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

Before the State Corporation Commission of Virginia

500-230 kV Aspen Substation, 500 kV Aspen-Goose Creek Line #5002, 500 kV and 230 kV Aspen-Golden Lines #5001 and #2333, 500-230 kV Golden Substation, and Lines #2081/ #2150 Loop

Application No. 332

Case No. PUR-2024-00032

Filed: March 7 2024

Volume 3 of 3

Environmental Routing Study

Aspen-Golden 500-230 kV Electric Transmission Project

March 2024

Project No.: 0622601

Cover Photo:
Stone grave markers at the African American Burial Ground for the Enslaved at Belmont

Credit: Tyrone Turner/WAMU

The business of sustainability

Signature Page

March 2024

Environmental Routing Study

Aspen-Golden 500-230 kV Electric Transmission Project

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CONTENTS

List of Tables

List of Figures

Acronyms and Abbreviations

Name	Description
AADT	annual average daily traffic
ADU	affordable dwelling unit
AIOD	Airport Impact Overlay District
AMSL	above mean sea level
BOS	Loudoun County Board of Supervisors
BRWRF	Broad Run Water Reclamation Facility
CASA	County After School Activities
CBG	census block group
CCB	Center for Conservation Biology
CDP	Census Designated Space
CFR	Code of Federal Regulations
Company	Virginia Electric and Power Company
CPNC	Certificate of Public Convenience and Necessity
CTP	Loudoun County Countywide Transportation Plan
CWA	Clean Water Act
DCA	Data Center Alley
DCR-DNH	Virginia Department of Conservation and Recreation Division of Natural Heritage
Dominion Energy Virginia	Virginia Electric and Power Company
Dominion	Virginia Electric and Power Company
Dulles International Airport	Washington Dulles International Airport
EJ	environmental justice
ELLA	Eastern Loudoun Load Area
ERM	Environmental Resources Management, Inc.
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FCV	Forest Conservation Value
FOD	floodplain overlay district
Plan	Loudoun County General Plan of 2019
GIS	geographic information systems
Guidelines	*Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia*
HOA	Homeowners' association

Name	Description
HUC	hydrologic unit code
IP	Industrial Park
IPaC	Information for Planning and Consultation
IVMP	Integrated Vegetation Management Plan
Kincora	US Kincora Purchaser LLC and/or NA Dulles Real Estate
KOP	Key Observation Point
kV	kilovolt
LCPS	Loudoun County Public Schools
Loudoun Water	Loudoun County Sanitation Authority
MP	milepost
NERC	North American Electric Reliability Corporation
NHD	National Hydrography Dataset
NHL	National Historic Landmark
NHP	Natural Heritage Program
NLEB	Northern Long-Eared Bat
Notice	Notice of Proposed Construction or Alteration
NOVA Parks	Northern Virginia Regional Parks Authority
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
PEM	Palustrine Emergent
PFO	Palustrine Forested
Project	Aspen-Golden 500-230 kV Electric Transmission Project
PSS	Palustrine Scrub-Shrub
PUB	Palustrine Unconsolidated Bottom
Rt.	State Route
SCC	State Corporation Commission
SCU	Stream Conservation Unit
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
Va. Code	Code of Virginia
VAC	Virginia Administrative Code
VaFWIS	Virginia Fish and Wildlife Information Service
VDCR	Virginia Department of Conservation and Recreation
VDEQ	Virginia Department of Environmental Quality
VDHR	Virginia Department of Historic Resources
VDOT	Virginia Department of Transportation
VOF	Virginia Outdoors Foundation
VDWR	Virginia Department of Wildlife Resources
VSR	visually sensitive resource
W&OD	Washington and Old Dominion
WERMS	Wildlife Environmental Review Map Service
WMCAR	William & Mary Center for Archaeological Research
XLPE	cross-linked polyethylene

1. OVERVIEW

This report presents the results of an environmental constraint identification and routing study undertaken by Environmental Resources Management. (ERM) on behalf of Virginia Electric and Power Company (herein referred to as Dominion Energy Virginia, Dominion, or the Company) for the proposed 500-230 kilovolt (kV) Aspen Substation, 500 kV Aspen-Goose Creek Line, 500 kV and 230 kV Aspen-Golden Lines, and 500-230 kV Golden Substation, and Lines #2081/#2150 Loop (Aspen-Golden 500-230 kV Electric Transmission Project or Project) in Loudoun County, Virginia.

1.1 Project Description

1.1.1 Purpose and Need

The purpose of the Project is threefold:

- Maintain and improve electric service to customers in the Eastern Loudoun Load Area (ELLA), generally the area north and west of Washington Dulles International Airport (Dulles International Airport), including Data Center Alley (DCA);
- Address significant load growth in the ELLA; and
- Relieve identified violations of mandatory North American Electric Reliability Corporation (NERC) reliability standards.

As of March 2024, the ELLA includes approximately 27 locations where load is being served. Based on load flow studies performed by PJM Interconnection LLC (PJM) and validated by the Company, Dominion anticipates that projected load growth in the area will produce multiple contingency conditions that would cause thermal overloads in several parts of the system by summer 2028. If not relieved by the Project, in conjunction with other proposed or planned projects in the area, the identified reliability violations would impact the transmission system's ability to provide reliable service to the Company's customers in the ELLA.

The planned or proposed projects in this area include the "Loudoun Reliability Projects," which are three 500 kV transmission line projects. The Company filed the first project—the Mars-Wishing Star Project—with the State Corporation Commission (SCC) in October 2022 and received an order for a Certificate of Public Convenience and Necessity (CPCN) in April 2023. The second project is the Aspen-Golden 500-230 kV Electric Transmission Project, which the Company is now seeking approval of in this filing. The third project is the Golden-Mars Project.

The purpose of the Loudoun Reliability Projects is to construct a loop of 500 kV lines through the ELLA, which combined will bring 500 kV service through the DCA by connecting four new 500 kV substations – Wishing Star, Mars, Golden, and Aspen – thus providing the needed capacity and redundancy to the ELLA.

The locations of the Loudoun Reliability Projects, ELLA, and DCA are depicted on Figure 1-1. All figures referred to in this document are provided in Appendix A, Figures.

1.1.2 Proposed Facilities

To meet the purpose and need for the Project, Dominion proposes to construct and operate the following facilities:

- A new 500-230 kV substation (Aspen Substation) to be built east of and adjacent to Dominion's existing 500 kV Line (Brambleton-Goose Creek Line #558) and 230 kV Lines (Beaumeade-Belmont

Line #227 and Belmont-Pleasant View Line #2180), east of the existing Goose Creek Substation, within existing Company right-of-way and on property owned by the Company;

- A new 500 kV single circuit transmission line extending for approximately 0.2 mile from the proposed 500-230 kV Aspen Substation to the Company's existing 500 kV Goose Creek Substation, named Aspen-Goose Creek Line #5002 (or "Aspen-Goose Creek Line");[1]
- A new overhead 500 kV single circuit transmission line and a new 230 kV single circuit transmission line[2] extending for approximately 9.4 or 9.5 miles from the proposed 500-230 kV Aspen Substation to the proposed 500-230 kV Golden Substation, named Aspen-Golden Line #5001 and Aspen-Golden Line # 2333 (or "Aspen-Golden Lines");
- A new 500-230 kV substation, referred to as Golden Substation, to be built on an open land parcel between Pacific Boulevard and Route 28 (Sully Road) directly north of the existing 230 kV Lines (Paragon Park-Sterling Park Line #2081 and Paragon Park-Sterling Park Line #2150) on property to be obtained by the Company north of the Washington & Old Dominion (W&OD) Trail; and
- A new loop of two existing 230 kV single circuit transmission lines (Lines #2081 and #2150) extending for approximately <0.1 mile (490 feet) from the Company's existing Lines #2081/#2150 transmission corridor to the proposed 500-230 kV Golden Substation, resulting in (i) Golden-Sterling Park #2081, (ii) Golden-Sterling Park #2150, (iii) Golden-Paragon Park #2348, and (iv) Golden-Paragon Park #2351, named the Lines #2081/#2150 Loop (or the "Line Loop" or the "Loop").[3]

In identifying potential routes for the proposed new Aspen-Golden Lines, ERM considered the facilities required to construct and operate the new infrastructure, the length and width of new right-of--way- that would be required, the extent of existing development in the area, the potential for impacts on environmental and human resources, and cost.[4] As discussed in more detail below, ERM identified one viable overhead route for the Aspen-Golden Lines, referred to as Route 1. Within Route 1, two overhead route variations were identified along State Route (Rt.) 7, referred to as the Belmont Park Segment, and two overhead route variations were identified near Broad Run, referred to as the Broad Run Segment. Additional descriptions of Route 1 and the Belmont Park and Broad Run Segments are provided in Section 5.1.

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[1] For the Aspen-Goose Creek Line #5002, the Company identified one 0.2-mile overhead route that would be constructed entirely on Company-owned property or existing right-of-way. Because the existing right-of-way and Company-owned property are adequate for the proposed Aspen-Goose Creek Line #5002, no new right-of-way is required. Given the availability of existing right-of-way and the statutory preference given to use of existing rights-of-way, and because additional costs and environmental impacts would be associated with the acquisition of and construction on new right-of-way, the Company did not consider any route alternatives requiring new right-of-way for the proposed Aspen-Goose Creek Line.

[2] The 230 kV Aspen-Golden Line #2333 separates from a collocated corridor with the 500 kV Aspen-Golden Line #5001 in order to connect to the appropriate backbones located at either substation. These short, but separate, 230 kV rights-of-way are referred to as the "Aspen 230 kV Split" and "Golden 230 kV Split" whenever such distinction is needed in this report. Both "230 kV Splits" are included in Route 1 when calculating impacts, acreages, etc. Line #2332 is approximately 0.2 mile longer than #5001 based on the extra distance needed for the 230 kV Splits to reach their respective tie-in points at Aspen and Golden Substations.

[3] For the Lines #2081/#2150 Loop, the Company identified one approximately <0.1-mile (approximately 490 feet) overhead route that would be constructed entirely on existing right-of-way or property to be obtained by the Company at the Golden Substation. Because the existing right-of-way and Company-owned property are adequate for the proposed Loop, no new right-of-way is required. Given the availability of existing right-of-way and the statutory preference given to use of existing rights-of-way, and because additional costs and environmental impacts would be associated with the acquisition of and construction on new right-of-way, the Company did not consider any route alternatives requiring new right-of-way for the proposed Loop.

[4] Cost is addressed in the Company's Appendix for the Project. Because as noted above the existing right-of-way and Company-owned or to-be-owned property are adequate for the proposed Aspen-Goose Creek Line #5002 and Lines #2081/#2150 Loop, no new right-of-way is required. Given the availability of existing right-of-way and the statutory preference given to use of existing rights-of-way, and because additional costs and environmental impacts would be associated with the acquisition of and construction on new right-of-way, the Company did not consider any alternative routes requiring new right-of-way for the proposed Aspen-Goose Creek Line. Accordingly, the Company did not request that ERM identify any potential route alternatives for the Aspen-Goose Creek Line or the Loop.

1.1.3 Structure Types and Right-of-Way Widths

The proposed Aspen-Golden Lines will be constructed primarily on new right-of-way measuring between 100 feet and 150 feet wide. The lines include single circuit 500 kV conductors and single circuit 230 kV conductors in one of two 5-2 configurations[5]: (1) a monopole configuration using double circuit tangent monopole structures and two-pole angle structures (requiring a 100-foot-wide right-of-way); or (2) an H-frame configuration using double circuit three-pole angle structures and two-pole tangent H-frame structures (requiring a 150-foot-wide right-of-way). All structures would be built with dulled galvanized steel.

Most of the new Aspen-Golden Lines (approximately 7.9 of 9.4-9.5 total miles) would use the 100-foot-wide 5-2 monopole configuration except at three locations where 150 feet of right-of-way would be needed to support the H-frame configuration.[6] The latter configuration would be needed at crossings of existing 230 kV overhead transmission lines and the crossing of Goose Creek (which also includes a crossing of Dominion's future 230 kV Twin Creek Lines[7]).

The distance (span) between structures varies between the monopole and H-frame configurations and is dependent on topography, ground elevation, and nearby constraints such as bridge or highway on-ramp crossings. On average, both the monopole configuration and the H-frame configuration require a span averaging 670 feet.

For the Aspen-Golden Lines, monopole and two-pole structures are expected to have an average height of 178 feet. The H-frame and three-pole structures are expected to have an average height of 145 feet.

For the Aspen-Goose Creek Line, the Company will install one 500 kV single circuit monopole structure within Company-owned property (the Goose Creek Substation) that is expected to have a height of 190 feet. As the Aspen-Goose Creek Line will be constructed entirely within existing right-of-way or on Company-owned property, there is no actual new or defined right-of-way for the line.

For the Lines #2081/#2150 Loop, the Company will remove one existing double circuit lattice tower and replace it with four dulled galvanized steel single circuit monopoles, which are expected to have an average height of 110 feet. As the Loop will be constructed entirely within existing right-of-way or on property to-be-owned by the Company, there is no actual right-of-way for the Loop. Strictly for purposes of studying any impacts relative to the Loop, ERM assumed that the width of the right-of-way would be 250 feet.

Section views depicting typical right-of-way widths (as applicable) and structure configurations are provided as Appendix B, Structural Drawings.

1.1.4 Construction, Operation, and Maintenance Procedures

Construction of new overhead transmission lines may involve some or all of the steps listed below:

- Detailed survey of the route alignment;

[5] A "5-2 configuration" means that the supporting structures will be vertically aligned such that one position of the structure will have a 500 kV circuit and one position will have a 230 kV circuit.

[6] The right-of-way would be primarily 100-feet-wide, except at the following location, at the following locations, which would require a 150-foot-wide right-of-way: (1) approximately 0.2 mile from the Aspen Substation heading east to cross the existing Lines #227/#274; (2) approximately 1.0 mile from the west side of Goose Creek heading east across Goose Creek to Belmont Ridge Road; and (3) about 0.3 mile from Loudoun County Parkway near the W&OD Trail across the existing 230 kV Lines #2143, #2150, and #2165 near Broad Run. Where transitioning in width, the right-of-way would taper down from 150-feet-wide to 100-feet-wide where H-frame or three-pole structures transition to monopole or two-pole structures; and increase from 100-feet-wide to 150-feet-wide where monopole and two-pole structures transition to H-fame or three-pole structures.

[7] For approximately 0.9 mile, the proposed Aspen-Golden Lines will be collocated with two future 230 kV double circuit lines along the same corridor, referred to herein as the future Twin Creeks Lines. See Section 3.6.

- Right-of-way acquisition and clearing;
- Construction of access roads, where necessary;
- Installation of tower foundations;
- Assembly and erection of new structures;
- Stringing and tensioning of conductors; and
- Final cleanup and land restoration.

All materials for the Project's structures will be delivered and assembled at each structure location within the approved right-of-way. Detailed foundation design will not be completed until prior to construction; however, foundation design could include poured concrete requiring excavation or steel piles or caissons that might be vibrated, drilled, or driven into place depending on soil conditions. Structures will be erected with a crane and anchored to the foundation during final assembly. In upland areas, excess soil from foundation construction will be evenly distributed at each structure and the soil replanted and stabilized. In wetland areas, excess soil will be removed and evenly distributed on an upland site within Dominion's approved right-of-way. Typical construction equipment may include hole diggers or drilling equipment, cranes, wire stringing rigs, tensioners, backhoes, and trucks.

All conductors and shield wires will be strung under tension. This system involves stringing a "lead line" between structures for the conductors and ground wires. The line pulls a steel cable that is connected to the conductors and shield wires, which are pulled through neoprene stringing blocks to protect the conductor and shield wire from damage. Stringing the conductors and shield wires under tension protects them from possible damage should they touch the ground, fences, or other objects.

Once the Project is in-service, maintenance of the right-of-way under the transmission lines will be essential for the reliable operation of the lines as well as for public safety. Operation and maintenance of the Project will include periodic inspections of the line and the right-of-way; occasional replacement of hardware as necessary; periodic clearing of vegetation, either mechanically or by selective, low-volume application of approved herbicides within the corridor; and the cutting of danger trees outside the right-of-way. Danger trees are trees outside the cleared corridor that are sufficiently tall enough to fall into the right-of-way potentially impacting the transmission lines. Periodic inspections will use both aerial and walking patrols. Normal operation and maintenance will require only infrequent visits by Dominion Energy Virginia or its contractors.

Most maintenance activities consist of selective, low-volume herbicide applications targeting only tree species on the right-of-way every 3 to 5 years and the cutting of danger trees every 3 years. Dominion uses only herbicides that are approved by the U.S. Environmental Protection Agency (USEPA) on power line rights-of-way.

Based on a discussion between Company and Virginia Department of Conservation and Recreation Division of Natural Heritage (DCR-DNH) representatives, the Company reviewed its Integrated Vegetation Management Plan (IVMP) for application to both woody and herbaceous species based on the species list available on the VDCR website. The Company continues to coordinate with DNH on an addendum to the IVMP to further explain how the Company's operations and maintenance forestry program addresses invasive species. In November 2023, the Company submitted the addendum draft to VDCR for review and continued discussions. VDCR provided an initial response to the addendum in January 2024. The Company will continue to meet with VDCR to further discuss the documentation provided. Once the

addendum is finalized, the Company will report on the results of its communications with VDCR in future transmission certificate of public convenience and necessity (CPCN) filings.[8]

1.2 Objectives of the Study

For the Aspen-Golden Lines, the Company requested ERM's services to complete the following: a) define a study area; b) collect information on resources within the study area; c) identify and compare alternative routes, and d) prepare this report.[9] More specifically, ERM's scope of work consisted of these activities:

- Defining and describing a study area for routing the transmission lines required for the Project;
- Gathering and assessing information about routing constraints and opportunities to be considered as part of the study;
- Identifying and mapping routing constraints and opportunities within the study area;
- Participating in public outreach efforts for the Project (e.g., public open house and agency meetings) to gather information from stakeholders, agency staff, and the public regarding constraints to be considered as part of the routing process;
- Identifying buildable alternative routes for the transmission lines meeting the siting criteria provided in the Code of Virginia (Va. Code) and included in the Virginia SCC's minimum filing guidelines for transmission projects;
- Comparing the alternative routes based on an analysis of environmental impacts and use of routing opportunities; and
- Recommending a preferred route.

1.3 Report Organization

This report is organized into eight sections as follows:

- Section 1 describes the purpose and need of the Project and its proposed facilities.
- Section 2 describes the routing process for the Aspen-Golden Lines.
- Section 3 describes the Project study area.
- Section 4 describes and evaluates route corridors for the Aspen-Golden Lines.
- Section 5 describes the Aspen-Golden Lines route alternatives that were identified and selected for analysis as well as routes considered but rejected for analysis.
- Section 6 inventories resources and routing constraints within 0.25 mile of the proposed Project facilities/routes and assesses the Project's potential impacts to each resource.
- Section 7 provides a conclusions and recommendation of the Company's preferred route for the Aspen-Golden Lines.

[8] *See, Application of Virginia Electric and Power Company, For approval and certification of electric transmission facilities: 230 kV Line #293 and 115 kV Line #83 Rebuild Project*, Case No. PUR-2021-00272, Final Order at 9-11 (Aug. 31, 2022) *(The Commission agreed with the Chief Hearing Examiner and declined to adopt DCR-DNH's recommendation regarding an invasive species management plan ("ISMP"), but directed the Company to meet with DCR-DNH and to report on the status of the meetings in the Company's next transmission certificate of public convenience and necessity ("CPCN") filing)*; *see also* Report of Alexander F. Skirpan, Jr., Chief Hearing Examiner (Jun. 22, 2022) at 22 *(agreeing with the Company that, with its IVMP, the Company should not be required to undergo the additional cost of DCR-DNH's ISMP; however, recommending that the Company meet with DCR-DNH regarding its IVMP and report the results of the meeting in the next transmission CPCN filing)*.

[9] See Section 1.4 as to the remaining components of the Project.

- Section 8 included citations, references, and a bibliography of the data sources and literature used throughout the report.

1.4 Discussion and Analysis of Impacts

Route alternatives for the Aspen-Golden Lines are comprised of Route 1, a Belmont Park Variation, and a Broad Run Variation, as described in Section 5.2. Discussion and analysis of impacts of each segment of the route alternatives are described independently in this Report. When discussing Route 1 impacts, such discussion includes impacts associated with the proposed Aspen and Golden Substations, Line #5002 (to the extent the route is located at Aspen Substation) and the Line Loop, unless otherwise noted.

2. ROUTING PROCESS

The process of routing new electric transmission lines follows a sequence whereby potential route corridors are developed into potential routes, which are further refined into viable alternatives. Although details may differ, the fundamental objectives of the process are the same regardless of the project: maximize collocation with compatible linear features or land uses; avoid, minimize, or mitigate impacts to the human and natural environment; and provide regulators with viable routes meeting the purpose and need of the project that are efficient and equitable. Route viability is assessed through permitting risk, right-of-way acquisition, cost, and constructability after the least impactful alternatives are identified.

The routing process, outlined below, provides a framework for understanding the Aspen-Golden Lines, the route identification process, and the selection of a preferred alternative.

2.1 Step 1: Defining the Study Area

The first step in the routing process is defining a geographic study area for the Project based on Dominion's electric transmission needs and service obligations. The study area was defined to encompass the Aspen-Golden Lines' planned beginning and end points, Aspen Substation and Golden Substation, as well as an area broad enough to allow for the identification of reasonable route alternatives meeting the Project's objectives. Additionally, and to the extent practicable, the limits of the study area were defined by reference to easily distinguished landmarks, such as roads or other features. The use of such features in defining boundaries helps communicate those boundaries to stakeholders, such as potentially affected landowners or county and agency staff. Section 3 of this document describes the characteristics of the Project study area in greater detail.

2.2 Step 2: GIS Mapping and Inventory of Routing Constraints and Opportunities

The second step in the routing process involves the identification and mapping of environmental and built features within the study area. Based on extensive data collection, an inventory of routing constraints and opportunities in the study area is developed, including but not limited to:

- Electric transmission and other utility rights-of-way;
- Residences and residential areas;
- Planned developments;
- State, county, and private road rights-of-way;
- Conservation and open space easements;

- Parks and trails;
- Wetlands and waterbodies;
- Forested land;
- Hospitals, schools, cemeteries, and convalescent centers;
- Areas of ecological significance (e.g., ecological cores and habitat for threatened and endangered species);
- Visual resources; and
- Historic sites and other nationally or locally significant historic and cultural resources.

2.3 Step 3: Identifying Potential Route Corridors

The third step in the routing process is the identification of potential route corridors – swaths of the study area within which it is possible to route new transmission infrastructure – and the exclusion of areas where transmission line routing is infeasible or impracticable due to land use or other conflicts. This step is critical in larger, heavily developed study areas, such as the Project, where planned developments or protected lands, like parks, can block potential routes. The viability or feasibility of a potential route corridor is assessed by evaluating environmental impacts, compatibility with existing and future land uses, permitting risk, community input, ability to acquire new right-of-way, cost, and constructability.

2.4 Step 4: Identifying and Assessing Route Alternatives

After a route corridor is identified, potential route alternatives or segments within that corridor are developed using geographic information system (GIS) software. To the extent practicable, routes are identified that avoid constraints and utilize opportunities. The Project team continues to collect and assess data on constraints along the routes, including input from stakeholders through community outreach. This information is used to qualify and better understand resources that could be affected and to refine routes, where feasible, to reduce potential impacts.

The proposed route and route variations developed for the Aspen-Golden Lines are described in Sections 5.1 and 5.2. Routes alternatives that were considered but rejected and eliminated from further consideration are described in Section 5.3.

2.5 Step 5: Field Reconnaissance and Public Engagement

Field reconnaissance and stakeholder/public engagement activities (e.g., a project website, open houses, targeted mailings, and virtual and in-person meetings) were conducted throughout the routing process. These activities are used to gather information, identify resources, and help inform on routing and route selection. Public engagement activities are further discussion in Section 5.1.

2.6 Step 6: Route Alternative Analysis and Route Recommendation

After gathering data and conducting stakeholder outreach, route alternatives are analyzed and compared quantitatively and qualitatively based on constraint data and community/stakeholder input. After completing this analysis, a preferred route is selected through comparison of the advantages and disadvantages of each alternative relative to SCC Guidelines. A Proposed Route and Alternative Routes are then presented for notice in the SCC Application for the Project. Conversely, routes deemed too impactful and/or infeasible or impracticable are not carried forward for notice.

3. STUDY AREA

The study area identified for the Project encompasses approximately 30 square miles entirely within unincorporated areas of southeastern Loudoun County. It includes portions of the U.S. Census Bureau census-designated places of Ashburn, Belmont, Broadlands, Dulles Town Center, Kincora, Lansdowne, Moorefield, One Loudoun, Sterling, and University Center. There are no incorporated cities within the study area. The limits of the study area, depicted in Figure 3-1, are generally defined by the following features:

- The Company's existing 500 kV Line #558 to the west;
- Riverside Parkway to the north;
- Atlantic Boulevard to the east; and
- Rt. 267 (Dulles Greenway) to the south.

Sources used by the ERM team to identify constraints and opportunities within the study area include:

- Loudoun County Geohub GIS datasets (Loudoun County 2023a; Loudoun County 2023b; Loudoun County 2023c);
- Virginia Department of Transportation (VDOT) Projects and Studies Database (VDOT 2023)
- National Conservation Easement Database (NCED 2023);
- VDCR Conservation Lands Database (VDCR 2023);
- U. S. Census Bureau American Community Survey, 5-Year Estimates (2018-202);
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping (USFWS 2023);
- Virginia Cultural Resources Information System (VCRIS; VDHR 2023);
- Current aerial imagery taken in March 2023 (Loudoun County 2023d);
- Existing utility transmission and distribution lines (Rextag 2023); and
- Proprietary facility data from the Company, Loudoun County Sanitation Authority (Loudoun Water) (Loudoun Water 2023), and Washington Gas Company (Washington Gas 2023)

ERM researched, vetted, mapped, and incorporated resources identified through these sources into GIS, where the layers were organized by resource type.

3.1 Land Use: 1970 to Present

From 1970 to today, eastern Loudoun County transformed from a rural and agricultural area to a Washington D.C. beltway exurb and bedroom community to a booming suburb with the highest concentration of data centers in the world. Development accelerated in the 1990s and continued through the early 2000s as large residential subdivisions, commercial offices, and light industrial uses accompanied a growing population and the extension of major roadways. Residential and commercial growth continued rapidly, with the County population increasing from 86,000 in 1990, to 169,000 in 2000, to 315,000 in 2010, to an estimated 440,000 in 2023, marking two decades averaging 90 percent decennial growth. As of 2022, the Federal Reserve measured Loudoun County's GDP at $37 billion, making it the wealthiest county in the United States with a household median income exceeding $170,000. Figure 3.1-1 shows aerial photography of the study area in 1985 and 2023 depicting the changes in land use occurring over the past 40 years.

Beginning in 1991 with the birth of the Commercial Internet eXchange in nearby Reston, internet infrastructure began to grow rapidly (DataCenters.com 2023). In 1996, Ashburn became the site of the first data center in Loudoun County. Due to the combination of land availability, low land and utility costs, and access to a skilled and educated workforce, Northern Virginia became a major hub of the data center industry. By 1997, half of the world's internet traffic moved through the area north of Dulles International Airport, known today as DCA. Today, Loudoun County data centers occupy 25 million square feet, provide 12,000 direct jobs, and provide services for over 3,500 technology companies (Loudoun Virginia Economic Development 2023). In 2023, approximately 30 percent of Loudoun County tax revenues ($576 million) came from data centers, which occupy less than 3 percent of the County's land area but are drivers of the County's electric demand. Exponential growth of electrical demand in eastern Loudoun County has resulted in the recent construction of dozens of new substations that are connected by the densest network of 230 kV transmission lines in the state, all of which connect to the region's primary 500 kV line, demarcating the western edge of the Project study area and the ELLA.

As of 2024, the few remaining undeveloped parcels in the study area are either under construction or in various stages of land use approvals for new construction projects. Based on current site plan submittals and legislative applications, the remaining undeveloped lands in the study area, including those adjacent to Rt. 7, will likely be developed as data center or residential/mixed-use communities within the next decade.

3.2 Land Use and Land Cover

Land use/land cover in the study area is dominated by low to medium density single-family residential neighborhoods. Typical of late 1990s and early 2000s suburban development, roadways throughout the study are almost entirely curvilinear with cul-de-sac and loop streets branching off collector and arterial roads. The neighborhoods (or "residential communities") in the study area are almost entirely master planned developments with homeowners' association (HOA)-maintained open space or golf courses (e.g., the Belmont and Lansdowne communities).

Commercial, office park, and light industrial uses are common along major roadway frontages throughout the study area. More recently, new urbanist-style mixed-use developments have become more common and support greater housing densities with a variety of housing types including mid-rise apartments and condos as well as office, retail, and civic components.

While mostly developed and urbanized, the study area is bound by two significant riparian corridors. Broad Run and Goose Creek - both tributaries of the Potomac River - flow from south to north through the eastern and western portions of the study area, respectively. Smaller order streams, generally flowing from west to east, include Broad Run tributaries (Russell Branch and Beaverdam Run) and Goose Creek tributaries (Tuscarora Creek and Sycolin Creek). The only significant wetland complex in the study area is along Broad Run between Loudoun County Parkway and Rt. 28. The Goose Creek and Broad Run riparian corridors contain the few remaining natural habitats and hardwood forests in the study area.

Three major Virginia state highways cross the study area:

- Rt. 7 (Leesburg Pike), with a southeast-to-northwest orientation in the northern portion of the study area;
- Rt. 267 (Dulles Greenway), with a southeast-to-northwest orientation in the southern portion of the study area; and
- Rt. 28 (SR 28; Sully Road), with a north-to-south orientation along the eastern boundary of the study area.

In addition to the highways, several major arterial roadways bisect the study area, including Belmont Ridge Road, Claiborne Parkway, Ashburn Village Boulevard, and Loudoun County Parkway, which run generally north-to-south; and Riverside Parkway, Russell Branch Parkway, Gloucester Parkway, Ashburn Farm Parkway/Farmwell Road, and Waxpool Road, which run generally east-to-west.

Lands along the major highway corridors are mostly developed and include older commercial and industrial areas and more recent data center and mixed-use developments. There also are several large residential communities (organized under HOAs) along Rt. 7, including Lansdowne and Belmont, as well as new mixed-use developments, such as One Loudoun and Kincora.

Other prominent features within the study area include three large operational quarries and one former quarry (now a reservoir) along Goose Creek on the west side of the study area. The southeast corner of the study area also encompasses portions of DCA. Loudoun Water's Ashburn Campus is on the eastern side of the study area and contains the Broad Run Water Reclamation Facility (BRWRF), north of Gloucester Boulevard and east of Loudoun County Parkway. The facility treats wastewater and provides reclaimed water for industrial cooling, mainly to data center customers, with a capacity of up to 15 million gallons per day.

There are no designated agricultural districts within the study area.

3.3 Natural Resources

The most significant natural resources within the study area are the riparian corridors along Goose Creek, Broad Run, and their tributary streams. Along these rivers are forests, floodplains, and wetlands. The riparian corridors support wildlife habitat and contain limited areas of undisturbed hardwood forests. There is a well-known Great blue heron rookery along Broad Run near Kincora and Goose Creek, a state-designated scenic river, which also provides habitat for the federally protected Green floater (*Lasmigona subviridis*), a species of freshwater mussel.

3.4 Major Routing Constraints

The single most significant routing constraint in the study area is existing homes and neighborhoods, which are less compatible than other land use types with new electric transmission lines. Of the approximately 30 square mile study area, about half consists of single-family detached homes on quarter acre lots. Moreover, the suburban pattern of residential development in the study area – with single family homes set along roads terminating in cul-de-sacs – provides no open corridors able to accommodate a new 100-to-150-foot-wide right-of-way without the condemnation and removal of existing homes or other buildings. Thus, a primary focus of routing the Aspen-Golden Lines was the avoidance of neighborhoods and homes.

Other major constraints in the study area include existing commercial and industrial buildings, various planned developments, the Broad Run and Goose Creek riparian corridors, Loudoun Water and other publicly owned lands, and several historic and cultural resources, including the African American Burial Ground for the Enslaved at Belmont (Belmont Cemetery).

While existing utility and road rights-of-way can provide opportunities for routing new transmission infrastructure (see discussion below), in areas with space constraints, existing utilities can be an impediment to routing new facilities, or alternatively, could require the relocation of the existing utilities (and subsequent service outages during construction). Utility conflicts occur in developed areas where multiple utilities have been installed along roadways. From an engineering and construction perspective, it can be difficult to safely site and install new transmission structures in areas with existing buried water, sewer, natural gas, and fiberoptic lines. Throughout the study area, the relatively low-density suburban development patterns belie a dense network of buried utility infrastructure including those directly serving

data centers such as electric distribution lines, fiber optic cables, and reclaimed water mains. Consequently, road corridors that appeared suitable for new transmission right-of-way (e.g., Rt 7, Ashburn Village Boulevard, Loudoun County Parkway, and Sully Road) required a great deal of utility mapping (protected under non-disclosure agreements for security reasons) and detailed engineering review in order to assess potential structure placement and construction access.

3.5 Major Routing Opportunities

Major routing opportunities within the study area are limited to existing linear features and compatible land uses. Linear features include existing electric transmission rights-of-way, roadways (especially limited access highways and arterials), and various utility rights-of-way. Compatible land uses include proposed data center developments, existing industrial or commercial developments, and utility corridors paralleling major roadways.

The following is a list of specific routing opportunities for the Aspen-Golden Lines within the study area:

- Proposed data center developments adjacent to Goose Creek, Belmont Ridge Road, Rt. 7 and Rt. 28, and existing data center land;
- Rt.7;
- Loudoun County Parkway;
- Sully Road;
- Existing Company-owned right-of-way for Lines #227 and #274 along the W&OD Trail;
- Utility corridors on the north and south side of Rt. 7; and
- Dulles Greenway.

Routing opportunities for the Aspen-Golden Lines routes are discussed further in Section 6.7.

3.6 Twin Creeks Lines Collocation

For approximately 0.9 mile, the Aspen-Golden Lines will be collocated with two future 230 kV double circuit lines along the same corridor, referred to as the future Twin Creeks Lines. The future Twin Creeks Lines will serve five new substations on three new data center campuses. The five future substations include the Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations. One future substation, Twin Creeks Substation, will be located northeast of the Aspen Substation, and the four additional substations will be located along the east side of Goose Creek between the W&OD Trail and Rt 7. The Company anticipates filing an application with the SCC for approval of the Twin Creeks Lines and related transmission infrastructure later in March 2024. Due to the proximity of the two projects, a collocated overhead transmission corridor was planned for and evaluated to mitigate cumulative impacts to the environment, landowners, and planned developments; to avoid Loudoun Water facilities and easements' and to minimize impacts to the Scenic Creek Valley Buffer – a conservation overlay that Loudoun County enforces to prevent construction adjacent to creeks or streams with watersheds greater than 640 acres. Perhaps most significantly from a recreation and land use perspective, the two projects' use of a shared corridor would minimize impacts to Goose Creek, a state-designated scenic river.

4. ROUTE CORRIDORS

ERM identified three potential corridors for routing the proposed Aspen-Golden Lines: the W&OD Trail Corridor (which includes the Company's existing right-of-way for Lines #227 and #274), the Dulles Greenway/Waxpool Road Corridor, and the Rt. 7 Corridor. The corridors were defined to leverage potential routing opportunities while excluding areas where routing new overhead lines was impractical. In

the context of the study area, the three corridors were selected primarily for their potential to avoid residential areas and maximize collocation along existing linear features (e.g., roads and utility rights-of-way) and compatible land uses. The route corridors are depicted on Figure 4-1 and described in detail in Sections 4.1 through 4.3.

ERM assessed the feasibility of routing the proposed Aspen-Golden Lines with a new, predominantly 100-foot-wide right-of-way within each corridor. Numerous conceptual routes segments were identified and evaluated to assess potential pinch points and other flaws within the corridors. As end-to-end conceptual routes were identified, the routing team further investigated potential flaws and refined the route to avoid or minimize impacts on scenic assets, historic resources recorded with the Virginia Department of Historic Resources (VDHR), and the environment of the area concerned.

Routing flaws generally fall into three categories: right-of-way flaws, permitting flaws, or engineering flaws. Right-of-way flaws occur where right-of-way acquisition would be impossible, pose serious risk to the project in-service date, or force the Company into a condemnation proceeding. Examples include public lands (which cannot be condemned), SCC regulated utilities, and residences. The Company prefers routes that do not require the removal of homes or businesses or cross lands the where the Company has no authority to condemn in the absence of a special agreement.

Permitting flaws are constraints that pose major permitting risks to a project typically due to impacts on sensitive environmental or cultural resources under one or more state and federal jurisdictional authorities. Examples of permitting flaws could include wetland crossings requiring an Individual Permit from the U.S. Army Corps of Engineers (USACE) or impacts on cultural or historic resources requiring implementation of a treatment or mitigation plan. If a permit would be difficult or impossible to obtain in time to meet the in-service deadline for a particular alternative, then that alternative is not feasible.

Engineering flaws are instances where it would be prohibitive or impossible to physically construct the infrastructure along the route due to terrain, space constraints, or need to avoid one or more adjacent or overlapping constraints. Conceptual route identified by the routing team are reviewed by Dominion's transmission line engineers and construction managers to assess the buildability of the route. Complicating factors can include structure placement within constrained areas, meeting minimum safety requirements related to conductor sway (called blowout), or crossings of existing transmission lines where the width of the right-of-way needs to expand to provide sufficient space for the new lines to pass over (or under) the existing lines.

Another element tangential to engineering is transmission planning, which takes into account potential electrical service outages. In instances where new lines cross existing lines, outages are sometimes required to safely construct new transmission lines. Routes resulting in outages may not be feasible where load capacity and redundancy needs cannot otherwise be met.

The following chapter provides a detailed assessment of each of the three route corridors for the Aspen-Golden Lines.

4.1 Washington & Old Dominion Trail Corridor

4.1.1 Description

Bisecting the study area is a 6.7-mile-long segment of Dominion's existing overhead 230 kV Lines #227 and #274 that follow the W&OD Trail, a former railroad turned multi-use recreational trail owned and maintained by Northern Virginia Regional Parks Authority (NOVA) Parks. Lines #227 and #274 are within a 100-foot-wide right-of-way directly overhead and parallel to the W&OD Trail, which passes within 0.1 mile of the proposed Aspen and Golden Substations and provides the most direct potential corridor for routing the Aspen-Golden Lines. The W&OD Trail Corridor is defined by a narrow area flanking the

existing transmission right-of-way. The boundaries of the corridor are limited because nearly the entire length of the corridor passes through residential neighborhoods. The W&OD Trail Corridor and constraints are shown on Figure 4.1-1.

The W&OD Trail Corridor best meets SCC Guideline #1 which prioritizes the use of existing transmission right-of-way when routing new lines. The W&OD Trail Corridor is notable for its collocation potential and its proximity to both the Aspen and Golden Substations. However, despite the advantage of collocation, the route corridor is incompatible with the Aspen-Golden Lines and cannot support a viable route.

The W&OD Trail Corridor begins directly adjacent to the proposed Aspen Substation near Dominion's existing 500 kV Line #558 on the west side of Cochran Mill Road, then heads southeast for approximately 1.2 miles to Belmont Ridge Road. This segment of the corridor crosses between a quarry to the south and a Loudoun Water parcel to the north, crosses Goose Creek, and then passes between two quarry sites east of Goose Creek. West of the creek, there is an active quarry (Luck Stone) south of the W&OD Trail. To the north, a property owned by Loudoun Water is the site of the future Milestone Reservoir Pump Station but is currently undeveloped and wooded with hiking and mountain bike trails. East of Goose Creek, there is another Luck Stone quarry to the south and a former quarry (now Loudoun Water's Milestone Reservoir) to the north. The current and former quarries are separated by a narrow isthmus (200-feet-wide at its narrowest point) with the existing transmission lines and W&OD Trail running through its middle.

Continuing to the southeast and east, the corridor crosses Belmont Ridge Road, curves south for approximately 0.4 mile, then continues southeast for approximately 5.1 miles to the eastern boundary of the study area. After crossing Belmont Ridge Road, the W&OD Trail Corridor continues through residential neighborhoods for approximately 3.0 miles. This segment of the W&OD Trail Corridor generally has trees on one or both sides of the trail except where residential lots are directly adjacent to the trail right-of-way. The corridor then crosses approximately 0.4 mile of floodplain forest along Beaverdam Run, approximately 1.0 mile of industrial land, approximately 0.4 mile of golf course, then another 0.6 mile of commercial/industrial land, to Rt. 28 (Sully Road). The Company's existing Lines #227 and #274 tie into two existing substations along the corridor, Ashburn and Beaumeade, which are both directly adjacent to the north side of the W&OD Trail Corridor.

4.1.2 Assessment

The W&OD Trail Corridor has several significant routing flaws. First, and most significantly, obtaining an additional 75-feet of new right-of-way[10] adjacent to the existing 100-foot right-of-way would require the condemnation and removal of between 61 and 123 residences depending on which side of the existing right-of-way would be expanded. These homes would be directly within the proposed new right-of-way with hundreds more in close proximity to the Aspen-Golden Lines.

The second major flaw involves the W&OD Trail, which is a major constraint. Dominion met with NOVA Parks on April 11, 2023, to discuss potential collocation of new right-of-way along the W&OD Trail. NOVA Parks said it would oppose any new right-of-way directly parallel to the W&OD Trail due to the potential for impacts on cultural resources, wetlands, species, and viewsheds.. Installation of new transmission lines along the trail would likely require permanent tree clearing and trail closures throughout construction.

As a public entity, NOVA Parks land cannot be condemned if the Company needs new right-of-way. Furthermore, any new rights-of-way or amendments to the existing easement would need to be approved by NOVA Parks, which indicated during the April 11, 2023, meeting that it would neither grant new right-

[10] Collocation along the W&OD Trail assumes 25 feet of overlap between the existing Dominion right-of-way and new right-of-way that would be required for the Aspen-Golden Lines.

of-way along the entirety of the W&OD Trail between the Aspen and Golden Substations nor alter the conditions of the easement for the existing transmission line.

Further complicating new right-of-way acquisition are mandatory crossing of at least one county park and one Loudoun County School Board parcel that are adjacent to the trail at several locations.

Lastly, the section of the W&OD Trail Corridor to the east of Goose Creek is situated between Milestone Reservoir to the north and the Luck Stone quarry to the south on a narrow isthmus. The lack of space and existing 230 kV line in this corridor would make collocation of the future Twin Creeks and the Aspen-Golden Lines impracticable.

For all these reasons, the W&OD Trail Corridor was rejected as a feasible alternative for routing the new transmission lines.

4.2 Dulles Greenway/Waxpool Road Corridor

4.2.1 Description

The Project team received numerous comments from residents, stakeholders, and elected officials urging Dominion to study the Dulles Greenway (Rt. 267) as a possible location for the Aspen-Golden Lines. The Dulles Greenway/Waxpool Road Corridor (or Dulles Greenway Corridor) was subsequently studied for its routing potential. The corridor is defined by Dominion's existing 500 kV transmission right-of-way extending south, then turns west, expanding to encompass the Dulles Greenway to the south, and undeveloped land to the north. The corridor narrows after crossing Belmont Ridge Road where it follows the Dulles Greenway and is flanked on either side by neighborhoods. At Ashburn Village Boulevard, the corridor widens southward to Loudoun County Parkway to include a wide swath of DCA before reaching the proposed Golden Substation. The variable width of the Dulles Greenway Corridor correlates to the surrounding availability of routing opportunities and density of constraints, expanding in areas with greater routing opportunities and narrowing when blocked by constraints. The Dulles Greenway/Waxpool Road Corridor and constraints are shown on Figure 4.1-2.

The Dulles Greenway (Rt 267) is a privately-owned and operated 14-mile-long toll road running southeast to northwest from Dulles International Airport to Leesburg (Dulles Greenway, 2023). The Dulles Greenway was created under the Virginia Highway Corporation Act of 1988 and has been operating since 1995 (Dulles Greenway, 2023). Per the terms of the Virginia Highway Corporation Act, the Dulles Greenway will be transferred to VDOT in 2056 (USDOT, 2014).

The Project team met with the operator of the Dulles Greenway, Toll Road Investors Partnerships II (TRIP II), on May 15, 2023, to collect information about the greenway as a potential route corridor. In that meeting, TRIP II explained their obligation to keep dedicated space along either side of the existing Dulles Greenway to accommodate future expansion of up to two traffic lanes in both directions. Additionally, TRIP II stated that the median is reserved for the future extension of the Metrorail Silver Line. For the purposes of conceptual routing, ERM was directed to assume that the Aspen-Golden Lines right-of-way would need to be set back 35 feet from the existing pavement so as not to interfere with future road expansion.

The Dulles Greenway runs southeast to northwest for approximately 5.3 miles across the southern extent of the study area. It passes approximately 1.9 miles south of the proposed Aspen Substation site and 2.0 miles southwest of the proposed Golden Substation site at its closest points. Currently, the Metrorail Silver Line terminates within the center median of the Dulles Greenway in the southeastern corner of the study area at Ashburn Station located about 0.4 mile south of Ashburn Village Boulevard.

To develop the Dulles Greenway as a potential route corridor for the Aspen-Golden Lines, additional corridors were needed to connect Dulles Greenway to the substation sites. To the west of the proposed

Aspen Substation site, Dominion's existing 500 kV transmission corridor and Belmont Ridge Road were identified as the most direct linear features to the Dulles Greenway and were incorporated into the Dulles Greenway/Waxpool Road Corridor. To the east from the proposed Golden Substation site, Ashburn Village Boulevard, Waxpool Road, and Loudoun County Parkway provided the most direct connections to the Dulles Greenway and were incorporated into the route corridor. However, there were significant constraints along each of the roadways, including residential neighborhoods to the north and south of Ashburn Village Boulevard and existing commercial and industrial developments along Waxpool Road and Loudoun County Parkway. Additionally, DCA is crossed by multiple existing Dominion 230 kV overhead transmission lines, most of which occupy 100-foot-wide rights-of-way and would need to be crossed by the Aspen-Golden Lines.

ERM reviewed the Dulles Greenway/Waxpool Road Corridor in three parts; 1) Aspen Substation to the Dulles Greenway, 2) the Dulles Greenway, and 3) Dulles Greenway to Golden Substation, as described below.

4.2.2 Assessment

4.2.2.1 Aspen Substation to Dulles Greenway:

The most direct path between the proposed Aspen Substation site and Dulles Greenway is along the 1.9-mile-long segment of the Company's existing 500 kV transmission corridor for Line #558 south to the Dulles Greenway, as shown on page 1 of Figure 4.1-2. Following the existing right-of-way, the Aspen-Golden Lines would follow the east side of the corridor to avoid a transmission line crossing that would require multiple line outages. Just north of the Dulles Greenway, the Stonewater Substation and a data center are located approximately 115 feet east of the existing transmission line corridor, leaving insufficient space for a new 100-foot right-of-way. Another major constraint are several Virginia Outdoors Foundation (VOF) conservation easements (land which is also part of a Loudoun County Park) which follow the east bank of Goose Creek to the north and both the north and south sides of the Dulles Greenway. VOF easements cannot be crossed by new utility right-of-way without permission from the VOF, landowner, or other grantees.. Avoidance of these constraints requires crossing Goose Creek north of the VOF easements, as shown on page 2 of Figure 4.1-2.

To reach the Dulles Greenway, routes through this corridor would have to cross Goose Creek north of the VOF easements or follow either Belmont Ridge Road through forest to the east side of Goose Creek. Both routing options along this section would cross public (Loudoun Water) land and pass adjacent to the existing Goose Creek Village mixed-use development northwest of the Dulles Greenway and Belmont Ridge Road intersection (see page 2 of Figure 4.1-2). Throughout this area, there is insufficient space for a new 100-foot right-of-way on either the east or south sides of the Goose Creek Village development without the removal of existing homes. Avoidance of the Goose Creek Village development further east or south is also not possible due to existing adjacent residential areas. As shown on page 2 of Figure 4.1-2, there are approximately 40 existing multi-family residences along the west side and 10 single family residences along the east side of Belmont Ridge Road. Locating south of the Goose Creek Village development would require the removal of two homes currently under construction, as well as planned residences with the Goose Creek West development (10 single-family dwellings and one 72-unit multi-family building).

Given these constraints, no feasible options for a route connecting the proposed Aspen Substation site to the Dulles Greenway without requiring the condemnation and removal of existing homes could be identified.

4.2.2.2 The Dulles Greenway (from Goose Creek to Loudoun County Parkway)

Along the Dulles Greenway (from Goose Creek to Loudoun County Parkway), there are several significant routing constraints. First, the median of the greenway, approximately 50 feet wide, is reserved for a potential future expansion of the Metrorail Silver Line. Therefore, any corridors along the Dulles Greenway would need to be located along either the north or southbound lanes. As previously mentioned, a 35-foot-wide area along both sides of the road needs to be avoided to preserve space for a potential future roadway expansion, further limiting the space available for new transmission lines.

Southeast of Belmont Ridge Road, any potential route would have to (1) cross both Loudoun County Public School and Loudoun County Board of Supervisor lands or (2) align the right-of-way within 60 feet of several existing homes on the north side of the Dulles Greenway. Additionally, there are child daycare centers on either side of Dulles Greenway at the intersection with Broadlands Boulevard. Any potential right-of-way would cross daycare center grounds, including areas where the right-of-way would overlap with portions of outdoor playgrounds associated with these centers (see page 3 of Figure 4.1-2). South of Broadlands Boulevard/Shellhorn Road are single-family and multi-family homes within 60 feet of the right-of-way on both sides of the Dulles Greenway (see pages 3 and 4 of Figure 4.1-2). South of Waxpool Road is another pinch point where existing homes are within 60 feet of the potential 100-foot-wide right-of-way on both the north and south sides of the Dulles Greenway, including two multi-family buildings to the north.

Between Ashburn Village Boulevard and Loudoun County Parkway is the Metrorail Silver Line Ashburn Station, which includes a pedestrian bridge connecting stations on both sides of the Dulles Greenway. Impacts to the station could only be avoided by crossing existing and planned mixed-use developments (including Silver District West) on either side of the station.

Given the extent of residential development immediately adjacent to the Dulles Greenway, routing along this segment of the greenway is impractical, particularly where existing residences would be located within 60 feet of the edge of the right-of-way or directly within the right-of-way where homes would need to be removed. Additionally, impacts to other civic features, such as daycare centers and the Metrorail Station, further limit the space available for routing and diminish the viability of the Dulles Greenway Corridor which is almost entirely residential.

4.2.2.3 Dulles Greenway to Golden Substation

From the Dulles Greenway to the proposed Golden Substation, two potential options through this corridor were evaluated: one following Ashburn Village Boulevard and Waxpool Road, and the other following Loudoun County Parkway, as shown on pages 4, 5,and 6 of Figure 4.1-2.

Following Ashburn Village Boulevard east of the Dulles Greenway, all potential routes within the corridor would cross existing commercial and residential buildings on either the north or south side of the road. Along the north side of Ashburn Village Boulevard are approximately 135 residential units within the potential right-of-way corridor, including single family stacked and multi-family housing units. To the south of Ashburn Village Boulevard are three commercial buildings and three, 12-unit, multi-family residences. Further east along the boulevard, any potential route would cross more residences to the north and/or data center buildings to the south along Ashburn Village Boulevard and Waxpool Road (see pages 4 and 6 of Figure 4.1-2).

Along Loudoun County Parkway, multiple existing data centers are located within the potential right-of-way along with five existing 230 kV transmission lines that cross the parkway in highly constrained areas (see pages 5 and 6 of Figure 4.1-2). From an engineering perspective, crossing existing transmission lines typically requires wider rights-of-way (an additional 50 feet for a total width of 150 feet), which is not possible between the existing roads and commercial buildings in this area. Further complicating routing

throughout DCA is a vast network of buried utility lines (water, sewer, and fiber) whose easements occupy nearly all available space. This includes large diameter reclaimed water mains that supply the DCA with water used for cooling.

Based on direct impacts to existing residential and commercial buildings, no viable route options within the corridor between the Dulles Greenway and the proposed Golden Substation site were identified.

For all the reasons discussed above, but most importantly the removal homes, the Dulles Greenway/Waxpool Road Study Corridor was deemed infeasible, and no transmission line routes within this corridor were developed for further review. Additionally, Dulles Greenway/Waxpool Road Study Corridor would not allow collocation of the future Twin Creeks Lines with the Aspen-Golden Lines resulting in two new transmission line corridors across within study area instead of one corridor. The purpose of collocating the two projects was to minimize impacts of new transmission lines and avoid unnecessary resource impacts such as an additional crossing of the Goose Creek Scenic River.

4.3 Rt. 7 Corridor

4.3.1 Description

Rt. 7 is a six-lane limited access divided highway extending for approximately 5.7 miles in a northwest-to-southeast orientation through the study area, passing approximately 1.2 miles north of the proposed Aspen Substation site and 2.5 miles north of the proposed Golden Substation site. As a primary state highway and major commuter route, Rt. 7 is one of the busiest highways in the state with an average daily traffic count of 134,000 vehicles (VDOT, 2022). Leaving Aspen Substation, the Rt. 7 Corridor was defined to encompass planned data center campuses along both sides of Goose Creek before turning southeast and narrowing along the length of Rt. 7. The corridor widens at Loudoun County Parkway, extending east to Sully Road as it continues south toward Golden Substation. Whereas the Goose Creek data center campuses and open lands adjacent to Broad Run provided a degree of routing flexibility, the corridor narrowed along Rt. 7 where it is constrained by neighborhoods, historic resources, and commercial development. The Rt. 7 Corridor and constraints are shown on Figure 4.1-3.

Based on setback requirements and development patterns, the existing residential and commercial buildings along Rt. 7 are almost all further than 150 feet from the roadway, making it suitable for the 100-foot-wide right-of-way required for the Aspen-Golden Lines. Along the north and south sides of Rt. 7, portions of VDOT right-of-way and adjacent privately held lands contain existing underground and overhead utility easements including for fiber optic lines, a major Washington Gas natural gas line, Loudoun Water sewer and water lines, Dominion distribution lines, and stormwater pipes and drains. Although specific utility location data is protected under non-disclosure agreements with the various utilities, the Company determined that the north side of Rt. 7 contains a much higher concentration of buried utilities compared to the south side. The existing utility rights-of-way provide a routing opportunity as well as an engineering challenge for siting the foundations of the proposed structures.

Between the proposed Aspen Substation site and Rt. 7 are several major constraints that inhibit routing in the corridor, including Luck Stone Quarry and the Belmont Residential Community located approximately 0.4 mile north and 1.2 miles east of the proposed Aspen Substation, respectively, as shown on aerial imagery of Figure 4.1-3. The area between these features includes developed industrial land, forested land along both the east and west sides of Goose Creek in various stages of planned data center development, and Belmont Ridge Road. Throughout this portion of the corridor, the planned Loudoun Water Milestone Pump Station and a series of planned and existing Loudoun Water infrastructure improvements also limit the space available for routing new transmission lines.

Between Rt. 7 and the proposed Golden Substation site, the route corridor encompasses the area between Loudoun County Parkway and Rt. 28 (Sully Road), bisected by Broad Run. This area was

considered for routing because it provides the most direct connection between Rt. 7 and the proposed Golden Substation site and has more open land than areas east of Rt. 28 and west of Loudoun County Parkway.

South of Rt. 7, the west side of Loudoun County Parkway has dense residential development, much of which is part of the One Loudoun mixed-use development, while the east side of Loudoun County Parkway has residential, commercial, and industrial development including the Loudoun Water BRWRF (see pages 4 and 5 of Figure 4.1-3). Similarly, the east side of Rt. 28 has existing commercial and data center developments, while the west side of Rt. 28 consists of existing and planned residential, mixed-use commercial, and industrial developments. Broad Run, Loudoun County Board of Supervisors (BOS) open space easements, and adjacent forested riparian areas are found between the roadways (see pages 4 and 5 of Figure 4.1-3).

4.3.2 Assessment

The area east of the proposed Aspen Substation site consists mainly of industrial and mineral extraction sites with forested parcels on both sides of Goose Creek planned for future data center development. Crossing Belmont Ridge Road, the corridor encompasses only those areas nearest the VDOT right-of-way to avoid residential neighborhoods (namely, Belmont and Lansdowne) to the north and south and to maximize collocation along the highway and adjacent utilities.

Along Rt. 7, there are no existing buildings within 150 feet of either the north or south sides of the highway from Belmont Ridge Road east to Rt. 28, except for one residence and one historic resource (Broad Run Tollhouse) next to the Rt. 7 bridge over Broad Run (see pages 2 through 5 of Figure 4.1-3). The majority of land adjacent to Rt. 7 is not zoned specifically for residential use, especially along the south side of Rt. 7, where only short sections of residential zoning districts would be crossed (page 3 of Figure 4.1-3).

The corridor turns south from Rt. 7 toward the proposed Golden Substation site crossing the asea between Loudoun County Parkway and Rt. 28. Several potential routing opportunities are available in this section of the corridor where the Aspen-Golden Lines could collocate with existing roadway and utility rights-of-way, while largely avoiding existing and planned developments and Broad Run (see pages 3, 4, and 5 of Figure 4.1-3). While there are routing constraints throughout this corridor, including public lands, conservation easements, and other sensitive natural resources, the Rt. 7 corridor would not require the condemnation of existing residences or commercial/industrial buildings.

Given the collocation opportunities afforded by major roadways, existing utility corridors, and planned data center developments, as well as the avoidance of residential areas, the Rt. 7 Corridor was deemed feasible for additional study and the development of route alternatives for the Aspen-Golden Lines.

4.4 Summary and Corridor Selection

Evaluation of the three potential route corridors revealed major distinctions leading to the selection of the Rt. 7 Corridor for the development of route alternatives. Firstly, the Rt. 7 Corridor could accommodate the Aspen-Golden Lines' right-of-way needs without requiring the removal of existing homes or businesses. Whereas no existing homes would be directly impacted by an alternative within the Rt. 7 Corridor, a minimum of 61 residences along the W&OD Trail Corridor and 36 residences along the Dulles Greenway/Waxpool Road Corridor (in four multi-family apartment buildings) would need to be removed to accommodate new right-of-way for the Aspen-Golden Lines. In accordance with SCC Guideline #1, which states that transmission line rights-of-way should avoid and minimize impacts to existing land uses to the extent possible, the priority is to avoid impacts to residences, especially when feasible alternatives are possible.

From a land use and future land use planning perspective, the Rt. 7 Corridor is the most compatible for routing new transmission lines in comparison to the other corridors in the study area. While the W&OD Trail Corridor and Dulles Greenway/Waxpool Road Corridor were defined on the basis of collocation with a key feature (major roads or existing transmission lines, respectively), in both cases the surrounding land uses are far less compatible with the Aspen-Golden Lines. Both the W&OD Trail and Dulles Greenway Corridors cross predominately residential areas whereas the Rt. 7 Corridor crosses primarily developed lands or undeveloped lands zoned for industrial, commercial, mixed use, and even by-right data center uses. In contrast, residential and mixed-use zoning only made up a small fraction of land within the Rt. 7 Corridor. Moreover, in consideration of parcels with pending and proposed data centers, the Rt. 7 Corridor is the only option that anticipates future data center delivery points between Belmont Ridge Road and Ashburn Village Boulevard. Use of the Rt. 7 Corridor for the Aspen-Golden Lines would obviate the need for additional future transmission infrastructure along Rt. 7 to serve these planned data centers. Selection of the W&OD Trail Corridor or Dulles Greenway/Waxpool Road Corridor for the Aspen-Golden Lines would still require new transmission infrastructure along Rt. 7 to service the data centers.

Given these reasons, the Rt. 7 Corridor was selected for route identification and analysis and is described and evaluated in the remainder of this report. The W&OD Trail Corridor and Dulles Greenway/Waxpool Road Corridor were deemed infeasible for routing, and no route alternatives were developed.

5. ASPEN-GOLDEN LINES ROUTES

After identifying the routing constraints and opportunities in the study area and identifying the Rt. 7 Corridor as the only feasible option for routing a new overhead transmission line, ERM developed potential routes for the Aspen-Golden Lines. Efforts were made to avoid existing and planned developments, collocate with existing linear infrastructure, such as utility lines and roads, and minimize crossings of natural resources such as wetlands, waterbodies, and forested areas. After the identification of preliminary routes, ERM conducted several site visits and began refining and evaluating each one. The Company and ERM also began stakeholder and agency outreach during this time to assist with route evaluation and data gathering. Descriptions of the viable routes identified and developed by ERM for the Aspen-Golden Lines are provided in Section 5.1 below. Impacts and effects from these alternatives are assessed and evaluated throughout the remainder of this report.

In some instances, during the process of route identification and refinement, or as a result of stakeholder engagement (see Section 5.1 below), ERM and the Company became aware of a constraint or other issue rendering a potential alternative infeasible or impracticable. In total, ERM and the Company identified eight route variations that subsequently were eliminated from further consideration for the Aspen-Golden Lines. Descriptions of these route variations, along with the reasons they were eliminated from further consideration, are provided in Section 5.2.

Finally, ERM assisted in the evaluation of an underground solution for the Aspen-Golden Lines. ERM created a conceptual underground route to allow the Company to evaluate the feasibility of an underground solution. Due to various issues, including but not limited to routing constraints, an underground solution for the Aspen-Golden Lines was deemed infeasible by Dominion. A summary of the routing, engineering, and construction constraints evaluated by Dominion and the rationale for the Company's conclusion that an underground route is infeasible is provided in Section 5.3.3.

5.1 Stakeholder Engagement

ERM and Company representatives conducted field reconnaissance of the study area and potential route corridors from public roads and rights-of-way between Fall of 2022 and Winter of 2023. During these visits, ERM took photographs over the course of a year of the route corridors and certain resources in the

study area in different seasonal conditions to aid in the analysis of impacts, particularly on visual and cultural resources.

Following a preliminary route assessment, Dominion Energy Virginia engaged the public, elected officials, regulatory, planning, and conversations groups, and land managing agencies, to gather feedback on routing. Dominion held virtual and in-person open houses to share Project information and receive feedback in June and August of 2023 and January 2024 (one virtual and one in-person meeting in each month). To serve the two most widely spoken foreign language speakers in the study area (besides English) each Project open house event included Spanish- and Vietnamese-language translation services as well as Spanish and Vietnamese translated Project websites. Dominion also maintained a website[11] with up-to-date Project information and an interactive public comment map.[12] Some of the feedback obtained through stakeholder engagement resulted in ERM making adjustments to optimize routing and, in certain cases, helped to inform the Company's decision to reject others.

Through January 2024, the Company conducted dozens of individual meetings seeking stakeholder input on the Project. In addition to this outreach, the Company engaged a stakeholder group with an interest in electric transmission line projects within all of Loudoun County, called the Loudoun Reliability Engagement Group, to provide information and solicit feedback. The Loudoun Reliability Engagement Group typically meets bi-monthly with Dominion representatives regarding multiple projects. At least five meetings of the Loudoun Reliability Engagement Group specifically discussed the Project.

5.2 Route Alternatives

Due to the combination of rapid development in the study area with complex and changing land use issues over the last several decades (much of it associated with data center development), ERM identified one corridor for the Aspen-Golden Lines—the Rt. 7 Study Corridor—where new transmission lines meeting the objectives of the Project could be routed. Within this corridor, ERM identified one viable route (Route 1). Within Route 1, two overhead route variations were identified along Rt. 7, referred to as the Belmont Park Segment (Belmont Park Variations A and B), and two overhead route variations were identified near Broad Run, referred to as the Broad Run Segment (Broad Run Variations A and B), referred to collectively as the Variations (see Figures 5.1-1 and 5.1-2). The Route 1 alignment was developed through data review, field reconnaissance, and outreach to landowners, Loudoun County agency staff (including Planning and Zoning and Natural Resources staff), and other stakeholders, such as homeowner associations, VDOT, and the general public through open houses and other meetings. This outreach contributed to the development of Route 1 and the Belmont Park and Broad Run Variations, as well as the rejection of other route variations determined to be infeasible or impracticable for the Aspen-Golden Lines as discussed in Section 5.3.

5.2.1 Route 1

As discussed in Section 5.1, Route 1 was developed following extensive study of the feasibility and impacts of its specific location. Route 1 consists of three segments that will be connected to one another by one of the Belmont Park Variations and one of the Broad Run Variations. Throughout this document, the term "Route 1" will be used to describe the three segments of Route 1, as shown on Figures 5.1-1 and 5.1-2.

The proposed 500 kV and 230 kV Aspen-Golden Lines required for the Project originate from what will be two different backbones within the proposed Aspen Substation, with the 500 kV line to the north and the 230 kV line to the south. From here, the lines head northeast for approximately 0.2 mile on adjacent but

[11] See https://www.dominionenergy.com/nova.

[12] See https://geovoice.powereng.com/dominion/LoudounCounty/.

converging alignments, crossing two of the Company's existing 230 kV transmission lines (Lines #227 and #274) and merging into a combined 5-2 configuration on the north side of Cochran Mill Road. Route 1 then heads east in a combined 500-230 kV configuration for about 0.3 mile along the north side of Cochran Mill Road south of the future Twin Creeks Substation. The route then continues southeast for approximately 0.4 mile, passing between planned buildings associated with a proposed data center planned development (Campus A) and continuing to a crossing of Goose Creek.

After crossing Goose Creek, Route 1 continues southeast for about 0.1 mile, then turns and continues northwest for approximately 0.5 mile, crossing another planned data center development (Campus B). The route then heads east for 0.3 mile towards Belmont Ridge Road, crossing the future Russell Branch Parkway dedication[13] and a third planned data center development (Campus C). It next heads northeast for 0.5 mile, crossing Belmont Ridge Road, Freedom Trail Road, and a forested parcel that is also a planned data center development (Campus D) on the south side of Rt. 7. Route 1 then continues southeast adjacent to the south side of the highway for approximately 0.5 mile along Belmont Ridge Road.

At this point, Route 1 would either continue southeast adjacent to the south side of Rt. 7 for about 0.6 mile ("Belmont Park Variation A" or "Belmont Park A"), or alternatively, it would cross to the north side of the highway, continue southeast adjacent to the north side of the highway for about 0.6 mile, then cross the highway a second time to the south ("Belmont Park Variation B" or "Belmont Park B"). Both variations cross the interchange at the intersection of Claiborne Parkway/Lansdowne Boulevard with Rt. 7. Additional description of the Belmont Park Variations is provided in Section 5.2.2.

On the east side of the Claiborne Parkway/Lansdowne Boulevard interchange, Rt. 7 continues southeast adjacent to the south side of Rt. 7 for another approximately 2.4 miles, crossing a planned data center development (Campus E) Ashburn Village Boulevard and Loudoun County Parkway, and passing between Rt. 7 and Atwater Drive for about 0.4 mile. Before reaching George Washington Boulevard, the route turns and heads south for approximately 0.3 mile, crossing Russell Branch Parkway, then continues southwest for about 0.3 mile toward Loudoun County Parkway, passing south of an existing data center and across the edge of two BOS open space easements. The route continues another approximately 0.3 mile south passing east of a commercial building south of the intersection of Loudoun County Parkway and Malden Place (north of Beaverdam Run).

The route next would follow Broad Run Variation A or B south and east towards Pacific Boulevard. Broad Run Variation A (Broad Run A) heads south adjacent to the east side of Loudoun County Parkway for about 1.4 miles, then east/southeast for about 0.7 mile mostly adjacent to the north side of Dominion's existing right-of-way for Lines #2150 and #2081. In contrast, Broad Run Variation B (Broad Run B) heads east for about 0.4 mile towards Broad Run, then parallels Broad Run to the southeast through mostly forested, undeveloped area, then continues south for about 1.4 miles across the Broad Run floodplain with a crossing of Gloucester Parkway.

At the south end of the Broad Run Variations, Route 1 continues along a common alignment adjacent to the east side of Pacific Boulevard near Cabin Branch on a parcel with a proposed data center development (Campus F). The route then turns south for 0.2 mile, where the 500 kV line enters the west side of the proposed Golden Substation (approximately 0.1 mile). The 230 kV line continues for another 0.3 mile south and east, then enter the south side of the Golden Substation.

Excluding the Belmont Park and Broad Run Variations, Route 1 measures approximately 6.4 miles in length for the 500 kV portion of the Project and approximately 6.6 miles in length for the 230 kV portion of the Project.

[13] A planned, but conceptual, extension of Russell Branch Parkway connecting Belmont Ridge Road and Cochran Mills Road via a bridge over Broad Run.

Multiple variations of Route 1 were studied to reach a consensus with affected stakeholders and avoid impacts to resources where practicable. Section 5.3 below describes the conceptual route variations studied along the Rt. 7 Corridor, the reason why each variation was considered, and the reasons why these variations were rejected in favor of Route 1.

5.2.2 Belmont Park Variations

5.2.2.1 Belmont Park Variation A

Belmont Park Variation A is an approximately 0.6-mile-long route segment along the south side of Rt. 7 extending from a point approximately centered on the crossing of Claiborne Parkway at the interchange of the parkway with Rt. 7 (Figure 5.2.2-1). Belmont Park A crosses through the south side of the cloverleaf interchange of Rt. 7 and Claiborne Parkway/Lansdowne Boulevard. It crosses approximately 0.1 mile of land that was rezoned in January 2023 from industrial to high-density residential land (Residential 16) as part of the Belmont Park residential planned development (discussed in Section 6.1.6). It otherwise crosses about 0.5 mile of industrial, office, and commercial zoned land.

5.2.2.2 Belmont Park Variation B

Belmont Park Variation B is an approximately 0.6-mile-long route segment beginning approximately 0.3 mile west of Claiborne Parkway on the south side of Rt. 7. From here, the route crosses to north side of Rt. 7; then extends approximately 0.4 mile southeast adjacent to the north side of Rt. 7, crossing Lansdowne Boulevard; then crosses back to the south side of Rt. 7. Belmont Park B crosses through the north side of the cloverleaf interchange of Rt. 7 and Claiborne Parkway/Lansdowne Boulevard. It was identified and assessed as a potential option to avoid impacts to the Belmont Park residential planned development discussed in Section 6.1.6. Belmont Park B crosses approximately 0.4 mile of land zoned for housing (H3), with the remaining 0.3 mile zoned for office and industrial uses. It is approximately 430 feet longer than Belmont Park A.

5.2.3 Broad Run Variations

The Broad Run Variations, as noted above, begin on the east side of Loudoun County Parkway and continue south/southeast to east side of Pacific Boulevard. A significant portion of each Broad Run variation crosses Loudoun Water-owned land, the Ashburn Campus, containing the Loudoun Water BRWRF (see Figure 5.2.3-1). Any right-of-way across Loudoun Water property, regardless of the route/variation selected, must be voluntarily obtained. Discussions between Loudoun Water and Dominion are ongoing and, as of February 20, 2024, Loudoun Water agreed to allow Broad Run Variation B across the BRWRF. Loudoun Water is still considering Broad Run Variation A, pending detailed design and engineering.

5.2.3.1 Broad Run Variation A

The Broad Run Variation A (Broad Run A) begins approximately 0.6 mile south of Russell Branch Parkway on the east side of Loudoun County Parkway. From there, it heads south for 0.2 mile towards Loudoun County Parkway, crossing Beaverdam Run and collocating with Loudoun County Parkway. The route variation follows the east side of Loudoun County Parkway for approximately 1.3 miles, crossing the Loudoun Water BRWRF parcel, Gloucester Parkway, and Coach Gibbs Drive. Less than 0.1 mile north of the W&OD Trail, the route turns east for about 0.3 mile, crossing over Broad Run and towards the existing Paragon Substation. It then continues north and east for about 0.4 mile, bypassing an existing data center and crossing Pacific Boulevard, where it rejoins Route 1. In total, Broad Run A measures approximately 2.2 miles long.

5.2.3.2 Broad Run Variation B

The Broad Run Variation B (Broad Run B) begins along Route 1 approximately 0.6 mile south of Russell Branch Parkway on the east side of Loudoun County Parkway. From there, it heads southeast for about 0.2 mile, then northeast for another 0.2 mile towards Broad Run. Approximately 280 feet south of Broad Run, the route turns and continues southeast for about 0.4 mile following the existing Russell Branch Interceptor sewer line on the southwest side of Broad Run. It then heads south/southwest for about 0.4 mile, then south for 1.0 mile, where it parallels an existing water line for approximately 0.8 mile, then crosses Broad Run and Gloucester Parkway and passes west of BECO Substation. Before reaching Cabin Branch, the route variation turns and heads east for 0.2 mile, crossing Pacific Boulevard, then turns south for about 0.1 mile across Cabin Branch where it rejoins with Route 1. In total, Broad Run B measures approximately 2.3 miles long.

5.2.4 Aspen-Goose Creek Line

The Aspen-Goose Creek Line is a 0.2-mile-long 500 kV transmission line extending from the existing Goose Creek Substation to the proposed Aspen Substation. The Aspen-Goose Creek Line consists of a single monopole structure forming the elbow of a 90-degree turn between the backbones of the existing Goose Creek Substation and proposed Aspen Substation. The Aspen-Goose Creek Line would be entirely within the boundary of the existing Goose Creek Substation, existing Dominion transmission line right-of-way, and the proposed Aspen Substation boundary, all of which are within a Dominion-owned parcel. Because of this, no route alternatives were considered for the Aspen-Goose Creek Line, and it is not analyzed as a separate feature in this study. To the extent the Aspen-Goose Creek Line is located within the Company's existing Goose Creek Substation or transmission right-of-way corridor, any impacts resulting from the construction of that line already were mitigated during permitting of the Goose Creek Substation expansion and transmission corridor. Where the Aspen-Goose Creek Line is located within the proposed Golden Substation, any impacts from construction of that line are included with Route 1. The location of the Aspen-Goose Creek Line is depicted on figures 5.1-1 and 5.1-2.

5.2.5 Lines #2081/#2150 Loop

The Lines #2081/#2150 Loop are 0.1-mile-long 230 kV transmission lines that would connect the Company's existing Paragon Park-Sterling Park 230 kV Lines #2081 and #2150 to the proposed Golden Substation. Specifically, the Company proposes to cut Line #2081 and Line #2150 between Structure #2081/124 / #2150/184 and Structure #2081/123 / #2150/183, and loop the existing lines into and out of the proposed Golden Substation, resulting in (i) Golden-Sterling Park #2081, (ii) Golden-Sterling Park #2150, (iii) Golden-Paragon Park #2348, and (iv) Golden-Paragon Park #2351. To cut the lines into the proposed Golden Substation, the Company will remove one existing double circuit lattice tower (Structure #2081/123 / #2150/183) and replace it with four dulled galvanized steel single circuit monopoles (Structures #2081/122A, #2150/182A, #2348/123A, and #2351/183A). From the proposed single circuit structures within the existing transmission corridor, the Company will extend new conductor for one span (approximately 490 feet (<0.1 mile)) that runs contiguous with the Line #2333 right-of-way where Line #2333 terminates into the proposed Golden Substation. The Loop will be constructed entirely within existing right-of-way or on property to be obtained by the Company at the proposed Golden Substation, and as such, there are no route alternatives considered for the Loop. The location of the Loop is depicted in Figures 5.1-1, 5.1-2, and 5.2.3-1. The impacts of construction of the Loop are included with Route 1 in this report.

5.2.6 SCC Appendix Routes

The analysis and conclusions of this report are reflected in the SCC Appendix using the same approach whereby Route 1 is analyzed alone (having no route alternative), and the Belmont Park and Broad Run Variations are analyzed comparatively. While the SCC Appendix uses the same route nomenclature as this report, it also organizes Route 1 and the Belmont Park and Broad Run Variations into complete end-to-end routes. The nomenclature of the full route combinations and total route mileages in the SCC Appendix – four in total - are as follows:

- Route 1AA: Route 1 + Belmont Park Variation A + Broad Run Variation A (9.4 miles).
- Route 1AB: Route 1 + Belmont Park Variation A + Broad Run Variation B (9.5 miles).
- Route 1BA: Route 1 + Belmont Park Variation B + Broad Run Variation A (9.4 miles).
- Route 1BB: Route 1 + Belmont Park Variation B + Broad Run Variation B (9.5 miles).

The complete end-to-end routes are discussed in Section 7 of this report.

5.3 Routes Rejected

In developing Route 1, ERM studied several route variations for the Aspen-Golden Lines that were subsequently rejected from further consideration (see Figure 5.3-1). Descriptions of these routes and the rationale for both considering and eliminating them is provided below.

5.3.1 Overhead Route Variations

5.3.1.1 Sycolin Creek Variation

ERM identified and assessed the Sycolin Creek Variation at the request of the owner of the planned Data Center Campus A development as a potential option for reducing impacts to buildable space on the parcel and avoiding conflicts with the site development plan currently under review by the County. The variation deviates from Route 1 north of the W&OD Trail on the west side of Cochran Mill Road. From here, it heads southeast for 0.1 mile, crossing Cochran Mill Road, then heads east for 0.5 mile, crossing Sycolin Creek in four places and a county-owned parcel containing Loudoun Water's Milestone Pump Station. The route variation terminates Route 1 just west of Goose Creek. It measures approximately 0.6 mile long.

As the Sycolin Creek Variation was studied in detail and discussed with affected landowners, the following issues were identified:

- Loudoun Water Setback Requests: In communications with Dominion and the data center developer, including an email on August 16, 2023, Loudoun Water requested various setbacks from existing and planned infrastructure on the Milestone Pump Station parcel and adjacent industrial parcels and also requested clearance minimums for a planned bridge over Sycolin Creek that has not yet been designed (see Section 6.1.1 Loudoun Water, Planned Facilities). After reviewing the setback and height requests with Loudoun Water and the data center developer in a virtual meeting on September 15, 2023, the Company determined that the requested setbacks cannot reasonably be met with the Sycolin Creek Variation due to concerns with construction and maintenance access, facility encroachment, and transmission outages during bridge construction. As a result, Loudoun Water does not support and is unwilling to grant a right-of-way across its land for the route variation.
- Environmental Impacts to Sycolin Creek: The Sycolin Creek Variation would require four overhead crossings of Sycolin Creek within an approximately 0.4-mile-long segment. It would also require the clearing of trees along both sides of Sycolin Creek along over 0.2 mile of shoreline, which would add

to the overall impact of the Project. Construction in these areas would affect riparian vegetation, including wetlands.

- Project Schedule Risk: The additional wetland impacts associated with the crossings of Sycolin Creek increases the probability that an Individual Permit (as opposed to a general permit) would be required from the USACE under Section 404 of the Clean Water Act for crossings of surface waters. The additional time needed both to design and successfully permit the crossings would risk the required Project in-service date of June 2028.

For these reasons, the Sycolin Creek Variation was eliminated from further consideration.

