road, Stoneham Lane, Dolley Madison Boulevard (SR 123), Dead Run Road. The corridor then heads south, crossing the Capital Beltway (I-495), Georgetown Pike (SR 193), Old Dominion Drive (SR 738), Lewinsville Road (SR 694), Spring Hill Road (SR 684), and Dulles Toll Road (VA 267), and ending at the Tysons Substation.

There area other existing 230 kV Dominion Energy Virginia transmission lines (Lines #2035, #202, and #2010) that are located along the southern and western sides of the study area for the project. This line would be wrecked and rebuilt for Overhead Route 04. The route originates at the Idylwood Substation, and turns west to follow the W & OD Park Trail. After entering Northside Park, the route veers east then northeast, following Line #2010 to the Tysons Substation.

Additionally, there are seven existing Dominion Energy Virginia substations located within the Project area. The Idylwood Substation is located on Shreve Road, and is the proposed starting location for all routes. The Tysons Substation is located off of Tyco Road, and is the proposed ending location for all of the routes. There are five more substations in the area that are not part of the Project: the Reddfield Substation located off of Idylwood Road, the Pimmit Substation located off of Reed Road, the McLean Substation located off of Chain Bridge Road, the CIA Substation located off of Georgetown Pike, and the Swinks Mill Substation located off of Spencer Road.

3.7.2 Railroad Corridors

WMATA was created in 1967 by an interstate compact to plan, develop, build, finance, and operate a regional transportation system in the national capital area. It began building its heavy rail system in 1969. It serves 91 stations and has 117 miles of track (WMATA 2017). The Greensboro Metro Station is located within the study area. Greensboro Metro Station is located off of Greensboro Station Place, near the intersection with Leesburg Pike. The Spring Hill Metro Station is located at the intersection of Spring Hill Road and Leesburg Pike. Within the study area, the Silver Line runs from the intersection of Dulles Airport Access Road and Wiehle Avenue and parallel to VA 276, until the intersection with Leesburg Pike. The rail then travels along Leesburg Pike, until the intersection with Chain Bridge Road, which it follows until it intersects with VA 267, which it continues to follow. The route then heads south and follows along Curtis Memorial Parkway, through the remainder of the study area. The Silver Line is crossed by Overhead Route 04. Within the study area the Orange Line follows I-66 and would be crossed by all of the Overhead Alternatives.

3.7.3 Pipeline Corridors

The Washington Gas Light Company Natural Gas Transmission line is located within the Project area. This pipeline runs east to west, and begins just north of the Project starting location and follows Leesburg Pike (VA 7). The pipeline would be crossed by Overhead Routes 03 and 04.

3.7.4 Major Road Corridors

Major road corridors in the Project area include Curtis Memorial Parkway (I-66), Capital Beltway (I-495), Leesburg Pike (VA-7), Idylwood Road (SR 695), Dulles Access Road (VA 267), Great Falls Street (SR 694), Chain Bridge road (VA 123), and George Washington Memorial Parkway. There are many more roads located within the Project area. Road rights-of-way were considered potential routing opportunities, although constructing and operating a transmission line within road rights-of-way, especially those that are considered 'limited access' such as portions of the I-66 right-of-way, can require certain limitations on those activities.

4.0 RESOURCES AFFECTED

Environmental conditions along each of the routes were identified, mapped, and reviewed as discussed in Section 3.0. Refer to Table 3-1 for a list of environmental features considered during the evaluation process. To further evaluate and consider the environmental advantages and disadvantages of each route, the environmental features potentially affected by these routes were quantified for comparison purposes. A quantified environmental features comparison table for the four overhead routes considered is presented in Table 4-1. The locations of all routes are described in Section 2.1. A discussion and comparison of each route's environmental advantages and disadvantages is presented below.

4.1 LAND USE

4.1.1 Land Ownership/Land Use

While the majority (40 percent) of lands crossed by Overhead Route 01 is privately owned, about 23 percent (2.9 miles) are local government lands, 15 percent (1.9 miles) is VDOT right-of-way, 1.6 miles (12 percent) are federal government land, and 10 percent (1.3 miles) is MWAA right-of-way. The right-of-way along Overhead Route 01 is primarily open land (5.5 miles or 43 percent) and forested lands (4.2 miles or 32 percent). Other land uses that would be crossed by Overhead Route 01 consist of about 2.3 miles (18 percent) of developed land, 0.8 mile (6 percent) of wetlands, and 0.1 mile (1 percent) of cropland. Development of this route would require the clearing of about 20.2 acres of trees. Of these 20.2 acres, 18.9 are within the expanded right-of-way, 2.3 of those are within the VDOT right-of-way, and 4.9 are within MWAA right-of-way.

TABLE 4-1

Idylwood-Tysons 230 kV Underground Transmission Line Project
Environmental Features Comparison Table – Overhead Routes

Environmental Features	Unit	OH 01	OH 02	OH 03	OH 04
Route					
Route Length Total	miles	12.9	6.1	5.2	7.2
Rebuild [1]	miles	12.9	3.5	1.8	7.2
New	miles	0.0	2.6	3.4	0.0
Pole Line Easement [1]	percentage	26	21	0	44
	miles	3.4	1.3	0.0	3.2
Acres Expanded or New ROW	acres	52.92	39.63	39.94	17.41
Land Use Features / Constraints					
State Owned Lands	miles	0.0	0.0	0.0	0.0
Local Government Lands	miles	2.9	0.3	0.1	1.1
Federal Government Lands	miles	1.6	0.0	0.0	0.0
Private Lands Crossed (total)	miles	5.2	1.4	1.5	1.7
Northern Virginia Regional Park Authority	miles	<0.1	<0.1	0.4	4.0
MWAA Crossings (roads)	miles	1.3	1.3	0.7	0.0
Virginia DOT Crossings (roads)	miles	1.9	3.1	2.3	0.4
Parcels crossed by ROW (total)	number	261	84	60	156
Existing ROW	number	218	66	34	145
Expanded or New ROW	number	43	18	26	11
Existing Land Use (VDOF)					
Open Land	miles	5.5	3.6	1.9	1.9
Cropland	miles	0.1	0.0	0.0	0.0
Developed	miles	2.3	2.0	2.7	2.2
Forested	miles	4.2	0.5	0.6	2.9
Wetland	miles	0.8	<0.1	0.0	0.2
Zoning					
Commercial	miles	0.1	0.1	0.3	<0.1
Industrial	miles	<0.1	<0.1	<0.1	0.1
Planned Units	miles	0.4	0.2	0.7	0.0
Residential	miles	11.2	2.9	2.1	6.7
Tysons	miles	0.0	0.0	0.0	0.1
Other	miles	0.0	0.0	0.0	0.1
Uncategorized/ROW	miles	1.2	2.9	2.1	0.2
Planned Developments Crossed (Centerline)	miles	0.0	0.0	0.3	0.2
	(number)	0	0	2	2
Planned Developments Crossed (ROW)	acres	0.0	0.0	2.9	3.2
	(number)	0	0	4	4
Proposed Commuter Rail stations Crossed	miles	0.0	0.0	0.0	0.0
	(number)	0	0	0	0
Recreational Areas Crossed					
City Parks					
Existing ROW	number	0	0	0	1
	acres	0.0	0.0	0.0	0.8
Expanded or New ROW	number	0	0	0	1 (0 new)
	acres	0.0	0.0	0.0	0.8
National Park Service Land					
Existing ROW	number	1	0	0	0
	acres	12.9	0.0	0.0	0.0
Expanded or New ROW	number	1 (0 new)	0	0	0

TABLE 4-1

Idylwood-Tysons 230 kV Underground Transmission Line Project
Environmental Features Comparison Table – Overhead Routes

Environmental Features	Unit	OH 01	OH 02	OH 03	OH 04
	acres	8.5	0.0	0.0	0.0
County Parks					
Existing ROW	number	8	2	1	4
	acres	21.3	1.9	0.9	2.5
Expanded or New ROW	number	8 (0 new)	2 (0 new)	1 (0 new)	4 (0 new)
	acres	8.9	0.9	0.7	2.3
NOVA Parks [2]					
Existing	number	1	1	1	1
	acres	0.5	0.5	5.1	47.4
Expanded or New ROW	number	1 (0 new)	1 (0 new)	1 (0 new)	1 (0 new)
	acres	<0.1	<0.1	0.0	0.0
Virginia Birding and Wildlife Trails Crossed	number	1	1	1	1
Other Land Use Constraints					
Single-family residences within 500 feet	number	1,154	738	374	1,225
Single-family residences within 200 feet	number	305	186	80	383
Single-family residences within 100 feet	number	107	40	18	157
Mutli-family buildings within 500 feet	number	15	19	7	7
Mutli-family buildings within 200 feet	number	3	4	1	3
Mutli-family buildings within 100 feet	number	2	2	0	0
Single-family residences in New or Expanded ROW	number	13	8	0	51
Multi-family buildings in New or Expanded ROW	number	2	2	0	0
Single-family residences within 60 feet of the Expanded or New ROW [3]	number	100	26	12	108
Multi-family buildings within 60 feet of Expanded or New ROW	Number	2	2	0	0
Buildings within Existing Right-of-Way (total)	number	35	13	1	30
Single-family Residences	number	0	0	0	0
Multi-family Buildings	number	0	0	0	0
Industrial/Commercial/Public	number	12	4	0	11
Outbuildings	number	23	9	1	19
Buildings within Expanded Right-of-Way (total)	number	24	14	6	61
Single-family Residences	number	13	8	0	51
Multi-family Buildings	number	2	2	0	0
Industrial/Commercial/Public	number	3	0	3	2
Outbuildings	number	6	4	3	8
Cemeteries within 500 feet	number	0	0	0	0
Churches within 500 feet	number	1	0	1	3
Schools within 500 feet	number	3	1	1	2
Environmental Constraints					
Wetlands Crossed by Existing Right-of-Way (total)	acres	6.0	0.7	0.0	1.3
Wetlands Crossed by Expanded Right-of-Way (total)	acres	3.0	<0.1	<0.1	1.0
Freshwater Emergent					
Existing ROW	acres	1.5	0.0	0.0	0.0
Expanded or New ROW	acres	0.5	0.0	0.0	0.0
Forested					
Existing ROW	acres	3.6	0.0	0.0	1.3
Expanded or New ROW	acres	2.4	0.0	0.0	1.0
Pond					

TABLE 4-1

Idylwood-Tysons 230 kV Underground Transmission Line Project
Environmental Features Comparison Table – Overhead Routes

Environmental Features	Unit	OH 01	OH 02	OH 03	OH 04
Existing ROW	acres	0.9	0.7	0.0	0.0
Expanded or New ROW	acres	0.1	<0.1	<0.1	0.0
Waterbody Crossings (total)	number	32	8	5	11
Perennial	number	26	4	1	10
Intermittent	number	5	4	4	1
Open Waters	number	1	0	0	0
Forested Lands Crossed					
Existing ROW	acres	1.3	0.1	0.9	12.3
Expanded or New ROW	acres	18.9	12.7	6.5	3.7
Resource Protection Areas Crossed and Expanded or New ROW Impacted	miles	3.7	0.9	0.7	0.9
	(acres)	15.8	6.1	4.8	3.4
Conservation Easements Crossed					
Fairfax County Conservation Easements – Existing ROW	acres	1.9	1.8	0.0	1.6
	(number)	4	3	0	4
Fairfax County Conservation Easements – Expanded or New ROW	acres	1.1	0.5	0.1	0.6
	(number)	10 (6 new)	7 (4 new)	2	4 (0 new)
VDCR Conservation Lands – Existing ROW	acres	1.1	1.1	0.0	0.0
	(number)	1	1	0	0
VDCR Conservation Lands – Expanded or New ROW	acres	0.2	0.2	0.0	0.0
	(number)	1 (0 new)	1 (0 new)	0	0
Cultural Resources Constraints					
Archaeology (VDHR)					
Archaeological Sites Within Right-of-Way	number	8	3	3	2
Architectural Resources (VDHR)					
Architectural Resources Within Right-of-Way (Battlefields listed below)	number	2	1	1	1 (DHR eligible)
National Register-Eligible and –Listed Properties, Battlefields, Historic Landscapes, and National Historic Landmarks within 0.5 mile of centerline	number	5	1	0	1 (NRHP/VLR), 1 (DHR eligible)
National Register-Listed Properties, Battlefields, Historic Landscapes, and National Historic Landmarks between 0.5 and 1.0 mile of centerline	number	1	1	1	0
National Historic Landmarks between 1.0 and 1.5 miles of centerline	number	1	0	0	0
Historic Districts (VDHR) Crossed	miles	<0.1	0.1	<0.1	4.1
	(number)	1 (eligible)	1 (eligible)	1 (eligible)	1 (eligible)
Easements (VDHR) Crossed	miles	0.0	0.0	0.0	0.0
	(number)	0	0	0	0
Battlefields (NPS, ABPP, VDHR)					
Battlefields Crossed	miles	0.0	0.0	0.0	0.0
	(number)	0	0	0	0
Geological or Physical Constraints					
Mines or Mining Areas Crossed	miles	0.0	0.0	0.0	0.0
Visual Features/Constraints					
Length Parallel to Scenic Byway/Road	miles	0.0	0.0	0.0	0.0
Engineering Constraints					
Total Length	miles	12.9	6.1	5.2	7.2
Roads Crossings (total)	number	57	44	47	30

TABLE 4-1

Idylwood-Tysons 230 kV Underground Transmission Line Project
Environmental Features Comparison Table – Overhead Routes

Environmental Features	Unit	OH 01	OH 02	OH 03	OH 04
U.S. or State Highways (including on/off ramps)	number	34	39	42	15
County or Local Roads	number	23	5	5	15
Existing Electric Facilities Crossed	number	6	2	1	6
VDOT Impacts					
Length of Existing ROW Within VDOT ROW	miles	1.9	0.8	<0.1	0.3
Length of New ROW Within VDOT ROW	miles	0.0	2.3	2.2	0.0
Crossings of VDOT Limited Access Freeways	number	3	4	8	2
Existing Crossings of VDOT Limited Access Freeways	number	3	2	2	2
Structures on VDOT ROW	number	16	31	18	0
Structures inside VDOT Soundwall	number	0	3	2	0
Forest land in VDOT ROW	acres	2.3	8.3	1.5	0.1
MWAA Impacts					
Length of Existing ROW Within MWAA ROW	miles	0.7	0.4	0.4	0.0
Length of New ROW Within MWAA ROW	miles	0.0	0.3	0.2	0.0
Crossings of MWAA Freeways	number	1	2	2	0
Existing Crossings of MWAA Freeways	number	1	1	1	0
Structures on MWAA ROW	number	7	6	6	0
Structures inside MWAA Soundwall	number	0	0	0	0
Forest land in MWAA ROW	acres	4.9	3.2	3.2	0.0
Routing Opportunities					
Collocation Opportunities (total)	miles	12.9	6.1	5.2	7.2
	(percent)	100	100	100	100
Road	miles	0.0	2.6	3.4	0.0
Electric Line	miles	8.6	1.5	0.8	7.2
Electric Line and Road	miles	4.3	2.0	1.0	0.0

[1] Rebuild portions of the routes follow Dominion Energy Virginia's existing rights of way. Dominion Energy Virginia operates the existing lines within various easement widths and types. In certain portions of the routes, Dominion Energy Virginia has a pole line easement as described in Section 3.6. The existing easement widths vary depending on the location.

- Overhead Route 01 existing right-of-way width varies between 35 and 100 feet.
- Overhead Route 02 existing right-of-way width varies between 50 and 100 feet.
- Overhead Route 03 existing right-of-way width varies between 60 and 100 feet.
- Overhead Route 04 existing right-of-way width varies between 27 and 100 feet.

[2] Dominion Energy Virginia has a 100-foot easement along NOVA Parks W&OD Park trail. No new easement is required to construct a double circuit 230 kV line along the W&OD Park trail

[3] The development of new right-of-way within 60 feet of a residence would invoke the provisions of Va. Code § 56-49.

The majority (50 percent) of lands crossed by Overhead Route 02 is VDOT right-of-way, about 23 percent (1.4 miles) are private lands, 22 percent (1.3 miles) is MWAA right-of-way, and 5 percent (0.3 mile) are local government lands. The right-of-way along Overhead Route 02 is primarily open land (3.6 miles or 59 percent) and developed lands (2.0 miles or 32 percent). Other land uses that would be crossed by Overhead Route 02 consist of about 0.5 mile (9 percent) of forested land, and <0.1 mile (<1 percent) of wetlands. Development of this route would require the clearing of about 12.8 acres of trees. Of these 12.8 acres, 12.7 are within the expanded right-of-way, 8.3 of those are within the VDOT right-of-way, and 3.2 are in the MWAA right-of-way.

The majority (49 percent) of lands crossed by Overhead Route 03 consists of VDOT right-of-way, about 29 percent (1.5 miles) are private lands, 12 percent (0.7 mile) is MWAA right-of-way, and 10 percent (0.5 mile) are local government lands. The right-of-way along Overhead Route 03 is primarily developed land (2.7 miles or 52 percent) and open lands (1.9 miles or 37 percent). Other land uses that would be crossed by Overhead Route 03 consist of about 0.6 mile (11 percent) of forested land. Development of this route would require the clearing of about 7.4 acres of trees. Of these 7.4 acres, 6.5 are within the expanded right-of-way, 3.2 acres are within the MWAA right-of-way, and 1.5 acres are within VDOT right-of-way.

Along Overhead Route 04, the majority (71 percent) of lands crossed is local government owned, about 1.7 miles (24 percent) private lands, and 5 percent (0.4 mile) is VDOT right-of-way. The right-of-way along Overhead Route 04 is primarily forested (2.9 miles or 40 percent) and developed lands (2.2 miles or 31 percent). Other land uses that would be crossed by Overhead Route 04 consist of about 1.9 mile (26 percent) of open land, and 0.2 mile (3 percent) of wetlands. Development of this route would require the clearing of about 16.0 acres of trees. Of these 16.0 acres, 3.7 are within the expanded right-of-way and 0.1 acre is within VDOT right-of-way.