5.3.1.2 Cochran Mill Road North Variation

The Cochran Mill Road North Variation begins near the Route 1 crossing of Cochran Mill Road and through a property with an approved development plan (Data Center Campus A). The variation heads east along Cochran Mill Road for about 0.3 mile towards Durham Court, crossing the north side of the planned development. The variation then turns and heads southeast for about 0.4 mile adjacent to a 90-foot-wide dedication for a planned future extension of Gloucester Parkway where it crosses Goose Creek. The variation terminates at an intersection with Route 1 on the east side of the creek near the proposed future Sycolin Creek Substation. The Cochran Mill Road North Variation is approximately 0.7 mile long.

The Cochran Mill Road North Variation was studied in detail and discussed with affected landowners, the following issues were identified:

- Insufficient Space between Cochran Mill Road and Existing and Planned Buildings: An approximately 0.3-mile-long segment of the route variation parallels Cochran Mill Road in the area east of the future Twin Creeks Substation. Along this segment of the route, there are three existing commercial buildings within 100 feet of the north side of Cochran Mill Road. To the south, the planned data center development (Campus A) is within 115 feet of Cochran Mill Road. Given the existing buildings to the north and planned future data center campus to the south, there is insufficient space in this area for either a new 100- or 150-foot-wide right-of-way or for a collocated right-of-way with the future Twin Creeks Lines.
- Impact on Future Gloucester Parkway Road Expansion: The Gloucester Parkway Expansion is a 90-foot-wide dedication identified within the Loudoun County Countywide Transportation Plan (CTP) for a future road extension and a bridge from the east side of Belmont Ridge Road to the west side of Cochran Mill Road across Goose Creek. The road dedication cannot directly accommodate the new transmission lines right-of-way with an existing residence within 120 feet of the north side of the dedication and planned data center buildings and ancillary infrastructure to the south. The landowner additionally advised Dominion they do not favor the alignment of the route variation. Another issue is that the exact location and height of the planned future bridge across Goose Creek are unknown, so it is not possible to assess the potential impact of the route on this development. For these reasons, there is insufficient space for a new 100- or 150-foot-wide right-of-way or for a collocated right-of-way with the future Twin Creeks Lines in this area.
- Impact to Historic Cooke's Mill Ruins: The Cooke's Mill Ruins site is approximately 200 feet north of the Gloucester Parkway Expansion crossing of Goose Creek. Any transmission line alignment, whether on the north or south side of the dedication, would result in a direct visual impact on this site. While Cooke's Mill Ruins is not listed on the National Register of Historic Places (NRHP), it is locally significant.
- Reduced Collocation with Twin Creeks Lines: To increase collocation (in accordance with SCC Guidelines) and reduce visual and environmental impacts, the future Twin Creeks Lines and the proposed Aspen-Golden Lines are planned to share a common alignment across Goose Creek.

Given the constraints indicated above along Cochran Mill Road and the dedication, there is insufficient space for collocating the transmission lines from each project along the Cochran Mill Road North Variation without impacting the Campus A data center planned development or causing direct impacts to the future Gloucester Parkway extension.

For these reasons, the Cochran Mill Road North Variation was eliminated from further consideration.

5.3.1.3 Belmont Ridge Road Variation

The Belmont Ridge Road Variation originates along Route 1 on the southeast side of Goose Creek. From here, it heads southeast for about 0.2 mile along the east side of the Milestone Quarry Reservoir, then heads east and northeast for approximately 0.3 mile, passing north of Belmont Ridge Self Storage on the west side of Belmont Ridge Road. The route variation then heads north for 0.5 mile along the west side of Belmont Ridge Road, intersecting Route 1 on the parcel containing the Data Center Campus C planned development. In total, the route variation measures approximately 1.0 mile long.

As the Belmont Ridge Road Variation was studied in detail and discussed with affected landowners, the following issues were identified:

- Coordination with Data Center Planned Development Campus B: The developer of Campus B coordinated with Dominion on the location of transmission lines across their parcel, as Campus B will be crossed by the Aspen-Golden Lines in addition to having two future substations and the future Twin Creeks Lines (see Section 3.6). Dominion and the developer found that there was insufficient space for a new transmission right-of-way in the area between Belmont Ridge Road and the planned buildings within the data center campus. The developer preferred the an alignment (later selected as Route 1), which, in addition to avoiding planned buildings, would increase the width of the vegetated buffer between the campus and Goose Creek.[14]
- Impacts to Belmont Community Association: In a meeting with Dominion on May 5, 2023, members of the Belmont Community Association (Belmont HOA) Board of Directors advised the Company of their preference for Route 1 rather than along Belmont Ridge Road, as Route 1 is further from existing residences and would have less visual impact on the community.

For these reasons, the Belmont Ridge Road Variation was eliminated from further consideration.

5.3.1.4 Goose Creek North Variation

The Goose Creek North Variation begins on the northwest side of the future Starlight Substation (see Section 3.6). From here, it heads north along the eastern side of Goose Creek for approximately 0.5 mile towards Rt. 7. After passing west of the future Apollo Substation, the route variation turns and heads east for about 0.5 mile along the south side of Rt. 7, passing north of two proposed buildings on Data Center Campus C. At the intersection of Rt. 7 and Belmont Ridge Road, the route variation heads north for about 0.1 mile along the west side of Belmont Ridge Road, crossing over Rt. 7, thereby avoiding the African American Burial Ground for the Enslaved at Belmont on a parcel immediately east of Belmont Ridge Road. The route terminates at an intersection with Belmont Park Variation B west of Lansdowne Boulevard. In total, the Goose Creek North Variation measures approximately 2.0 miles long.

As the Goose Creek North Variation was studied in detail and discussed with affected landowners, the following issues were identified:

[14] The developer and Dominion agreed to route the new transmission rights-of-way nearest the Goose Creek Scenic Creek Valley Buffer rather than the future substations. By placing the new rights-of-way nearer to Goose Creek, the amount of vegetative buffer could be increased from the requisite 300 feet to approximately 500 feet in accordance with the proffers under consideration in the legislative application (ZMAP-2022-0021).

- Impacts to Goose Creek Scenic River and Scenic Creek Valley Buffer: The Goose Creek North Variation passes between Goose Creek to the west and the future Twin Creeks Lines and future Lunar and Apollo Substations to the east. The right-of-way for the route variation in this area would be less than 150 feet east of the creek and within the current 200-foot-wide (and future 300-foot-wide) Scenic Creek Valley Buffer designated by Loudoun County. The buffer is intended to maintain and promote vegetation along state-designated scenic rivers, which includes Goose Creek at this location. Route 1 avoids the buffer in this area.
- Impacts to Residential Areas: Along the north side of Rt. 7 east of Belmont Ridge Road, the Goose Creek North Variation passes within 500 feet of a minimum of 57 multi-family stacked or attached residences and 3 multi-family buildings within a total of 100 housing units. In contrast, the corresponding segment of Route 1 crosses the industrial-zoned Data Center Campus D parcel with no residences within 500 feet of the route.
- Proximity to Selden's Landing Elementary School: The Goose Creek North Variation crosses to the north side of Rt. 7 on the west side of Belmont Ridge Road to avoid direct impacts to the African American Burial Ground for the Enslaved at Belmont. At this crossing, the right-of-way for the route variation would be approximately 140 feet from the Sheldon's Landing Elementary School property and approximately 580 feet from the school building. In contrast, the corresponding segment of Route 1 is approximately 1,750 feet from the school property. While there is no safety risk to the elementary school from either alternative, Dominion received comments at public open houses held on June 29, 2023, and August 29, 2023, and via its online website asking that the transmission lines be routed as far as possible from the school.
- Conflict with Lansdowne Town Center: Northeast of Belmont Ridge Road and Rt. 7, the Goose Creek North Variation an area called Lansdowne Town Center zoned as Town Center (TC) for mixed uses. The route variation crosses a planned development with an entitled and submitted site plan for a restaurant and would cross Lansdowne Dog Park. The transmission lines would conflict with and could prevent construction of the restaurant and encroach within the fenced area of the dog park.

For these reasons, the Goose Creek North Variation was eliminated from further consideration.

5.3.1.5 Freedom Center Variation

Toll Brothers Inc. (Toll Brothers) is the former owner of a parcel located south of the intersection of Rt. 7 and Belmont Ridge Road. Toll Brothers submitted two concurrent plans for this parcel to Loudoun County. One application, submitted in September 2021, was for a zoning change from IP (Industrial Park) to mixed used/residential zoning in order to build up to 1,600 residential units with additional commercial/retail uses. A second site plan, submitted in May 2023, proposed to develop the parcel into a data center campus, which is a by-right use in the IP zoning district. In discussions with Toll Brothers in August, September, and October 2023, Dominion became aware that the parcel was under contract to be sold to another developer who plans to construct a data center campus on the parcel. The residential rezoning application was subsequently put on hold and the property was sold to the developer of Data Center Campus D (see Section 6.1.6).

On October 4, 2023, the Company discussed routing with the future landowner, who suggested that Dominion route the Aspen-Golden Lines across the property along a specific corridor to best accommodate the planned data center campus. The route, approximately 0.4-mile in length, extended northeast from the west side of Belmont Ridge Road to the south side of Rt. 7. The suggested route paralleled and overlapped 0.3 mile of a stream and wetlands . Dominion responded that the route was impracticable due to the potential environmental impacts and permitting risk associated with putting the right-of-way and structures over a significant length of the stream. The future landowner then suggested a

new route that shifted the route to the north side of the stream. The route, called the Freedom Center Variation, is shown on of Figure 5.3-1.

As Dominion reviewed the route, several issues were identified, including environmental and cultural resource impacts, federal and state permitting risks, and impacts to the Project schedule, as discussed in more detail in the bullet list below. The route would be in close proximity to the African American Burial Ground for the Enslaved at Belmont and would impact the proposed interpretive center at the site (the Loudoun Freedom Center that was proffered as part of the Northstar Square planned development discussed in 6.1.6). Because the cemetery is locally significant historic resource with potentially unmarked graves extending beyond the known cemetery site, Dominion did not want to notice a route variation in the absence of field surveys delineating the extent of the cemetery. Dominion suggested that routing discussion be continued after the developer closed on the property. On October 26, 2023, Dominion rejected the developer's proposed route north of the stream and encouraged the developer to reconsider the Company's assessment (documented in this report). Dominion further suggested that the developer join the SCC case as respondents whereupon their preferred, but more impactful route alignment, could be put forth to the SCC as a potential alternative for the Aspen-Golden Lines.

After closing on the property on February 9, 2024, the developer (now owner), resumed discussions with Dominion and again asserted their preference for a route alignment north of the stream and closer to the historic resource. Dominion reiterated that the Company's preferred alignment for Route 1 better conformed to SCC guidelines by placing the new right-of-way next to a compatible land use (the proposed data center campus) and avoid the nearby a historic resource (the historic cemetery).

A summary of routing concerns identified by Dominion regarding the Freedom Center Variation are as follows:

- Reduced Setback from the African American Burial Ground for the Enslaved at Belmont and Proposed Loudoun Freedom Center: The Freedom Center Variation right-of-way would be approximately 125 feet south of the African American Burial Ground for the Enslaved at Belmont parcel and would cross an area within the parcel that has a planned development for the Loudoun Freedom Center, which would include a building and amphitheater just south of the cemetery parcel. The Freedom Center Variation would directly cross the planned Loudoun Freedom Center site and position the new right-of-way approximately 240 feet closer to the cemetery parcel compared to Route 1, resulting in potentially greater impacts to the historic resource and potentially crossing an area with unmarked gravesites.
- Environmental Permitting and Project Schedule Risk: Compared to Route 1, the Freedom Center Variation would have greater wetland and waterbody impacts and be closer to the African American Burial Ground for the Enslaved at Belmont. The variation would increase risk to the Project schedule by triggering additional cultural and wetland/waterbody permitting. To help address some of the unknowns regarding this alignment, particularly the potential for unmarked burials outside the known limits of the cemetery, Dominion requested access to conduct a ground penetrating radar survey, which can be used to identify changes in near-surface soil conditions, such as soil changes associated with the excavation and backfilling of a burial. As of January 31, 2024, the landowner, Toll Brothers Inc., was unwilling to let Dominion conduct a ground penetrating radar survey or provide Dominion with previously-completed cultural resource surveys of the area crossed by the Freedom Center Variation. Consequently, the schedule and permitting risk to the Project from this route variation remained higher than Route 1. As of March 1, 2024, the new owner/developer stated that a ground penetrating radar survey was recently conducted and found no evidence of gravesites. The developer said they would furnish Dominion with a final report of the survey once completed, however no such report was provided before the filing date.

For these reasons, the Freedom Center Variation was eliminated from further consideration.

5.3.1.6 Rt. 7 North Variation

The Rt. 7 North Variation begins at the Belmont Park Variation B, southeast of the intersection of Lansdowne Boulevard and Rt. 7 on the Inova Loudoun Hospital property. From here, the route continues southeast along the north side of Rt. 7 for approximately 2.4 miles to the east side of George Washington Boulevard. Along this 2.4-mile segment, three potential crossing locations of Rt. 7 were evaluated, as shown on pages 2 and 3 of Figure 5.3-1.

As the route variation and potential crossings of Rt. 7 were studied in detail and new information from affected landowners became available, the following issues were identified.

- Potential Delivery Point Requests South of Rt. 7: During the process of identifying potential routes, a site plan for the proposed Data Center Campus E was submitted to Loudoun County (Loudoun County application STPL-2023-0007). The Campus E site currently has an office building but is zoned as IP and is therefore a by-right data center parcel. The data center application indicates that a future delivery point request is likely. Dominion subsequently confirmed with the parcel owner in a meeting on August 31, 2023, that an on-site substation would be required, and they would support the location of the Aspen-Golden Lines on their parcel as Route 1 does. Dominion prefers to locate the Aspen-Golden Lines on this industrial land and to avoid the additional crossing of Rt. 7 that would be required to serve this area south of the highway.
- Impacts to Planned Developments: Along the north side of Rt. 7 are two approved planned residential mixed-use developments, Dogwood Farm Station and University Center Lakeview, on the west and east sides of Riverside Parkway, respectively (ZMAP-2021-0010 and ZMAP-2021-0022). These approved developments involved a rezoning to the R-24 district (dense residential), which does not include transmission lines as a compatible use. The Rt. 7 North Variation along the Dogwood Farm Station development would be less than 50 feet from four planned multi-family buildings, including one building with 90 to 100 residential units.
- Affordable Dwelling Units (ADUs): Further to the east, the University Center Lakeview planned development would require that one large multi-family building with 250 be removed or reduced in size to accommodate the transmission line right-of-way. By comparison, there are no site plans or planned residential buildings that have been submitted to the Loudoun County Planning Department for Route 1 on the south side of Rt. 7 in this area.
- Coordination with a Landowner/Developer with Parcels on the North and South Sides of Rt. 7: Peterson Companies (Peterson) owns two planned developments, University Center Lakeview and Commonwealth Center Residential, on either side of Rt. 7, east of Loudoun County Parkway. Peterson indicated in a meeting with Dominion on April 13, 2023, that they prefer a route along the frontage of the Commonwealth Center Residential parcel to the south (as Route 1 does) rather than the University Center Lakeview parcel to the north. This is because the zoning application for University Center Lakeview has been approved by the County, and there is insufficient space to locate the transmission line right-of-way without directly impacting future buildings on the development, including a planned multi-family residence with ADUs. In contrast, there is space to locate a transmission line right-of-way along the Commonwealth Center Residential planned development to the south of Rt.7. Additionally, it would be easier for Peterson to adjust this site plan if needed as it has not yet been approved than it would be to modify the approved site plan for University Center Lakewood.

For these reasons, the Rt. 7 North Variation was eliminated from further consideration.

5.3.1.7 Sully Road Variation

The Sully Road Variation begins along the south side of Rt. 7 west of the George Washington Boulevard bridge, then continues east along the south side of Rt. 7 for approximately 0.4 mile. From there, it heads south for about 0.1 mile, crossing Russell Branch Parkway, then turns east and continues along the south side of the parkway for about 0.2 mile across Broad Run.[15] The variation next heads south, entering and continuing within a "median" area between Pacific Boulevard and Sully Road for approximately 0.9 mile, at which point Pacific Boulevard turns to the southwest while Sully Road continues south. The route continues south along the west side of Sully Road for about 0.9 mile, crossing the cloverleaf at the intersection of Nokes Boulevard and Sully Road, to the north side of Cabin Branch (see pages 3-5 of Figure 5.3-1). It then heads west for about 0.2 mile to Broad Run Variation B.

The following constraints were identified for the Sully Road Variation:

- Conflicts with Existing Utilities and Engineering Constraints: The route segment passing between Pacific Boulevard and Sully Road is an approximately 90-foot-wide strip of land which slopes down sharply from Sully Road towards Pacific Boulevard. The area contains existing Dominion distribution lines. Dominion engineering and construction teams concluded that the segment of the route is infeasible due to difficulties with construction and maintenance on the steep slope, the presence of the distribution lines (which limits the space available for new transmission lines or would require relocation of the distribution lines), and the need to expand the right-of-way to 150 feet in width in order to accommodate modified structures types and line configurations needed for the Aspen-Golden Lines to cross the approved future BECO-DTC Lines.
- Impacts to approved developments west of Russell Branch Parkway: The County-approved Kincora development is a planned multi-use development south and east of Broad Run, west of Sully Road/Pacific Boulevard, and north of Gloucester Parkway/Nokes Boulevard that includes mixed-use residential and commercial developments and a proposed data center. The approved zoning application has multiple residential, commercial, or data center buildings planned within 100 feet of Pacific Boulevard, leaving insufficient space for a new 100-foot-wide right-of-way. This development cannot be avoided to the west because of Broad Run and the presence of County Board of Supervisors easements along the entirety of the Kincora development. East of Pacific Boulevard is the sloped, 90-foot-wide, strip of land leading up to Sully Road, where there is insufficient space for transmission line structures and right-of-way as noted above.

For these reasons, the Sully Road Variation was eliminated from further consideration.

5.3.2 Underground Feasibility

In anticipation of public interest and preference for undergrounding the Aspen-Golden Lines, multiple underground routing solutions were studied to assess feasibility, cost, impacts, and schedule. Some underground solutions were deemed hypothetically possible but rejected nonetheless, including the seemingly lowest-risk construction method, in which cross-linked polyethylene (XLPE) cable is installed with a trenched ductbank. As discussed in more detail below, undergrounding the Aspen-Golden Lines was determined to be infeasible or impracticable despite the perceived advantage of mitigating visual impacts.

As of 2024, there are only a few examples of long distance, underground, high-voltage (500 kV or greater) transmission lines in operation globally. The longest, the 25-mile Shinkeiyo to Toyosu Line in Tokyo, Japan, was built in 2000 utilizing a custom-built cable tunnel and duct installations under bridges and elevated expressways (Yonemoto, et. al, 2008). In China, the Shibo to Sanlin Line, built in 2010,

[15] Russell Branch Parkway turns into Pacific Boulevard near the intersection of Rt. 7 and Sully Road.

consists of 10 miles of 500 kV underground cable under the city of Shanghai (Moorabool Shire Council, 2020). In 2016, the first 500 kV underground cable (an XLPE in a ductbank) in North America was constructed in the city of Chino Hills, California, as part of the Southern California Tehachapi Renewable Transmission Project (Moorabool Shire Council, 2020). The first two examples, both subterranean tunnels, are located in Tokyo and Shanghai, which by United Nations estimates are the first and third most populous urban areas in the world, respectively. The Chino Hills example, more applicable to the geographic context of Northern Virginia, used an already existing 150-foot-wide overhead transmission right-of-way bisecting a residential neighborhood with homes only 20 to 30 feet from the right-of-way.

These examples illustrate how unprecedented it is to underground high voltage lines (500 kV or greater), especially at this length, and how inappropriate it would be for the Company to propose an underground solution in the context of the study area because a viable, constructable overhead solution exists. All three of the underground lines mentioned here were severely space constrained to the point of tunneling or, in the case of Chino Hills, the line crossed a residential area along an existing right-of-way. In contrast, the overhead routes identified for the Aspen-Golden Lines do not have use of an existing right-of-way that can be taken out of service and completely rebuilt, nor does the Project cross an area so densely developed that no overhead solution is possible.

The cost of an underground option would be unprecedented. Comparing transmission costs alone, the Project is estimated at approximately $170 million for an overhead solution compared to over $1 billion for buried 500-230 kV XLPE lines based on preliminary estimates. Due to lack of comparable projects and reliance on variable cost assumptions, even the $1 billion estimate for the underground solution assumes a +/- 50 percent margin of error, meaning transmission costs exceeding $1.5 billion are possible. This estimated transmission-related cost does not account for right-of-way acquisitions or the increased costs of transition station facilities.

With a targeted in-service date of June 1, 2028, even a conservative estimate of construction timeline for undergrounding (47 months based on a Dominion's preliminary estimates) does not allow for delays in the anticipated 12-month lead time for special underground equipment and cable manufacture. Schedule estimates also do not account for the relocation of existing utilities, availability of multiple construction crews, the ability to close roads for construction, or the results of the substantial field investigations that would be required including topographic survey, subsurface utility investigation, and geotechnical investigations. With CPCN issuance requested for the Project by the end of 2024, it is unlikely that an underground option could be in service by early 2029, let alone June 2028.

There are a number of other considerations contributing to the infeasibility of an underground option. First, the additional area needed for transition stations – a facility that transitions the overhead arrangement to an underground arrangement and visa-versa – at either the substation sites or elsewhere along an underground route is not available. Each transition station would be a minimum of five acres, and possibly larger, depending on potential station arrangement and number of cables (i.e., electrical phases) needed.

Second, underground routes pose their own unique siting challenges especially when considering special construction methods, such as the two separate horizontal directional drill (HDD) crossings that would be needed to bore beneath Goose Creek and Broad Run. These HDDs would require permanent right-of-way and temporary workspace, some of which would likely require condemnation at several existing buildings and buildings under construction and significantly increase impacts to affected landowners.

Third, while underground transmission lines may have fewer visual impacts than overhead transmission lines, they often have greater overall environmental impacts and the visual impacts of the transition stations (which are analogous to a substation) are often overlooked. Underground transmission lines are not able to span certain environmental features as can be done with overhead transmission lines. Specifically, through wetland areas and small waterbodies, underground transmission lines would lead to

increased permanent conversion of wetlands when compared to overhead transmission lines and can have permanent impacts to wetland hydrology and cause greater impacts to riparian areas, whereas permanent wetland impacts from overhead construction are typically limited to structure foundations. The visual impacts of transition stations are similar to those of substations since they require structures and equipment with heights consistent with an overhead line configuration. While transition station visual impacts are not linear (like an overhead line) in the sense that impact long corridors and potential more sensitive resources, transition stations localize and intensify visual impacts to resources in their vicinity.

Fourth, an underground solution would not be able to be connected to future delivery point requests along a route without the installation of additional multi-acre transition stations (minimum of 5 acres). As of March 2024, there are two parcels with data center site plans under review by Loudoun County crossed by Route 1 along Rt. 7 that will likely require connection to a 230 kV transmission line. In addition to these two active site plans, there are multiple other parcels with IP zoning (i.e., by-right data center use) that could require future delivery points. There may be insufficient space for new transition stations at these sites such that additional overhead transmission lines could be needed in the future.

Other issues with an underground route include following:

- Soil compaction is more likely from underground transmission construction than for an overhead installation;
- Faults or damage to underground lines are more difficult to locate than along overhead lines and often require five to ten times longer repair; and
- The prevalence of shallow and hard diabase rock throughout the study area that makes trenching or tunneling extremely difficult.

Considering all these issues, an underground solution was deemed impracticable for meeting the Project purpose and need.

In addition to the Company's own analysis and at the request of the Lansdowne Conservancy, Dominion reviewed a proposal for a hybrid overhead/underground route utilizing an underground segment along Rt. 7. Specifically, the Lansdowne Conservancy, represented by their legal counsel and an engineering consultant, proposed that an approximately 2.0-mile-long segment of Route 1 be installed underground from Belmont Ridge Road to Ashburn Village Boulevard. The Lansdowne Conservancy provided Dominion with a feasibility study produced by RLC Engineering, LLC titled *500kV and 230kV XLPE Dual Circuit Underground Transmission Lines Summary Estimate*, dated January 31, 2024. Dominion reviewed this report and determined that several of the underlying assumptions used by RLC Engineering LLC were not applicable to the Project, including the total number of cables per phase per circuit required to meet the Company's loading requirements, the cable and ductbank spacing, the size of the ductbank, and the area required to construct and operate transition stations. Furthermore, the report did not specify the size and location of temporary workspace or the width of the permanent right-of-way needed for ductbank installation and/or trenchless installation methods such as HDD.

The assumptions used in the study by RLC Engineering LLC did not appear to allow for the underground segment to meet Dominion's construction and operations standards or the electrical requirements of the Project from a planning perspective. As a result, the Company did not believe that a hybrid project as presented in the report was viable. The report additionally did not appear to account for major routing constraints and permitting risks, including crossings of planned developments, the need to condemn and remove one or more commercial buildings, crossings of known archaeological sites, the need to relocate gas and water utilities, the inability to serve future delivery point requests at the two proposed data center campuses, impacts to nearby residences, and significant delay to the Project in-service date.

Dominion met with Lansdowne Conservancy and RLC Engineering LLC on February 15, 2024, to discuss the underground study and share information on engineering and routing. Following the meeting, Dominion continued to discuss their underground proposal. In particular, the Lansdowne Conservancy's claim that the 2.0-mile underground segment would significantly alleviate visual impacts to nearby historic resources is unfounded. Based on the location of the transition stations, the underground route would likely exacerbate visual impacts to several resources, particularly Janelia and the African American Burial Ground for the Enslaved at Belmont. In contrast to the overhead structures, the transition stations needed for the underground route – a minimum of five acres in size and similar in scale to substations – could localize and intensify visual impacts to the nearby Belmont neighborhood and the Community Church, if parcels of that size existed in the area.

6. RESOURCES AND IMPACTS

After defining the study area, ERM developed a list of features to consider and assess as part of the routing process and to provide a basis for comparing potential routes (Table 6-1). These include routing constraints (e.g., land uses, planned developments, and biological resources) and routing opportunities (e.g., existing transmission lines, roads, and other linear features). ERM inventoried existing conditions, routing constraints, and routing opportunities using information from publicly available GIS and other databases; agency websites; published documents, such as county or municipal land use plans; and communication with agency and County staff, stakeholders, and elected officials. In 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.

Descriptions of resources within 0.25 mile of Route 1 and the Belmont Park and Broad Run Variations and an assessment of potential impacts on those resources are provided in the subsections below.

Table 6-1: Features Considered for Routing

Feature Type	Description
Existing Corridors	
Existing electric facilities	■ Transmission or distribution lines, and substations
Other utilities	■ Natural gas pipelines, water and sewer lines, and fiber optic cables
Transportation infrastructure	■ Roads, railroads, and related corridors
Land Ownership	■ Federal, state, and local lands ■ Private lands
Land Uses	
Existing land use and land cover	■ Existing subdivisions ■ Land cover types (e.g., forested, agricultural, developed) ■ Residences, churches, schools, cemeteries
Recreational areas	■ Federal, state, county, or municipal parks ■ Federal-, state-, county- or municipal-managed recreation areas ■ Golf courses ■ Trails (biking, hiking, birding, wildlife)
Land use planning and zoning	■ Zoning districts ■ County Comprehensive Plan
Planned developments	■ Planned, proposed, or conceptual residential, commercial, or industrial developments
Conservation lands and easements	■ VOF and VDCR conservation lands and easements ■ Loudoun County conservation easements ■ Wetland mitigation banks ■ Other conservation lands
Transportation	■ Road and railroad crossings ■ Public and private airport facilities

Feature Type	Description
Natural Resources	
Surface waters	■ Wetlands ■ Waterbodies
Protected or managed areas	■ Resource protection areas ■ Wildlife management areas ■ Ecological cores
Protected species	■ Natural heritage resources ■ Threatened and endangered species ■ Bald eagles
Vegetation	■ Vegetation characteristics ■ Forested land
Visual Resources	
Visual resources	■ Viewsheds to and from visually sensitive areas ■ Scenic rivers ■ Scenic byways
Cultural Resources	
Cultural resources	■ Archaeological sites ■ Historical or architectural sites and districts ■ NRHP-listed and NRHP-eligible properties ■ Battlefields ■ VDHR-protected easements
Geological Resources	
Mineral resources	■ Mines or quarries
Environmental Justice	■ Low-income populations ■ Populations of color ■ Limited English-speaking households

NRHP = National Register of Historic Places; VDCR = Virginia Department of Conservation and Recreation; VDHR = Virginia Department of Historic Resources; VOF = Virginia Outdoors Foundation

6.1 Land Use

6.1.1 Land Ownership and Public Lands

ERM reviewed land ownership information in the study area using publicly available GIS databases and digital parcel data obtained from Loudoun County (Loudoun County 2023a). Current parcel data indicates that most of the parcels within the study area are privately owned. Land uses on these private parcels include, but are not limited to, residential, commercial, industrial (including data center), and mineral extraction uses, with the majority of land being privately-owned residential lots. Public lands in the study area include school properties (Loudoun County Public Schools), various County-owned land (including public parks and public safety facilities), and Loudoun Water-owned lands (BRWRF and other facilities).

VDOT owns and maintains the majority of road rights-of-way in the study area, including all the major roadways proximate to the proposed Aspen-Golden Lines, including Rt. 7, Cochran Mill Road, Belmont Ridge Road, Claiborne Parkway, Ashburn Village Boulevard, Loudoun County Parkway, Russell Branch Parkway, Gloucester Parkway, and Pacific Boulevard. Crosstrail Boulevard is currently maintained by a

developer who will turn maintenance responsibility over to VDOT in the future (Loudoun County 2024). One exception is the Dulles Greenway (SR 267), which is a private toll road owned by TRIP II (which has concessions on the highway until 2056) but contracts with Atlas Arteria to maintain the roadway (AtlasArteria 2023).[16]

Figure 6.1-1 depicts land ownership along the Project route alternatives.

Loudoun County Public Schools

Within the study area, ERM identified 17 Loudoun County Public Schools (LCPS) properties including 11 elementary schools, two middle schools, three high schools, and LCPS's Administrative Building. In addition to the school buildings themselves, the LCPS properties include playgrounds, athletic fields, parking lots, and opens spaces (Loudoun County 2023a). While the predominant use for these properties is classroom space for public education, other uses include sporting events, community open houses, training, and voting precincts (Loudoun County 2022).

Of the 17 LCPS properties within the study area, only one, Steuart W. Weller Elementary School, is within 0.25 mile of the Aspen-Golden Lines routes (see Section 6.1.9). No routes cross LCPS lands.

Loudoun Water

ERM identified four Loudoun Water properties or facilities on private land within 0.25 mile of the Aspen-Golden Lines (Loudoun County 2023a, Loudoun Water 2023a). Table 6.1-1 provides descriptions of these properties and identifies the distance and direction of each one from the applicable routes. Unless otherwise specified, the descriptions below are either from the Loudoun Water facilities webpage (Loudoun Water 2023a) or Loudoun County's Land Management, Application, Research, and Coordination website (Loudoun County 2023i). Proposed Loudoun Water facilities are discussed in Section 6.1.6.

Table 6.1-1: Loudoun Water Facilities within 0.25 Mile of the Aspen-Golden Lines

Facility	Description	Distance and Direction of Loudoun Water Property from Aspen-Golden Lines
Belmont Interim Pump Station	Sewage pump station with access driveway and associated facilities; expected to be decommissioned per the proposed Russell Branch Pump Station (see Section 6.1.6)	Approximately 250 feet south of Route 1 at MP 2.1

[16] Since 1992, the Washington Metropolitan Area Transit Authority has by-right authority to expand the Metrorail Silver Line further west through the Dulles Greenway, but no plan or funding currently exists for a project of that scope (Metropolitan Washington Airports Authority 2022).

Facility	Description	Distance and Direction of Loudoun Water Property from Aspen-Golden Lines
Broad Run Water Reclamation Facility (Loudoun Water Ashburn Campus)	Facility purposed for the treatment of wastewater and its release back into the community for non-potable uses; expected to be expanded (Loudoun Water 2023c). The facility also serves data center customers with reclaimed water used for cooling. Campus facilities also include the Dale C. Hammes Administration Building, administrative offices serving as Loudoun Water's headquarters for the maintenance of countywide water and sewage systems, and Loudoun Aquiary, an educational exhibit about wetlands, water conservation, and water treatment processes, including a 1-mile outdoor interpretative trail with additional educational resources (Loudoun Water 2023b)	Crossed by Broad Run A from MPs 6.8 to 7.7 Crossed by Broad Run B from MPs 0.0 to 1.3
Loudoun Water Milestone Reservoir and Goose Creek Dike	Former quarry pit being filled as a water reservoir, with an existing non-engineered dike between the reservoir and Goose Creek.	Crossed by Route 1 from MPs 0.9 to 1.1
Goose Creek Industrial Park Wastewater Treatment Plant	Lagoon-style wastewater treatment plant; expected to be decommissioned per proposed Goose Creek Sewage Pump Station (National Water Quality Monitoring Council 2023)	Approximately 80 feet southwest of Route 1 from MP 0.7

MP = milepost

Loudoun County Board of Supervisors

The Loudoun County Board of Supervisors (BOS) maintains properties throughout the County variously used for public transit, public safety, recreation, and public health, of which five properties are within 0.25 mile of the Project routes and other facilities (Loudoun County 2023a). Table 6.1-2 provides a description of each property and identifies the distance and direction from the applicable routes. Unless otherwise specified, the descriptions of these facilities are based on information from Loudoun County's Land Management, Application, Research, and Coordination website (Loudoun County 2023i). Planned future Loudoun County BOS facilities are discussed in Section 6.1.6.

Table 6.1-2: Board of Supervisors Facilities within 0.25 Mile of Aspen-Golden Lines

Facility	Description	Distance and Direction of Loudoun Water Property from Aspen-Golden Lines
Ashburn Sheriff Station	Ashburn public safety headquarters; intake, record checks, and event space for trainings (Loudoun County 2023h)	Approximately 0.2 mile southwest of Route 1 near MP 4.9
Lansdowne Fire and Rescue Station	Facility includes offices, three-bay pull through garage, two fire engines, two ambulances, kitchen, bunks, gym, training space, gear lockers, and a living room (Ashburn Volunteer Fire and Rescue Department 2016)	Approximately 0.2 mile northeast of Route 1 near MP 2.9 Approximately 0.2 mile northeast of Belmont Park A near MP 3.0 Approximately 0.2 mile northeast of Belmont Park B near MP 0.1

Facility	Description	Distance and Direction of Loudoun Water Property from Aspen-Golden Lines
Meladon Park	County-owned undeveloped land along Rt. 7; property occupied within Office Park zoning district	Approximately 0.1 mile northeast of Route 1 near MP 4.7
One Loudoun Park and Ride	Transit station bus stop with 500 parking spots and bicycle lockers (Loudoun County 2023k).	Approximately 0.2 mile southwest of Route 1 near MP 4.9
Philip A. Bolen Memorial Park	Regional Park inclusive of multipurpose trail, athletic facilities, concessions, picnic tables, creek, parking, and visitor's center (Loudoun County 2023j).	Less than 0.1 mile south of the Route 1

MP = milepost

Federal or State-Owned Lands

There are two federally owned properties within the study area, though neither is within 0.25 mile of the routes and facilities discussed in this study. The Federal Aviation Administration (FAA) owns and operates a radar tower serving the Leesburg Executive Airport approximately 0.6 mile northwest of the proposed Aspen Substation site (Loudoun County 2023a, Mapcarta 2023). Another federal property, the Dulles Post Office, is approximately 1.2 miles southeast of the proposed Golden Substation site (Loudoun County 2023a). Neither parcel would be affected by the Project.

Based on publicly accessible Loudoun County databases and land parcel data, there are no state-owned lands in the study area. The closest Commonwealth of Virginia property is a VDOT maintenance facility approximately 2.0 miles northwest of the proposed Aspen Substation site near Leesburg (Loudoun County 2023a).

6.1.1.2 Impact Assessment

Public lands which are within 0.25 mile of Project facilities (but not directly crossed) could be visually impacted by construction and operation of the Project. The severity of these impacts would depend on factors such as surrounding tree cover, landscaping, orientation of development towards/away from transmission infrastructure, topography, and screening from other structures. Visual impacts from the Project are addressed in Section 6.3. The discussion below addresses potential impacts from crossings of public lands along and within the various routes and facilities proposed for the Project.

Route 1

Route 1 does not cross federal, state, or county lands administered by Loudoun County Public Schools or the Loudoun County BOS. Crossings of county lands administered by Loudoun Water are discussed below. See Section 6.1.7 for a discussion of BOS easement crossings.

Route 1 crosses several Loudoun Water properties or facilities near Goose Creek (Table 6.1-3). Construction and operation of the Aspen-Golden Lines along Route 1 would not impact Loudoun Water operations on these properties as the route avoids all structures associated with the Belmont Interim Pump Station, Milestone Reservoir and Goose Creek Dike, and Goose Creek Industrial Park Wastewater Treatment Plant. Moreover, the alignment on Loudoun Water lands helps minimize impacts to nearby private property. Dominion coordinated closely with Loudoun Water throughout the routing process to ensure that the Route 1 alignment avoids impacting existing facility operations or planned expansions.

Table 6.1-3: Crossings of Loudoun Water Property along Route 1

Facility	Crossing Length (miles)	Right-of-Way Impact (acres)
Belmont Interim Pump Station	0.0 (crosses privately owned parcel but no Loudoun Water facilities)	0.0
Milestone Reservoir and Goose Creek Dike	0.2	2.7
Goose Creek Industrial Park Wastewater Treatment Plant	0.1	0.7

Belmont Park A

Belmont Park A does not cross federal, state, or county lands administered by Loudoun County Public Schools, Loudoun Water, or the Loudoun County BOS.

Belmont Park B

Belmont Park B does not cross federal, state, or county lands administered by Loudoun County Public Schools, Loudoun Water, or the Loudoun County BOS.

Broad Run A

Broad Run A does not cross federal, state, or county lands administered by Loudoun County Public Schools or the Loudoun County BOS, but crosses Loudoun Water's BRWRF property from approximate MP 6.8 to 7.7 where the route parallels Loudoun County Parkway south from Rt. 7 to Gloucester Parkway (Table 6.1-4). In coordination with Loudoun Water, ERM and the Company aligned Broad Run A to avoid existing and planned future Loudoun Water facilities, including buried utility lines. Loudoun Water's primary concern with Broad Run Variation A is the potential limitations it places on facility expansion, especially developable areas adjacent to Loudoun County Parkway near the Dale C. Hammes Administration building. To address these concerns, Dominion agreed to the following:

- Provide Loudoun Water with written confirmation from VDOT that confirms right-of-way licensing that would allow for encroachment of the proposed transmission right-of-way onto VDOT right-of-way.
- Use dead-end structures (which have shorter conductor arms) which would allow Dominion to place structures as close to the VDOT right-of-way as possible and minimize new Project right-of-way encroachment beyond Loudoun Water's 50-foot building setback.
- Use a licensing agreement option, rather than conveyance of an easement, which would allow Loudoun Water to request relocation of structures and/or route alignment across the property in the future should transmission infrastructure installed along the Broad Run A alignment ever impede future BRWRF expansion.

As of February 28, 2024, Dominion was in discussions with VDOT regarding a licensing agreement that would help address Loudoun Water's concern about potential future VDOT road expansion. Loudoun Water's concern is the potential for a VDOT road expansion that would require Broad Run A to shift further onto Loudoun Water property. VDOT does not have future expansion plans along this section of Loudoun County Parkway; Dominion anticipates that VDOT will approve the agreement for the Broad Run A alignment as proposed based on discussions held to-date. Loudoun Water staff told Dominion that having this agreement in place would contribute to the Loudoun Water Board of Directors support of the

Broad Run A alignment by addressing the condition that no additional encroachments into buildable areas on the BRWRF property would occur over the life of the Project. As discussed throughout this report, Broad Run A has significant positive characteristics that differentiate it from Broad Run B including avoidance of wetland, floodplain, the heron rookery, forests, and recreation resources associated along the Broad Run riparian corridor. Dominion has pursued Broad Run A to avoid the impacts and permitting/in-service risks associated with Broad Run B.

Broad Run B

Broad Run B does not cross federal or state lands or county lands administered by Loudoun County Public Schools or the Loudoun County BOS, but crosses Loudoun Water's BRWRF property from MP 0.0 to 1.3 (Table 6.1-4). In this segment, the route variation parallels an existing utility right-of-way and access road along the east side of the property adjacent to Broad Run. The alignment was proposed by Loudoun Water staff early in the routing process as their preferred alignment across the BRWRF property for avoiding impacts to buildable areas adjacent to Loudoun County Parkway and instead crossing otherwise unbuildable floodplain land along Broad Run.

Table 6.1-4: Crossings of the Loudoun Water BRWRF Property along Broad Run Route Variations A and B

Broad Run Variation	Crossing Length (miles)	Rights-of-Way Impacts (acres)
Broad Run A	0.8	7.2
Broad Run B	1.2	14.3

6.1.2 Existing Land Use and Land Cover

Land use and land cover within the study area were classified using a combination of local and state-wide datasets along with aerial photo interpretation to identify the most current uses for a given area. Land use and land cover in the study area can be broken down into the following five main categories:[17]

- Developed lands: These are areas characterized by medium to high density constructed buildings, such as certain residential subdivisions, industrial uses, and commercial areas and impervious surfaces. Additional information about residences, residential areas, and commercial areas near the transmission line routes is provided in Sections 6.1.4 and 6.1.5.
- Open space: These are areas primarily covered by planted grasses, including vegetation planted in developed settings for erosion control or aesthetic purposes but also natural herbaceous vegetation and undeveloped land, parks, and open-space recreational facilities. Additional information about recreation areas near the routes, including parks and trails, is provided in Section 6.1.8.
- Forested lands: These are areas where land cover consists of natural or semi-natural woody vegetation. Additional information about forested lands near the routes is provided in Section 6.2.4.
- Agricultural lands: These are areas used for commercial farming (e.g., commercial row crops or specialized agricultural activities) or grazing.
- Open water: These are open-water features, including rivers, streams, and natural and artificial ponds.

[17] For purposes of land use/land cover, wetland areas have been classified as open space, forested land, or open water depending on wetland type. Wetlands near the routes are discussed separately in Section 6.2.1, Wetlands.

Figure 6.1.2-1 depicts land use/land cover within 0.25 mile of Route 1 and the Variations. No agricultural lands are crossed by Route 1 or the Variations. As mentioned in Section 3.2, land use and land cover in the study area consists predominantly of low to medium density single-family residential neighborhoods and commercial/industrial areas. Two significant forested riparian areas along Broad Run and Goose Creek are located to the east and west within the study area, respectively. Route 1 primarily crosses forested land, smaller amounts of developed land and open space, and a negligible amount of open water. Belmont Park Variations A and B both cross developed land, forested land, and a small amount of open space. Broad Run Variations A and B both cross forest, open space, developed land, and open water, though Broad Run Variation A crosses mostly open space and Broad Run Variation B crosses mostly forested land. See Table 6.1-5 for calculations of the land use/land cover types encompassed by what would be the right-of-way for each route.

Table 6.1-5: Land Use/Land Cover Crossed by the Routes (acres) *

Land Use/Land Cover	Route 1[a]	Belmont Park Variation A	Belmont Park Variation B	Broad Run Variation A	Broad Run Variation B
Forested	56.5	2.3	2.4	9.1	19.5
Agricultural	0.0	0.0	0.0	0.0	0.0
Developed	27.6	3.7	4.4	7.5	1.4
Open Space	20.4	0.8	0.9	12.8	9.3
Open Water	1.6	0.0	0.0	0.3	0.3

** Based on local and state-wide data sets and aerial photo interpretation*

[2] Includes Aspen-Goose Creek Line and Line Loop

6.1.2.1 Impact Assessment

Route 1

Route 1 crosses approximately 6.6 miles of land and encompasses approximately 106.1 acres of new right-of-way. Of this, the Golden Substation occupies 8.5 acres, the Aspen Substation (including the portion shared with the Aspen-Goose Creek Line) occupies 6.0 acres, and the Aspen 230 kV Split and Golden 230 kV Split occupy 1.5 acres and 3.1 acres respectively. While there is no actual new right-of-way for the Line Loop, it would occupy 1.7 acres or existing right-of-way and land to be obtained for Golden Substation. Land use within the footprint of all components of Route 1 consists of 56.5 acres of forested land, 27.6 acres of developed land, 20.4 acres of open space, and 1.6 acres of open water.

Belmont Park Variations

Belmont Park Variation A crosses approximately 0.6 mile of land and encompasses about 6.9 acres of new right-of-way. Land use within the footprint of this variation consists of 3.7 acres of developed land, 2.3 acres of forested land, and 0.8 acre of open space.

Belmont Park Variation B crosses approximately 0.6 mile of land and encompasses about 7.7 acres of right-of-way. Land use within the footprint of this variation consists of 4.4 acres of developed land, 2.4 acres of forested land, and 0.9 acre of open space.

While similar, Belmont Park Variation B would impact more developed land, forest, and open space areas than Belmont Park Variation A.

Broad Run Variations

Broad Run Variation A crosses approximately 2.2 miles of land and encompasses approximately 29.7 acres of new right-of-way. Land use within the footprint of this variation consists of 12.8 acres of open space, 9.1 acres of forested land, 7.5 acres of developed land, and 0.3 acre of open water.

Broad Run Variation B crosses approximately 2.3 miles of land and encompasses approximately 30.6 acres of right-of-way. Land use within the footprint for this variation consists of 19.5 acres of forested land, 9.3 acres of open space, 1.4 acres of developed land, and 0.3 acre of open water.

Overall, Broad Run Variation B would impact more forested land than Broad Run Variation A, which instead would impact more open space and developed land.

6.1.3 Land Use Planning and Zoning

6.1.3.1 Loudoun County General Plan 2019

Section 15.2-2223 of the Va. Code requires local planning commissions to adopt a comprehensive plan that provides guidance for the physical development of the territory within its jurisdiction. The plan considers existing and future land uses, anticipates development trends, and makes recommendations for guiding long-term development decisions within a city or county. Virginia requires that a comprehensive plan be reviewed at least once every 5 years to adjust to actual or projected changes in land use conditions or needs (Section 15.2-2230).

The 2019 Loudoun County General Plan (the Plan) guides the County's land use policy and legislative actions, including objectives for natural resource management, accessible housing, cultural heritage protection, and economic development. With the involvement of over 3,000 public officials, private citizens, and different stakeholders, The Plan was adopted in 2019 and most recently amended through February 2023. Loudoun County emphasizes the need to balance land uses between commercial, industrial, residential, and recreational growth, while addressing existing land constraints. The Plan provides future land use recommendations used to guide zoning decisions and direct capital projects.

Loudoun County implements the Plan goals and objectives through the designation of "policy areas" which are further divided into "place types". Policy areas, which broadly define land planning objectives for a geographically defined region, are based on the size and configuration of buildings, land uses, availability and purpose of open spaces, and special amenities (Loudoun County 2023e). Table 6.1-6 lists the policy areas crossed by or within 0.25 mile of the Project routes; describes the land use objective of the policy area (based on the 2019 Plan); and indicates if the area is crossed by or within a proposed Project facility. Policy areas are not addressed further in this report but are described here to characterize current land use planning in the study area and provide context for a discussion of zoning in Section 6.1.3.3.

Table 6.1-6: Policy Areas within 0.25 Mile of Project Facilities

Policy Area	Description	Project Facility Crossed
Leesburg Joint Land Management	Towns, operating as independent incorporated entities; combines agricultural tradition with cultural and economic growth; encompasses the majority of western Loudoun County.	Route 1 Aspen-Goose Creek Line Aspen Substation

Policy Area	Description	Project Facility Crossed
Suburban	Contains a combination of self-sustaining residential, commercial, and employment uses which promote community and a high standard of living; incorporates public services and facilities.	Route 1 Belmont Park A Belmont Park B Broad Run A Broad Run B Golden Substation Line Loop
Transitional	Features open spaces visually distinct from surrounding development; incorporates public recreation, residential development, and clusters of economic activity	Route 1

Place types, which characterize permitted uses with within a specific area, are determined by existing and proposed land uses and the size and density of development as well as the policy area they occupy (Loudoun County 2023e). Table 6.1-7 lists the place types within 0.25 mile of the routes, describes permitted uses within each area, and indicates if the area is crossed by or within a proposed Project facility. Place types are described here to demonstrate land use compatibility in relation to zoning and are not analyzed further in this report.

Table 6.1-7: Place Types within 0.25 Mile of Project Facilities

Place Type	Permitted Uses	Project Facility Crossed
Leesburg Joint Land Management Area Employment	Core uses include light production, research and development, warehousing, contractor with outdoor storage, fleet and equipment sales and service, and flex space. Complementary uses include offices, retail and service commercial, and data centers. Conditional uses for the place type include institutional, civic/cultural/community space, public facilities, special activities, and parks and recreation.	Route 1 Aspen-Goose Creek Line Aspen Substation
Leesburg Joint Land Management Area Industry/Mineral Extraction	Core uses include general and heavy manufacturing and assembly, warehousing, contractor with outdoor storage, data centers, fleet and equipment sales and service, outdoor storage, public utilities, and quarry. Complementary uses include retail and service commercial, flex space, light production, and research and development. Conditional uses of the place type include offices, public facilities, special activities, and parks and recreation.	Not Crossed
Suburban Compact Neighborhood	Core uses include single family attached residential, single family detached residential, and multi-family residential. Complementary uses include active adult retirement communities, accessory residential units, and retail and service commercial. Conditional uses of the place type include office, civic/cultural/community space, public facilities, special activities, and parks and recreation.	Not Crossed

Place Type	Permitted Uses	Project Facility Crossed
Suburban Employment	Core uses include light production, offices, research and development, contractor with outdoor storage, and flex space. Complementary uses include retail and service commercial. Conditional uses of the place type include institutional, civic/cultural/community space, public facilities, special activities, parks and recreation, data centers, and warehousing.	Route 1 Broad Run A Broad Run B
Suburban Industrial/Mineral Extraction	Core uses include general and heavy manufacturing and assembly, warehousing, contractor with outdoor storage, data centers, fleet and equipment sales and service, research and development, outdoor storage, public utilities, quarry, and outdoor manufacturing. Complementary uses include retail and service commercial, flex space, and light production. Conditional uses of the place type include offices, public facilities, special activities, and parks and recreation.	Route 1 Broad Run A Broad Run B
Suburban Mixed Use	Core uses include retail and service commercial, office, entertainment commercial, multi-family residential, institutional, and hotel. Complementary uses include small-lot single family residential attached, active adult retirement communities, civic/cultural/community space, and accessory residential units. Conditional uses include small-lot single family residential detached, public facilities, conference center, special activities, and parks and recreation.	Route 1 Belmont Park A Belmont Park B Broad Run A Broad Run B Line Loop
Suburban Neighborhood	Core uses include single family detached residential, single family attached residential, and civic/cultural/community space. Complementary uses include retail and service commercial, active adult retirement communities, multi-family residential, and accessory residential units. Conditional uses of the place type include office, public facilities, special activities, and parks and recreation.	Route 1 Belmont Park A Belmont Park B
Transition Industrial/Mineral Extraction	Core uses include general manufacturing and assembly, data centers, research and development, outdoor storage, public facilities, and quarry. Complementary uses include offices, outdoor manufacturing, and retail and service commercial (ancillary retail). Conditional uses of the place type include special activities and parks and recreation.	Route 1

6.1.3.2 2019 Countywide Transportation Plan

The land use planning policies and objectives in the Plan are closely coordinated with the CTP, whose purpose is to anticipate and coordinate land use development and transportation improvement needs through 2040. Two regional coordination topics addressed in the CTP along Rt. 7 are Corridor D and Corridor E. Corridor D is located near Rt. 7 and Sully Road, and Corridor E is near Rt. 7 and Loudoun County Parkway. According to the CTP, new transportation infrastructure along Corridors D and E would impact residential, commercial, historic/cultural, and natural resources in these areas, as Loudoun County anticipates updates to its transportation network (Loudoun County 2023f). Dominion and ERM met with

Loudoun County Department of Transportation and Infrastructure (DTCI) staff in February 2023 to discuss the CTP and the Project. DTCI staff did not identify any potential conflicts between the Project and new or planned road infrastructure at that time.

6.1.3.3 Loudoun County Zoning Ordinance

Local governments use zoning to regulate land use and implement the objectives of the comprehensive plan. A zoning ordinance regulates orderly and efficient development by separating incompatible land uses and establishing development standards. A zoning ordinance may be modified by the local governing bodies or through public petitions to change zoning designations or approve new uses. Under Virginia law, public utilities planning to construct any transmission line of 138 kV or higher may either obtain a CPNC from the SCC or obtain the applicable local zoning ordinance approvals. The SCC's issuance of a CPCN preempts local zoning ordinances (Va. Code § 56-265.2).

In 2019, Loudoun County initiated a rewrite of the 1993 Revised Zoning Ordinance to support the land use planning objectives of the 2019 Plan. In December 2023, the BOS repealed the1993 Revised Zoning Ordinance and adopted the 2023 Zoning Ordinance (Loudoun County 2023g). Although the transmission line components of the Project are exempt from local zoning regulations, substations and other facilities are subject to local land use approvals and screening standards, including buffers and landscaping. The 2023 Zoning Ordinance included changes related to data center and industrial uses including redefining which zoning districts allow data centers as a use-by-right versus zoning districts where data centers require BOS approval. Zoning districts with by-right (entitled) data center use, and other industrial uses, are relevant to the Project because they provide a local land use context for assessing the compatibility of new transmission lines with the underlying zoning. Within the study area, the Project facilities are most compatible with zoning districts that support industrial uses and less compatible with those supporting residential uses.

Additionally, the 2023 Zoning Ordinance establishes zoning overlay districts, which provide additional resource-specific land use regulations applicable to defined areas (Loudoun County 2023g). Three zoning overlay districts are crossed by one or more of the Project routes: the Airport Impact Overlay District (AIOD), Floodplain Overlay District, and Quarry Notification Overlay District. The AIOD is discussed further in Section 6.1.11. The Floodplain Overlay District and Quarry Notification Overlay District are not relevant to the Project.

6.1.3.4 Impact Assessment

Transmission lines and associated facilities on or crossing industrial zoning districts are generally less impactful to a community than those on or crossing residential zoning districts. Figure 6.1.3-1 shows the zoning districts within 0.25 mile and Table 6.1-8 lists and describes zoning districts that are crossed by or within 0.25 mile of Project routes and facilities. The zoning district descriptions are from the 2023 Zoning Ordinance. The impact assessment following the table quantifies crossings of zoning districts to show the relative compatibility of the Project routes with planned land use and current zoning.

Table 6.1-8: Zoning Districts within 0.25 Mile of Project Facilities

Zoning District	Description and Allowed Uses	Project Facility Crossed
Agriculture-3	Legacy zoning district. Agriculture, farm operations, rural home businesses, and low-density residential development.	Route 1

Zoning District	Description and Allowed Uses	Project Facility Crossed
Commercial Center-Community Center	Large format retail and commercial establishments located along major roads and smaller, community-serving retail. Small-scale office, retail, and service use compatible with surrounding residential uses and pedestrian-oriented streetscape.	Not crossed
Commercial Center-Small Regional Center	Large format retail and commercial establishments located along major roads. Smaller, community-serving retail and commercial establishments within a “main street” environment. Small-scale office, retail, and service uses compatible with the neighborhood.	Route 1
General Business	Legacy zoning district. General destination business uses to serve residents and other businesses in the vicinity.	Not crossed
General Industrial	Provides for industrial uses incompatible with residential uses.	Route 1
Industrial Park	Office, light production, flex space, and warehouse uses. Limited retail. Buildings make up the predominant feature.	Route 1 Belmont Park A Belmont Park B Broad Run A Broad Run B Line Loop Golden Substation
Joint Land Management Area-3	Mix of residential and non-residential uses, provides for a combination of low density rural residential uses with limited agricultural businesses in a rural setting.	Route 1 Aspen-Goose Creek Line Aspen Substation
Joint Land Management Area-20	Legacy zoning district. Provides for uses compatible with Leesburg Executive Airport, future airport expansion, agricultural activities, home-based business.	Route 1
Mineral Resource/Heavy Industry	Mineral extraction and industrial activities incompatible with residential uses.	Route 1
Office Park	Employment uses, locations for administrative, business, and professional offices, research and development, supporting commercial and institutional uses and facilities, limited first floor retail.	Route 1 Belmont Park A Belmont Park B
Planned Development-Active Adult/Age Restricted	Legacy zoning district. Planned adult residential communities for a population over 55 years of age.	Not Crossed
Planned Development-Commercial Highway	Legacy zoning district. Large format retail.	Not Crossed
Planned Development Housing-3	Legacy zoning district. Residential and some complimentary non-residential uses. Three dwelling units per acre.	Belmont Park B

Zoning District	Description and Allowed Uses	Project Facility Crossed
Planned Development Housing-4	Legacy zoning district. Residential dwelling types in a neighborhood setting and some non-residential uses. Four dwelling units per acre.	Not Crossed
Planned Development Housing-6	Legacy zoning district. Residential dwelling types in a neighborhood setting and some non-residential uses. Six dwelling units per acre	Not Crossed
Planned Development-Mixed Use Business	Legacy zoning district. Mixed-use business developments, pedestrian-orientated mix of uses including potential flex-industrial, retail, service, civic, public amenities, and residential. Link major land uses by trails and greenways, preserve environmental features of development.	Broad Run B
Planned Development-Research and Development Park	Legacy zoning district. Planned mixed employment park that is at least 20 acres in size, located within the Rt. 28 Tax District.	Not Crossed
Planned Development-Special Activity	Legacy zoning district. Accommodate uses which require sizable land area of a minimum of 100 acres. Accommodate uses which may require functional separation from typical residential, commercial, and industrial development.	Route 1
Residential-2	Legacy zoning district. Low-to-moderate density single-family detached and attached residences on lots of 20,000 square feet or more in areas served by public utilities but unsuitable for higher residential densities.	Not Crossed
Residential-8	Legacy zoning district. Manufactured housing, single-family detached, duplex, townhouse, single-family attached, and multi-family dwelling units at gross residential parcel densities not to exceed 8 dwelling units per acre.	Not Crossed
Residential-16	Legacy zoning district. Manufactured housing, townhouse, and multi-family units at gross residential parcel densities not to exceed 16 dwelling units per acre.	Belmont Park A
Residential-24	Multi-family dwelling units at densities not to exceed 24 dwelling units per acre in areas served by public utilities and with access to collector or arterial roads, designed for infill development.	Not Crossed
Rural Commercial	Legacy zoning district. Rural commercial and residential uses.	Belmont Park A
Town Center	Compact, pedestrian-orientated environments with a mix of residential, lodging, commercial, and civic uses, appropriate scale and design of buildings, streetscapes, and open spaces for pedestrian-oriented development, serve as logical locations for transit stops.	Not Crossed

Route 1

Table 6.1-9 lists the crossing length and area encompassed by what would be the right-of-way for Route 1 across the affected zoning districts. In addition to Route 1, the length includes the Aspen and Golden

230 kV Splits and the Line Loop, and the area includes the Aspen and Golden Substation sites and the Line Loop. Route 1 generally avoids less compatible (residential and mixed-use) land uses and zoning districts by crossing predominately the Industrial Park, Office Park, Mineral Resources/Heavy Industry, and General Industry zoning districts. These crossings constitute approximately 87 percent of the route length and 79 percent of the area that would be encompassed by Route 1 and the associated Project facilities.

Table 6.1-9: Zoning Districts Crossed by Route 1

Zoning District	Length (miles) (Percent of Total)	Right-of-Way (acres) (Percent of Total)
Industrial Park	3.6 (52%)	52.2 (49%)
Office Park	1.5 (21%)	17.7 (17%)
Mineral Resource/Heavy Industry	0.7 (10%)	9.6 (9%)
Agriculture-3	0.5 (8%)	9.8 (9%)
General Industrial	0.3 (4%)	4.5 (4%)
Joint Land Management Area-20	0.2 (2%)	7.5 (7%)
Joint Land Management Area-3	0.1 (2%)	2.1 (2%)
Planned Development-Special Activity	0.1 (1%)	0.6 (1%)
Commercial Center-Small Regional Center	< 0.1 (< 1%)	0.5 (< 1%)

Belmont Park A

Table 6,1-10 lists the crossing length and area encompassed by what would be the right-of-way for Belmont Park A across the affected zoning districts. The route crosses the recently rezoned (future) Belmont Park residential development for 0.1 mile (17 percent of its length) but the majority of the route, 0.5 mile or 83 percent of its length, crosses commercial or industrial zoned land.

Table 6.1-10: Zoning Districts Crossed by Belmont Park A

Zoning District	Length (miles) (Percent of Total)	Right-of-Way (acres) (Percent of Total)
Office Park	0.3 (50%)	4.3 (62%)
Industrial Park	0.1 (17%)	0.8 (12%)
Residential-16	0.1 (17%)	1.1 (16%)
Rural Commercial	0.1 (17%)	0.6 (9%)

Belmont Park B

Table 6.1-11 lists the crossing length and area encompassed by what would be the right-of-way for Belmont Park B across the affected zoning districts. The route crosses the Planned Development Housing-3 district for 0.4 mile (67 percent of its length) at the Camden Lansdowne Apartments and a small portion of the future Belmont Park residential development. The remaining 33 percent of the route variation crosses commercial and industrial zoned land.

Table 6.1-11: Zoning Districts Crossed by Belmont Park B

Zoning District	Length (miles) (Percent of Total)	Right-of-Way (acres) (Percent of Total)
Planned Development Housing-3[2]	0.4 (67%)	5.2 (68%)
Office Park[1]	0.2 (26%)	2.0 (26%)
Residential-16[2]	0.0 (0%)	< 0.1 (< 1%)
Industrial Park	< 0.1 (7%)	0.5 (6%)

Broad Run A

Table 6.1-12 lists the crossing length and area encompassed by what would be the right-of-way for Belmont Park A within the Industrial Park zoning district, the only district crossed by this variation.

Table 6.1-12: Zoning Districts Crossed by Broad Run A

Zoning District	Total Impacted Distance (miles)	Total Impacted Rights-of-Way (acres)
Industrial Park	2.2 (100%)	29.7 (100%)

Broad Run B

Table 6.1-13 lists the crossing length and area encompassed by what would be the right-of-way for Broad Run B across the affected zoning districts. Broad Run B crosses the Industrial Park district for 1.7 mile (77 percent its total length) with 0.5 mile (23 percent) crossing commercial or industrial zoned land. The Planned Development – Mixed Use Business crossing coincides with a BOS open space easement.

Table 6.1-13: Analysis of Zoning Districts Crossed by Broad Run B

Zoning District	Total Impacted Distance (miles)	Total Impacted Rights-of-Way (acres)
Industrial Park	1.7 (74%)	21.1 (69%)
Planned Development – Mixed Use Business	0.5 (23%)	9.4 (31%)

6.1.4 Residential Areas and Residences

ERM identified residences (multi-family dwellings and single-family dwellings) within 60 feet of what would be the right-of-way and within 100 feet, 250 feet, and 500 feet of the centerline of the Aspen-Golden Lines through review of various digital datasets, maps, and recent (2023) digital aerial photography. Table 6.1-14 lists the number of dwellings by type within these tiers for Route 1 and each of the Variations. The locations of dwellings along the routes are depicted on Figure 6.1.4-1. Additional information about the residential areas along each route is provided in the subsections below.

The majority of buildings along the routes are commercial structures or non-residential buildings on privately owned parcels; however, about half of the study area consists of single-family homes on quarter-acre lots. There are no dwellings located within what would be the rights-of-way of Route 1 or the Variations. There is one vacant dwelling within what would be within the right-of-way of Route 1 on the parcel owned by the Campus B data center developer, but as part of their zoning application proffers, it

would be demolished by the developer prior to transmission line construction. There are no existing ADUs within 500 feet of any route centerline.

Table 6.1-14: Residences within 60 Feet of the Right-of-Way and within 100 Feet, 250 Feet, and 500 Feet of the Centerline of the Aspen-Golden Lines

Route Name	Structure Type	Structures within 60 Feet of ROW	Structures within 100 Feet of Centerline	Structures within 250 Feet of Centerline	Structures within 500 Feet of Centerline
Route 1	Single-Family Residence	0	0	1	2
	Multi-Family Residence	0	0	0	0
Belmont Park Variation A	Single-Family Residence	0	0	0	0
	Multi-Family Residence	0	0	0	1 (48 units)
Belmont Park Variation B	Single-Family Residence	0	0	0	0
	Multi-Family Residence	0	0	3 (112 units)	10 (334 units)
Broad Run Variation A	Single-Family Residence	0	0	0	0
	Multi-Family Residence	0	0	0	0
Broad Run Variation B	Single-Family Residence	0	0	0	0
	Multi-Family Residence	0	0	0	0

6.1.4.1 Residential Areas

Residential areas that are crossed by or within 0.25 mile of the Project routes are described below. These areas are depicted in Figure 6.1.4-1.

- **Belmont Community Association** manages a mixed-use residential country club containing 2,157 homes and an 18-hole golf course. Route 1 crosses the residential area for about 0.9 mile from approximate MPs 2.0 to 2.9, and both Belmont Park variations cross the area for less than 0.1 mile following the Route 1 segment. Other residential communities managed by the Belmont Community Association within 0.25 mile of a route include Belmont Executive Plaza (0.2 mile southwest of Belmont Park Variation A at approximate MP 3.2) and Regency at Belmont (0.1 mile southwest of Belmont Park Variation A at approximate MP 3.4).
- **Lansdowne on the Potomac HOA** manages a residential, recreational, and retail mixed-use area with neighborhoods containing a total of 2,155 homes. The Lansdowne community is situated on the northside of Rt. 7. Belmont Park Variation B crosses the community for about 0.2 mile in two segments from approximate MPs 0.1 to 0.2 and MPs 0.5 to 0.6. Route 1 spans the southside of Rt. 7 adjacent to the Lansdowne community from approximate MPs 2.4 to 2.9 and MPs 3.5 to 3.7. Other residential communities managed by Lansdowne on the Potomac HOA within 0.25 mile of a route include Hawthorn at Lansdowne (0.1 mile northeast of Belmont Park Variation B at approximate MP 0.3) and Poet's Walk (0.1 mile northeast of Belmont Park Variation B at approximate MP 0.2).
- **Ashburn Village Community Association, Inc.** manages a mixed-use community with residences (5,552 units), recreational facilities, and retail spaces. Route 1 crosses the Ashburn Village residential area for approximately 0.2 mile from approximate MPs 3.8 to 4.0.
- **Ashbrook** is a mixed-use residential community with 310 homes managed by the Ashbrook HOA. Route 1 spans the northeastern boundary of the Ashbrook community for approximately 0.4 mile from approximate MPs 4.2 to 4.7.

- **One Loudoun Neighborhood Association, Inc.** manages a mixed-use community with 1,040 residences. Route 1 spans its northeastern boundary for about 0.5 mile from approximate MPs 4.7 to 5.2.
- **Commonwealth Center Residential** is a planned residential community. The zoning map amendment for the area, special exception, and zoning modifications have been approved. Additional discussion of this planned development is provided in Section 6.1.6. Route 1 spans the northeastern boundary of the area between approximate MPs 5.3 and 5.5.
- **Kincora** is an under-construction mixed-use community that will consist of retail, industry, and residences. Additional discussion of this development is provided in Section 6.1.6. Broad Run Variation B spans the southwestern portion of the area for about 0.5 mile from approximate MPs 1.3 to 1.8.
- **Tuscarora Crossing** is an under-construction mixed-use residential area less than 0.1 mile northwest of the Aspen-Goose Creek Line and approximately 0.1 mile northwest of the proposed Aspen Substation.
- **Goose Creek Club** is an under-construction mixed-used residential area. Several residences have been built and a site plan for additional residences approved by the County. The community lies about 0.1 mile northwest of Route 1 at approximate MP 1.5.
- **Lexington 7** is a mixed-use commercial and residential area on the south side of Rt. 7. Route 1 passes adjacent to the Lexington 7 area from approximate MPs 4.3 to 4.7.
- **Potomac Farms** is a mixed-use commercial and residential area on the south side of Rt. 7. Route 1 passes adjacent to the Potomac Farms area from approximate MPs 4.7 to 4.9.
- **University Center** is a mixed-use commercial and residential area the south side of Rt. 7. Route 1 is adjacent to the University Center area from approximate MPs 4.9 to 5.9.
- **Ashby Ponds** is a mixed-use residential area west of Loudoun County Parkway. Broad Run Variation A passes east of the area from approximate MPs 6.9 to 7.7, with the nearest point approximately 0.2 mile west of approximate MP 7.4.

6.1.4.2 Planned Residences

ERM tallied the number of planned residences associated with ongoing development along and near each route. Table 6.1-15 lists the number of planned dwellings by type for the Aspen-Golden Lines. ERM also considered planned residential developments with ADU proffers to avoid potential impacts to future residents qualifying for affordable housing assistance. Because the implementation of planned ADU proffers and programming is not certain, no specific impacts were tabulated. Regardless, ERM identified several developments with significant ADU proffers including Dogwood Farm Station, Commonwealth Center Residential, and University Center at Lakeview. Routing was informed, in part, to avoid planned high-density multi-family ADU buildings that would place the Aspen-Golden Lines proximate to dozens, or hundreds, future affordable housing units. Planned residential developments are discussed further in Section 6.1.6. While planned residential areas are not discussed in detail in this section, the locations of the planned residences within 500 feet of the routes are depicted in Figure 6.1.4-1, so they can be visualized in comparison to the existing residences.

Table 6.1-15: Planned Residences within 60 Feet of Right-of-Way and 100 Feet, 250 Feet, and 500 Feet of the Centerline of Route 1 and the Variations

Route Name	Structure Type	Structures within 60 Feet of ROW	Structures within 100 Feet of Centerline	Structures within 250 Feet of Centerline	Structures within 500 Feet of Centerline
Route 1	Single-Family Residence	0	0	0	11
	Multi-Family Residence	0	0	27 (54 units)	89 (428 units)
Belmont Park Variation A	Single-Family Residence	4	3	34	57
	Multi-Family Residence	0	0	0	33 (66 units)
Belmont Park Variation B	Single-Family Residence	0	0	0	28
	Multi-Family Residence	0	0	0	0
Broad Run Variation A	Single-Family Residence	0	0	0	0
	Multi-Family Residence	0	0	0	0
Broad Run Variation B	Single-Family Residence	0	0	0	0
	Multi-Family Residence	0	0	0	0

6.1.4.3 Impact Assessment

Route 1

There are no existing dwellings either within or within 60 feet of what would be the right-of-way for Route 1; and zero, one, and two dwellings (both of which are single-family), respectively, within 100 feet, 250 feet, and 500 feet of the route centerline. Route 1 largely avoids existing dwellings by paralleling Rt. 7, which provides the least impactful alignment with regard to residential areas. The nearest existing dwelling to the route is a single-family residence approximately 162 feet from the centerline at approximate MP 1.0 on a parcel zoned for Mineral Resources/Heavy Industry adjacent to an existing quarry and a planned data center campus. In developing the Route 1 alignment, the Company attempted to minimize impacts to that residence to the extent practicable given the other constraints in this area. Dominion met with the owner and resident of this parcel on July 11, 2023, to solicit feedback about routing. The landowner expressed no immediate concerns and would await contact from Dominion's right-of-way representatives after the filing.

There are no planned future dwellings either within or within 60 feet of what would be the right-of-way for Route 1; and zero, zero, and 11 single-family dwellings within 100 feet, 250 feet, and 500 feet of the route centerline. There additionally are zero, 27 (54 units), and 89 (428 units, inclusive of all buffers) multi-family dwellings within 100 feet, 250 feet, and 500 feet of the route centerline. The future residences are planned to be built in the One Loudoun, Commonwealth Center Residential, and University Center communities.

Belmont Park Variations

There are no existing dwellings either within or within 60 feet of the rights-of-way for Belmont Park Variation A or B, and no existing single-family dwellings within 100 feet, 250 feet, and 500 feet of either route centerline. There is one existing multi-family residence (with 48 units) within 500 feet of the Belmont Park A Variation; and 3 multi-family dwellings (with a combined 112 units) within 250 feet and 10 multi-family dwellings (with a combined 334 units) within 500 feet of the Belmont Park B Variation. The nearest

existing dwelling to Belmont Park Variation A, the multi-family residence with 48 units, is 448 feet from the centerline at approximate MP 3.4.

There are no planned future dwellings within the right-of-way for Belmont Park Variation A, but four planned future dwellings within 60 feet of the edge of the right-of-way. Otherwise, there are three, 34, and 57 planned future single-family dwellings within 100 feet, 250 feet, and 500 feet of the route centerline and 33 planned multi-family dwelling (66 units) within 500 feet of the centerline. The planned units would be in the Belmont Park development.

There are no existing dwellings either within or within 60 feet of the right-of-way for Belmont Park Variation B, and no existing single-family dwellings within 100 feet, 250 feet, and 500 feet of the route centerline. There is one existing multi-family residence with 48 units within 500 feet of the route.

There are no planned future single-family dwellings either within or within 60 feet of the right-of-way for Belmont Park Variation B, and no existing single-family dwellings within 100 feet, 250 feet, and 500 feet of the route centerline. There are three existing multi-unit buildings (with a combined 112 units) and 10 existing multi-family single family dwellings (with a combined 334 units), respectively, within 250 feet and 500 feet of the route centerline.

Based on the above, Belmont Park Variation B is nearer to more existing residences but fewer planned future residences than Belmont Park Variation A.

Broad Run Variations

There are no existing or planned dwellings within 100 feet, 250 feet, and 500 feet of the Broad Run Variation A and B centerlines.

6.1.5 Commercial/Industrial Areas and Buildings

Commercial and industrial areas and buildings are present throughout the study area, including but not limited to data centers, office buildings, retail/mixed use areas, utility infrastructure, warehouses and distribution centers, and quarries. As discussed in Section 6.1.3, zoning districts considered commercial or industrial include Mineral Resource/Heavy Industry, Commercial Center, General Industry, Industrial Park, Office Park, and Mixed-use Business. In general, these commercial and industrial areas in the study area occur along major roadways, including Rt. 7, Rt. 28, and Loudoun County Parkway. In accordance with SCC Guidelines, crossing these commercial and industrial areas is preferred to crossing residential areas as doing so can minimize potential conflicts with existing and planned land uses.

Commercial and non-residential buildings within 0.25 mile of the Aspen-Golden Lines are depicted on Figure 6.1.5-1. Table 6.1-16 tabulates the number of commercial and non-residential structures within 500 feet of the centerline of each route.

Table 6.1-16: Commercial and Non-Residential Buildings within Right-of-way and 500 Feet of the Centerline of Route 1 and the Variations

Route Name	Structure Type	Structures within ROW	Structures within 500 Feet of Centerline
Route 1	Commercial Buildings	0	54
	Non-residential Buildings	0	14
Belmont Park Variation A	Commercial Buildings	0	1
	Non-residential Buildings	0	0

Route Name	Structure Type	Structures within ROW	Structures within 500 Feet of Centerline
Belmont Park Variation B	Commercial Buildings	0	2
	Non-residential Buildings	0	0
Broad Run Variation A	Commercial Buildings	0	13
	Non-residential Buildings	0	3
Broad Run Variation B	Commercial Buildings	0	6
	Non-residential Buildings	0	4

6.1.5.1 Impact Assessment

No commercial or non-residential buildings were identified within what would be the right-of-way of Route 1 or the Variations; thus, no commercial or non-residential buildings would be directly impacted by the Project. Multiple commercial and non-residential buildings were identified within 500 feet of the route centerlines. While there is potential for temporary impacts to commercial buildings during construction (e.g., road or land closures), the Project would have no effect on the operation or use of commercial and other non-residential buildings. In the event there are temporary access impacts to commercial businesses, Dominion would coordinate directly with individual property owners to plan for and mitigate affects.

6.1.6 Planned Developments

ERM obtained information on planned developments through publicly available data on Loudoun County websites and consultations with County planning officials and other stakeholders.[18] In most cases, information on planned developments was found on the Loudoun County Land Management, Applications, Research, and Coordination website or provided by Loudoun County Planning Department staff (Loudoun County 2023i).

Table 6.1-17 lists planned developments crossed by or within 0.25 mile of the Project facilities, and documents type of development, status, and location relative to the Project facilities. Figure 6.1.6-1 depicts the planned developments within 0.25 mile of the Project.

Information on future road expansion projects is provided in Section 6.1.10.

Table 6.1-17: Planned Developments within 0.25 mile of Project Facilities

Development Name	Development Type	Status	Distance to Project Facilities
Luck Stone Cochran Mill	Data centers	Proposed; zoning map amendment and zoning modification in review	Approximately 0.1 mile (585 feet) southeast of Aspen Substation

[18] "Planned developments" refers to projects that have been submitted to the Loudoun County for review/approval (or have been shared with Dominion through stakeholder outreach) but where construction has not yet been completed as of February 2024.