4.1.2 Recreational Use

Overhead Route 01

All of the recreation areas crossed by Overhead Route 01 are currently crossed by the existing right-of-way. The crossed recreation areas include Kent Gardens Greenway Stream Valley Park (MPs 2.6-2.8, 3.1-3.3), Kent Gardens Park (MPs 3.4-3.6), Langley Oaks Park (MPs 7.4-7.8), McLean Little League Park (MPs 2.9), McLean Hamlet Park (MPs 12.0-12.2), Pimmit Run Stream Valley Park (MPs 2.8, 3.7, 3.9, 4.2-4.4, 4.6, 4.7), Potomac Hills Park, Ruckstuhl Park (MP 0.9), Scott's Run Nature Preserve (MPs 9.4-9.6), Timberly Park (MP 10.7), Turkey Run Park (MPs 6.0-8.7), and W&OD Park (MP 0.2). The existing right-of-way would need to be expanded for this route. This expansion would require tree clearing along the route, which may cause permanent visual impacts. Temporary impacts during construction may occur including restricted access to these recreation areas; however, no long-term access restrictions are expected to occur. Overhead Alternative 01 crosses a section of the Great Falls Loop Virginia Birding and Wildlife Trail. Given the developed nature of the trail that follows major roadways through the Project area and the fact that these roads would be spanned by the overhead route, no impacts to the trail are expected.

Overhead Route 02

Overhead Route 02 crosses W&OD Park, Ruckstuhl Park, and McLean Hamlet Park along Dominion Energy Virginia's existing right-of-way. This expansion would require tree clearing along the route, which may cause permanent visual impacts. Temporary impacts during construction may occur including restricted access to these recreation areas; however, no long-term access restrictions are expected to occur. Overhead Alternative 02 crosses a section of the Great Falls Loop Virginia Birding and Wildlife Trail. Given the developed nature of the trail that follows major roadways through the Project area and the fact that these roads would be spanned by the overhead route, no impacts to the trail are expected.

Overhead Route 03

Overhead Route 03 crosses W&OD Park and McLean Hamlet Park along Dominion Energy Virginia's existing right-of-way. Potential impacts from these crossings are similar to those described for Overhead Route 02 above. Overhead Route 03 is also located within the existing Tysons Corner Center Pedestrian/Bike Trail. It is likely that the trail would need to be permanently closed or relocated if Overhead Route 03 were constructed. Overhead Alternative 03 crosses a section of the Great Falls Loop Virginia Birding and Wildlife Trail. Given the developed nature of the trail that follows major roadways through the Project area and the fact that these roads would be spanned by the overhead route, no impacts to the trail are expected.

Overhead Route 04

Overhead Route 04 follows W&OD Park between MPs 0.3 and 4.2. The entirety of this crossing is collocated with Dominion Energy Virginia's existing right-of-way. Temporary impacts during construction may occur including restricted access or reroutes of the trail. The right-of-way of Overhead Route 04 extends slightly into the Vienna Community Center and Waters and Caffi Fields near MP 3.1. This portion of the park is a parking lot and not impacts are expected.

The right-of-way extends slightly into the Vienna Town Green near MP 3.3. Temporary impacts during construction may occur including restricted access; however, no long-term access restrictions are expected to occur.

The right-of-way crosses Northside Park from MP 4.1 to 4.4, Waverly Park at MP 5.2, and Foxstone Park from MP 5.3 to 5.5. These crossings are all located within Dominion Energy Virginia's existing right-of-way; however, the right-of-way will require expansion of the existing right-of-way resulting in tree clearing, which may cause permanent visual impacts. During constriction, there may be temporary impacts that may restrict access to recreation areas.

Overhead Alternative 04 crosses a section of the Great Falls Loop Virginia Birding and Wildlife Trail, which follows I-495 through the Project area. Given the developed nature of the trail that follows major roadways through the Project area and the fact that these roads would be spanned by the overhead route, no impacts to the trail are expected.

4.1.3 Residential, Existing, and Planned Developments

Overhead Route 01

Overhead Route 01 crosses 11.2 miles of land zoned residential. There are 1,154 single-family residences and 15 multi-family residential buildings within 500 feet of the Overhead Route 01 centerline. There are 305 single-family residences and three multi-family buildings within 200 feet of the centerline and 107 single-family residences and two multi-family buildings within 100 feet of the centerline. One hundred single-family residences and two multi-family building are located within 60 feet of the new or expanded Overhead Route 01 right-of-way.

Within the existing Overhead Route 01 right-of-way there are no single-family residences, no multi-family buildings, 12 industrial/commercial/public buildings, and 23 outbuildings. Where Overhead Route 01 right-of-way will be expanded, there are 13 single-family residences, two multi-family buildings, three industrial/commercial/public buildings, and six outbuildings within the right-of-way.

No planned developments would be crossed by Overhead Route 01.

Overhead Route 02

Overhead Route 02 crosses 2.9 miles of land zoned residential. There are 738 single-family residences and 19 multi-family residential buildings within 500 feet of the Overhead Route 02 centerline. There are 186 single-family residences and four multi-family buildings within 200 feet of the centerline and 40 single-family residences and two multi-family buildings within 100 feet of the centerline. Twenty-six single-family residences and two multi-family buildings are located within 60 feet of the new or expanded Overhead Route 02 right-of-way.

Within the existing Overhead Route 02 right-of-way there are no single-family residences, no multi-family buildings, four industrial/commercial/public buildings, and nine outbuildings. Within the new or expanded portions of the Overhead Route 02 right-of-way, there are eight single-family residences, two multi-family buildings, no industrial/commercial/public buildings, and four outbuildings.

No planned developments would be crossed by Overhead Route 02.

Overhead Route 03

Overhead Route 03 crosses 2.1 miles of land zoned residential. There are 374 single-family residences and seven multi-family residential buildings within 500 feet of the Overhead Route 03 centerline. There are 80 single-family residences and one multi-family building within 200 feet of the centerline and 18 single-family residences within 100 feet of the centerline. Twelve single-family residences are located within 60 feet of the new or expanded Overhead Route 03 right-of-way.

Within the existing Overhead Route 03 right-of-way there are no single-family residences, no multi-family buildings, no industrial/commercial/public buildings, and one outbuilding. Within the new or expanded Overhead Route 03 right-of-way, there are no single-family residences, no multi-family buildings, three industrial/commercial/public buildings, and three outbuildings.

The Overhead Route 03 right-of-way crosses four planned developments for a total of about 2.9 acres. The route crosses Tysons Technology Center near MP 3.8 for less than 0.1 mile. The portion of the planned development crossed would consist of parking spaces and open space buffer between the parking lot and the highway. No impacts are expected to the development. Overhead Route 03 crosses Towers Crescent for about 0.1 mile between MPs 2.5 and 2.6. This portion of the development has already been constructed and no impacts to the planned portion of the development would occur. The route crosses Tysons Corner Center for about 0.2 mile between MPs 2.6 and 2.8. Similar to Towers Crescent, the route will cross Tysons Corner Center along a portion of the development where construction has been completed and no impacts to the planned portions of the development would occur. Lastly, the route will cross Tysons Overlook near MP 3.8 for less than 0.1 mile. The right-of-way barely crosses the northeastern most portion of the development area and no impacts are expected to occur.

Overhead Route 04

Overhead Route 04 crosses 6.7 miles of land zoned residential. There are 1,225 single-family residences and seven multi-family residential buildings within 500 feet of the Overhead Route 04 centerline. There are 383 single-family residences and three multi-family buildings within 200

feet of the centerline and 157 single-family residences within 100 feet of the centerline. One hundred and eight single-family residences are located within 60 feet of the new or expanded Overhead Route 04 right-of-way.

Within the existing Overhead Route 04 right-of-way there are no single-family residences, no multi-family buildings, 11 industrial/commercial/public buildings, and 19 outbuildings. Within the new or expanded Overhead Route 04 right-of-way, there are 51 single-family residences, no multi-family buildings, two industrial/commercial/public buildings, and eight outbuildings.

The Overhead Route 04 right-of-way crosses four planned developments for a total of about 3.2 acres. The east side of right-of-way of Overhead Route 04 crosses the Dominion Square planned development from MP 6.6 to 6.8, while the west side crosses Sunburst at Spring Hill Metro from MP 6.6 to 6.7. The portion of Sunburst at Spring Hill Metro that would be crossed consists of open space and a parking lot. Some impacts may occur as there is a swimming pool adjacent to the right-of-way in this area. The portion of the Dominion Square planned development crossed appears to be primarily open space between planned and existing buildings. No impacts are expected to this planned development. Overhead Route 04 will cross about 0.1 mile of The View planned development. The portion of the development crossed includes open space and buildings. Impacts on this development would occur if Overhead Route 04 were constructed. Lastly, Overhead Route 04 will cross about 0.1 mile of Spring Hill Station planned development. The portion of the development crossed includes open space, a proposed road, and park. Impacts on this development would occur if Overhead Route 04 were constructed.

4.1.4 Zoning

Overhead Route 01 would cross the following zoning districts: Residential (11.2 miles or 87 percent), Uncategorized/right-of-way (1.2 miles or 9 percent), Planned Units (0.4 mile or 3 percent), Commercial (0.1 mile or 1 percent), and Industrial (less than 0.1 mile or less than 0.1 percent).

Overhead Route 02 would cross the following zoning districts: Residential (2.9 miles or 47 percent), Uncategorized/ right-of-way (2.9 miles or 47 percent), Planned Units (0.2 mile or 3 percent), Commercial (0.1 mile or 2 percent), and Industrial (less than 0.1 mile or less than 0.1 percent).

Overhead Route 03 would cross the following zoning districts: Residential (2.1 miles or 40 percent), Uncategorized/ right-of-way (2.1 miles or 40 percent), Planned Units (0.7 mile or 13 percent), and Commercial (0.3 mile or 6 percent), and Industrial (less than 0.1 mile or 1 percent).

Overhead Route 04 would cross the following zoning districts: Residential (6.7 mile or 93 percent, Uncategorized/right-of-way (0.2 mile or 3 percent), and less than 0.1 mile to 0.1 mile each of Industrial, Tysons, Commercial, and Other totaling 0.4 mile or 7 percent.

4.1.5 Conservation Lands

Overhead Route 01 would cross four Fairfax County conservation easements within the existing right-of-way and 10 (six of which are new crossings) along the expanded right-of-way. These crossings total 3.0 acres of impact. Overhead Route 02 would cross three Fairfax County conservation easements within the existing right-of-way and seven (four of which are new

crossings) along the expanded right-of-way. These crossings total 2.3 acres of impact. Overhead Route 03 would cross two Fairfax County conservation easements (totaling 0.1 acre), both of which are new crossings along new right-of-way. Overhead Route 04 would cross four Fairfax County conservation easements within the existing right-of-way. These four easements are also crossed by the expanded right-of-way and total 2.2 acres of impact.

4.1.6 Transportation

As noted in Table 4-1, Overhead Route 01 would cross or would be installed within a total of 57 roads, Overhead Route 02 would cross a total of 44 roads, Overhead Route 03 would cross a total of 47 roads, and Overhead Route 04 would cross a total of 30 roads. All road crossings for the Overhead Routes would be spanned.

The Overhead Routes cross several transportation projects in various stages of development. As noted in Table 4.1.6-1, these projects include large-scale highway construction as well as bike and pedestrian trail improvements. A description of all known projects crossed by the Overhead Routes is provided below.

TABLE 4.1.6-1

Idylwood-Tysons 230 kV Underground Transmission Line Project
Transportation Projects Crossed by Overhead Routes

Project Name	Scope	Status	Route Crossing(s)
I-495 Express Lanes Ped/Bike at Chain Bridge Road	Both sides from Old Meadow Road to Tysons Boulevard	On Hold	Overhead 03
I-495 Express Lanes Ped/Bike at Idylwood Road (North)	North side from I-495 to Shreve Hill Road	On Hold	Overhead 03
I-66 Inside the Beltway Tolling from I-495 (Capital Beltway) to U.S. Route in Rosslyn	Convert I-66 inside the Beltway into a managed express lane facility in peak directions	Construction	Overhead 01, 02, 03, and 04
Jones Branch Connector	Final Design for extension of Scotts Crossing Rd from Jones Branch Drive to Dolley Madison Blvd. over I-495 and the I-495 Express Lanes"	Construction	Overhead 03
Pavement Marking Plans (TMSAMS)	Install bike lanes on Margarity Road, Westmoreland Street, Madrillon Road through repavement projects	Design	Overhead 02
Route 7 Widening from Route 123 to I-495 (Study Only)	Conceptual Design and traffic operations study to determine future cross section	Study	Overhead 03
Vesper Court Trail (TMSAMS)	Trail from Vesper Court to Route 7 at Spring Hill Road	Design	Overhead 04

I-495 Express Lanes Ped/Bike at Chain Bridge Road

The I-495 Express Lanes Ped/Bike at Chain Bridge Road project is crossed by Overhead Route 03 at MP 3.0. As a follow-up project to the recently completed I-495 Express Lanes, this project will complete pedestrian and bicycle facility connections along Idylwood Road (Route 695) and Chain Bridge Road (Route 123), providing enhanced and safer pedestrian and bicycle access at I-495 in Fairfax County.

On Idylwood Road, a five-foot wide sidewalk will be constructed on the south side of the Idylwood Bridge across I-495, connecting with the sidewalk on the bridge. On Chain Bridge Road, a 10-foot-wide shared-use path will be constructed on the south side of I-495 between Tysons Boulevard and Old Meadow Road.

Two primary alternatives remain under consideration: one adjacent to Chain Bridge Road and one adjacent to the end of Old Meadow Road. The construction schedule will be determined once the preferred location and design is selected. Construction is anticipated from summer 2018 to summer 2020.

I-495 Express Lanes Ped/Bike at Idylwood Road (North)

The I-495 Express Lanes Ped/Bike at Idylwood Road (North) project is crossed by Overhead Route 03 at MP 1.0. The project will complete missing pedestrian facilities outside the limits and original scope of the I-495 Express Lanes Project. VDOT held a public hearing in June 2014. The project is on hold pending resolution of final alignment of the I-495 Express Lanes Ped/Bike at Chain Bridge Road project.

I-66 Inside the Beltway Tolling from I-495 (Capital Beltway) to U.S. Route in Rosslyn

The I-66 Inside the Beltway Tolling from I-495 (Capital Beltway) to U.S. Route in Rosslyn project is crossed by Overhead Routes 01, 02, 03, and 04 at MPs 0.4, 0.4, 0.5 and 0.5, respectively. The project includes the following components: converting I-66 inside the Beltway to dynamically-priced toll lanes during rush hours in the peak directions. High occupancy vehicles (HOV) and buses will travel the lanes for free, while others must pay a toll and widening of I-66 eastbound from the Dulles Connector Road to Ballston with the additional eastbound lane opening in late 2020.

The project is currently underway with tolling and implementation of initial multimodal projects anticipated in August 2017.

Jones Branch Connector

The Jones Branch Connector Project is crossed by Overhead Route 03 at MP 3.6. The project will provide a new link to Route 123 over the Capital Beltway (I-495) for commuters and visitors to Tysons. The link will improve local traffic and access for drivers, as well as provide an option for area bicyclists and pedestrians.

The 0.5-mile project includes new roadway from the interchange of the I-495 Express Lanes and Jones Branch Drive to Scotts Crossing Road. Improvements will also be made along the access road from Jones Branch Drive to the Express Lanes, as well as along Scotts Crossing Road. The project features includes two travel lanes and on-street bike lanes in each direction, three bridges over the I-495 Express and general-purpose lanes, 8- to 12-foot-wide lighted sidewalks, landscaping and other streetscape amenities, and a wide, raised median to accommodate the future Tysons Circulator bus.

The Jones Branch Connector Project is currently under construction and the estimated completion date is late 2019.

Pavement Marking Plans

The Pavement Marking Plans project is crossed by Overhead Route 02 at MP 3.5. The project is part of the Third Four-Year Transportation Program approved by the Board of Supervisors in 2012. Westmoreland bicycle lanes are being extended in fall 2017 from Haycock Road to Hopewood Drive as part of VDOT repaving. Design for Westmoreland Street project completed

by VDOT and Magarity Road and Madrillon Road will be reviewed for bicycle facilities when scheduled for future repavement. This project is currently under design.

Route 7 Widening from Route 123 to I-495

The Route 7 Widening from Route 123 to I-495 is under study, crossed by Overhead Route 03 at MP 2.2. A conceptual design and traffic operations study to underway to determine the future road cross section.

Vesper Court Trail

The Vesper Court Trail runs parallel to Overhead Route 04 between MPs 6.5 and 6.8. The trail is identified as part of the bicycle master planning process for Tysons, this project involves construction of an asphalt shared use path including a bridge spanning Old Courthouse Spring Branch. This trail will connect Vesper Court with Route 7 at Spring Hill Road providing enhanced pedestrian and bicycle access from the North Vienna area. Construction is pending authorization from VDOT with completion anticipated in spring 2018.

Silver Line

No impacts to the WMATA Silver Line including existing and planned metro stations are expected along any of the Overhead Routes.

VDOT and MWAA

All of the Overhead Routes require multiple crossings of limited access roadways (see table 4. 1.6-2). For VDOT managed roadways, Overhead Route 01 requires three crossings and Overhead Route 04 requires two crossings of limited access roadways. In the case of these two routes, the crossings would replace existing crossings. Overhead Route 02 requires four crossings and Overhead Route 03 requires eight crossings of limited access roadways. Of these crossings, two along Overhead Route 02 are new crossings, and six along Overhead Route 03 are new crossings. Of these new crossings, four along Overhead Route 02 and eight along Overhead Route 03 would be non-perpendicular to the roadway. Additionally each of these routes would require expansion of existing rights-of-way or new rights-of-way parallel to a VDOT right-of-way resulting in tree clearing. For Overhead Routes 02 and 03, 2.3 miles and 2.2 miles, respectively, would be within VDOT right-of-way and parallel to a limited access roadway. For Overhead Routes 02 and 03, tree clearing of 8.3 acres (Overhead Route 02) and 1.5 acres (Overhead Route 03), would be required, primarily resulting from the construction new right-of-way.