Development Name	Development Type	Status	Distance to Project Facilities
Tuscarora Crossing Landbay 3	Data center	Proposed; site plan in review	Approximately 0.1 mile (590 feet) northeast of Route 1 near the proposed Aspen Substation
Loudoun County Asphalt	Concrete pad for three new silos	Proposed; site plan amendment in review	Crossed by Route 1 between approximate MPs 0.1 and 0.3
Data Center Campus A (Cochran Mill Road)	Data centers, warehouses	Proposed; site plan in review	Crossed by Route 1 between approximate MPs 0.2 and 0.9
Goose Creek Sewage Pump Station	Sewage pump station	Under construction	Crossed by Route 1 between approximate MPs 0.5 and 0.6
Loudoun Water Milestone Reservoir	Raw water pump station	Proposed; site plan in review	Crossed by Route 1 between approximate MPs between MPs 0.5 and 0.6
Loudoun Water Quarry A	Water pump station	Proposed; site plan in review	Crossed by Route 1 between approximate MPs 0.8 and 1.1
Luck Stone Leesburg Plant	Mineral extraction	Proposed; zoning map amendment, zoning concept plan amendment, and special exception in review	Crossed by Route 1 between approximate MPs 0.8 and 1.1
Data Center Campus B (Belmont Innovation)	Data centers	Proposed; zoning map amendment, special exceptions, and zoning modification in review	Crossed by Route 1 between approximate MPs 0.9 and 1.6
Data Center Campus C	Data centers	Site plan approved; site under construction	Crossed by Route 1 between approximate MPs 1.5 and 2.0
Goose Creek Club II	Residential development	Proposed; zoning map amendment and zoning modifications are in review	Approximately 0.1 mile (460 feet) west of Route 1 near MP 1.5
Loudoun Water Russell Branch Pump Station	Sewage pump station	Proposed; site plan amendment in review	Crossed by Route 1 between approximate MPs 1.5 and 2.9
Data Center Campus D (Belmont Landbay KK)	Data center	Proposed; site plan in review	Crossed by Route 1 between approximate MPs 2.0 and 2.9 Crossed by Belmont Park A between approximate MPs 2.9 and 3.0 Crossed by Belmont Park B between approximate MPs 0.0 and 0.1

Development Name	Development Type	Status	Distance to Project Facilities
Northstar Square	Residential development	Proposed; zoning map amendment, special exceptions, and zoning modifications in review	Crossed by Route 1 between approximate MPs 2.0 and 2.9 Crossed by Belmont Park A between approximate MPs 2.9 and 3.0 Crossed by Belmont Park B between approximate MPs 0.0 and 0.1
Lansdowne Town Center Fringe Landbay 1E1	Restaurant	Under construction	Approximately 0.1 mile (595 feet) northwest of Route 1 near MP 2.3
Belmont Cove Rezoning	Residential development	Proposed; zoning map amendment and zoning modifications in review	Approximately 0.1 mile (385 feet) southeast of Route 1 near MP 2.9 Approximately 0.1 mile (345 feet) south of Belmont Park A near MP 3.0 Approximately 0.1 mile (350 feet) south of Belmont Park B near MP 0.0
Belmont Park	Residential development	Proposed; site plan in review	Crossed by Belmont Park A between approximate MPs 2.9 and 3.1 Crossed by Belmont Park B between approximate MPs 0.0 and 0.1
West Belmont Place	Residential development	Site plan approved; under construction	Approximately 0.2 mile (1,225 feet) southeast from Route 1 near MP 2.9 Approximately 0.2 mile (855 feet) southwest of Belmont Park A near MP 3.1 Approximately 0.2 mile (1,220 feet) southwest of Belmont Park B near MP 0.2

Development Name	Development Type	Status	Distance to Project Facilities
Belmont Chase II	Residential development	Proposed; zoning concept plan amendment in review	Approximately 0.2 mile (1,275 feet) southwest of Route 1 near MP 3.5 Approximately 0.1 mile (695 feet) southwest of Belmont Park A near MP 3.3 Approximately 0.2 mile (1,225 feet) southwest of Belmont Park B near MP 0.4
Ashburn Chase	Residential development	Site plan approved	Approximately 0.1 mile (315 feet) southwest of Belmont Park A near MP 3.4 Approximately 0.1 mile (580 feet) west of Belmont Park B near MP 0.6
Data Center Campus E (Telos)	Data center	Proposed; site plan in review	Crossed by Route 1 between approximate MPs 3.5 and 3.6 Crossed by Belmont Park A between approximate MPs 3.4 and 3.5 Crossed by Belmont Park B near MP 0.6
Community Church	Place of worship, school	Site plan approved	Crossed by Route 1 between approximate MPs 3.5 and 3.7
Amazon Distribution Facility	Distribution warehouse	Legislative land development pre-meeting completed in November 2021; application is inactive.	Crossed by Route 1 between approximate MPs 3.7 and 4.0
Ashburn Village Development	Residential development, commercial development, office park	Proposed; zoning map amendment, special exceptions, and zoning modification; no further action since 2016	Crossed by Route 1 between approximate MPs 3.7 and 4.0
Ashbrook Building 11	Flex industrial building	Proposed; site plan in review	Crossed by Route 1 between approximate MPs 4.3 and 4.6
Lexington 7 Landbay A	Residential development	Construction plans and profiles approved (proposed; site plan amendment in review)	Approximately 0.2 mile (1,260 feet) northeast of Route 1 near MP 4.5

Development Name	Development Type	Status	Distance to Project Facilities
Lexington 7	Commercial development, warehouse	Site plan approved; under construction	Approximately 0.1 mile (245 feet) northeast of Route 1 near MP 4.6
Lexington 7 Mezzanine	Warehouse	Site plan approved	Approximately 0.1 mile (245 feet) northeast of Route 1 near MP 4.6
Dogwood Farm Station	Residential development	Zoning map amendment, special exception, and zoning modifications approved	Approximately 0.1 mile (265 feet) northeast of Route 1 near MP 4.7
Eastern Loudoun Group Home	Medical facility	Under construction	Approximately 0.2 mile (1,235 feet) northeast of Route 1 near MP 4.8
One Loudoun Landbay A1 Multi-family	Residential development	Proposed; site plan in review	Less than 0.1 mile (55 feet) south of Route 1 near MP 4.8
One Loudoun Landbay A-11	Office Park	Proposed; site plan in review	Crossed by Route 1 between approximate MPs 4.7 and 4.9
One Loudoun Landbay A-11 (Site Amendments)	Restaurant	Proposed; site plan amendment in review	Crossed by Route 1 between approximate MPs 4.7 and 4.9
Ashburn Station Monopole	Telecommunications facility	Legislative land development pre-meeting completed October 2022	Approximately 0.2 mile (1,210 feet) southwest from Route 1 near MP 4.9
One Loudoun Landbay C	Glass recycling facility	Proposed; site plan amendment in review	Approximately 0.2 mile (1,210 feet) southwest of Route 1 near MP 4.9
One Loudoun Uptown	Residential and commercial development	Proposed; site plan in review	Crossed by Route 1 between approximate MPs 4.9 and 5.3
Lakeview Center Plaza	Automobile service station and car wash	Proposed; special exception in review	Approximately 0.1 mile (615 feet) northeast of Route 1 near MP 5.2
Commonwealth Center Residential	Residential development	Zoning map amendment, special exception, and zoning modifications approved	Crossed by Route 1 between approximate MPs 5.3 and 5.5

Development Name	Development Type	Status	Distance to Project Facilities
Commonwealth Center Residential North	Residential development	Proposed; site plan in review	Crossed by Route 1 between approximate MPs 5.3 and 5.5
University Center at Lakeview	Residential development	Proposed; site plan in review	Approximately less than 0.1 mile (195 feet) northeast of Route 1 near MP 5.5
XAVO Car Club Russell Branch Parkway	Exhibition and convention center, restaurant	Legislative land development pre-meeting completed January 2024	Crossed by Route 1 between approximate MPs 5.7 and 5.9
Loudoun Square Storage	Self-storage facility	Proposed; site plan in review	Crossed by Route 1 between approximate MPs 5.8 and 5.9
The Flats at Broad Run	Residential development	Proposed; zoning map amendment, special exception, and zoning modifications in review	Approximately 0.2 mile (915 feet) southeast of Route 1 near MP 6.0
Russell Branch Rezoning	Residential or commercial development	Legislative land development pre-meeting completed June 2023	Approximately 0.2 mile (1,160 feet) southeast of Route 1 near MP 6.1
Commonwealth Center Offsite Trail Extension	Walking path	Proposed; construction plans and profiles in review	Crossed by Route 1 between approximate MPs 6.3 and 6.5
Broad Run Water Reclamation Facility	Wastewater treatment plant	Site plan approved	Crossed by Broad Run A between approximate MPs 6.8 and 7.7 Crossed by Broad Run B between approximate MPs 0.0 and 1.3
Kincora Village Center K1	Residential development	Proposed; site plan amendment in review	Approximately 0.1 mile (545 feet) northeast of Broad Run B near MP 0.5
Kincora Village Center Landbay K	Museum	Proposed; site plan in review	Approximately 0.1 mile (750 feet) northeast of Broad Run B near MP 0.7
Kincora Village Center Public Plaza	Proffered plaza	Zoning concept amendment approved	Approximately 0.1 mile (610 feet) northeast of Broad Run B near MP 0.7

Development Name	Development Type	Status	Distance to Project Facilities
Corscale VA 2	Data Center	Proposed; site plan in review	Approximately 0.1 mile (395 feet) northeast of Broad Run B near MP 0.8
Kincora Daycare Center	Daycare	Proposed; site plan in review	Approximately 0.2 mile (1,200 feet) east of Broad Run B near MP 1.3
Temple Baptist Church Ballfields	Athletic fields	Proposed; site plan in review	Approximately 0.2 mile (1,130 feet) east of Broad Run B near MP 1.1
One Loudoun Landbay B-72	Trail	Construction plans and profiles approved	Less than 0.1 mile (110 feet) west of Broad Run A near MP 6.9
Ashburn Crossing Parking Modification	Flex industrial buildings	Special exception approved	Approximately 0.1 mile (755 feet) west of Broad Run A near MP 7.6
Ashburn Crossing Phase V	Flex industrial buildings	Proposed; modified process site plan in review	Approximately 0.1 mile (755 feet) west of Broad Run A near MP 7.6
Ashby Ponds Care Centre Expansion	Medical facility	Site plan approved; under construction	Approximately 0.2 mile (790 feet) west of Broad Run A near MP 7.6
Ashby Ponds NH 3 PH 3C	Residential development	Site plan approved; under construction	Approximately 0.2 mile (790 feet) west of Broad Run A near MP 7.6
Beaumeade Loudoun County Parkway Phases 1 & 2	Flex industrial buildings	Site plan approved; under construction	Less than 0.1 mile (105 feet) west of Broad Run A near MP 7.6
Ashburn North Phases 3 and 4	Flex industrial buildings	Approved; under construction	Approximately less than 0.1 mile (110 feet) west of Broad Run A near MP 8.1
AREP Beaumeade Data Center	Data center	Approved; under construction	Approximately 0.1 mile (235 feet) southwest of Broad Run A near MP 8.2
Interconnection Substation	Substation	Proposed; site plan in review	Approximately 0.1 mile (230 feet) southwest of Broad Run A near MP 8.2

Development Name	Development Type	Status	Distance to Project Facilities
Dulles 28 Technology Park	Data center, flex industrial buildings	Proposed; modified process site plan in review	Approximately 0.2 mile (915 feet) south of Broad Run A near MP 8.5
Data Center Campus F (Paragon Park)	Data center	Proposed; modified process site plan in review	Crossed by Route 1 between approximate MPs 9.0 and the Golden Substation site Crossed by Broad Run A near MP 8.9 Crossed by Broad Run B near MP 2.2

6.1.6.1 Impact Assessment

Depending on when they are built, planned developments within 0.25 mile of Project facilities could experience temporary impacts during the construction period (e.g., noise, dust, or traffic) or visual impacts during operations. The severity of visual impacts would depend on factors such as surrounding tree cover, landscaping, orientation of development towards/away from transmission infrastructure, and topography. Visual impacts also would depend on the development type and the visual sensitivity of the development and its occupants or users. For example, a residential development implies future tenants or homeowners who constitute a sensitive user group compared to a data center development and its employees. Visual impacts are discussed in Section 6.3. The following discussion, organized alphabetically, addresses potential impacts by route to those planned developments that would (or could) be crossed by new Project rights-of-way (depending on the route variations selected).

6.1.6.2 Route 1

Amazon Distribution Facility

In November 2021, a Legislative Land Development Pre-meeting request was submitted to Loudoun County by Amazon.com Services LLC to discuss a potential application for an e-commerce parcel delivery station on a 52.3-acre undeveloped parcel (PRAP-2021-0086). The sketch plan included a 142,796 square foot building with parking and circulation areas. The project would require a rezoning application to amend the 1984 Concept Development Plan for the property (ZMAP-1984-0007, Ashburn Village), which requires the parcel to be used for “Research and Development/High Tech Office Park.” While the Legislative Land Development Pre-meeting request was completed on November 21, 2021, no zoning application has been submitted as of January 2024.

ERM and the Company met with a representative of B.F. Saul, the landowner of the parcel, on August 4, 2023. During that meeting, the representative indicated that B.F. Saul is in the process of determining the best use of the site, either a data center development, which is a by-right use in this area, or an alternative type of development, which would require a rezoning. No new site plans were shared with ERM and the Company during the meeting.

The right-of-way of Route 1 would be within the northern portion of the site for about 0.2 mile between approximate MPs 3.7 and 4.0. The Route 1 right-of-way would occupy approximately 1.9 acres within the parcel boundary adjacent to Rt. 7. The route would be within an area shown on the sketch plan as having no improvements and including wetlands, a stream, and a 200-foot setback from the right-of-way of the

Rt. 7/Ashburn Village Boulevard interchange. The potential impact of Route 1 on the development potential of the property is minimized by the route's alignment parallel to the property boundary and its collocation with Rt. 7. Further, per the Amazon Distribution Facility sketch plan, Route 1 would not impede the development of any planned structures on the parcel.

Ashbrook Building 11

In January 2023, a site plan approval request was submitted to Loudoun County by Merritt Properties, LLC to construct a flex-industrial building on a 7.1-acre parcel of developed land, inclusive of a two-story office building (STPL-2023-0005). The site plan includes a 34,000 flex-industrial building with modified parking, infrastructure roads, and utilities. Ashbrook Building 11 required a Zoning Concept Amendment Plan to reduce the required setback from Rt. 7 from 300 feet to 200 feet to allow the construction of a second building on the parcel, which was approved in September 2022 (ZCPA-2021-0006). The site plan approval request is still under review as of January 2024.

The right-of-way of Route 1 follows the property boundary separating Ashbrook Building 11 from the Rt. 7 right-of-way for about 0.1 mile between approximate MPs 4.3 and 4.6. The Route 1 right-of-way would occupy approximately 0.5 acre within the northern portion of the parcel boundary. Because the centerline follows the property line, approximately half of the proposed right-of-way would be on the affected parcel and within the required 200-foot setback area between the highway and proposed new building. Route 1 would cross an area shown on the site plan as a parking lot, north of the proposed flex-industrial building. The impact of Route 1 on the development potential of the property is minimized by the route's alignment parallel to the property boundary and its collocation with Rt. 7. Further, per the Ashbrook Building 11 site plan, Route 1 would not prevent the construction or use of planned structures or the parking lot.

Ashburn Village Development[19]

In June 2016, a Legislative Land Development Application request was submitted to Loudoun County by B. F. Saul Real Estate Investment Trust for a potential mixed-use residential, commercial, and office development on a 52.3-acre undeveloped parcel (LEGI-2023-0003). The Concept Development Plan includes 720 residential dwellings, 144,000 square feet for active recreation, 325,000 square feet for offices, and 35,000 square feet for retail space, in addition to parking and landscaping improvements. The project would require a rezoning application to amend the 1984 Concept Development Plan for the property (ZMAP-1984-0007, Ashburn Village), which requires the parcel to be used for "Research and Development/High Tech Office Park." Inclusive in the LEGI-2023-0003 application are the following:

- A zoning map amendment to rezone 52.3 acres of Planned Development-Industrial Park to 21.4 acres of Planned Development-Office Park, 5.9 acres of Planned Development-Community Center, and 25.0 acres of Residential-24 (ZMAP-2016-0009);
- A special exception to permit use in excess of 5,000 square feet in gross floor area up to a maximum of 15,000 square feet (SPEX-2016-0025);
- A special exception to allow any compatible use which serves the immediate neighborhood and is not a use already listed (SPEX-2016-0026); and
- A zoning modification to reduce the required building and parking setback from Rt. 7 from 300 feet and 100 feet, respectively, to 100 feet and 35 feet, respectively (ZMOD-2016-0010).

The Legislative Land Development Application is in review as of January 2024.

[19] The Ashburn Village Development and the Amazon Distribution Facility are two separate plans for the same parcel.

As noted above in the discussion of the Amazon Distribution Facility, ERM and the Company met with a representative of B.F. Saul, the landowner of the parcel, on August 4, 2023. During that meeting, the representative indicated that B.F. Saul is in the process of determining the best use of the site, considering either a by-right data center development or pursuing rezoning for a different type of development. No new site plans were shared with ERM and the Company during the meeting.

The right-of-way of Route 1 would cross the northern portion of the site for about 0.2 mile between approximate MPs 3.7 and 4. 0. The Route 1 right-of-way would occupy approximately 1.9 acres within the parcel boundary adjacent to Rt. 7. Route 1 crosses an area shown on the illustrative plan as including building footprints, parking lots, and landscaping. The impact of Route 1 on the development potential of the property is minimized by the route's alignment parallel to the property boundary and its collocation with Rt. 7. Per the Ashburn Village Development Concept Development Plan, however, Route 1 would impact the development of multiple structures along the northern portion of the affected parcel.

Commonwealth Center Offsite Trail Extension

In June 2023, Ashburn Station Residential LC submitted a construction plan and profile approval request to Loudoun County for an extension of the roadside trail along Loudoun County Parkway on an approximately 56.3-acre parcel of developed land inclusive of a flex-industrial building (CPAP-2023-0011). The site plan indicates impact to only 0.3 acre of the parcel and includes a 300 foot long, 10-foot-wide shared use asphalt trail, guardrails, and Woodlawn Communication easement. As a permitted (by-right) use, no zoning applications were required prior to the site plan approval request. The Commonwealth Center Offsite Trail Extension construction plans and profile application is in review as of January 2024.

Route 1 would cross the eastern portion of the affected parcel in a northeast/southwest orientation for about 0.2 mile between approximate MPs 6.3 and 6.5. The rights-of-way of Route 1 would occupy approximately 2.5 acres of the impacted parcel. According to the site plan, the trail extension is located to the west of the flex-industrial building, while Route 1 passes to the east of the structure. Since Route 1 does not cross any of the actual trail extension, it would not prevent the development or use of the shared use trail.

Commonwealth Center Residential

In July 2022, CWC Shops LC submitted a Legislative Land Development Application to Loudoun County to request approval for residential and commercial development within an approximately 32.1 acre two-parcel site of both undeveloped and developed land (LEGI-2023-0041). Current uses of the land include two restaurants and a pharmacy. The northern 26.7-acre parcel is south of Rt. 7, east of Loudoun County Parkway, and north of Russell Branch Parkway, while the southern 5.4-acre parcel is southeast of the intersection between Loudoun County Parkway and Russell Branch Parkway. The Conceptual Development Plan includes two residential communities, the 236,095 square-foot Commonwealth Center Residential North and 150,000 square-foot Commonwealth Residential South, for a total of 118 multi-family dwelling units. The Commonwealth Center Residential Legislative Land Development application was approved in November 2023.

The Legislative Land Development Application includes the following:

- A zoning map amendment to rezone the property to Residential-24 zoning district (ZMAP-2022-0016);
- A special exception to reduce the front yard 25-foot setback to a 10-foot setback, and reduce the 10-foot side and 25-foot corner setback to a 10-foot side and corner setback (SPEX-2023-0018);
- A zoning modification to modify previously approved ADU requirements (ZMOD-2022-0057);

- A zoning modification to allow access from private access easements (ZMOD-2022-0058);
- A zoning modification to allow access through a commercial center on private streets (ZMOD-2022-0059);
- A zoning modification to modify parking requirements (ZMOD-2022-0061);
- A zoning modification to reduce buffer requirements (ZMOD-2022-0062);
- A zoning modification to provide a total of 7,000 square feet of active recreation space (ZMOD-2023-0029);
- A zoning modification to allow a 60-foot building height without additional setback requirements for a height over 45 feet for attached and multi-family buildings (ZMOD-2023-0033);
- A zoning modification to allow a 10-foot building and parking setback along Commonwealth Center Drive (ZMOD-2023-0034); and
- A zoning modification to allow access to lots created after the rezoning to be provided by private roads.

See the subsection on Commonwealth Center Residential North below for a discussion of potential impacts.

Commonwealth Center Residential North

In September 2022, CWC Overlook LC submitted a site plan approval request to Loudoun County for a residential development on a 26.7-acre parcel of undeveloped land (STPL-2022-0036). The site plan includes 222 stacked and 282 attached multi-family dwelling units, parking lots, ponds, and landscaping. Prior to the site plan approval request, a Legislative Land Development Application, inclusive of a zoning map amendment to rezone the property to Residential-24 (ZMAP-2022-0016), was approved in November 2023 (LEGI-2023-0041). The Commonwealth Center Residential North site plan application is in review as of January 2024.

Route 1 would cross the northern portion of the parcel for about 0.2 mile between approximate MPs 5.3 and 5.5. The right-of-way of Route 1 would occupy approximately 1.8 acres of the impacted parcel. Based on the site plan, Route 1 avoids all planned residential dwellings and parking lots but crosses a stormwater retention pond within the development. Potential impacts of Route 1 are minimized by its alignment along the parcel boundary and collocation with Rt. 7. Although a segment of the Route 1 right-of-way would cross a planned pond, Route 1 would not prevent the planned development of residential units within the parcel.

Community Church

In June 2022, the Community Church submitted a site plan approval request to Loudoun County for a building addition with associated parking lot and utilities on an approximately 40.3-acre parcel of developed land, inclusive of a church and school building, soccer field, outdoor pavilion, and parking lots (STPL-2022-0024). The site plan includes a 61,734 square foot three-story addition on the northwest side of the existing church and an additional parking area to the south of the structure. No zoning change was required for the site plan, which was approved in December 2022. The addition is under construction as of February 2024.

In October 2023, the Community Church of Ashburn submitted a site plan pre-meeting request to Loudoun County for a site plan amendment to approved STPL-2022-0024 to add a 168-foot by 310-foot soccer field and a walking trail (PMTG-2023-0115). The plan indicates the soccer field, surrounded by a walking trail, would be north of the current church/school building, adjacent to Rt. 7 and west of an

existing stormwater management pond. While the site plan pre-meeting request was completed December 28, 2023, no site plan application has been submitted as of January 2024.

Route 1 would cross about 1.1 acre of the northern side of the parcel between approximate MPs 3.5 and 3.7. Route 1 avoids the proposed building addition and parking lot, but a conceptual site plan pre-meeting sketch from a Planning and Zoning Department pre-meeting indicates the route crosses portions of a planned soccer field and walking trail. Dominion is coordinating directly with Community Church with regard to transmission structure placement on the parcel to minimize impacts to the planned development. The impact of Route 1 on the development of the property is minimized by the route's alignment along the parcel boundary and its collocation with Rt. 7, however, a segment of the Route 1 right-of-way overlaps the planned soccer field identified in the conceptual site plan. Recreation fields and trails are often an approved uses within transmission rights-of-way, but due to this potential conflict Dominion has met with Community Church representatives to address routing issues specific to the property. Dominion may attempt to shift the right-of-way in detailed engineering to avoid the planned recreation areas and/or continue work with the Church on other adjustments to avoid and mitigate impacts. Discussions with the Church are ongoing as of February 23, 2023.

Data Center Campus A (Cochran Mill Road)

In September 2022, Twin Creeks Development, LLC submitted a site plan for the Data Center Campus A development, consisting of three data center buildings and two warehouse buildings on an approximately 112.6-acres spanning nine parcels of undeveloped and industrial land (STPL-2022-0040). Outside of the undeveloped land, current land uses include concrete, equipment, and material storage facilities. The planned development is on the south side of Cochran Mill Road, except for a 13.4 acre parcel located on the north side of the road that is designated for a future substation that would service the data center (Twin Creeks Substation). The site plan includes a 121,000 square foot warehouse, a 160,549 square foot warehouse, and three data centers (181,755 square feet, 177,325 square feet, and 170,500 square feet, respectively). The three data center buildings are on 60.12 acres subject to a zoning approval granted in 2020 (ZMAP-2018-0009). The Campus A site plan is under review as of January 2024.

Collocated along Cochran Mill Road, Route 1 would cross portions of the dedicated future substation parcel, then head southeast through the planned campus towards Goose Creek. Altogether, Route 1 would cross the development for about 0.5 mile between approximate MPs 0.2 and 0.9 (and collocate with the future Twin Creeks Lines between MPs 0.5 and 0.9). The planned right-of-way for the route would occupy approximately 7.2 acres within the site. Impacts to the development are minimized by collocating along Cochran Mill Road and following parcel boundaries.

Based on the current site plan, Route 1 avoids all three data center structures and one of the warehouse buildings but crosses a portion of the planned substation and one of the warehouse buildings. While the approved site plan shows that Route 1 would cross, and therefore conflict with, a planned warehouse building, Dominion and the developer of Campus A have held recurring meetings to coordinate on routing. The developer has shared updated site plans (not yet public), and routes were subsequently adjusted to avoid future data center buildings and Loudoun Water utilities. Based on this ongoing coordination, no impacts to buildings are anticipated. Furthermore, the alignment also provides the most efficient and least impactful option for collocating Route 1 with the future Twin Creeks Lines across the site. The developer also indicated the likelihood of the site being reconfigured without the warehouses in order to take advantage of recent Zoning Ordinance amendments that now allow data centers as a by-right use in underlying zoning district (Mineral Resource/Heavy Industry).

Data Center Campus B (Belmont Innovation)

In October 2022, Loudoun GC LLC (which is a local affiliate of Sentinel Data Centers) submitted a Legislative Land Development Application request to Loudoun County for a data center campus on an approximately 114.5-acre site of undeveloped land (LEGI-2023-0048). The Concept Development Plan shows a 4,854,958 square foot buildable area, possible substation site, setbacks from Belmont Ridge Road, a 500-foot buffer from Goose Creek, and possible future road right-of-way for extensions of Gloucester Parkway and Russell Branch Parkway. Included in the Legislative Land Development application are the following petitions:

- A zoning map amendment to rezone 84.5-acres from A-3 and General Industry to Industrial Park (ZMAP-2022-0021);
- A special exception to increase floor-area-ratio in the Industrial Park zoning district to 1.0 (SPEX-2022-0042);
- A minor special exception to allow for increased data center development potential on the property (SPMI-2023-0013); and
- A zoning modification to reduce required setbacks along Gloucester Parkway and Russell Branch Parkway (ZMOD-2022-0077).

The Campus B Legislative Land Development Application is in review as of February 2024.

Route 1 would cross the western portion of the site in a primarily north/south orientation for about 0.5 mile between approximate MPs 0.9 and 1.6, occupying approximately 9.4 acres within the planned development. According to the Concept Development Plan, Route 1 would overlap portions of the proposed buildable area. Potential impacts of Route 1 to the development are minimized by partial encroachment of the route on the enhanced 500-foot buffer along Goose Creek.

Dominion and ERM coordinated with the developer to identify a route that would avoid impacts to the development, minimize impacts to Goose Creek, and accommodate future routing of the Twin Creeks Lines and siting of the Sycolin Creek and Starlight Substations. Route 1 would not impact the development of the data center campus as proposed.

Data Center Campus C

In August 2022, the Data Center Campus C developer submitted a modified process site plan application for a data center complex on a 134.40-acre parcel of undeveloped land (STMP-2022-0016). The planned future land use of the site includes the proposed data center campus and a Loudoun Water Russell Branch Pump Station (SPAM-2023-0028). The site plan proposes the development of up to 2.3 million square feet of floor area split between four buildings (two two-story buildings and two three-story buildings), utilities, and parking lot improvements. Because the data center is a by-right use, no zoning application was required prior to seeking site plan approval from the County. The Campus C site application subsequently was approved in May 2023. Clearing and grading of much of the site was complete as of February 2024.

In January 2024, an engineering plan revision application was submitted to Loudoun County for revised storm management facilities, truck entry, and retaining wall infrastructure (EPLAN-2024-0004). The revised engineering plan does not move any of the footprints of the data centers from the approved site plan application. EPLAN-2024-0004 is in review as of February 2024.

Route 1 crosses the southern portion of the parcel in a northwest/southeast orientation before turning northeast adjacent to Belmont Ridge Road, exiting the site at the Belmont Ridge Road crossing. Route 1 crosses the planned development for about 0.4 mile between approximate MPs 1.5 and 2.0 and would

occupy approximately 6.0 acres of the site. According to the site plan, Route 1 would cross some fencing across the southern side of the campus, the right-of-way for the proposed Russell Branch Parkway extension, and portions of the roadway access within the data center campus but would not cross of any data center buildings. Impacts from Route 1 on the development potential of the property are minimized by the route's alignment along the parcel boundary and its collocation with Belmont Ridge Road. While the route does cross some of the planned development's utility and road improvements, it would not prevent construction of the data centers within the site. Because Campus C would be served by two future substations as well as the future Twin Creeks Lines, Dominion coordinated with the developer to ensure compatibility between these facilities and the future data center.

Data Center Campus D (Belmont Landbay KK)

In May 2023, Toll Brothers, Inc., submitted a site plan approval request to Loudoun County for a data center campus and office building on an approximately 108 acres parcel of undeveloped land (STPL-2023-0025). The site plan lays out two 504,000 square foot three-story data centers, a 22,4000 square foot two-story office building, an 852,900 square foot area dedicated for a utility substation, equipment yards, parking lots, and the future road right-of-way extension for Russell Branch Parkway. Because the planned development parcel includes by-right data center use, no zoning applications were required prior to the site plan approval request. The Belmont Landbay KK Data Center site plan is under review as of January 2024.

Route 1 crosses into the western side of the affected parcel, turns northeast, and then runs parallel to the northern portion of the parcel adjacent to Rt. 7. Altogether, Route 1 crosses the planned development for about 0.9 mile between approximate MPs 2.0 and 2.9 and would occupy approximately 10.4 acres of the property. Based on the most recent site plan, Route 1 avoids the data center buildings, office building, substation, and potential expansion of Russell Branch Parkway. The right-of-way of Route 1 would cross over the equipment yard and parking at the western-most data center building but avoids the footprint of the data center itself. The impact of Route 1 on the development potential of the property is minimized by the route's alignment parallel to the property boundary and its collocation with Rt. 7. While part of the Route 1 right-of-way would overlap with portions of the site's equipment yards and parking lots, it would not prevent the development of data centers within the affected parcels.

Belmont Park Variations A and B cross less than 400 feet of the planned development at the far western end of the Belmont Landbay KK Data Center parcel where no buildings or improvements are proposed. Neither Belmont Park Variation is anticipated to impact the proposed development and are not discussed further.

Data Center Campus E (Telos)

In February 2023, Finmarc Management, Inc, submitted a site plan application to Loudoun County for a data center on a 25.3-acre parcel where the Telos Corporation office building complex is currently located (STPL-2023-0007). Per the site plan, the Telos office building complex would be demolished and replaced with a 180,000 square foot, two-story data center with a parking lot. Because the zoning allows by-right data center use, no zoning application is required prior to site plan approval. The Telos Data Center site plan is in review as of February 2024.

Route 1 crosses the northwestern side of the parcel in a northwest/southeast orientation for less than 0.1 mile between approximate MPs 3.5 and 3.6 and would occupy approximately 0.4-acre of right-of-way. The route avoids the proposed data center and parking lot by crossing an area where no future improvements have been identified. Potential impacts are minimized by the route's alignment along the parcel boundary and collocation with Rt. 7. Because the Route 1 does not cross any planned structures

or improvements, no impacts to the development are anticipated. The planned data center will likely need 230 kV service to a proposed substation area located on the southeast side of the parcel in the future.

Goose Creek Sewage Pump Station

In January 2022, Loudoun Water submitted a site plan approval request to Loudoun County to convert an existing wastewater treatment plant to a sewage pump station on a 5.5-acre site (STPL-2022-0001). The sewage pump station would be located on the same parcel adjacent to the proposed Loudoun Water Milestone Reservoir wastewater treatment plant and proposed Cochran Mill Road data center campus. The site plan proposes an access road with turnaround, 400 square-foot control building, emergency storage tank, and pump station. The right-of-way would be within an area of floodplain and moderately steep slopes near Sycolin Creek. As a by-right use, no zoning application was required prior to site plan approval. The Goose Creek Sewage Pump Station was approved in May 2023 and construction began in January 2024.

Route 1 crosses the north side of the impacted parcel for about 0.1 mile between approximate MPs 0.5 and 0.6 and would occupy approximately 0.7 acre of the parcel. The impact of Route 1 on the development is minimized by the route's alignment along the parcel boundary and avoidance of planned structures. Because Route 1 will not affect the sewage pump station or its appurtenant facilities, no impacts are anticipated. We additionally note that Dominion coordinated with Loudoun Water to adjust the route on the parcel to avoid conflicts with buried utility lines around the site.

Loudoun County Asphalt

In October 2023, Allan Myers VA, Inc. submitted a site plan amendment to Loudoun County for an additional concrete pad to hold three new silos on a 9.7-acre parcel of developed land, inclusive of the existing Loudoun County Asphalt facility (EPLAN-2023-0099). The Land Development Application proposes a 2,016 square foot concrete pad. Because this would be a permitted use of the parcel, no zoning application was required prior to seeking site plan approval. The Loudoun County Asphalt site plan amendment is in review as of February 2024.

Route 1 (including the Aspen 230 kV Split) crosses the southwestern corner of the site in a northeast/southwest orientation before turning southeast. Altogether, the route crosses the Loudoun County Asphalt parcel for about 0.2 mile between approximate MPs 0.1 and 0.3 and would occupy approximately 1.9 acres. There is no published site plan for the development. Based on land grading identified via aerial imagery, Route 1 avoids the planned structures and outdoor storage areas on the property. Impacts are minimized by the route alignment along the parcel boundary and its collocation along Cochran Mill Road. Because no planned structures are crossed by Route 1, no impacts are anticipated.

Loudoun Square Storage

In June 2022, Loudoun Square Storage, LLC, submitted a site plan application to Loudoun County for a building expansion on an approximately 4-acre parcel of developed land (STPL-2022-0023). Current land uses include the existing operation of Loudoun Square Storage, a commercial, secured storage facility. The site plan proposes a 10,254 square-foot, three-story southward expansion of the existing facility in addition to parking and landscaping modifications. Prior to site plan approval request, Loudoun Square Storage, LLC, submitted several zoning applications to Loudoun County including a zoning conversion from the 1972 Loudoun County Zoning Ordinance to the 1993 Revised Zoning Ordinance, approved in March 2020 (ZRTD-2019-0001). The Loudoun Square Storage site plan is in review as of January 2024.

Route 1 crosses the northwest corner of the parcel for about 0.1 mile between approximate MPs 5.8 and 5.9 and would occupy approximately 0.3 acre. Based on the site plan, the route avoids the planned

expansion and crosses a wooded tree conservation area established by the original approval of the use in 2004 (STPL-2004-0002 and SPEX-2002-0010). Potential impacts to the site are minimized by the alignment of the route along the parcel boundary and its collocation along Rt. 7. Although the route crosses a proffered tree conservation area, it would not prevent development of the planned storage facility expansion.

Loudoun Water Milestone Reservoir

In September 2022, Loudoun Water submitted a site plan approval request to Loudoun County for a new pumping station on 214.6-acres of undeveloped land and partially developed land, inclusive of a lagoon-style wastewater treatment plant (STPL-2022-0037). Most of the planned infrastructure sits within an 18.8-acre parcel of undeveloped land north of Goose Creek and east of the W&OD Trail. The pump station project is expected to occupy an area shared by the proposed Goose Creek Pump Station and Cochran Mill Road data center campus. The site plan proposes a 15,449 square foot pump station building and 5,201 square foot maintenance building along with equipment, parking, and circulation areas. The facility would be connected to the proposed Loudoun Water Quarry A (to be called the Milestone Reservoir; see description below). The site plan for the development is in review as of January 2024.

In May 2023, Loudoun Water submitted a Legislative Land Development pre-meeting request to Loudoun County for a special exception to modify buffer yard requirements and eliminate screening requirements (PRAP-2023-0039). While the request was completed in June 2023, no further zoning applications or site plan amendments have been submitted to Loudoun County for review as of January 2024.

Route 1 crosses the northern portion of the affected parcels for about 0.1 mile between approximate MPs 0.5 and 0.6 and would occupy approximately 0.8 acre. Route 1 avoids all planned infrastructure and would not cross into the 18.8-acre Loudoun Water facility parcel. The right-of-way would be within spaces designated for tree conservation and a buffer area along Sycolin Creek. The impact of Route 1 is minimized by the route's alignment along the parcel boundary. The route would not affect the development of the planned pump station.

Loudoun Water Quarry A

In June 2019, Loudoun Water submitted a site plan approval request to Loudoun County for a water storage facility and associated infrastructure on a 67.5-acre parcel of developed land, including for use of Quarry A at the Luck Stone Leesburg Plant (STPL-2019-0027). The site plan proposes to establish a water storage reservoir capable of holding one billion gallons of water that would be withdrawn for treatment at an offsite water treatment plant. Additional project improvements include a pump station with a 300-foot deep, 25-foot diameter pump shaft, raw water transmission mains, stormwater facilities, and water and sewer connections (Loudoun Water 2023a). Prior to site plan approval, Loudoun Water was required to apply for zoning applications to permit the future use of a quarry for public utility water storage. The Loudoun Water Quarry A site plan is in review as of January 2024.

Route 1 crosses the north side of the parcel for about 0.2 mile between approximate MPs 0.8 and 1.1 and occupy about 2.7 acres of the site. According to the site plan, no planned improvements would be within the area crossed by the route. The impact on the development is minimized by the route's alignment along the parcel boundary such that the planned development would be impacted.

Loudoun Water Russell Branch Pump Station

In April 2023, Loudoun Water submitted a site plan amendment application to Loudoun County for a pump station and access road on two parcels of undeveloped land encompassing approximately 242.4-acres (SPAM-2023-0028). The pump station project is expected to occupy an area shared by three other

proposed developments: Data Center Campus C, Data Center Campus D, and Northstar Square Residential. The site plan proposes the development of about 2,773 square feet of structures inclusive of a pump station and emergency storage tank as well as an access road and related utilities to create an underground connection with an existing offsite sewer pumping station across Belmont Ridge Road. Because the pump station would be a permitted use, no zoning application was required prior to Loudoun Water seeking site plan approval. The site plan amendment application seeks to reduce the scope of a site plan previously approved by the County in 2019 (STPL-2018-0008). The Loudoun Water Russell Branch Pump Station site plan amendment is in review as of January 2024.

Route 1 crosses into the pump station planned development in a northwest/southeast orientation before turning northeast, then heading eastward across Belmont Ridge Road. It then cuts northeast to collocate with Rt. 7. Altogether Route 1 crosses about 1.2 miles of the planned development between approximate MPs 1.5 and 2.9 and would occupy about 16.4 acres within the affected parcels. Neither the existing Belmont Pump Station on the property nor the proposed Russell Branch Pump Station are crossed by Route 1, though the route would cross over a proposed underground sewage line near MP 2.0. The impact of Route 1 on the development potential of the property is minimized by the route's alignment along parcel boundaries and its collocation with Rt. 7. Because Route 1 avoids crossing the planned sewage pump station and would not impact underground piping, there would be no conflict between the route and planned development.

Luck Stone Leesburg Plant

In July 2023, Luck Stone Corporation and Luck Towers LLC, submitted a Legislative Land Development application to Loudoun County to amend permitted uses and consolidate proffers within the Luck Stone Leesburg Plant. The development would occupy an approximate 779-acre group of eight parcels of developed and undeveloped land (LEGI-2023-0084). Current land uses include operation of Luck Stone Leesburg Plant mining facilities. Future shared use within the affected parcels includes the proposed Loudoun Water Quarry A site and a data center development per the Luck Stone Cochran Mill application. The zoning application proposes to revise and consolidate proffers associated with ZCPA-2023-0002, ZMAP-1999-0004, and ZMAP-1990-0009, to amend the mining limits of Quarry B to include land underneath the current processing plant, and to permit utilization of Stonewater Lane to ship mined aggregates at the time Quarry B is closed, expected in approximately 25 years. The Legislative Land Development application is inclusive of a zoning map amendment to rezone all impacted parcels to the Mineral Resource-Heavy Industry zoning district (ZMAP-2023-0010); a zoning concept plan amendment to amend permitted uses and consolidate previous proffered conditions (ZCPA-2023-0001); and a special exception to permit stone quarrying within Quarry B (SPEX-2023-0002). The Luck Stone Leesburg application is in review as of January 2024.

The Legislative Land Development application and Concept Development plan show Quarry A as being included in the zoning application but notes that the parcel has been approved to include the Loudoun Water Quarry A water storage facility and is no longer used for active mining (SPEX-2009-0020). The right-of-way of Route 1 would cross into the affected parcel for Quarry A for about 0.2 mile between approximate MPs 0.8 and 1.1, occupying approximately 2.7 acres of the site. However, Route 1 does not cross any of the parcels expected to feature expanded mining operations. Use of the route would neither prevent the development potential of the parcels nor create physical impacts to the affected site for future Luck Stone Leesburg Plant mining, storage, and data center development.

Northstar Square

In September 2021, Belmont Land LP submitted a Legislative Land Development Application to allow for a mixed-use residential community on 110.8 acres of predominantly undeveloped land (LEGI-2023-0020). Dated May 12, 2023, the most recent Concept Development Plan proposes up to 2,276 dwelling units

(594 single family attached units, 970 multi-family attached units, and 712 multi-family stacked units), open space and recreational areas, and 63,350 square feet of non-residential uses including a retail center, and a proffer for the Loudoun Freedom Center, which is a conceptual plan to create a visitors center adjacent to the Belmont African American Cemetery for the Enslaved. The Northstar Square application was subsequently withdrawn following the sale of the property to the developer of Data Center Campus D. No further discussion of the development is provided in this report.

One Loudoun Landbay A-11 (Office Building)

In March 2019, One Loudoun Holdings LLC submitted a site plan application for a two-story office building on Landbay A-11 Lot 2 within the One Loudoun mixed-use development on 5.5-acres of undeveloped land (STPL-2019-0008). The site plan proposes a two-story office building with a 10,675 square-foot ground floor area and a 4,575 square-foot second floor in addition to a 3,000 square-foot patio, a parking lot, and landscaping improvements. Because the proposed use is by-right, no zoning application was required prior to seeking site plan approval. The site plan was conditionally approved on February 28, 2020, subject to required easement recordation and bonds. No further action was taken, and the site plan was switched to a dormant status by the County on June 16, 2022. As of January 2024, the site plan remains in review on the Loudoun County Land Management, Applications, Research, Coordination website.

Route 1 crosses the northwest side of the development parallel to Rt. 7 for about 0.2 mile between approximate MPs 4.7 and 4.9 and would occupy approximately 2.0 acres. Based on the site plan, Route 1 avoids the proposed office building and outdoor patio area, but its right-of-way would overlap part of the proposed parking lot. Impacts to the development are minimized by the route's alignment along parcel boundary and collocation with Rt. 7. Impacts to proposed office development are not anticipated because parking lots are an allowed use within the transmission rights-of-way and the proposed office building is not crossed.

One Loudoun Landbay A-11 Site Amendments (Restaurant)

In August 2023, One Real Land, LLC submitted a site plan amendment to Loudoun County for a restaurant on a 1.9-acre parcel of undeveloped land (EPLAN-2023-0059). One Loudoun is a mixed-use project that has been in development since 1986. The northern portion of the project is primarily unbuilt and planned for a combination of multi-family residential, commercial, and office land uses. Part of the unbuilt northern land area is currently used for an open-air farmers market. Open space along the Rt. 7 frontage of the One Loudoun project was established in the 2017 approval of a zoning map and concept development plan amendment (ZMAP-2015-0007, ZCPA-2015-0013). The site plan proposes a 22,000 square foot, two story restaurant with rooftop seating, a 3,000 square foot outdoor patio, parking lot, and landscaping improvements. Because this is a permitted use, no zoning application was required prior to seeking site plan approval. The restaurant site plan seeks to amend the conditionally approved STPL-2019-0008, changing the proposed office building into a restaurant to allow for the manufacture, processing, fabrication, and assembly of food products. The One Loudoun Landbay A-11 Lot 2 Site Amendments application is in review as of January 2024.

Route 1 crosses the northwestern side of the affected parcel then parallels Rt. 7 for about 0.1 mile between approximate MPs 4.7 and 4.9. The Route 1 right-of-way would occupy approximately 0.5 acre of the site. Based on the site plan, Route 1 avoids the proposed restaurant and outdoor patio, but its right-of-way would overlap a portion of the proposed parking lot. The impact of Route 1 on the development is minimized by the route's alignment along parcel boundaries and its collocation with Rt. 7. While Route 1 crosses over a portion of the planned parking lot, the Project would not prevent the overall development of the site for the proposed restaurant use.

One Loudoun Uptown

In December 2023, Kite Realty Group submitted a site plan application to Loudoun County for five mixed-use commercial and office buildings on 38-acres (across four parcels) of undeveloped land (EPLAN-2023-0133). The site plan proposes a total of 71,762 square feet for retail and restaurant space and 73,490 square feet for office space, including a one-story, two-story, three-story, four-story, and five-story building. Additional improvements include a dog park, parking garage and lots, new roads, and an ice rink. Because these are permitted uses, no zoning application was required prior to seeking site plan approval. The One Loudoun Uptown site plan is in review as of January 2024.

Route 1 crosses the northwestern side of one affected parcel while adjacent to Rt. 7 for about 0.3 mile between approximate MPs 4.9 and 5.3 and would occupy about 4.0 acres of the development. Based on the site plan, Route 1 follows the north side of Atwater Drive while and all the proposed buildings would be on the south side of the road. Route 1 crosses an area with no proposed improvements. The impact of Route 1 on the development potential of the property is minimized by the route's alignment along the north side of an unused portion of parcel and its collocation along Rt. 7. Route 1 does not cross any planned structures and would not prevent the development of One Loudoun's Uptown commercial and office buildings as proposed.

Data Center Campus F (Paragon Park)

In November 2022, Paragon Park Lot 3B, LLC submitted a modified process site plan application to Loudoun County for the development of a data center on a 49.7-acre parcel of undeveloped land (STMP-2022-0024). The site plan proposes a 1,216,833 square foot, three story data center with parking lots and associated utilities. Prior to seeking site plan approval, a zoning map amendment application was filed with Loudoun County to convert the site to the Planned Development-Industrial Park zoning district, which was approved in March 2017. The Data Center Campus F (Paragon Park) site plan is in review as of January 2024.

Route 1 crosses the western side of the affected parcel in a north/south orientation near MP 9.0, then continues south and away from the parcel to cross Pacific Boulevard, then splits along alternate routes for Dominion's proposed 500 and 230 kV lines, which turn east to terminate at the proposed Golden Substation site near MP 9.1. Altogether, Route 1 crosses the affected parcel for less than 0.1 mile and would occupy approximately 0.5 acre. Based on the site plan, the route (inclusive of the Golden 230 kV Split) does not cross the planned data center or its associated infrastructure. The impact of Route 1 on the development potential of the site is minimized by the route's alignment along the parcel boundary and Pacific Boulevard. The proposed data center is not crossed and would not be impacted.

Dominion will obtain a portion of the Paragon Park property for the proposed Golden Substation. Discussions with the property owner/developer for the purchase of this area are ongoing as of February 23, 2024.

XAVO Car Club Russell Branch Parkway

In December 2023, CWC Walk, LC submitted a Legislative Land Development Pre-meeting request to Loudoun County for the development of an exhibition facility and restaurant on a 5.5-acre parcel of undeveloped land (PMTG-2023-0167). The pre-meeting request application proposes a one-building event space capable of exhibiting cars plus a restaurant, offices, member lounge, and parking lots. The applicant is also applying for a special exception to permit development of the exhibition center itself, and a minor special exception for the restaurant. The Legislative Land Development Pre-meeting request was completed in January 2024. As of February 2024, Loudoun County has not received any zoning applications for the XAVO Car Club.

Route 1 crosses the northwestern side of the affected parcel adjacent to Rt. 7 for about 0.1 mile between approximate MPs 5.7 and 5.9 and would occupy about 0.7 acre of the affected site. Based on the pre-meeting application sketch plan, Route 1 passes north of the proposed exhibition center and parking lots in an area identified on the plan as having no improvements. The impact of Route 1 on the development potential of the property is minimized by the route's alignment along the parcel boundary and collocation along Rt. 7. Route 1 avoids crossing the planned building and is not expected to impact the planned development.

6.1.6.3 Belmont Park Variations

Belmont Park

In June 2023, Beazer Homes – Virginia Division submitted a site plan application for a residential development of multi-family/condominium units on a 12.2-acre parcel of undeveloped land (STPL-2023-0030). The site plan proposes 106 multi-family units, inclusive of eight ADUs, in addition to outdoor recreation space, walking paths, and the rights-of-way of the proposed Russell Branch Parkway extension. Prior to seeking site plan approval, the applicant submitted several zoning applications to Loudoun County including a zoning map amendment to rezone the property the Residential-16 zoning district (ZMAP-2021-0005); a zoning modification to reduce building and parking reductions from Rt. 7 and Russell Branch Parkway (ZMOD-2021-0015); a zoning modification to increase building heights to 55 feet (ZMOD-2021-0046); and a special exception to reduce front yard setbacks (SPEX-2022-0022). By January 2023, all four of the zoning applications were approved. The Belmont Park site plan application is still in review as of February 2024.

In July 2023, the applicant submitted a construction plans and profiles application to Loudoun County for single family attached townhouses within the Belmont Park development (CPAP-2023-0013). The site plan proposes 57 single family attached units, including eight ADUs. The construction plans and profiles application are in review as of February 2024.

Belmont Park A

Belmont Park A cross the northwestern side of the parcel adjacent to Rt. 7 in a northwest/southeast orientation for about 0.1 mile between approximate MPs 2.9 and 3.1 and would occupy about 1.2 acres of the property. Based on the site plan, Belmont Park A crosses over a portion of the planned (and proffered) outdoor recreation space, a sound wall, and open spaces and walking paths along the north side of the development. The right-of-way would also be immediately adjacent to the northernmost single family attached townhome parcel. The impact of Belmont Park A on the development potential of the property is minimized by its alignment along the parcel boundary and along Rt. 7. The route could impact proposed uses within the right-of-away and, without further intervention, affect the site plan to the extent that the owner/developer would be out of compliance with the approved site plan and proffers. However, Belmont Park A is not anticipated to impact the overall development, nor does it appear to cross any of the proposed townhome lots.

Because Belmont Park A could pose significant impacts to the development – in this instance, one that is fully approved/entitled – Dominion has been in discussions with the developer throughout the routing process. As of February 23, 2024, the developer and Dominion have shared information, discussed small shifts in structure locations, and are in the process of determining which improvements are allowed in the proposed right-of-way. Dominion's intent is to preserve the site plan and proffers as much as practical and avoid placing the site in potential nonconformity with the approved proffer dedications. If proffer impacts become unavoidable, Dominion has suggested initiation of a "friendly" condemnation process that would exculpate the developer from site plan nonconformities cause by the Project.

Belmont Park B

Belmont Park B would cross a small portion of the northwest corner of the Belmont Park development as Belmont Park B turns northeast and crosses Rt. 7. The route crosses the northwestern corner of the parcel for less than 0.1 mile and would occupy less than 0.1 acre. Based on the approved Belmont Park site plan, Belmont Park B avoids all planned residential units, open spaces, walkways, and recreational areas within the development.

Data Center Campus E (Telos)

In February 2023, Finmarc Management, Inc, submitted a site plan application to Loudoun County for a data center on a 25.3-acre parcel where the Telos Corporation office building complex is currently located (STPL-2023-0007). Per the site plan, the Telos office building complex would be demolished and replaced with a 180,000 square foot, two-story data center with a parking lot. Because the zoning allows by-right data center use, no zoning application is required prior to site plan approval. The Telos Data Center site plan is in review as of February 2024.

Belmont Park A

Belmont Park A crosses the northwestern side of the Telos parcel adjacent to Rt. 7 for about 0.1 mile between approximate MPs 3.4 and 3.5 (where it joins Route 1) and would occupy approximately 0.6 acre of the site. Belmont Park A avoids crossing the data center building and parking lot. Impacts are minimized by the alignment of the route along the parcel boundary and Rt. 7. Because it avoids crossing planned structures, Belmont Park A would not impact development of the proposed data center.

Belmont Park B

Belmont Park B crosses the north side of the parcel before turning eastward adjacent to Rt. 7 near where the route intersects Route 1. Belmont Park B crosses the Telos site for less than 0.1 mile near MP 0.6 and would occupy about 0.1 acre of the property. Belmont Park B avoids all planned structures and would be aligned along the parcel boundary and Rt. 7. Because the route variation avoids the planned structures, Belmont Park B would not impact development of the proposed data center.

6.1.6.4 Broad Run Variations

Broad Run Water Reclamation Facility

Loudoun Water owns and operates the Loudoun Water Broad Run Water Reclamation Facility located east of Loudoun County Parkway and north of Gloucester Parkway. The original BRWRF site plan application submitted by Loudoun Water was approved in August 2004, and all future site improvements and expansions have been submitted as site plan amendments and construction plans and profiles (STPL-2003-0057). Loudoun Water is a political subdivision of the Commonwealth and is not a department of Loudoun County, although its Board of Directors are appointed by the Loudoun County BOS. The existing BRWRF consists of administrative offices at the Dale C. Hammes Administrative Building, the Loudoun Aquiary, maintenance facilities, and the water reclamation facility complex on a 342-acre property.

According to the Loudoun Water 2023-2032 Capital Improvement Plan, facility expansion is underway to increase treatment capacity from 10 million to 16.5 million gallons per day. Design for the next phase of expansion, which would increase capacity to 30 million gallons per day, is underway with construction planned to commence within the next 10 to 15 years. According to the facility master plan, the water reclamation facility expansion will be to the north of the existing complex and include new administrative and lab buildings, a research and education center, new storm water ponds, water storage tanks, and

maintenance and warehouse buildings. BRWRF expansion to the east is constrained by the floodplain adjacent to Broad Run, which is further encumbered by proffers and buried water/sewer infrastructure, including the Russell Branch Diversion Sewer (Loudoun Water 2023d).

In October 2022, Loudoun Water submitted a site plan amendment application for the addition of sidewalks, parking, and additional access on the approximately 342-acre parcel of developed and undeveloped land (SPAM-2022-0074). The site plan proposes new areas of impervious surfaces, the new buildings, parking lot improvements, and an access road, which were approved in January 2024. Other development includes two proposed wastewater equalization tanks, permittable per a special exception application to locate wastewater facilities within the Flood Overlay District, which Loudoun County approved in June 2022 (SPEX-2021-0005). No site plan or site plan amendment concerning wastewater equalization tanks has been submitted to the County as of February 2024. The most recent plan submitted to the County by Loudoun Water is a construction plans and profiles application for early grading, stormwater management facilities, and access roads within the facility (CPAP-2023-0014). The application, submitted in July 2023, is in review as of February 2024.

Broad Run A

Broad Run A crosses the west side of the BRWRF property in a north/south orientation parallel to Loudoun County Parkway for about 0.8 mile between approximate MPs 6.8 and 7.7 and would occupy about 7.2 acres of the parcel. Based on the BRWRF master plan, Broad Run A avoids all planned structures within the development and would be west of the proposed expansion area identified on the master plan. Broad Run A would cross the far western side of the property in an area where there is existing, berms, landscaping, and an existing 30-foot-wide Dominion overhead and underground distribution line and communication line easement. The impact of Broad Run A on the development potential of the property is minimized by the route's alignment along parcel boundaries and its collocation with Loudoun County Parkway. Because the route does not cross any planned structures or facilities, Broad Run A is not expected to impact the planned expansion of the BRWRF.

As of February 23, 2024, Loudoun Water is in the process of deciding which route variation (Broad Run A or Broad Run B) they would allow across the BRWRF property. From Loudoun Water's perspective, any encroachment of the proposed Aspen-Golden Lines past the property's 50-foot setback represents a potential risk to future expansion on a site planned for additional development in the coming decades. Dominion is working to secure a VDOT licensing agreement that would allow the Broad Run A right-of-way to overlap VDOT right-of-way along Loudoun County Parkway as much as possible without having transmission structures encroach over the roadways. Similarly, Dominion offered Loudoun Water a license agreement (in lieu of an easement) that would allow Loudoun Water to retain land rights and, with sufficient notice, allow Loudoun Water to move the Aspen-Golden Lines in the future should they conflict with expansion plans.

Broad Run B

Broad Run B crosses the north side of the BRWRF, then turn southeast towards an existing access road and utility easement right-of-way. Broad Run B then follows the existing utility to the southeast, then turns and heads southwest, exiting the property to the southeast. Broad Run B crosses about 1.2 miles of the property between approximate MPs 0.0 and 1.3 and would occupy approximately 14.3 acres of the site. Based on the BRWRF master plan, Broad Run B would avoid all planned structures and minimizes impacts by following the existing access road/buried utilities.

Although Loudoun Water has not yet made a final decision, they have indicated to Dominion in previous discussions a preference for Broad Run B (where future expansion is less likely) over Broad Run A.

However, Broad Run B crosses substantially more forest and forested wetland than Broad Run A and would result in greater environmental impact.

Data Center Campus F (Paragon Park)

A description of this development is provided above.

Broad Run A

Broad Run A crosses the west side of the parcel for less than 0.1 mile near MP 8.9 and would occupy approximately 0.3 acre of the site before rejoining Route 1. Broad Run A avoids all planned structures on the parcel based on review of the site plan. Because Broad Run A does not cross any planned buildings, it would not impact the planned data center development at the site.

Broad Run B

Broad Run B crosses the northwest corner of the property containing the planned development before turning south and paralleling Pacific Boulevard for about 0.1 mile near MP 2.2. It would occupy about 1.6 acres of the site. Broad Run B avoids all proposed structures and would not impact the development the planned data center development at the site.

Golden Substation

The proposed Golden Substation would occupy the southern half of the Data Center Campus F (Paragon Park) development adjacent to the proposed data center. Golden Substation would not impact the development of the data center.

Line Loop

The proposed Line Loop would be within areas of existing Company right-of-way (Lines #2081/#2150 transmission corridor that runs along the W&OD Trail) or the future Golden Substation property to be obtained by the Company. No impacts to the data center development are anticipated.

6.1.7 Conservation Easements and Lands

Land conservation preserves Virginia's heritage, provides recreational opportunities, and improves water and habitat quality and overall quality of life. In addition to managing lands under its jurisdiction, the VDCR helps landowners, land trusts, and localities by serving as a clearinghouse and keeping an inventory of protected lands. The agency also helps by identifying important open space and lands rich with plant and animal diversity. The VDCR provides grants and information on conservation easements and other land protection tools.

ERM used the VDCR's Managed Conservation Lands Database (VDCR 2024c) to identify easement types and individual easements within the study area. Descriptions of the easements within the study area and their proximity to the Project facilities are provided in the subsections below. The easements are depicted on Figure 6.1.7-1. Easements that are crossed by or within 0.25 mile of Route 1, the Belmont Park Variations, and the Broad Run Variations are addressed below. No Virginia Natural Area Preserves are present in the study area.

Dominion understands that properties are placed under easements throughout the year, and additional easements could be identified in the study area as the Project moves forward. Dominion will continue to consult with the various land managing entities and conservation agencies for the study area regarding potential new easements along the routes.

6.1.7.1 Virginia Outdoors Foundation

The VOF, which was created under the Virginia Open-Space Land Act, leads the Commonwealth in land conservation, protecting over 850,000 acres (VOF n.d.). Most easements created under the Virginia Open-Space Land Act are held by the VOF, but any state agency is authorized to create and hold open space easements, which 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.

There are four VOF easements within the study area, all of which are located on land adjacent to Goose Creek. Two parcels are publicly owned and two are privately owned but protected by perpetual conservation easements dedicated to the VOF. Of the four VOF easements in the study area, none are crossed and only one is within 0.25 mile of the Route 1 or the Variations.

The VOF easement within 0.25 mile of Route 1 encompasses two 300-foot-wide privately owned parcels along both sides of Goose Creek for approximately 1.0 mile. The easement contains forested shorelines adjacent to two operational quarries. The northern boundary of the easement begins on the south side of the W&OD Trail, approximately 0.2 mile southwest of Route 1 at approximate MP 0.8. While the easement occupies about 65 acres in total, less than 4 acres is within 0.25 mile of Route 1. Moreover, because it is not crossed, there would be no impact on the habitat protected by the easement from the Project.

6.1.7.2 Virginia Board of Historic Resources

The Virginia Board of Historic Resources holds easements designed to protect and preserve historic sites. One Virginia Board of Historic Resources easement is within the study area, though it is greater than 0.25 mile from the Project routes. The easement is on private land owned by the Howard Hughes Medical Institute. It encompasses mostly developed land about 0.3 mile northeast of Route 1 at approximate MP 4.0. Because none of the routes cross this resource, the Project would not impact the historic resources within the easement or their preservation in perpetuity.

6.1.7.3 Board of Supervisors Easements

BOS open space easements are gifted easement areas within Loudoun County. These entail over 75,000 acres of land protected through various conservation easement instruments designed to preserve and protect open space or other resources in perpetuity. There are several BOS open space easements within the Project study area mostly clustered near large residential communities, such as: northwest in the Potomac Station community, west central in the Chase at Belmont Country Club and Alexandras Grove communities, central in the area between the Wild Meadow and Hannan Division communities, south in The Regency community, and east in the Kincora community and Broad Run area. There are other smaller BOS easements scattered within the study area outside these clusters.

Route 1 crosses two contiguous BOS-dedicated open space easements between approximate MPs 6.0 and 6.5 south of Russell Branch Parkway and north of Broad Run. Both parcels are privately-owned and associated with open space proffers as part of the approval of nearby residential developments. The crossing of these easements is generally parallel to the parcel boundary and an existing buried utility corridor (see Section 6.7). What would be the right-of-way for Route 1 would overlap approximately 3.7 acres of the easements. The primary impact would be permanent clearing of forested land within the maintained right-of-way where it crosses the easement. Due to other constraints in this area, avoidance of the easements is impracticable. Dominion discussed the crossing of the easements with staff from Loudoun County Planning and Zoning and the Loudoun County Attorney's office, who indicated the County will work with the Company to obtain the necessary rights to cross the easements.

Broad Run Variation B crosses an open space easement through the Kincora area from approximate MPs 1.3 to 1.8, south of Broad Run and on both the north and south sides of Gloucester Parkway. The crossing parallels the Company's approved future BECO-DTC Lines and an existing Loudoun Water utility corridor. What would be the right-of-way for Broad Run B would encompass approximately 8.7 acres of the easement, with the main impact being permanent clearing of trees. Staff from Loudoun County Planning and Zoning and the Loudoun County Attorney's Office advised Dominion that avoidance of this easement is preferred, but the BOS would work with Dominion to obtain the necessary easement crossing rights. Broad Run Variation A avoids this easement.

6.1.7.4 Belmont Viewshed Easement

Route 1 and Belmont Park Variation A each cross the BOS-dedicated Belmont Viewshed Easement between approximate MPs 2.6 and 3.0, and Belmont Park B crosses the easement at MP 0.0. The easement extends between Belmont Manor and Rt. 7, with the crossings occurring over open land parallel to Rt. 7 and the Belmont County Club driving range. The crossing is directly adjacent to the planned Russell Branch Parkway extension, and once this extension is completed, Route 1 would be between Rt. 7 and Russell Branch Parkway. The Belmont Viewshed Easement is intended to protect the view of the Belmont Manor looking south from Rt. 7. Due to the 0.4-mile crossing length, it is not possible to span the entire easement. The Company anticipates that two structures would be placed within the easement area. Avoidance of the easement is not possible along the south side of Rt. 7 due to the presence of nearby constraints, and as discussed in Section 5.3.1, an alternative north of Rt. 7 is not feasible in this area. While Route 1 and both Belmont Park Variations would both cross the easement, transmission lines and utilities are exempt from restrictions within the easement; therefore, crossing this easement is allowed.

6.1.7.5 Lansdowne Scenic Easement

Belmont Park Variation B crosses portions of the BOS-dedicated Lansdowne Scenic Easement along the north side of Rt. 7. Due to the poor quality of the publicly available easement exhibit, it is difficult to determine the boundary of the easement; however, it is assumed that Belmont Park Variation B crosses the easement outside of VDOT right-of-way along the north side of the highway. Per the conditions of this easement, new utility infrastructure is not a restricted use; therefore, the crossing of this easement is allowed. Belmont Park Route Variation A avoids the easement.

6.1.7.6 Potomac Conservancy

The Potomac Conservancy is a nationally accredited land trust that works to improve the water quality of the Potomac River. Landowners are able to donate land through the Land Protection program, in which the Potomac Conservancy places an easement on the land in perpetuity. There is one Potomac Conservancy easement within the study area on approximately 9.1 acres of private land. The easement is approximately 1.6 miles southeast of approximate MP 1.0 along Route 1, and due to this distance, there would be no impacts to this easement as a result of the Project.

6.1.7.7 Northern Virginia Conservation Trust

The Northern Virginia Conservation Trust is a regional nonprofit land trust that protects lands and waters in Northern Virginia by granting conservation easements to landowners. The Northern Virginia Conservation Trust has protected over 9,000 acres through preservation and easements. There is a Northern Virginia Conservation Trust easement within the study area south of Belmont Country Club on approximately 27.1 acres of private land. The easement is about 1.4 miles southwest of approximate MP 4.1 of Route 1, and due to this distance, there would be no impacts to this easement as a result of the Project.

6.1.7.8 Scenic Creek Valley Buffer

Loudoun County recognizes that forests along waterways (i.e., riparian buffers) naturally provide protection from degradation of waters by filtering stormwater runoff, decreasing streambank erosion, reducing the impact of floodwaters, providing essential shade for organisms, and creating habitat (Loudoun County n.d.). The Scenic Creek Valley Buffer rules prevent the construction of new structures within 200 feet of the scenic river-designated portions of Goose Creek and within 150 feet of each creek or stream where the watershed is greater than 640 acres. This designation exists along Goose Creek throughout the study area and along a portion of Sycolin Creek, north of the W&OD Trail. As a result, it is not possible to avoid a crossing of the resource. Route 1 crosses the Scenic Creek Valley Buffer over Goose Creek between approximate MPs 0.8 and 1.0 and over Sycolin Creek between approximate MPs 0.7 and 0.8, both in areas where the proposed Aspen-Golden Lines would be collocated with the future Twin Creeks Lines. The primary impact to these buffer areas would be the clearing of trees within the maintained right-of-way for the new transmission lines.

Even though transmission lines are exempt from the buffer restrictions, ERM and the Company attempted to minimize impacts to the Scenic Creek Valley Buffer to the extent practicable. Route 1 crosses parallel to an approximate 0.1-mile-long segment of the Sycolin Creek buffer, avoidance of which is not possible without direct impacts to Loudoun Water property and the Campus A data center planned development. Route 1 also has an approximate 0.1-mile-long perpendicular crossing of the Goose Creek buffer, but impacts from Route 1 would be minimized by collocation with the future Twin Creeks Lines. While both of the Scenic Creek Valley Buffers would be impacted, utilities are allowed in these areas and the collocated Aspen-Golden Lines and the future Twin Creeks Lines were aligned to minimize impacts to the buffer to the extent practicable.

6.1.7.9 Impact Assessment

Route 1

Route 1 crosses two BOS easements, the Belmont Viewshed easement, and the Scenic Creek Valley Buffer. Where Route 1 crosses the BOS easements near Broad Run, avoidance of this easement is not feasible without impacting nearby developments or buildings. Dominion discussed the crossing of this easement with the Loudoun County Attorney, who indicated that Loudoun County would work with Dominion to allow a crossing of this open space easement. A total of 3.7 acres of BOS easements would be encompassed by the right-of-way for Route 1.

Where Route 1 crosses the Belmont Viewshed easement, it collocates along the south side of Rt. 7 to minimize impacts. The route would not fragment the easement, as it spans the northern boundary encompassing just 3.0 acres. Additionally, per the conditions of the easement, new utility infrastructure is an allowable use of the easement.

Route 1 crosses the Scenic Creek Valley Buffers over Goose Creek and Sycolin Creek encompassing a total of approximately 4.3 acres of the buffers. To minimize impacts to Goose Creek, which has been designated as a state scenic river within Loudoun County under the Virginia Scenic Rivers System, Route 1 crosses perpendicular to the waterbody and would be collocated with the future Twin Creeks Lines in this area in order to minimize impacts to the resource.

Belmont Park Variations

Both Belmont Park Variations A and B cross the BOS-dedicated Belmont Viewshed Easement near MP 3.0, with Belmont Park A crossing approximately 0.1 mile and Belmont Park B crossing less than 0.1-mile. One difference between the routes is that Belmont Park B would require a two-pole angle structure for the crossing of Rt. 7, whereas Belmont Park A would not require any structures within this easement.

Therefore, despite the longer crossing length of Belmont Park A, Belmont Park B would have a greater impact on the Belmont Viewshed Easement. Per the conditions of the easement, however, new utility infrastructure is not prohibited; therefore, both Belmont Park A and B would be allowed to cross this easement.

While Belmont Park B crosses the Lansdowne Scenic Easement, the full extent of the crossing length is unknown due to the poor quality of publicly available data. Regardless, per the easement conditions, new utility infrastructure is not prohibited within the easement. Belmont Park A avoids the Lansdowne Scenic easement altogether.

Broad Run Variations

Broad Run Variation A does not cross any easements. Broad Run Variation B crosses a BOS easement in the Kincora area south of Broad Run encompassing approximately 8.7 acres. The area crossed is a mix of forest and open land adjacent to Broad Run. While Broad Run Variation B bisects the easement it would be collocated with the Company's approved future BECO-DTC Lines and an existing Loudoun Water utility corridor. As such, additional fragmentation of this easement would be minimal, and the primary impact would be the additional tree clearing.

Crossing this easement would require permission from the BOS. Dominion coordinated with staff from the Loudoun County Attorney's Office and Loudoun County BOS, who said their preference is to avoid the easement by using Broad Run Variation A. If a crossing of the easement is required, the County has indicated that they would work with Dominion to obtain the necessary approvals.

6.1.8 Recreational Resources

ERM collected information on recreational resources through digital data sets and maps, recent digital aerial photography, publicly available information on County websites, and through consultation with County officials and other stakeholders. Unless otherwise noted, information on existing recreational resources were found on the Loudoun County Parks, Recreation, and Community Service website (Loudoun County 2023j), and planned recreational resources were found on the Loudoun County Land Management, Application, Research, and Coordination website (Loudoun County 2023i). Table 6.1-18 lists and describes those recreational resources crossed by or within 0.25 mile of the Project facilities and describes the location of each resource relative to Project facilities. Figure 6.1.8-1 depicts recreational resources within 0.25 mile of the Project facilities. Visual impacts are discussed in Section 6.3.

Most of the existing and planned recreational resources described below are found within three distinct places within the study area: along Goose Creek, along Rt. 7, or along Broad Run. Within and along Goose Creek, recreationalists can hike, boat, picnic, play sports, and fish. Parks, golfing, and shared-use pathways are available along Rt. 7. Within Broad Run, recreationalists can hike, bird watch, and enjoy shared-use pathways. Additional planned recreational resources along Rt. 7 and Broad Run are associated with proffer requirements for future residential developments and include things like pools, athletic facilities, lawns, trails, and playgrounds.

Table 6.1-18: Recreational Resources within 0.25 Mile of Project Facilities

Recreational Resource	Recreational Type	Status	Distance to Project Facilities
1757 Golf Club	Golf course	Active; operated by Heritage Golf Group (1757 Golf Club 2024)	Less than 0.1 mile southwest of Broad Run A near MP 8.4

Recreational Resource	Recreational Type	Status	Distance to Project Facilities
Belmont County Club	Golf course	Active; owned by Invited ClubCorp (Belmont County Club 2024)	Less than 0.1 mile southwest of Route 1 near MP 2.9 Less than 0.1 mile southwest of Belmont Park A near MP 2.9 Less than 0.1 mile southwest of Belmont Park B MP 0.0
Belmont Park Proffers	Shared-use asphalt pathway, shared-use natural surface pathway, bike racks, playground, picnic area, volleyball court, lawn, garden, bocce court	Proposed; Beazer Homes-Virginia Division's site plan application is in review	Crossed by Belmont Park A between approximate MPs 2.9 and 3.1 Crossed by Belmont Park B between approximate MPs 0.0 and 0.1
Central Park – One Loudoun	Walking paths, playground, picnic area, public amphitheater	Active; owned and maintained by the One Loudoun Neighborhood Association (One Loudoun 2024)	Approximately 0.2 mile southwest of Route 1 near MP 4.9
Commonwealth Center Athletic Fields	Fields	Active; owned by Dulles Overlook LC	Approximately 0.1 mile northwest of Route 1 near MP 6.4
Commonwealth Center Residential North Proffers	Two shared-use trails, outdoor fitness facilities, lawn, picnic area, playground, pool, bike racks	Proposed; CWC Overlook LC's site plan application is in review	Crossed by Route 1 between approximate MPs 5.3 and 5.5
Data Center Campus A (Cochran Mill Road)	Shared-use asphalt trail, two natural surface trails	Proposed; Twin Creeks Development LLC's site plan application is in review	Crossed by Route 1 between approximate MPs 0.2 to 0.9
Data Center Campus B (Belmont Campus)	Bike racks, two natural surface trails, non-motorized boat launch	Proposed; Loudoun GC LLC's zoning applications are in review	Crossed by Route 1 between approximate MPs 1.0 and 1.6

Recreational Resource	Recreational Type	Status	Distance to Project Facilities
Goose Creek Scenic River	River	Active; maintained via partnership with Virginia, Loudoun County, advisory committees, and landowners (Goose Creek Association 2024)	Crossed by Route 1 between approximate MPs 0.8 and 0.9
Kincora Heron Nature Trail	Natural surface and boardwalk trail, heron rookeries	Active; developed by TRITEC with Norton Scott LLC (Kincora 2024)	Approximately 0.1 mile northeast of Broad Run B near MP 0.4
Kincora Village Center Proffers	Outdoor public plaza, lawn, natural surface, boardwalk trails, three shared-use asphalt pathways	Zoning application submitted by Greenway Engineering approved in April 2021; some proffered requirements are active while others are in progress	Approximately 0.1 mile northeast of Broad Run B near MP 0.4
Loudoun County Linear Parks and Trails System	Interconnected multi-use trail system	Countywide Plan Linear Parks and Trails System adopted by Loudoun County in July 2021; owned and maintained through public-private partnership (Loudoun County 2021)	Crossed by Route 1 between approximate MPs 0.8 and 0.9 Crossed by Broad Run A between approximate MPs 8.3 and 8.4 Crossed by Broad Run B between approximate MPs 2.1 and 2.2
Loudoun Water Aquiary	Self-guided educational tour around pond, walking paths	Active; owned and maintained by Loudoun Water (Loudoun Water 2023b)	Approximately 0.1 mile east of Broad Run A near MP 7.5 Approximately 0.1 mile west of Broad Run B near MP 1.3
NorthStar Square Proffers	Bike racks, lawn, shared-use paths, playground, athletic courts, pool, picnic area, firepits, pavilion, garden	Proposed; Belmont Land LP's zoning application has been indefinitely deferred as of July 2023	Crossed by Route 1 between approximate MPs 2.0 and 2.9 Crossed by Belmont Park A between approximate MPs 2.9 and 3.0 Crossed by Belmont Park B between approximate MP 0.0 and MP 0.1

Recreational Resource	Recreational Type	Status	Distance to Project Facilities
Philip A. Bolen Memorial Park	Athletic fields, picnic area with concessions, walking paths, adult daycare center	Active; owned and maintained by Loudoun County	Less than 0.1 mile south of Route 1 near MP 0.0 Less than 0.1 mile south of the proposed Aspen Substation site
Washington and Old Dominion Trail	Shared-use asphalt trail (adjacent gravel equestrian trail)	Active: owned and maintained by NOVA (NOVA Parks 2024)	Crossed by the Route 1 Aspen Split between approximate MPs 0.0 and 0.1 Adjacent to Broad Run A between approximate MPs 8.2 and 8.5 Adjacent to the Golden Substation 230 kV Split

6.1.8.1 Impact Assessment

Route 1

Commonwealth Center Residential North Proffers

Commonwealth Center Residential is proposed to be located south of Rt. 7, north of Russell Branch Parkway, east of Loudoun County Parkway, and west of the Top Golf facility within Ashburn. The proposed site contains an approximately 26.7-acre parcel of undeveloped, partially graded land. CWC Overlook LC submitted a site plan application for approval for a residential community with recreational proffered commitments (STPL-2022-0036 is in review as of February 2024). These recreational proffers include at least two shared-use trails, an outdoor fitness station, lawn, picnic area, playground, pool, and bike racks. One recreational proffer, Commonwealth Residential Athletic Fields, has already been constructed.

Route 1 crosses the northwestern corner of the development in a northwest/southeast orientation adjacent to Rt. 7 for about 0.1 mile between MPs 5.3 and 5.5 and would encompass about 1.8 acres of currently open land within the parcel. The transmission line would not affect development of the pathways or green spaces, nor would it affect the playground and pool as they would be outside the right-of-way. Impacts on the setting would be mitigated through the route's proximity to Rt. 7 and Loudoun County Parkway. Though construction noise could temporarily disturb some recreational activity, these impacts would be temporary, limited to the period of construction in the immediate vicinity of the property. Overall, Route 1 would not prevent the proffered recreational uses of the Commonwealth Center Residential North development.

Data Center Campus A (Cochran Mill Road)

Data Center Campus A is planned to be built within the Goose Creek riparian corridor north of the W&OD Trail, along both sides of Cochran Mill Road, and west of the creek. The site contains approximately 112.6 acres of industrial land, inclusive of an existing Loudoun Water temporary sewage treatment plant. Twin Creeks Development LLC submitted a site plan application for approval for a data center and warehouse development with recreational proffered commitments (STPL-2022-0040 in review as of February 2024). The proffers include a 10-foot-wide shared-use asphalt trail, two natural surface trails, and a 225-foot-wide open space easement along the Goose Creek Scenic Creek Valley Buffer.

Route 1 crosses the planned development for about 0.6 mile between approximate MPs 0.2 and 0.9 (collocating with the Twin Creeks Lines from approximate MPs 0.5 and 0.9) and would encompass about 7.0 acres of the property. In this area, the route runs adjacent to, and crosses, Cochran Mill Road, which already creates a linear clearing through the development. Additional industrial uses within the vicinity include mineral extraction, wastewater treatment, and pavement manufacturing.

Route 1 would create a new right-of-way through a currently undeveloped, but partially graded, segment of the Goose Creek riparian corridor where Route 1 would collocate with the future Twin Creeks Lines. The new transmission lines would not affect the recreational development of pathways and open spaces and impacts on setting would be mitigated through the route's proximity to Cochran Mill Road and other industrial uses within the area. Though construction noise could temporarily disturb some recreational activity if these trails are in use prior to transmission line construction, these impacts would be temporary, limited to the period of construction in the immediate vicinity of the property. Overall, Route 1 would not prevent the development or use of Campus A's proffered recreational facilities.

Data Center Campus B (Belmont Campus)

Data Center Campus B is planned to be built north of the W&OD Trail, south of Rt. 7, east of Goose Creek, and west of Belmont Ridge Road. The site contains approximately 114.5-acres of forested, undeveloped land. Loudoun GC LLC applied for zoning application approval for a data center development with recreational proffered requirements (LEGI-2023-0048 in review as of February 2024). The proffers include bike racks, pedestrian pathways and sidewalks around parking lots, an earthen trail along Goose Creek, an earthen trail from Belmont Ridge Road to Goose Creek, a new non-motorized boat launch into the creek, and a 300-foot open space easement along the creek.

Route 1 crosses about 0.5 mile of the planned development between approximate MPs 1.0 and 1.6 and would occupy 9.4 acres, which would be adjacent to the forested Goose Creek Scenic Creek Valley Buffer to the west and the Company's future Twin Creeks Lines and two future substations and other developments (planned data centers) to the east. The new Aspen-Golden Lines would not affect the development of pathways/trails, bike racks, and the boat launch. Impacts on setting would be mitigated through the route's proximity to other industrial uses within the area. Though construction noise could temporarily disturb some recreational activity, if any of the resources are open for use at that time, these impacts would be temporary, limited to the period of construction in the immediate vicinity of the development. Overall, Route 1 would not prevent the development or use of the proffered recreation facilities at Campus B.