TABLE 4.1.6-2

Idylwood-Tysons 230 kV Underground Transmission Line Project
Overhead Routes Crossings of VDOT and MWAA Limited Access Rights-of-Way

Overhead Route	Crossing MP	Crossing Length (feet)	ROW Crossed	VDOT or MWAA	Existing or New	Perpendicular or Non-Perpendicular
01	0.5	305	I-66	VDOT	Existing	Perpendicular
	2.3	440	VA-267	VDOT	Existing	Non-Perpendicular
	9.3	375	I-495	VDOT	Existing	Non-Perpendicular
	12.7	596	Dulles Toll Road	MWAA	Existing	Non-Perpendicular
02	0.5	305	I-66	VDOT	Existing	Perpendicular
	3.3	315	VA-267	VDOT	New	Non-Perpendicular

TABLE 4.1.6-2

Idylwood-Tysons 230 kV Underground Transmission Line Project
Overhead Routes Crossings of VDOT and MWAA Limited Access Rights-of-Way

Overhead Route	Crossing MP	Crossing Length (feet)	ROW Crossed	VDOT or MWAA	Existing or New	Perpendicular or Non-Perpendicular
	3.7	368	VA-267	VDOT	New	Non-Perpendicular
	4.6	525	I-495	VDOT	New	Non-Perpendicular
	4.8	602	Dulles Toll Road	MWAA	New	Non-Perpendicular
	6.0	596	Dulles Toll Road	MWAA	Existing	Non-Perpendicular
03	0.3	378	I-66	VDOT	Existing	Non-Perpendicular
	0.6	405	I-495	VDOT	Existing	Perpendicular
	0.8	878	I-495	VDOT	New	Non-Perpendicular
	1.0	352	I-495	VDOT	New	Non-Perpendicular
	1.3	408	I-495	VDOT	New	Non-Perpendicular
	1.6	457	I-495	VDOT	New	Non-Perpendicular
	1.8	430	I-495	VDOT	New	Non-Perpendicular
	2.0	602	I-495	VDOT	New	Non-Perpendicular
	3.9	596	Dulles Toll Road	MWAA	New	Non-Perpendicular
	5.1	530	Dulles Toll Road	MWAA	Existing	Non-Perpendicular
04	0.3	378	I-66	VDOT	Existing	Perpendicular
	0.6	405	I-495	VDOT	Existing	Perpendicular

The VDOT Northern Virginia District Office reviewed the Overhead Routes and provided comments in a letter dated August 11, 2017 (VDOT, 2017). The VDOT comments include general comments and recite the applicable regulations found in 24 VAC 30-151-310 - *Utility installations within limited access highways.* General comments on the Overhead Routes include possible contention over local road and limited access right-of-way crossings, the need for Central Office Approval for crossings of I-66 and I-495, the prohibition of tree removal within limited access right-of-way, and the need for MWAA approval of Toll Road crossings. Specific comments on the routes are summarized in Table 4.1.6-3 and provide preliminary feedback from VDOT on the Overhead Routes.

TABLE 4.1.6-3

Idylwood-Tysons 230 kV Underground Transmission Line Project
Specific VDOT Comments on Overhead Routes

Overhead Route	VDOT Comments
01	• Total Length within the VDOT ROW is minimal and will be on an existing running line. • No new overhead crossings of limited access highways. • GW Parkway right of way may come into play requiring Park Authority approval. • This route will have limited disruption to traffic as compared to the other routes. • Significant impacts to parks and schools. • Route 01 has the least new overhead crossings of exit/entrance ramps, structures on VDOT right-of-way and structures within soundwall. • Route 01 is the Overhead Route with the least impacts to VDOT roadways.
02	• New construction at Route 123 and I-495 with new crossings. • May affect future road expansion for the Dulles Toll Road (Route 267). • Major traffic impacts during construction.

TABLE 4.1.6-3

Idylwood-Tysons 230 kV Underground Transmission Line Project
Specific VDOT Comments on Overhead Routes

Overhead Route	VDOT Comments
03	• Majority of the route is within I-495 with multiple new crossing of I-495, Route 7 and Route 123. • Many of the crossings of I-495 are not perpendicular to the highway alignment. Overhead crossings shall be located on a line that is perpendicular to the highway alignment. • Significant traffic impacts during construction. • Future maintenance of the line is a critical issue. Maintenance operations may require closing of I-495 lanes. Traffic volumes on I-495 are high and closing of lanes on this roadway can affect regional traffic operations. • May affect future road expansion of I-495. • From the VDOT perspective, Overhead 03 is the least favored overhead option.
04	• No comments received to date.

For MWAA managed roadways, Overhead Route 01 requires one crossing of Dulles Toll Road, which replaces an existing non-perpendicular crossing. Overhead Routes 02 and 03 each require two crossings of the Dulles Toll Road including one new crossing along each route. Neither of the crossings would be perpendicular (90 degrees) to the roadway. Additionally, three of the routes would require expansion of existing rights-of-way or new rights-of-way parallel to a MWAA right-of-way resulting in tree clearing. For Overhead Route 01, 0.7 mile of the route would be within existing MWAA right-of-way and parallel to the Dulles Access Toll Road. In the case of this route, tree clearing of 4.9 acres would result from expanding existing rights-of-way. For Overhead Routes 02 and 03, 0.4 mile would be within MWAA right-of-way and parallel to a limited access roadway. Tree clearing of 3.2 acres would be required for both Overhead Routes 02 and 03, which would primarily be the result of constructing new right-of-way. Overhead Route 04 would not run parallel to or cross MWAA right-of-way. The company also corresponded with MWAA and requested their review the Overhead Routes (see Attachment 2.N.2 to the DEQ Supplement).

4.1.7 Environmental Constraints

4.1.7.1 Wetlands

ERM reviewed National Wetland Inventory wetland data to calculate impacts on wetlands along the Overhead Routes. Based on this review, the routes would impact the following amounts of wetlands

- Overhead Route 01 contains approximately 9.0 acres of wetlands crossings, 6.0 of which are within the existing right-of-way and 3.0 within the expanded right-of-way. These 9.0 acres consist of 2.0 acres of PEM wetlands, 6.0 acres of PFO wetlands, and 1.0 acre of ponded wetland.

- Overhead Route 02 contains approximately 0.7 acre of wetlands crossings, 0.7 of which are within the existing right-of-way and less than 0.1 within the expanded right-of-way. These 0.7 acre consist entirely of ponded wetlands.

- Overhead Route 03 contains less than 0.1 acre of wetlands crossings located within the expanded right-of-way. This acreage consists entirely of ponded wetlands.

- Overhead Route 04 contains approximately 2.3 acres of wetlands crossings, 1.3 of which are within the existing right-of-way and 1.0 within the expanded right-of-way. These 2.3 acres consist entirely of forested wetlands.

To minimize impacts on wetland areas, the transmission line would be designed to span or avoid wetlands where possible. Most of the wetlands in the area of the Overhead Routes are associated with streams and rivers, and it is anticipated that these features can be spanned keeping tower locations outside of wetlands. Where the removal of trees or shrubby vegetation occurs within wetlands, Dominion Energy Virginia would use the least intrusive method reasonably possible to clear the corridor. Hand-cutting of vegetation would be conducted, where needed, to avoid and minimize impacts on streams and/or wetlands. There would be no change in contours or redirection of the flow of water, and the amount of spoilage from foundations and structure placement would be minimal. Excess soil in wetlands generated through foundation construction would be removed from the wetland.

Mats would be used for construction equipment to travel over wetlands, as appropriate. Where new rights-of-way cross wetlands, some new access roads may be necessary. If a section of line cannot be accessed from existing roads, Dominion Energy Virginia may need to install a culvert, ford, or temporary bridge along the right-of-way to cross small streams. In such cases, some temporary fill material in wetlands adjacent to such crossings may be required. This fill would be placed on erosion control fabric and removed when work is completed, returning ground elevations to original contours. Potential direct impacts on wetlands would be temporary in nature, but a reduction in wetland functions and values would occur where tree clearing within wetlands is necessary.

4.1.7.2 Waterbodies

Based on ERM's desktop waterbody analysis, the follow waterbody impacts include:

- Overhead Route 01 crosses 32 waterbodies, including 5 intermittent streams, 1 open water pond and 26 perennial streams. None of these streams are greater than 100-feet-wide and no open water is crossed.

- Overhead Route 02 crosses eight waterbodies, including four intermittent streams and four perennial streams. None of these stream crossings are greater than 100-feet-wide and no open water is crossed.

- Overhead Route 03 crosses five waterbodies including one perennial stream crossings and four intermittent streams. None of these streams are greater than 100-feet-wide. The crossings include no open waterbodies.

- Overhead Route 04 crosses eleven waterbodies including ten perennial stream crossings and one intermittent stream. None of these streams are greater than 100-feet-wide. The crossings include no open waterbodies.

The four Overhead Routes would have the following average span lengths respectively; 368 feet, 435 feet, 534 feet, and 434 feet. These span lengths would likely be adequate to span the waterbodies identified along the Overhead Routes. However, tree clearing would likely be required within the forested riparian areas at the crossing locations. Avoidance of waterbodies would be incorporated where possible. Overhead Routes would likely have an effect on surface waters along these routes due to the removal of forested riparian areas adjacent to streams.

Short-term, minor water quality impacts could occur during the construction of the Overhead Routes. Such impacts would be associated with the soils from disturbed areas being transported by stormwater into adjacent waters during rain events. Increased turbidity and localized sedimentation of the stream bottom may occur as a result of the runoff. However, these impacts would be significantly reduced by the implementation of the Company's erosion control measures, including the installation of erosion control structures and materials.

Waterways crossed by the project would be maintained for proper drainage through the use of culverts or other crossing devices, according to Dominion Energy Virginia's standard policies. Where clearing of trees and/or woody shrubs is required, clearing within 100 feet of a stream would be conducted by hand. Vegetation would be cut at or slightly above ground level, and there would be no grubbing of stumps. Dominion Energy Virginia would use sediment barriers along waterways and steep slopes during construction to protect waterways from soil erosion and sedimentation. If a section of line cannot be accessed from existing roads, Dominion Energy Virginia may need to install a culvert, or temporary bridge to cross small streams. In such case, there may be some temporary fill material required that would be placed on erosion control fabric and removed when work is completed, returning the surface to original contours.

According to the U.S. Army Corps of Engineer documentation, no waters considered navigable under Section 10 of the Rivers and Harbors Act would be crossed by any of the Overhead Routes.

4.1.7.3 Resource Protection Areas and Areas of Ecological Significance

When assessing RPA crossings, the Overhead Routes cross at least four RPAs each. Overhead Route 01 crosses nine RPAs, the most number out of all routes. In addition, Overhead Route 01 follows an RPA within its boundaries for approximately 3.7 miles. Overhead Route 02 crosses four RPAs totaling 0.9 mile, and Overhead Route 03 and Overhead Route 04 cross six RPAs totaling 0.7 mile and 0.9 mile, respectively. Of the Overhead Routes, Overhead Route 02 would impact the least amount of RPAs, and Overhead Route 01 would impact the most amount of RPAs.

When assessing VDCR natural heritage area crossings, Overhead Route 01 is the least favorable of the Overhead Routes. No routes cross an SCU, and only one route, Overhead Route 01, crosses one CS. In addition, Overhead Route 01 crosses the CS for approximately 2.7 miles. Overhead Route 01 also crosses the most number of GLNHRs (3), whereas the other routes cross only one or two GLNHRs. Overhead Route 02 crosses the fewest natural heritage areas, a single GLNHR.

4.1.7.4 Protected Species

Overhead Route 01 and Overhead Route 04 utilize existing utility corridors, which provide ideal foraging habitat for bats where the powerline rights-of-way create herbaceous corridors through forested areas. Overhead Route 01 utilizes the greatest amount of this habitat, approximately 4.5 miles.

Based on a review of the species' habitat requirements, none of the routes appear to contain suitable habitat for small-whorled pogonia.

When considering potential impacts on freshwater mussels and other stream-dependent species such as Appalachian springsnail, each Overhead Route crosses at least one perennial stream,

most of which have the potential to contain protected freshwater mussels. Overhead Route 01 crosses more waterbodies than the other routes. Overhead Route 01 crosses 26 perennial waterbodies, Overhead Route 02 crosses four perennial waterbodies, Overhead Route 03 crosses one perennial waterbody, and Overhead Route 04 crosses 10 perennial waterbodies. It is worth noting that depending on the methods used to cross each waterbody, the potential impacts resulting from each route are variable, and impacts, if any, would only occur during the construction period.

When considering possible impacts to peregrine falcon and loggerhead shrike, routes that utilize edge habitats and existing utility corridors have the greatest relative potential to impact these species. This type of habitat can be found along Overhead Route 01 and Overhead Route 04. Overhead Route 01 crosses the greatest amount of this habitat, about 4.5 miles. However, after the construction period, Overhead Route 01 and Overhead Route 04 would add perching structures for the peregrine falcon and loggerhead shrike, which could benefit individuals of both species. None of the Overhead Routes cross the open grassland habitat suitable for Henslow's sparrow, so there is a very low potential for any route to impact this species. When accounting for the number of bald eagle nest management buffers crossed, no Overhead Route crosses a known bald eagle nest 330-foot or 660-foot management buffer.

The wood turtle is known to occur in Pimmit Run, and is predicted to occur in Turkey Run. Overhead Route 01 and Overhead Route 02 cross Pimmit Run, and Overhead Route 01 also crosses Turkey Run. Overhead Route 01 crosses Pimmit Run 21 times, whereas Overhead Route 02 crosses Pimmit Run once. It is worth noting that depending on the methods used to cross each waterbody, the potential impacts resulting from each route are variable, and impacts, if any, would only occur during the construction period.

4.1.7.5 Vegetation

When accounting for vegetation impacts by each Overhead Route, the routes can be generally divided into two categories: routes that entirely follow an existing roadway and routes that partially follow an existing utility corridor. Overhead Route 02 and Overhead Route 03 parallel roadways and are thus minimally impactful to vegetation. However, where these new routes or expanded routes cross forested lands, impacts on tree cover (12.7 and 6.5 acres, respectively) will occur. Overhead Route 01 and Overhead Route 04 will cross approximately 4.5 and 0.8 miles of herbaceous or shrub-scrub vegetation within existing utility corridors, respectively; however, expansion of these rights-of-way will result in impacts on tree cover of 18.9 acres and 3.7 acres, respectively.

4.1.8 Visual Conditions

Overhead Route 01

The 12.9-mile Overhead Route 01 would follow Dominion Energy Virginia's existing Lines #2035, #2029, and #2108. Visual impacts associated with this route would include the increased visibility of the new transmission poles, and the removal of trees along the route, necessitated by increased right-of-way requirements.

Based on preliminary engineering design, the new transmission poles for Overhead Route 01 would be taller than existing poles, and would include additional conductors. From a distance, these changes would be incremental--the route would continue to use monopoles. Viewers at close range would perceive these changes as more substantial, particularly from residential and

recreational areas such as Potomac School Road (where the existing Line 2035 already runs in front of houses between MPs 5.4 and 5.8) and the trail through park land along Pimmit Run (large portions of the segment between MPs 2.6 and 4.8), where the trail is generally under, parallel to, or within view of the existing Line #2035.

In addition, the increased height of the line for this route could make the tops of support poles visible from locations where they were not previously visible, or more prominent in locations where they are already visible. For example, drivers on I-66 between MPs 0.5 and 1.3 can currently see Line #2035 (including conductors and poles) through or occasionally emerging above existing trees. Similarly, Line #2108 is partly visible through and above trees and behind the sound wall along I-495 and VA 267 between MPs 8.9 and 12.7. Taller poles would likely be visible above the treetops in more locations. Similar effects could occur in residential areas near this route.

Viewers in recreational and residential settings typically expect a higher level of visual quality than in commercial and industrial areas, or along major highways. Due to the length of the route, and especially the amount of forested park land affected, Overhead Route 01 would have substantial visual impacts.

Overhead Route 02

The 6.1-mile Overhead Route 02 would follow Dominion Energy Virginia's existing Lines #2035 and #2108 for about 3.5 miles, and would include a 2.6 mile new-build segment. Visual impacts associated with this route would include the increased visibility of the new transmission poles, and the removal of trees along both the new-build and wreck and rebuild portions of the route.

Based on preliminary engineering design, the new transmission poles for Overhead Route 02 would be taller than existing poles, and would include additional conductors. From a distance, these changes would be incremental. The route would continue to use monopoles; however, viewers at close range would perceive these changes as more substantial.

The increased height of the line for this route could make the tops of support poles visible from locations where they were not previously visible, or more prominent in locations where they are already visible. For example, drivers on I-66 (between MPs 0.5 and 1.3) and VA 267 (between MPs 2.0 and 2.3 and between MPs 4.9 and 5.9) can currently see Line #2035 (including conductors and poles) through or occasionally emerging above existing trees.

Construction of Overhead Route 02 would result in new segments of transmission line visible along VA 267 (between MPs 2.3 and 4.9). This segment of the route would be directly visible adjacent to the highway, and would also require tree removal.

Nearly the entire route of Overhead Route 02 is adjacent to major highways in an urban/suburban setting, an environment where infrastructure such as transmission lines is not out of character with expected visual conditions. As a result, the visual impacts of Overhead Route 02 would be minor to moderate.

Overhead Route 03

The 5.2-mile Overhead Route 03 would follow Dominion Energy Virginia's existing Lines #2035, #202 and #2108 for about 1.8 miles, and following a new alignment, primarily along I-495 and VA 267. Visual impacts associated with this route would include the increased visibility of the

new transmission poles, and the removal of a limited number of trees where Dominion Energy Virginia's existing transmission lines are already visible.

Transmission lines along and across I-495 and VA 267 would be new visual features. These segments of Overhead Alternative 03 would also be visible from residential streets and commercial areas near I-495, VA-267, and the Dulles Toll Road. For example, the line would likely be a new visual element for residences near I-495 between MPs 0.7 and 1.3; the Tysons Executive Village community recreation area on Sandburg Street (MP 1.7); commercial and office areas from MP 1.8 to 3.5; and the Dexter E. Wood Memorial Pond recreation area near MP 3.8.

Nearly all of these areas are within sight of I-495, VA-267, the Dulles Toll Road, or the existing noise walls bordering those roads. Other utilities, such as cell towers, and electrical distribution lines, are generally visible from (or from areas near) these locations. Transmission lines are common features in the overall Tysons area. As a result, while Overhead Alternative 03 would be a new visual feature from the locations described above, it would be an incremental change to existing visual conditions. Therefore, the visual impacts of Overhead Alternative 03 would be minor.

Overhead Route 04

The 7.2-mile Overhead Route 04 would follow Dominion Energy Virginia's existing Lines #2035, #202, and #2010. Visual impacts associated with this route would include the increased size and visibility of the new transmission poles, and the removal of trees along the route, necessitated by increased right-of-way requirements.