Goose Creek Scenic River

Goose Creek Scenic River crosses through the study area from Leesburg to Ashburn, predominantly parallel and to the west of Belmont Ridge Road. Historically serving as a waterway of commerce for the shipping of grain and timber, Goose Creek flows approximately 48 miles between Loudoun County and Fauquier County and drains into the Potomac River. Adopted into the Virginia Scenic Rivers System in 1984, Goose Creek Scenic River is maintained by the Commonwealth of Virginia, Loudoun and Fauquier Counties, advisory committees, and private landowners, and managed for fishing, hiking, canoeing, and kayaking (Goose Creek Association 2024). There are several boat launches into Goose Creek including a launch within Keep Loudoun Beautiful Park, located near the intersection of Rt. 7 and Crosstrail Boulevard within the study area. Goose Creek Scenic River is crossed by the Company's existing 230 kV Lines #227 and #274, as well as by the W&OD Trail.

Route 1 crosses Goose Creek at a perpendicular angle between approximate MPs 0.8 and 0.9 and would be adjacent to the future Twin Creeks Lines within a shared 250-foot-wide wide right-of-way. Route 1 crosses the creek about 0.2 mile northeast of the W&OD Trail and existing transmission lines, which

already create a perpendicular, linear clearing across the creek. Additional industrial uses within the vicinity include mineral extraction, wastewater treatment, and pavement manufacturing.

While Aspen-Golden Lines Route 1 and the future Twin Creeks Lines would create a new, 250-foot-wide cleared corridor through a currently forested segment of Goose Creek, the structures would not affect the use of Goose Creek and impacts on the setting would be minimized by the route's proximity to the W&OD Trail, use of dulled galvanized steel, and proximity to adjacent industrial uses. While Aspen-Golden Lines Route 1 and the future Twin Creeks Lines would create a new, 250-foot-wide cleared corridor through a currently forested segment of Goose Creek, the structures would not affect the recreational use of Goose Creek and impacts on the setting would be minimized by the route's proximity to the W&OD Trail, use of dulled galvanized steel, and proximity to adjacent industrial uses. The crossing location additionally is between two bends in the creek, which would limit the visual impact from locations on the creek both upstream and downstream of the new transmission lines. Noise during construction could temporarily disturb some recreational activity on the creek depending on season, but these impacts would be temporary, limited to the period of construction in the immediate vicinity of the creek. Installation of the transmission lines along Route 1 would not prevent uses of the creek, and though it would alter viewshed conditions, the alignment adjacent to the Twin Creeks Lines (as opposed to in two separate creek crossings) would minimize visual effects (see Section 6.3).

Loudoun County Linear Parks and Trails System

Loudoun County's Linear Parks and Trails System is a proposed network of an interconnected, multi-use trail systems along streams and natural corridors throughout Loudoun County. Within the study area, new trails are expected to be installed near Goose Creek and Broad Run from Leesburg to Ashburn. The Loudoun County BOS adopted the Linear Parks and Trails System Countywide Plan in 2021 to create a general "roadmap" for future trails to be built out in a phased development. Loudoun County's goal is to expand its existing 224 miles of trails to 509 miles throughout the County to provide citizens safe recreational opportunities and travel accessibility as well as for the preservation of natural and cultural resources (Loudoun County 2021).

While the specific locations of trails are not dictated by the Linear Parks and Trails System Countywide Plan, Route 1 is in areas where future trails may be located, including near Goose Creek and Broad Run. As trails are a compatible, allowable use within transmission line rights-of-way, Route 1 would not prevent the use of existing trails or the development and use of future trails. During construction, temporary impacts to users of existing trails (or any additional trails installed prior to construction of the Project) would be limited to noise and possible closures, but these impacts would be temporary, limited to the period of active construction in the vicinity of the trails.

Northstar Square Proffers

As noted in Section 6.1.6 above, Northstar Square is a planned development south of Rt. 7 and east of Belmont Ridge Road encompassing 110.8 acres of undeveloped, currently forested land. Belmont Land LP applied for a zoning application approval for a residential and commercial development with recreational proffered commitments (LEGI-2023-0020), but the application has been indefinitely deferred as of July 2023. The recreational proffers associated with the development include 12 bike racks, a 45,000 square foot open space dubbed "Freedom Park," natural surface trails, playground, athletic courts, lawn, pool, fitness area, picnic area, firepits, garden, and an outdoor pavilion.

ERM and Dominion believe, due to the deferral of the zoning application and through outreach with the developer, that a data center campus currently awaiting site plan approval – the Belmont Landbay KK Campus D Data Center – is the likely future land use of the parcel. Unlike Northstar Square, the site plan for the data center does not include proffered recreational areas as no rezoning of the parcel is required.

It is unlikely that the proffered recreation facilities will be constructed as part of the data center development. If the Northstar Square rezoning application is ever approved and moves forward, however, transmission infrastructure installed along Route 1 would be unlikely to impact the proffered facilities, as the only recreational ones within the right-of-way would be open spaces and trails, which are compatible uses with a transmission line. Visual impacts are addressed in Section 6.3.

Washington and Old Dominion Trail

The W&OD Trail runs through the study area from Leesburg to Ashburn, roughly parallel to but between Rt. 7 and the Dulles Greenway. Previously called the Washington and Old Dominion Railroad, the multi-use asphalt trail runs approximately 45 miles (also adjacent to a 32-mile-long gravel equestrian trail) incorporating recreational land in Loudoun, Fairfax, and Arlington Counties. NOVA Parks owns the trail, which is managed for recreational uses, including walking, running, biking, skating, and horseback riding. There are multiple parking areas along the trail for ease of access. The trail is collocated with the Company's existing 230 kV Lines #227 and #274 for the entirety of its crossing within the study area.

The 500 kV and 230 kV Aspen-Golden Lines proposed for the Project cross the W&OD Trail at perpendicular angles along diverging alignments into the proposed Aspen Substation site (i.e., the Aspen 230 kV Split) between approximate MPs 0.0 and 0.1. This is an industrial area with existing substations, industrial facilities and warehouses, and other transmission lines. Route 1 would occupy an area of approximately 0.6 acre within the resource.

Additionally, an approximately 0.2-mile-long segment of the 230 kV circuit for Route 1 is parallel to the W&OD Trail directly south of the Golden Substation site (i.e., the Golden 230 kV Split) and east of Pacific Boulevard near MP 9.1. The Company's existing Lines #2081/#2150 transmission corridor also is adjacent to this portion of the trail. As a part of the Line #2081/#2150 Loop, one existing 230 kV lattice structure would be removed from Dominion's existing 100-foot right-of-way and four 230 kV monopole structures would be constructed. The new Loop Line would cross over the trail from the existing transmission corridor to the proposed Golden Substation.

The crossings of and construction within the trail right-of-way are anticipated to cause temporary closures of portions of the W&OD Trail but would not permanently impact its use. As the trail currently is collocated with and often directly underneath existing 230 kV transmission lines, the additional Route 1 crossing and collocation with the W&OD Trail would not change the overall character or use of the trail. While temporary impacts will occur during construction, Dominion will coordinate with NOVA Parks regarding potential mitigation measures to minimize impacts.

Belmont Park Variation A

Belmont Park Proffers

Belmont Park would be located along the south side of Rt. 7, east of Ridge Road and west of Claiborne Parkway. The proposed site is a 12.2-acre parcel of undeveloped, partially cleared land. Beazer Homes-Virginia Division applied for site plan approval for a residential community with proffered recreational commitments including two shared-use pathways, bike racks, playground, picnic area, volleyball pit, bocce court, garden, and lawn (STPL-2023-0030 in review as of February 2024).

Belmont Park A crosses approximately 0.1 mile of the development adjacent to Rt. 7 between approximate MPs 2.9 and 3.1. The right-of-way for Belmont Park A would encompass approximately 1.2 acres of the development. The right-of-way would create a new, cleared corridor through the northern portion of the property, but the corridor would be less than 100-feet-wide due to anticipated overlap with VDOT rights-of-way in this location. If the residential community is approved, however, clearing is expected within a majority of the impacted parcel, thus minimizing impacts on forest from Belmont Park A.

Moreover, while the transmission lines would cross over a section of the proffered recreational spaces, Belmont Park A would not impact the development or use of pathways and green spaces, though the location of playground equipment may need to be adjusted or modified where directly within the right-of-way. Though noise could temporarily disturb some recreational activity during construction if the resources are built and in use by that time, these impacts would be temporary and limited to the duration of construction in the immediate vicinity of the property. Dominion is coordinating directly with the developer regarding potential impacts to the planned facilities.

While Belmont Park A may cause modifications to the recreation facility plans, development and use of the Belmont Park proffered recreational facilities could still occur. Based on the potential need to relocate some playground facilities, Belmont Park A would be more impactful to the recreational proffer than Belmont Park B, which avoids them.

Northstar Square Proffers

Belmont Park A would cross approximately 100 feet of the Northstar Square parcel. As described above for Route 1, this development is not expected to move forward.

Belmont Park Variation B

Belmont Park Proffers

This development is described above. Belmont Park B crosses less than 180 square feet of the northwestern corner of the planned Belmont Park residential development directly adjacent to Rt. 7. No recreational facilities are planned within the portion of the parcel crossed by the route. While there could be temporary impacts to the planned recreation facilities during construction (e.g., noise) depending on when they are built, use of Belmont Park B for the new transmission lines would not impact development or use of the planned recreation facilities during operations.

Northstar Square Proffers

Belmont Park B would cross approximately 100 feet of the Northstar Square parcel. As described above for Route 1, this development is not expected to move forward.

Broad Run Variation A

Loudoun County Linear Parks and Trails System

As described in the impact assessment for Route 1, the Loudoun County Linear Parks and Trails System is a conceptual plan that does not include specific locations of trails but serves as a roadmap for future trail and linear park development. While the locations of trails are not dictated by the plan, Broad Run A crosses areas where future trails may be located, including near Broad Run and the W&OD Trail. As trails are a compatible, allowable use within transmission line rights-of-way, Broad Run A would not prevent the use of existing trails or the development and use of future trails. During construction, temporary impacts to users of existing trails (or any additional trails installed prior to construction of the Project) would be limited to noise and possible closures, but these impacts would be temporary, limited to the period of active construction in the vicinity of the trails.

Broad Run Variation B

Loudoun County Linear Parks and Trails System

As described above for Broad Run A, while the locations of trails are not dictated by the County's conceptual plan for expansion, Broad Run B crosses areas where future trails may be located, including near Broad Run and the W&OD Trail. As trails are a compatible, allowable use within transmission line rights-of-way, Broad Run B would not prevent the use of existing trails or the development and use of future trails. During construction, temporary impacts to users of existing trails (or any additional trails installed prior to construction of the Project) would be limited to noise and possible closures, but these impacts would be temporary, limited to the period of active construction in the vicinity of the trails.

6.1.9 Cemeteries, Schools, and Places of Worship

ERM reviewed U.S. Geological Survey (USGS) topographic quadrangles (USGS 2022), recent digital aerial photography (Loudoun County 2023), county parcel data (Loudoun County 2023a), information from VCRIS (VDHR 2023), and various websites[20] to identify cemeteries, schools, and places of worship within 0.25 mile of the right-of-way of the routes discussed in this study. Figure 6.1.9-1 depicts those resources within 0.25 mile of each route.

6.1.9.1 Existing Conditions

Cemeteries

ERM identified two cemeteries within 0.25 mile of the routes. A description of each cemetery and its location relative to the routes is provided in Table 6.1-19. While neither cemetery is crossed, the parcels lie within 500 feet of a route, although the actual cemetery boundaries are further than 500 feet from the route centerline. Potential impacts on the cemeteries are addressed in Section 3.9.1.2 below.

Table 6.1-19: Cemeteries within 0.25 Mile of the Aspen-Golden Lines Routes

Name	Description	Distance and Direction from the Aspen-Golden Lines Routes
African American Burial Ground for the Enslaved at Belmont	Established between 1796 and 1802, the Burial Ground for the Enslaved at Belmont contains around 80 interments, predominantly persons enslaved by the Ludwell-Lee family, the former owners of Belmont Plantation. Decades of neglect and nearby development resulted in the destruction of perhaps half the burials originally interred at the site. Since 2017, the cemetery has been conserved and improved for visitors with the addition of the Freedom Heritage Trail, a 400-foot-long path through and around the burial ground. The cemetery is within a privately-owned, forested parcel at the southeast corner of the intersection of Rt. 7 and Belmont Ridge Road and is protected by a Loudoun County BOS easement.	Approximately 0.1 mile (370 feet) northwest of Route 1 near MP 2.2

[20] These sources are: Christian Fellowship Church 2024, Community Church 2024, Find A Grave 2024, George Washington University 2023, Karter Schools 2023, Loudoun County 2023j, Loudoun County Public Schools 2024, Shenandoah University 2024, Strayer University 2024, St. David's Episcopal Church and School 2024, St. David's Episcopal Preschool 2024, The Goddard School 2024, The Learning Experience 2024, and Virginia Academy 2024.

Name	Description	Distance and Direction from the Aspen-Golden Lines Routes
Belmont Chapel / St. David's Episcopal Cemetery	Established in 1835, Belmont Chapel / St. Davis's Episcopal Cemetery is an active burial ground with the most recent interment occurring in 2018. As of February 2024, it contains 67 memorials. The cemetery is within an approximately 8.2-acre parcel that also contains St. David's Episcopal Church and Preschool. The burial ground is in a forested area along the southern boundary of the parcel, south of the church and an associated parking lot. There's a shopping center containing a Whole Foods Market just south of the cemetery.	Approximately 0.1 mile (395 feet) southwest of Belmont Park A near MP 3.2 Approximately 0.2 mile (840 feet) southwest of Belmont Park B near MP 0.3

Schools

ERM identified ten schools within 0.25 mile of the Aspen-Golden Lines routes, including Loudoun County public schools, private and religious schools, daycare centers, after-school enrichment and tutoring programs, and college/university campuses. A description of each school and its location relative to the routes is provided in Table 6.1-20.

Table 6.1-20: Schools within 0.25 Mile of the Aspen-Golden Lines Routes

Name	Description	Distance and Direction from Aspen-Golden Lines Routes
St. David's Episcopal Preschool	This is a private religious preschool facility associated with St. David's Episcopal Church south of Rt. 7 and west of Claiborne Parkway. The school provides religious-based and play-focused programs for students ages 3 to 5. The preschool is located on an approximately 8.2-acre parcel along with the church and a cemetery (see Tables 6.1.9-1 and 6.1.9-3). The campus containing the school, church, and cemetery is surrounded by developed lands to the east, south, and west, with cleared lands and Rt. 7 to the north.	Approximately 0.1 mile (635 feet) southwest of Belmont Park A near MP 3.2 Approximately 0.2 mile (1075 feet) southwest of Belmont Park B near MP 0.3
Virginia Academy	Virginia Academy is a private religious educational facility located south of Rt. 7 and east of Ashburn Road offering religious-based, service-emphasized programs for students from preschool through high school. The campus occupies approximately 40 acres of partially developed, partially cleared land and contains a building and parking area with open fields to the south. There are commercial buildings on adjacent parcels to the west and northeast with forested land to the south. The school building also contains Community Church (see Table 6.1-21).	Parcel crossed by Route 1 between approximate MPs 3.5 and 3.7, school building approximately 0.1 mile (540 feet) south of Route 1 near MP 3.6

Name	Description	Distance and Direction from Aspen-Golden Lines Routes
Shenandoah University – Loudoun Campus - Scholar Plaza	Scholar Plaza is a building within the Shenandoah University – Loudoun Campus located north of Rt. 7 and west of Riverside Parkway. Scholar Plaza serves as the headquarters campus of graduate programs in business, education, and healthcare. The building is surrounded by a parking lot with forested lands north and west and developed lands to the east and south (including Rt. 7).	Approximately 0.1-mile (550 feet) northeast of Route 1 near MP 3.7 Approximately 0.2-mile (1,185 feet) northeast of Belmont Park A near MP 3.5 Approximately 0.2 mile (1,185 feet) northeast of Belmont Park B near MP 0.6
County After School Activities (CASA)	CASA is a public after-school facility in the Ashbrook Office Park providing after-school enrichment for elementary-aged students. The area surrounding the building is developed.	Approximately 0.2 mile (760 feet) southwest of Route 1 near MP 4.5
The Learning Experience - Ashburn	The Learning Experience is a private childcare facility in a developed commercial area north of Rt. 7, south of Riverside Parkway, and east of Ashburn Village Lane. The school offers programs for children from 6 weeks to 12 years old.	Approximately 0.1 mile (520 feet) northeast of Route 1 near MP 4.5
George Washington University (GWU) – Science and Technology Campus – Enterprise Hall and Discovery Hall	Enterprise Hall and Discovery Hall are buildings within the GWU – Science and Technology Campus, a private school, located north of Rt. 7 opposite the golf practice facilities at Top Golf. The campus holds classes in the fields of engineering, physics, and chemistry.	Enterprise Hall: Approximately 0.1 mile (525 feet) northeast of Route 1 near MP 5.6 Discovery Hall: Approximately 0.2 mile (970 feet) northeast of Route 1 near MP 5.5
The Goddard School of Ashburn	The Goddard School of Ashburn is a private daycare facility north of Rt. 7 and west of George Washington Boulevard offering programs for infants and toddlers, classes for pre-school and kindergarten, after-school enrichment, and summer daycare. The school building is with a developed area with Rt. 7 immediately to the south.	Approximately 0.1 mile (550 feet) northeast of Route 1 near MP 5.8
Strayer University - Loudoun Campus	This is a building within the Strayer University - Loudoun Campus, a private school south of Rt. 7, north of Russell Branch Parkway, and east of Richfield Way. The Loudoun Campus holds classes in technology repair, criminal justice, education, health services, and public administration. The building is surrounded by cleared or developed lands to the north (including Rt. 7), east, west, and southwest, and forested land to the southeast.	Approximately 0.2 mile (995 feet) east of Route 1 near MP 5.9

Name	Description	Distance and Direction from Aspen-Golden Lines Routes
Karter Schools of One Loudoun	This is a private daycare and educational facility in the One Loudoun development offering daycare programming for infants and toddlers, preschool and kindergarten classes, after-school enrichment, and a summer camp-style daycare. The building is on the west side of Loudoun County Parkway in a developed (residential) area opposite a commercial strip mall. There are outdoor play areas on the west side of the building.	Approximately 0.1 mile (705 feet) west of Route 1 near MP 6.5
Steuart W. Weller Elementary School	This a public elementary school for kindergarten to Grade 5 located west of Loudoun County Parkway and south of Marblehead Drive.	Approximately 0.2 mile (1,190 feet) west of Route 1 near MP 6.7 Approximately 0.2 mile (1,160 feet) west of Broad Run A near MP 6.8 Approximately 0.2 mile (1,225 feet) of Broad Run B near MP 0.0

Places of Worship

ERM identified 3 places of worship (churches) within 0.25 mile of the Aspen-Golden Lines routes. A description of each place of worship and its location relative to the routes is provided in Table 6.1-21. Of the three churches, the property containing Community Church is crossed by Route 1.

Table 6.1-21: Places of Worship within 0.25 Mile of Aspen-Golden Lines Routes

Name	Description	Distance and Direction from Aspen-Golden Lines Routes
St. David's Episcopal Church	Located south of Rt. 7 and west of Claiborne Parkway, St. David's Episcopal Church is on the same parcel as St. David's Episcopal Preschool and Belmont Chapel / St. Davis's Episcopal Cemetery. Worship and education at the site of St. David's began in 1836 when Margaret Mercer, a wealthy philanthropist, purchased Belmont Plantation and established a school for all children regardless of race, gender, and class. Today, St. David's Episcopal Church holds weekend services and religious studies. See Tables 6.1.9-1 and 6.1.9-2 for descriptions of the parcel containing the church, school, and cemetery.	Approximately 0.1 mile (635 feet) southwest of Belmont Park A near MP 3.2 Approximately 0.2 mile (1,075 feet) southwest of Belmont Park B near MP 0.3
Community Church	This is a church within the same building as the Virginia Academy. It holds weekend services and religious studies for adults and children and provides community service opportunities. A description of the campus is provided for Virginia Academy in Table 6.1-20 above.	Parcel crossed by Route 1 between approximate MPs 3.5 and 3.7, church building approximately 0.1 mile (540 feet) south of Route 1 MP 3.6

Name	Description	Distance and Direction from Aspen-Golden Lines Routes
Christian Fellowship Church	Located near the intersection of Russell Branch Parkway and Ashbrook Place, Christian Fellowship Church holds weekend services, Wednesday evening religious studies, events, and community service groups. The campus encompasses about 13 acres, approximately half of which consists of the church building and parking lot, with the remainder open space. The campus is surrounded by developed commercial or residential lands to the north, west, and south, and by forest to the east.	Approximately 0.2 mile (1,200 feet) southwest of Route 1 near MP 4.8

6.1.9.2 Impact Assessment

Tables 6.1.9-1, 6.9.1-2, and 6.9.1-3 list and describe the cemeteries, schools, and places of worship within 0.25 mile of Route 1 and the Belmont and Broad Run Variations. While some of these resources are directly crossed by a route, the majority are outside what would be the right-of-way for the new transmission lines. Impacts on land uses at these types of resources outside the rights-of-way (such as impacts from changes in viewshed) are less likely with increasing distance from the resource. Therefore, the discussions below address potential land use impacts on cemeteries, schools, and places of worship within 500 feet of each route. No further discussion of cemeteries, schools, and churches greater than 500 feet from a route is provided in this study. Visual impacts are addressed in Section 6.3.

Route 1

Of the resources discussed above, one cemetery (African American Burial Ground for the Enslaved at Belmont), one school (Virginia Academy), and one place of worship (Community Church) fall within 500 feet of Route 1.

African American Burial Ground for the Enslaved at Belmont

In the early 18th century, the Burial Ground for the Enslaved served as the resting ground for approximately 80 individuals, enslaved by Ludwell Lee, a member of the prominent Lee family[21]. Decades of neglect and development resulted in the destruction of around half the burials originally interred. Of the remaining perhaps 40 memorials, the gravestones are unmarked and consist of triangular stones, a common burial ritual amongst the enslaved during the time period. Since 2017, the cemetery has been conserved and improved with the Freedom Heritage Trail. In 2020, the Virginia Senate approved the first burial in the site since the 18th century, representing the first internment of a free citizen at the cemetery (Find a Grave 2024).

The Burial Ground for the Enslaved at Belmont is within a 2.7-acre parcel located at the intersection of Rt. 7 and Belmont Ridge Road. While currently forested, the property south of the cemetery has been proposed for a data center campus and there are several planned several data center campuses west of Belmont Ridge Road (see Section 6.1.6). The burial ground is bordered by Rt. 7 to the north with the Lansdowne Town Center shopping mall on the north side of the highway. There has been public interest

[21] Lee's two eldest sons, Richard Henry Lee and Philip Ludwell Lee, became U.S Cavalry captains during the Civil War. Further, Lee's Belmont Plantation was sold to Margaret Mercer who created a school for all children, regardless of race.

in preserving and maintaining with additional planned improvements such as a Freedom Center with classrooms, gardens, reflective pool, and public artwork.

Route 1 passes approximately 0.1 mile (370 feet) south of the parcel encompassing the cemetery near MP 2.2, thereby avoiding physical impacts to the burial ground. During construction, noise could potentially be heard from within the cemetery, but this impact would be temporary, limited to the period of construction, and may be further mitigated from noise associated with traffic along Rt. 7.

As discussed in Section 6.3, a small portion of Route 1 would be partially visible above the tree line from within the cemetery (KOP 4, looking east from Freedom Trail Road; see Appendix G), where the transmission corridor parallels the southern side of Rt. 7. While the tops of several monopoles would be visible, these structures would not change the overall visual character of the landscape from the KOP. Due to the presence of road signage, trees, and lighting along the foreground, Route 1 would not be visually dominant and would present a minor impact on the overall visual conditions at this KOP. Within the burial ground looking south toward Route 1, visual simulations indicate no impact due to tree cover. Thus, while the Project would introduce transmission infrastructure to the viewshed from the resource, this change would be minor and would not impact land uses associated within the cemetery as a burial ground.

Community Church and Virginia Academy

Route 1 avoids crosses the parcel containing Virginia Academy, a Christian-faith church and associated religious school located within the same structure. Encompassing about 40 acres of developed and cleared land, the property has been improved with parking lots, athletic fields, and an outdoor pavilion. Future development within the parcel has been proposed by Community Church for an expansion to the church/school structure and an additional athletic field (see Section 6.1.6). The property is bordered to the north by Rt. 7, to the west and northeast by commercial development, and to the south by forested land.

The right-of-way for Route 1 crosses into the northern side of the parcel containing the school/church along Rt. 7 for about 0.2 mile between approximate MPs 3.5 and 3.7. The right-of-way would encompass approximately 1.1 acres of the parcels in a cleared area immediately adjacent to Rt. 7. Route 1 avoids all existing Community Church and Virginia Academy structures, parking lots, athletic facilities, and an outdoor pavilion. The impacts of new transmission infrastructure installed along the route would be minimized by following the parcel boundary adjacent to Rt. 7, which already impacts the viewshed from the property. During construction, noise could potentially be heard from within the school/church, but this impact would be temporary, limited to the period of construction, and may be further mitigated by noise associated with traffic along Rt. 7. Therefore, while the Project would introduce transmission infrastructure to the viewshed from the resource, it would not impact land uses associated with the property for education, athletics, and religious assembly.

Belmont Park Variations

One cemetery (Belmont Chapel / St. David's Episcopal Cemetery) lies within 500 feet of Belmont Park A as measured from the parcel boundary. There are no schools or places of worship within 500 feet of Belmont Park A, and no cemeteries, schools, or places of worship within 500 feet of Belmont Park B.

Belmont Chapel / St. David's Episcopal Cemetery

Belmont Chapel was established in 1835 after wealthy philanthropist, abolitionist, and educator Margaret Mercer purchased Belmont Plantation from the Lee family. Mercer established a chapel, cemetery, and school on the plantation grounds, located at the site of the current St. David's Episcopal Church. Mercer's school was unique at the time as all students, regardless of race, sex, or class, could attend. Students from well-off families were asked to pay their share, but no student was turned away based on their ability

to pay. Closing after Mercer's death in 1846, the site became re-opened for religious assembly in the 1990s with the establishment of St. David's Episcopal Church, which now manages the historic cemetery and runs a preschool on the same parcel. As of February 2024, the burial ground contains 67 internments, the oldest from 1835 and the most recent from 2018.

Belmont Chapel / St. David's Episcopal Cemetery is within an 8.2-acre parcel located at the intersection of Rt. 7 and Claiborne Parkway. Parts of the property are developed, inclusive of the church/preschool building and associated parking lot, but also features forest to the east and south. The parcel is surrounded by Rt. 7 to the north, a shopping center with a Whole Foods to the south, Claiborne Parkway to the east, and Russell Branch Parkway to the west.

Belmont Park A heads approximately 0.1 mile (395 feet) southwest of the parcel encompassing the cemetery near MP 3.2. The route avoids all structures, trails, and signage and would not incur any physical impacts to the burial ground. During construction, noise could potentially be heard from within the cemetery, but this impact would be temporary, limited to the period of construction, and may be further mitigated from noise associated with traffic along Rt. 7, Claiborne Parkway, and Russell Branch Parkway. While the Project could introduce transmission infrastructure to the viewshed from the cemetery (see Section 6.3), it would not impact uses of the burial ground.

Broad Run Variations

There are no cemeteries, schools, or places of worship within 500 feet of the Broad Run Variation routes.

6.1.10 Transportation Infrastructure

The road network in the study area includes a variety of road types ranging from principal arterials (such as Rt. 7 and Rt. 28) to minor arterials (such as Gloucester Parkway) to minor collectors (such as Cochran Mill Road). Figure 6.1.10-1 shows the existing roads and planned road projects and extensions along and near the routes. Summary of the number and general types of roads crossed by each route are provided in the subsections below.

The only existing railroad identified within the study area is an approximately 0.7-mile-long segment of the Metrorail Silver Line, which is aboveground within the median of the Dulles Greenway (Rt. 267). The rail line is located approximately 2.0 miles south of the proposed Golden Substation site. No existing or planned railroads are crossed by Route 1 or any of the Variations. Airports are addressed in Section 6.1.11 of this document.

Route 1

Table 6.1-22 lists the nine existing roadways crossed by Route 1, identifies functional classification of each road, and identifies the number of lands at each crossing.

Table 6.1-22: Existing Roadways Crossed by Route 1

Road Crossed	Number of Lanes at Crossing Location	Functional Classification
Samuels Mill Court	2	local road
Cochran Mill Road	2	minor collector
Goose Glen Lane	1	local road (private)
Belmont Ridge Road	4	minor arterial

Road Crossed	Number of Lanes at Crossing Location	Functional Classification
Freedom Trail Road	2	local road
Ashburn Village Boulevard	4	major collector
Loudoun County Parkway	6	principal arterial (non-freeway)
Russell Branch Parkway	4	major collector
Pacific Boulevard	4	major collector

In addition to these crossings, Route 1 parallels Cochran Mill Road for about 0.4 mile from approximate MPs 0.1 to 0.5, and Rt. 7 for about 2.9 miles from approximate MPs 2.4 to 5.8 (excluding Belmont Park A).

Route 1 crosses two planned road extensions identified in the Loudoun CTP: Gloucester Parkway and Russell Branch Parkway. Both roads currently extend between Rt. 28 in the east and Belmont Ridge Road in the west, and both have dedicated right-of-way for future road extensions and bridges extending west from Belmont Ridge Road across Goose Creek, with Gloucester Parkway following Cochran Mill Road then heading west to connect with Kincaid Boulevard, and Russell Branch Parkway following Cochran Mill Road to Crosstrail Boulevard. The dedicated future road rights-of-way are 90-feet-wide for Gloucester Parkway and 120-feet-wide for Russell Branch Parkway. See Figure 6.1.10-1. The planned Gloucester Parkway road dedication is crossed once by Route 1 while the planned Russell Branch Parkway road dedication is crossed three times within an approximately one-quarter-mile section along planned data center campuses. This alignment accommodates planned development site plans and substation layouts and allows for a perpendicular crossing of the future Twin Creeks Lines across Data Center Campuses B and C.

Route 1 is located within 0.25 mile of one Loudoun County DTCI planned project: the Rt. 7 Eastbound Widening from Loudoun County Parkway to Rt. 28 Project. This road project, which is in the preliminary planning phase, will add an extended auxiliary lane eastbound (i.e., on the south side) of Rt. 7 from Loudoun County Parkway to the Rt 28 exit, thereby providing four continuous lanes between the interchanges. Where currently only three lanes wide, the traffic lane is generally located 30 feet from the edge of the VDOT right-of-way. Route 1 is parallel to this road project for approximately 0.4 mile between about MPs 5.4 and 5.8.

Belmont Park Variation A

Belmont Park A crosses Claiborne Parkway (major collector), including the associated on/off ramps and the cloverleaf on the south side of the Rt. 7 and Claiborne Parkway/Lansdowne Boulevard interchange. Belmont Park A does not cross any planned road projects or road extensions. The route parallels Rt. 7 for its entire 0.6-mile-long length.

Belmont Park Variation B

Belmont Park B crosses Rt. 7 twice (eight-lane principal arterial freeway) and Lansdowne Boulevard (major collector) once, including the associated on/off ramps and the cloverleaf on the north side of the Rt. 7 and Claiborne Parkway/Lansdowne Boulevard interchange. Belmont Park B does not cross any planned road projects or road extensions. The route parallels Rt. 7 for about 0.4 mile from approximate MPs 0.1 to 0.5 and has two 0.1-mile-long crossings of Rt. 7, from MPs 0.0 to 0.1 and MPs 0.5 to 0.6.

Broad Run Variation A

Broad Run A crosses the following five roads: Reuse Lane (local road), Aquiary Way (local road), Gloucester Parkway (minor arterial), Coach Gibbs Drive (private road), and Pacific Boulevard (major collector). Broad Run A does not cross any planned road projects or road extensions. The route parallels Loudoun County Parkway for about 1.3 miles from approximate MPs 6.9 to 8.2.

Broad Run Variation B

Broad Run B crosses Gloucester Parkway (minor arterial) and Pacific Boulevard (major collector) one time each. It does not cross any planned road projects or road extensions and does not parallel any roadways.

Impact Assessment

Route 1 would have one perpendicular crossing of the planned Gloucester Parkway dedication and three crossings of the Russell Branch Parkway road dedication. The latter crossings are necessary to accommodate planned developments and the crossing of the future Twin Creeks Lines. All three crossings are within an approximately one-quarter-mile section along planned data center campuses and all structures would be outside of the road dedication. As such, the Project would not have long term impacts on either future road expansion.

Route 1 parallels the Rt. 7 Eastbound Widening from Loudoun County Parkway to Rt. 28 Project for approximately 0.4 mile along the south side of Rt. 7. In this area, Route 1 typically overlaps the VDOT right-of-way by approximately 10 feet but does not overlap any of the paved roadway, including the 0.1-mile segment of Rt. 7 in this area that currently has four eastbound traffic lanes. Therefore, although the Project right-of-way is anticipated to have some overlap with VDOT right-of-way where an additional traffic lane is planned, no impacts on the planned road project are anticipated. Dominion will coordinate with VDOT regarding potential overlap with existing Rt. 7 right-of-way through a licensing agreement with VDOT.

Belmont Park B requires two crossings of Rt. 7, a principal arterial roadway, while Belmont Park A has none. Both Belmont Park A and Belmont Park B cross Claiborne Parkway/Lansdowne Boulevard and the associated interchange at Rt. 7. Based on the additional crossing, Belmont Park B would likely have greater visual impact along the roadway, but neither route would permanently impact vehicle traffic on the highway, which would be spanned. Temporary vehicle traffic impacts to Rt. 7 would likely occur during construction and maintenance activities of the Belmont Park B Variation, but as the Belmont Park A Variation does not cross Rt. 7 no temporary traffic impacts to R7. 7 are anticipated.

Broad Run A crosses five roadways while Broad Run B crosses two. Both routes cross Gloucester Parkway and Pacific Boulevard and Broad Run A crosses three local/private roads: two at the BRWRF and one at the Commanders training facility. Neither route would impact vehicle traffic on the roads, which would be spanned.

Temporary closures of roads and/or traffic lanes may be required during Project construction for Route 1 and all Variations. No long-term impacts on roads are anticipated. The Project will comply with VDOT requirements for access to the rights-of-way from public roads. At the appropriate time, the Project will obtain the necessary VDOT permits, as required, and comply with permit conditions.

6.1.11 Airports and Heliports

Transmission line structures have the potential to affect airspace in and around airports. The following sections describe the airports in the vicinity of the study area and the airspace regulations that could impact the Project, followed by discussions of the potential impacts of the Project on navigable airspace.

6.1.11.1 Airports and Heliports near the Project Area

ERM reviewed the FAA's 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 2023a, 2023b). Based on this review, 11 airports, private airstrips, or heliports are within 10 nautical miles of the Project facilities (Figure 6.1.11-1). Table 6.1-23 provides information on these facilities, including the FAA identification (ID) number, distance and direction from the nearest route or substation to the nearest runway/heliport, type of use, and maximum runway length.

Table 6.1-23: Airports and Heliports Located in the Project Vicinity

Airport/Heliport Name	FAA Identifier	Approximate Distance and Direction from Nearest Project Facility (nautical miles)	Use	Maximum Runway Length (feet)
Inova Loudoun Hospital Heliport	34VA	0.2 nm north of Belmont Park B	Private	NA
Leesburg Executive Airport	KJYO	1.1 nm west of Aspen Substation	Public	5,500
Dulles International Airport	IAD	2.8 nm south of Golden Substation	Public	11,500
Reston Hospital Heliport	43VA	4.4 nm southeast of Golden Substation	Private	NA
Crippen's Heliport	VA54	4.8 nm east of Golden Substation	Private	NA
Goose Hunt Farm Airport	3VA5	5.1 nm southwest of Aspen Substation	Private	1,700
Longview Heliport	6VG8	5.6 nm north of Route 1	Private	NA
Stonesprings Heliport	6VG4	6.6 nm southwest of Golden Substation	Private	NA
Inova Fair Oaks Hospital Heliport	74VA	8.1 nm southeast of Golden Substation	Private	NA
Egypt Farms Heliport	4VA0	8.4 nm west of Aspen Substation	Private	NA
Fairfax County Police Heliport	26VA	9.9 nm southeast of Golden Substation	Private	NA

FAA = Federal Aviation Administration; NA = not applicable

6.1.11.2 Federal Aviation Administration 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 in the Code of Federal Regulations (CFR), Title 14, Part 77 (14 CFR Part 77). A summary of the rule as it relates to the Project is provided below, and the full rule is available online at https://www.ecfr.gov/current/title-14/chapter-I/subchapter-E/part-77.

Civil Airport Imaginary Surfaces

Civil airport imaginary surfaces have been established with relation to each airport and 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**: This surface is 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. The Leesburg Executive Airport is located at a surveyed elevation of 389.5 feet above mean sea level (AMSL), meaning the horizontal surface is 539.5 feet AMSL. Dulles International Airport has a surveyed elevation of 312.3 feet AMSL, placing the horizontal surface at 462.3 feet AMSL.
- **Conical surface**: This is 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. For the Leesburg Executive Airport and Dulles International Airport, the conical surface would extend from 539.5 feet to 739.5 feet AMSL and from 462.3 feet to 662.3 feet AMSL, respectively.
- **Primary surface**: This is 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. This surface is 250 feet wide for visual approach runways, 500 feet wide for runways with non-precision instrument approaches, and 1,000 feet wide for precision instrument runways. Both the Leesburg Executive Airport and Dulles International Airport have primary surfaces that are 1,000 feet wide.
- **Approach surface**: This is a surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of each 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). For both Leesburg Executive Airport and Dulles International Airport, the inner edge of the approach surface is the same width as the primary surface (1,000 feet), and it expands uniformly to a width of 16,000 feet. The approach surfaces extend for a horizontal distance of 10,000 feet at a slope of 50 to 1 with an additional 40,000 feet at a slope of 40 to 1.
- **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.

Figures 6.1.11-2 and 6.1.11-3 provide a visual representation of the imaginary surfaces for Leesburg Executive Airport and Dulles International Airport, respectively.

Terminal Instrument Procedures

In addition to the civil airport imaginary surfaces, there are imaginary surfaces associated with terminal instrument procedures, which are procedures for instrument approach and departure of aircraft to and

from civil and military airports. They are used for airport obstruction analyses to protect airspace by establishing restrictions on the height of buildings, antennas, trees, and other objects, as necessary, to protect the airspace needed for aircraft during preparation for, and completion of, the landing or departure phases of flight. None of the Project routes discussed in this report would exceed the terminal instrument procedures surfaces of the airports identified in Table 6.1-23.

Federal Aviation Administration Notice Requirements and Timing

Based on the runway categories and dimensional standards described above, a notice must be filed with the FAA for any of the following conditions:

- Any construction or alteration that is more than 200 feet above ground level at its site;
- Any construction or alteration that 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; or
  - 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; or
  - 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, excluding heliports.
- If requested by the FAA.

Construction or alteration of any structure that meets the notification requirements set forth above requires submittal of an FAA Form 7460-1, Notice of Proposed Construction or Alteration, to the FAA regional office with 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.

Based on current plans, the proposed transmission line structures for the Aspen-Golden Lines, Aspen-Goose Creek Line, and Line Loop would range in height from 105 to 196 feet tall, depending on route and structure locations. It is anticipated that cranes would be used to install the structures. Based on current plans, the proposed Project, regardless of the route variations selected, would exceed the FAA notification thresholds described above for the Leesburg Executive Airport and therefore would require notification to the FAA.

State and Local Regulations Commonwealth of Virginia Aviation Regulations

Section 5.1-25.1 of the Va. Code establishes that it is unlawful for a person to erect any structure that 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 Board of Aviation. However, it also states that this requirement does not apply to any structure to be erected in a county, city, or town that has an ordinance regulating the height of such structures to prevent the penetration of zones and surfaces provided for in 14 CFR Part 77 and Rule 19 of the Virginia Department of Aviation. While Loudoun County has drafted land use restrictions for the Leesburg Executive Airport and Dulles International Airport associated with noise contour lines, the restrictions do not regulate the height of structures. Therefore, the Part 77 airspace restrictions as codified in the Va. Code apply.

Local Airport Regulations

Va. Code Sections 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. The following is a summary of the zoning regulations applicable to the airports listed in Table 6.1-23.

Loudoun County has established restricted-use zones to regulate the use of property in the vicinity of the Leesburg Executive and Dulles International Airport. The AIOD is a zoning overlay district administered by the Loudoun County Department of Building and Development. The district was established to acknowledge the unique land use impacts of airports, regulate the siting of noise-sensitive uses, ensure that the heights of structures are compatible with airport operations, and complement FAA regulations regarding noise and height.

The AIOD boundaries are based on the 60 decibels (dBs) and 65 dBs loudness day-night noise contours and a 1-mile buffer that extends beyond the 60 dB day-night average sound level contour for both the Leesburg Executive and Dulles International Airport. The zones include all land lying beneath the approach surfaces, transitional surfaces, horizontal surfaces, and conical surfaces as they apply to these airports.

6.1.11.3 Airport Resources Affected

Of the 11 airports and heliports listed in Table 6.1-23, the Leesburg Executive Airport and Dulles International Airport are the only public use airports or helipads close enough to a route or substation for a transmission structure to potentially impact navigable airspace. ERM conducted an airport analysis to determine if any of the FAA-defined airport imaginary surfaces at these airports could be penetrated by transmission structures associated with the Project. ERM reviewed the height limitations associated with the FAA-defined imaginary surfaces for all runways at these airports.

Standard GIS tools, including ESRI's ArcMap 3D and Spatial Extension software, were used to create and geo-reference the airport imaginary surfaces in space and in relation to the locations and heights of transmission structures along the alternative routes. Ground surface data was derived by using a USGS 10 Meter Digital Elevation Model. Height limitations for the Project were analyzed along with FAA Part 77 airspace surfaces.

Civil airport imaginary surfaces have been established by the FAA with relation to each airport and each runway. Imaginary surfaces were developed to prevent existing or proposed objects from extending from the ground into navigable airspace. As part of the D2 Dulles Development Project for the airport, a fifth runway is proposed. The future runway would be south of and parallel to the existing Runway 12/30. Dominion has incorporated this future runway into the analysis for this study.

Leesburg Executive Airport

The Leesburg Executive Airport is the closest public airport to the Project. The proposed Aspen Substation and Aspen-Goose Creek Line are approximately 5,800 feet east of and perpendicular to the airport's runway 17/35 at the closest point, with Route 1 continuing east (i.e., further away) from the airport. The site is at an estimated elevation of 255 feet AMSL, which is approximately 120 feet lower than the surveyed Leesburg Executive Airport elevation of 389.5 feet AMSL. Therefore, given the distance, the estimated decrease in elevation of the Project compared to the Leesburg Executive Airport, and the planned 120- to 196-foot-tall structure heights for the Project, no structure associated with a route or substation would penetrate the restricted Part 77 airspace surfaces of the airport. Temporary construction equipment (e.g., cranes) must also be cognizant of Part 77 airspace surfaces.

Washington Dulles International Airport

Dulles International Airport is approximately 16,700 feet south of the closest point of the Project (the proposed site for the Golden Substation and Line Loop). At this distance, the Project is only within the Approach Surface area where elevations range from 210 to 250 feet AMSL. The Runway 3 elevation is 270 feet AMSL. Therefore, due to the distance from the runway, elevations in the Project area, and the planned 120- to 195-foot-tall structure heights for the Project, there would be no potential to impact navigable airspace associated with Dulles International Airport

Inova Loudoun Hospital Helipad

The Inova Loudoun Hospital Helipad is a privately owned helipad and thus is not regulated by the FAA. Additionally, restrictions to structure heights set forth in 14 CFR Part 77 only apply to public use airports/heliports, not privately owned ones. Belmont Park B is approximately 980 feet south of the helipad at its closest point with a total of four planned structures within 1,600 feet of the helipad. Belmont Park A is approximately 1,400 feet south of the helipad at its closest point with two planned structures within 1,600 feet of the helipad.

Due to the proximity of the Belmont Park B and Belmont Park A variations to the helipad (approximately 980 feet and 1,400 feet south of the helipad, respectively), Dominion discussed the potential impact of the Project on hospital helicopter navigation with representatives of Inova Loudoun Hospital in a virtual meeting on July 25, 2023. Dominion explained the approximate distance of the Project to the helipad (980 feet at its closest point along the Belmont Park B Variation). Hospital staff said they would contact Dominion with any concerns regarding helicopter navigation, but no feedback on the routes subsequently was received as of January 2024.

A follow-up meeting with Inova Loudoun Hospital occurred on January 29, 2024, during which Dominion explained the proposed monopole structure design and shared the approximate height of the structures along both the Belmont Park A and Belmont Park B alignments. Inova Loudoun Hospital said they would review the design and contact Dominion with any comments or preferences with regard to the routes.

On February 15, 2024, Dominion received email comments from Inova Loudoun Hospital in which they stated that installation of the transmission line along Belmont Park A would not likely impact the helipad but along Belmont Park B could hamper future operations of the helipad and alter the ability to take off or land from a southern direction (i.e., over the Aspen-Golden Lines along the Belmont Park Variation B). See Appendix C. While Belmont Park A would not affect helipad operations, due to the estimated 195-foot-tall height of the two structures adjacent to Claiborne Parkway, Inova Loudoun Hospital requested that obstruction markings be used to increase visibility of the Aspen-Golden Lines along Belmont Park Variation A.

6.1.11.4 Impact Assessment

While structures associated with the routes would be below some of the imaginary surfaces discussed above, none would penetrate any of the surfaces of either public use airport (Leesburg Executive and Dulles International Airport) within 10 nautical miles of the Project.

Because the Inova Loudoun Hospital helipad is not regulated by the FAA, the limits on structure heights set forth in 14 CFR Part 77 do not apply. Based on the comments from Inova Loudoun Hospital in their email dated February 15, 2024, the Aspen-Golden Lines installed along Belmont Park B could affect hospital helicopter operations due to the structure heights and proximity to the helipad. In contrast, Belmont Park A would not impact hospital helicopter operations given its greater distance, but Inova Loudoun Hospital requested the use of air navigation obstruction markings (e.g., marker balls) to increase

visibility of the transmission lines in this area. Dominion will coordinate with Inova Loudoun Hospital regarding the requested visual obstruction markers.

Since the FAA manages air traffic in the United States, it evaluates any physical objects that may affect the safety of aeronautical operations through an obstruction evaluation. It is anticipated that regardless of the route variations selected for the Project, submittal of FAA Form 7460-1, Notice of Proposed Construction or Alteration, would be required pursuant to 14 CFR Part 77.9. Submittal of this notice would take place during the permitting phase of the Project.

6.2 Natural Resources

6.2.1 Surface Waters

ERM identified and mapped watersheds, wetlands, and waterbodies (e.g., lakes, streams, ponds, stormwater features) in the study area using publicly available sources, including:

- Recent aerial imagery, taken in spring of 2023 (Loudoun County 2023)
- Google Earth Aerial Imagery (Google LLC 2022)
- USGS 10-meter Digital Elevation Model (USGS 2022)
- ESRI World Topographic Map, multiple scales (ESRI et al. 2023)
- NWI maps from the USFWS online data mapping portal (USFWS 2021)
- The National Hydrography Dataset (NHD) Plus High Resolution (USGS 2023)
- Soils data from the U.S. Department of Agriculture-Natural Resources Conservation Service Soil Survey Geographic Database (USDA-NRCS 2023)

For reference, an overview map illustrating the locations of NWI-mapped wetlands, NHD-mapped waterbodies, and watershed boundaries in the study area is provided as Figure 6.2.1-1.

6.2.1.1 Watersheds

Watersheds are used to define the geographic area within the boundaries of drainage divides throughout the country. For purposes of classifying watersheds, the United States is divided into hydrologic units in four levels—regions, subregions, accounting units, and cataloging units—which may contain an entire or part of a watershed. Each level is identified by a hydrologic unit code (HUC). The first level, HUC 2-digit, is a major geographic area or region containing several rivers or the drainage area of a major river. Subsequent levels encompass progressively smaller areas based on the drainage divides of lower order waterbodies.

The study area is within the following HUC areas:

- The Mid-Atlantic HUC 2-digit (02) region, which discharges into the Atlantic Ocean, Long Island Sound, and the Riviere Richelieu, a tributary of the St. Lawrence River,
- The Potomac HUC 4-digit (0207) subregion, which drains about 14,600 square miles within the Potomac River basin, including Washington D.C., Maryland, Pennsylvania, Virginia, and West Virginia, and
- The Middle Potomac-Catoctin (02070008) HUC 8-digit watershed, which drains about 1,210 square miles into the Potomac River (USGS 2019).

The study area is further split into smaller HUC 10-digit watersheds: the Lower Goose Creek (0207000807) and the Broad Run-Potomac River (0207000809) watersheds. The proposed Aspen

Substation, approximately 3.0 miles of Route 1, approximately 370 feet of Belmont Park A, and about 300 feet of Belmont Park B are within the Lower Goose Creek HUC 10-digit watershed. Within the study area, this HUC contains intermittent and perennial tributaries to Sycolin Creek and Goose Creek, which are both perennial streams at this point in the watershed, and flow southwest to northeast across the study area, eventually converging with the Potomac River. The remainder of Route 1 and the Variations are within the Broad Run-Potomac River HUC 10-digit watershed. Within this HUC, Beaverdam Run, a perennial stream, flows northeast across the study area. Additionally, Broad Run, a perennial stream, generally flows south to north through the study area, along with Russell Branch and Cabin Branch, both perennial streams, and other unnamed, intermittent tributaries that generally flow into these waterbodies.

6.2.1.2 Wetlands

Wetland acreages and Cowardin classifications within the rights-of-way for the Project routes are based on ERM's desktop wetland and waterbody probability analysis described in the Wetland and Waterbody Desktop Summary, attached as Appendix D. Wetlands have been classified based on the classification system defined by Cowardin, et al. (1979) as:

- Palustrine Emergent (PEM)—wetlands characterized by erect, rooted, herbaceous hydrophytes (i.e., aquatic plants) and woody species less than 3 feet in height, excluding mosses and lichens;
- Palustrine Scrub-Shrub (PSS)—wetlands characterized by woody vegetation, excluding woody vines, approximately 3 to 20 feet in height;
- Palustrine Forested (PFO)—wetlands characterized by woody vegetation, excluding woody vines, approximately 20 feet or more in height and 3 in. or larger diameter at breast height (DBH);
- Palustrine Unconsolidated Bottom (PUB)—wetlands characterized by bottom substrate particles smaller than stones (less than 10 inches) covering greater than 25 percent of the area, with plants covering less than 30 percent of the area; and
- Riverine—wetlands within a channel, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergent, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts in excess of 0.5%. (USFWS 2013).

Wetlands provide a wide range of ecological functions, including flood storage and groundwater recharge, nutrient and sediment capture, erosion control, filtration of pollutants from adjacent waterbodies, and diverse fish and wildlife habitat. PFO wetlands are of especially high value because of their habitat biodiversity and carbon sequestration functions, as well as their increased filtration capabilities (Wetland Forest Initiative Undated; USDA 2007).

Most wetlands in the study area are adjacent to, or contiguous with, rivers, streams, and associated tributaries regulated by the USACE and Virginia Department of Environmental Quality (VDEQ) under Sections 404 and 401 of the Clean Water Act (CWA), respectively. Wetlands within the study area are generally associated with the tributaries on the east side of the study area. Surface flow within these wetlands generally drains to the north within the Goose Creek watershed and to the northeast within the Broad Run-Potomac River watershed.

ERM did not conduct an onsite delineation of wetlands or waterbodies along the routes, however, field delineations were completed by external parties in association with unrelated projects along parts of Route 1 and Broad Run Variation B.

A field delineation of wetlands and waterbodies was completed by Wetland Studies and Solutions Inc. in September 2020 and revised in January 2023 along Route 1 between MPs 2.0 and 2.8, southeast of the intersection of Belmont Ridge Road and Rt. 7 (USACE 2023). This field delineation of wetlands and waterbodies was approved by the USACE in an Approved Jurisdictional Determination in April 2023,

attached as Appendix E (Permit # NAO-2020-02065) (USACE 2023). Another field delineation of wetlands and waterbodies was conducted on behalf of Loudoun Water in 2013 in connection with a floodplain development permit (issued in 2016) and includes areas between MPs 0.3 and 1.0 of Broad Run Variation B. The boundaries of these field delineated wetlands and waterbodies were used in the desktop wetland delineation in these locations and are included in the wetland and waterbody numbers provided in this report.

Calculated acres of wetlands identified based on the probability analysis described in the Wetland and Waterbody Desktop Summary (attached as Appendix D) as having high, medium-high, or medium probability along each route and route variation are provided in Table 6.2-1.[22]

Table 6.2-1: High, Medium-high, and Medium Probability Wetlands along Route 1 and Variations

Route	Route 1[a]	Belmont Park Variation A	Belmont Park Variation B	Broad Run Variation A	Broad Run Variation B
Wetlands (total acres)	16.5	0.8	2.5	6.6	13.9
PFO Wetlands (acres)	6.5	0.7	1.8	5.3	10.3
PEM Wetlands (acres)	4.9	0.2	0.7	1.0	2.7
PSS Wetlands (acres)	1.6	0.0	0.0	0.0	0.0
PUB Wetlands (acres)	2.3	0.0	0.0	0.0	0.4
Riverine Wetlands (acres)	1.3	0.0	0.0	0.4	0.4

[a] *Includes Aspen-Goose Creek Line, Line Loop, and Aspen and Golden Substations*

Route 1

Route 1 right-of-way encompasses approximately 16.5 acres of wetlands, including 6.5 acres of PFO, 1.6 acres of PSS, 4.9 acres of PEM, 2.3 acres of PUB, and 1.3 acres of riverine wetlands. Larger areas of wetlands along each route are described in the subsections below:

- PFO and PUB wetlands between MPs 0.0 and 0.3
- PFO, PSS, and PEM wetlands associated with an unnamed tributary to Lower Goose Creek between MPs 2.0 and 2.1, MPs 2.3 and 2.4, and at approximate MP 2.7
- PFO wetlands between MPs 3.5 and 3.6
- PSS and PEM wetlands between MPs 3.8 and 4.0
- PFO wetlands associated with an unnamed tributary to Russell Branch at approximate MP 4.2
- PFO, PEM, and PUB, wetlands between MPs 4.3 and 4.8 and between MPs 4.9 and 5.2
- PFO and PUB wetlands associated with an unnamed tributary to Broad Run between MPs 5.8 and 6.2
- PFO wetlands associated with an unnamed tributary to Russell Branch and Russell Branch itself between MPs 6.3 and 6.5

[22] Wetland acreages have been rounded to the tenths place; as a result, the totals may not reflect the sum of the addends.

Belmont Park Variation A

The Belmont Park Variation A right-of-way encompasses approximately 0.8 acre of wetlands, including 0.7 acre of PFO and 0.2 acre of PEM, with larger areas of wetlands at the following locations:

- PEM wetlands at approximate MP 3.2
- PFO wetlands between MPs 3.4 and 3.5

Belmont Park Variation B

The Belmont Park Variation B right-of-way encompasses approximately 2.5 acres of wetlands, including 1.8 acres of PFO and 0.7 acre of PEM, with larger areas of wetlands at these locations:

- PFO and PEM wetlands between MPs 0.1 and 0.2 and at approximate MP 0.5
- PEM wetlands at approximate MPs 0.3 and 0.4

Broad Run Variation A

The Broad Run Variation A right-of-way encompasses approximately 6.6 acres of wetlands, including 5.3 acres of PFO, 1.0 acre of PEM, less than 0.1 acre of PUB, and 0.4 acre of riverine wetlands, with larger areas of wetlands in the following places:

- PFO, PEM, and PUB wetlands associated with perennial Beaverdam Run between MPs 6.8 and 6.9
- PEM wetlands associated with an unnamed tributary to Broad Run between MPs 7.7 and 7.8
- PFO and PEM wetlands associated with an unnamed tributary to Broad Run between MPs 8.0 and 8.5
- PFO and riverine wetlands associated with an unnamed tributary to Broad Run between MPs 8.6 and 8.7
- PEM wetlands between MPs 8.9 and 9.0

Broad Run Variation B

The Broad Run Variation B right-of-way encompasses approximately 13.9 acres of wetlands, including 10.3 acres of PFO, 2.7 acres of PEM, 0.4 acre of PUB, and 0.4 acre of riverine wetlands, with larger areas of wetlands in these places:

- PFO, PEM, and PUB wetlands associated with Beaverdam Run between MPs 0 and 0.1
- PFO and riverine wetlands between MPs 0.4 and 1.2
- PFO and PEM wetlands associated with perennial Broad Run between MPs 1.2 and 1.8
- PFO and PEM wetlands associated with perennial Cabin Branch between MPs 2.0 and 2.2
- PEM wetlands between MPs 2.2 and 2.3

Impact Assessment

To minimize impacts on wetland areas, the Project has been designed to span or avoid wetlands, keeping transmission structures outside of wetland boundaries to the extent practicable. The majority of potential direct impacts on wetlands due to Project construction would be temporary in nature. Temporary timber matting would be used for construction equipment to travel over wetlands, as appropriate. Due to the absence of an existing right-of-way, some new access roads may be necessary along the route (though we note that most of the Route 1 and the route variations are along or proximate to existing roads). If a

section of line cannot be accessed from existing roads, Dominion 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 preexisting conditions.

Permanent direct impacts to wetlands would be limited to placement of structures within wetlands if unavoidable and the permanent conversion of PSS/PFO wetlands within the right-of-way to PSS or PEM type wetlands. Where tree clearing is required within the new right-of-way, PFO and PSS wetlands would be permanently converted to PSS or PEM wetland types. Forested wetlands and riparian buffers provide functions such as peak flood flow reduction, nutrient and sediment capture, filtration of pollutants to adjacent waterbodies, and habitat diversity. The conversion of forested wetlands would reduce or eliminate some of these functions.

Where the removal of trees or shrubby vegetation occurs within wetlands, Dominion 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.

No change in contours of wetlands and waterbodies, or redirection of the flow of water, is anticipated and the amount of spoil from foundation and structure placement would be minimal. Excess spoil in wetlands generated through foundation construction would be controlled through construction best management practices (e.g., the implementation erosion and sediment controls).

Upon SCC approval of a route and final line engineering, Dominion will obtain the appropriate permits from the USACE and VDEQ for work within wetlands and waterbodies to ensure full compliance with Section 404 and 401 of the CWA and minimize potential impacts on aquatic resources within the approved transmission line corridor.

6.2.1.3 Waterbodies

ERM identified and mapped waterbodies, including streams, rivers, and other open waterbody features (e.g., reservoirs, lakes, impoundments, ponds, and stormwater features) within the study area using the publicly available GIS databases identified above and the field delineation completed by Wetland Studies and Solutions Inc. between MPs 2.0 and 2.8 of Route 1 (USACE 2022). Waterbodies crossings are regulated by the USACE and VDEQ under Sections 404 and 401 of the CWA and the Virginia Water Protection permit program. No navigable waters are crossed by the routes; therefore, no Rivers and Harbors Act Section 10 authorization from the USACE would be required for the Project.

Named waterbodies crossed by Route 1 and the Variations include the perennial Goose Creek (Route 1), Russell Branch (Route 1), Beaverdam Run (Broad Run A and B), Broad Run (Broad Run A and B), and Cabin Branch (Broad Run B), as well as unnamed perennial and intermittent tributaries and open waterbody features. Waterbody counts are shown in Table 6.2-2 with the locations of crossings described for each route below. For reference, a general location map illustrating waterbodies crossed by each route is provided in ERM's Wetland and Waterbody Desktop Summary, provided as Appendix D.

Table 6.2-2: Waterbodies along Route 1 and Route Variations

Route	Route 1[a]	Belmont Park Variation A	Belmont Park Variation B	Broad Run Variation A	Broad Run Variation B
Waterbodies (total)	32	0	0	5	6
NHD-Mapped Perennial Waterbodies	4	0	0	2	3

Route	Route 1[a]	Belmont Park Variation A	Belmont Park Variation B	Broad Run Variation A	Broad Run Variation B
NHD-Mapped Intermittent Waterbodies	12	0	0	2	2
Non-NHD Mapped Waterbodies [b]	16	0	0	1	1

[a] *Includes Aspen-Goose Creek Line, Line Loop, and Aspen and Golden Substations*
[b] *Identified via aerial imagery during desktop analysis using recent (2023) aerial imagery.*

Route 1

Route 1 crosses 32 waterbodies, of which 16 are NHD-mapped, including 3 perennial waterbodies (Sycolin Creek, Goose Creek, and Russell Branch), 12 unnamed, intermittent streams, and one lake/pond. The 16 unmapped waterbodies include 11 open waterbodies that appear to be stormwater control features and 5 unnamed, unclassified streams identified within the right-of-way using recent aerial imagery (Planet Imagery, 2023). Based on ERM's desktop wetland and waterbody analysis, the right-of-way for Route 1 would encompass approximately 1.3 acres of riverine and 2.3 acres of PUB wetlands. Waterbody crossing locations are summarized below:

- A lake/pond at approximate MP 0.0
- An open waterbody feature between MPs 0.2 and 0.3
- The perennial Sycolin Creek between MPs 0.7 and 0.8
- The perennial Goose Creek at approximate MP 0.9 and unnamed, intermittent tributaries to Goose Creek at approximate MPs 1.0, 1.2, and 1.3, between MPs 2.0 and 2.1 and MPs 2.3 and 2.4, and at approximate MP 2.7
- An unnamed, intermittent tributary to Russell Branch at approximate MP 4.2
- Open waterbody features between MPs 4.3 and 4.4 and MPs 4.5 and 4.7, and at MP 5.0
- An unnamed, intermittent tributary to Broad Run between MPs 5.8 and 5.9
- Open waterbody features between MPs 5.9 and 6.1
- Perennial Russell Branch and unnamed, intermittent tributaries to Russell Branch and Goose Creek between MPs 6.3 and 6.5
- An unnamed, intermittent tributary to Russell Branch at approximate MP 9.1 and within the proposed Golden Substation footprint

Belmont Park Route Variations

Based on ERM's desktop wetland and waterbody analysis, the Belmont Park Variations do not cross any NHD-mapped or unmapped waterbodies.

Broad Run Variation A

Broad Run A crosses 5 waterbodies, of which 4 are NHD-mapped waterbodies, including 2 perennial streams (Beaverdam Run and Broad Run) and 2 unnamed intermittent tributaries to Broad Run. One unmapped open waterbody feature was identified within the right-of-way using recent aerial imagery (Planet Imagery, 2023). Based on ERM's desktop wetland and waterbody analysis, the Broad Run A right-of-way would encompass approximately 0.4 acre of riverine and less than 0.1 acre of PUB wetlands. Waterbody crossing locations are summarized below:

- An open waterbody feature at approximate MP 6.8
- The perennial Beaverdam Run between MPs 6.8 and 6.9
- The perennial Broad Run at approximate MP 8.4 and unnamed, intermittent tributaries to Broad Run at approximate MP 8.0 and between MPs 8.6 and 8.7

Broad Run Variation B

Broad Run B crosses 6 waterbodies, of which 3 are NHD-mapped perennial streams (Beaverdam Run, Broad Run, and Cabin Branch) and 2 are NHD-mapped unnamed intermittent tributaries to Broad Run. ERM additionally identified one unmapped open waterbody feature within the right-of-way using recent aerial imagery (Planet Imagery, 2023). Based on ERM's desktop wetland and waterbody analysis, the Broad Run A right-of-way would encompass approximately 0.4 acre of riverine and 0.4 acre of PUB wetlands. Waterbody crossing locations are summarized below:

- The perennial Beaverdam Run at approximate MP 0.1
- An unnamed, intermittent tributary to Broad Run between MPs 0.5 and 0.6
- The perennial Broad Run between MPs 1.2 and 1.3, and two unnamed, intermittent tributaries to Broad Run at approximate MPs 1.1 and MP 1.5
- The perennial Cabin Branch at approximate MP 2.2

Impact Assessment

Waterbodies crossed by the routes would be spanned, with permanent impacts to waterbodies limited to riparian buffer transition from tree cover to herbaceous vegetation within the maintained right-of-way. Tree removal adjacent to waterbodies would reduce riparian buffer functions such as stream bank stabilization and erosion control, nutrient and sediment filtration, floodwater storage and peak flow reduction, and water temperature changes due to loss of shading. The right-of-way would be maintained with a cover of herbaceous vegetation during operations, which would provide some filtration and stabilization to protect waterbodies from runoff.

Where removal 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 would use sediment barriers along waterways and steep slopes during construction to protect waterways from soil erosion and sedimentation.

Temporary, minor impacts on water quality could occur during construction from disturbed soils transported by storm water entering into adjacent surface waters during rain events. Increased turbidity and localized sedimentation of stream bottoms may occur as a result of runoff. Potential impacts would be mitigated by the implementation of erosion control measures.

Waterways crossed by the Project would be maintained for proper drainage using culverts or other crossing devices in accordance with Dominion's standard policies. If a section of line cannot be accessed from existing roads, Dominion may need to install a culvert or temporary bridge to cross small streams. In such cases, temporary fill may be required. Fill would be placed on erosion control fabric and removed when work is completed, returning the surface to original contours.

Upon SCC approval of a route and final line engineering, Dominion will obtain the appropriate permits from the USACE and VDEQ for work within wetlands and waterbodies to ensure full compliance with Section 404 and 401 of the CWA and minimize potential impacts on aquatic resources within the approved transmission line corridor.

6.2.2 Areas of Ecological Significance

ERM reviewed available ecological datasets for the area within a 1-mile buffer around the right-of-way for each route. ERM also consulted the VDCR's Natural Heritage Program (NHP) (VDCR 2024a) and requested a formal review of the routes from the VDCR to identify areas of ecological significance along and near the alternative routes, including natural area preserves, conservation sites, stream conservation units (SCUs), ecological cores, and general location areas for natural heritage resources. These areas collectively delineate habitats containing rare, threatened, or endangered plants and animals, unique or exemplary natural communities, and/or significant geologic formations.

The VDCR responded to Dominion's request for formal review of the routes in a letter dated September 21, 2023 (attached as Appendix F). Based on that response and research conducted by ERM, no natural area preserves are present, and no state-listed insects are expected to be present along the routes. Due to these findings, no further discussion of these resource types is provided in this study. Areas of ecological significance that are present along the routes include SCUs, conservation sites, ecological cores, and general location areas for natural heritage resources. General descriptions of these areas are provided below.

- SCUs were identified (when present) up to two miles upstream and one mile downstream of the Project area. 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. The units can be used to identify land management needs, protection priorities, and potential conflicts with development activities.
- Conservation sites identify a planning boundary delineating the NHP's 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 long-term survival of these resources. The size and dimensions of a conservation site 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. Conservation sites do not necessarily preclude human activities, but a site's viability may be greatly influenced by human activities. Conservation sites may require ecological management, such as invasive species control or water management, to maintain or enhance their viability. Each conservation site is given a biodiversity significance ranking based on rarity, quality, and number of natural heritage resources it contains.
- Ecological cores are areas of at least 100 acres of continuous interior, natural cover that provide habitat for a wide range of species, from interior-dependent forest species to habitat generalists, as well as species that use marsh, dune, and beach habitats. Interior ecological core areas begin 100 meters inside the nearest core edges and continue to the deepest parts of the ecological core. Ecological cores also provide natural and economic benefits of open space, recreation, water quality (including drinking water recharge and protection, and erosion prevention), and air quality (including carbon sequestration and oxygen production). Ecological cores are ranked from C1 to C5 (C5 being the least significant) using nine prioritization criteria, including the habitats of the natural heritage resources the cores contain.
- General location areas for natural heritage resources represent the approximate locations of documented natural heritage resource occurrences that were not incorporated into Conservation sites, 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 the 100-foot buffer, are included in the screening coverage 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.

6.2.2.1 Conservation Sites

Ashburn Quarry Conservation Site

The Ashburn Quarry Conservation Site consists of approximately 280.5 acres of quarry land with a conservation rating of B5, indicating a site of general interest or open space significance. Quarries can resemble natural cliff surfaces and act as habitat for certain species. The natural heritage resource associated with this site is the Peregrine falcon (*Falco peregrinus*), which is currently state-listed as threatened and federally protected under the Migratory Bird Treaty Act, which makes it unlawful to "take, kill, possess, transport, or import migratory birds, or their eggs, parts, or nests" without a federal permit from the USFWS (16 U.S.C. §703). Intentional take is considered to be direct and affirmative purposeful actions that reduce migratory birds, their eggs, or their nests. Peregrine falcon nests naturally exist on cliffs, bluffs, talus slopes, old tree hollows, and abandoned nests of other birds of prey. The Ashburn Quarry has created a habitat that resembles this natural environment for the Peregrine falcon (VDCR 2024b). This site is an active quarry called the Leesburg Plant and owned by Luck Stone Corporation. In 2019, a pair of nesting falcons were first observed in the quarry, where they raised four eyasses (i.e., chicks) (Booth 2020). The following year, the Center for Conservation Biology (CCB) released a report identifying breeding adults in Virginia, and the presence of the Ashburn Quarry breeding pair and four additional eyasses were confirmed in 2020 (Watts 2020). The placement of the routes relative to the Ashburn Quarry Conservation Site is depicted on Figure 6.2.2-1.

For Peregrine falcons in Virginia, nesting typically begins in March, following a period of courtship. The falcons build their nests in a depression scraped in substrate such as dirt, sand, or fine gravel. Nests can be reused multiple times over the course of many breeding seasons (VDWR 2024e). The breeding season concludes when the young leave the nests, typically in June.

Route 1 would cross the northern boundary of the Ashburn Quarry Conservation Site from approximate MPs 0.9 to 1.0, encompassing about 0.4 acre of the site.. The portion of the conservation site crossed by Route 1 consists of mostly forest with a short segment of an access road.

Murray's Ford Conservation Site

The Murray's Ford Conservation Site encompasses approximately 35.6 acres of land with a conservation rating of B2 indicating a site of very high significance. The natural heritage resource associated with this site is the Piedmont Mafic Barren, which consists of small-patch communities of sparse woodlands, scrub, and herbaceous vegetation. The communicates can exist up to 3,200 feet in elevation, with most recorded communities occurring on mafic outcrops, including diabase outcrops. These communities have a high level of vascular plant cover growing among the exposed bedrock and organic soils. The communities are easily destroyed and overrun with invasive weeds by foot traffic near popular trails. The placement of the routes relative to the site is depicted on Figure 6.2.2-1.

The conservation site resides on a commercial property that is partially developed. Approximately 4.8 acres of the site have been disturbed by clearing for development or access roads. The access roads bisect the site resulting in habitat fragmentation.

Impact Assessment

No impacts are anticipated due to the minor crossing of the Ashburn Quarry Conservation Site by Route 1, which avoids fragmentation of the site by crossing its northern boundary of the site for about 0.1 mile, encompassing approximately 0.4 acre. Because Route 1 is on the periphery of the site, it avoids the

steep slopes of the quarry utilized by the Peregrine falcon. Therefore, no impacts are anticipated for any potential Peregrine falcon nests.

The existence of transmission lines has caused many migratory bird deaths – collisions with electric lines kill up to 175 million birds annually, and electrocution from lines kills up to hundreds of thousands more Manville 2005). Few electrocution records exist for the Peregrine falcon, however, and according to the data, Peregrine falcon electrocutions are rare (Avian Power Line Interaction Committee 2006).

To mitigate any impacts, VDCR recommends limiting disturbances to periods outside of the breeding season, when the species is most vulnerable to human disturbance, and coordinating with the Virginia Department of Wildlife Resources (VDWR) to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

No routes cross Murray's Ford Conservation Site. Route 1 at about MP 0.0 is the closest, lying approximately 1.9 miles north of the site. Given this distance, no impacts are anticipated to the conservation site or natural heritage resource (Piedmont Mafic Barren) it contains.

6.2.2.2 Stream Conservation Units

The Broad Run – Route 607 SCU has a biodiversity ranking of B5, which represents a site of general interest or open space significance. The location of this SCU within the study area is depicted on Figure 6.2.2-2. The natural heritage resource associated with this site is the Yellow lampmussel (*Lampsilis cariosa*), which is neither federally listed nor state-listed, but it is classified as Tier II in the VA Wildlife Action Plan, indicating a very high conservation need for the species. The Yellow lampmussel inhabits the Roanoke, Chowan, James, York, and Potomac drainages. It occurs in sand and gravel substrates within larger streams or rivers and in small creeks and ponds (VDCR 2024b).

Impact Assessment

None of the routes cross the Broad Run – Route 607 SCU. Broad Run Variations A and B intersect the main stem of Broad Run, while Route 1 and these variations cross several of its tributaries, but the SCU begins at a segment of Broad Run that is 0.5 mile south of Broad Run Variation A (at about MP 8.5) and 0.6 mile west of the Golden Substation. Although Broad Run Variations A and B cross the main stem of Broad Run upstream from the SCU, it is unlikely that the SCU would be impacted. No instream work would be performed; therefore, it is unlikely that construction or right-of-way maintenance along the routes would have an impact on the Yellow lampmussel with adherence to applicable state/local erosion and sediment control requirements and stormwater management laws and regulations.

6.2.2.3 Ecological Cores

Route 1 and Broad Run Variations A and B cross multiple ecological core units identified by the VDCR. The VDCR ranking system for the integrity of ecological cores includes the following categories:

- Rank C1—Outstanding
- Rank C2—Very High
- Rank C3—High
- Rank C4—Moderate
- Rank C5—General

Larger and more biologically diverse core areas have higher rankings. Ecological integrity is enhanced if the core is part of a larger complex of natural lands or if the core contributes to water quality

enhancement. Ecological cores in the two highest categories (i.e., C1 and C2) are connected by landscape corridors creating a statewide network of natural lands.

Route 1

Three crossings of ecological cores occur along Route 1. For each crossing, Table 6.2-3 provides the core unit identification number, VDCR rank, size, location, starting and ending MPs for the crossing, and a description of each core's condition based on ERM's observations of aerial photography for each crossing.

Table 6.2-3: Ecological Cores Crossed by Route 1

Ecological Core ID	Ecological Core Rank	Total Core Acres	Location	Milepost (Start)	Milepost (End)	Condition	Miles Crossed	Acres Crossed
31054	5-General	64	South of Cochran Mill Road, west of Goose Glen Lane, adjacent to the northeast boundary of the Washington and Old Dominion Trail	0.6	0.9	Mostly forested, approximately 6.4 acres on northwest corner has been cleared, and core is fragmented by a distribution line	0.3	4.7
30885	4-Moderate	182	West of Belmont Ridge Road, east of Goose Creek, south of Rt. 7, north of Goose Glen Lane	1.4	2.0	Aerial imagery indicates that the core was altered between June 2022 and the Spring of 2023 due to clear cutting of approximately 26.3 acres	0.6	9.8
30975	5-General	44	South of Rt. 7, east of Freedom Trail Road, north of Saratoga Springs Place, west of Ridge Road	2.1	2.5	Mostly unfragmented forest; unmarked trail intersects the southern portion of the core	0.3	4.1

Belmont Park Variations A & B

No ecological cores are crossed by Belmont Park Variation A or B.

Broad Run Variation A

One crossing of an ecological core occurs along Broad Run Variation A. Table 6.2-4 provides the core unit identification number, VDCR rank, size, location, starting and ending MPs for the crossing, and a description of the core condition based on ERM's observations of aerial photography.

Table 6.2-4: Ecological Cores Crossed by Broad Run Variation A

Ecological Core ID	Ecological Core Rank	Acres	Location	Milepost (Start)	Milepost (End)	Condition	Miles Crossed	Acres Crossed
32138	5-General	93	East of Loudoun County Parkway, south of Gloucester Parkway, west of Pacific Boulevard, and north of the Washington and Old Dominion Trail	8.2	8.5	Forested area fragmented by access roads and three existing Dominion transmission lines (Lines #2143, #2150, and #2165)	0.2	4.1

Broad Run Variation B

Two crossings of ecological cores occur along Broad Run Variation B. For each crossing, Table 6.2-5 provides the core unit identification number, VDCR rank, size, location, starting and ending MPs for the crossing, and a description of each core's condition based on ERM's observations of aerial photography.

Table 6.2-5: Ecological Cores Crossed by Aspen to Golden Broad Run Variation B

Ecological Core ID	Ecological Core Rank	Acres	Location	Milepost (Start)	Milepost (End)	Condition	Miles Crossed	Acres Crossed
31766	5-General	216	East of Loudoun County Parkway, north of Gloucester Parkway, west of Pacific Boulevard, northeast of the Loudoun Water facilities	0.2	1.3	Forested area partially fragmented by distribution lines; contains Broad Run	1.0	11.9
32138	5-General	93	East of Loudoun County Parkway, south of Gloucester Parkway, west of Pacific Boulevard, and north of the Washington and Old Dominion Trail	1.7	1.8	Forested area fragmented by access roads and three existing Dominion transmission lines (Lines #2143, #2150, and #2165)	0.1	1.3

Impact Assessment

Route 1 and Broad Run Variations A and B are the only Aspen-Golden Lines routes to cross ecological cores identified in the VDCR letter dated September 21, 2023 (VDCR 2024b). Tables 6.2-1, 6.2-2, and 6.2-3 summarize the impact on cores for each route, while Figure 6.2.2-3 depicts the location of the cores relative to the routes. According to the VDCR, impacts on ecological cores occur when their natural cover is partially or completely converted to developed land uses. Habitat conversion can result in changes that reduce ecosystem processes, biodiversity, population viability, and habitat quality (VDCR 2024b). Impacts on ecological cores from the Project would result from tree clearing for the new Project right-of-way.

Route 1 crosses three ecological cores, with two cores having VDCR rankings of C5 and one having a VDCR ranking of C4, with a combined crossing length of approximately 1.2 miles, and a right-of-way footprint of about 18.6 acres of land. Route 1 briefly collocates with and crosses an existing Dominion distribution line through Core 31054 for approximate 0.2 mile (17 percent of the core crossing length). It additionally is worth noting that Cores 31054 and 30975 do not meet the minimum area requirement for an ecological core (100 acres) based on the VDCR's definition, as these cores measure 64 acres and 44 acres in area, respectively (VDCR 2024b). Each crossing would bisect the cores, reducing the extent and character of the vegetation it contains.

Broad Run Variation A crosses one ecological core with a VDCR ranking of C5, with a crossing length of approximately 0.2 mile and a right-of-way footprint of about 4.1 acres. For the entire length of the core crossing, the route variation collocates with the existing W&OD Trail corridor, which borders but does not intersect Core 32138. The crossing does not bisect the core, as the route spans its southwestern boundary. Although the core covers a mostly forested area, it encompasses 93 acres and therefore does not meet the minimum area requirement for an ecological core (100 acres) based on the VDCR's definition.

Broad Run Variation B crosses two ecological cores, each having VDCR rankings of C5, with a combined crossing length of approximately 1.1 miles, and a right-of-way footprint of about 13.1 acres. Broad Run Variation B would collocate with an existing utility right-of-way for 0.7 mile (64 percent of total core crossing length) within Core 31766, but the crossing would bisect the core, reducing the extent and character of its vegetation. The crossing would not bisect Core 32138 as the route spans the eastern boundary of the core. Additionally, as mentioned previously, Core 32138 is 93 acres, which does not meet the VDCR's minimum area requirement of 100 acres for a core.

6.2.3 Protected Species

To protect and recover imperiled species and the ecosystems they depend on, Congress passed the federal Endangered Species Act (ESA) in 1973, 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 USFWS. 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 of the species, including their parts and products, unless federally permitted.

To 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 Sections 29.1 563–29.1 570) designates VDWR as the state agency with jurisdiction over state listed endangered or threatened fish and wildlife. The Virginia Endangered Species Act authorizes the Board of the VDWR to adopt the federal list of endangered and threatened species and to identify and protect state listed wildlife. The Virginia Endangered Species 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 impacts on these species.

ERM identified protected species along and near the Project facilities using the following sources:

- USFWS Information for Planning and Consultation System (IPaC) online system (USFWS 2024)
- VDCR NHP (VDCR 2024a)
- VDWR Wildlife Environmental Review Map Service (WERMS) (VDWR 2024a)
- Virginia Fish and Wildlife Information Service (VaFWIS) (VDWR 2024b)
- CCB Eagle Nest Locator (CCB 2022)
- VDWR Little Brown Bat and Tricolored Bat Winter Habitat and Roost Tree Application (VDWR 2024c)
- VDWR Northern Long-Eared Bat (NLEB) Winter Habitat & Roost Tree Application (VDWR 2024d)

ERM obtained query results from the VDCR NHP, the VDWR VaFWIS, the VDWR WERMS, and the USFWS IPaC to identify federal- and state-listed species that may occur within the study area. Digital data were obtained from the VDCR to identify locations within the rights-of-way of the routes and substations that potentially support protected species. Query results from the VDCR include species known to occur in the area and communities known to historically or currently contain protected species (VDCR 2024b). Query results from USFWS IPaC include species that may occur in the study area (USFWS 2024). Query results from VaFWIS include species known to occur or likely to occur within a 3.9-mile radius from the geographic center of the Project routes (VDWR 2024b). Data for species known to occur within the routes were retrieved using queries of the VDWR WERMS.

The VDCR's element occurrence representations are mapped representations of plants, animals, and exemplary natural communities, which are tracked by the VDCR NHP due to their rarity. Each occurrence is represented by a polygon indicating its known location. The polygons are intended to indicate the full known aerial extent of the occurrence, modified to account for the locational uncertainty of the source data. VDWR's Species Observation dataset includes all verified species documentations maintained by the VDWR.

6.2.3.1 Federal- and State-Listed Endangered and Threatened Species

Database queries identified multiple federal- and state-listed threatened and endangered (T&E) species within and adjacent to the study area. Federal-listed species (each of which are also state-listed) consist of the NLEB (*Myotis septentrionalis*) and Dwarf wedgemussel (*Alasmidonta heterodon*). There are six state-listed species identified by queries that have not been federally listed, including: the Wood turtle (*Glyptemys insculpta*), Henslow's sparrow (*Ammodramus henslowii*), Peregrine falcon (*Falco peregrinus*), Torrey's mountain mint (*Pycnanthemum torreyi*), Tricolored bat (*Perimyotis subflavus*), and Green floater (*Lasmigona subviridis*). Federal-listing of the Tricolored bat and Green floater has been proposed, but neither species has been listed. Each federal- and state-listed species was reviewed for potential of occurrence within and adjacent to the route, route variations, and substation sites. Information on the federal- and state-listed species is provided in Table 6.2-6.

Table 6.2-6: Potential Federal- and State-Listed Species in the Project Area

Common Name	Scientific Name	Status	Global Rank	Habitat	Potential Route Occurrence	Source
Mammals						
Northern long-eared bat	*Myotis septentrionalis*	FE, ST	G2	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.	All	IPaC VDWR—Winter Habitat and Roost Tree Map
Tricolored bat	*Perimyotis subflavus*	FPE, SE	G3	Typically roosts in trees near forest edges during summer. Hibernates deep in caves or mines in areas with warm, stable temperatures during winter.	All	IPaC VDWR—Winter Habitat and Roost Tree Map
Invertebrates						
Dwarf wedgemussel	*Alasmidonta heterodon*	FE, SE	G1	Large rivers and small streams, often burrowed into clay banks among the root systems of trees; also associated with mixed substrates of cobble, gravel, and sand.	All	IPaC
Green floater	*Lasmigona subviridis*	FPT, ST	G3	Small to medium streams in quiet pools and eddies with gravel and sand substrates.	All	IPaC VaFWIS
Reptiles						
Wood turtle	*Glyptemys insculpta*	ST	G3	Forested floodplains, fields, wet meadows, and farmland with a perennial stream nearby.	All	VaFWIS
Birds						
Henslow's sparrow	*Ammodramus henslowii*	ST	G4	Open grasslands with few or no woody plants and tall dense grasses and litter layer.	All	VaFWIS

Common Name	Scientific Name	Status	Global Rank	Habitat	Potential Route Occurrence	Source
Peregrine falcon	*Falco peregrinus*	ST	G4	Nests on cliffs, bluffs, talus slopes, old tree hollows, and abandoned nests of other birds of prey.	All	VDCR
Plants						
Torrey's mountain-mint	*Pycnanthemum torreyi*	ST	G2	Dry upland forests; rocky woodlands over mafic, ultramafic, or calcareous rocks; edges of sandstone glades; dry-mesic barrens; thickets; upland meadows; and powerline rights-of-way	All	VDCR

Sources: USFWS 2024; VDCR 2024a, 2024b; VDWR 2024b, 2024c, 2024d

IPaC = Information for Planning and Consultation; VDWR = Virginia Department of Wildlife Resources; VaFWIS = Virginia Fish and Wildlife Information Service; VDCR = Virginia Department of Conservation and Recreation

Federal/State Status:

FE	*Federally listed as endangered*	*SE*	*State-listed as endangered*	*FPE*	*Federally proposed as endangered*
FT	*Federally listed as threatened*	*ST*	*State-listed as threatened*	*FPT*	*Federally proposed as threatened*

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.*

Federal-Listed Species

Two federal-listed species and two species with a federally proposed listing, each of which are also state-listed species, were identified as potentially occurring within the study area. The IPaC database identified the NLEB, Tricolored bat, and Dwarf wedgemussel, and both the VaFWIS database and IPaC database identified the Green floater.

The USFWS proposed that the Tricolored bat be listed as endangered in 2022 (USFWS 2024). The Tricolored bat can be found throughout the state and lives a relatively solitary life. The species hibernates in caves and rock shelters in mountainous areas in the winter. This bat is one of the earliest feeders in the evenings with a diet consisting of small insects (VDWR 2023b).

Potential summer foraging habitat for NLEB and Tricolored bat includes multiple forested areas along each route. However, a review of the VDWR winter habitat and roost trees online mapping system did not show winter habitat (i.e., hibernacula) or roost trees for NLEB or Tricolored bat within the Project facilities (VDWR 2024c, 2024d). In addition, the Company performed a bat survey south of the Project study area in May of 2023, and no threatened or endangered species were identified in the survey results (see Appendix F).

The Dwarf wedgemussel is described by the VDWR as a habitat “generalist” in terms of its preference for stream size, substrate, and flow conditions. This mussel species can live in a range of habitats, from small streams less than 15 feet wide, to large rivers more than 330 feet wide. It can inhabit a variety of substrate types including clay, sand, gravel, and pebble, and sometimes in silt depositional areas near banks. Dwarf wedgemussel occurrences are usually associated with hydrologically stable areas, including very shallow water along streambanks and under root mats of trees along streambanks (VDWR 2024b).

The Green floater is a species of mussel that can be found in small creeks and streams that other mussel species do not occupy. Their habitats consist of clean, fast-flowing streams and firm rubble, gravel, and sand substrates that lack siltation (VDWR 2024b).

While all four of these species were identified by either the IPaC or VaFWIS databases as having potential occurrence within the study area, the VaFWIS data show that only the Green floater has an occurrence confirmed as present within a 3.9-mile search radius due to the presence of Goose Creek within the study area. Because there have been documented occurrences of this state-listed (and proposed federal-listed) species and its habitat, Goose Creek has been classified as Threatened and Endangered Species Waters (T&E Waters). This designation classifies streams and rivers that contain documented occurrences of federal- or state-listed species and their habitat.

State-Listed Species

Eight state-listed species – the Wood turtle, Henslow’s sparrow, Peregrine falcon, Torrey’s mountain mint, NLEB, Tricolored bat, Green floater, and Dwarf wedgemussel – were identified as potentially occurring within the study area. The VaFWIS and/or WERMS data show that of the eight species, only the Wood turtle, Henslow’s sparrow, and Green floater have documented occurrences within the 3.9-mile search radius for the Project. Non-database sources also confirmed the presence of the Peregrine falcon within the study area (Watts 2020, Booth 2020).

Peregrine falcons nest on cliffs, bluffs, talus slopes, old tree hollows, and abandoned nests of other birds of prey. The existence of quarries can create nesting habitat for the species, as the quarry walls can resemble sloping cliffs (VDCR 2024b). As previously noted in Section 6.2.2, the presence of Peregrine falcons within the study area was confirmed in 2019 and 2020 (Watts 2020, Booth 2020).

Torrey’s mountain mint can generally be found in dry upland forests; rocky woodlands over mafic, ultramafic, or calcareous rocks; edges of sandstone glades; dry-mesic barrens; thickets; upland meadows; and powerline rights-of-way. In Virginia specifically, populations of this species are found in dry, rocky, deciduous woods, along roadsides, and in thickets near streams (NatureServe 2024).

Wood turtle habitat typically includes forested communities near streams used for hibernation. Suitable stream habitat for the Wood turtle includes well-oxygenated water that is free from pollutants, with streambed material composed of sand, gravel, or rock. Wood turtles are semiaquatic and leave the water in the spring to move into open grasslands, barrens, and sandy shores for nesting and foraging. The closest confirmed

documentation of the Wood turtle to the Project was identified in 2015 and borders the northeast corner of the study area, approximately 0.7 mile east of Route 1 at MP 5.8 (VDWR 2024a).

Henslow's sparrow typically forages in open habitats that lack dense forested cover; this habitat is present in multiple locations across each of the routes. According the VaFWIS database, the Virginia Breeding Bird Atlas Survey recorded the presence of the Henslow's sparrow in 1988 along the southern boundary of the study area (VDWR 2024b).

As mentioned previously, VaFWIS confirmed the presence of the Green floater within a 3.9-mile search radius of the Project due to the presence of Goose Creek, which is classified as T&E Waters.

Impact Assessment

The eight federal-listed and/or state-listed species identified as potentially occurring within the study area and/or within a 3.9-mile radius of the geographic center of the study area are identified in Table 6.2-2. There is potential habitat for all eight species along the routes, but the VDWR, VaFWIS, WERMS data, and non-database sources show that only the Green floater, Wood turtle, Henslow's sparrow, and Peregrine falcon have been confirmed within a 3.9-mile radius of the geographic center of the study area.

While no instream construction would be required for the Project, if shade is reduced along the streambank due to right-of-way clearing, the water temperature may increase, which could negatively impact the presence of the Green floater. Coordination with the VDWR may be needed to determine if surveys and/or construction timing windows are warranted for the Project to avoid impacts on this species.

Route 1 avoids the steep slopes of the quarry in the study area utilized by the Peregrine falcon, so no impacts are anticipated for any potential Peregrine falcon nests. To mitigate additional impacts, construction activities disturbing the birds should be limited to periods outside of the breeding season. Additionally, the Company will coordination with VDWR to ensure compliance with the Virginia Endangered Species Act.

While none of the routes cross the area where the Wood turtle was documented in 2015, Route 1 and the Broad Run variations span potentially suitable habitat where they cross streams and wetlands. No instream construction activities would be required, but forested floodplains may be cleared adjacent to waterbodies within the right-of-way. Coordination with the VDWR will be needed to determine if surveys and/or construction timing windows are warranted for the Project to avoid the Wood turtle.

Although suitable habitat might be present near Route 1 and the Variations, the Henslow's sparrow has not been documented in the area in the last few decades, with the last recorded occurrence approximately 1.0 mile from Route 1 near MP 9.1; therefore, it is unlikely that there would be an impact on the Henslow's sparrow.

While VDWR data show that occurrences of federal and state-listed bats have not been confirmed within a 3.9-mile radius of the geographic center of the study area, summer foraging habitat for these species is likely present within forested habitats crossed by each route. No impacts to these bat species are anticipated if trees are cleared during the winter according to VDWR time-of-year restrictions (TOYRs).

The Company is aware of and actively monitoring potential regulatory changes associated with the NLEB and how these changes could impact TOYRs. The existing interim guidance from the USFWS for the NLEB expires on March 31, 2024. The Company is also monitoring the potential for regulatory changes associated with an up-listing of the Tricolored bat. On September 14, 2022, the USFWS published a proposed rule in the Federal Register proposing to up-list the Tricolored bat to endangered, with an estimated announcement of a final decision within 12 months. Regulatory guidance on the Tricolored bat will be available upon up-listing.

Regardless of the route variations selected for the Project, Dominion will coordinate with state and federal agencies as needed to determine if surveys, construction TOYRs, or other mitigation would be required.

6.2.3.2 Bald Eagles

The Bald eagle (*Haliaeetus leucocephalus*) is no longer federally listed under the ESA, but it is a state-listed threatened species in Virginia under the Virginia Endangered Species Act and is protected under Va. Code § 29.1-521 and VDWR 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 then Virginia Department of Game and Inland Fisheries (now VDWR) provides management practices for avoiding the take of Bald eagles and outlines restrictions on construction activities within defined management zones (within 330 feet or 660 feet around a known nest). Proposed activities that have the potential to affect Bald eagles are evaluated by the agency on a case-by-case basis (Virginia Department of Game and Inland Fisheries et al. 2012).

To obtain the most current eagle nest data, ERM reviewed the CCB website (CCB 2022), 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, there is one eagle nest (Nest ID LD1901) within the study area approximately 1.1 miles southwest of Broad Run Variation A at about MP 8.5 and 1.2 miles southwest of the Golden Substation. According to the CCB, the nest was last observed to be occupied in 2023 (CCB 2022). The next closest nest (Nest ID LD0501) is approximately 5.5 miles southwest of the Aspen Substation.

The study area is not within an Eagle Concentration Area.

Impact Assessment

The VDWR provides activity-specific guidelines for work within 330-foot and 660-foot buffer zones surrounding a known Bald eagle nest. While the Project is not anticipated to affect Bald eagle nests, Dominion will work with VDWR and other appropriate jurisdictional agencies to minimize potential impacts to Bald eagle activity associated with known nests and within nest buffer zones. Moreover, if eagle nests are identified within 660 feet of the right-of-way approved by the SCC, Dominion will work with the VDWR and other appropriate jurisdictional agencies to minimize any impacts on this species.

6.2.3.3 Species of Concern

Rare Plant Species

Species of concern typically include rare plants and animals that are not afforded the same level of protection as federal- and state-listed threatened or endangered species. NatureServe, an international network of NHPs, assigns a global rank to species based on their rarity and conservation status. Species ranked "G1" (global rank 1 / critically imperiled) or "G2" (global rank 2 / imperiled) are most at risk. Based on the VDCR's September 21, 2023 letter, several rare plant species have the potential to occur in the Project area (VDCR 2024b). These species are listed in Table 6.2-7, which also provides the global and state rank and habitat description for each species.

Table 6.2-7: Rare Plant Species with the Potential to Occur in the Project Area

Common Name	Scientific Name	Status	Global Rank	State Rank	Habitat	Source
Plants						
Earleaf False Foxglove	*Agalinis auriculata*	None	G3	S1	Exposed diabase flatrock located within Triassic Basins	VDCR
American bluehearts	*Buchnera americana*	None	G5?	S1/ S2	Exposed diabase flatrock located within Triassic Basins	VDCR
Downy phlox	*Phlox pilosa*	None	G5	S1	Exposed diabase flatrock located within Triassic Basins	VDCR
Torrey's mountain-mint	*Pycnantheum torreyi*	ST	G2	S2	Exposed diabase flatrock located within Triassic Basins	VDCR
Stiff goldenrod	*Solidago rigida var. rigida*	None	G5	S2	Exposed diabase flatrock located within Triassic Basins	VDCR

Common Name	Scientific Name	Status	Global Rank	State Rank	Habitat	Source
Hairy hedgenettle	*Stachys arenicola*	None	G5	S1	Exposed diabase flatrock located within Triassic Basins	VDCR

Source: VDCR 2024b

VDCR = Virginia Department of Conservation and Recreation

Federal/State Status:

ST State listed as threatened

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.

? Denotes inexact or uncertain numeric rank; may need review.

State Rank:

S1 Critically Imperiled: At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.

S2 Imperiled: At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.

S3 Vulnerable: At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.

S4 Apparently Secure: At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.

S5 Secure: At very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.

Impact Assessment

According to the VDCR, there is potential for six rare plants to occur within the study area (VDCR 2024b). All six species are typically found within semi-open diabase glades and prairies, which are characterized by historically fire-dominated grassland vegetation on relatively nutrient-rich soils underlain by Triassic bedrock. Diabase flatrock, a dark-colored volcanic rock, is found primarily in northern Virginia counties within the geologic formation known as the Triassic Basin. Where the bedrock is exposed, a distinctive community type of drought-tolerant plants occurs. The VDCR considers diabase flatrocks to be rare natural communities threatened by earth disturbing activities. If identified, the Company will work with the appropriate regulatory agencies to minimize any impacts on listed species and/or listed habitat(s).

Route 1 would impact approximately 38.1 acres of diabase soils; however, due to the mostly forested and developed nature along the majority of this route, it is unlikely that the plant species of concern identified by the VDCR would be present. Belmont Park Variations A and B would impact 1.4 acres and 0.7 acre of diabase soils, respectively, but the majority of the land crossed by these footprints is developed or forested, so it similarly is unlikely that diabase flatrock is present along the routes. Table 6.2-8 provides a summary of diabase soil impacts.

Table 6.2-8: Diabase Soils Impacts (acres)

	Route 1*	Belmont Park Variation A	Belmont Park Variation B	Broad Run Variation A	Broad Run Variation B
Total	38.1	1.4	0.7	0.0	0.0

** Route 1 includes diabase soils impacts of the Aspen and Golden Substations, Aspen 230 kV Split and the Golden 230 kV Split, and the Line Loop.*

Great Blue Heron Rookery

The Great blue heron (*Ardea herodias*) is a migratory bird species native to North America. A nesting site ("rookery") for the species has been found near Route 1 and Broad Run Variations A and B. Like the Peregrine falcon, the Great blue heron is protected by the Migratory Bird Treaty Act.

Heron rookeries are established by colonial nesting species of herons, such as Great blue herons, Great egrets (*Ardea alba*), or Snowy egrets (*Egretta thula*). These breeding colonies can often be found in or near bodies of water such as rivers, lakes, swamps, or coastal regions but also in highly developed urban areas (Kelly et al. 2007; Knight 2016). Heron rookeries are characterized by an abundance of tall trees, typically hardwoods or conifers, that provide suitable nesting sites for the birds. Colony locations are related to the amount of and distance to foraging habitat and are usually found between 1.4 and 4 miles (7,546 and 21,326 feet, respectively) from primary foraging habitat (Knight 2016). Further, the number of nests in a colony is positively related to surrounding wetland area, suggesting food availability is a limiting factor (Bayer McMahon 1981; Gibbs et al. 1987).

For Great blue herons, the establishment of a rookery occurs during the breeding season, typically from February 15 to July 31 in Virginia. During this time, herons gather at the rookery to build their nests, court potential mates, lay eggs, and raise their young. The nests are constructed using large twigs, branches, and other available materials and are placed close to the tops of trees (>100 feet) to provide protection from predators. Nests in rookeries can be reused multiple times over the course of many breeding seasons, with some notable colonies being occupied for over 30 years (Vennesland 2020).

According to data provided by the Loudoun Wildlife Conservancy, an existing Great blue heron rookery is located along Broad Run, with the nearest nest approximately 0.2 mile east of Route 1 at about MP 6.6, 0.2 mile north of Broad Run Variation B from about MPs 0.0 to 0.4, and 0.3 mile northeast of Broad Run Variation A at MP 0.0 (Figure 6.2.3-1). While nest surveys have not been formally conducted, the rookery appears to contain approximately 30-40 active nests within at least three mature American sycamore (*Platanus occidentalis*) trees on the easternmost bank of Broad Run. The Loudoun Wildlife Conservancy has reported that the rookery has been increasing in the number of nests it contains within recent years.

Impact Assessment

There is potential for Broad Run Variation B to intersect forested habitat adjacent to the rookery (approximately 1,180 feet from the rookery at the closest point). Since construction activities would require the removal of forested habitat within the approved right-of-way, the rookery would be indirectly impacted by this route segment as logging is a known negative factor directly and indirectly affecting Great blue heron nesting behavior, potentially leading to nest abandonment (Parnell et al. 1988; Rodgers and Smith 1995; Carney and Sydeman 1999; Vennesland 2002; 2004). Great blue herons may not be sensitive to acute noise disturbances, however, as evidence suggests the species tolerates repeated mechanical disturbances more so than human foot-traffic (Carlson and McLean 1996; Rodgers and Smith 1995; Vennesland 2002; 2004). To mitigate potential effects, VDWR guidance recommends limiting disturbances to periods outside of the breeding season, which occurs from February 15 to July 31, when the species is most vulnerable to human disturbance (VDWR 2021). VDWR further recommends maintaining a 500-foot buffer around the rookery.

Broad Run Variation B is approximately 1,180 feet away from the nearest nest within the rookery, and thus complies with all VDWR recommendations for working outside of the breeding season. We note, however, that Broad Run Variation B is approximately 205 feet closer to the nearest nest than Broad Run Variation A.

6.2.4 Vegetation

6.2.4.1 Local Vegetation Characteristics

The study area is situated within the Northern Piedmont physiographic province. Vegetation in this province 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, vegetation was influenced by the practices of Native Americans. Literature from early explorers indicate that parts of the Piedmont were once open, savanna-like woodlands and grasslands. Native American 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. Fallow farmlands 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*). Over time, early successional communities in the Northern Piedmont ultimately mature into late successional oak hickory forests (VDCR 2021).

The effects of human development activities on the landscape have resulted in a patchwork of early and late successional forests, pastures, and agricultural fields. The study area lies in a highly developed portion of Loudoun County where remnant communities of forested vegetation and open fields are commonly interspersed with developed land. As such, the vegetation in the study area is typically limited to small fragments of mixed pine (*Pinus* spp.) and hardwood forest communities, turfgrass communities associated with developed land, and forested "edge" communities that border larger forested tracts.

Impact Assessment

ERM reviewed publicly available recent (2023) Loudoun County aerial photography to calculate impacts on vegetation. Herbaceous vegetation could be temporarily affected by construction and vehicular movement. No agricultural areas crossed by the routes, but there are areas of open space which may contain herbaceous vegetation. In forested areas, trees would be cleared from the right-of-way during construction and maintained with an herbaceous cover during operations. Disturbed areas resulting from use of temporary workspace would revert to preconstruction vegetative conditions.

As shown in Table 6.2-9, forested land would be the vegetation resource primarily affected by Route 1, Belmont Park Variations A and B, Broad Run Variation B. Broad Run Variation A would impact more open space than forested land.

Table 6.2-9: Vegetation Impacts (acres) [1]

Vegetation Impacts	Route 1[2]	Belmont Park Variation A	Belmont Park Variation B	Broad Run Variation A	Broad Run Variation B
Forest	56.5	2.3	2.4	9.1	19.5
Open Space	20.4	0.8	0.9	12.8	9.3
Total	**75.3**	**3.2**	**3.3**	**21.9**	**28.8**

[1] The sum of the addends may not equal the totals due to rounding.
[2] Route 1 includes vegetation impacts of the Aspen and Golden Substations, Aspen 230 kV Split and the Golden 230 kV Split, Aspen and Golden Substations, and the Line Loop.

6.2.4.2 Forested Vegetation

Forested vegetation within the study area is generally associated with relatively small contiguous tracts of trees found in upland and/or alluvial forests. Upland forests are composed of tree species typically found in the Northern Piedmont physiographic province, with vegetation assemblages such as pine forest and mixed hardwood forest dominated by Loblolly pine (*Pinus taeda*) species, Red maple (*Acer rubrum*), Shortleaf pine (*Pinus echinata*), Sweetgum (*Liquidambar styraciflua*), Tulip tree (*Liriodendron tulipifera*), American beech (*Fagus grandifolia*), hickories (*Carya* spp.), and various upland oaks (*Quercus* spp.). Upland forest communities have usually become smaller because of historic encroachment from agricultural land use and residential development, and usually exist in small contiguous tracts of woodlands or fragmented forests located between croplands, pastures, and developed areas.

Alluvial forests in the study area are found at lower topographic elevations in floodplains and drainageways associated with wetlands and waterbodies like the Broad Run floodplain. Alluvial forest composition typically includes species like Silver maple (*Acer saccharinum*), Sycamore, American elm (*Ulmus americana*), Box elder (*Acer negundo*), Hackberry (*Celtis occidentalis*), and River birch (*Betula nigra*). Floodplain sloughs and backswamps are common landforms in the Northern Piedmont region and can support a variety of water-tolerant oak species in the forest canopy, like Pin oak (*Quercus palustris*), Swamp white oak (*Quercus bicolor*), Willow oak (*Quercus phellos*), and Swamp chestnut oak (*Quercus michauxii*). Beneath the forest canopy, understory plants include a variety of shrubs and herbaceous species such as Sweet pepperbush

(*Clethra alnifolia*), Northern spicebush (*Lindera benzoin*), Arrowwood (*Viburnum dentatum*), sedges (*Carex* spp.), and rushes (*Juncus* spp.).

As noted in Section 6.1.2, ERM classified land cover along the routes using a combination of local and state-wide datasets as well as aerial photo interpretation to identify the most current uses for a given area. Figure 6.1-2 depicts land use/land cover, including forested areas, along the routes.

Forest Conservation Values

The Forest Conservation Value (FCV) model is a tool designed by the Virginia Department of Forestry to strategically identify the highest priority forestland for conservation in Virginia (VDCR 2023b). The intent is to maximize the efficiency of limited resources by focusing conservation efforts on the highest quality, most productive, and most vulnerable forestland statewide. The FCV model identifies five conservation values:

- 5: Outstanding
- 4: Very High
- 3: High
- 2: Moderate
- 1: Average

ERM reviewed publicly available FCV model data prepared by the VDCR to assess the value of forest resources crossed by the alternative routes (VDCR 2023b). The area of forested habitat through which each route passes is ranked by the VDCR as C1: Average and C2: Moderate. Route 1 and Broad Run Variation A also cross forest ranked as C3: High, but the total amount is minimal. Overall, the habitats through which the routes pass are not designated as high-ranking areas for conservation planning by the VDCR.

Route 1

Table 6.2-10 identifies and describes the FCV crossed by Route 1.

Table 6.2-10: Forest Conservation Values Crossed by Route 1

FCV	Location	MP (Start)	MP (End)	Condition
1, 2	East and west of Washington and Old Dominion Trail, northwest of Cochran Mill Road	0.0	0.2	Western portion partially fragmented by the Company's distribution line ROW; mostly FCV 1: Average, with a short segment of FCV 2: Moderate (which spans over a pond) at MP 0.0.
1	Along Cochran Mill Road, east of Samuels Mill Circle, west of Goose Creek	0.4	0.6	Area near MP 0.4 was clearcut sometime before 2002, but forest appears to have recovered; most of the area near MP 0.6 has been cleared for industry.
1, 2, 3	Northwest of Goose Creek, south of Cochran Mill Road	0.6	0.8	Between about MPs 0.6 and 0.8, the route spans forest classified as FCV 1: Average, FCV 2: Moderate, and FCV 3: High; the FCV 3 area surrounds Sycolin Creek; the FCV 2 area is fragmented by a Company distribution line ROW.
3	Spans east over Goose Creek, Belmont Ridge Road, and Freedom Trail Road; south of Rt. 7	0.8	2.5	Goose Creek is crossed at about MP 0.9; mostly unfragmented forest; crossed by a Company distribution line ROW at MPs 1.1 and 1.4, Goose Glen Lane at MP 1.4, and Belmont Ridge Road and Freedom Trail Road at MP 2.0.
1	Northwest of Atwater Drive, south of Rt. 7, east of Ashbrook Place	4.7	4.8	Approximately 1.8 acres of this forested area have been cleared.

FCV	Location	MP (Start)	MP (End)	Condition
1	East of Loudoun County Parkway, south of Russell Branch Parkway, west of Pacific Boulevard	6.1	6.5	Unnamed tributary to Broad Run and Russell Branch cross at MP 6.4 and 6.5, respectively; forest is fragmented by the Company's distribution line ROW at MP 6.4.

ROW = right-of-way

Belmont Park Variation A

Table 6.2-11 identifies and describes the FCV crossed by Belmont Park Variation A.

Table 6.2-11: Forest Conservation Values Crossed by Belmont Park Variation A

FCV	Location	MP (Start)	MP (End)	Condition
1	Adjacent to the south side of Rt. 7, east of East of Ashburn Road	3.4	3.5	Area was cleared of trees until approximately 2005; approximately a quarter of the area has been cleared for Rt. 7.

ROW = right-of-way

Belmont Park Variation B

Table 6.2-12 identifies and describes the FCV crossed by Belmont Park Variation B.

Table 6.2-12: Forest Conservation Values Crossed by Belmont Park Variation B

FCV	Location	MP (Start)	MP (End)	Condition
1	Adjacent to the north side of Rt. 7, east of Lansdowne Boulevard, west of Riverside Parkway	0.5	0.6	Area has been cleared due to location adjacent to Rt. 7 and the Company's distribution line ROW.

ROW = right-of-way

Broad Run Variation A

Table 6.2-13 identifies and describes the FCV crossed by Broad Run Variation A.

Table 6.2-13: Forest Conservation Values Crossed by Broad Run Variation A

FCV	Location	MP (Start)	MP (End)	Condition
1	Adjacent to the east side of Loudoun County Parkway, north of Reuse Lane, west of unmarked road off of Reuse Lane	6.8	6.9	Forested area crossed by Beaverdam Run at MP 6.9; within floodplain.
1, 2, 3	East of Loudoun County Parkway, north of Washington and Old Dominion Trail, west of Pacific Boulevard, and south of Gloucester Parkway	8.2	9.0	Areas with FCVs of 2: Moderate and 3: High (approximately from MPs 8.3 to 8.5) have been almost completely cleared of forest; much of the area rated as 1: General encroaches upon developed areas or the route spans the border; within floodplain.

ROW = right-of-way

Broad Run Variation B

Table 6.2-14 identifies and describes the FCV crossed by Broad Run Variation B.

Table 6.2-14: Forest Conservation Values Crossed by Broad Run Variation B

FCV	Location	MP (Start)	MP (End)	Condition
1	Adjacent to eastern side of Maiden Place and Loudoun County Parkway intersection	0.0	0.1	Crossed by Beaverdam Run and the Company's distribution line ROW at MP 0.1; within floodplain.
1	East of Loudoun County Parkway, west of Pacific Boulevard, north of Gloucester Parkway	0.2	1.5	Crossed by Broad Run at MP 1.3 and tributary to Broad Run at MPs 0.6 and 1.5; forest is crossed by an existing Company distribution line but is mostly unfragmented; within floodplain.
1	East of Broad Run, west of Pacific Boulevard, south of Gloucester Parkway	1.7	2.0	Mostly unfragmented forest; borders developed industrial area to the east; within floodplain.
1	Adjacent to eastern side of Pacific Boulevard and Charles View Drive intersection	2.1	2.2	Crossed by Cabin Branch at MP 2.2; forest partially cleared for Pacific Boulevard; within floodplain.

ROW = right-of-way

Impact Assessment

ERM reviewed FCV data to characterize the quality of vegetation along the routes. Table 6.2-15 summarizes the impact in acres by FCV value for each route. No routes cross forest designated as possessing Outstanding and Very High FCVs. Of the route variations, Belmont Park A would impact less forested land with combined FCV ratings than Belmont Park Variation B (0.1 acre vs. 0.4 acre, respectively) and Broad Run Variation A would impact less forested land with combined FCV ratings than Broad Run Variation B (7.3 acres vs. 18.5 acres, respectively).

Table 6.2-15: Forest Conservation Value Along Routes (acres)

Conservation Value	Route 1 [1]	Belmont Park Variation A	Belmont Park Variation B	Broad Run Variation A	Broad Run Variation B
Average	30.2	0.1	0.4	6.5	18.5
Moderate	3.1	0.0	0.0	0.7	0.0
High	0.4	0.0	0.0	0.1	0.0
Total [2]	**33.8**	**0.1**	**0.4**	**7.3**	**18.5**

[1] Route 1 includes totals from the Aspen Substation and Aspen 230 kV Split. There is no FCV data within the Golden Substation footprint.

[2] The sum of the addends may not equal the totals due to rounding.

Fragmentation

According to the VDCR, loss of habitat presents the greatest risk to biodiversity (VDCR 2023a). When development alters the landscape and fragments large natural tracts of land into smaller, scattered pieces of land, the biodiversity of the area is affected. Large patches of land have more benefits than the same area of land among smaller fragmented pieces as, a) the number and diversity of species increases progressively as habitat size increases, b) there is an opportunity in larger patches for more habitat diversity and protection from disturbance in adjacent developed areas, and c) the ecosystem services (i.e., any direct or indirect benefit that ecosystems provide to people) provided by larger areas are greater (VDCR 2023a).

The majority of vegetation cover types crossed by the route are forested lands; however, there are a number of planned data centers, substations, and developments, as mentioned in Section 6.1.6 that will require the clearing of these forested lands. Forested areas most at risk of fragmentation due to route alignment are described below:

Route 1

- There are no habitats at risk of fragmentation due to the alignment of Route 1.

Belmont Park Variations A and B

- There are no habitats at risk of fragmentation due to the alignment of either Belmont Park Variation A or B.

Broad Run Variation A

- There are no habitats at risk of fragmentation due to the alignment of Broad Run A.

Broad Run Variation B

- Forest fragmentation would occur between about MPs 0.2 and 1.3 along Broad Run B.

Impact Assessment

Current forest conditions along the routes will be impacted by several planned developments. The sole route that would impact a significant piece of forested land is Broad Run Variation B. The land that Broad Run Variation B would span from about MPs 0.2 to 1.3 contains a forested floodplain surrounding Broad Run. Forested areas cleared for right-of-way would be converted into a natural emergent/scrub shrub habitat that resembles successional conditions and would allow for natural communities to exist within this converted habitat. However, this will differ from original forested conditions and create habitat fragmentation, causing potential loss in biodiversity, less protection from developed areas, and a decrease in ecosystem services.

6.3 Visual Conditions and Resources

6.3.1 Overview

ERM conducted a visual resource assessment to characterize the existing scenic/landscape conditions and understand potential impacts resulting from the installation of the Project.. This assessment included the following activities:

- Identification of visually sensitive resources (VSRs) through review of recent digital aerial photography (ESRI 2022; Google Earth 2022; Planet Earth 2023),
- Site reconnaissance and local outreach,
- Definition of potential user groups,
- Review of visual simulations from Key Observation Points (KOPs) along the routes, and
- Evaluation of the Project components with respect to visual impacts.

Overall, the study area has a suburban land use character, with clusters of residential, park and open space, industrial, and commercial uses, as well as related infrastructure (e.g., highways and roads, cell towers, electric transmission and distribution lines, etc.) to support these uses. At the time of the assessment, there were multiple commercial, industrial, and residential sites throughout the study area that had been recently developed or were under construction. The amount of construction (both recent and ongoing) indicates a landscape that is changing from more rural to more urbanized. In contrast to the currently developed areas and ongoing construction, some landscaped and naturally vegetated areas (primarily along waterbodies) frame and provide visual interest to the developed elements of the landscape in the study area.

The Project would add transmission line structures along the identified routes in the study area. The structures would include monopoles, paired 2-pole turning structures, multiple cross arms and insulators on each pole, and overhead lines or conductors. The poles would appear as tall, vertical structures with a wider

base and tapered top with smaller, thinner horizontal and diagonal lines created by the cross arms and insulators extending out from the poles (the thinner cross arms and insulators would look like a series of triangles stacked along the upper portion of the transmission poles). The upper portions of the poles (at the cross arms/insulators) would be connected by long, thin horizontal or diagonal (depending on viewing perspective) lines that start high (at the appropriate level of the pole) and dip toward the ground to a low point at approximately the center point between poles. Where required, FAA obstruction markings will be placed along the conductors. These small (typically 36-inch diameter), circular markers would be visible along the conductors but generally do not change their visual characteristics (e.g., thin, horizontal lines).

Depending on the lighting, the Project's metal structures would appear as lighter to darker shades of gray with the conductors (overhead lines) appearing as darker gray to black against the skyline. The general form, lines, and colors of the Project's structures are not uncommon in landscapes with other human modifications (e.g., buildings, travel corridors, distribution and communication poles and lines, signs, lights, etc.), though they do contrast with natural features (e.g., trees and other vegetation, rock formations and exposed soil, rivers and other waterbodies, etc.). In addition, the height of the monopoles may cause them to be the tallest structures on the landscape (human-made or natural) and thereby highly visible in the fore-, middle, and background depending on viewing perspectives and existing foreground features (e.g., the presence of trees, buildings, or other structures that may limit more distant views).

6.3.2 Visually Sensitive Resources

VSRs are defined as areas containing resources with unique scenic qualities or sensitive viewsheds and/or areas where a project's components and any associated vegetation clearing would likely contrast with the surrounding landscape. Common examples of VSRs include designated scenic resources (e.g., scenic byways, rivers, overlooks, and landscapes), residential areas, parks and other recreational areas, historic landscapes or districts, conservation areas and other open spaces, documented natural features, cultural destinations, road corridors, and areas of high public concentration. Table 6.3-1 lists and describes the VSRs along and near the various routes for the Project (Figure 6.3-1 depicts the identified VSRs for the Project).

The perception of visual resources by the primary user groups in a study area provides additional context in assessing the potential impacts of a project on the visual resources of a landscape. Common examples of user groups include area residents, workers, commuters and other travelers, recreationists, and tourists. Sensitivity and potential impacts tend to vary by setting and user group. There are many factors that influence user sensitivity and the perception of impacts. In general, users with static, direct, frequent, or longer duration views (e.g., area residents, some workers), as well as those users engaged in setting-dependent activities (e.g., some types of recreation, tourism) tend to have higher levels of sensitivity to change compared to others. Table 6.3-1 lists the typical user groups who are most likely to be sensitive to changes in the visual conditions of each VSR.

Table 6.3-1: Visually Sensitive Resources and User Groups

VSR Number	VSR Name	VSR Description	User Group(s)
Scenic Resources			
1	Goose Creek Scenic River	48 miles of Goose Greek in Fauquier and Loudoun Counties were designated as Scenic River in 1976. The river is used by recreationalists for boating and fishing and also provides drinking water for Loudoun County. Goose Creek was historically used for transporting grain and other goods.	Residents and recreationists (e.g., boaters, anglers, photographers, bird watchers, and other nature appreciation)
2	Kincora Heron Nature Trail	1.7-mile out-and-back trail with a bird-watching platform along Broad Run. The trail is used by local residents and tourists for hiking, running, dog walking, and bird watching.	Local residents, recreationists/tourists (e.g. pedestrians and bird watchers)

VSR Number	VSR Name	VSR Description	User Group(s)
Recreational Resources			
2	W&OD Trail	Former railroad between Shirlington and Purcellville, Virginia, converted to a paved trail for non-motorized use and parallel unpaved trail for horseback riding. Additional information on this resource is provided in Section 4.1.	Local residents, recreationists/tourists (e.g., bicyclists, pedestrians, horseback riders)
3	Seldens Landing Elementary School	Loudoun County public elementary school (kindergarten through 5th grade) with associated athletic fields. The school is located on the north side of Rt. 7, west of Belmont Ridge Road, and accessed from Coton Commons Drive.	Local residents (including students), workers (school employees), and recreationists (e.g., organized sports participants and spectators)
4	Steuart W. Weller Elementary School	Loudoun County public elementary school (kindergarten through 5th grade) with associated athletic fields. The school is located at the intersection of Marblehead Drive and Exchange Street, west of Loudoun County Parkway.	Local residents (including students), workers (school employees), and recreationists (e.g., organized sports participants and spectators)
5	Belmont Country Club	Private country club with an 18-hole golf course, tennis courts, fitness center, event space, and other amenities. The country club and associated gated community is accessed via Russell Branch Parkway, south of Rt. 7, or at several intersections along Gloucester Parkway, east of Belmont Ridge Road.	Local residents, workers, recreationists (e.g., golfers, tennis players, swimmers), and tourists
6	1757 Golf Club	Private golf club with an 18-hole golf course and event center in Dulles, Virginia. It is located on the north side of Waxpool Road, west of Pacific Boulevard.	Local residents, workers, recreationists (e.g., golfers), and tourists
7	Lansdowne Resort	Private resort with golf course, tennis courts, and spa. Located north of Rt. 7, accessed from Woodridge Parkway, east of Lansdowne Boulevard	Local residents, recreationists (e.g., golfers, tennis players, swimmers), workers, and tourists
8	Potomac Green Community Park	28-acre community park with athletic fields, trails, playground, and tennis courts. The park is located on the southeast side of Marblehead Drive, west of Loudoun County Parkway.	Local residents and recreationists (e.g., organized sports participants and spectators, court-based sports players, playground users, pedestrian trails users)
Historic Resource			
9	Cooke's Mill (Ruins)	Historic structure at a former mill site along Goose Creek. The access road for this location is along Cochran Mill Road.	Recreationists (e.g. pedestrians and boaters on Goose Creek)

VSR Number	VSR Name	VSR Description	User Group(s)
10	African American Burial Ground for the Enslaved at Belmont	Historic and active burial ground for formerly enslaved people of Loudoun County area plantations and their descendants. Accessed via Freedom Trail Road, southeast of the intersection of Rt.7 7/Rt. 659 (Belmont Ridge Road).	Local residents and tourists
11	Janelia Farm	Historical structure designed by Philip Smith for Vinton Pickens in the Normandy manor style. The building is now owned by the Howard Hughes Research Institute. Accessed via Janelia Farms Boulevard, north of the Ashburn Village Boulevard/ Riverside Parkway intersection.	Local residents, commuters, and workers
Cultural Resources			
12	St. David's Episcopal Church and School	Faith gathering site located on Russell Branch Parkway, south of Rt. 7. This is also the location of the former Belmont Chapel and Cemetery.	Local residents and workers
13	Telugu Christian Fellowship Church	Faith gathering site located on the south side of Rt. 7 on Ashbrook Place, north of Russell Branch Parkway.	Local residents and workers
14	Community Church	Faith gathering site located south of Rt. 7 on Ashburn Road, north of Russell Branch Parkway	Local residents and workers
Road Corridors			
15	Leesburg Pike (Rt. 7)	Six-lane divided highway with a mix of at-grade intersections and grade-separated interchanges. Major thoroughfare for Loudoun County and all of northern Virginia.	Local residents, workers, commuters, and through-travelers
16	Belmont Ridge Road (Rt. 659)	Four lane divided road with occasional turning lanes and at-grade intersections.	Local residents, workers, and commuters
17	Lansdowne Boulevard (Rt. 2400 N)/Claiborne Parkway (Rt. 901)	Four lane divided road with occasional turning lanes and at-grade intersections.	Local residents, workers, and commuters
18	Ashburn Village Boulevard	Four lane divided road with occasional turning lanes and at-grade intersections.	Local residents, workers, and commuters
19	Russell Branch Parkway	Four lane, divided roadway.	Local residents, workers, and commuters
20	Loudoun County Parkway	Four to six lane divided highway with occasional turning lanes and at-grade intersections.	Local residents, workers, and commuters
21	Gloucester Parkway	Four lane divided road with occasional turning lanes and at-grade intersections.	Local residents, workers, and commuters
22	Pacific Boulevard	Four lane divided road with occasional turning lanes and at-grade intersections.	Local residents, workers, and commuters
23	Darrell Green Boulevard/Sully Road (Rt. 28)	Six lane divided highway with occasional turning lanes and at-grade intersections.	Local residents, workers, commuters, and through-travelers
Areas of High Public Concentration			

VSR Number	VSR Name	VSR Description	User Group(s)
24	Ashburn CDP	Population of 456,479	Residents, workers, commuters, and through-travelers
25	Belmont CDP	Population of 9,888	Residents, workers, commuters, and through-travelers
26	Lansdowne CDP	Population of 12,840	Residents, workers, and commuters
27	One Loudoun CDP	No Census data available for this location.	Residents, workers, and commuters

Sources: U.S. Census Bureau 2023 (population data), VDOT 2023 (AADT data)

AADT = annual average daily traffic; CDP = Census Designated Place; MP = milepost; VDCR = Virginia Department of Conservation and Recreation; VSR = visually sensitive resource

6.3.3 Key Observation Points

In addition to considering the existing landscape characteristics across broader geographic areas (as represented by VSRs), ERM visual resource specialists also chose 15 specific locations to document point-specific existing conditions and anticipated changes to these conditions from the proposed Project (Table 6.3-2). These KOPs are representative of the VSRs and user groups in the study area. Photography captured at each KOP was used to document existing visual conditions, as well as to create photographic simulations of the proposed Project. Each VSR does not necessarily have a corresponding KOP; rather, the KOPs represent typical viewpoints from which the proposed Project would be visible. Figure 6.3-2 shows the locations and viewing directions the KOPs identified for the Project.

Table 6.3-2: Key Observation Points

KOP Number	Location	Reason for Inclusion	Routes Represented
1	View looking east from W&OD Trail	Example of the proposed right-of-way (with clearing) through a suburban industrial landscape. Affected user groups include local residents, workers, and recreationalists. Representative of VSR W&OD Trail.	Route 1 Aspen Substation
2	View looking northeast from a community parking lot off Cochran Mill Road.	Example of the proposed right-of-way (with clearing) through a suburban wooded landscape. Affected user groups include local residents, workers, and recreationalists. Representative of suburban views along a natural area.	Route 1
3	View looking northeast from Belmont Ridge Road/Freedom Trail Road intersection	Example of the proposed right-of-way (with clearing) crossing a roadway through wooded lands north of a residential and golf course area south of Rt. 7. Affected user groups include local residents, commuters, and workers. Representative of VSR Belmont Ridge Road.	Route 1
4	View looking east from Freedom Trail Road, at the northeast corner of the African-American Burial Ground for the Enslaved at Belmont	Example of the proposed right-of-way (with clearing) paralleling a roadway through a suburban landscape. Affected user groups include local residents, workers, travelers, and commuters. Representative of VSR African American Burial Ground for the Enslaved at Belmont	Route 1

KOP Number	Location	Reason for Inclusion	Routes Represented
5	View looking southwest from the golf course path next to townhomes	Example of the proposed right-of-way paralleling a highway through a suburban area. Affected user groups include local residents, recreationalists, and workers. Representative of suburban views.	Route 1 Belmont Variation A Belmont Variation B
6	View looking southwest from Timber Square/Tantara Terrace	Example of the proposed right-of-way paralleling the highway through a suburban area. Affected user groups include local residents, and workers. Representative of suburban neighborhood.	Belmont Variation A Belmont Variation B
7	View looking northeast from Belmont Country Club	Example of the proposed right-of-way paralleling the highway through a suburban area. Affected user groups include local residents, recreationalists, and workers. Representative of VSR Belmont Country Club.	Route 1 Belmont Variation A Belmont Variation B
8	View looking south from Riverside Parkway/Ashburn Village Boulevard intersection	Example of the proposed right-of-way through a suburban area paralleling a roadway. Affected user groups include local residents, workers, and commuters. Representative of a suburban roadway and VSR Janelia Farm.	Route 1 Belmont Variation A Belmont Variation B
9	View looking northwest on Ashburn Village Boulevard	Example of the proposed right-of-way paralleling the highway through a suburban area. Affected user groups include local residents, commuters, and workers. Representative of VSR Ashburn Village Boulevard.	Route 1 Belmont Variation A Belmont Variation B
10	View looking southeast on Rt. 7	Example of the proposed right-of-way (with clearing) paralleling a highway. Affected user groups include local residents, commuters, through-travelers, and workers. Representative of VSR Route 7.	Route 1
11	View looking southeast from Russell Branch Parkway/Commonwealth Center Drive intersection	Example of the proposed right-of-way paralleling a highway through a suburban commercial area, and the proposed right-of-way (with clearing) paralleling a highway through a suburban area. Affected user groups include local residents, workers, travelers, and commuters. Representative of VSR Russell Branch Parkway.	Route 1
13	View looking east from Duxbury Terrace/Malden Place intersection	Example of the proposed right-of-way paralleling a suburban roadway (with clearing). Affected user groups include local residents, commuters, and workers. Representative of suburban residential neighborhood.	Route 1 Broad Run Variation A Broad Run Variation B
14	View looking north from Interconnection Plaza/Loudoun County Parkway intersection	Example of the proposed right-of-way (with clearing) crossing a suburban roadway in an industrial area. Affected user groups include local residents, workers, and commuters. Representative of VSR Loudoun County Parkway.	Broad Run Variation A
15	View looking east on the W&OD Trail	Example of the proposed right-of-way and substation (with clearing), with the line paralleling and crossing roadways and trails. Affected user groups include local residents, commuters, and recreationalists.	Route 1 Broad Run Variation A Broad Run Variation B

KOP Number	Location	Reason for Inclusion	Routes Represented
		Representative of VSRs W&OD Trail and Pacific Boulevard.	
16	View looking east from Kincora Village Center	Example of the proposed right-of-way with clearing. Affected user groups include local residents and recreationalists. Representative of VSR Kincora Heron Nature Trail.	Route 1 Broad Run Variation A Broad Run Variation B

KOP = Key Observation Point; ROW = right-of-way; VSR = visually sensitive resource; W&OD = Washington & Old Dominion

Descriptions of the existing visual conditions and predicted changes to these conditions as a result of the Project are provided below for each KOP. Photographs of existing conditions, as well as visual simulations of the proposed Project from each KOP, are provided in Appendix G.

6.3.3.1 KOP 1

Existing Conditions: KOP 1 faces east from the intersection of the W&OD Trail and Cochran Mill Road. There is a moderate amount of existing development visible from this KOP, including the W&OD Trail, a Dominion transmission line (Line #274) with lattice structures along the northern side of the trail, distribution lines that parallel and cross Cochran Mill Road, and a private materials yard partially screened by a fence and vegetation. Evergreen and deciduous trees, shrubs, and other vegetation partially screen the industrial facilities of the W&OD Trail from users on the trail. The height and density of foreground vegetation and structures limit most views from this KOP, although some middle ground and background views are possible through the vegetation looking east along the W&OD Trail.

The primary user groups at this KOP are trail users, motorists and other travelers along Cochran Mill Road, and workers at the nearby industrial facilities. Given the existing level of development and other infrastructure visible from this KOP, these user groups are anticipated to be less sensitive to visual changes in this area. The KOP is representative of both dynamic and static views.

Visual Simulation: From this KOP, Route 1 and the Aspen Substation would be partially visible through the screening vegetation along the northern side of the W&OD Trail, in particular when the deciduous trees have lost their leaves for the season (Appendix G, KOP 1). User groups at this KOP would be able to see the monopole structures (addition of vertical lines on the landscape) and associated conductors (addition of horizontal lines above existing trees and buildings), although these new structures are generally compatible with the existing development and infrastructure visible from the KOP.

While not visible in the simulation, travelers along Cochran Mill Road would have unobscured views of the proposed transmission lines for less than 0.5 mile when traveling north from this KOP. The removal of vegetation and the installation of the proposed transmission lines would constitute a moderate degree of change along the western side of Cochran Road; however, the proposed transmission lines would generally be visually consistent with the existing industrial uses along this portion of the road. Overall, the addition of the proposed Project would add structures to the landscape, but this change would have a minor impact on the visual conditions of the landscape as viewed from KOP 1.

6.3.3.2 KOP 2

Existing Conditions: KOP 2 faces east/southeast from a parking lot for a park (recreational field and basketball court) along Cochran Mill Road. The existing view from this site primarily is of a naturally vegetated area with a mix of deciduous and coniferous trees as well as other ground cover. The vegetation transitions from a maintained lawn around the parking lot to a buffer area with a mix of ground cover and trees to a more densely forested area parallel to Goose Creek, a designated Virginia Scenic River. Other than the parking lot and maintained lawn areas in the immediate foreground, there is little to no other development visible from this KOP.

The primary user group at KOP 2 is recreationists, although area residents in the small neighborhood to the north of this park likely would have similar views. These user groups be moderately sensitive to visual

changes from this KOP. While recreationists may be more sensitive to new visual intrusions on a landscape, the primary sports-related uses at this park draw views in the opposite direction of the proposed Project. The KOP is representative of static views.

Visual Simulation: Route 1 transmission structures would be partially visible above the existing tree line from KOP 2 (Appendix G, KOP 2). This would increase the level of visible development from this site. Specifically, the proposed monopole structures would add substantially taller vertical lines to the existing landscape and introduce new horizontal lines where most elements are aligned vertically. The new structures would contrast with the primarily natural landscape but would likely have a minor to moderate impact on the overall visual conditions at the KOP because only a portion of the view would be modified by the Project.

6.3.3.3 KOPs 3A and 3B

Existing Conditions: KOPs 3A and 3B are located along Belmont Ridge Road approximately 0.4 mile south of the intersection of Belmont Ridge Road and Rt. 7. KOP 3A faces to the north/northeast toward Route 7 and the African American Burial Ground for the Enslaved at Belmont (see the KOP 4 description below). KOP 3B faces to the north toward Rt. 7 but focuses on the western side of Belmont Ridge Road instead of the eastern side (KOP 3A). The existing view from both KOP 3A and 3B is typical of a suburban road corridor with a wide, multi-lane paved road and associated barriers and signs, a paved walkway that parallels the road, and a mix of developed and naturally vegetated areas. Most of the existing development and vegetation sits close to the ground in the foreground with trees providing some taller vertical elements. For KOP 3A the middle ground, the vegetation, and commercial/residential areas appear as a low block of continuous buildings and trees. For KOP 3B, the western hillside next to the roadway has mature deciduous trees that offer additional screening during the leaf-on time of year.

The typical user groups at KOP 3A and KOP 3B include area residents, commuters, and other travelers along Belmont Ridge Road. Since most of these user groups would be traveling by vehicle along the road, their sensitivity level to changes in visual conditions would be low to moderate. For pedestrians along the multi-use paved path, viewer sensitivity would be moderate, because they can stop and take in any angle of view. These KOPs are primarily representative of dynamic views.

Visual Simulation: Route 1 would be highly visible on the landscape as viewed from both KOP 3A and KOP 3B (Appendix G, Viewpoint 3A and Viewpoint 3B). The monopole structures would feature prominently on the western side and the conductors would cross Belmont Ridge Road. This would increase the level of visible development in this area and add substantially taller vertical lines as well as add contrasting horizontal lines to the landscape. Some trees and other vegetation would be removed from the western side of Belmont Ridge Road, which would reduce the level of vegetative contrast and open views in this direction (i.e., it would remove foreground vegetation that currently partially obscures more distance views). For motorists and other travelers along Belmont Ridge Road, the proposed Project would be visible for a short duration thereby decreasing their sensitivity to change. Area residents would be more sensitive to changes in visual conditions, however, as they are likely more familiar with the existing conditions at the KOP.

Given the current conditions, sensitivity levels of user groups, and anticipated changes, the proposed Project is predicted to have moderate impacts on the overall visual conditions as viewed from KOP 3A and KOP 3B. ERM notes that the land west of Belmont Ridge Road is now actively under construction and being developed as a data center property—activity that had not started at the time of photography for this KOP. The presence of the data center would somewhat reduce the visual contrast introduced by Route 1 at these KOPs, particularly for views focused to the west of Belmont Ridge Road.

6.3.3.4 KOP 4

Existing Conditions: KOP 4 is located at the pedestrian path on the southeast corner of the intersection of Belmont Ridge Road and Rt. 7. It faces to the east and provides views of the Rt. 7 corridor, with commercial and residential areas along the northern side of the highway framing the left side of the view, and a densely forested area that includes the African American Burial Ground for the Enslaved at Belmont along the southern side of Rt. 7 (at the northern terminus of Freedom Trail Road) to the right. The view is typical of a well-traveled highway corridor with a mix of road and related infrastructure such as signs, lights, and guardrails, commercial and residential buildings, and both maintained (i.e., lawn) and naturally vegetated buffer areas.

The primary user groups at KOP 4 include area residents, workers, commuters and other travelers, and visitors to the African American Burial Ground for the Enslaved at Belmont. These user groups, in particular area residents and visitors to the cemetery, would be moderately to highly sensitive to changes in visual conditions at this KOP, which is representative of both dynamic and static views.

Visual Simulation: A small portion of Route 1 would be partially visible above the tree line from KOP 4 (Appendix G, KOP 4), where the proposed transmission corridor parallels the southern side of Rt. 7. The trees in the foreground along the south side of the highway generally block views of the proposed Project. The tops of several monopoles, including their crossarms and insulators, would be visible, but would not change the overall visual character of the landscape as viewed from this KOP. While taller than other built features on the landscape, the new structures for Route 1 would not be visually dominant compared to more prominent features in the foreground such as road signage, lighting, and nearby trees. As such, the proposed Project would have a minor impact on the overall visual conditions at this KOP.

6.3.3.5 KOP 5

Existing Conditions: KOP 5 is on the southern (eastbound) side of Riverside Parkway along the northern edge of the fairway on the seventh hole of The Golf Club at Lansdowne's course. It provides views to the south/southwest across the southernmost section of the course (Holes 4, 5, 6, and 7) towards Rt. 7. The foreground of the existing view from this KOP is dominated by a manicured and well-maintained golf course with some sporadic taller trees providing vertical contrast in the foreground and more densely vegetated buffers in the middle to background. The landscape is generally flat with open views that are not constrained by other features in the foreground. Other than the existing trees in the foreground, most of the existing features sit low to the ground and there is a general lack of taller vertical features in the landscape.

The primary user groups at this KOP include recreationists (golfers), area residents (from residential areas that border the golf course), and travelers along Riverside Parkway (motorists, bicyclists, walkers/runners, etc.). Golfers and area residents would likely be most sensitive to visual changes to the landscape at KOP 5. Golfers in particular may be impacted as the scenic setting and condition of the course could be one of the reasons they chose this specific place to play (although this portion of the course is immediately adjacent to Rt. 7, which is heavily traveled). While some area residents would also be highly sensitive to visual change, berms, trees, and other vegetation generally block more extensive views of the golf course and wider landscape for many others. Travelers along Riverside Parkway would likely be less sensitive to changes in the landscape as their views are generally oriented to the east or west depending on their travel direction and not to the south at this KOP, which is primarily representative of static views.

Visual Simulation: Route 1 would be highly visible on the landscape as viewed from KOP 5 (Appendix G, KOP 5). The vertical monopole structures and horizontal conductors would feature prominently across the viewshed. This would increase the level of visible development in the area and add substantially taller vertical structures to the landscape. For golfers, the proposed Project would be visible for the duration of their round on this portion of the course, thereby increasing their sensitivity to change. Some area residents may also be highly sensitive to change, though others and other user groups may be less sensitive to changes from the proposed Project given foreground screening features and limited sightlines. Based on current conditions, sensitivity levels, and anticipated changes, the proposed Project is estimated to have a moderate impact on the overall visual conditions as viewed from KOP 5. The western ends of the Belmont Park Variations (both A and B) would also be visible to the south/southeast (note: these variations are not shown on the simulation in Appendix G given the viewing orientation to the southwest of this KOP) and would have similar visual impacts as Route 1 at this location.

6.3.3.6 KOP 6

Existing Conditions: KOP 6 faces to the south/southwest from a parking area in a residential complex in Lansdowne on the north side of Rt. 7. A vegetated buffer between the residential area and highway generally blocks wider views of the landscape from this KOP. There is a moderate degree of existing development in the foreground, including a paved parking lot, car port (covered parking spaces), parked vehicles, a perimeter fence, and maintained landscaped areas. When the deciduous trees in the vegetated buffer seasonally lose their leaves, an existing distribution line is slightly visible. The primary user group at this site

is area residents, who are most familiar with the existing conditions and more sensitive to changes to the existing landscape viewed from this KOP, which is representative of static views.

Visual Simulation for Belmont Park Variation A: From KOP 6, Belmont Park Variation A would be partially visible through the screening vegetation between the residential area and Rt. 7, especially when the deciduous trees have lost their leaves for the season (Appendix G, KOP 6 - Belmont Park Variation A). Area residents, the primary user group at this KOP, would be able to see the monopole structures and associated conductors with FAA obstruction markings through the buffer vegetation, though neither are dominant on the cluttered landscape (e.g., existing distribution lines, trees and other vegetation, perimeter fencing). While the conductors add additional horizonal lines to the landscape, the monopoles are partially obscured by and/or appear as another vertical feature similar to the existing trees. Given the density of buffer vegetation (in particular during leaf-on conditions), Belmont Park Variation A would result in a low degree of change and minor impacts on the visual conditions at KOP 6.

Visual Simulation for Belmont Park Variation B: From KOP 6, Belmont Park Variation B would be clearly visible through the screening vegetation between the residential area and Rt. 7 (Appendix G, KOP 6 – Belmont Park Variation B). Existing vegetation would provide minimal visual buffering for area residents (the primary user group at this KOP). Conductors with FAA obstruction markings and especially a monopole structure would be dominant horizontal and vertical features. Due to the height of the structures and associated conductors, the proposed Project would result in a substantial degree of change and a moderate to major impact on the visual conditions at KOP 6.

6.3.3.7 KOP 7

Existing Conditions: KOP 7 is located near the entrance to the Belmont Country Club on Belmont Manor Lane. The existing view from this KOP, which faces to the north/northeast, includes the golf course driving range and putting greens in the foreground, with the highway, commercial and residential buildings (Lansdowne), and other natural landscape features in the middle to background. The KOP provides broad, open views of the landscape that are not constrained by existing built features or vegetation in the foreground. Other than a few planted trees in the foreground that provide vertical contrast, most of the landscape generally appears flat with varying textures from different types of land uses (e.g., transitions from smooth, manicured lawn areas to coarse buildings and vegetation). The overall view includes a balance of maintained vegetation, natural vegetation, and built structures across the landscape as viewed from KOP 7.

The primary user groups at this KOP include recreationists (golfers) and other visitors to the Belmont Country Club. These user groups would likely be highly sensitive to visual changes to the landscape at KOP 7, because the scenic quality of the area may be one of the reasons they chose this specific country club. The KOP is representative of dynamic and static views.

Visual Simulation for Belmont Park Variation A: Route 1 and Belmont Park Variation A would be highly visible on the landscape as viewed from KOP 7 (Appendix G, KOP 7 – Belmont Park Variation A). The route would appear as a new long, linear feature running above the existing tree line and other built structures to the north of the KOP. The vertical monopole structures and horizontal conductors would be prominent and generally increase the prominence of other built features on the landscape. While the majority of the golf course and other country club features are primarily oriented to the south of the KOP, golfers using the driving range along with some visitors to the Belmont Country Club would have prolonged views of the proposed Project. These user groups would be most sensitive to the changes introduced by the proposed Project on the landscape. As such, Belmont Park Variation A would have a moderate impact on the overall visual conditions as viewed from KOP 7.

Visual Simulation for Belmont Park Variation B: Route 1 and Belmont Park Variation B would be highly visible on the landscape as viewed from KOP 7 (Appendix G, KOP 7 – Belmont Park Variation B). The route would appear as a new long, linear feature running above the existing tree line and other built structures to the north of the KOP. The vertical monopole structures and horizontal conductors would be prominent and generally increase the prominence of other built features on the landscape. While the majority of the golf course and other country club features are primarily oriented to the south of this KOP, golfers using the driving range along with some visitors to the Belmont Country Club would have prolonged views of the proposed Project. These user groups would be most sensitive to the changes introduced by the proposed Project on the landscape. Belmont Park Variation A would be closer to the viewer than Belmont Park

Variation B, and thus would have slightly stronger impacts; however, Belmont Park Variation B would still have a moderate impact on the overall visual conditions as viewed from KOP 7 due to the additional monopoles needed to cross Rt. 7.

6.3.3.8 KOP 8

Existing Conditions: KOP 8 is located along Riverside Parkway at its intersection with Ashburn Village Boulevard. The KOP provides views to the south/southwest toward Rt. 7 and beyond. Riverside Parkway and Ashburn Village Boulevard are typical of other travel corridors in the study area with low, serpentine, paved roadways lined with associated infrastructure including signs, lights, and maintained lawn areas. Pedestrian crosswalks cross the roadway on either side of Ashburn Village Boulevard heading north/south. Rt. 7 sits at a lower elevation in this area and is thus only partially visible from the KOP. Across Rt. 7, multiple commercial and residential buildings in Ashburn are visible in the middle ground. The existing landscape is generally flat with a few taller elements (e.g., trees in the foreground) that add visual contrast. The lack of substantial topography and tall foreground elements creates open views and longer viewing distances at this KOP, which is representative of dynamic and static views. The typical user groups at KOP 8 include workers at the nearby commercial and industrial areas, commuters, and other travelers along the major travel corridors adjacent to the KOP (such as Riverside Parkway, Ashburn Village Boulevard, and Rt. 7). These groups would be moderately sensitive to visual changes along the travel corridors.

Visual Simulation: Route 1 would be highly visible on the landscape as viewed from KOP 8 (Appendix G, Viewpoint 8). The Belmont Park Variations would not be visible within this view but could be visible along Ashburn Village Boulevard as it crosses over Rt. 7 (see KOP 9). Similar to KOP 7, the proposed Project would appear as a new, long, linear feature running above the existing built structures and tree line to the south of this KOP. The vertical monopole structures and horizontal conductors would be prominent and would generally increase the prominence of other built features on the landscape. Travelers on Ashburn Village Boulevard would be most exposed to the visual changes associated with Route 1 because the north-south alignment of the roadway provides direct views and travelers will pass under the new conductors that cross the roadway. As such, travelers would likely be most sensitive to the change in the landscape from KOP 8. Other user groups may also be sensitive to the visual changes from Route 1 that introduce new linear features and structures that are substantially taller than other features in the middle to background. Compared to existing visual conditions, Route 1 would have a moderate impact on the overall visual conditions as viewed from KOP 8.

6.3.3.9 KOP 9

Existing Conditions: KOP 9 is located on the Ashburn Village Boulevard overpass as it crosses Rt. 7. The KOP is oriented to the northwest and provides views of the Rt. 7 corridor between the Ashburn Village Boulevard and Lansdowne Boulevard overpasses (a distance of approximately 0.8 mile). More distant views from this KOP are generally constrained by existing vegetation and topography. The Rt. 7 travel corridor and related infrastructure (e.g., signs, overpass, barriers, etc.) are the focal points of the foreground and middle ground of this KOP. The highway is a flat, paved roadway with maintained grass and other low vegetation in the median and along both sides. Trees and other taller vegetation add texture and color to the landscape, and generally obscure more distant views on both the northern and southern sides of Rt. 7. Distribution lines along the northern side of the highway generally blend into the vegetation, while more distant distribution lines are somewhat visible above the tree line primarily to the south of Rt. 7. Several taller buildings in the foreground provide vertical scale and mass to the landscape.

Similar to KOP 8, the typical user groups at KOP 9 include commuters and other travelers along the major corridors adjacent to this location (including Ashburn Village Boulevard and Rt. 7) as well as pedestrians along the paved walkway on either side of the road. These groups are likely moderately sensitive to visual changes along the travel corridors. This KOP is representative of both dynamic and static views.

Visual Simulation for Belmont Park Variation A: Belmont Park Variation A would be highly visible along a cleared right-of-way to the south (left) of Rt. 7 from KOP 9 (Appendix G, KOP 9 – Belmont Variation A). Similar to other KOPs, the vertical monopoles would feature prominently and would generally increase the extent of development on the landscape. In particular, the monopoles would add structures that are substantially taller than the existing elements in the foreground and middle ground and would be strong

vertical features in a landscape that generally lacks such features. The horizontal conductors would add new horizontal lines across the skyline (generally above the existing tree line). Travelers on Rt. 7 would have longer duration and more direct views of the visual changes associated with Belmont Park Variation A, because it parallels the southern side of the roadway. Travelers on the Ashburn Village Boulevard overpass would also have views of Belmont Park Variation A, but these views to the northwest would be oblique and for shorter durations than travelers on Rt. 7. The user groups would likely be moderately sensitive to the visual changes introduced by Belmont Park Variation A, although this sensitivity may be tempered somewhat by the extent of existing development in the Rt. 7 corridor. As a result, Belmont Park Variation A would have a low to moderate impact on the overall visual conditions as viewed from KOP 9.

Visual Simulation for Belmont Park *Variation B:* Belmont Park Variation B would be highly visible along a cleared right-of-way to the north (right) of Route 7 from KOP 9 (Appendix G, KOP 9 – Belmont Variation B). Similar to other KOPs, the vertical monopoles would feature prominently and would generally increase the extent of development on the landscape. In particular, the monopoles would add structures that are substantially taller than the existing elements in the foreground and middle ground of the landscape and would be strong vertical features in a landscape that generally lacks such features. The horizontal conductors would add new horizontal lines across the skyline (generally above the existing tree line). Travelers on Rt. 7 would have more direct views of the visual changes associated Belmont Park Variation B, because it crosses the roadway several times within a short distance. Travelers on the Ashburn Village Boulevard overpass would also have views of Belmont Park Variation B. The user groups would likely be moderately sensitive to the visual changes introduced by Belmont Park Variation B, although this sensitivity may be tempered somewhat by the extent of existing development in the Rt. 7 corridor. As a result, Belmont Park Variation B would have a low to moderate impact on the overall visual conditions as viewed from KOP 9.

6.3.3.10 KOP 10

Existing Conditions: KOP 10 is located along Rt. 7 less than 0.5 mile west of the Loudoun County Parkway interchange, providing views to the southeast along the highway corridor. The foreground of this KOP is typical of the Rt. 7 corridor with the paved roadway and associated elements (e.g., signs, barriers, light poles, maintained lawns, and other ground vegetation) as dominant features. Trees and other taller vegetation serve as a buffer along the northern (left) side of Route 7 and partially obscure views of the buildings beyond. Multiple buildings and other developed features (e.g., distribution lines, light poles, overpass, billboards, signs) are visible in the foreground to middle ground of this KOP. More distant views are generally blocked by vegetation and built features in the foreground and middle ground. Overall, there is a moderate level of development visible from KOP 10 with vegetated buffers, maintained lawns, and other landscaped areas providing contrast and texture to the landscape. The primary user groups at KOP 10 include commuters and other travelers along Rt. 7, who are likely moderately sensitive to visual changes within this travel corridor. This KOP is representative of dynamic views.

Visual Simulation: Similar to the views from KOP 9, Route 1 would be highly visible along the south (right) side of Rt. 7 from KOP 10 (Appendix G, KOP 10). The vertical monopoles and horizontal conductors would feature prominently and generally increase the level of development in the landscape. The apparent scale of Route 1's vertical features would be similar to other existing vertical elements including light poles, the poles and netting at Top Golf, and other built features. Travelers on Rt. 7 would have longer duration and direct views of the visual changes associated with Route 1, because it parallels the southern side of the travel corridor. Due to the extent of existing development in the Rt. 7 corridor, Route 1 would have low to moderate impacts on the overall visual conditions as viewed from KOP 10.

6.3.3.11 KOP 11

Existing Conditions: KOP 11 sits at the intersection of Russell Branch Parkway and Commonwealth Center Drive facing to the east. The view from this KOP is typical of the study area's mix of commercial, office, and recreational uses that serve residents in nearby residential areas and beyond. At this KOP, Russell Branch Parkway appears as a flat, wide, multi-lane travel corridor with a grassy center median. The road is lined by multi-story buildings and associated development such as fencing, flagpoles, light poles, parking areas, the pole and netting structure at Top Golf, and maintained lawns and other landscaped areas. The topography and presence of taller buildings and vegetation in the foreground limit more distant views into the middle and

background from KOP 10. The typical user groups at this location include workers, shoppers, recreationists, and other travelers commuting along Russell Branch Parkway and adjacent roadways. These user groups likely have low to moderate sensitivity to changes in visual conditions in this location. This KOP is representative of both dynamic and static views.

Visual Simulation: A small portion of Route 1 would be partially visible from KOP 11 (Appendix G, KOP 11). Specifically, the tops of several monopoles would be visible above the cluster of buildings on the north (left) side of Russell Branch Parkway. These monopoles would add vertical lines that appear to extend from the tops of the buildings into the sky. Additionally, the conductors would cross Russell Branch Parkway and add a clustered series of horizontal lines to the skyline above the roadway. While visible, these new structures are not visually dominant compared to more prominent features in the foreground at this location (like the pole and netting structure at Top Golf). As such, the proposed Project would have a low impact on the overall visual conditions at this KOP.

6.3.3.12 KOP 13

Existing Conditions: KOP 13, which is situated on Malden Place off of Loudoun County Parkway, faces east providing open views towards Loudoun County Parkway and the forested area to the east. The landscape as viewed from KOP 13 contains a mix of vegetated areas (natural and maintained) and existing development. The foreground includes maintained landscaped areas (lawns, trees, shrubs, and other planting beds) and generally extends across and into the forested area across from the parkway. Signs, light poles, distribution lines, and trees add vertical context to the landscape, while most other features visible from this location sit closer to the ground (e.g., paved roadways and sidewalks, sewer grates and manholes, trash receptacles, etc.). Typical user groups at KOP 13 include area residents and travelers on area roadways including Loudoun County Parkway. These user groups, especially area residents, likely are moderately to highly sensitive to changes in the visual conditions from this KOP, which is representative of dynamic and static views.

Visual Simulation for Broad Run Variation A: As viewed from KOP 13, Route 1 and Broad Run Variation A would generally parallel the eastern side of Loudoun County Parkway (Appendix G, KOP 13 – Broad Run Variation A). The monopoles would add taller vertical structures to the landscape, while the conductors would add additional horizontal lines to the skyline generally above the existing tree line. Some existing vegetation would also be removed or otherwise modified in the proposed Project's right-of-way, though these changes would be difficult to distinguish due to the density of existing vegetation. The new features, including built structures and modified vegetation, would be noticeable but would not dominate the existing landscape character as viewed from this KOP, primarily due to the strong horizontal lines provided by Loudoun County Parkway, existing adjacent distribution lines, and the background tree line. As such, Route 1 and Broad Run Variation A would result in a moderate impact on the existing landscape at KOP 13.

Visual Simulation for Broad Run Variation B: As viewed from KOP 13, Route 1 and Broad Run Variation B would parallel the eastern side of Loudoun County Parkway before angling southwest to cross the woodland landscape to the southwest (Appendix G, KOP 13 – Broad Run Variation B). The monopoles would add taller vertical structures to the landscape, while the conductors would add additional horizontal lines to the skyline generally above the existing tree line. Existing vegetation would be removed or otherwise modified in the proposed Project's right-of-way, especially along Broad Run Variation B as it turns southwest to enter and cross the woodland. The new features, both built structures and modified vegetation, would be noticeable within the existing landscape character as viewed from this KOP. Therefore, the proposed Project would result in a moderate impact on the existing landscape at KOP 13.

6.3.3.13 KOP 14

Existing Conditions: KOP 14 faces north from the intersection of Loudoun County Parkway and Coach Gibbs Drive. It is characterized by a mix of roads, maintained vegetation, and industrial and commercial buildings (including the Washington Commanders indoor practice bubble) common to this portion of the study area. The landscape is generally flat with built structures providing some vertical context. In addition to the Commanders facility, which appears as a large, white domed structure to the east of Loudoun County Parkway, there is also a data center complex visible to the west of the parkway, as well as other typical built features (e.g., street signs, distribution lines, fences). Most of the vegetation in this area is planted and

maintained with multiple taller trees primarily along the periphery of the roadways and around the Washington Commanders facility. This vegetation provides a contrast in color and texture to the roads and other built structures visible from KOP 14.

The typical user groups at KOP 14 are likely workers at the neighboring commercial and industrial properties and travelers along Loudoun County Parkway and other adjacent roadways. Given the existing level of development along the Parkway, these user groups likely have low to moderate sensitivity to potential changes to the visual condition at this KOP, which is representative of both dynamic and static views.

Visual Simulation: Broad Run Variation A would be highly visible from KOP 14 (Appendix G, KOP 14). It would parallel the eastern side of Loudoun County Parkway and generally extended to the north as viewed from this location. Similar to other KOPs, the monopoles would add new, taller, vertical structures to the landscape. The conductors would add clusters of horizontal to diagonal lines to the skyline as they extend to the north between monopoles. These Project components would be most visually prominent in the foreground and would become less prominent as they extend into the middle and background. The proposed Project would also require the removal of several trees in the foreground (located along Coach Gibbs Drive and partially screening the Washington Commanders indoor practice facility), reducing the color and texture contrast provided by the vegetation. Workers at adjacent commercial and industrial properties and travelers on Loudoun County Parkway would have extended and direct views of the visual changes associated with the proposed Project, because it parallels the eastern side of the travel corridor. Based on existing development patterns, visibility, and user group sensitivity, the proposed Project would have moderate impacts on the overall visual conditions as viewed from KOP 14.

6.3.3.14 KOP 15

Existing Conditions: KOP 15 is located along the W&OD Trail with views oriented toward the northeast. The view from this location is dominated by deciduous and evergreen trees, shrubs, and other vegetation in the foreground. The height and density of existing vegetation generally blocks any views beyond the foreground. While this view captures the existing vegetation along the north (left) side of the trail, it does not show the full context of the trail corridor at this spot. An existing transmission line parallels the southern (right) side of the trail in this location, along with a shorter distribution line and parking lot light posts. Within a short distance of KOP 15 itself are road crossings (an underpass under Pacific Boulevard to the west and an overpass over Rt. 28 to the east) with multiple industrial and commercial facilities adjacent to and visible from the trail corridor. While the northern side of the trail is vegetated, the overall trail corridor includes a high degree of existing modifications to the landscape.

Given its location on the W&OD Trail, the primary user groups at KOP 15 are non-motorized use trail users. While recreationists may be more sensitive to potential changes in visual conditions in general, the trail users on this segment of the W&OD Trail may be less sensitive to change because of the existing extent of nearby development and other infrastructure. This KOP is representative of dynamic and static views.