From MP 0.2 to 4.2, the route would follow Dominion Energy Virginia's existing Line #202 along the W&OD Park trail. From MP 4.2 to 6.6, the route would pass through residential areas (typically behind homes), as well as Waverly Park, Foxstone Park, and Old Courthouse Spring Branch Stream Valley Park. This includes crossings of recreational trails within Waverly and Foxstone Parks. From MP 6.6 to 7.2, the route would cross through heavily-developed commercial areas. Construction of Overhead Route 04 would require clearing of trees in the recreational and residential areas between MPs 0.0 and 6.6.

Based on preliminary engineering design, the new transmission poles for Overhead Route 04 would be taller than existing poles, and would include additional conductors. Unlike Overhead Routes 01 and 02, little of Overhead Route 04 would be visible from major roads; thus, most views of Overhead Route 04 would be from closer range. This includes views from the W&OD Park trail and other recreational trails directly under the route, as well as from houses adjacent to the route.

Viewers in recreational and residential settings typically expect a higher level of visual quality than in commercial and industrial areas, or along major highways. As a result, Overhead Route 04 would have substantial visual impacts.

4.1.9 Cultural Resources

4.1.10 Cultural Resources Constraints

A full analysis of effects to cultural resources from the Overhead Routes was discontinued when those alternatives were eliminated from consideration. In a general sense, each overhead route

traverses highly developed areas in which modern infrastructure and other intrusive features have impacted the landscape setting of historic resources. Without presenting specific information about how any given overhead route would have affected any given historic resource, it is likely that no resources would have been subject to severe effects from any of the routes. Any viewshed changes resulting from the construction of any of the Overhead Routes would have likely constituted one additional modern element within an already cluttered setting. In the case of linear resources actually crossed by the Overhead Routes—029-0228, 029-0466, and 053-0276 for Overhead Route 01 and 053-0276 for Overhead Routes 02 through 04—although there would be a more obtrusive visual effect where the route would have crossed the resource, the severity of the effect would be minimized by the overall length of the resource, with the majority of the resource remaining unaffected by the transmission line construction. Since the overhead routes have been removed from further consideration, there will be no effects to historic resources from these alternatives. The effects to archaeological sites from any of the Overhead Routes cannot be speculated upon without archaeological investigations to determine the current status of sites (many of which may already have been destroyed), and information about the specific placement of transmission structures where direct effects to archaeological sites would take place. Again, since the overhead routes have been removed from further consideration, there will be no effects to archaeological resources from these alternatives.

4.1.11 Geological Constraints

As indicated in Section 3.5 above, the closest mineral resource is the Turkey Run Quarry located about 0.7 mile from MP 6.8 of Overhead Route 01. No impacts on geological constraints will occur from construction of any of the Overhead Routes.

4.1.12 Engineering Constraints

As discussed above, Dominion Energy Virginia has pole line easements along significant portions of its existing routes. These pole line easements vary in width. The minimum widths for the existing rights-of-way along each route include: Overhead Route 01 at 35 feet; Overhead Route 02 at 50 feet; Overhead Route 03 at 60 feet; and Overhead Route 04 at 27 feet. In each of these cases, the existing rights-of-way will need to be widened to 100 feet accommodate a double circuit 230 kV line. This widening results in conflicts with existing residences and other buildings, requires encroachment into parks and conservation easements and requires tree clearing that are described above.

4.1.13 Routing Opportunities

All of the Overhead Routes are collocated with either existing electric transmission lines, roads, or a combination of the two for the entirety of each route. Overhead Routes 01 and 04 are both collocated with an existing transmission line right-of-way for the entire route (which will require an expanded right-of-way), portions of which are also collocated with roads.

5.0 ANALYSIS OF ROUTES

Considerations relevant to selecting a constructible route from the four Overhead Routes are discussed below. The specific resources associated with some or all of the routes which have a noteworthy variance include the following:

Length of Route – Of the four Overhead Routes considered, Overhead Route 01 represents the longest route at 12.9 miles. This is 5.7 miles longer than the next longest route,

Overhead Route 04, which is 7.2 miles long. After Overhead Route 04, the next longest route is Overhead Route 02 at 6.1 miles long, while Overhead Route 03 is the shortest at 5.2 miles long.

Length of Rebuild vs. New Right-of-Way – Overhead Routes 01 and 04 are existing transmission lines that would be wrecked and rebuilt for the entirety of their lengths, 12.9 and 7.2 miles, respectively. Overhead Route 02 is 3.5 miles (57 percent) wreck and rebuild, while Overhead Route 03 comprises the least amount of wreck and rebuild line 1.8 miles (35 percent).

Percent of Pole Line Easement – Overhead Route 04 has the most pole line easement (44 percent) followed by Overhead Route 01 (26 percent), and Overhead Route 02 (21 percent). Overhead 03, which has the least amount of rebuild, has no pole line easements.

Crossings of Limited Access Roadways – Overhead Route 01 would require four crossings of limited access roadways (VDOT and MWAA) and Overhead Route 04 requires two crossings. The crossings on both of these routes are replacement of existing crossings. Overhead Route 02 requires six crossings of limited access roadways (VDOT and MWAA), three of which would be new and would be non-perpendicular. Overhead Route 03 requires 10 crossings of limited access roadways (VDOT and MWAA), seven of which would be new and would be non-perpendicular.

VDOT Review – VDOT commented that Overhead Routes 01, 02, and 03 would require tree clearing in limited access roadways, which is prohibited by VDOT regulation. Overhead Routes 02, and 03, would result in major impacts during construction. Overhead Route 01 would result in significant impacts on parks and schools but of all the Overhead Routes, it would have the least impacts on VDOT roadways. Overhead Routes 02 and 03 may affect future expansion of the Dulles Toll Road and I-495, respectively. Future maintenance on Overhead Route 03 could require closing I-495 traffic lanes, which could affect regional traffic operations. Of the Overhead Routes, Overhead Route 03 is VDOT's least favored Overhead Route.

Perennial Waterbody Crossings – Overhead Route 01 crosses the most perennial streams (26 crossings), followed by Overhead Route 04 (10 crossings), Overhead Route 02 (4 crossings) and Overhead Route 03 (1 crossing).

Proximity to Residences – Overhead Route 04 would result in the greatest number of residences in close proximity to the right-of-way compared with the other routes. Expansion of the Overhead Route 04 right-of-way will result in 108 houses being within 60 feet of and 51 houses within the expanded right-of-way. Expansion of the Overhead Route 01 right-of-way will result in 100 houses being within 60 feet of and 13 houses within the expanded right-of-way. The number of residences in close proximity to the right-of-way is significantly reduced along Overhead Route 02 at 26 houses within 60 feet of and eight houses within the new or expanded right-of-way. Overhead Route 03 affects the least number of residences in close proximity to the right-of-way, with 12 houses within 60 feet of the new or expanded right-of-way and no houses within the right-of-way.

Forested Lands Affected – Overhead Route 01 will result in the greatest amount of new tree clearing (18.9 acres), while Overhead Route 02 will result in the 12.7 acres of clearing. Overhead Route 03 will result in 6.5 acres of tree clearing while Overhead Route 04 will result in the least amount of tree clearing at 3.7 acres. Overhead Route 2 would have the greatest amount of forest clearing within VDOT and MWAA limited access right-of-ways (8.3 acres VDOT and 3.2 MWAA), followed by Overhead Route 01 (2.3 acres VDOT and 4.9 acres MWAA) and Overhead Route 03 (1.5 acres VDOT and 3.2 acres MWAA). Overhead Route 04 would have

the least amount of forest clearing within VDOT and MWAA limited access right-of-ways (0.1 acre VDOT).

Forested Wetlands Affected – Overhead Route 01 will result in the largest impact on forested wetlands affecting 2.4 acres where the route will be expanded. Overhead Route 04 will result in the next largest impact on forested wetlands with 1.0 acre affected where the route will be expanded. Overhead Routes 02 and 03 will not affect forested wetlands.

Fairfax County Park/Conservation Easement Crossings – Of the Overhead Routes, Overhead Route 01 affects the most Fairfax County parkland requiring a total of 8.9 acres of expansion affecting 8 Fairfax County parks. Overhead Route 04 will require a total of 2.3 acres of expansion within four Fairfax County parks. Overhead Route 02 will require a total of 0.9 acre of expansion affecting two Fairfax County parks and Overhead Route 03 will require 0.7 acre within one Fairfax County park.

In a letter dated November 2, 2017 Fairfax County Park Authority responded to the Company's consultation letter regarding the Project (See Attachment II.A.7.a in the Appendix to this Application for correspondence with the Fairfax County Park Authority). After reviewing the impacts of the various route options on County parks, the Fairfax County Park Authority concluded with respect to the Overhead Routes that Overhead Route 03 would be the most preferable, and Overhead Routes 01 and 02 were the least preferable and are not recommended.

Overhead Route 01 will result in the greatest impact on Fairfax County conservation easements, with the expansion of the existing right-of-way affecting a total of 1.1 acre within 10 conservation easements, of which six are newly affected (i.e., not crossed by the existing right-of-way). Expansion of Overhead Route 04 will require a total 0.6 acre expansion into Fairfax County conservation easements affecting 4 conservation easements, all of which are crossed by the existing right-of-way. Overhead Route 02 will require a total of 0.5 acre expansion of Fairfax County conservation easements within seven conservation easements, four of which are newly affected. Overhead Route 03 affects the least amount of conservation easement, (0.1 acre) within two conservation easements neither of which are crossed by the existing portions of route.