Visual Simulation: Route 1 and both Broad Run Variations, which share the same corridor at this location, would be highly visible from KOP 15, as would the improvements at Golden Substation and Line Loop (Appendix G, KOP 15). The substation improvements (buildings, transmission lines and support structures, perimeter fencing, and other structures) would dominate the view from this location. The removal of vegetation would reduce the visual complexity (e.g., colors, textures, etc.) along the northern side of the trail. The perimeter fence would block unobstructed views of the substation, but would create a blocky, linear feature in the landscape. The transmission line structures would create new, tall vertical lines and the conductors would add new horizontal and diagonal lines above the substation and adjacent areas. Additional non-Project-related buildings and other features would also be visible in the middle ground due to the loss of the vegetative buffer along the northern side of the trail. Overall, this would result in a high degree of change to the visual conditions at KOP 15. This level of change notwithstanding, the proposed Project's new infrastructure would be somewhat in character with the commercial and industrial development that dominates the views from adjacent areas along the W&OD Trail. As a result, the proposed Project would have moderate visual impacts on visual conditions as viewed from KOP 15.

6.3.3.15 *KOP 16*

Existing Conditions: KOP 16 faces southwest from a location near the trailhead of the Kincora Heron Nature Trail at the southwest corner of the Kincora commercial and residential zoned area, which is still under construction. Views from this location are dominated by existing dense deciduous vegetation, split by the unpaved trail surface. Glimpses of Broad Run may be available during leaf-off conditions. Based on the proposed residential structures and recreational use of the area, the primary user groups—residents and recreationists--would be moderately sensitive to change at this KOP, which is representative of static views.

Visual Rendering for Broad Run Variation A: The transmission structures and associated conductors for Broad Run Variation A would be skylined and partially visible above the tree line when looking southwest from KOP 16 due to the height and density of screening vegetation. The transmission structures would add vertical human-built elements to the predominately natural view at KOP 16. Due to the extent of existing and planned construction at Kincora (would be immediately behind the viewer at this location), the proposed Project would have a minor impact on visual conditions as viewed from KOP 16.

Visual Rendering for Broad Run Variation B: The transmission structures and associated conductors for Broad Run Variation B would be partially to fully visible above the trees when looking to the west and southwest from KOP 16. Due to vegetation clearing and the short distance to the transmission corridor, several transmission structures would be partially or fully visible through trees to the southwest on the southwestern side of an existing cleared corridor for an underground pipeline. Transmission structures and their associated conductors would be partially skylined above the existing tree line as the corridor runs northwest to southeast. The transmission structures would add vertical man-made elements and the conductors would add curvilinear horizontal lines to a predominately natural view from KOP 16. Overall, this would result in a major degree of change to the visual conditions at KOP 16. Due to the extent of existing and planned construction at Kincora (which would be immediately behind the viewer at this location), the proposed Project would have moderate impacts on visual conditions as viewed from KOP 16.

6.3.4 Visual Impact Assessment for Visually Sensitive Resources

The degree to which overhead transmission lines influence and are visible on a landscape depends on a number of factors, including (but not limited to) structure height, existing landscape features (e.g., topography, vegetation, human-made development), and distances from the viewer. The specific combination of these factors changes from location to location, contributing to a range of potential influences and impacts across the study area. The anticipated impacts from the proposed Project to the visual resource conditions in each VSR are described in Table 6.3-3. This table also indicates a potential impact rating (major, moderate, minor, or negligible) for each VSR.

Table 6.3-3. Summary of Anticipated Impacts by Visually Sensitive Resource and Key Observation Point.

VSR Number	VSR Name	Representative KOP(s)	Relevant Route (Mileposts)	Description of Impact	Potential Impact Rating / Visual Sensitivity
Scenic Resources					
1	Goose Creek Scenic River	2	Route 1	Route 1 crosses the river approximately 0.2 mile northeast of where the W&OD Trail crosses Goose Creek. Mature trees line both sides of the creek, and the route would require vegetation clearing. The proposed monopole structures would add substantially taller vertical lines to the existing landscape and would introduce new horizontal lines to a landscape where most elements are aligned vertically.	Impact: Moderate Visual sensitivity is moderate to high due to recreational use and the State Scenic River designation.

VSR Number	VSR Name	Representative KOP(s)	Relevant Route (Mileposts)	Description of Impact	Potential Impact Rating / Visual Sensitivity
Recreational Resources					
2	W&OD Trail	1, 15	Route 1 Broad Run Variation A Broad Run Variation B Line Loop	At the western portion of the project, Route 1 crosses the W&OD Trail approximately 150-feet from the west side of Cochran Mill Road. Mature trees line the southwest side of the trail, while Dominion's existing Line #274 parallels the northeast side of the trail with trees bordering the northern side of the transmission corridor. At the eastern portion of the project, Route 1 heads south, parallels and crosses Pacific Boulevard towards Golden Substation on the north side of the W&OD Trail between Pacific Boulevard and Route 28. Mature trees border the northern side of the trail. Broad Run Variation A parallels the east side of Loudoun County Parkway before angling southeast to parallel the northern side of the trail towards the data centers on the west side of Pacific Boulevard. Dominion's existing Line #274 parallels the northern side of the trail with trees bordering the northern side of the transmission corridor. Broad Run Variation B crosses Pacific Boulevard before heading south to parallel the roadway on the east side, approximately 0.4 mile north of where the W&OD Trail crosses under Pacific Boulevard. All of the route options along the W&OD Trail would require vegetation clearing and introduce human-built structures to the landscape. The vegetation clearing and amount of development at the Golden Substation would reduce the visual complexity while the perimeter fence around the substation would introduce a blocky, linear feature on the landscape. The transmission structures would introduce tall vertical lines and the conductors would add horizontal and diagonal lines above the substation and adjacent areas.	Impact: Low to Moderate Visual sensitivity is moderate to high due to the recreation use and historic nature of the trail.
3	Seldens Landing Elementary School	NA	Route 1	Route 1 parallels the south side of Rt. 7 starting approximately 0.3 mile east of the Belmont Ridge Road/Rt. 7 interchange and running southeast. The route would add transmission structures and associated conductors above adjacent tree lines and require vegetation clearing south of Rt. 7.	Impact: Low Visual sensitivity is low to moderate due to the typical activities at the site (student drop-off/pick-up; athletic and recreation events; views from the school building).

VSR Number	VSR Name	Representative KOP(s)	Relevant Route (Mileposts)	Description of Impact	Potential Impact Rating / Visual Sensitivity
4	Steuart W. Weller Elementary School	NA	Route 1 Broad Run Variation A Broad Run Variation B	Route 1 runs north-south paralleling Loudoun County Parkway staying east of a commercial property on the east side of the roadway. Broad Run Variation A continues paralleling Loudoun County Parkway across Beaverdam Run to the south. Broad Run Variation B angles southeast before crossing Beaverdam Run and follows the northeast property boundary of a densely forested parcel. The route would require vegetation clearing. Route 1 and both of the Broad Run variations would add transmission structures and associated conductors to the landscape in this area.	Impact: Low Visual sensitivity is low to moderate due to the typical activities at the site (student drop-off/pick-up; athletic and recreation events; views from the school building).
5	Belmont Country Club	7	Route 1 Belmont Variation A Belmont Variation B	Route 1 parallels the south side of Rt. 7 in an area requiring vegetation clearing to the northwest and southeast of the VSR. Belmont Variation A follows the south side of Rt. 7 in an area requiring vegetation clearing. Belmont Variation B angles northeast to cross Rt. 7, then parallels the north side of the highway for approximately 0.4 mile in an area requiring vegetation removal, then crosses back to the south side of Rt. 7. Route 1 and both Broad Run variations would appear as a new, long, linear feature running above adjacent tree lines and built structures in this area. The vertical monopole structures and horizontal conductors would be prominent and would increase the prominence of other built features on the landscape.	Impact: Low to Moderate Visual sensitivity is high due to the historic and recreational uses of the property.

VSR Number	VSR Name	Representative KOP(s)	Relevant Route (Mileposts)	Description of Impact	Potential Impact Rating / Visual Sensitivity
6	1757 Golf Club	NA	Route 1 Broad Run Variation A	Route 1 connects to the south side of either Broad Run Variation A or Broad Run Variation B on the east side of Pacific Boulevard, then immediately crosses the roadway to the west side and angles southeast to parallel the W&OD Trail towards Golden Substation. This segment would require vegetation clearing and add additional human-built infrastructure to the landscape. Broad Run Variation A parallels the east side of Loudoun County Parkway before angling southeast to parallel the north side of the W&OD Trail for approximately 0.3 mile to a crossing of Broad Run. It then angles northeast to follow the western and northern boundaries of a data center parcel. The route would require vegetation clearing and add additional human-built infrastructure to the landscape (an existing Dominion transmission line currently parallels the southern side of the W&OD Trail in this area).	Impact: Low (Route 1); Moderate (Broad Run Variation A) Visual sensitivity is moderate to high due to the recreational and event uses of the property.
7	Lansdowne Resort	5	Route 1 Broad Run Variation A Broad Run Variation B	Route 1 parallels the south side of Rt. 7 in an area that would require vegetation clearing to the northwest and southeast of the VSR. Belmont Variation A follows the same southeast corridor as Route 1 for approximately 0.7 mile and stays on the south side of Rt. 7. The variation would require vegetation clearing in this area. Belmont Variation B angles northeast to cross to the north side of Rt. 7, then parallels the north side of the roadway for approximately 0.4 mile in an area that would require vegetation clearing, then crosses to the south side of Rt. 7. Route 1 and both of the Broad Run variations would introduce tall vertical monopole structures and associated conductors above the tree line and along Loudoun County Parkway. This would increase the level of visible development in this area and add substantially taller vertical structures to the landscape.	Impact: Moderate Visual sensitivity is moderate to high due to the recreational uses of the property.

VSR Number	VSR Name	Representative KOP(s)	Relevant Route (Mileposts)	Description of Impact	Potential Impact Rating / Visual Sensitivity
8	Potomac Green Community Park	NA	Route 1 Broad Run Variation A Broad Run Variation B	Route 1 runs north-south paralleling Loudoun County Parkway on the east side of the roadway. Broad Run Variation A continues paralleling Loudoun County Parkway crossing Beaverdam Run to the south. Broad Run Variation B angles southeast before crossing Beaverdam Run and following the northeast property boundary of a densely forested parcel. The route would require vegetation clearing. Route 1 and both of the Broad Run variations would introduce tall vertical monopole structures and associated conductors above the tree line and along Loudoun County Parkway. This would increase the level of visible development in this area and add substantially taller vertical structures to the landscape.	Impact: Low (Route 1; Broad Run Variation A); Negligible (Broad Run Variation B) Visual sensitivity is moderate to high due to the recreational uses of the property.
Historic Resources					
9	Cooke's Mill (Ruins)	NA	Route 1	Route 1 crosses the Goose Creek approximately 0.2 mile northeast of where the W&OD Trail crosses the waterbody. Mature trees line both sides of the creek. The route then heads northeast towards Rt. 7 for approximately 0.7 mile through dense woodland. The route would require vegetation clearing and introduce transmission structures and associated conductors to the natural landscape.	Impact: Low Visual sensitivity is moderate to high due to the historic area.
10	African-American Burial Ground for the Enslaved at Belmont	4	Route 1	Route 1 parallels the west side of Belmont Ridge Road for approximately 725 feet, approximately 0.3 mile south of Rt. 7. The route then angles northeast across Belmont Ridge Road heading south/southeast of the VSR, then parallels the southern side of Rt. 7. The route would require vegetation clearing and add additional transmission structures and associated conductors to the landscape.	Impact: Low to moderate Visual sensitivity is moderate to high.
11	Janelia Farm	8	Route 1 Belmont Variation A Belmont Variation B	Route 1 parallels Rt. 7 on the south side of the roadway crossing the interchange with Ashburn Village Boulevard. There are mature trees bordering the south side of Rt. 7 within the right-of-way that would require vegetation clearing. The vertical monopole structures and horizontal conductors would add to the existing transmission corridors and increase the prominence of other built features on the landscape.	Impact: Moderate Visual sensitivity is moderate.
Cultural Resources					

VSR Number	VSR Name	Representative KOP(s)	Relevant Route (Mileposts)	Description of Impact	Potential Impact Rating / Visual Sensitivity
12	St. David's Episcopal Church and School	NA	Route 1 Belmont Variation A Belmont Variation B	Route 1 and Belmont Variation A parallel the south side of Rt. 7, crossing the interchange with Claiborne Parkway. An existing transmission corridor parallels the south side of the roadway. Mature trees and tall shrubs border the south side of the transmission corridor. Belmont Variation B crosses from the south side of Rt. 7 to the parallel the north side of the roadway, heading southeast, approximately 0.3 mile northwest of the Claiborne Parkway interchange. Route 1 and both Belmont variations would require additional vegetation clearing and introduce additional vertical structures and associated conductors on the landscape.	Impact: Low Visual sensitivity is low to moderate as viewers would be in the parking lot, school buildings, or playground.
13	Telugu Christian Fellowship Church	NA	Route 1	Route 1 parallels the south side of Rt. 7 before angling southwest on the west side of Waverly Road. Mature trees border the south side of the existing distribution line along the south side of Rt. 7. The route would require vegetation clearing, an expansion of existing transmission corridors and add additional human-built structures in the area.	Impact: Low Visual sensitivity is low as viewers would predominately be indoors or walking to/from the parking lot.
14	Community Church	NA	Route 1 Belmont Variation A Belmont Variation B	Route 1 and Belmont Variation A parallel the south side of Rt. 7, crossing the interchange with Claiborne Parkway to the northwest and the interchange with Ashburn Village Boulevard to the southeast. An existing transmission corridor parallels the south side of the roadway. Mature trees and tall shrubs border the south side of the transmission corridor. Belmont Variation B parallels the north side of Rt. 7 before crossing the roadway 0.2 mile southeast of Claiborne Parkway. Mature trees border the north side of Rt. 7. Route 1 and both Belmont Variations would require additional vegetation clearing and introduce additional vertical structures and associated conductors on the landscape.	Impact: Low Visual sensitivity is low as viewers would predominately be indoors or walking to/from the parking lot.

VSR Number	VSR Name	Representative KOP(s)	Relevant Route (Mileposts)	Description of Impact	Potential Impact Rating / Visual Sensitivity
Road Corridors					
15	Harry Byrd Highway (Rt. 7)	10	Route 1 Belmont Variation A Belmont Variation B	Routes 1 parallels the south side of Rt. 7 for approximately 2.8 miles total, while Belmont Variation A parallels the south side of the highway for about 0.4 mile. Belmont Variation B crosses from the south to the north side of Rt. 7, then parallels the north side of the highway for about 0.4 mile, then crosses back to the south side of Rt. 7. Route 1 and both Belmont variations would require vegetation clearing and add additional transmission structures and associated conductors along the highway corridor.	Impact: Low to Moderate Visual sensitivity is low as viewers would predominately be in vehicles traveling along the roadway.
16	Belmont Ridge Road (Rt. 659)	3	Route 1	At the Route 1 crossing, the road experiences an AADT of 8,800 vehicles in both directions. The crossing currently has dense forest on both sides of the roadway. The route would require vegetation clearing on both sides of the road and introduce new, tall vertical structures on either side with horizontal conductors crossing the roadway.	Impact: Moderate Visual sensitivity is low to moderate as most viewers would be in vehicles traveling along the roadway, though there are wide multi-use paths that parallel both sides of the road for pedestrian traffic.
17	Lansdowne Boulevard (Rt. 2400 N)/ Claiborne Parkway (Rt. 901)	NA	Belmont Variation A Belmont Variation B	Lansdowne Boulevard turns into Clairborne Parkway where it crosses Rt. 7. Both roads have an AADT of 14,000 cars in both directions. A grassy median bisects the roadway on both sides of Rt. 7. Both Belmont route options would require vegetation clearing and add new human-built structures across Lansdowne Boulevard (Belmont Variation A would cross to the south of Rt. 7 and Belmont Variation B would cross to the north of Rt. 7).	Impact: Low Visual sensitivity is low as viewers would predominately be in vehicles traveling along the roadway.
18	Ashburn Village Boulevard	8, 9	Route 1	South of Rt. 7, Ashburn Village Boulevard experiences an AADT of 13,000 cars in both directions. Dense trees and wetlands border the northwest side of the roadway and commercial areas with open grassy fields border the southeast side of the roadway. A grassy median bisects traffic directions, and a paved sidewalk runs along the western side of the roadway between Ashbrook Commons Plaza and Riverside Parkway. Route 1 would require vegetation clearing and introduce new human-built structures that span the Ashburn Village Boulevard on the southern side of Rt. 7.	Impact: Low Visual sensitivity is low to moderate as viewers would predominately be in vehicles traveling along the roadway, though there also are wide multi-use paths parallel to both sides of the roadway for pedestrians.

VSR Number	VSR Name	Representative KOP(s)	Relevant Route (Mileposts)	Description of Impact	Potential Impact Rating / Visual Sensitivity
19	Russell Branch Parkway	NA	Route 1 Belmont Variation A Belmont Variation B Broad Run Variation B	From Claiborne Parkway to Ashburn Road, Russell Branch Parkway experiences an AADT of 9,500 cars in both directions. From Ashburn Road to Atwater Drive, the road experiences and AADT of 5,800 cars in both directions. From Atwater Drive to Loudoun County Parkway, the road experiences an AADT of 9,600 cars in both directions. From Loudoun County Parkway to Waverly Court, the road experiences an AADT of 2,900 cars in both directions. From Richfield Way to Pacific Boulevard, the road experiences an AADT of 860 cars in both directions. The roadway routes through commercial and suburban residential areas and riparian/wetland areas along Russell Branch. As noted above, Route 1 would require some vegetation clearing and add additional human-built structures to the landscape. Belmont Variation A and Variation B would have similar impacts. The Broad Run Variation B option would require substantial vegetation clearing though much of the clearing would be screened to motorists on Russell Branch Parkway because of remaining vegetation. The route would add new human-built structures to the landscape that may be visible above the screening vegetation.	Impact: Low Visual sensitivity is low to moderate as viewers would predominately be in vehicles traveling along the roadway, though there are wide multi-use paths parallel to both sides of the roadway pedestrians.
20	Loudoun County Parkway	10	Route 1 Broad Run Variation A Broad Run Variation B	From South of Rt. 7 to Waxpool Road, Loudoun County Parkway experiences an AADT of 14,000 vehicles in both directions. The road has intermittent grassy medians, weaves through commercial and suburban residential areas and several hayed fields and crosses riparian areas/wetlands associated with Russell Branch, Beaverdam Run, and Broad Run. Route 1 and Broad Run Variation A would require some vegetation clearing and add additional human-built structures along the eastern side of Loudoun County Parkway. The location of these structures along the road would make them more noticeable to motorists and others on the parkway. The Broad Run B Variation would require substantial vegetation clearing and introduce new human-built structures to the landscape. While much of the new, cleared right-of-way would be screened by remaining vegetation to motorists and others on Loudoun County Parkway, the height of the new structures would make them visible above the remaining tree line.	Impact: Low to Moderate Visual sensitivity is low to moderate as viewers would predominately be in vehicles traveling along the roadway, though there are also wide multi-use paths parallel to both sides of the roadway for pedestrians.

VSR Number	VSR Name	Representative KOP(s)	Relevant Route (Mileposts)	Description of Impact	Potential Impact Rating / Visual Sensitivity
21	Gloucester Parkway	14	Broad Run Variation A Broad Run Variation B	From Belmont Ridge Road to Ashburn Road, Gloucester Road experiences an AADT of 3,600 cars in both directions. From Ashburn Road to Marblehead Drive, it experiences an AADT of 12,000 cars in both directions. The roadway has intermittent grassy medians, weaves through commercial and suburban residential areas, and crosses riparian/wetland areas associated with Beaverdam Run and Broad Run. Both Road Run variations would require vegetation clearing and introduce new vertical structures and horizontal overhead crossings to Gloucester Parkway.	Impact: Low Visual sensitivity is low to moderate as viewers would predominately be in vehicles traveling along the roadway, though there are also wide multi-use paths parallel to both sides of the roadway for pedestrians.
22	Pacific Boulevard	NA	Route 1 Broad Run Variation A Broad Run Variation B	Pacific Boulevard experiences an AADT of 10,000 cars in both directions. The roadway has intermittent grassy medians and transects industrial, commercial, and suburban residential areas. All three routes would require vegetation clearing and add additional human-built structures to the landscape. All three routes also include at least one crossing of Pacific Boulevard (Route 1 has two crossings). Transmission infrastructure installed at these crossings would be more noticeable to motorists and others on the boulevard compared to other segments of the routes.	Impact: Low Visual sensitivity is low as viewers would predominately be in vehicles traveling along the roadway.
23	Darrell Green Boulevard/Sully Road (Rt. 28)	NA	Route 1 Broad Run Variation A Broad Run Variation B	No AADT are available for this for road. The roadway has grassy medians and is bordered by dense woodland, commercial/industrial areas, and suburban residential neighborhoods. All three routes would require vegetation clearing and add additional human-built structures that would add new forms and lines to the landscape in this area.	Impact: Low Visual sensitivity is low as viewers would predominately be in vehicles traveling along the roadway.

VSR Number	VSR Name	Representative KOP(s)	Relevant Route (Mileposts)	Description of Impact	Potential Impact Rating / Visual Sensitivity
Areas of High Public Concentration					
24	Ashburn CDP	9, 10, 11, 13	Route 1 Belmont Variation A Belmont Variation B Broad Run Variation A Broad Run Variation B	Route 1 and Belmont Variation A parallel the south side of Rt. 7 while Belmont Variation B crosses and parallels Rt. 7 to the north along the north side of Ashburn CDP. The eastern/southeastern segments of Route 1 and both Broad Run variations transect the eastern side of Ashburn CDP, west of Highway 28. This area is dominated by suburban residential neighborhoods. All of the route options would require vegetative clearing and introduce new human-built structures to the landscape. These changes would be most noticeable in the immediate vicinity of the routes and other nearby locations where existing trees, buildings, and other structures would not block more distant views of the new transmission structures. Across a majority of the CDP, existing vegetation, buildings, and other structures would screen the visual impacts to the landscape from the route options.	Impact: Moderate Visual sensitivity is moderate to high due to the high volume of residences and commercial shopping areas.
25	Belmont CDP	9	Route 1 Belmont Variation A Belmont Variation B	Route 1 and Belmont Variation A parallel the south side Rt. 7 while Belmont Variation B crosses and parallels Rt. 7 to the north. Rt. 7 forms the north/northeastern boundary of the Belmont CDP. The area is dominated by suburban residential neighborhoods and several small commercial areas. The changes to the landscape from the route options would be similar to those describe above for the Ashburn CDP. That is, the routes would require vegetation clearing and the installation of additional human-built structures to the landscape. These structures would add additional forms and lines similar to existing structures, but the mass and height would differentiate them. The changes would be most noticeable in the immediate vicinity of the routes and other nearby locations where existing trees, buildings, and other structures would not block more distant views of the new transmission structures. Across a majority of the CDP, the existing vegetation, buildings, and other structures would screen the visual impacts to the landscape from the route options.	Impact: Low to Moderate Visual sensitivity is moderate to high due to the high volume of residences.

VSR Number	VSR Name	Representative KOP(s)	Relevant Route (Mileposts)	Description of Impact	Potential Impact Rating / Visual Sensitivity
26	Lansdowne CDP	6	Route 1 Belmont Variation A Belmont Variation B	See the Belmont CDP VSR description for the route descriptions within this CDP. Rt. 7 forms the southwest boundary of the Lansdowne CDP and borders the Ashburn CDP to the east. Goose Creek and the Potomac River form the western and northern boundaries. The area is dominated by suburban residential neighborhoods, several recreational golf clubs/resorts, and several commercial areas near Rt. 7. The changes to the landscape from the route options would be similar to those described for other CDPs. That is, the routes would require vegetation clearing and the installation of additional human-built structures to the landscape. These structures would add additional forms and lines that are similar to existing structures, but the mass and height would differentiate them. The changes would be most noticeable in the immediate vicinity of the routes and other nearby locations where existing trees, buildings, and other structures would not block more distant views of the new transmission structures. Across a majority of the CDP, the existing vegetation, buildings, and other structures would screen visual impacts to the landscape from the route options.	Impact: Low Visual sensitivity is high due to the high volume of residences and recreational uses.
27	One Loudoun CDP	NA	Route 1	Route 1 runs along the northeastern boundary of the CDP on the south side of Rt. 7. The area is dominated by a multi-land use commercial and suburban residential area. The changes to the landscape from Route 1 would be similar to those identified for other CDPs. That is, the routes would require vegetation clearing and the installation of additional human-built structures to the landscape. These structures would add additional forms and lines that are similar to existing structures, but the mass and height would differentiate them. These changes would be most noticeable in the immediate vicinity of the route and other nearby locations where existing trees, buildings, and other structures would not block more distant views of the new structures. Across a majority of the CDP, the existing vegetation, buildings, and other structures would screen the visual impacts to the landscape from Route 1.	Impact: Low Visual sensitivity is moderate to high due to the high density of residences and commercial traffic.

AADT = annual average daily traffic; CDP = Census Designated Place; W&OD = Washington & Old Dominion Trail

The routes and most of the new transmission line structures generally would be along existing travel corridors where the predicted visual changes from the Project would be consistent with the character of existing commercial and industrial developments. Within travel corridors, new transmission structures would be comparable in visual character to, and generally consistent with, other built elements, including distribution lines, signs, lights, fencing and barriers, and neighboring buildings. However, the height of the monopole structures would differentiate them from the existing human-made features commonly found along the routes. In particular, the height and mass of the monopoles would make them highly noticeable and dominant in the foreground when viewed at close range. The height of these structures would also make them visible (and thus new visual features) when viewed from more distant vantages (e.g., middle and background areas), although their dominance on the landscape would be reduced at these distances.

6.3.5 Impact Assessment by Route

Table 6.3-4 summarizes the anticipated impacts on visual conditions from Route 1 and the Belmont Park and Broad Run Variations. This table also provides a potential impact rating (major, moderate, minor, or negligible) for each route or variation.

6.3.5.1 Route 1 Conclusion

For Route 1, the central segment of the alignment along Rt. 7 would be more visible than the western end (from the proposed Aspen Substation site to Belmont Ridge Road) and to a lesser extent the eastern end (south of Rt. 7 to Loudoun County Parkway). Since the central segment runs parallel to Rt. 7, it would be visible to motorists on the highway as well as area residents, recreationists, and workers with direct views of the travel corridor. As noted previously, the visual character of the Project's proposed infrastructure is comparable to and generally consistent with existing human-built modifications along Rt. 7; however, the height and mass of the transmission line structures would make them more prominent than existing development and dominant when viewed at close range.

The western and eastern segments of Route 1, with the except of the eastern terminus at the Golden Substation, would be less noticeable and dominant on the landscape due to existing tree cover, buildings, and other structures that wholly or partially block foreground views of the proposed transmission line. In these areas, the tops of some transmission line structures would be visible above the existing tree and building lines but would create less of a visual contrast than for the central segment along Rt. 7. The Golden Substation and Line Loop would be highly visible from the W&OD Trail and would constitute a high level of change from existing conditions. Nonetheless, the proposed Project's new infrastructure would be somewhat in character with the commercial and industrial development that dominates the views from adjacent areas along the W&OD Trail.

6.3.5.2 Belmont Park Variation Conclusions

Belmont Park Variation A would have similar visual impacts to those previously described for the portion of Route 1 that runs along Rt. 7. Belmont Park Variation B would have slightly greater visual impacts due to its two perpendicular crossings of Rt. 7. These crossings would include additional, closely spaced towers that would draw the attention of and be more noticeable to travelers on the highway. Belmont Park Variation A would have three spans with FAA obstruction markings, while Belmont Park Variation B would have five spans with FAA market balls.

6.3.5.3 Broad Run Variation Conclusions

Broad Run Variation A would be more visible and create a greater contrast on the existing landscape than Broad Run Variation B. This is primarily because Broad Run A runs parallel to Loudoun County Parkway and thus would be more visible to travelers, area residents, and other user groups in this area. The visual

character of Project infrastructure installed along Broad Run Variation A would be comparable to and generally consistent with existing human-built modifications along this portion of Loudoun County Parkway, but the height and mass of the transmission structures would make them visually dominant in the foreground. The visual dominance would decrease when viewed in the middle to background.

Because Broad Run Variation B generally is aligned away from existing travel corridors, recreational paths, and other areas with open views, there would be fewer unobstructed foreground views of the new transmission infrastructure compared to Broad Run Variation A. The transmission line for Broad Run B would still be visible above existing tree and building lines in many locations as well as at road crossings but would be less dominant and create less visual contrast with the existing landscape. At the same time, Broad Run Variation B would require substantial clearing of trees and other natural vegetation. This would modify existing visual conditions along the route and create gaps in the vegetative cover that may draw the attention of user groups and would create openings through which the transmission line structures would be more visible.

While the transmission line structures are anticipated to result in changes to the visual conditions, their adverse impacts would be moderate because:

- Human influences and built structures (modifications to the landscape) are common in the area;
- The study area has and continues to experience a transformation from a rural to more suburban/urban setting with a mix of residential, commercial, and industrial development and related infrastructure (e.g., travel corridors, distribution lines, lights, signs, cell towers), and
- Opportunities for foreground views (where the transmission route structures are most noticeable) are limited due to existing buildings and vegetated areas that limit sightlines and generally occur along travel corridors where there is already a higher level of visual disturbance.

Table 6.3-4: Visually Sensitive Resource Impact Results

Route or Variation	Potentially Impacted VSRs	Description of Impact	Potential Impact Rating
Route 1	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, and 27 **Total 26**	Road crossings: ■ New right-of-way – 9 crossings ■ **Total – 9 crossings** Sensitive VSRs: ■ 1757 Golf Club ■ Belmont Country Club ■ African American Burial Ground for the Enslaved at Belmont ■ Community Church ■ Goose Creek Scenic River ■ Lansdowne Resort ■ St. David's Episcopal Church and School ■ Seldens Landing Elementary School ■ Steuart W. Weller Elementary School ■ Telugu Christian Fellowship Church ■ Washington and Old Dominion Trail Impacted User Groups: ■ Local residents/workers ■ Commuters/through-travelers ■ Recreationalists/tourists	Low to Moderate Low to Moderate Moderate to High **Overall: Moderate**
Belmont Variation A	5, 11, 12, 14, 15, 17, 19, 24, 25, 26, **Total 10**	Road crossings: ■ New right-of-way – 1 crossing ■ **Total – 1 crossing** Sensitive VSRs: ■ Belmont Country Club ■ Community Church ■ Janelia Farm ■ St. David's Episcopal Church and School Impacted User Groups: ■ Local residents/workers ■ Commuters/through-travelers ■ Recreationalists/tourists	Low Moderate Moderate **Overall: Moderate**

Route or Variation	Potentially Impacted VSRs	Description of Impact	Potential Impact Rating
Belmont Variation B	5, 11, 12, 14, 15, 17, 19, 24, 25, and 26 **Total 10**	Road crossings: ■ New right-of-way – 1 crossing ■ **Total –1 crossing** Sensitive VSRs: ■ Belmont Country Club ■ Community Church ■ Janelia Farm ■ St. David's Episcopal Church and School Impacted User Groups: ■ Local residents/workers ■ Commuters/through-travelers ■ Recreationalists/tourists	Low Moderate Moderate **Overall: Moderate**
Broad Run Variation A	2, 4, 6, 7, 8, 20, 21, 22, 23, and 24 **Total 10**	Road crossings: ■ New right-of-way – 3 crossings ■ **Total –3 crossings** Sensitive VSRs: ■ 1757 Golf Club ■ Lansdowne Resort ■ Potomac Green Community Park ■ Steuart W. Weller Elementary School ■ Washington and Old Dominion Trail Impacted User Groups: ■ Local residents/workers ■ Commuters/through-travelers ■ Recreationalists/tourists	Low to Moderate Low to Moderate Moderate **Overall: Moderate**
Broad Run Variation B	2, 4, 7, 8, 20, 21, 22, 23, and 24 **Total 9**	Road crossings: ■ New right-of-way – 2 crossings ■ **Total –2 crossings** Sensitive VSRs: ■ Lansdowne Resort ■ Potomac Green Community Park ■ Steuart W. Weller Elementary School ■ Washington and Old Dominion Trail Impacted User Groups: ■ Local residents/workers ■ Commuters/through-travelers ■ Recreationalists/tourists	Low Low to Moderate Moderate **Overall: Moderate**

VSR = visually sensitive resource

6.4 Cultural Resources

ERM conducted a pre-application analysis of potential impacts on known cultural resources along and near the routes under consideration in accordance with the VDHR's *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* (Guidelines) (VDHR 2008). For each alternative route, the analysis identified and considered previously recorded resources within the following study tiers as specified in the Guidelines:

- National Historic Landmarks (NHLs) within a 1.5-mile radius of each route centerline;
- NRHP-listed properties, NHLs, battlefields, and historic landscapes within a 1.0-mile radius of each route centerline;
- NRHP-eligible and NRHP-listed properties, NHLs, battlefields, and historic landscapes within a 0.5-mile radius of each route centerline; and
- All of the above qualifying resources and archaeological sites within what would be right-of-way for each alternative route.

These study tiers additionally encompassed the proposed Aspen and Golden Substation sites.

Data on previously recorded cultural resources within each study tier was obtained from VCRIS. ERM additionally collected information from the Loudoun County Preservation Society (2023), Loudoun County Heritage Commission (2023), Loudoun County Preservation and Conservation Commission (2023), and Loudoun County African-American Historic Architectural Resources Survey (2004) to find locally significant resources within a 1.0-mile radius of each route centerline.

Many of the previously recorded aboveground cultural resource sites in the vicinity of the routes have not been assessed for NRHP eligibility and, therefore, are not included in the pre-application analysis per the Guidelines. These resources should be considered potentially eligible for listing in the NRHP until they are assessed, and a determination of eligibility made by the VDHR. Additionally, there may be unreported historic and archaeological resources that could be affected by construction or operation of the proposed facilities. Any such resources would be addressed during an intensive cultural resources survey to be conducted along the route certificated by the SCC in a subsequent phase of investigation to support permitting.

Along with the records review, ERM conducted field assessments of the considered architectural resources and historic districts for each route in accordance with the Guidelines. Digital photographs were taken of each architectural resource with views toward the applicable transmission line route (or routes) or other facility. Photo simulations were prepared to assess potential visual effects on the considered resources within the tiered study area. For the previously recorded archaeological sites under consideration, aerial photographs were examined to assess the current land condition and spatial relationship between the sites and any existing or planned transmission lines. The results of these assessments are presented in Section 6.4.1 Archaeology Sites and Findings, and Section 6.4.2, Aboveground Historic Properties and Findings, as appropriate.

As enumerated in more detail below, ERM identified 14 previously recorded archaeological sites within what would be the right-of-way for each route. Of these, nine are considered not eligible for listing in the NRHP, three have not been evaluated, one is potentially eligible, and one is eligible for listing in the NRHP.

With regard to historic architectural resources, ERM identified ten previously recorded sites and/or districts within the study tiers described above. Of these, one is an NHL, three are listed in the NRHP, two

are eligible for listing in the NRHP, and four are unevaluated for the NRHP but considered locally significant for purposes of this report.

6.4.1 Archaeological Sites and Findings

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 (e.g., due to transmission structure placement, tree clearing, or heavy equipment usage within a site). The known archaeological sites in what would be right-of-way for each route are listed and described in Table 6.4-1. A confident and complete assessment of the integrity of each site would require archaeological field investigations, which as noted above, would be completed in a subsequent phase of studies for the Project along the route certificated by the SCC.

Of the 14 known archaeological sites proximate to the routes, four are along Route 1 (44LD0213, 44LD0579, 44LD0581, and 44LD2010), five are along Broad Run Variation A (44LD0110, 44LD0142, 44LD0647, 44LD0649, and 44LD0651), and five are along Broad Run Variation B (44LD0021, 44LD0107, 44LD0109, 44LD0209, and 44LD0650). No previously recorded sites were identified proximate to Belmont Park Variation A, Belmont Park Variation B, Line Loop or Aspen-Goose Creek Line.

Information on the sites that would be impacted by each route, such as the eligibility of each site for listing in the NRHP and an assessment of each site's condition based on desktop review, are provided in Table 3.4-1 described below. A confident evaluation of the nature of archaeological deposits at each site and impacts from prior land use activities would require a field survey to verify the desktop analysis. An assessment of potential impacts on the sites by route is provided in the subsections below.

Table 6.4-1: Archaeological Resources in the Rights-of-Way for each Route

Route	Greenfield or Existing/Expanded ROW?	Site Number	Description	NRHP Status
Route 1	Greenfield	44LD0213	Surface scatter (Pre-Contact)	Not Eligible
	Greenfield	44LD0579	Stone Foundation (Antebellum Period, Early National Period)	Not Eligible
	Greenfield	44LD0581	Historic Farmstead (Antebellum Period, Civil War, Early National Period, Reconstruction and Growth)	Potentially Eligible
	Greenfield	44LD2010	Lithic scatter (Pre-Contact) and Dwelling (Antebellum Period, Civil War, Early National Period, Reconstruction and Growth)	Unevaluated
Belmont Park Variation A	Not applicable	None identified	Not applicable	Not applicable
Belmont Park Variation B	Not applicable	None identified	Not applicable	Not applicable
Broad Run A	Greenfield	44LD0110	Artifact scatter (Early Woodland, Late Archaic)	Not Eligible
	Greenfield	44LD0142	Artifact scatter (Pre-Contact)	Not Eligible
	Greenfield	44LD0647	Historic farmstead (Antebellum Period, Civil War, Reconstruction and Growth)	Not Eligible

Route	Greenfield or Existing/Expanded ROW?	Site Number	Description	NRHP Status
	Greenfield	44LD0649	Historic farmstead (Antebellum Period, Civil War, Reconstruction and Growth)	Eligible
	Greenfield	44LD0651	Historic farmstead (Antebellum Period, Early National Period)	Not Eligible
Broad Run B	Greenfield	44LD0021	Artifact scatter (Woodland)	Not Eligible
	Greenfield	44DL0107	Artifact scatter (Woodland)	Not Eligible
	Existing/Expanded ROW	44LD0109	Artifact scatter (Pre-Contact)	Not Eligible
	Greenfield	44DL0209	Temporary camp (Pre-Contact)	Unevaluated
	Greenfield	44LD0650	Temporary camp (Early Archaic)	Unevaluated
Aspen-Goose Creek Line	Not applicable	None identified	Not applicable	Not applicable

6.4.1.1 Route 1

44LD0213 is a Pre-Contact (AD 1500–1606) Native American camp consisting of a surface artifact scatter. The site was originally identified in 1981 during a Phase I survey conducted by William Rust. It was later revisited in 1997 by the William & Mary Center for Archaeological Research (WMCAR) and again in 2005 by Thunderbird Archeology/Wetland Studies & Solutions. The site has been determined not eligible for listing in the NRHP. Approximately 110 feet of Route 1 intersects the site along Rt. 7. Given the site's proximity to the existing highway shoulder, it is unlikely that intact cultural deposits would be encountered within what would be the right-of-way for the route.

Site 44LD0579 consists of a farmstead with an early to mid-twentieth century domestic occupation before the property was abandoned. The site was originally surveyed in 1998 by Cultural Resources, Inc. and subsequently surveyed in 2009 by WMCAR and in 2020 by Thunderbird Archaeology. 44LD0579 has been determined not eligible for listing in the NRHP. Approximately 0.2 mile of Route 1 intersects the site along Rt. 7. Given the findings of previous surveys and the site's proximity to the existing highway shoulder, it is unlikely that intact cultural deposits would be encountered along the route in this area.

44LD0581 is a single dwelling farmstead. According to a deed from Ludwell Lee to John Waters, the area contained a building on a one-acre parcel since at least 1829. Specific occupants and use of the building are unclear, but it likely served a combined commercial and residential function. It appears to have remained in use until at least 1879, when a deed from Columbus Waters to Mary Ross Stanton notes Charles Keene as occupying the property. The site was originally surveyed in 1998 by Cultural Resources, Inc. and again in 2020 by Thunderbird Archaeology. At the time of the 2020 survey, an unknown portion of the site had been destroyed, but the remaining site area had been recommended potentially eligible for listing on the NRHP. Approximately 377 feet of Route 1 intersects 44LD0581 along Rt. 7. Given the complexity and history of the site as well as the artifact distribution noted by previous investigators, it is possible that intact cultural components could be encountered in the site area. However, no transmission structures are currently planned to be installed within the site boundaries.

Site 44LD2010 is a multicomponent site consisting of a Pre-Contact lithic scatter and single Euro-American dwelling circa 1820 to 1877. The dwelling is situated on a terrace above a dam and lock and opposite the known location of Mavin's Mill (053-0336), which can be seen in a Yardley Taylor map and a 1937 aerial photograph. The site was originally surveyed in 2022 by Thunderbird Archaeology, at which

time up to 24 percent of the site was reported as destroyed. Approximately 104 feet of Route 1 intersects the site. Due to the lack of twentieth century land use impacts and the presence of a potential feature and historic fills identified in 2022 survey, the site has the potential to yield additional intact subsurface features and other data, though it has not been formally evaluated to determine NRHP eligibility. However, no transmission structures are planned to be placed within the site boundaries.

6.4.1.2 Belmont Park Variation A

No known archaeological sites fall within what would be the right-of-way for Belmont Park Variation A.

6.4.1.3 Belmont Park Variation B

No known archaeological sites fall within what would be the right-of-way for Belmont Park Variation B.

6.4.1.4 Broad Run Variation A

44LD0110 represents a multicomponent artifact scatter dating from the Late Archaic to Early Woodland cultural periods. The site was surveyed in 1979, 1997, and most recently in 2008 by Dutton and Associates. It has been determined not eligible for listing in the NRHP. Broad Run Variation A intersects 0.2 mile of the site. The overall integrity of the archaeological deposits at 44LD0110 has likely been impacted by the construction of an existing building. Given that Broad Run Variation A intersects the site proximate to this building, it is unlikely that any intact cultural remains would be encountered there.

44LD0142 is a prehistoric surface artifact scatter that dates from an unknown cultural period. The site was identified during a 1981 survey conducted by William F. Rust at which time an unknown portion of the site was reported as destroyed. There is an existing building and graded road within the site, which was determined not eligible for listing in the NRHP. About 170 feet of the route crosses the center of the site. Given its proximity to the existing building and graded road, it is unlikely that intact cultural remains would be encountered at the site.

44LD0647 consists of the remains of a Euro-American farmstead dating from 1850 to 1899 identified through surface survey of a plowed field at an unknown date. Approximately 76 feet of Broad Run Variation A intersects the site along Loudoun County Parkway. Based on the route's proximity to the existing highway and sidewalks in the site area, it is unlikely that intact cultural remains would be encountered at this location. The site has been determined not eligible for listing on the NRHP.

44LD0649 represents a Euro-American farmstead that dating from 1850 to 1899 through surface survey of a plowed field at an unknown date and again by VDHR in 2001. The site is located along Loudoun County Parkway and within the Loudoun Water Utility Company building complex. Broad Run Variation A intersects the site for a distance of 334 feet. While the site has been determined eligible for listing in the NRHP, the archaeological deposits in the western portion of the site have likely been disturbed by the construction of the existing utility complex and adjacent highway. Nonetheless, no transmission structures are planned to be installed within the site boundary.

Site 44LD0651 consists of a Euro-American farmstead dating from 1800 to 1849 identified through surface survey of a plowed field in 1999 by Archaeological & Cultural Solutions, Inc. The site has been determined not eligible for listing in the NRHP. Approximately 108 feet of Broad Run Variation A intersects the site. The overall integrity of the archaeological deposits at the site has likely been diminished by construction of an adjacent highway, transmission line, and water utility complex.

6.4.1.5 Broad Run Variation B

44LD0021 consists of a multicomponent site surveyed in February 1970 and December 1979 by unknown parties, and in July 2022 by Dovetail Cultural Resources Group. It was defined as a multicomponent

artifact scatter with Middle Archaic, Early Woodland, Middle Woodland, and Late Woodland components. Broad Run Variation B intersects the defined extent of 44LD0021 for a distance of 0.1 mile. The site has been determined not eligible for listing in the NRHP and was described as destroyed as of the 2022 survey. Given the current nature of the site, it is unlikely that any intact cultural remains would be encountered at this location.

44LD00107 represents a multicomponent site dating from the Early Woodland to Late Woodland cultural periods. The site was surveyed in 1979, 1997, and most recently in 2008 by Dutton and Associates. It lies within an existing transmission corridor. Broad Run Variation B would intersect the site for a distance of 540 feet. The site has been determined not eligible for listing in the NRHP. The previous survey reports indicate that a portion of the site has been destroyed.

44LD0109 is a prehistoric lithic scatter of an indeterminate cultural period. The site was originally identified in a Phase I survey conducted by William Rust in 1979 and later revisited by WMCAR in 1997. The site, which was partially destroyed by construction of the BECO Substation and Cyrus One Data Center, was determined not eligible for listing on the NRHP. Approximately 96 feet of Broad Run Variation B intersects the site. Given the land use history of the site, it is unlikely there are intact archaeological deposits at this location.

Site 44LD0209 consists of a Pre-Contact temporary encampment. It was originally identified through surface surveys conducted by William Rust in 1981 and by WMCAR in 1997. The site has not been evaluated to determine its NRHP eligibility. 44LD0209 occupies open space east of an unnamed paved road. Approximately 239 feet of Broad Run Variation B intersects the site. No transmission structures are planned to be installed within the site boundary.

44LD0650 represents an Early Archaic temporary encampment. The site was originally identified during a Phase I surface survey in 2001 by VDHR. The site, which occupies open space east of an unnamed paved road, has not been evaluated for NRHP eligibility. Approximately 225 feet of Broad Run Variation B intersects the site. No transmission structures are planned to be installed within the site boundary.

6.4.1.6 Aspen-Goose Creek Line and Line Loop

No known archaeological sites fall within the right-of-way for the Aspen-Goose Creek Line or Line Loop.

6.4.2 Aboveground Historic Resources and Architectural Sites and Findings

Each alternative route reviewed in this study has the potential to affect a number of historic architectural sites and districts. This section of the report presents information on known aboveground cultural resources in the vicinity of each alternative route using the VDHR's tiered study area model described above. The locations of resources relevant to the routes are depicted on Figure 6.4-1. Individual descriptions of the resources are provided in the Pre-application Analysis Report, which is attached as Appendix H Some of these resources could be affected regardless of the route selected by the SCC for the Project. A comparison of the number of resources that would be impacted and the degree of impact on these resources for each route is presented in Table 6.4-2. Based on desktop analysis and visual simulations prepared for the routes (see Appendix H), Route 1 passes near ten historic resources meeting the VDHR criteria for inclusion in the study. Belmont Park Variations A and B pass near four such historic resources while Broad Run Variations A and B pass near three.

As discussed in more detail below, ERM recommends that:

- Route 1, which includes the Aspen and Golden Substations and the Line Loop, would have no impact on four resources, a minimal impact on three resources, and a moderate impact on three.

- Belmont Park Variations A and B would each have a minimal impact on one resource and a moderate impact on three.
- Broad Run Variations A and B would each have no impact on two resources and a minimal impact on one.
- The Aspen-Goose Creek Line would have a minimal impact on two resources.

Between the two Belmont Park Variations, Belmont Park B appears to present the least impact on aboveground cultural resources because this alternative is farther from aboveground historic resources than Belmont Park A. Similarly, between the two Broad Run Variations, Broad Run A appears to present the least impact on aboveground cultural resources as it is farther away from the historic resources than Broad Run B.

The specific resources affected for each route are discussed in the following subsections.

Table 6.4-2: Comparison of Project Impacts on Historic Resources in the Study Tiers for Each Route

Route	Number of Considered Resources in Each Impact Category				
	No Impact	Minimal Impact	Moderate Impact	Severe Impact	Total
Route 1*	4	3	3	0	10
Belmont Park Variation A	0	1	3	0	4
Belmont Park Variation B	0	1	3	0	4
Broad Run Variation A	2	1	0	0	3
Broad Run Variation B	2	1	0	0	3
Aspen-Goose Creek Line	0	2	0	0	2

*Including Aspen and Golden Substations and the Line Loop

6.4.2.1 Route 1

Information on the ten resources meeting the VDHR criteria for inclusion in the study is provided in Table 6.4-3. ERM conducted a field reconnaissance at each of these resources to assess conditions and take photographs to support the preparation of simulations to assist with the impact assessment. Based on our study, we conclude that construction and operation of the proposed transmission infrastructure along this route would have no impact on four resources (053-0110, 053-5223, 053-6406, and 253-5182), a minimal impact on three resources (053-0276, 053-0278, and 053-0336), and a moderate impact on three resources (053-0084, 053-0106, and 053-6238). Note that some of the resources listed above are also within the study tiers for the Aspen and Golden Substations and the Line Loop and discussed below.

There would be no visibility of Project infrastructure along Route 1 due to intervening vegetation, infrastructure, and distance from the following resources:

- Broad Run Bridge and Toll House (053-0110), which lies about 0.5 mile southeast of Route 1 at approximate MP 6.1.
- Nokes House (053-5223), which is about 0.8 mile northeast of Route 1 at approximate MP 9.0 and 0.9 mile to the northeast of the proposed Golden Substation.

- Tippet's Hill Cemetery (053-6406), which sits about 0.9 mile south of Route 1 at approximate MP 0.1, 0.9 mile to the south of the proposed Golden Substation, and 0.8 mile to the south of the Line Loop.
- The Ball's Bluff Battlefield and National Cemetery Historic District Boundary Increase (253-5182), which lies about 1.5 miles north of Route 1 at approximate MP 2.3.

Consequently, construction and operation of the Aspen-Golden Lines along Route 1 would have no impact on these resources.

The Washington and Old Dominion Railroad Historic District (053-0276) is crossed by Route 1 at approximate MP 0.1 and lies about 100 feet to the northeast of the proposed Aspen Substation site and Aspen-Goose Creek Line. The district is also crossed by the Line Loop, where it connects to the proposed Golden Substation. The surrounding area is wooded and contains existing Dominion substations. An existing Company transmission line corridor containing Lines #227 and #274 runs perpendicular to Route 1 through the resource. Infrastructure installed along Route 1, the Line Loop, and at the proposed Aspen and Golden Substations would be visible from the site near its intersection with the route and at other places in close proximity to the route but would not be visible from other areas. Dominion's existing transmission lines are already conspicuous elements in the district's viewshed. In addition, multiple existing Dominion substations are visible and directly adjacent to the district. Although the district's historic landscape has been severely altered by comparable infrastructure, because Route 1 would be visible, it constitutes a change. Thus, ERM recommends that Route 1 would have a Minimal Impact on 053-0276. The Twin Creeks Lines also would be minimally visible to the east of the proposed Aspen Substation. However, when looking east at this location, Aspen-Golden Lines Route 1 would not be visible.

Belmont Chapel and Cemetery (053-0278) lies about 0.2 mile to the southeast of Route 1 at approximate MP 2.9. By itself, Route 1 would not be visible from the resource due to distance and intervening vegetation. However, Route 1 connects with both Belmont Park Variations in this area. Thus, for the purposes of the report, both Route 1 and Belmont Park Variation A are analyzed (Belmont Park Variation B would also be visible, but less obtrusively given its alignment farther north). Belmont Park Variation A is only visible from the northern edge of the resource, and nowhere else within the site due to screening tree cover. This view towards the route includes an existing overhead utility line from behind a modern residential development. Still, because the Project would be visible and add additional modern elements to the northern viewshed, ERM recommends that there would be a Minimal Impact to this resource from Route 1, primarily because of its connection with both the Belmont Park Variations.

Cooke's Mill (053-0336) is located 276 feet west of Route 1 at MP 1.3. The area between the resource and the route includes one residential property surrounded by dense vegetation consisting of mature trees. Route 1 would only be visible from the eastern portion of the resource through a clearing in the trees. All other areas of the resource would have no visibility towards the route due to intervening vegetation. Because discrete locations within the resource would have limited views towards Route 1, construction and operation of the Aspen-Golden Lines on this alignment would add modern elements to the historic viewshed. Thus, ERM recommends there would be a Minimal Impact to the resource from Route 1. The Twin Creeks Lines and related future substations would also be minimally visible from the eastern portion of the resource, although none of the future substations would be visible from the site. One of the Twin Creeks Lines transmission structures and associated conductors would be visible from the site.

Janelia/Howard Hughes Research Center (053-0084) lies about 0.3 mile northeast of Route 1 at approximate MP 3.9. The area between the resource and the route contains landscaped open space, Riverside Parkway, and Rt. 7. Construction of the new transmission lines along Route 1 would introduce modern elements (structures and conductors) to the southwest viewshed. The resource would have an unobstructed view of the route when looking south from its southern boundary due to their close proximity

and open land between the resource and route. However, while this view from the periphery of the resource towards the route is unobstructed, the view from the dwelling itself towards Route 1 would be somewhat obstructed by the trees and other vegetation surrounding the dwelling. A small portion of the transmission lines would be visible from the dwelling itself, but greater viewshed effects would occur within the southernmost corner of the resource boundary, and to a lesser extent along the western portion of the parcel, which also features open lawn. Route 1 would add modern transmission infrastructure (structures and conductors) to a viewshed where it does not currently exist, but where other modern development, such as divided highways and commercial buildings intrude. The scale of the new transmission lines in relatively close proximity to the resource, however, would represent a more obtrusive new element within the viewshed. Because the Project would add a highly visible modern element to Janelia's southern and western views, ERM recommends that there would be a Moderate Impact on this resource from Route 1.

Route 1 transects Belmont Manor (053-0106) on its northeastern boundary from approximate MPs 2.7 to 2.9. The area crossed consists of predominately open field with sparse tree coverage on the northwest corner, which would be removed for the installation of the new transmission lines. The resource would have an unobstructed view of the route when looking north due to the open expanse of land. However, modern infrastructure is visible to the northwest beyond Route 1, which has impacted the viewshed. More importantly, construction of a golf course on the property containing the site between November 2011 and October 2012 significantly altered the landscape viewshed towards the northeast, which was historically undeveloped land. The new transmission lines, if installed along Route 1, would be visible from many vantage points across the resource. The Project would add additional, obtrusive modern infrastructure to the viewshed; however, the setting of the resource is compromised by the golf course and associated residential development within its boundaries. Nonetheless, while the resource has lost much of its historic setting, the Project would add a more substantial modern element to the northern viewshed. Thus, ERM recommends that there would be a Moderate Impact on this resource from Route 1.

The African-American Burial Ground for the Enslaved at Belmont (053-6238) lies 408 feet to the north of Route 1 at approximate MP 2.2. The area between the resource and the route consists of dense woodland to the southwest, south, and southeast. Areas to the west-southwest and east consist of strips of cleared land along the right-of-way for Rt. 7 and Belmont Ridge Road. If installed along Route 1, the Aspen-Golden Lines would be minimally visible from the southernmost point of the resource, where it is closest to the route. This would be the extent of route visibility from the historic section of the cemetery. All other areas within the cemetery and the forested area containing the cemetery facing in this direction (i.e., west/southwest and east) would have no view of Route 1 or no more of a view than from the southernmost tip. The Twin Creeks Lines also would be minimally visible from the walking path, outside of the resource boundary. However, only the tips of two of the Twin Creeks Lines transmission structures would be visible.

Visitors at the northeastern boundary looking southeast, and from the northernmost point of the boundary looking to the southwest would have unobstructed sight lines to infrastructure installed along Route 1 due to limited vegetative screening in this area. This view would only be visible to visitors walking alongside the resource, outside of the cemetery parallel to Rt. 7, or as they walk into the cemetery entrance from Belmont Ridge Road. The view would quickly be screened upon entering the wooded interior of the resource. Moreover, the area surrounding the resource has lost its historic feeling as a result of the construction of divided highways to the north and west; transmission lines installed along Route 1 would constitute one more element of modern infrastructure within an altered landscape. Therefore, although the historic section of the cemetery has minimal views to the route, the portions of the resource outside of the tree line would have clear line of sight to the route. Thus, ERM recommends that there would be a Moderate Impact on the resource from Route 1.

Table 6.4-3: Historic Resources in VDHR Tiers for Route 1

Buffer (mile)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	253-5182	Ball's Bluff Battlefield & National Cemetery Historic District Boundary Increase	None
0.5 to 1.0	National Register Properties (listed)	Not applicable	None identified	Not applicable
	Locally Significant	053-6406 [b, c]	Tippet's Hill Cemetery	None
0.0 to 0.5	National Register Properties (listed)	053-0084	Janelia/ Howard Hughes Research Center	Moderate
		053-0110	Broad Run Bridge and Toll House	None
	National Register—eligible	053-0278	Belmont Chapel and Cemetery	Minimal
	Locally Significant	053-0336 [a]	Cooke's Mill	Minimal
		053-5223 [b]	Nokes House	None
		053-6238	African American Burial Ground for the Enslaved at Belmont	Moderate
0.0 (within the ROW)	National Register Properties (listed)	053-0106	Belmont Manor	Moderate
	National Register—eligible	053-0276 [a,b, c]	Washington and Old Dominion Railroad Historic District	Minimal

ROW = right-of-way

[a] Resource is also within the designated tiers for the proposed Aspen Substation

[b] Resource is also within the designated tiers for the proposed Golden Substation

[c] Resource is also within the designated tiers for the and Line Loop

6.4.2.2 Belmont Park Variation A

The four considered resources that lie within the VDHR study tiers for Belmont Park Variation A are presented in Table 6.4-4. ERM conducted a field reconnaissance at each of these resources to assess conditions and take photographs to support the preparation of simulations. Construction and operation of new transmission infrastructure along this route is predicted to have a minimal impact on one resource (053-0278) and a moderate impact on three (053-0084, 053-0106, and 053-6238).

The Belmont Chapel and Cemetery (053-0278) lies about 0.1 mile southwest of Belmont Park Variation A at approximate MP 3.2. The area between the resource and the route encompasses the cloverleaf at the intersection of Rt. 7 and Lansdowne Boulevard, an open field, and scattered trees. The surrounding views to the west and south include modern elements like a grocery store and office building. If the transmission infrastructure is installed along this variation, the view to the northwest from the northwestern point of the resource would include visibility of one transmission structure and its associated conductors, the view to the north from this same point would be obstructed by a hill, and the view to the northeast would include part of the route. It is important to note that the historic view to the north has already been diminished through the addition of modern residential development. Further, the viewpoint to the north is located

outside of a group of trees that would screen the viewshed from more significant parts of the resource (notably the cemetery) to the south. Still, Belmont Park Variation A would introduce additional modern elements that would be more prominent within the resource's viewshed, even if the visibility is only from the northern boundary. Thus, ERM recommends that Belmont Park Variation A would have a Minimal Impact to 053-0278.

Janelia/Howard Hughes Research Center (053-0084) sits about 0.6 mile to the east-northeast of Belmont Park Variation A at approximate MP 3.5. The area between the resource and the route consists of a high traffic highway, parkway, additional areas associated with Janelia's Research Campus, and Shenandoah University's Northern Virginia Campus. By itself, Belmont Park Variation A would not be visible from the resource due to distance and intervening structures. However, Route 1 connects with Belmont Park Variation A in this area. Thus, for the purposes of this report, both Route 1 and Belmont Park Variation A are analyzed together. The new transmission line structures for Route 1/Belmont Park A would be visible from the public right-of-way and from the southern margin of the resource, which consists of open lawn. However, the view towards Belmont Park Variation A from the historic dwelling within the site would be obstructed by a line of trees on the southern edge of the property that blocks most of the view south. Still, transmission infrastructure installed along Route 1 would be visible from the dwelling's second story and from the edges of the resource boundary. While the southern viewshed already contains other modern developments such as divided highways and commercial buildings, Belmont Park Variation A would introduce new, large-scale modern infrastructure that would be prominent in the landscape. Thus, ERM recommends that there would be a Moderate Impact to this resource from Belmont Park Variation A because of its connection with Route 1.

Belmont Manor's (053-0106) eastern corner is crossed by Belmont Park Variation A at approximate MP 2.9. The surrounding area contains woodlands and large modern residential developments. Parts of these developments extend into Belmont Manor's boundary. Belmont Park Variation A connects to Route 1 in this area. Thus, for the purposes of this report, both Route 1 and Belmont Park Variation A are analyzed together. Route 1 and Belmont Park Variation A would be visible from various locations inside the resource. However, modern infrastructure has already compromised the historic viewshed inside and outside of the resource. This includes a residential development and golf course constructed between November 2011 and October 2012, which is inside of the resource boundary. In addition, modern utility lines are present in the landscape along Rt. 7, although they are smaller in scale. All of these changes have significantly compromised the setting of the resource, which was historically undeveloped agricultural land. Furthermore, other than the northern and northeastern views, all other views would remain unchanged. Nevertheless, the installation of transmission infrastructure along Belmont Park Variation A would both directly impact the resource and be visible from multiple points within the site. Thus, ERM recommends that Belmont Park Variation A would have a Moderate Impact on 053-0106.

The African American Burial Ground for the Enslaved at Belmont (053-6238) lies about 0.7 mile to the northwest of Belmont Park Variation A at approximate MP 2.9. The area between the resource and the route includes dense vegetation and Rt.7. Belmont Park Variation A connects to Route 1 in this area. Thus, for the purposes of this report, both Route 1 and Belmont Park Variation A are analyzed together. Although Belmont Park Variation A would not be visible from inside the resource itself, there would be minimal visibility towards Route 1 from the southernmost point of the resource, where it is closest to the route. This is the extent of the route visibility from within the historic section of the cemetery. All other areas within the cemetery and the forested area containing the cemetery facing in this direction (i.e., west/southwest and east) would have no view of Route 1 or no more of a view than from the southernmost tip.

Visitors at the northeastern boundary looking southeast, and from the northernmost point of the boundary looking to the southwest would have unobstructed sight lines to infrastructure installed along Route 1 due to limited vegetative screening in this area. This view would only be visible to visitors walking alongside

the resource, outside of the cemetery parallel to Rt. 7, or as they walk into the cemetery entrance from Belmont Ridge Road. The view would quickly be screened upon entering the wooded interior of the resource. Moreover, the area surrounding the resource has lost its historic feeling as a result of the construction of divided highways to the north and west; transmission lines installed along Route 1 would constitute one more element of modern infrastructure within an altered landscape. Therefore, although the historic section of the cemetery has minimal views to the route, the portions of the resource outside of the tree line would have clear line of sight to the route. Thus, ERM recommends that there would be a Moderate Impact on the resource from Route 1.

Table 6.4-4: Historic Resources in VDHR Tiers for Belmont Park Variation A

Buffer (mile)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	Not applicable	None identified	Not applicable
0.5 to 1.0	National Register Properties (listed)	053-0084	Janelia/ Howard Hughes Research Center	Moderate
	Locally Significant	053-6238	African American Burial Ground for the Enslaved at Belmont	Moderate
0.0 to 0.5	National Register—eligible	053-0278	Belmont Chapel and Cemetery	Minimal
0.0 (within ROW)	National Register Properties (listed)	053-0106	Belmont Manor	Moderate

ROW = right-of-way

6.4.2.3 Belmont Park Variation B

The four considered resources that lie within the VDHR study tiers for Belmont Park Variation B are presented in Table 6.4-5. ERM conducted a field reconnaissance at each of these resources to assess conditions and take photographs to support the preparation of simulations. Construction and operation of the new transmission infrastructure along this route would have a minimal impact on one resource (053-0278) and a moderate impact on three (053-0084, 053-0106, and 053-6238).

The Belmont Chapel and Cemetery (053-0278) lies about 0.2 mile southwest of Belmont Park Variation B at approximate MP 0.3. The area between the resource and the route encompasses the cloverleaf at the intersection of Rt. 7 and Lansdowne Boulevard as well as the highway itself. The surrounding views to the west and south include modern elements like a grocery store and office building. If the transmission infrastructure is installed along this route variation, the view to the northwest from the northwestern point of the resource would include visibility of one transmission structure and its associated conductors, the view to the north from this same point would be entirely obstructed by a hill, and the view to the northeast would include part of the route. It is important to note that the historic view to the north from this location has already been diminished through the addition of modern residential development. Further, the viewpoint to the north is located outside of a group of trees that would screen the view from more significant parts of the resource (notably the cemetery) to the south. Still, Belmont Park Variation B would introduce additional modern elements that would be more prominent to the resource, even if the visibility is only from the northern boundary. Thus, ERM recommends that Belmont Park Variation B would have a Minimal Impact to 053-0278.

Janelia/Howard Hughes Research Center (053-0084) sits about 0.6 mile to the east-northeast of Belmont Park Variation B at approximate MP 0.6. The area between the resource and the route consists of a high traffic highway, parkway, additional areas associated with Janelia's Research Campus, and Shenandoah University's Northern Virginia Campus. By itself, Belmont Park Variation B would not be visible from the resource due to distance and intervening structures. However, Route 1 connects with Belmont Park Variation B in this area. Thus, for the purposes of this report, both Route 1 and Belmont Park Variation B are analyzed together. The new transmission line structures for Route 1/Belmont Variation B would be visible from the public right-of-way from the southern margin of the resource, which consists of open lawn. However, the view towards Belmont Park Variation B from the historic dwelling within the site would be obstructed by a line of trees on the southern edge of the property that blocks most of the view to the south. Still, transmission infrastructure installed along Route 1 would be visible from the dwelling's second story and from the edges of the resource boundary. While the southern viewshed already contains other modern development such as divided highways and commercial buildings, Belmont Park Variation B would introduce new, large-scale modern infrastructure that would be prominent in the landscape. Thus, ERM recommends that there would be a Moderate Impact to this resource from Belmont Park Variation B because of its connection with Route 1.

Belmont Manor's (053-0106) northeastern corner is crossed by Belmont Park Variation B at approximate MP 0.0. The surrounding area contains woodlands and large modern residential developments. Parts of these developments extend into Belmont Manor's boundary. Belmont Park Variation B connects to Route 1 in this area. Thus, for the purposes of this report, both Route 1 and Belmont Park Variation B are analyzed together. Route 1 and Belmont Park Variation B would be visible from various locations inside the resource. However, modern infrastructure has already compromised the historic viewshed inside and outside of the resource. This includes a residential development and golf course constructed between November 2011 and October 2012, which is inside of the resource boundary. In addition, modern utility lines are present in the landscape along Rt. 7, although they are smaller in scale. All of these changes have significantly compromised the setting of the resource, which was historically undeveloped agricultural land. Furthermore, other than the northern and northeastern views, all other views would remain unchanged. Nevertheless, the installation of transmission infrastructure along Belmont Park Variation B would both directly impact the resource and be visible from multiple points within the site. Thus, ERM recommends that Belmont Park Variation B would have a Moderate Impact on 053-0106.

The African American Burial Ground for the Enslaved at Belmont (053-6238) lies about 0.7 mile to the northwest of Belmont Park Variation B at about MP 0.0. The area between the resource and the route includes dense vegetation and Rt. 7. Belmont Park Variation B connects to Route 1 on the south side of Rt. 7 southeast of the resource. Thus, for the purposes of this report, both Route 1 and Belmont Park Variation B are analyzed together. Although Belmont Park Variation B would not be visible from inside the resource itself, there would be minimal visibility towards Route 1 from the southernmost point of the resource, where it is closest to the route. This is the extent of the route visibility from the historic section of the cemetery. All other areas within the cemetery and the forested area containing the cemetery facing in this direction (i.e., west/southwest and east) would have no visibility or no more of a view than from the southernmost tip.

Infrastructure installed along Route 1 and Belmont Park Variation B would be visible to visitors walking alongside the resource, outside of the cemetery and parallel to Rt. 7 or as they walk into the cemetery entrance from Belmont Ridge Road. This area would more visibility of the route due to its location outside of the historic forested area. Although the historic section of the cemetery would have minimal views of Route 1, the portions of the resource outside of the tree line would have clear line of sight of infrastructure along Route 1 and Belmont Park Variation B. The route variation would introduce modern elements to the southeastern viewshed for viewers outside the tree line along Rt. 7, but no other locations in the resource boundary would have this view. Moreover, the area surrounding the resource has lost its historic feeling

as a result of the construction of divided highways to the north and west; transmission lines would constitute one more element of modern infrastructure within an altered landscape. Thus, ERM recommends that there would be a Moderate Impact on this resource from Belmont Park Variation B because of its connection to Route 1.

Table 6.4-5: Historic Resources in VDHR Tiers for Belmont Park Variation B

Buffer (mile)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	Not applicable	None identified	Not applicable
0.5 to 1.0	National Register Properties (listed)	053-0084	Janelia/ Howard Hughes Research Center	Moderate
	Locally Significant	053-6238	African American Burial Ground for the Enslaved at Belmont	Moderate
0.0 to 0.5	National Register—eligible	053-0278	Belmont Chapel and Cemetery	Minimal
0.0 (within ROW)	National Register Properties (listed)	053-0106	Belmont Manor	Moderate

ROW = right-of-way

6.4.2.4 Broad Run Variation A

The three considered resources that lie within the VDHR study tiers for Broad Run Variation A are presented in Table 6.4-6. ERM conducted a field reconnaissance of these resources to assess conditions and take photographs to support the preparation of simulations. Construction and operation of the new transmission facilities along this route would have no impact on two resources (053-0110 and 053-5223) and a minimal impact on one (053-0276).

The Broad Run Bridge and Toll House (053-0110) lies about 0.6 mile to the northeast and the Nokes House (053-5223) lies about 0.8 mile to the northeast of Broad Run Variation A at MPs 6.8 and 8.9, respectively. The area between the resources and the route consists of dense vegetation and intervening infrastructure. There would be no view to the route from either resource due to distance and intervening infrastructure and vegetation. Thus, ERM recommends there would be No Impact on these resources from Broad Run Variation A.

The Washington and Old Dominion Railroad Historic District (053-0276) is located about 20 feet to the southwest of Broad Run Variation A at approximate MP 8.5. The route here is directly adjacent to Dominion's existing Lines #227 and #274. The surrounding area is wooded and contains data centers. While the majority of the district would have no visibility towards infrastructure installed along the route variation, the segment in closest proximity to the resource would be visible where the route parallels the alignment of the district for about 0.3 mile. Route 1 would connect to Broad Run Variation A, which would be visible near the proposed Aspen Substation. Still, Dominion's existing lines are more prevalent in the district as they cross the length of the resource boundary. Although the district's historic landscape has been severely altered by the construction of transmission lines and substations, because Broad Run Variation A would be visible in a small section of the resource, it constitutes a change. Thus, ERM recommends that Broad Run Variation A would have a Minimal Impact on 053-0276.

Table 6.4-6: Historic Resources in VDHR Tiers for Broad Run Variation A

Buffer (mile)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	Not applicable	None identified	Not applicable
0.5 to 1.0	National Register Properties (listed)	053-0110	Broad Run Bridge and Toll House	None
	Locally Significant	053-5223	Nokes House	None
0.0 to 0.5	National Register—eligible	053-0276	Washington and Old Dominion Railroad Historic District	Minimal
0.0 (within ROW)	National Historic Landmarks, National Register Properties (listed and eligible)	Not applicable	None identified	Not applicable

ROW = right-of-way

6.4.2.5 Broad Run Variation B

The three considered resources that lie within the VDHR study tiers for Broad Run Variation B are presented in Table 6.4-7. ERM conducted a field reconnaissance of these resources to assess conditions and take photographs to support the preparation of simulations. Construction and operation of the new transmission facilities along this route would have no impact on two resources (053-0110 and 053-5223) and a minimal impact on one (053-0276).

The Broad Run Bridge and Toll House (053-0110) lies about 0.9 mile to the northeast and the Nokes House (053-5223) is located 0.7 mile to the east of Broad Run Variation B at MPs 0.4 and 1.7, respectively. The area between the resources and the route consists of dense vegetation and intervening infrastructure. There would be no view to the route from either resource due to distance and intervening infrastructure and vegetation. Thus, ERM recommends there would be No Impact on these resources from Broad Run Variation B.

The Washington and Old Dominion Railroad Historic District (053-0276) is located approximately 0.2 mile southwest of Broad Run Variation B at approximate MP 2.2 in an area where the route uses a greenfield alignment but is adjacent to the existing Dominion Line #227/274. The surrounding area is wooded and contains data centers. By itself, Broad Run Variation B would not be visible from the resource due to distance, however, it connects to Route 1 in this area, just north of the resource. Thus, for the purposes of this report, both Route 1 and Broad Run Variation B are analyzed. The new transmission line structures for Route 1 and the proposed Golden Substation would be visible from the historic district. Nevertheless, this view towards the route is small in comparison to the resource as a whole. Likewise, Dominion's existing Lines #227 and # 274 follow the length of the district, making them prominent in the viewscape. These existing lines already have introduced modern infrastructure to the resource and to its historic viewshed. Thus, the addition of the route would constitute a very minor change to the existing view. ERM recommends that there would be a Minimal Impact to this resource from Broad Run Variation B because of its connection with Route 1.

Table 6.4-7: Historic Resources in VDHR Tiers for Broad Run Variation B

Buffer (mile)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	Not applicable	None identified	Not applicable

Buffer (mile)	Resource Category	Resource Number	Description	Impact
0.5 to 1.0	National Register Properties (listed)	053-0110	Broad Run Bridge and Toll House	None
	Locally Significant	053-5223	Nokes House	None
0.0 to 0.5	National Register—eligible	053-0276	Washington and Old Dominion Railroad Historic District	Minimal
0.0 (within ROW)	National Historic Landmarks, National Register Properties (listed and eligible)	Not applicable	None identified	Not applicable

ROW = right-of-way

6.4.2.6 Aspen-Goose Creek Line

The two considered resources that lie within the VDHR study tiers for the Aspen-Goose Creek Line are presented in Table 6.4-8. ERM conducted a field reconnaissance of these resources to assess conditions and take photographs to support the preparation of simulations. Construction and operation of the new facilities along this route would have a minimal impact on both resources (053-0276 and 053-0336).

The Washington and Old Dominion Railroad Historic District (053-0276) lies about 0.1 mile to the east of the Aspen-Goose Creek Line in an area where the route connects the proposed Aspen Substation to the existing Goose Creek Substation. It encompasses Dominion's existing Line #227/#274 transmission corridor which connects to the existing Line #227/#558/#2180 corridor. The surrounding area is wooded and contains existing Dominion substations. Route 1 and the proposed Aspen Substation connect with the Aspen-Goose Creek Line in this area. Thus, for the purposes of this report, both Route 1 and the Aspen-Goose Creek Line are analyzed, since Route 1 will have more impact on land not already occupied by Dominion infrastructure.

The Aspen-Goose Creek Line would be visible from vantage points within the resource in close proximity to the line. While only the cables and one structure would be visible from the resource., infrastructure installed along Route 1 and at the proposed Aspen Substation would also be visible. However, Dominion's existing lines are more prominent in the district's viewshed than would be the new proposed infrastructure for the Project. In addition, multiple existing Dominion substations are visible and directly adjacent to the district in this area. The historic landscape of the district has been severely altered by existing Dominion infrastructure and other modern elements. The Aspen-Goose Creek Line nonetheless would be a new, visible addition, and thus constitutes a change. It is important to note that the Aspen-Goose Creek Line would be entirely within the boundary of the existing expanded Goose Creek Substation, existing Dominion transmission line right-of-way, and the proposed Aspen Substation boundary. For this reason, ERM concludes that the Aspen-Goose Creek Line would have a Minimal Impact on 053-0276.

Cooke's Mill (053-0336) is located about 0.9 mile east of the Aspen-Goose Creek Line in an area where the route is entirely within the existing expanded Goose Creek Substation, existing Dominion transmission line right-of-way, and proposed Aspen Substation boundary. The resource is adjacent to the Dominion's existing Line #227/#274 transmission corridor which connects to their existing Line #227/#558/#2180 corridor. The area between the resource and the route consists of dense vegetation and existing Dominion substations. There would be no view of the Aspen-Goose Creek Line from any vantage point at 053-0336 because of distance and dense intervening vegetation. However, the line would connect to the proposed Aspen Substation and Route 1. Thus, for the purposes of this report, impacts from the installation of transmission infrastructure along Route 1 were also analyzed.

Route 1's conductors would only be visible from the eastern portion of the resource where there is a clearing in the trees and add modern elements to the historic viewshed. No other areas of the resource would have a view of the route due to dense vegetation. Thus, ERM recommends there would be a Minimal Impact to the resource from the Aspen-Goose Creek Line because of its connection to Route 1. We also note that Dominion's future Twin Creeks Lines (but not the associated substations) would be minimally visible from the eastern portion of the resource. One of the Twin Creeks Lines transmission structures and associated conductors would be visible from the site.

Table 6.4-8: Historic Resources in VDHR Tiers for Broad Run Variation B

Buffer (mile)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	Not applicable	None identified	Not applicable
0.5 to 1.0	National Register Properties (listed)	Not applicable	None identified	Not applicable
	Locally Significant	053-0336	Cooke's Mill	Minimal
0.0 to 0.5	National Register—eligible	053-0276	Washington and Old Dominion Railroad Historic District	Minimal
0.0 (within ROW)	National Historic Landmarks, National Register Properties (listed and eligible)	Not applicable	None identified	Not applicable

ROW = right-of-way

6.4.3 Summary of Existing Data Collected under Section 106 or 110 of the National Historic Preservation Act

Some portions of the routes and associated facilities were previously surveyed for cultural resources. Research indicates that 22 prior Phase I cultural resource surveys have been conducted within 1.0 mile of the routes, including 9 that overlap portions of various routes. Because the routes share some common segments, many of the previous surveys have covered portions of multiple routes. The previous surveys relevant to the routes are identified in Table 6.4-9 and shown on Figure 6.4-1 (Appendix A, Figures).