National Park Service Crossings – Overhead Route 01 will cross the George Washington Memorial Parkway, which is managed by the National Park Service; it will require approximately 8.5 acres of new right-of-way across the park. In a letter dated July 26, 2017, the National Park Service responded to the Company's consultation letter regarding the Project (See Attachment C of Appendix A of the Environmental Routing Study for correspondence with the National Park Service). The National Park Service expressed specific concerns regarding the following: the need for additional right-of-way; the approximate 25 foot increase in structure height which would add a visual impact to the park's cultural landscape with an increase to the number of lines and associated risk from trees outside the right-of-way; and, the additional acres of clearing required to make space for the additional circuit. The letter concluded that it is the hope of the National Park Service that Company will not pursue any alternative that "places an action" on National Park Service land.

Overhead Route Conclusions

In general, the use of existing rights-of-way versus creating new rights-of-way is thought to be less impactful; however, in the case Overhead Routes 01 and 04, which utilize the highest

percentage of existing right-of-way of the routes considered, the routes are significantly more impactful when compared to the routes that utilize more new build (greenfield) right-of-way (Overhead Routes 02 and 03). As summarized above and tabulated in Table 4-1, Overhead Routes 01 and 04 are the longest routes, affect the largest amount of Fairfax County parks, conservation easements, and perennial streams, and are the only routes that require expansion within forested wetlands. Of all the overhead routes, Overhead Route 01 results in greatest impacts to forest land, while Overhead Route 04 results in the least. More significantly, Overhead Routes 01 and 04 affect between 4 - 9 times more residences within 60 feet of the edge of expanded right-of-way when compared to Overhead Routes 02 and 03 and would have a significantly greater number of residences located within the rights-of way. The reason for the greater impacts associated with these two particular routes is because large portions of these existing routes cross areas where the Company only has a pole line easement and/or has very narrow right-of-way widths, which include minimum right-of-way widths of 35 feet (Overhead Route 01) and 27 feet (Overhead Route 04) in several locations. These same portions of limited width easements cross through heavily forested park lands, county conservation easements and dense residential areas, where the right-of-way would need to be expanded. In certain cases, expansion of the easement by 65 feet (Overhead Route 01) and 73 feet (Overhead Route 04) will be required to achieve a 100-foot-wide right-of-way along the most restricted stretches of the route. In addition, rebuilding these routes results in less direct (i.e., longer) routes than the routes with new build segments, which were optimized to achieve shorter, more direct routes between the Idylwood and Tysons Substations. Comparing Overhead Routes 01 and 04, Overhead Route 01 result in the most impacts on parks, conservation easements, forest land, perennial streams, and forested wetlands; however Overhead 04 has 4 times as many residences within the expanded right of way. Due to the significantly greater impact on residences, Overhead 04 is the least desirable of these two routes.

Comparing Overhead Routes 02 and 03, Overhead Route 03 is the shortest, affects the least number of residences within 60 feet of the right-of-way and has no residences located within the right-of-way compared to eight residences that would be within the Overhead Route 02 right-of-way. Overhead Route 03 affects the least number of Fairfax County parks and conservation easements and perennial waterbodies and will require significantly less tree clearing than Overhead Route 02.

Considering the information above, Overhead Route 03 would be the most desirable of the Overhead Routes, resulting in the shortest route with the least impacts. However, it is important to note that while in most cases Overhead Route 03 is the least impactful route, this route also required the most total crossings and most non-perpendicular crossings of limited access roadways, which conflicts with VDOT (and MWAA) regulations, making it the least favorable option from the VDOT perspective. Overhead Route 02 would be the second most desirable route in terms of length and impacts, while Overhead Routes 01 and 04 are the least desirable and most impactful. Of the four Overhead Routes considered, Overhead Route 04 is the least desirable route.

The construction of Overhead Routes 01 and 04, the two complete wreck and rebuild routes, would have significant impacts on the environment due to the amount of new right-of-way that would be required to reconstruct these routes as double circuit 230 kV lines. The construction of these routes would have significant impacts on nearby residences, require a substantial amount of additional right-of-way across numerous conservation easements and parks, and have significant impacts on wetlands. In addition, Overhead Route 01 was one of the two least preferable of the Overhead Routes to the Fairfax County Park Authority due to the extent of its impacts on County parks and also was not supported by the National Park Service as a result of

its impacts on the George Washington Memorial Parkway. Most importantly, the expanded right-of-way required to build both Overhead Routes 01 and 04 would require taking homes – 51 homes in the case of Overhead Route 04 and 13 homes in the case of Overhead Route 01. In addition, there would be 100 homes within 60 feet of the new and expanded right-of-way required for Overhead Route 01 and 108 homes in the case of Overhead Route 04. The Company, therefore, has rejected both of these routes from further consideration.

Overhead Route 02 also has a number of significant constraints as well. The construction of this route would require a significant amount of tree clearing (10.6 acres) in VDOT and MWAA limited access right-of-ways. This clearing is prohibited by VDOT and MWAA regulations. In addition, Overhead Route 02 was one of the two least preferable of the Overhead Routes to the Fairfax County Park Authority due to the extent of its impacts on County parks. This route also would have a significant impact on residences - the expanded right-of-way required to build this route would require taking eight homes. In addition, there would be 18 homes within 60 feet of the new and expanded right-of-way required for this route. The Company, therefore, has rejected this route from further consideration.

While Overhead Route 03 appears to have the least environmental impacts of the four Overhead Routes and is the most preferable of the Overhead Routes to the Fairfax County Park Authority, there are still significant issues with this route. The construction of this route would require 10 crossings of limited access roadways (VDOT and MWAA), seven of which would be new crossings and nine would be non-perpendicular, which would not conform to VDOT and MWAA regulations for utility crossings. VDOT has stated that Overhead Route 03 is its least favored overhead option therefore creating risk, in the Company's opinion, that VDOT would not grant the Company a permit to construct this route. In addition, these multiple roadway crossings and associated structures also would introduce a significant visual impact both to motorist and the surrounding area. Overhead Route 03 would also require the clearing of 1.5 acres of trees within VDOT and MWAA limited access freeways, which is restricted by VDOT and MWAA regulations. The construction of this route would necessitate the placement of two transmission structures inside the VDOT soundwall along I-495. This route also would directly impact the Tysons Mall Pedestrian/Bike Trail, located on the east side of Tysons Corner Center mall.

Four overhead and six underground route solutions were studied for the Project. The Overhead Routes would have significantly greater environmental impacts than each of the Underground Alternatives. The Underground Alternatives would vary in length between 4.3 and 5.0 miles and, would all be shorter than the Overhead Routes. The shortest Overhead Route, Overhead Route 03, is 5.2 miles long. The Overhead Routes all would require significant amounts of new or expanded right-of-way, between 17.4 and 52.9 acres. Much of this new right-of-way would be located in and adjacent to densely populated residential areas and the construction of three of the Overhead Routes (Overhead Routes 01, 02, and 04) would result in direct impacts to residences. In contrast, the Underground Route Alternatives predominately would be constructed within existing road or public (the W & OD Park) rights-of-way, resulting mostly in temporary traffic and noise impacts. The Underground Alternatives only would require between 11.4 and 18.0 acres of new right-of-way (and would have no direct impacts on residences. A significant constraint associated with several of the Overhead Routes is both the number of crossings of limited access freeways that would be required and the fact that many of these crossings would be non-perpendicular. While each of the Underground Alternatives would require 2 crossings of limited access roadways, these crossings all would be constructed using HDD or liner plate tunnel installation, which would avoid impacts on the limited access roadways.

Conclusion Regarding Comparison of Overhead Routes to Underground Alternatives

The construction of the Underground Alternatives would require minimal tree clearing, at most 2.8 acres for Underground Alternative 01. Alternatively, the new right-of-way required for the Overhead Routes would require between 3.7 and 18.9 acres of forest clearing. The Underground Alternatives would affect between one and two parks, one of which is the W&OD Park, where the Company has an existing right-of-way; about 0.6 mile within the park would be crossed by HDD to avoid impacts on the W&OD Park trail. The other park that would be affected by two of the Underground Alternatives (Underground Alternatives 02 and 03) would be Idylwood Park, of which the majority would be crossed by HDD. In contrast, the Overhead Routes would affect between two and eight parks and require a significant amount of permanent tree clearing across these parks. No conservation easements would be crossed by the Underground Alternatives, whereas the Overhead Routes would cross between two and 10 conservation easements where permanent tree clearing would be required. Finally, the construction of the Overhead Routes would result in a much greater visual impact on the surrounding area than the Underground Alternatives. The wreck and rebuild portions of the Overhead Routes would be replaced with taller structures and new structures would be installed along the new build segments of these routes. In contrast, the Underground Alternatives would result in no permanent visual impacts.

In conclusion, in comparison to the Underground Alternatives, the Overhead Routes would be much longer, would require a large amount of new right-of-way, and would have significant impacts on residences, wetlands, parks, and conservation easements. The construction of the Overhead Routes would also require clearing of a large amount of forest lands and several of the routes would entail multiple crossings of limited access roadways. Finally, the Overhead Routes would all be more expensive than the Underground Alternatives. Therefore, Dominion Energy Virginia rejected these four Overhead Routes due their significant environmental impacts, the Company's ability to construct these routes, and/or cost.

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