Table 6.4-9: Cultural Resource Surveys Covering Portions of the Routes

VDHR Survey #	Title	Author	Date
LD-108	Phase I Archaeological Survey at Belmont Plantation, Loudoun County, Virginia	Douglas C. McLearen, Kimberly S. Zawacki, Matthew R. Laird, James G. Harrison III	1999
LD-140	Historic and Archaeological Site Survey of the Lansdowne Tract, Loudoun County, Virginia	Eugene M. Scheel	1991
LD-141	Phase I Cultural Resources Investigations of 218 Acres on the 352 Loudoun Water Tract, Loudoun County, Virginia	Alain C. Outlaw, Timothy E. Morgan, Mary B. Clemons	2001
LD-146	Interim Report: Archaeological Survey of Portions of Ashburn Village Development, Loudoun County, Virginia	Espey, Huston & Associates, Inc.	1989
LD-147	Archaeological Survey of the Proposed Route 607 (Loudoun County Parkway) Project, Proposed Route 28	Joe B. Jones	2003

VDHR Survey #	Title	Author	Date
	Corridor Improvements PPTA Project, Loudoun County, Virginia		
LD-182	Cultural Resources Survey, Proposed Connector of Pacific Boulevard, Loudoun County, Virginia	Heidi Luchsinger, Bill Hall, Loretta Lautzenheiser	2006
LD-199	Archaeological Survey of Route 659, Belmont Ridge Road Improvements, Loudoun County, Virginia	Barbara Shaffer, Lily Richards, Richard White, Brenda Carr-Weller	2007
LD-220	Phase I Archeological Investigation of the Circa 300 Acre One Loudoun Center Property, Loudoun County, Virginia	Christine Jirikowic, David Carroll, Kimberly Snyder	2005
LD-221	Cultural Resources Survey, Proposed Connector of Pacific Boulevard, Loudoun County, Virginia	Dennis Gosser, Bill Hall, Loretta Lautzenheiser	2007
LD-222	Cultural Resources Survey, Proposed Connector of Pacific Boulevard, Loudoun County, Virginia: Addendum: Stormwater Ponds	Loretta Lautzenheiser	2007
LD-230	A Phase I Investigation of the Circa 420 Acre A.S. Ray Property Along Broad Run, Loudoun County, Virginia	William M. Gardner, Kimberly A. Snyder, John Mullen, Gwen J. Hurst	2001
LD-265	Phase I Archeological Investigations of the 225.8 Acre Commonwealth Center Property, Loudoun County, Virginia	John Mullen, David Carroll, Paw Jorgensen, Christopher Shephard	2006
LD-290	Phase I Archeological Investigations of the Loudoun Water Proposed Pump Station and Water Transmission Line, Loudoun County, Virginia	Kimberly Snyder, David Carroll	2010
LD-320	Cultural Resources Survey of the Proposed Routes 7 and 659 Project, Loudoun County, Virginia	Elizabeth Monroe, Meg Malvasi	2010
LD-331	Phase I Architectural and Archaeological Survey of the Proposed Waxpool Transmission Line Right-of-Way Expansion Area, Loudoun County, Virginia	Arthur Striker, Danielle Worthing	2013
LD-343	Cultural Resources Survey of the Proposed Dominion Pleasant View Substation Expansion, Loudoun County, Virginia	Elizabeth Monroe, Mary Ruffin Hanbury	2012
LD-344	Supplemental Cultural Resources Survey of the Proposed Dominion Pleasant View Substation Expansion, Loudoun County, Virginia: An Addendum to Cultural Resources Survey of the Proposed Dominion Pleasant View Substation Expansion	Elizabeth Bell, Mary Ruffin Hanbury	2013
LD-350	A Phase I Cultural Resources Survey of Approximately 8.0 Miles of Proposed Improvements to the Dominion Virginia Power 500kV Transmission Line from the Goose Creek Substation to the Brambleton Substation, Loudoun County, Virginia	Brynn Stewart, Sandra DeChard, Ellen Brady	2013
LD-376	Phase I Archeological Investigation of the Circa 38 Acre Inova Loudoun Hospital Expansion Site, Loudoun County, Virginia	Jarod Hutson	2008
LD-392	Results of a Phase I Archeological Investigation of the Circa 88.8 Acre Beaumeade Corporate Park, Loudoun County, Virginia	William M. Gardner, Kimberly A. Snyder, Gwen J. Hurst	2002

VDHR Survey #	Title	Author	Date
LD-485	Phase I Archaeological Investigation TransCanada SIAP 245 Line VC-010 Pressure Test/Replacement Project, Loudoun County, Virginia	Barbara A. Munford, Jonathan Glenn	2019
LD-614	Phase I Cultural Resources Investigation, 19509 Belmont Ridge Road, Loudoun County, Virginia	David Carroll, Elizabeth Johnson, Daniel Baicy	2022

6.5 Environmental Justice

6.5.1 Desktop Review

The purpose of the desktop review is to determine if construction or operation of the Project could result in disproportionate environmental impacts on populations of color (inclusive of linguistically isolated communities) or low--income populations (i.e., environmental justice [EJ] populations). This review is consistent with federal and state guidance and statutes as well as the 2018 Guidance for Electric Transmission's Implementation of Dominion's Environmental Justice Policy document.[23]

According to USEPA guidance (USEPA 2016a), EJ analyses must address disproportionately high or adverse impacts on populations of color (i.e., who are non-white, or who are white but have Hispanic ethnicity) when these populations represent over 50 percent of the population of an affected area; or when the percentage of populations of color or low-income populations in the affected area is "meaningfully greater" than the population of color percentage or low-income population percentage in the "reference population". Low-income populations are those that fall within the annual statistical poverty thresholds from the U.S. Bureau of the Census, Population Reports, Series P-60 on Income and Poverty (USEPA 2016b). The reference population is the population of a larger area in which the affected population resides (e.g., a county, state, or region depending on the geographic extent of the analysis area).

The Commonwealth of Virginia's General Assembly adopted a new statute, the Virginia Environmental Justice Act (VEJA) in July 2021 (Va. Code § 2.2-234 through 2.2-235). The VEJA defines "Environmental Justice" and "Environmental Justice Community" as follows (Va. Code § 2.2-234):

- "Environmental Justice" means the fair treatment and meaningful involvement of every person, regardless of race, color, national origin, income, faith, or disability, regarding the development, implementation, or enforcement of any environmental law, regulation, or policy. For purposes of this definition:
  - "Fair treatment" means the equitable consideration of all people whereby no group of people bears a disproportionate share of any negative environmental consequence resulting from an industrial, governmental, or commercial operation, program, or policy.
  - "Meaningful involvement" means the requirements that (i) affected and vulnerable community residents have access and opportunities to participate in the full cycle of the decision-making process about a proposed activity that will affect their environment or health and (ii) decision makers will seek out and consider such participation, allowing the views and perspectives of community residents to shape and influence the decision.

[23] This is not a public document.

- "Environmental Justice Community" means any low-income community, population of color, or community of color. For purposes of this definition:

  - "Low-income community" means any census block group in which 30 percent or more of the population is composed of people with low income.

  - "Population of color" means a population of individuals who identify as belonging to one or more of the following groups: Black, African American, Asian, Pacific Islander, Native American, other non-white race, mixed race, Hispanic, Latino, or linguistically isolated.

  - "Community of color" means any geographically distinct area where the population of color, expressed as a percentage of the total population of such area, is higher than the population of color in the Commonwealth expressed as a percentage of the total population of the Commonwealth. If a community of color is composed primarily of one of the groups listed in the definition of "population of color," however, the percentage population of such group in the Commonwealth is used instead of the percentage population of color in the Commonwealth.

ERM used the Census Block Group (CBG) as the primary geographic unit for this EJ analysis because it is the smallest unit for which U.S. Census Bureau demographic data is available, providing information at a sub-county level. Demographic and socioeconomic data for CBGs in the study area are depicted on Figure 6.5-1.

While the Commonwealth of Virginia is the reference population for this analysis, data for Loudoun County was also considered in the review to assess regional demographic variations. Demographic data for the Commonwealth were compared with individual CBGs to help identify the presence of potential EJ populations. For example, if the reported percentage of population of color within an individual CBG is greater than the percentage of population of color in Virginia as a whole (40 percent), then a potential EJ population was identified in that CBG. The U.S. Census Bureau American Community Survey, 5 Year Estimates (2018-2022) was used to collect demographic data for the state, county, and CBGs (U.S. Census Bureau 2022a, 2022b, 2022c, 2022d, 2022e).

Virginia defines "population of color" as a group of individuals belonging to one or more of the following racial and ethnic categories: "Black, African American, Asian, Pacific Islander, Native American, other, nonwhite race, mixed race, Hispanic, Latino or linguistically isolated" (Va. Code §§ 2.2-234). The USEPA's definition of a population of color is analogous to Virginia's definition of population of color but does not include the linguistically isolated population. However, the U.S. Census Bureau American Community Survey has a separate table for limited English-speaking households in which all members over age 14 speak a language other than English and also speak English less than very well.

Virginia's criteria for an identified "population of color" and what constitutes an EJ population have a lower threshold and are more inclusive than that suggested in federal guidance. Therefore, the Commonwealth's criteria are used to identify CBGs that contain populations of color for this study. The same approach is used to identify limited English speakers, which is included in the state's definition for a population of color, although considered separately in federal guidance.

Federal guidelines recommend using an appropriate poverty threshold and comparing the analysis area with a reference population to identify low-income populations. Virginia defines a "low-income community" as any CBG in which 30 percent of the population is composed of low-income residents. It defines low income as "having an annual household income equal to or less than the greater of (i) an amount equal to 80 percent of the median income of the area in which the household is located, as reported by the Department of Housing and Urban Development, and (ii) 200 percent of the Federal Poverty Level" (Va. Code § 2.2-234). For this review, a low-income community is considered present when the low-income population percentage in the CBG exceeds 30 percent.

This EJ analysis also assesses the potential for other socioeconomic indicators to identify areas that may have higher environmental burdens and vulnerable populations when considered in combination with demographic and socioeconomic information meeting the EJ criteria and definitions under VEJA. These other indicators include education attainment (the percent of people over age 25 in a CBG with less than a high school education) and age-based vulnerabilities (i.e., the percent of people in a CBG under age 5 or over age 64). There is no equivalent VEJA definition for these groups, so age-based communities are identified using the federal guidance of a meaningfully greater threshold. A CBG is considered to contain a potential age-based vulnerable community (or community with low education attainment) when the percentage of the population either below age 5 or above age 64 (or with less than a high school education) exceeds twice the corresponding state averages.

6.5.2 Results

There are 48 CBGs within the Project study area and within one-mile of the routing options. Of these, 33 CBGs exceed EJ thresholds:

- 24 CBGs contain populations of color (including two with predominantly Hispanic populations)
- 21 CBGs contain limited English-speaking households (of which two CBGs also have populations of color and low-income populations, and 11 CBGs have populations of color)
- Two CBGs contain both low-income and populations of color

There are 12 CBGs crossed by one or more of the routing options (Table 6.5-1).

ERM's desktop review, as summarized by route below, suggests that construction and operation of the Project transmission lines could potentially affect EJ populations in 10 CBGs crossed by one or more of the routing options that exceed the thresholds for populations of color and/or low-income population. These include:

- 4 CBGs with populations of color (511076106044, 511076110061, 00511076110141, 511076110151)
- 2 CBG with limited English-speaking households (511076110152, 511076110182)
- 3 CBGs with populations of color and limited English-speaking households (511076110023, 511076110121, 511076110183)
- 1 CBG with populations of color, limited English-speaking households, and low-income populations (511076110112)

6.5.2.1 Route 1

Low-Income Populations

Route 1 does not cross CBGs that exceed the low-income threshold.

Populations of Color

Route 1 crosses four CBGs with populations of color, including one CBG that exceeds the English-speaking threshold.

Other Sensitive Populations

No CBGs with populations that exceed the educational attainment and age thresholds are crossed by Route 1.

6.5.2.2 Belmont Park Variation A

Low-Income Populations

Route 1 does not cross CBGs that exceed the low-income threshold.

Populations of Color

Route 1 crosses four CBGs with populations of color, including one CBG that exceeds the English-speaking threshold.

Other Sensitive Populations

No CBGs with populations that exceed the educational attainment and age thresholds are crossed by Belmont Park Variation A.

6.5.2.3 Belmont Park Variation B

Low-Income Populations

Belmont Park Variation B crosses one CBG with low-income households.

Populations of Color

Belmont Park Variation B crosses five CBGs with populations of color.

Other Sensitive Populations

No CBGs with populations that exceed the educational attainment and age thresholds are crossed by Belmont Park Variation B.

6.5.2.4 Broad Run Variation A

Low-Income Populations

Broad Run Variation A does not cross CBGs that exceed the low-income threshold.

Populations of Color

Broad Run Variation A crosses three CBGs with populations of color.

Other Sensitive Populations

Broad Run Variation A crosses one CBG that exceeds the educational attainment threshold.

6.5.2.5 Broad Run Variation B

Low-Income Populations

Broad Run Variation B does not cross CBGs that exceed the low-income threshold.

Populations of Color

Broad Run Variation B crosses two CBGs with populations of color.

Other Sensitive Populations

Broad Run Variation B crosses one CBB that exceeds the educational attainment threshold.

Table 6.5-1: Demographic and Socioeconomic Characteristics within the Environmental Justice Study Area

State/County Census Block Group (Census Tract, Block Group)	Population	Total Populations of Color (%) [a]	White, non-Hispanic (%)	Black or African American (%)	American Indian and Alaska Native (%)	Asian (%)	Pacific Islander (%)	Some Other Race Alone (%)	Two or More Races (%)	Hispanic or Latino (%)	Low-Income Population [b] (%)	Limited English-Speaking Household [c] (%)	Population with Less than High School Education [d] (%)	Population Under Age 5 [e] (%)	Population Over Age 64 [e] (%)	Route or Site Crossing CBG
VIRGINIA	8,624,511	40	60	19	0.1	7	0.1	0.5	4	10	24	3	9	6	16	
Loudoun County	420,773	53	53	7	0.2	21	<0.1	1	4	14	9	4	6	7	10	
511076105062 (CT 6105.06, BG 2)	1,892	61	39	9	<0.1	27	<0.1	<0.1	1	23	11	<0.1	8	6	6	N/A
511076105063 (CT 6105.06, BG 3)	967	32	68	9	1	9	<0.1	<0.1	3	11	23	<0.1	3	1	3	• Route 1
511076105073 (CT 6105.07, BG 3)	1,798	28	72	5	<0.1	11	<0.1	<0.1	<0.1	11	6	<0.1	2	1	9	N/A
511076105074 (CT 6105.07, BG 4)	1,490	40	60	11	<0.1	24	<0.1	<0.1	2	2	11	<0.1	5	6	8	N/A
511076106041 (CT 6106.04, BG 1)	1,287	32	68	4	<0.1	12	<0.1	<0.1	2	14	7	<0.1	0	9	9	N/A
511076106043 (CT 6106.04, BG3)	1,361	16	84	1	<0.1	1	<0.1	<0.1	4	9	2	4	0	3	1	N/A
511076106044 (CT 6106.04, BG 4)	1,913	46	54	20	<0.1	3	<0.1	<0.1	9	14	3	<0.1	7	1	7	• Route 1 • Aspen-Goose Creek Line • Aspen Substation
511076110021 (CT 6110.02, BG 1)	1,672	55	45	6	<0.1	24	<0.1	1	<0.1	22	17	<0.1	2	2	9	N/A

State/County Census Block Group (Census Tract, Block Group)	Population	Total Populations of Color (%) [a]	White, non-Hispanic (%)	Black or African American (%)	American Indian and Alaska Native (%)	Asian (%)	Pacific Islander (%)	Some Other Race Alone (%)	Two or More Races (%)	Hispanic or Latino (%)	Low-Income Population [b] (%)	Limited English-Speaking Household [c] (%)	Population with Less than High School Education [d] (%)	Population Under Age 5 [e] (%)	Population Over Age 64 [e] (%)	Route or Site Crossing CBG
511076110022 (CT 6110.02, BG 2)	1,743	60	40	7	<0.1	22	<0.1	<0.1	1	30	25	21	6	12	8	N/A
511076110023 (CT 6110.02, BG 3)	2,063	67	33	15	2	25	1	<0.1	8	16	22	8	8	5	9	• Belmont Park Variation B
511076110041 (CT 6110.04, BG 1)	4,752	49	51	12	<0.1	21	<0.1	1	8	7	7	1	4	6	3	N/A
511076110042 (CT 6110.04, BG 2)	1,163	32	68	1	<0.1	22	<0.1	<0.1	6	3	1	3	0	3	10	N/A
511076110061 (CT 6110.06, BG 1)	2,088	52	48	14	<0.1	30	<0.1	1	3	6	<0.1	2	<0.1	9	4	• Route 1 • Broad Run Variation A • Broad Run Variation B • Line Loop • Golden Substation
511076110091 (CT 6110.09, BG 1)	1,932	36	64	4	<0.1	19	<0.1	<0.1	<0.1	12	1	<0.1	2	4	8	N/A
511076110092 (CT 6110.09, BG 2)	2,001	27	73	4	1	9	<0.1	<0.1	5	8	9	3	2	4	4	N/A
511076110093 (CT 6110.09, BG 3)	1,737	44	56	11	<0.1	19	<0.1	2	3	9	3	<0.1	2	2	11	N/A
511076110101 (CT 6110.10, BG 1)	546	18	82	10	<0.1	4	<0.1	<0.1	<0.1	4	2	<0.1	<0.1	<0.1	89	N/A
511076110102	1,355	24	76	4	<0.1	13	<0.1	1	<0.1	5	17	7	1	1	81	N/A

State/County Census Block Group (Census Tract, Block Group)	Population	Total Populations of Color (%) [a]	White, non-Hispanic (%)	Black or African American (%)	American Indian and Alaska Native (%)	Asian (%)	Pacific Islander (%)	Some Other Race Alone (%)	Two or More Races (%)	Hispanic or Latino (%)	Low-Income Population [b] (%)	Limited English-Speaking Household [c] (%)	Population with Less than High School Education [d] (%)	Population Under Age 5 [e] (%)	Population Over Age 64 [e] (%)	Route or Site Crossing CBG
(CT 6110.10, BG 2)																
511076110111 (CT 6110.11, BG 1)	2,570	40	60	7	<0.1	20	<0.1	<0.1	5	8	5	1	2	6	4	N/A
511076110112 (CT 6110.11, BG 2)	1,207	41	59	24	<0.1	3	<0.1	<0.1	1	13	33	12	4	12	4	• Belmont Park Variation B
511076110121 (CT 6110.12, BG 1)	1,702	61	39	0	<0.1	50	<0.1	<0.1	7	3	8	8	4	4	2	• Route 1
511076110122 (CT 6110.12, BG 2)	2,876	33	67	2	<0.1	15	<0.1	<0.1	3	12	5	<0.1	2	7	11	• Route 1 • Belmont Park Variation A • Belmont Park Variation B
511076110131 (CT 6110.13, BG 1)	1,523	38	62	0	<0.1	28	<0.1	<0.1	2	8	<0.1	2	1	6	8	N/A
511076110132 (CT 6110.13, BG 2)	3,775	59	41	9	<0.1	32	<0.1	<0.1	2	15	18	11	5	10	4	N/A
00511076110141 (18CT 6110.14, BG 1)	2,151	47	53	7	<0.1	17	<0.1	<0.1	12	11	11	<0.1	4	7	4	• Route 1 • Belmont Park Variation A • Belmont Park Variation B
511076110142	2,421	35	65	6	<0.1	16	<0.1	1	4	8	3	<0.1	3	1	10	N/A

State/County Census Block Group (Census Tract, Block Group)	Population	Total Populations of Color (%) [a]	White, non-Hispanic (%)	Black or African American (%)	American Indian and Alaska Native (%)	Asian (%)	Pacific Islander (%)	Some Other Race Alone (%)	Two or More Races (%)	Hispanic or Latino (%)	Low-Income Population [b] (%)	Limited English-Speaking Household [c] (%)	Population with Less than High School Education [d] (%)	Population Under Age 5 [e] (%)	Population Over Age 64 [e] (%)	Route or Site Crossing CBG
(CT 6110.14, BG 2)																
511076110151 (CT 6110.15, BG 1)	1,910	47	53	5	<0.1	35	<0.1	<0.1	4	3	9	<0.1	1	5	23	• Route 1
511076110152 (CT 6110.15, BG 2)	1,245	29	71	1	<0.1	11	<0.1	<0.1	9	8	2	7	3	4	9	• Route 1 • Belmont Park Variation A • Belmont Park Variation B
511076110161 (CT 6110.16, BG 1)	1,123	39	61	3	<0.1	19	<0.1	<0.1	8	9	3	2	4	9	23	N/A
511076110162 (CT 6110.16, BG 2)	2,345	33	67	13	1	12	<0.1	<0.1	1	7	2	4	1	5	31	N/A
511076110163 (CT 6110.16, BG 3)	1,156	32	68	0	<0.1	17	<0.1	<0.1	1	15	8	14	5	4	63	N/A
511076110171 (CT 6110.17, BG 1)	2,142	28	72	2	<0.1	15	<0.1	<0.1	1	9	5	4	4	1	31	N/A
511076110172 (CT 6110.17, BG 2)	1,424	55	45	9	<0.1	18	<0.1	1	12	14	16	<0.1	8	8	24	N/A
511076110181 (CT 6110.18, BG 1)	1,576	58	42	11	<0.1	20	<0.1	<0.1	8	18	24	19	12	1	15	N/A
511076110182 (CT 6110.18, BG 2)	1,901	7	93	1	<0.1	5	<0.1	<0.1	0	0	17	7	2	<0.1	100	• Broad Run Variation A
511076110183 (CT 6110.18, BG 3)	317	49	51	12	<0.1	15	<0.1	<0.1	3	19	23	28	5	5	<0.1	• Broad Run Variation A

State/County Census Block Group (Census Tract, Block Group)	Population	Total Populations of Color (%) [a]	White, non-Hispanic (%)	Black or African American (%)	American Indian and Alaska Native (%)	Asian (%)	Pacific Islander (%)	Some Other Race Alone (%)	Two or More Races (%)	Hispanic or Latino (%)	Low-Income Population [b] (%)	Limited English-Speaking Household [c] (%)	Population with Less than High School Education [d] (%)	Population Under Age 5 [e] (%)	Population Over Age 64 [e] (%)	Route or Site Crossing CBG
																• Broad Run Variation B
511076110203 (CT 6110.20, BG 3)	2,172	67	33	1	<0.1	43	<0.1	<0.1	8	14	1	<0.1	9	4	2	N/A
511076111011 (CT 6111.01, BG 1)	2,899	36	64	11	<0.1	6	<0.1	<0.1	3	15	10	5	2	3	11	N/A
511076111012 (CT 6111.01, BG 2)	1,291	63	37	11	<0.1	16	<0.1	5	3	29	10	9	10	15	4	N/A
511076111013 (CT 6111.01, BG 3)	732	41	59	6	<0.1	7	<0.1	<0.1	8	20	21	8	8	0	7	N/A
511076111022 (CT 6111.02, BG 2)	1,073	21	79	5	<0.1	3	<0.1	<0.1	1	11	4	<0.1	9	9	13	
511076115011 (CT 6115.01, BG 1)	841	70	30	20	<0.1	38	<0.1	<0.1	7	5	6	9	5	4	6	N/A
511076115013 (CT 6115.01, BG 3)	3,166	63	37	12	<0.1	16	<0.1	<0.1	5	30	37	6	21	7	5	N/A
511076115021 (CT 6115.02, BG 1)	1,877	76	24	28	<0.1	24	<0.1	<0.1	2	22	13	1	8	6	7	N/A
511076115022 (CT 6115.02, BG 2)	3,529	68	32	6	<0.1	13	<0.1	1	1	49	12	7	31	9	16	N/A
511076116011 (CT 6116.01, BG 1)	1,681	63	37	9	<0.1	21	<0.1	1	7	25	3	<0.1	8	8	4	N/A
511076116012 (CT 6116.01, BG 2)	2,354	56	44	7	<0.1	8	<0.1	3	2	35	8	3	24	10	9	N/A
511076116021	1,352	84	16	2	<0.1	18	<0.1	3	1	59	15	20	35	4	14	N/A

State/County Census Block Group (Census Tract, Block Group)	Population	Total Populations of Color (%) [a]	White, non-Hispanic (%)	Black or African American (%)	American Indian and Alaska Native (%)	Asian (%)	Pacific Islander (%)	Some Other Race Alone (%)	Two or More Races (%)	Hispanic or Latino (%)	Low-Income Population [b] (%)	Limited English-Speaking Household [c] (%)	Population with Less than High School Education [d] (%)	Population Under Age 5 [e] (%)	Population Over Age 64 [e] (%)	Route or Site Crossing CBG
(CT 6116.02, BG 1)																

Source: U.S. Census Bureau (2022). American Community Survey, 5 Year Estimates (2018-2022), Tables B03002, C17002, C16002, B15002, B01001.

[a] U.S. Census Bureau American Community Survey 5 Year Estimates (2018-2022), Table B03002.
[b] U.S. Census Bureau American Community Survey 5 Year Estimates (2018-2022), Table C17002.
[c] U.S. Census Bureau American Community Survey 5 Year Estimates (2018-2022), Table C16002.
[d] U.S. Census Bureau American Community Survey 5 Year Estimates (2018-2022), Table B15002.
[e] U.S. Census Bureau American Community Survey 5 Year Estimates (2018-2022), Table B01001.

Bold font indicates a CBG crossed by a route/route variation.

Gray shaded cells include reference population.
Blue shaded cells indicate populations of color.
Pink shaded cells indicate that the community of color is composed primarily of one of the groups listed in the VEJA definition of "population of color" or the analysis area has a greater percentage of a community of color than the state as a whole.
Green shaded cells indicate low-income populations.
Yellow shaded cells indicate populations with language barriers.
Orange shaded cells indicate populations over age 24 with less than high school education.
Purple shaded cells indicate under age 5 or over age 64 population.

6.5.3 Impact Assessment

Rapid growth of the suburban and mixed-use landscape in Loudoun County has necessitated Dominion to develop the Project to meet demand and resolve identified violations of mandatory NERC Reliability Standards by ensuring capacity and redundancy in their transmission system. Based on current site plan submittals, the remaining undeveloped lands in the study area, including those adjacent to Rt. 7, will likely be developed as data center or residential, industrial/ commercial, or mixed-use communities within the next decade.

To support the Project goals, routes were identified through a systematic process that examined a variety of factors to identify constraints and opportunities, including avoidance of residential areas and sensitive environmental and cultural resources, identification of compatible land uses, and collocation along existing roads, utility rights-of-way, or other linear corridors, where feasible. ERM and Dominion worked to finding a routing solution that implemented an inclusive outreach process in line with the VEJA and the Company's Environmental Justice Policy. Dominion's interactive approach involved gathering feedback from community stakeholders regardless of EJ community status. Input from stakeholder groups regarding community considerations, historic and environmental resources, local development and land use, and environmental justice informed Project design. Information on Dominion's engagement activities is provided in Section 5.1 and in Appendix C. Based on Dominion's outreach efforts, the Company believes that all stakeholders, including EJ communities, have had and continue to have the opportunity to participate meaningfully in the outreach effort.

As part of the regulatory review process, and after a route is certificated by the SCC, Dominion will complete an evaluation of potential environmental, cultural, and historical impacts of the Project. The Company will continue to engage with local and state agencies to complete these evaluations and mitigate impacts from construction where practicable. In addition, Dominion will obtain all required environmental permits and comply with applicable permit conditions. The Company anticipates that environmental impacts generally will be mitigated through design and construction best practices.

In assessing whether a community would bear a disproportionate impact of the Project, ERM considered temporary construction impacts, visual impacts, property devaluation, and health impacts related to electric and magnetic fields as discussed in the sections below.

6.5.3.1 Construction Activities

Impacts associated with Project construction are considered temporary, lasting less than a year. Construction activity and crews would be present at a particular location during daytime hours for a few to several days at a time, but on multiple occasions throughout the construction period between initial right-of-way clearing and final restoration.

Various regulations, industry standards, and best management practices would guide construction and restoration of the right-of-way. The short-term impacts associated with construction may include equipment noise, dust, potential changes in traffic patterns, and general ground disturbance.

Noise is generally defined as unwanted sound. The primary noise receptors in the study area would be commercial and industrial properties and residences. During construction, temporary, localized noise from heavy equipment and increased vehicle traffic is expected to occur during daytime hours. Exceedances of daytime noise limits are not expected; if they occur, the exceedances would be temporary.

During construction, Dominion would minimize ground-disturbing activities to the extent practicable. Following construction, Dominion would remove construction-related equipment and debris from the right-of-way and restore the land within the right-of-way as closely as possible to preconstruction conditions (other than maintaining the right-of-way with an herbaceous cover).

6.5.3.2 Visual Impacts

The Company minimized visual impacts of the Aspen-Golden Lines by identifying route alignments that were most compatible with the landscape. Mitigation measures include avoiding unique viewsheds, placing structures to take advantage of natural screening (e.g., tall trees), and avoiding the placement of structures directly in front of residences. ERM evaluated existing visual conditions by identifying visually sensitive areas, describing the landscape and viewer types (e.g., local residents, recreational users, workers, motorists), identifying 16 KOPs, and preparing photo simulations to represent landscapes and sensitive areas that may be seen by the user groups in the area.

Route 1

KOPs 3A and 3B were identified to characterize the view to the north-northeast along Belmont Ridge Road approximately 0.4 mile south of its intersection with Rt. 7 in CBG 511076110121. The primary user groups include residents, commuters, and other travelers along Belmont Ridge Road, including motorists and pedestrians. The nearest residential community to KOP 3 is approximately 840 ft south of the location where Route 1 crosses Belmont Ridge Road. While Route 1 would be a prominent feature on the landscape where it crosses the road, deciduous woods would provide visual screening from the residences. Additionally, the visual contrast of Route 1 would be lessened by the data center that is under development on the west side of Belmont Ridge Road.

KOP 9 was identified to characterize the view to the northwest along the Rt. 7 corridor between the Ashburn Village Boulevard and Lansdowne Boulevard overpasses in CBG 511076110151, which contains populations of color. The primary user groups include pedestrians, commuters and travelers. The new monopoles for the Project would be taller than the signs and overpass along Rt. 7 and would be somewhat visible above the existing trees. The nearest residential community (“The Ashborough” apartments) to KOP 9 is approximately 0.3 mile southeast behind a shopping center. Visual changes would be greatest along Rt. 7, but the transmission lines would not likely be visible from the apartment complex due to the intervening commercial development. The visual impact would be low.

KOP 11 was identified to characterize the view east of the intersection of Russell Branch Parkway and Commonwealth Center Drive in CBG 511076110152, which contains limited English-speaking households. The view from this KOP is typical of the study area’s mix of commercial, office, and recreational uses that serve residents in nearby residential areas. The closest residential area is approximately 0.25 mile west at the southwest corner of Russell Branch Parkway and its intersection with Loudoun County Parkway. From the KOP, the tops of several monopoles would be visible above the buildings. However, from the residential area, Route 1 would not likely contrast with the existing view in the foreground of commercial development and an overhead utility corridor along Loudoun County Parkway. The visual impact would be low.

KOP 15 was identified to characterize the view to the northeast along the W&OD Trail in CBG 511076110061, which contains populations of color. The primary user group is recreationalists on the trail. The view from this location is dominated by deciduous and evergreen trees, shrubs, and other vegetation that generally blocks any views beyond the foreground. Within CBG 511076110061, the nearest residential area is approximately 1.6 miles west of KOP 15. The visual impact would be low.

Belmont Park Variations A and B

KOP 11 was identified to characterize the view east of the intersection of Russell Branch Parkway and Commonwealth Center Drive in CBG 511076110152, which contains limited English-speaking households. Similar to Route 1, the view to the route variations from the nearest residential area is not anticipated to strongly contrast with the existing foreground views along Loudoun County Parkway. The visual impact would be low.

Broad Run Variations A and B

KOP 16 was identified to characterize the view to the southwest of Kincora Village Center, a residential and commercial development in CBG 511076110183, which contains populations of color. The primary user groups are Kincora Village residents and recreational users of the Kincora Heron Nature Trail. The existing views from KOP 16 are dominated by dense vegetation.

The transmission structures and associated conductors for Broad Run Variation A would be partially visible above the trees when looking to the southwest from Kincora Village Center, which at its closest is approximately 0.5 mile northwest of this route variation. The visual impact would be low.

The transmission structures and associated conductors for Broad Run Variation B would likely be partially visible from the Kincora Village Center above the trees and in some locations and fully visible from the nature trail to the southwest. The visual impact would be low to moderate.

6.5.3.3 Property Value

Affected communities and landowners often express concern that the presence of transmission lines in the viewshed of homes could adversely affect aesthetics, resulting in the reduction of property values and deterring potential buyers. Indirect impacts on property values caused by direct visual impacts from high-voltage transmission lines (i.e., lines carrying more than 69 kV) depend on proximity, visibility, size, and type of transmission structures; easement landscaping; and surrounding topography. Based on a review of peer-reviewed and industry research published in peer-reviewed journals and trade journals, residential property values and sales prices primarily are affected by factors unrelated to the presence of a transmission line. Other factors have been shown through research to have greater influence on the value of residential property than the presence of a transmission line, such as location, type, and condition of improvements to the property; neighborhood; and local real estate market conditions (Jackson and Pitts 2010; Anderson et al. 2017). As noted in Section 6.1.4, no dwellings are located within what would be the rights-of-way for Route 1 or the Variations and no existing ADUs are within 500 feet of any route centerline.

6.5.3.4 Health Impacts

The conclusions of multidisciplinary scientific review panels assembled by national and international scientific agencies during the past three decades are the foundation of Dominion's opinion that no adverse health impacts are anticipated to result from the operation of the transmission infrastructure. The general scientific consensus of agencies that have reviewed this research, relying on generally accepted scientific methods, is that common sources of electromagnetic fields (EMFs) in the environment, including from transmission lines and other parts of the electric system, appliances, etc., are not a cause of any adverse health impacts.

Research on EMF and human health varies widely in approach. Some studies evaluate the impacts of high, short-term EMF exposures not typically found in people's day-to-day lives on biological responses, while others evaluate the impacts of common, lower EMF exposures found throughout communities. Studies also have evaluated the possibility of impacts (e.g., cancer, neurodegenerative diseases, and reproductive impacts) of long-term exposure. Altogether, this research includes well over 100 epidemiologic studies of people in their natural environment, and many more laboratory studies of animals (in vivo) and isolated cells and tissues (in vitro). Standard scientific procedures, such as weight-of-evidence methods, were used by the expert panels assembled by agencies to identify, review, and summarize the results of this large and diverse research.

The reviews of EMF-related biological and health research have been conducted by numerous scientific and health agencies, including, for example, the European Health Risk Assessment Network on

Electromagnetic Fields Exposure, the International Commission on Non-Ionizing Radiation Protection, the World Health Organization, the Institute of Electrical and Electronics Engineers International Committee on Electromagnetic Safety, the Scientific Committee on Emerging and Newly Identified Health Risks of the European Commission, and the Swedish Radiation Safety Authority (formerly the Swedish Radiation Protection Authority; WHO 2007; SCENIHR 2009, 2015; ICNIRP 2010; SSM 2015, 2016, 2018, 2019, 2020, 2021, 2022; ICES 2019). The general scientific consensus of the agencies that have reviewed this research, relying on generally accepted scientific methods, is that the scientific evidence does not confirm that common sources of EMF in the environment, including transmission lines and other parts of the electric system, appliances, etc., are a cause of any adverse health impacts.

The Project routes were designed to be as far from dwellings and other sensitive receptors as possible both within and outside of EJ communities. The desktop review suggests that EJ populations within one mile of the routes would not bear disproportionate impacts associated with the construction, property values, visual, and health-related impacts of the Project.

6.6 Geologic Resources

6.6.1 Geologic Setting

The study area is within the Piedmont geologic province, which lies between the mountainous Blue Ridge province to the west and the terraced slopes of the Coastal Plain province to the east. The Piedmont is characterized by rolling topography, thick soils, and heavily weathered bedrock primarily caused by the region's humid climate. The geologic terranes of the province are relatively complex where many of the rock units are separated by faults and contain various igneous and metamorphic histories. Based on review of the Geologic Map of Virginia, the Project is within a Mesozoic basin situated between the Blue Ridge and Western Piedmont-Potomac Terranes (William and Mary Department of Geology 2024).

6.6.1.1 Route 1

Route 1 crosses a Jurassic-age intrusive igneous mafic bedrock (diabase) from the beginning of the route to approximately the intersection of Rt.7 and Lansdowne Boulevard (MP 3.5) before transitioning into the Upper Triassic Newark Supergroup of interbedded sandstone, siltstone and shale. The route then transects a short interval of the Newark Supergroup predominantly composed of shale (MPs 8.0 to 8.6) before transitioning into a sandstone-dominated interval of the Newark Supergroup where the route then terminates at approximately Pacific Boulevard and the W&OD Trail (MP 9.1) (William and Mary Department of Geology 2024; USGS 2005).

6.6.1.2 Belmont Park Variations

Belmont Park Variations A and B cross intrusive igneous mafic bedrock (diabase) (William and Mary Department of Geology 2024; USGS 2005).

6.6.1.3 Broad Run Variations

Broad Run Variations A and B each cross-interchanging intervals of the Upper Triassic Newark Supergroup within an interval of interbedded sandstone, siltstone, and shale transitioning to interbedded shale and siltstone and back again to an interval of interbedded sandstone, siltstone, and shale (William and Mary Department of Geology 2024; USGS 2005).

6.6.2 Mineral Resources

ERM reviewed publicly available Virginia Energy datasets (2023), USGS topographic quadrangles, and recent (2023) digital aerial photographs to identify mineral resources in the study area. Two active mineral resource sites were within approximately 0.25 mile of Route 1 and no active mineral resource sites within approximately 0.25 mile of either the Belmont Park or Broad Run Variations. The closest active permitted mining site, the Goose Creek Plant site, is on Cochran Mill Road approximately 300 feet north of Route 1 at about MP 0.4. The closest mineral occurrence is a diabase prospect belonging to Quarry A (Milestone Reservoir), an abandoned quarry approximately 150 feet southwest of Route 1 at approximate MP 1.0 (Virginia Energy 2022). According to Loudoun Water, adjacent to this quarry is an area commonly referred to as the Goose Creek Dike which contains a zone of potential embankment with slope stability issues located approximately 150 feet south of Route 1 (MP 0.9). This zone received a factor of safety (FS) rating below the USACE's Levee Design requirement for long-term stability of 1.5 (Arcadis 2022). Route 1 intentionally bypasses Goose Creek Dike and places structures near the tops of the bluffs on either side of Goose Creek.

6.6.2.1 Impact Assessment

As noted above, ERM identified two active mineral resource sites and one mineral occurrence within 0.25 mile of Route 1 and none within 0.25 mile of the Variations. Given the distance between the quarries and Route 1, impacts from construction and operation of the Aspen-Golden Lines on use of the quarries are not anticipated. Additionally, a potential zone of embankment with slope stability concerns is located approximately 115 feet south of the closest Route 1 structure on the east side of Goose Creek. Due to the distance of this structure from Route 1, Dominion engineering concluded that construction and operation of the new transmission line would not likely impact or be impacted by this zone of embankment. By placing structures at high points, Dominion engineering found that the conductors can safely span over Goose Creek and the adjacent steep banks. The Company will continue to coordinate with Loudoun Water, which operates Goose Creek Dike, regarding the embankment, and work with Loudoun Water on a plan to minimize clearing within the right-of-way near the dike in the segment of Route 1 spanning Goose Creek to avoid exacerbating slope stability issues.

6.7 Routing Opportunities

Routing opportunities within the Rt. 7 Study Corridor were identified through review of recent (2023) digital aerial photography, the Loudoun County Comprehensive Plan, various publicly available data layers, and private utility data. Potential routing opportunities identified in the corridor include existing, future, and planned electric transmission lines; existing electric distribution lines; various buried utilities; and major road corridors. Descriptions of these collocation opportunities are provided in the following subsections.

Fiber telecommunication lines are present throughout the study area and within the Rt. 7 Study Corridor. Due to the narrow width of the rights-of-way for these utilities and their typical alignment adjacent to or within roadways, they were not evaluated as a routing opportunity.

No railroad corridors are located near the Project.

6.7.1 Electric Transmission Lines

The Company's existing transmission lines along the W&OD Trail bisect the Rt. 7 Study Corridor from west to east. At the western end of the Rt. 7 Study Corridor near Goose Creek, the existing right-of-way cannot be expanded to accommodate the Aspen-Golden Lines due to planned Loudoun Water facilities and existing quarries located directly adjacent to the existing right-of-way. As noted in Section 3, the Company's existing easement is surrounded by residential neighborhoods along the W&OD Trail as it passes through Ashburn. The width of the existing right-of-way width is not wide enough to accommodate the Aspen-Golden Lines and expansion of the existing right-of-way would require the removal of existing residences and most of the trees along the trail. At the eastern end of the Rt. 7 Study Corridor near the proposed Golden Substation, the existing right-of-way crosses commercia/industrial land that would have space to accommodate an expanded right-of-way without resulting in removal of existing residences or buildings. As such, an approximately 0.5-mile-long section of the Lines #227 and #274 corridor will be utilized as a routing opportunity near the Golden Substation.

The Company's approved future 230 kV BECO-DTC Line #2294 is located near Broad Run, and crosses Sully Road, Russell Branch Parkway, and Gloucester Parkway. While this future line is a potential routing opportunity, it crosses Broad Run, Loudoun County BOS easements, and Loudoun Water BRWRF land, and is adjacent to existing water/sewer lines. Despite these constraints, through coordination with the Loudoun County BOS and Loudoun Water regarding crossing these lands, there is a feasible corridor

adjacent to the future BECO-DTC Line #2294 that is utilized as a routing opportunity for the Broad Run Variation B.

Collocation with the future 230 kV Twin Creeks Lines was identified as an opportunity to minimize impacts to Goose Creek and the adjacent landowners through the use of a shared new utility corridor. The Aspen-Golden Lines will be collocated with the future Twin Creeks Lines for 0.9 mile, from Cochran Mill Road near MP 0.5 to the east side of Goose Creek at MP 1.4.

6.7.2 Electric Distribution Lines

Existing Dominion distribution lines rights-of-way are common throughout the study area and include both overhead and underground distribution line configurations. Distribution line rights-of-way are typically less than 30 feet wide and cannot accommodate transmission lines unless the easements are widened.

Regardless, Dominion attempted to utilize portions of existing distribution rights-of-way wherever feasible, including by overlapping the proposed new transmission right-of-way with the existing right-of-way, even if this would result in the need to underground the distribution lines. Existing Company-owned distribution rights-of-way along portions of Cochran Mill Road, Rt. 7, and Loudoun County Parkway, provide a few routing and collocation opportunities depending on the ability to adjust or bury the distributions lines within a shared right-of-way with the Aspen-Golden Lines.

6.7.3 Utility Easements

There are multiple major and minor utility easements within the study area, including sanitary sewers, water lines, reclaimed water lines, natural gas lines, and minor buried utilities serving residential and industrial developments. A large pressure main (water) and large diameter natural gas line are located along the north side of Rt. 7 occupying parallel easements that are 25 and 40 feet wide, respectively. Due to the collective width of these existing easements and their location between the existing roadway and existing buildings, portions of this corridor do not have space to accommodate the Aspen-Golden Lines and therefore these existing utilities are a routing constraint rather than opportunity. However, these existing utilities are a routing opportunity for Belmont Park B.

Additional existing water and sewer lines are located near the Loudoun Water BRWRF, including along portions of Loudoun County Parkway, Russell Branch Parkway, and the W&OD Trail. Two large-diameter sewer lines, the Potomac Interceptor operated by District of Columbia Water and Sewer Authority and the Russell Branch Interceptor operated by Loudoun Water, are both located adjacent to Broad Run. These existing corridors are feasible routing opportunities in areas where there is sufficient space to maintain appropriate setbacks and avoid parallel overlap of the future Dominion easements with the existing utility easements.

6.7.4 Roads

Major roadways within the Rt .7 Study Corridor include Rt. 7 and Rt. 28 (principal arterial freeways), and Loudoun County Parkway (principal arterial non-freeway). Other major roadways, such as minor arterials and major collectors, include Belmont Ridge Road, Claiborne Parkway, Ashburn Village Boulevard, Russell Branch Parkway, Gloucester Parkway, and Pacific Boulevard. Of these arterial and major collector roadways, Belmont Ridge Road, Rt 7, Loudoun County Parkway, and Pacific Boulevard were considered as potential routing opportunities due to their alignment and availability of adjacent land. Rt 28 is a principal arterial freeway located near the proposed Golden Substation site. Due to topography along the freeway, the presence of the adjacent Russell Branch Parkway, and adjacent existing buried utilities, there is insufficient space for the use of this road as a collocation opportunity. See Section 5.3 for additional detail related to Rt 28.

In addition to the larger roadways listed above, smaller minor collectors and local roads were evaluated for use a potential routing opportunity. Cochran Mill Road is an existing two-lane minor collector road adjacent to industrial properties and businesses. It was considered as a potential routing opportunity due to its orientation and proximity to Route 1.

6.7.5 Impact Assessment

Route 1 and the Variations use several collocation opportunities which vary by type (road, utility, planned facility) and character (overhead, underground, road type, context). The quality of collocation opportunities between the Variations was informed by determining which opportunity was most suitable for the Project, the routing context of the collocation, and stakeholder feedback. Table 6.7-1 summarizes the use of routing opportunities by type and length.

Although the Belmont Park Variations are collocated with Rt. 7, Belmont Park B is categorically inferior to Belmont Park A because it requires two overhead crossings of Rt. 7 within 0.5 mile, which greatly diminished the benefit of collocation by not simply following a single side of Rt. 7. Furthermore, VDOT was emphatic about its preference to not have the Aspen-Golden Lines cross Rt. 7.

The Broad Run Variations also use collocation opportunities which vary in type and character. Broad Run A is characterized by collocation along Loudoun County Parkway and existing overhead distribution/communication lines, whereas Broad Run B is collocated primarily along buried water/sewer lines. Along with having a greater length of collocation, Broad Run A's collocation along Loudoun County Parkway is generally considered the better of the collocation options across the BRWRF site when compared to Broad Run B. Broad Run A follows a section of Loudoun County Parkway along the BRWRF parcel that is already has industrial or commercial uses on either side of the road. In contrast, Broad Run B follows mostly underground utilities through wetland and forest which are characteristically less compatible with the proposed Aspen-Golden Lines than a major arterial roadway flanked with non-residential development. Two stakeholders, the Loudoun County Conservancy and Loudoun County Planning and NRT staff, also commented that Broad Run A represented a better route and collocation option given proximity of Broad Run B to the Broad Run riparian corridor.

Table 6.7-1: Existing Facilities Paralleled by the Aspen-Golden Lines (miles)

Existing Facility Feature	Route 1	Belmont Park Variation A	Belmont Park Variation B	Broad Run Variation A	Broad Run Variation B
Roadways (total)	3.6	0.6	0.4	1.3	0.0
Cochran Mill Road	0.4	0.0	0.0	0.0	0.0
Belmont Ridge Road	0.1	0.0	0.0	0.0	0.0
Rt. 7	2.9	0.6	0.4	0.0	0.0
Loudoun County Parkway	0.0	0.0	0.0	1.3	0.0
Pacific Boulevard	0.2	0.0	0.0	0.0	0.0
Dominion Energy Virginia Transmission Lines	0.2	0.0	0.0	0.3	0.0
Dominion Energy Virginia Distribution Lines	0.4*	0.1*	0.4*	0.8 *	0.4
Buried Water/Sewer/Gas Lines/	0.4	0.0	0.4*	0.2 *	0.8 *
Total Collocation Length Along Existing Features **	**4.2**	**0.6**	**0.4**	**1.6**	**0.4**

Existing Facility Feature	Route 1	Belmont Park Variation A	Belmont Park Variation B	Broad Run Variation A	Broad Run Variation B
Planned Facility Feature					
BECO-DTC 230 kV Transmission Lines	0.0	0.0	0.0	0.0	0.8
Future Twin Creeks Lines	0.9	0.0	0.0	0.0	0.0
Total Collocation Length Along Existing and Planned Features **	**5.0**	**0.6**	**0.4**	**1.6**	**1.2**

** Indicates all or part of the facility is located in a shared corridor with a larger existing facility, such as roadway or transmission line, and is therefore not included the Total Existing Collocation Length to avoid duplicate counting of corridors with multiple existing facilities.*

*** The sum of the features may not equal the totals due to rounding.*

7. CONCLUSIONS AND RECOMMENDATIONS

The Project is the second of three 500-230 kV projects that, together, will bring bulk power from the Company's existing 500 kV Brambleton-Goose Creek Line to the DCA and ELLA. In addition to the 500-230 kV Aspen-Golden Lines, the 500 kV Aspen-Goose Creek Line, and the Lines #2081/#2150 Loop, the Project requires two new 500 kV substations: one along the existing 500 kV line and one closer to the load area in DCA.[24] Dominion identified the proposed Aspen Substation to the west along the 500 kV corridor and proposed Golden Substation to the east near DCA. Using the substations as endpoints, ERM defined a broad study area to encompass multiple potential routing corridors for the Aspen-Golden Lines. Three such corridors were identified and developed on the basis of major collocation routing opportunities, specifically existing Dominion transmission rights-of-way or major highways and arterial roads. The corridors were selected to avoid, to the extent practicable, residential neighborhoods, which constitute the predominate land use in eastern Loudoun County and the study area.

The first corridor identified, along the corridor shared by the W&OD Trail and existing Company transmission lines potentially offered a direct route from substation to substation along the shortest path. However, the existing W&OD Trail right-of-way is not wide enough to accommodate the new 100-foot-wide right-of-way required for the Aspen-Golden Lines. ERM determined that in order to collocate the new transmission lines along this corridor, dozens of homes directly within the new right-of-way would need to be removed, multiple schools and park lands would be crossed, and most of the trees along the length of the corridor – a popular regional trail administered by NOVA Parks – would need to be removed. For these reasons, ERM did not develop routes for this corridor.

The second corridor identified, along the Dulles Greenway/Waxpool Road Corridor, uses a combination of existing Dominion right-of-way and major roadways to connect the Aspen and Golden Substations. ERM and the Company identified a number of flaws with the corridor, including crossings of public lands, proximity to residential areas, and areas where existing residences and commercial buildings could not be avoided. Moreover, the corridor posed several engineering challenges throughout the Waxpool Road area where buried utilities would need to be relocated and the proposed transmission lines would have to cross over multiple 230 kV lines. For these reasons, ERM did not develop routes for this corridor.

A third corridor along Rt. 7, was identified, developed, and selected as the preferred corridor for routing the new Aspen-Golden Lines. This corridor provided collocation routing along major roadways while avoiding homes and businesses and was the only corridor where the routes would cross planned data center developments. This is a significant feature of the corridor because the development of data center campuses (Campuses D and E) would require the extension of new 230 kV lines/rights-of-way which would continue approximately two miles east along Rt.7 from the future Twin Creeks Lines, regardless of the corridor chosen for the Project. Dominion ultimately selected the Rt. 7 Corridor for routing because it would be the least impactful to residences, most compatible with crossed and adjacent land uses, and, other than the W&OD Trail Corridor, the shortest and most direct alignment.

Routing the Aspen-Golden Lines was an iterative process whereby conceptual routes were continuously studied, adjusted, and sometimes rejected as constraints were identified and public/stakeholder input guided and informed routing choices. Several route segments coalesced into a single alignment - Route 1 - which comprises 6.6 miles of the approximately 9.4 or 9.5-mile-long Aspen-Golden Lines. In particular, routing through the Goose Creek area was difficult due to a myriad of other constraints – environmental features and planned development. Coordination amongst multiple stakeholders was necessary to form a

[24] As noted before, because the existing right-of-way and Company-owned or to-be-owned property are adequate for the proposed Aspen-Goose Creek Line #5002 and Lines #2081/#2150 Loop, no new right-of-way is required. Given the availability of existing right-of-way and the statutory preference given to use of existing rights-of-way, and because additional costs and environmental impacts would be associated with the acquisition of and construction on new right-of-way, the Company did not consider any alternative routes requiring new right-of-way for the proposed Aspen-Goose Creek Line or Line Loop.

consensus route that would maximize collocation with the future Twin Creeks Lines, avoid planned developments (especially data centers and Loudoun Water facilities), and minimize scenic and environmental impacts to the Goose Creek State Scenic River. Route 1 was also designed to stay parallel to Rt. 7 to the greatest extent possible to avoid residences and business, mitigate potential impacts to cultural and historic resources, and collocate with existing utilities. Further east, Route 1 passes One Loudoun and, rather than turn south at the intersection of Rt. 7 and Loudoun County Parkway, continues east to avoid residential areas. As such, Route 1 turns south near an existing data center and follows existing buried utility right-of-way back toward Loudoun County Parkway.

In addition to Route 1, route variations were developed to address specific routing constraints where consensus could not be reached amongst affected stakeholders and options needed to be presented to the SCC. The first, the Belmont Park Variations, sought to provide alternatives for crossing (or avoiding) a fully entitled planned residential development (Belmont Park) that would likely start construction before SCC issuance of a CPCN for the Project. Belmont Park A directly crosses a portion of the development whereas Belmont Park B avoids the development by crossing to the north side of Rt. 7. As discussed in this report, Dominion and ERM do not favor Belmont Park B because it would require two crossings of Rt. 7 and would be closer to existing residences and the Inova Hospital Helipad. Dominion, along with various stakeholders including VDOT, Loudoun County, Lansdowne Conservancy, and Inova Loudoun Hospital, prefer Belmont Park A for the following reasons:

- VDOT and Dominion wish to avoid two overhead crossings of Rt. 7 that would require special licensing and construction road closures over one of the busiest highways in the region.
- Dominion addresses Inova Loudoun Hospital's aviation safety concerns that Belmont Park B could impact operation of the helipad and address their request to locate the lines as far as possible from the helipad and flight surfaces.
- Dominion and the Lansdowne Conservancy wish to avoid the existing Camden Lansdowne Apartments where Belmont Park B would require removal of a 100-foot-wide tree buffer along the highway and result in significant visual impacts to residents. In contrast to Belmont Park A, which has zero existing residences within 250 feet of centerline, Belmont Park B would be proximate to as many as 112 residences within 250 feet of the centerline across several multi-family apartment buildings.
- Loudoun County, Dominion, and the Lansdowne Conservancy concur that Belmont Park B's requirements for four additional two-pole angle structures at either side of the Rt. 7 crossings constitute a greater visual impact than Belmont Park A, which would use monopoles along the south side of Rt. 7.
- In light of the planned Telos Data Center, a potential future 230 kV delivery point, Dominion believes it is unreasonable to cross Rt. 7 and impact largely incompatible existing land uses, only to cross back to the south side and immediately tie into a new substation.
- Belmont Park B would result in greater environmental impacts including the conversion of 1.1 more acres of forested wetland to PEM/PSS type wetland than Belmont Park Variation A (1.8 vs. 0.7 acres, respectively).
- Dominion concluded that potential impacts to existing residences take precedence over future development, even if that development is fully entitled.

Dominion has been working with the Belmont Park developer on route adjustments that would help minimize impacts to the property. Despite potential impacts to the development, ERM and the Company recommend both variations be noticed to the SCC, but that the SCC select Belmont Park A as the preferred variation.

The Broad Run Variations were identified early in the routing process as it became apparent that the best solution would involve crossing Loudoun Water's BRWRF property. Public (or quasi-public) lands are generally avoided in the routing process because Dominion does not have condemnation authority against the owner. In the context of the study area, and in consideration of stakeholder feedback, the Broad Run Variations were identified in lieu of routes that would be more impactful to the community. Specifically, Dominion was unwilling to propose routes in close proximity to the residences along Loudoun County Parkway south of Rt. 7, including the existing One Loudoun and the proposed (and approved) Commonwealth Center residential development. Furthermore, the location of buried utilities made engineering difficult and would conflict with existing utilities in this area.

Dominion and ERM routing staff coordinated with Loudoun Water starting in early 2023 and began routing what later became the Broad Run Variations. After numerous route iterations, two variations were identified and carried forward for full analysis. Broad Run A parallels Loudoun County Parkway for the majority of its length, whereas Broad Run B is nearer Broad Run and mostly within the Broad Run floodplain. Both routes leverage collocation opportunities but would result in substantially different impacts to the various resources in the area. Dominion favors Broad Run A, which avoids Broad Run and its associated wetlands, a heron rookery, recreation sites and trail, Kincora residences, forest, and ecological cores. Dominion and Loudoun County staff favor Broad Run A because it avoids approximately 8.7 acres of existing BOS easements south of Broad Run, which cannot be avoided by Broad Run B. Loudoun Water favors Broad Run B because it avoids buildable areas on the BRWRF property. The ability to expand within the BRWRF is of vital concern to Loudoun Water who is obligated to expand and serve the water treatment needs of their service territory.

Loudoun Water has indicated to the Company that it is willing to consider Broad Run A, but only on the condition that VDOT licensing can be obtained to maximize right-of-way overlap along Loudoun County Parkway and minimize the impact to buildable areas on the parcel. As of February 28, 2024, Dominion is finalizing detailed route adjustments and working with VDOT to approve licensing or permitting according to Loudoun Water's request. Dominion additionally is willing to accept a license agreement to cross Loudoun Water land in lieu of a permanent easement.

Dominion and ERM favor Broad Run A over Broad Run B because Broad Run A would minimize environment impacts.

Broad Run A is approximately 2.2 miles long, approximately 0.1 mile shorter than Broad Run B (2.3 miles). Broad Run A has a correspondingly smaller right-of-way footprint of 29.7 acres, compared to the slightly larger 30.6-acre footprint for Broad Run B.

As summarized in Table 7-1 below and discussed in Section 6.2, Natural Resources, the Broad Run A right-of-way encompasses approximately 6.6 acres of wetlands, including 5.3 acres of PFO, 9.1 acres of forest, 5 waterbodies, and 4.1 acres of a C5-ranked ecological core. In contrast, the Broad Run Variation B right-of-way encompasses 13.9 acres of wetlands overall and approximately 10.3 acres of PFO wetland, 19.5 acres of forest, and 13.1 acres of a C5-ranked ecological core. Broad Run B would convert twice as much PFO wetland to PSS/PEM wetland, would require 10.4 more acres of tree clearing, and cross one more perennial waterbody than Broad Run A, which would have fewer impacts on natural resources than Broad Run B.

Table 7-1: Summary of Natural Resource Impacts by the Broad Run Variations

Natural Resource	Broad Run Variation A	Broad Run Variation B
Wetlands (total acres)	6.6	13.9
Forested Wetlands	5.3	10.3

Natural Resource	Broad Run Variation A	Broad Run Variation B
Waterbodies (total)	5	6
Forest (acres)	9.1	19.5
Ecological Cores Crossed (acres)	4.1	13.1

Broad Run A also avoids existing and planned recreational areas along Broad Run including the Kincora Heron Trail as well as plans and proffers for the future extension of the Broad Run Trail along this section of river. Broad Run B would result in greater impacts to current and future trail users and diminish the scenic and natural qualities of Broad Run. This section of Broad Run also is home to a growing heron rookery. By following Loudoun County Parkway, Broad Run A better avoids the rookery and decreases the likelihood of impacts to the habitat.

Despite the Company's preference for Broad Run A, Dominion continues to work with Loudoun Water, which will make the final decision on the routing across the BRWRF property. As of February 23, 2024, Loudoun Water continues to study both options as Dominion works towards an agreement with VDOT and collaborates with Loudoun Water staff on detailed engineering. The Company proposes both route variations be noticed in the SCC filing until such time as Loudoun Water makes a final decision on its preferred alignment. In the course of stakeholder outreach, Loudoun County staff and various conservation organizations voiced support for Broad Run A for the reasons mentioned above and have expressed those opinions to Loudoun Water.

For the reasons discussed in Section 5.3.2, no viable underground or hybrid alternatives exist for the Project.

In conclusion, the Company selects Route 1 in combination with the Belmont Park A and Broad Run A variations as the preferred alternative after evaluating numerous routing constraints and opportunities identified through desktop study, stakeholder outreach, and fieldwork. Within the geographic context of the study area, the Company's most important factor guiding routing was consistency with SCC Guideline #1, specifically (1) that existing rights-of-way should be given priority as the locations for additions to existing transmission facilities; (2) that the joint use of existing rights-of-way by different kinds of utility services should be considered, and (3) that rights-of-way should be selected with the purpose of minimizing conflict between the rights-of-way and present and prospective uses of the land on which they will be located. Various alternatives to Route 1 could not meet SCC Guidelines or impacted sensitive resources to such a degree that they were dismissed outright. The Company also found that Belmont Park B and Broad Run B were inferior to the Belmont Park A and Broad Run A, which avoid or minimize impacts to residential areas and sensitive environmental features. The preferred alternative, Route 1 in combination with the Belmont Park A and Broad Run A variations, is referred to as Route 1AA (Aspen-Golden Lines Proposed Route) in the SCC Appendix.

7.1 Summary of Analysis in Support of Aspen-Golden Lines Proposed Route (Route 1AA)

Aspen-Golden Lines Proposed Route (Route 1AA): Route 1, Belmont Park Variation A, and Broad Run Variation A

Route 1AA (Route 1 + Belmont Park Variation A + Broad Run Variation A) was selected as the Proposed Route for the Aspen-Golden Lines as it avoids or reasonably minimizes adverse impacts to the greatest extent reasonably practicable on the scenic assets, historic resources, and environment of the area concerned. The Proposed Route was selected because of its compatibility with existing and proposed land uses, avoidance of existing residences and commercial buildings, minimization of impacts to

Loudoun County BOS easements and planned developments, and avoidance of wetlands and forests. The Proposed Route also crosses future data center developments to the extent practicable, potentially minimizing the need for additional delivery point-driven transmission lines and rights-of-way to serve new customers. The Proposed Route is collocated with the future Twin Creeks Lines across Goose Creek and avoids crossing Rt. 7. For these reasons, and with regard to the importance of land use planning and compatibility in this developed and highly constrained area, Route 1 was selected in conjunction with Belmont Park Variation A and Broad Run Variation A as the Proposed Route (Route 1AA).

In comparison, Alternative Routes 1AB, 1BA, and 1BB all use Belmont Park Variation B and/or Broad Run Variation B in combination with Route 1. Because Belmont Park Variation B is in closer proximity to existing residences, requires two crossings of Rt. 7, and impacts more forest lands and wetlands, Alternative Routes 1BA and 1BB were not selected for the Proposed Route. Similarly, because Broad Run Variation B would impact significantly more forested wetlands and other environmental features than the Broad Run Variation A, Alternative Route 1AB was also not selected for incorporation into the Proposed Route.

8. REFERENCES

1757 Golf Club. 2024. Welcome to 1757 Golf Club. Available online at: https://www.1757golfclub.com/. Accessed February 2024.

Belmont Country Club. 2024. Belmont Country Club History. Available online at: https://www.invitedclubs.com/clubs/belmont-country-club/who-we-are/history. Accessed February 2024.

Arcadis. 2022. Milestone Reservoir and Pump Station Preliminary Engineering Report. Available online at: https://www.loudounwater.org/current-projects/milestone-reservoir-raw-water-pumping-station. Accessed June 2023.

Ashburn Volunteer Fire & Rescue Department. 2016. Station 22. Available online at: https://ashburnfireresc ue.org/about/our-stations/station-22/. Accessed October 2023.

AtlasArteria. 2023. Dulles Greenway. Available online at: https://www.atlasarteria.com/portfolio/dulles-greenway. Accessed August 2023.

Avian Power Line Interaction Committee. 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Available online at: https://www.nrc.gov/docs/ML1224/ML12243A391.pdf. Accessed January 2024.

Bayer, R. D., and E. McMahon. 1981. Colony sizes and hatching synchrony of Great Blue Herons in coastal Oregon. *The Murrelet*, 62(3), 73-79. Available online at: https://www.jstor.org/stable/3534246. Accessed January 2024.

Booth, G. C. 2020. Luck-y Birds. *Ashburn Magazine*. Available online at: https://www.ashburnmagazine.com/features/peregrine-falcons-choose-ashburn-quarry-to-raise-their-young/. Accessed January 2024.

Carney, K. M., and W. J. Sydeman. 1999. A review of human disturbance effects on nesting colonial waterbirds. *Waterbirds*, 68-79. Available online at: https://www.jstor.org/stable/1521995. Accessed January 2024.

Carlson, B. A., and E. B. McLean. 1996. Buffer Zones and Disturbance Types as Predictors of Fledging Success in Great Blue Herons*, Ardea herodias*. *Colonial Waterbirds*, 19(1), 124–127. Available online at: https://doi.org/10.2307/1521816. Accessed January 2024.

CCB (Center for Conservation Biology). 2022. Eagle Nest Locator. Available online at: https://ccbbirds.org/what-we-do/research/species-of-concern/virginia-eagles/nest-locator/. Accessed January 2024.

Christian Fellowship Church. 2024. About Us. Available online at: https://cfcwired.org/about-us/. Accessed August 2023.

Community Church. 2024. Welcome to Community Church. Available online at: https://communitychurch.cc/. Accessed August 2023.

DataCenters.com. 2023. Why is Ashburn the Data Center Capital of the World? Available online at: https://www.datacenters.com/news/why-is-ashburn-the-data-center-capital-of-the-world. Accessed August 2023.

Dulles Greenway. 2023. Available online at: www.dullesgreenwaycom. Accessed September 2023.

ESRI, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community. (ESRI et al). 2023. World Topographic Map. Available online at: https://basemaps.arcgis.com/arcgis/rest/services/World_Basemap_v2/VectorTileServer. Accessed January 2024.

Federal Aviation Administration (FAA). 2024a. Airport Data and Information Portal. Available online at: https://adip.faa.gov/agis/public/#/public. Accessed January 2024.

2024b. Circle Search for Airports. Available online at: https://oeaaa.faa.gov/oeaaa/external/searchAction.jsp?action=showCircleSearchAirportsForm. Accessed January 2024.

Find a Grave. 2024. World's largest gravesite collection. Available online at: https://www.findagrave.com/. Accessed August 2023. George Washington University. 2023. Virginia Science and Technology Campus. Available online at: https://virginia.gwu.edu/. Accessed August 2023.

Gibbs, J. P., Woodward, S., Hunter, M. L., and A. E. Hutchinson. 1987. Determinants of Great Blue Heron colony distribution in coastal Maine. *The Auk*, 104(1), 38-47. Available online at: https://academic.oup.com/auk/article/104/1/38/5183683. Accessed January 2024.

Goose Creek Association. 2024. 50 Years of Scenic River Protection. Available online at: https://goosecreek.org/scenic-river-protection/. Accessed February 2024.

ICES (International Committee on Electromagnetic Safety). 2019. IEEE Standard for Safety Levels with Respect to Human Exposure to Electromagnetic Fields 0 to 300 GHz. IEEE Std C95.1-2019. New York, NY.

ICNIRP (International Commission on Non-ionizing Radiation Protection). 2010. Guidelines for Limiting Exposure to Time-varying Electric and Magnetic Fields (1 Hz to 100 kHz). Health Phys, 99: 818.

Jackson, T., and J. Pitts. 2010. The Effects of Electric Transmission Lines on Property Values: A Literature Review. Journal of Real Estate Literature, 18(2): 239–259.

Karter Schools. 2023. Childcare Programs. Available online at: https://karterschools.com/accredited-programs/. Accessed August 2023.

Kelly, J. P., Etienne, K., Strong, C., McCaustland, M., and M. L. Parkes. 2007. Status, trends, and implications for the conservation of heron and egret nesting colonies in the San Francisco Bay

area. *Waterbirds*, 455-478. Available online at: https://bioone.org/journals/waterbirds/volume-30/issue-4/1524-4695(2007)030%5b0455%3aSTAIFT%5d2.0.CO%3b2/Status-Trends-and-Implications-for-the-Conservation-of-Heron-and/10.1675/1524-4695(2007)030[0455:STAIFT]2.0.CO;2.short. Accessed January 2024.

Kincora. 2024. Nature. Available online at: https://kincora.com/nature/. Accessed February 2024.

Knight, E. C., Vennesland, R. G., & Winchester, N. N. 2016. Importance of proximity to foraging areas for the Pacific Great Blue Heron (*Ardea herodias fannini*) nesting in a developed landscape. *Waterbirds*, 39(2), 165-174. Available online at: https://bioone.org/journals/waterbirds/volume-39/issue-2/063.039.0207/Importance-of-Proximity-to-Foraging-Areas-for-the-Pacific-Great/10.1675/063.039.0207.short. Accessed January 2024.

Loudoun County. No date. Forested Stream Buffers. Available online at: https://www.loudoun.gov/3537/Forested-Stream-Buffers. Accessed January 2024.

2021. Linear Parks and Trails System; A Countywide Plan. Available online at: https://www.loudoun.gov/DocumentCenter/View/167395/LPAT-Plan_211029_Full-Appendices-4. Accessed February 2024.

2022. Elections and Voter Registration – Find Your Polling Place. Available online at: https://www.loudoun.gov/197/Where-is-my-Polling-Place. Accessed September 2023.

2023a. Loudoun Geohub. Available online at: https://geohub-loudoungis.opendata.arcgis.com/. Accessed January 2024.

2023b. Loudoun Online Land Applications. Available online at: https://www.loudoun.gov/3362/LOLA. Accessed January 2024.

2023c. Department of Transportation and Capital Infrastructure: Projects, Plans, and Studies. Available online at: https://www.loudoun.gov/128/Transportation-Capital-Infrastructure. Accessed January 2024.

2023d. Loudoun County Aerial Archive. Available online at: https://logis.loudoun.gov/archive/. Accessed August 2023.

2023e. Loudoun County 2019 General Plan. Available online at: https://www.loudoun.gov/DocumentCenter/View/152285/General-Plan---Combined-with-small-maps-bookmarked. Accessed August 2023.

2023f. Loudoun County 2019 Countywide Transportation Plan. Available online at: https://www.loudoun.gov/DocumentCenter/View/152287/CTP---Combined-with-small-maps-bookmarked#:~:text=The%202019%20CTP%20seeks%20to,relate%20to%20the%20transportation%20network. Accessed August 2023.

2023g. Loudoun County 2023 Zoning Ordinance. Available online at: loudoun.gov/DocumentCenter/View/180078/Combined-Zoning-Ordinance. Accessed August 2023.

2023h. Sheriff's Office – Ashburn Station. Available online at: https://www.loudoun.gov/4576/Ashburn-Station. Accessed October 2023.

2023i. Land Management, Applications, Research, Coordination (LandMARC). Available online at: https://www.loudoun.gov/5823/LandMARC-Land-Management-Applications-Re. Accessed January 2024.

2023j. Parks, Recreation, and Community Services. Available online at: https://www.loudoun.gov/4119/Parks-Recreation-Community-Services. Accessed October 2023.

2023k. Transit and Commuter Services. Available online at: https://www.loudoun.gov/4121/Transit-Commuter-Services. Accessed October 2023.

2024. Loudoun County Road Maintenance: Who Maintains My Street? Available online at: https://www.arcgis.com/apps/webappviewer/index.html?id=0626720fdd1e44aebdf2e438133b0a4d&extent=-8628075.3104,4728866.4157,-8623431.7609,4731486.7726,102100. Accessed February 2024.

Loudoun County Public Schools. 2024. Steuart W. Weller Elementary School. Available online at: https://www.lcps.org/site/Default.aspx?PageType=1&SiteID=9961&ChannelID=28664&DirectoryType=6. Accessed August 2023.

Loudoun Virginia Economic Development. 2022. Loudoun Data Center Land Study. Available online at: https://loudoun.granicus.com/MetaViewer.php?view_id=77&event_id=3407&meta_id=206361. Accessed August 2023.

2023. Key Business Sectors – Data Centers. Available online at: https://biz.loudoun.gov/key-business-sectors/data-centers/. Accessed August 2023.

Loudoun Water. 2023a. Loudoun Water Facilities. Available online at: Loudoun Water Facilities | loudounwater.org. Accessed September 2023.

2023b. Visit Our Exhibit. Available online at: https://www.loudounwater.org/community/visit-our-exhibit. Accessed October 2023.

2023c. Water Reclamation. Available online at: Water Reclamation | loudounwater.org. Accessed October 2023.

2023d. Loudoun Water 2023-2032 Capital Improvement Plan. Available online at: https://www.loudounwater.org/sites/default/files/Loudoun%20Water%202023%20-%202032%20CIP%20Capital%20Improvement%20Plan.pdf. Accessed June 2023.

Manville II, A. M. 2005. Bird strike and electrocutions at power lines, communication towers, and wind turbines: state of the art and state of the science - next steps toward mitigation. Available online at: https://www.fs.usda.gov/psw/publications/documents/psw_gtr191/psw_gtr191_1051-1064_manville.pdf. Accessed January 2024.

Mapcarta. 2023. FAA Radar. Available online at: https://mapcarta.com/N7601551232. Accessed October 2023.

Metropolitan Washington Airports Authority. 2022. Dulles Corridor Metrorail Project Timeline and History. Available online at: https://www.mwaa.com/business/construction/dulles-corridor-metrorail/project-background/project-timeline-and-history. Accessed August 2023.

Moorabool Shire Council. 2020. “Comparison of 500 kV Overhead Lines with 500 kV Underground Cables.” Available online at: https://www.moorabool.vic.gov.au/files/assets/public/orphans/documents/20200924-msc-transmission-comparison-overhead-with-underground.pdf. Accessed January 2024.

National Water Quality Monitoring Council. 2023. Goose Creek Industrial Park WWTP (21VASWCB-VA0080993-001) site data in the Water Quality Portal. Available online at: https://www.waterqualitydata.us/provider/STORET/21VASWCB/21VASWCB-VA0080993-001/. Accessed December 2023.

NatureServe. 2024. Pycnanthemum torreyi. Available online at: https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.141413/Pycnanthemum_torreyi. Accessed January 2024.

NCED (National Conservation Easement Database). 2023. Advanced Easement Search. Available online at: https://www.conservationeasement.us/adv-search/. Accessed August 2023.

NOVA Parks. 2024. Washington and Old Dominion Railroad Regional Park. Available online at: https://www.novaparks.com/parks/washington-and-old-dominion-railroad-regional-park. Accessed February 2024.

One Loudoun. 2024. The Club @ One Loudoun. Available online at: https://www.1lna.com/events/club.cfm. Accessed February 2024.

Parnell, J. F., et al. 1988. Colonial waterbird management in North America. *Colonial Waterbirds*, 129-169. Available online at: https://www.jstor.org/stable/1520996. Accessed January 2024.

Piedmont Environmental Council. 2018. Emerald Ribbons. Available online at: https://loudouncoalition.org/wp-content/uploads/2018/12/emeraldribbonswhitepaperfinal1.pdf. Accessed February 2024.

Postal Locations. 2023. Ashburn Post Office. Available online at: https://www.postallocations.com/va/dulles/ashburn. Accessed October 2023.

Rextag. 2023. Mapping & GIS Data Services for the Energy Industry. Available online at: https://rextag.com/services. Accessed August 2023.

Rodgers Jr, J. A., and H. T. Smith. 1995. Set-back distances to protect nesting bird colonies from human disturbance in Florida. *Conservation Biology*, 9(1), 89-99. Available online at: https://conbio.onlinelibrary.wiley.com/doi/10.1046/j.1523-1739.1995.09010089.x. Accessed January 2024.

SCENIHR (Scientific Committee on Emerging and Newly Identified Health Risks). 2009. Health Effects of Exposure to EMF. Brussels, Belgium: European Commission. Available online at: https://ec.europa.eu/health/scientific_committees/emerging/docs/scenihr_o_041.pdf. Accessed January 2024.

2015. Opinion on Potential Health Effects of Exposure to Electromagnetic Fields (EMF). Brussels, Belgium: European Commission. Available online at: https://ec.europa.eu/health/scientific_committees/emerging/docs/scenihr_o_041.pdf. Accessed October 2023.

Shenandoah University. 2024. Loudoun. Available online at: https://www.su.edu/campus-maps/campus-locations/scholar-plaza/. Accessed August 2023.

SSM (Swedish Radiation Safety Authority). 2015. Research 2015:19. Recent Research on EMF and Health Risk–- Tenth report from SSM's Scientific Council on Electromagnetic Fields. Stockholm, Sweden.

2016. Research 2016:15. Recent Research on EMF and Health Risk–- Eleventh report from SSM's Scientific Council on Electromagnetic Fields, 2016. Including Thirteen years of electromagnetic field research monitored by SSM's Scientific Council on EMF and health: How has the evidence changed over time? Stockholm, Sweden.

2018. Research 2018:09. Recent Research on EMF and Health Risk–- Twelfth report from SSM's Scientific Council on Electromagnetic Fields, 2017. Stockholm, Sweden.

2019. Research 2019:08. Recent Research on EMF and Health Risk – Thirteenth Report from SSM's Scientific Council on Electromagnetic Fields, 2018. Stockholm, Sweden.

2020. Research 2020:04. Recent Research on EMF and Health Risk – Fourteenth Report from SSM's Scientific Council on Electromagnetic Fields, 2019. Stockholm, Sweden.

2021. Research 2021:08. Recent Research on EMF and Health Risk – Fifteenth report from SSM's Scientific Council on Electromagnetic Fields, 2020. Stockholm, Sweden.

2022. Research 2022:16. Recent Research on EMF and Health Risk – Sixteenth report from SSM's Scientific Council on Electromagnetic Fields, 2021. Stockholm, Sweden.

St. David's Episcopal Church and School. 2024. Transforming Lives Through Christ. Available online at: https://www.sdlife.org/#dm. Accessed August 2023

St. David's Episcopal Preschool. 2024. Welcome Prospective Families! Available online at: https://www.stdavidspreschool.org/. Accessed August 2023.

Strayer University. 2024. Welcome to our Loudoun Campus. Available online at: https://www.strayer.edu/campus-locations/virginia/loudoun/. Accessed August 2023.

The Goddard School. 2024. The Goddard School of Ashburn. Available online at: https://www.goddardschool.com/schools/va/ashburn/ashburn. Accessed August 2023.

The Learning Experience. 2024. Ashburn. Available online at: https://thelearningexperience.com/centers/ashburn/. Accessed February 2024.

USACE (U.S. Army Corps of Engineers). 2023. Notification of Approved Jurisdictional Determination. Provided to Dominion Energy by Toll Brothers Inc.

U.S. Census Bureau. 2022a. American Community Survey 5-year Estimates Census Data (2018-2022). File No. B03002, Hispanic or Latino Origin by Race. Available online at: https://data.census.gov/cedsci/. Accessed February 2024.

2022b. American Community Survey 5-year Estimates Census Data (2018-2022). File No. C17002, Ratio of Income to Poverty Level in the Past 12 Months. Available online at https://data.census.gov/cedsci/. Accessed February 2024.

2022c. American Community Survey 5-year Estimates Census Data (2018-2022). File No. C16002, Household Language by Household Limited English-Speaking Status. Available online at: https://data.census.gov/cedsci/. Accessed February 2024.

2022d. American Community Survey 5-year Estimates Census Data (2018-2022). File No. B15002, Sex by Educational Attainment for the Population 25 Years and Over. Available online at: https://data.census.gov/cedsci/. Accessed February 2024.

2022e. American Community Survey 5-year Estimates Census Data (2018-2022). File No. B01001, Sex by Age. Available online at: https://data.census.gov/cedsci/. Accessed February 2024.

2023. QuickFacts Sterling CDP, Virginia; Belmont CDP, Virginia; Ashburn CDP, Virginia. Available online at: https://www.census.gov/quickfacts/fact/table/sterlingcdpvirginia,belmontcdpvirginia,ashburncdpvirginia/PST045222. Accessed February 2024.

USDOT (U.S. Department of Transportation). 2014. Dulles Greenway, Loudoun County, VA. Available online at: https://www.transportation.gov/buildamerica/projects/project-highlights/dulles-greenway-loudoun-county-va. Accessed January 2024.

USEPA (U.S. Environmental Protection Agency). 2016a. Promising Practices for the EJ Methodologies in NEPA Reviews. Available online at: https://www.epa.gov/sites/default/files/2016-08/documents/nepa_promising_practices_document_2016.pdf. Accessed February 2024.

2016b. Technical Guidance for Assessing Environmental Justice in Regulatory Analysis. Available online at: https://www.epa.gov/sites/default/files/2016-06/documents/ejtg_5_6_16_v5.1.pdf. Accessed February 2024.

USFWS (U.S. Fish and Wildlife Service). 2013. Classification of Wetlands and Deepwater Habitats of the United States. Available online at: https://www.fws.gov/program/national-wetlands-inventory/classification-codes. Accessed January 2024.

2022. National Wetlands Inventory (NWI): Wetlands Mapper. Available online at: https://www.fws.gov/program/national-wetlands-inventory/wetlands-mapper. Accessed February 2023.

2024. IPaC Information for Planning and Consultation. Online System. Available online at: https://ecos.fws.gov/ipac/. Accessed January 2024.

USGS (U.S. Geological Survey). 2005. Open-file Report 2005-1325, Preliminary integrated geologic map databases for the United States: Delaware, Maryland, New York, Pennsylvania, and Virginia. Available online at: https://pubs.usgs.gov/of/2005/1325/#VA. Accessed January 2024.

2022. 7.5-minute Digital Elevation Model (10-meter resolution) Available online at: https://pubs.usgs.gov/of/2003/of03-150/arcview/metadata/dem/dem.htm. Accessed January 2024.

Vennesland, R. G. 2002. The effects of disturbance from humans and predators on the breeding decisions and productivity of the Great Blue Heron in south-coastal British Columbia. MSc. Thesis. Simon Fraser University, Burnaby. Available online at: https://central.bac-lac.gc.ca/.item?id=MQ61507&op=pdf&app=Library&oclc_number=1006674982. Accessed January 2024.

Vennesland, R. G., and R. W. Butler. 2004. Factors influencing Great Blue Heron nesting productivity on the Pacific coast of Canada from 1998 to 1999. *Waterbirds*, 27(3), 289-296. Available online at: https://www.jstor.org/stable/1522504. Accessed January 2024.

2020. Great Blue Heron (*Ardea herodias*). *Birds of the World*. Cornell Lab of Ornithology, Ithaca, NY, USA. Available online at: https://doi-org.mutex.gmu.edu/10.2173/bow.grbher3.01. Accessed January 2024.

VDCR (Virginia Department of Conservation and Recreation). 2021. Overview of the Physiography and Vegetation of Virginia. Available online at: https://www.dcr.virginia.gov/natural-heritage/natural-communities/document/ncoverviewphys-veg.pdf. Accessed January 2024.

2023a. Virginia Natural Landscape Assessment. Available online at: https://www.dcr.virginia.gov/natural-heritage/vaconvisvnla. Accessed January 2024.

2023b. Forest Conservation Value. Model last updated 2020. Available online at: https://www.dcr.virginia.gov/natural-heritage/vaconvisforest. Accessed January 2024.

2024a. Virginia Natural Heritage Database Search. Available online at: https://vanhde.org/species-search. Accessed January 2024.

2024b. Project Review. Received September 21, 2023.

2024c. Virginia Natural Heritage Data Explorer. Available online at: https://vanhde.org/content/map. Accessed January 2024.

Virginia Academy. 2024. Students discovering their best future. Available online at: https://virginia-academy.com/. Accessed August 2023.

Virginia Department of Game and Inland Fisheries, the Center for Conservation Biology at the College of William, and Mary and Virginia Commonwealth University. 2012. Management of Bald Eagle Nests, Concentration Areas, and Communal Roosts in Virginia: A Guide for Landowners. Available online at: https://dwr.virginia.gov/wp-content/uploads/virginia-bald-eagle-guidelines-for-landowners.pdf. Accessed January 2024.

VDHR (Virginia Department of Historic Resources). 2023. Virginia Cultural Resources Information System. Available online at: https://www.dhr.virginia.gov/programs/vcris/. Accessed January 2024.

VDOT (Virginia Department of Transportation). 2023a. VDOT Traffic Volume. Available online at: https://vdot.maps.arcgis.com/home/item.html?id=a8da35dd9ce54993b25f64487c3717ec. Accessed February 2024.

2023b. Northern Virginia Projects. Available online at: https://www.vdot.virginia.gov/projects/northern-virginia-district. Accessed September 2023.

VDWR (Virginia Department of Wildlife Resources). 2021. Time of Year Restrictions. Available online at: https://dwr.virginia.gov/wp-content/uploads/media/Time-of-Year-Restrictions.pdf. Accessed September 2023.

2024a. Wildlife Environmental Review Map Service (WERMS). Available online at: https://dwr.virginia.gov/gis/werms/. Accessed January 2024.

2024b. Virginia Fish and Wildlife Information Service. Available online at: https://services.dwr.virginia.gov/fwis/index.asp. Accessed January 2024.

2024c. NLEB Winter Habitat & Roost Tree Application. Virginia Department of Game and Inland Fisheries. Available online at: https://dwr.virginia.gov/wildlife/bats/northern-long-eared-bat-application/. Accessed January 2024.

2024d. Little Brown Bat and Tri-colored Bat Winter Habitat and Roosts Application. Available online at: https://dwr.virginia.gov/wildlife/bats/little-brown-bat-tri-colored-bat-winter-habitat-roosts-application/. Accessed January 2024.

2024e. Virginia Peregrine Falcon Monitoring and Management Program. Available online at: https://dwr.virginia.gov/wildlife/birds/peregrine-falcon/. Accessed January 2024.

Virginia Energy. 2024. Mineral Mining Map. Virginia Department of Energy. Available online at: https://energy.virginia.gov/webmaps/MineralMining/. Accessed January 2024.

VOF (Virginia Outdoors Foundation). No date. Virginia Outdoors Foundation – Our Work. Available online at: https://www.vof.org. Accessed January 2024.

Watts, B. D., and M. U. Watts. 2020. Virginia peregrine falcon monitoring and management program: Year 2020 report. *Center for Conservation Biology Technical Report Series*, CCBTR-20-17. William & Mary, Williamsburg, VA. 21 pp. Available online at: https://scholarworks.wm.edu/cgi/viewcontent.cgi?article=1675&context=ccb_reports. Accessed January 2024.

William and Mary Department of Geology. 2024. Geology of Virginia. Available online at: http://geology.blogs.wm.edu/. Accessed January 2024.

Yonemoto, N., Muneta, Y., Yamanouchi, H., Seo, S., Kumada, Y., Itoh, M., Kunimura, Nakamura, S., Fujii, Y., and T. Ishii, 2008. “Construction of the World’s First Long-Distance 500 kV XLPE Cable Line.” Available online at: https://www.fujikura.co.jp/eng/rd/gihou/backnumber/pages/__icsFiles/afieldfile/2008/10/10/32e_06.pdf. Accessed January 2024.

APPENDIX A FIGURES

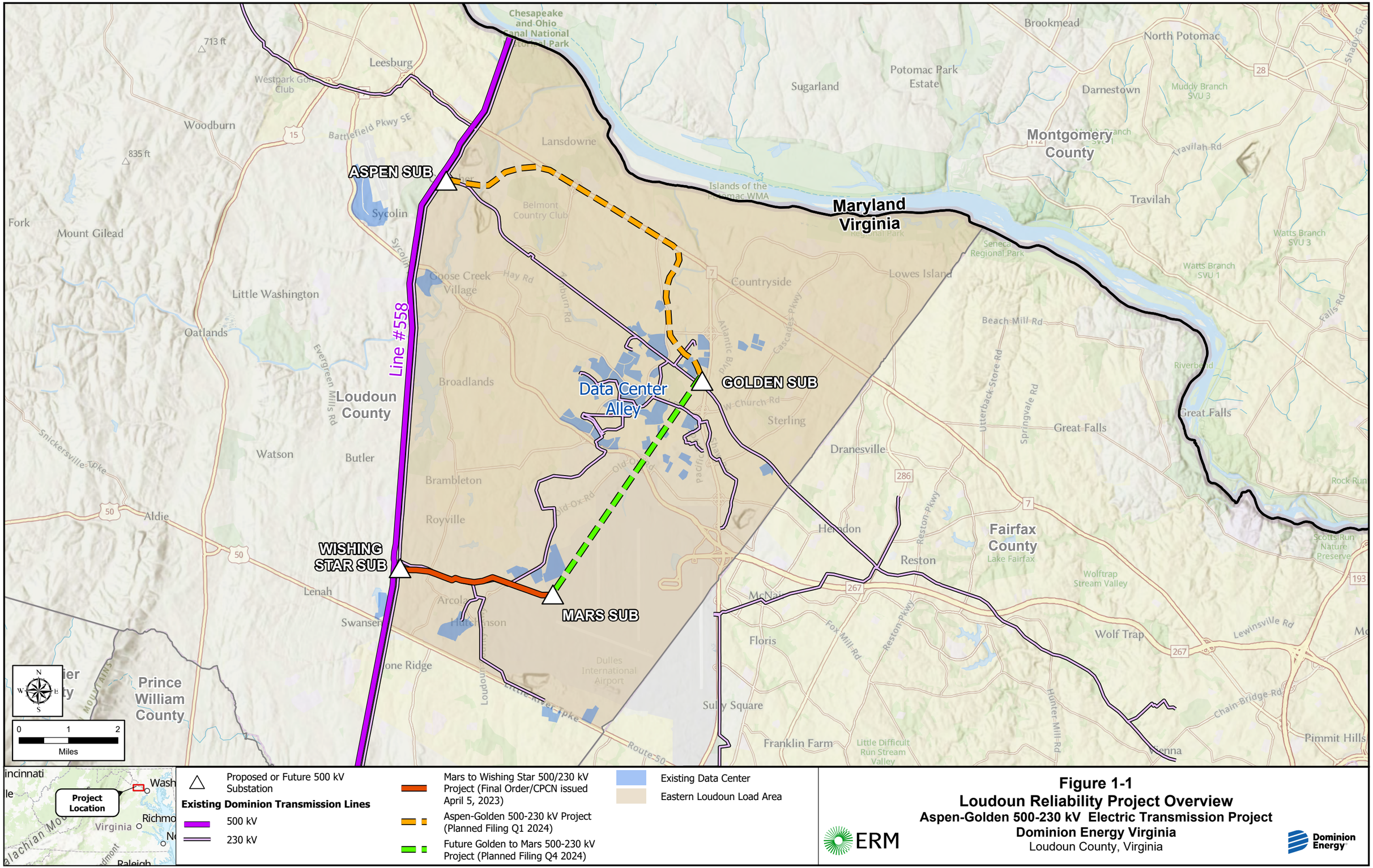

Figure 1-1
Loudoun Reliability Project Overview
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

PROPOSED ASPEN SUB

PROPOSED GOLDEN SUB

Line #558

Potomac River

Maryland

Virginia

Goose Creek

Broad Run

W&OD Trail

Lansdowne

Belmont

Sycolin

Dunlin

Goose Creek Village

Ashburn

Loudoun County

One Loudoun

University Center

Kincora

Dulles Town Center

Countryside

Cascades

Sugarland Run

Sterling

Fairfax County

Dranesville

Broadlands

Evergreen Mills

Moorefield

Moorefield Station

Brambleton

Little Washington

Montgomery County

Leesburg Executive Airport

Academies of Loudoun

Banshee Reeks Nature Preserve

Beaverdam Reservoir

Bazil Norman Riverfront Park

Lansdowne Golf Club

Loudoun Golf & Day Center

McKee-Beshers WMA

Islands of the Potomac WMA

Claude Moore Park / Recreation And Community Center / Heritage Farm Museum

392 ft

411 ft

474 ft

0 0.5 1 Miles

Existing Substation

Proposed Substation

Future Substation

Existing Dominion Transmission Line

Study Area

Project Location

Figure 3-1
Study Area Overview Map
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

1985

2023

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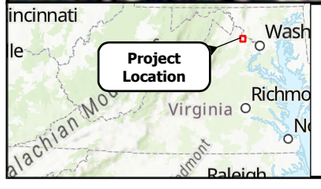


Study Area

Figure 3.1-1
Loudoun County Land Use, 1985 vs. 2023
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

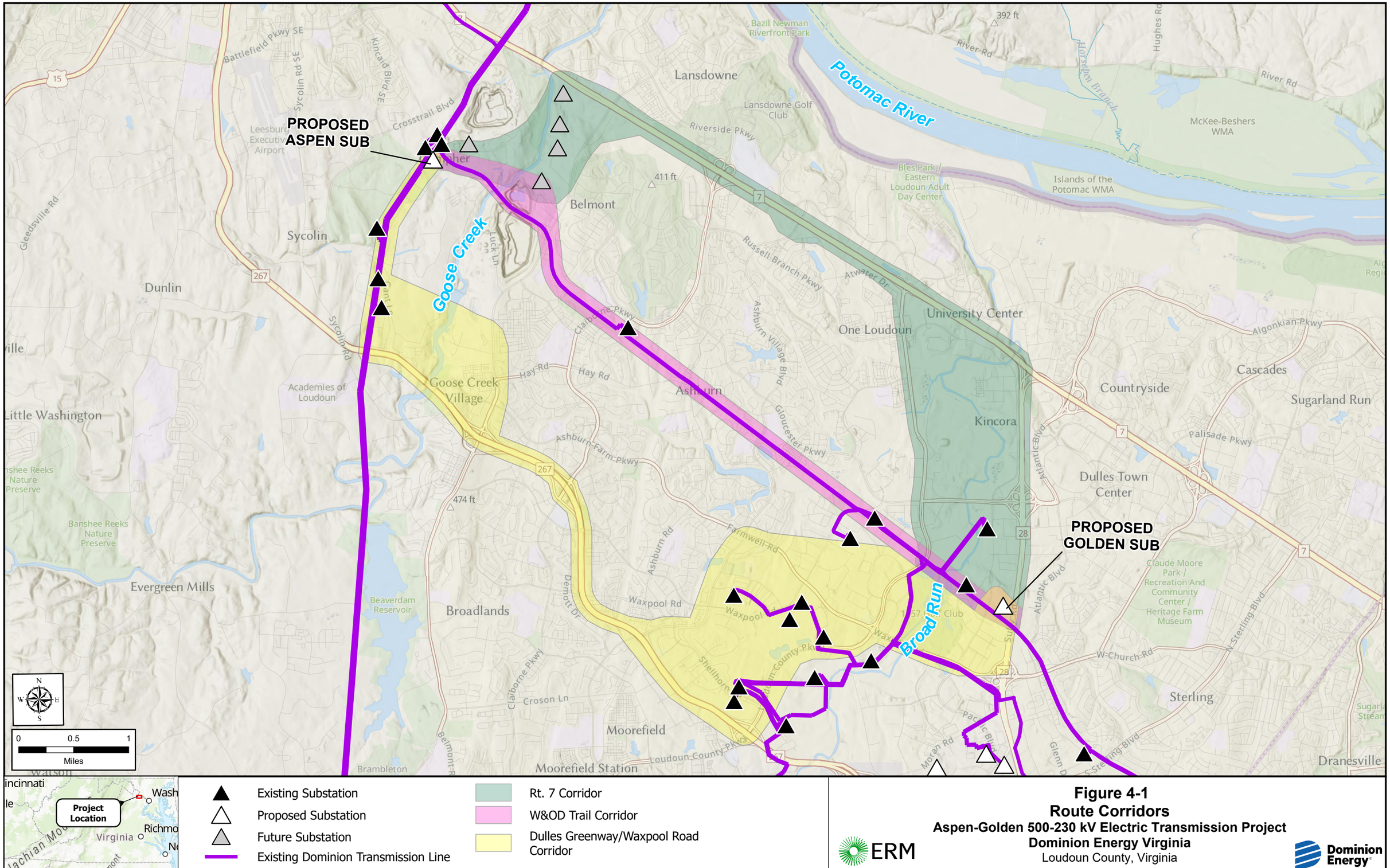


Figure 4-1
Route Corridors
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

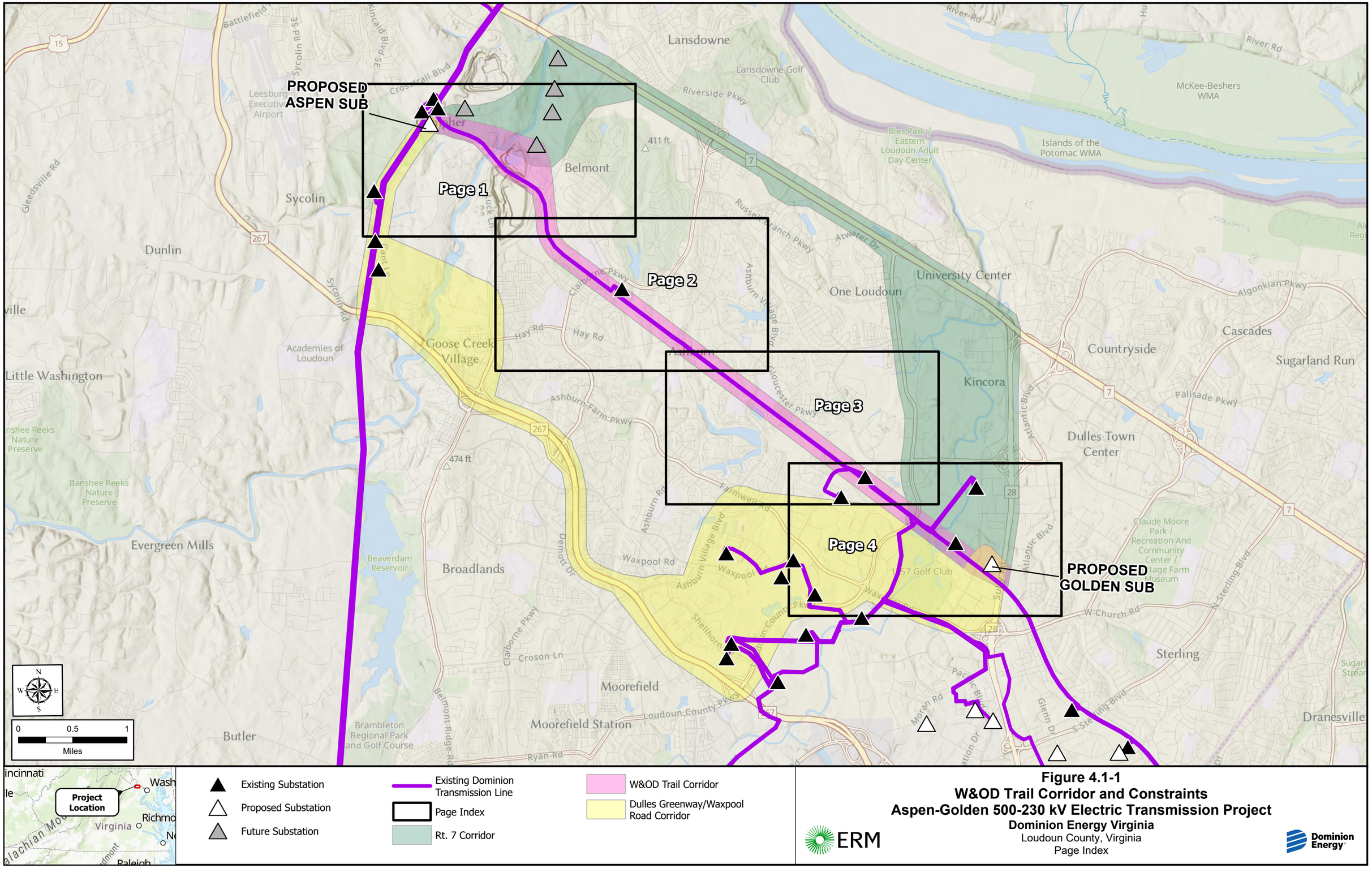


Figure 4.1-1
W&OD Trail Corridor and Constraints
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia
Page Index

ERM

Dominion Energy

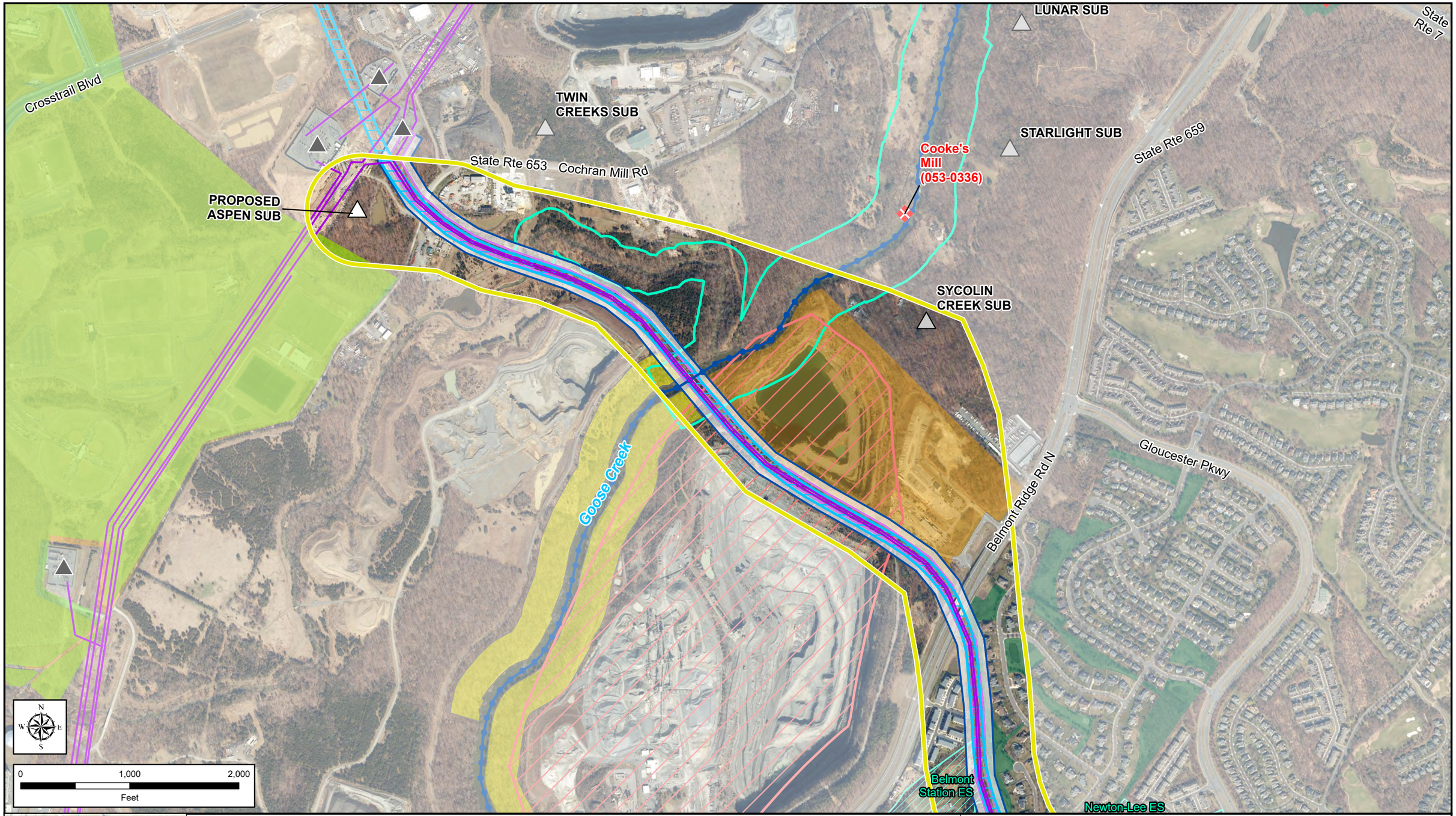


Figure 4.1-1
W&OD Trail Corridor and Constraints
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

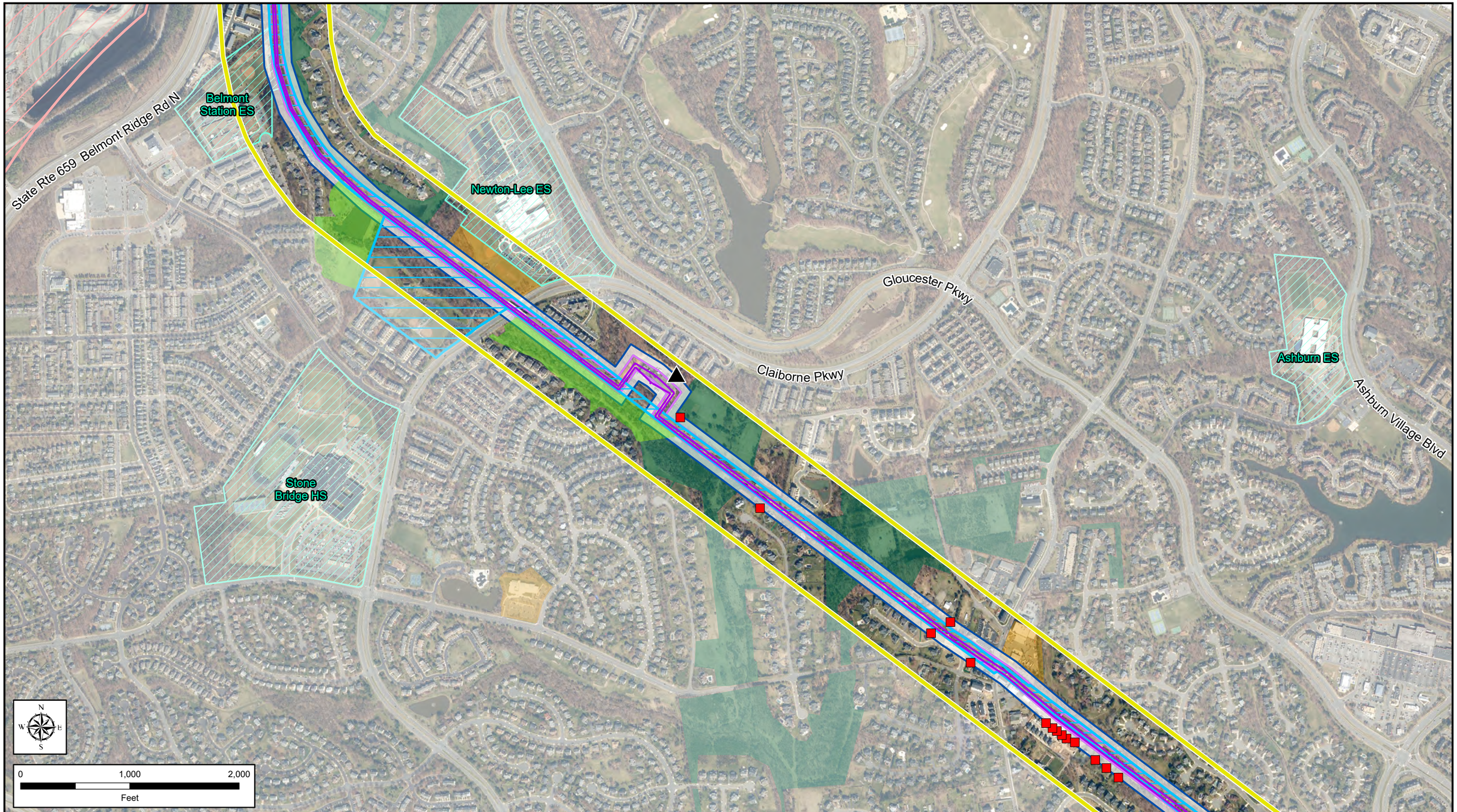


Figure 4.1-1
W&OD Trail Corridor and Constraints
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

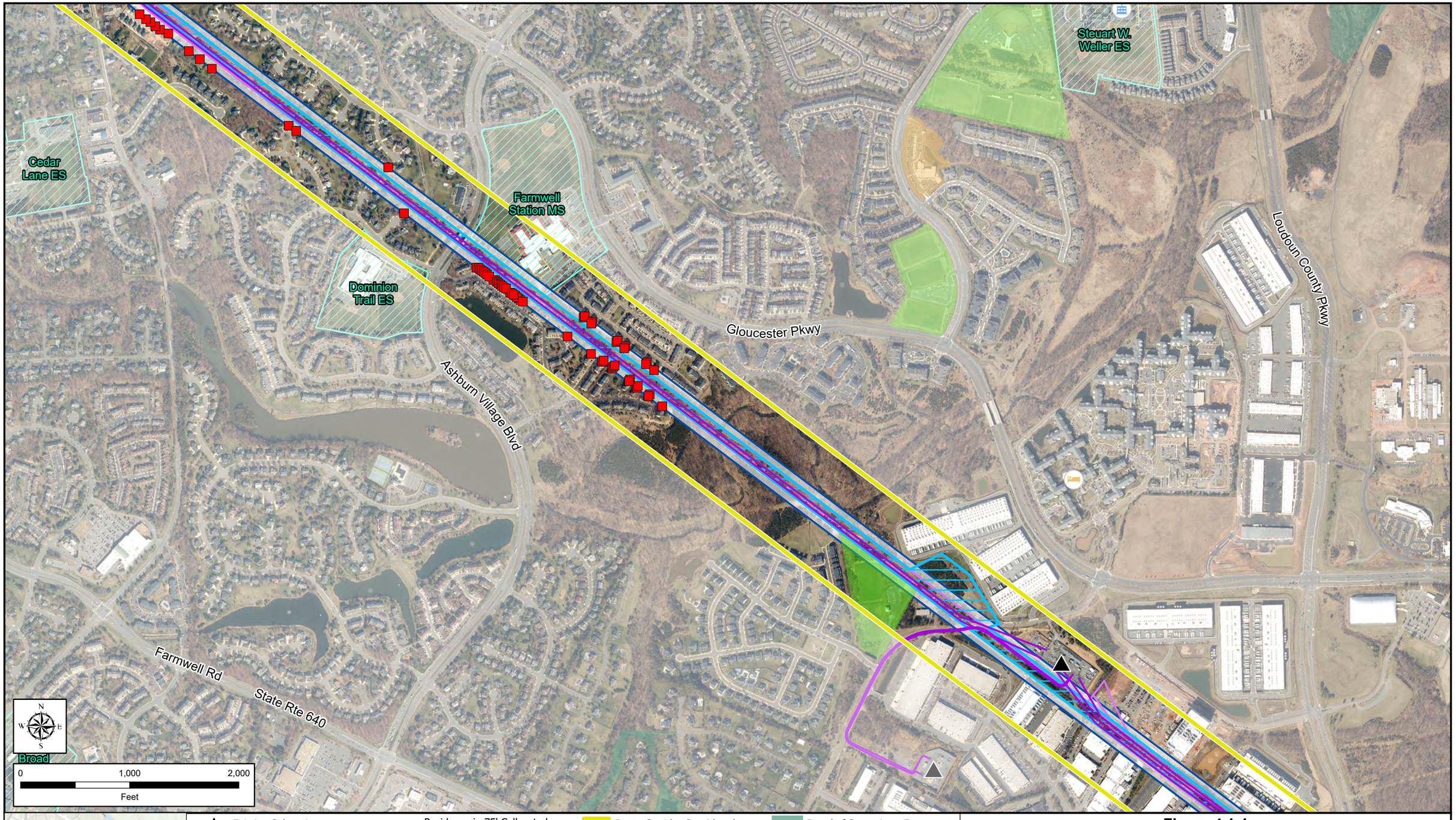
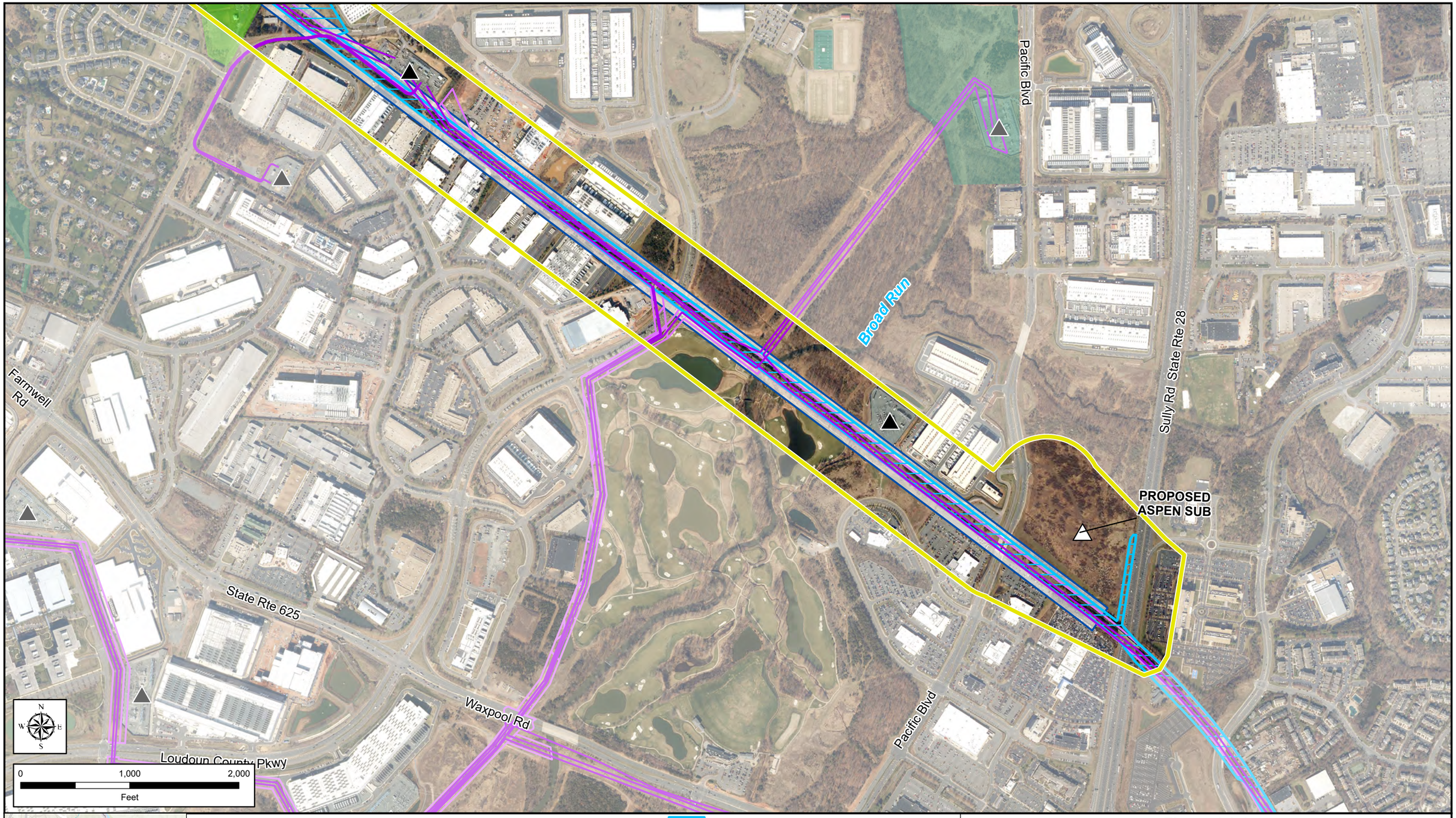


Figure 4.1-1
W&OD Trail Corridor and Constraints
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy



- Existing Substation
- Proposed Substation
- Existing Dominion Transmission Line
- Existing Transmission Line Right-of-Way
- Route Corridor Considered
- Loudoun County Park
- W&OD Trail (NOVA Parks)
- Board of Supervisors Easement
- W&OD Trail Potential Right-of-Way (additional 75-ft)

Figure 4.1-1
W&OD Trail Corridor and Constraints
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

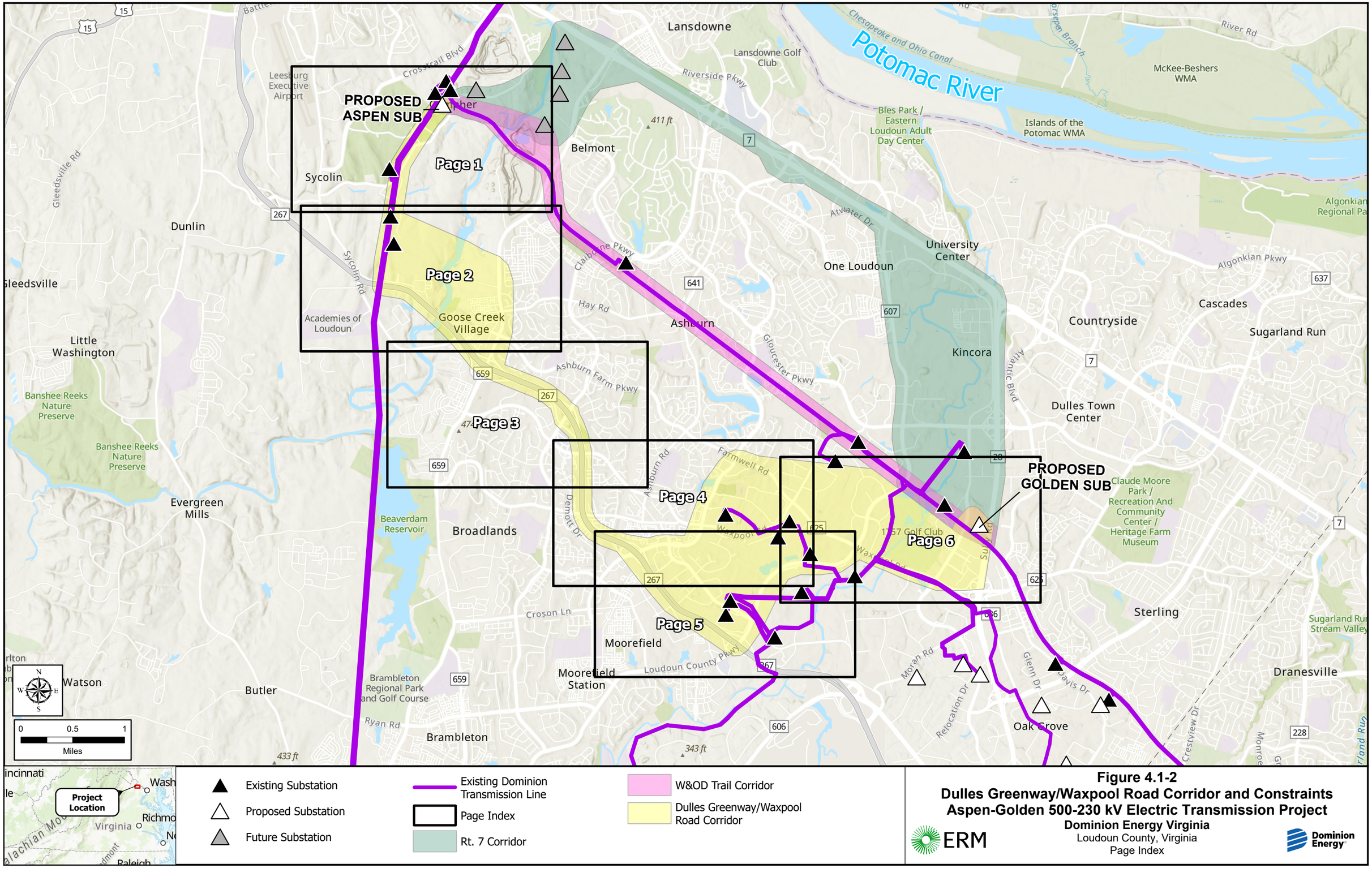
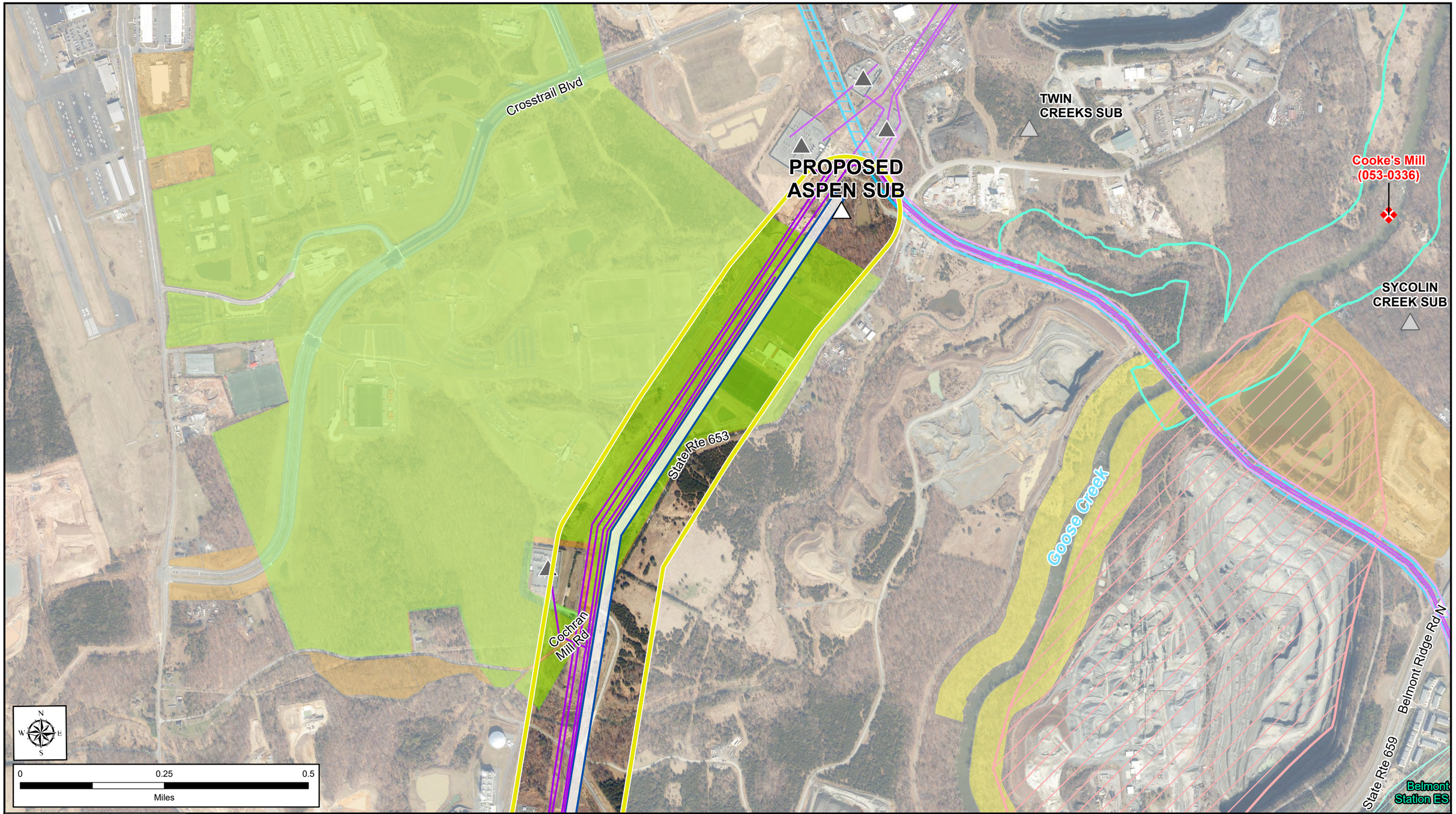
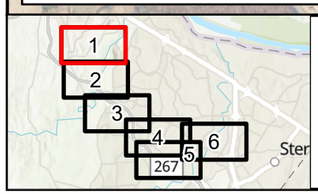


Figure 4.1-2
Dulles Greenway/Waxpool Road Corridor and Constraints
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia
Page Index

ERM

Dominion Energy





- Existing Substation
- Proposed Substation
- Future Substation
- Cultural/Historic Resources
- Existing Dominion Transmission Line
- Existing Transmission Line Right-of-Way
- Loudoun County Park
- W&OD Trail (NOVA Park)
- School Property
- Route Corridor Considered
- DCR Easement
- Scenic Creek Valley Buffer
- Board of Supervisors Easement
- Virginia Outdoors Foundation
- County Owned or Leased
- Dulles Greenway/Waxpool Road Potential Right-of-Way (100-ft)

Figure 4.1-2
Dulles Greenway/Waxpool Road Corridor and Constraints
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

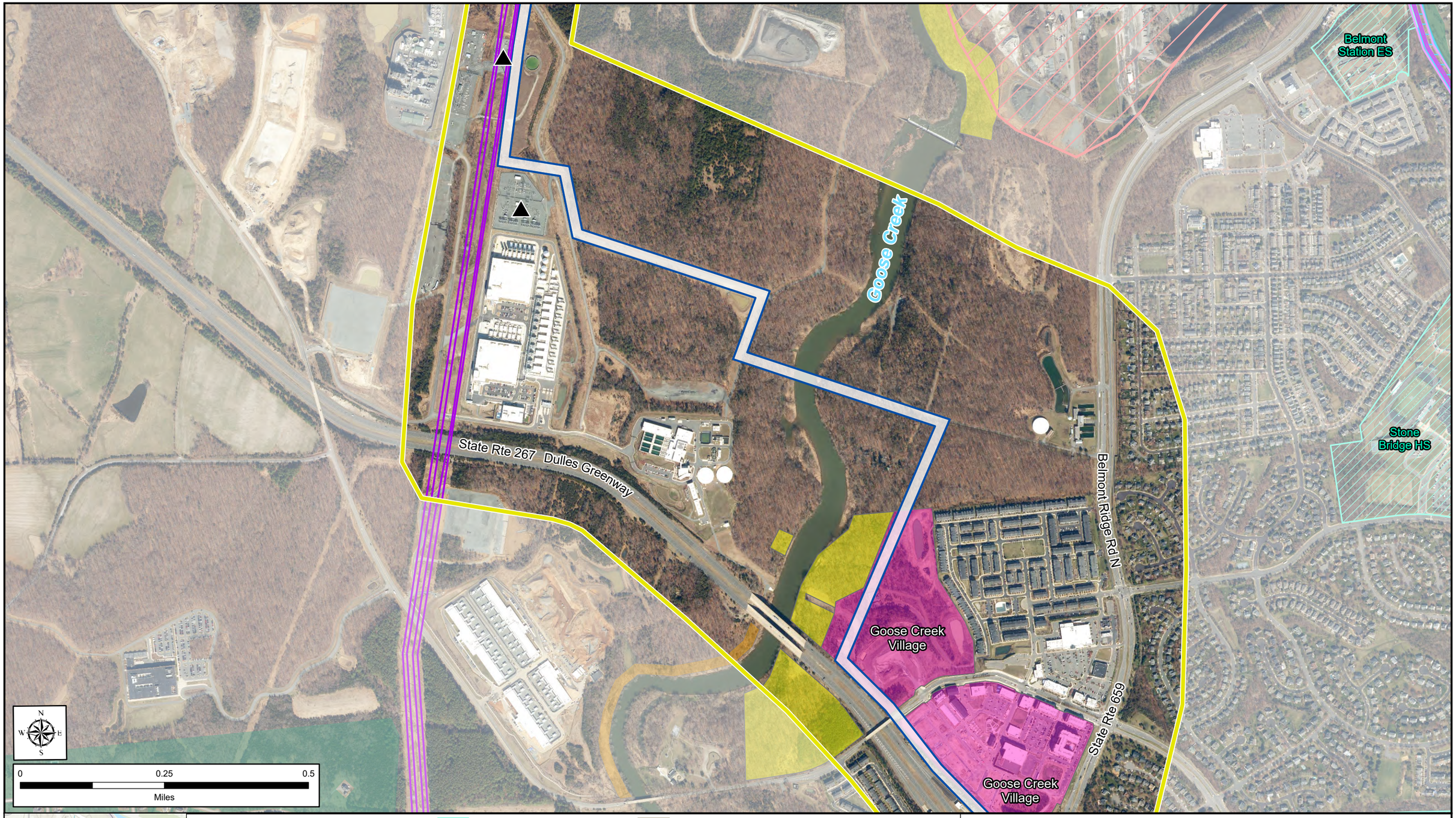


Figure 4.1-2
Dulles Greenway/Waxpool Road Corridor and Constraints
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

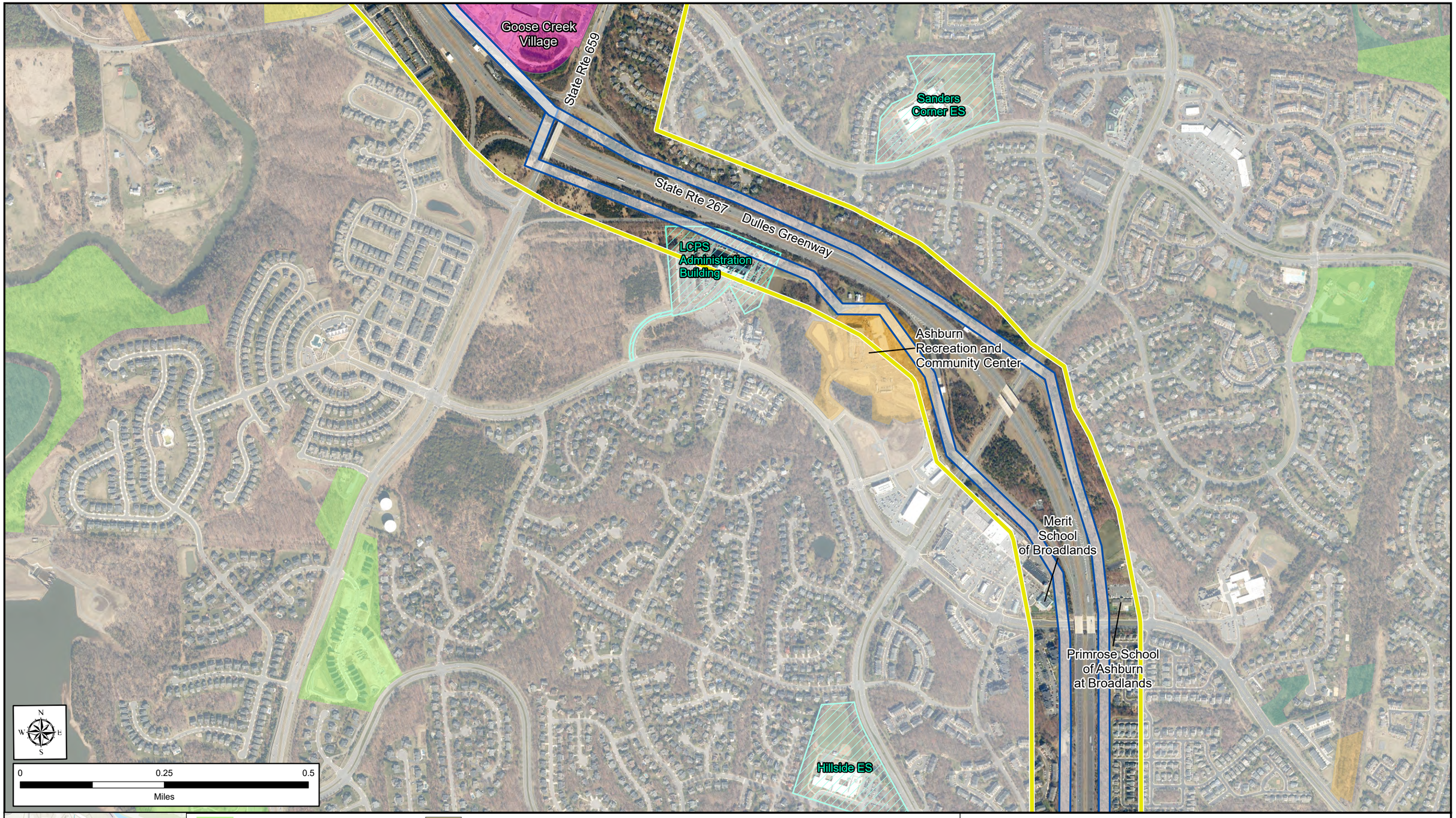


Figure 4.1-2
Dulles Greenway/Waxpool Road Corridor and Constraints
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

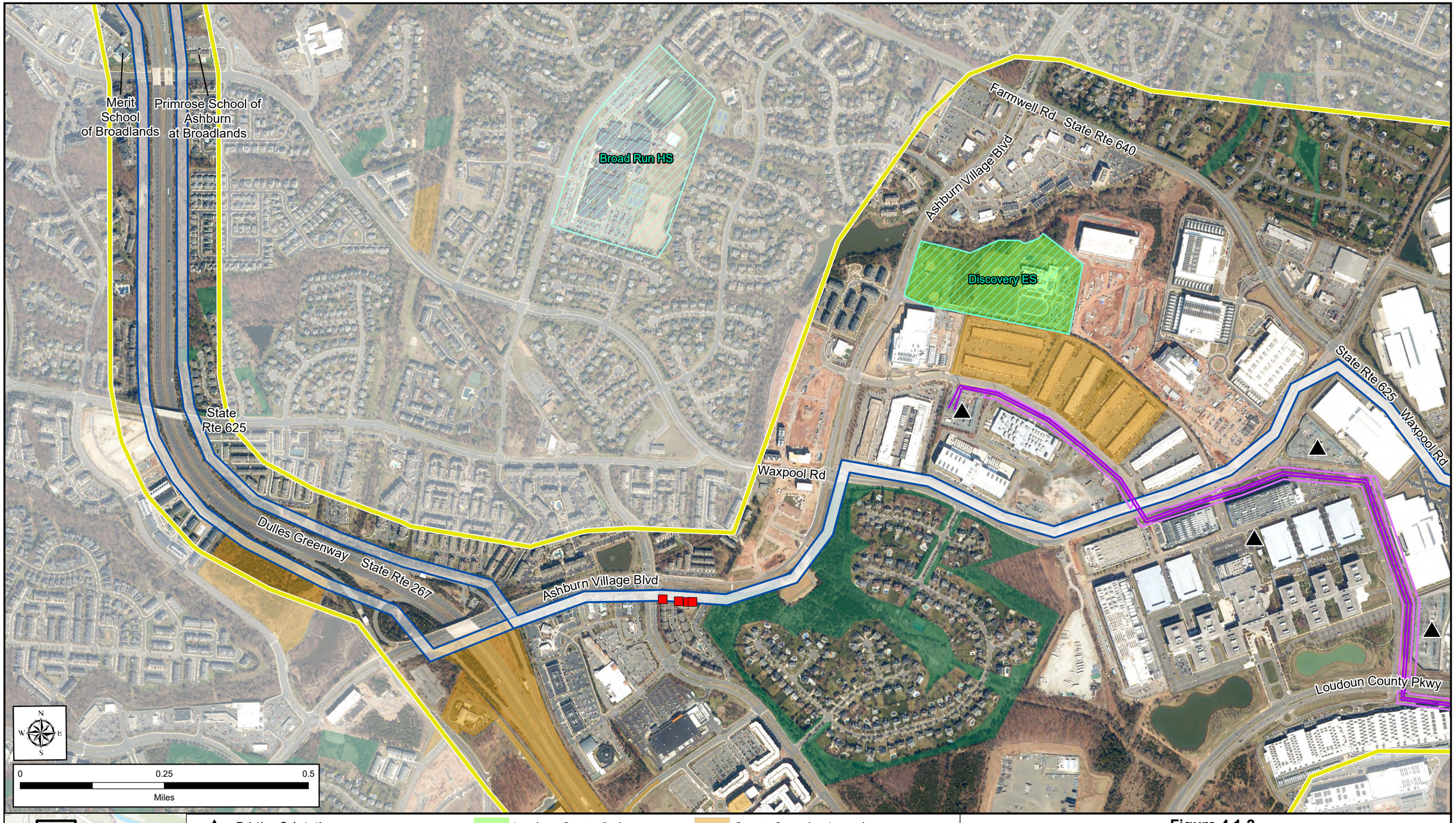


Figure 4.1-2
Dulles Greenway/Waxpool Road Corridor and Constraints
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

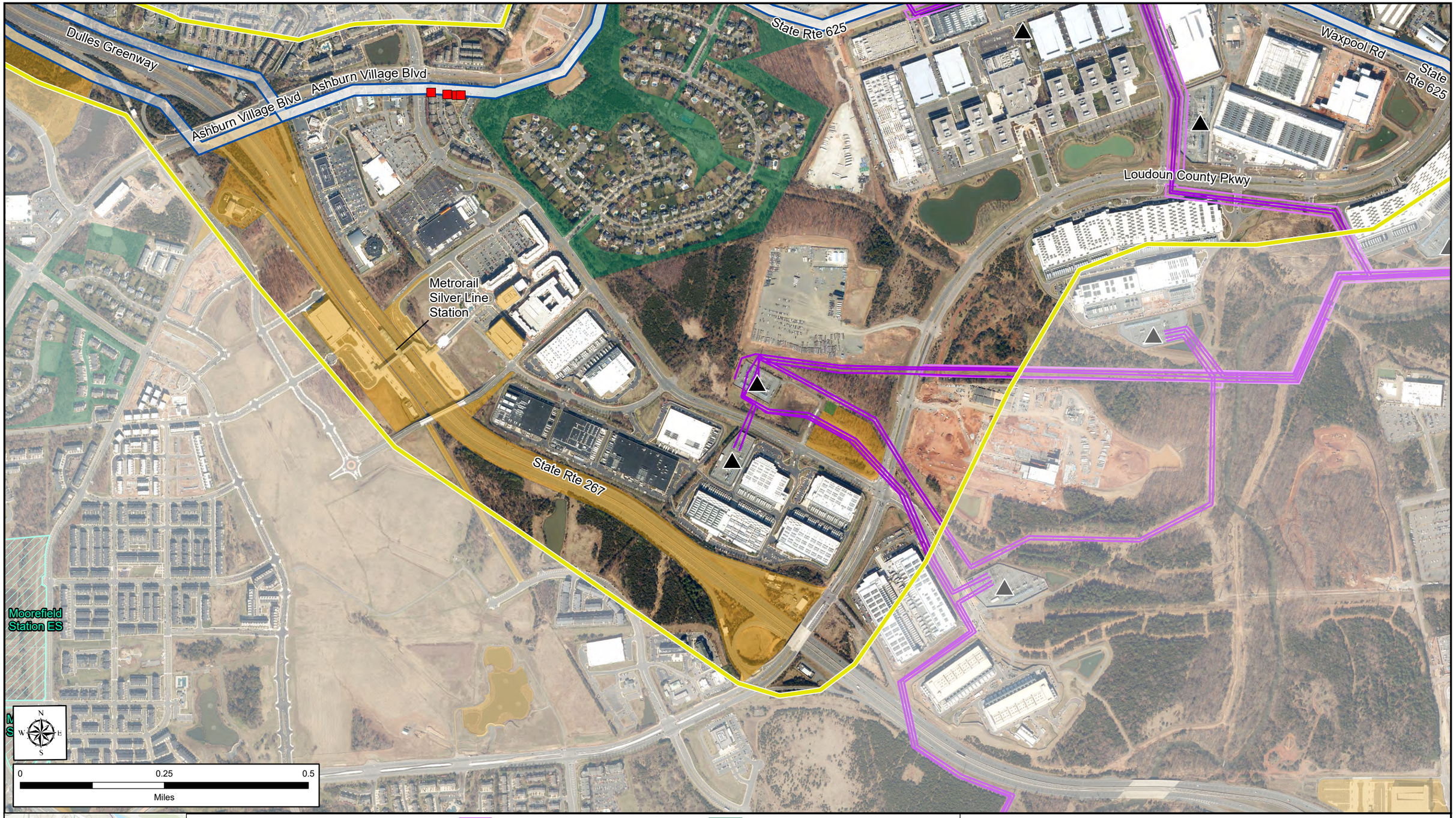


Figure 4.1-2
Dulles Greenway/Waxpool Road Corridor and Constraints
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

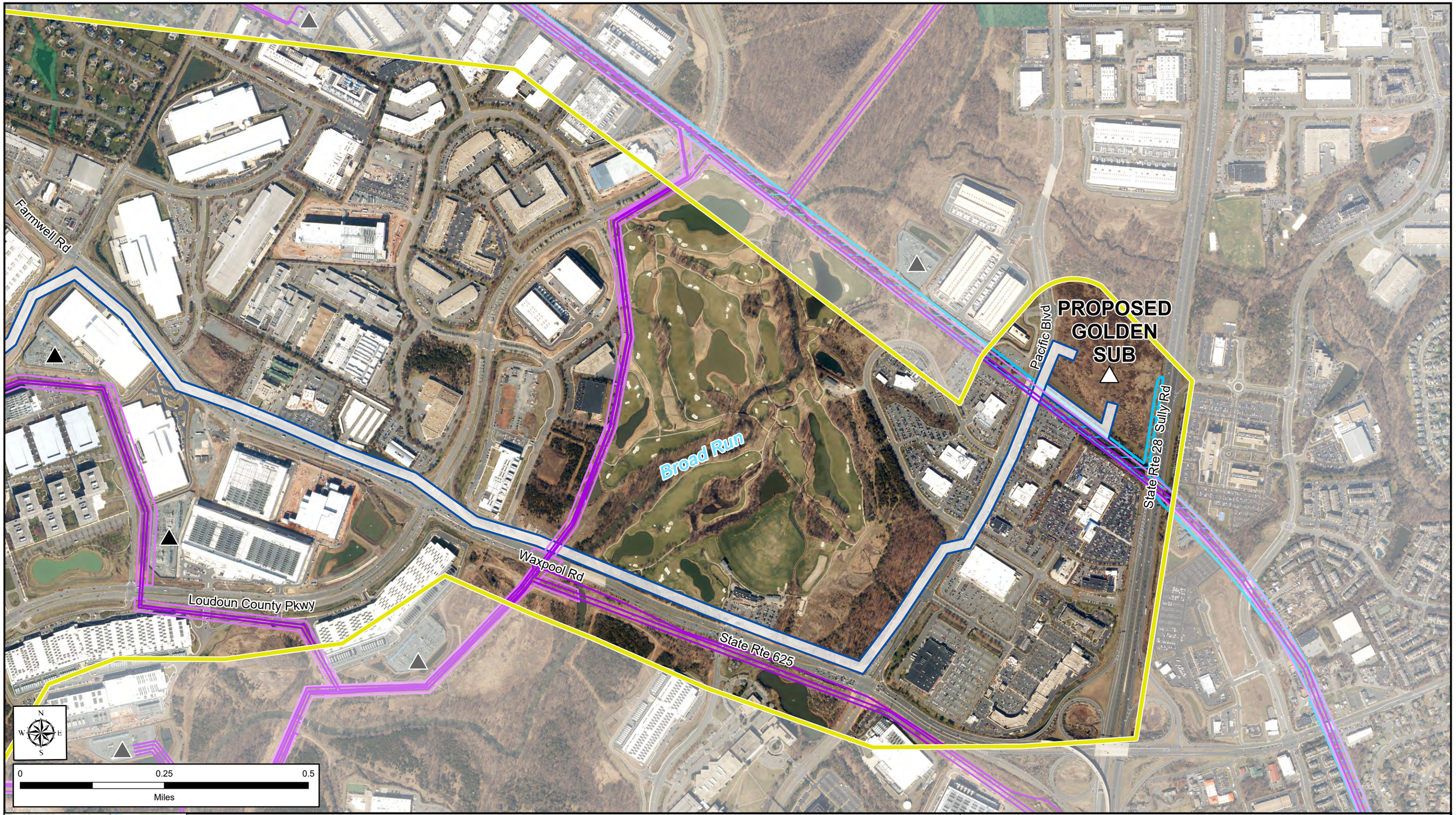


Figure 4.1-2
Dulles Greenway/Waxpool Road Corridor and Constraints
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

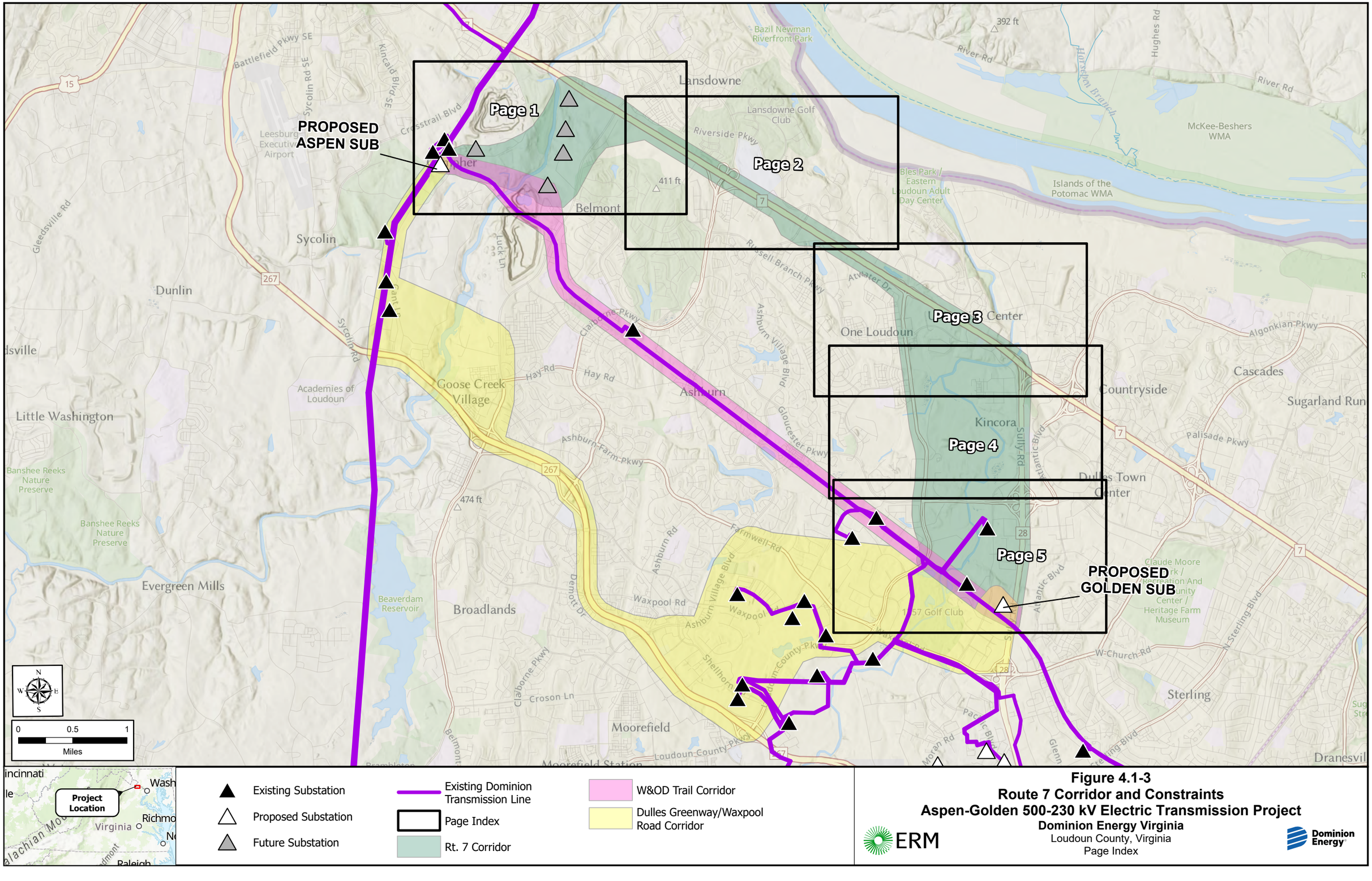


Figure 4.1-3
Route 7 Corridor and Constraints
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia
Page Index

ERM

Dominion Energy

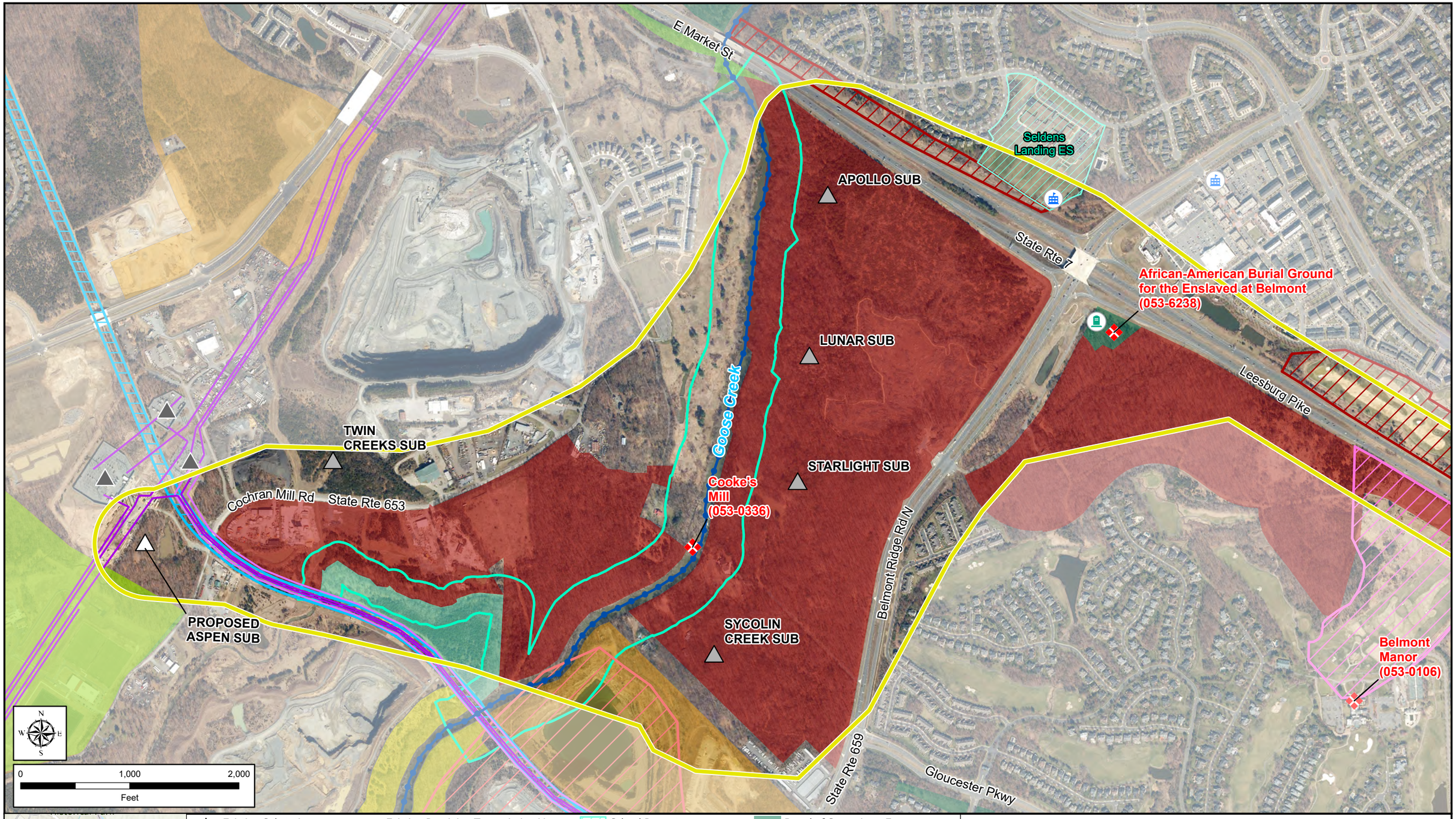


Figure 4.1-3
Route 7 Corridor and Constraints
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

Inova Loudoun Hospital Helipad

Belmont Manor (053-0106)

Janelia/Howard Hughes Research Center (053-0084)

Leesburg Pike

Claiborne Pkwy

State Rte 7

Russell Branch Pkwy

Ashburn Village Blvd

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1 2 3 4 5 Sterlin

- Cultural/Historic Resources
- School
- Cemetery
- Place of Worship
- Hospital
- Convalescent Center
- Heliport (Private)
- Route Corridor Considered
- Loudoun County Park
- Belmont Viewshed Easement
- Lansdowne Scenic Easement
- Board of Supervisors Easement
- Planned Development - Data Center
- Planned Development - Residential
- County Owned or Leased

Figure 4.1-3
Route 7 Corridor and Constraints
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

Figure 4.1-3
Route 7 Corridor and Constraints
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

- Cultural/Historic Resources
- School
- Convalescent Center
- Heron Rookery
- Existing Dominion Transmission Line
- Existing Transmission Line Right-of-Way
- Kincora Heron Trail
- Route Corridor Considered
- Loudoun County Park
- W&OD Trail (NOVA Parks)
- School Property
- Board of Supervisors Easement
- Planned Development - Mixed Use
- Planned Development - Residential
- Loudoun Water
- County Owned or Leased

Figure 4.1-3
Route 7 Corridor and Constraints
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

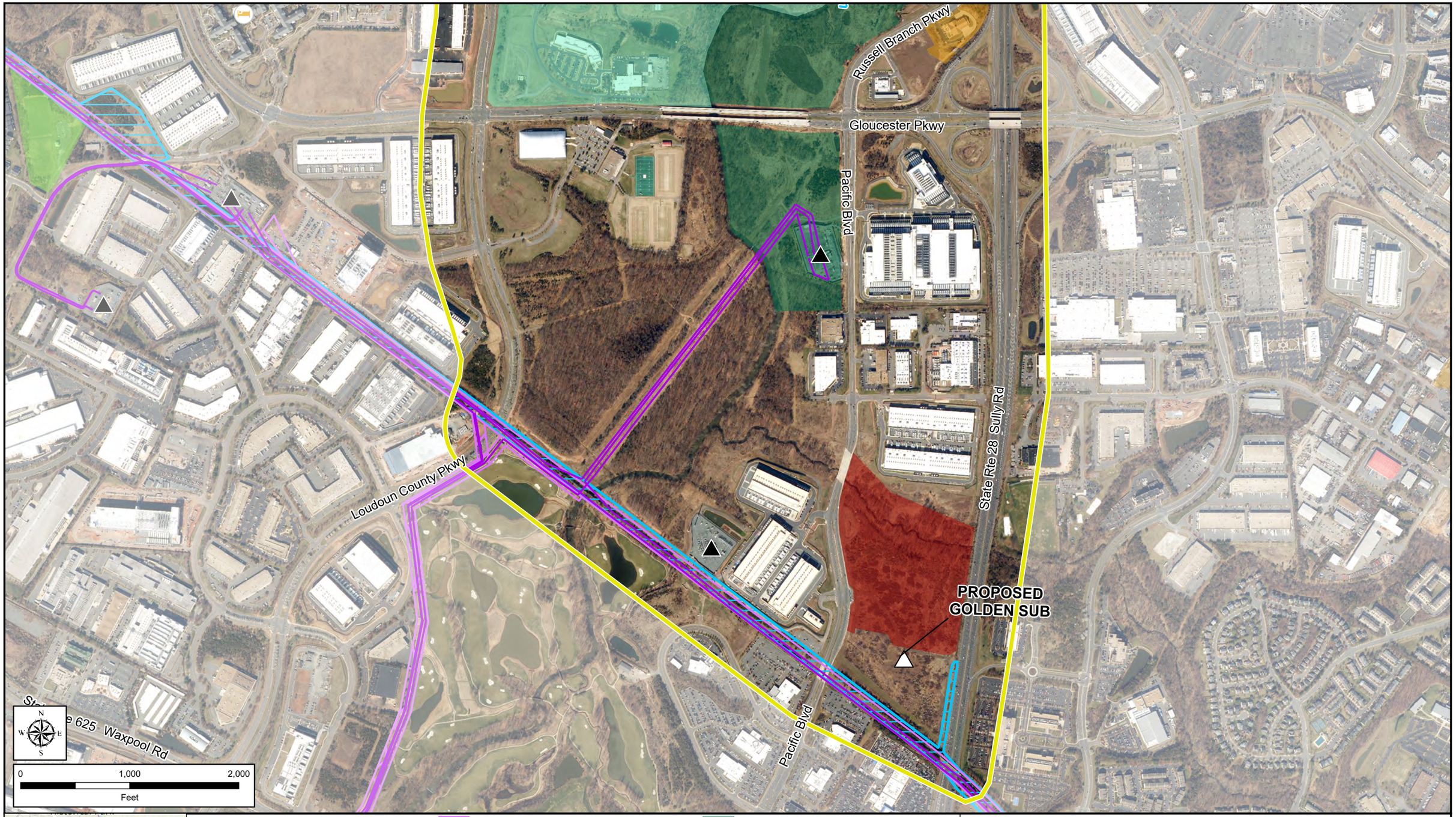

Figure 4.1-3
Route 7 Corridor and Constraints
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

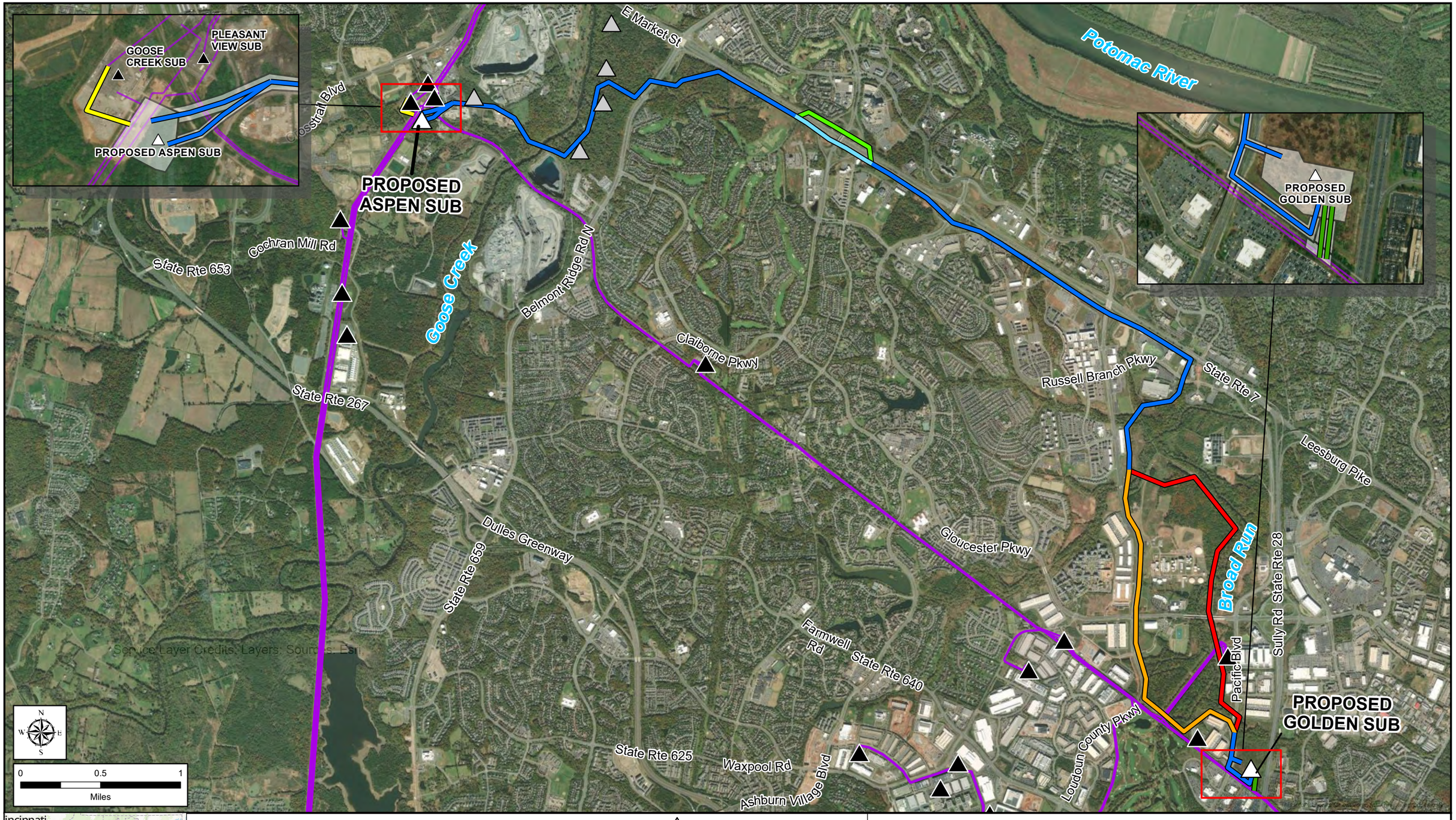

Figure 5.1-1
Aerial Overview
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

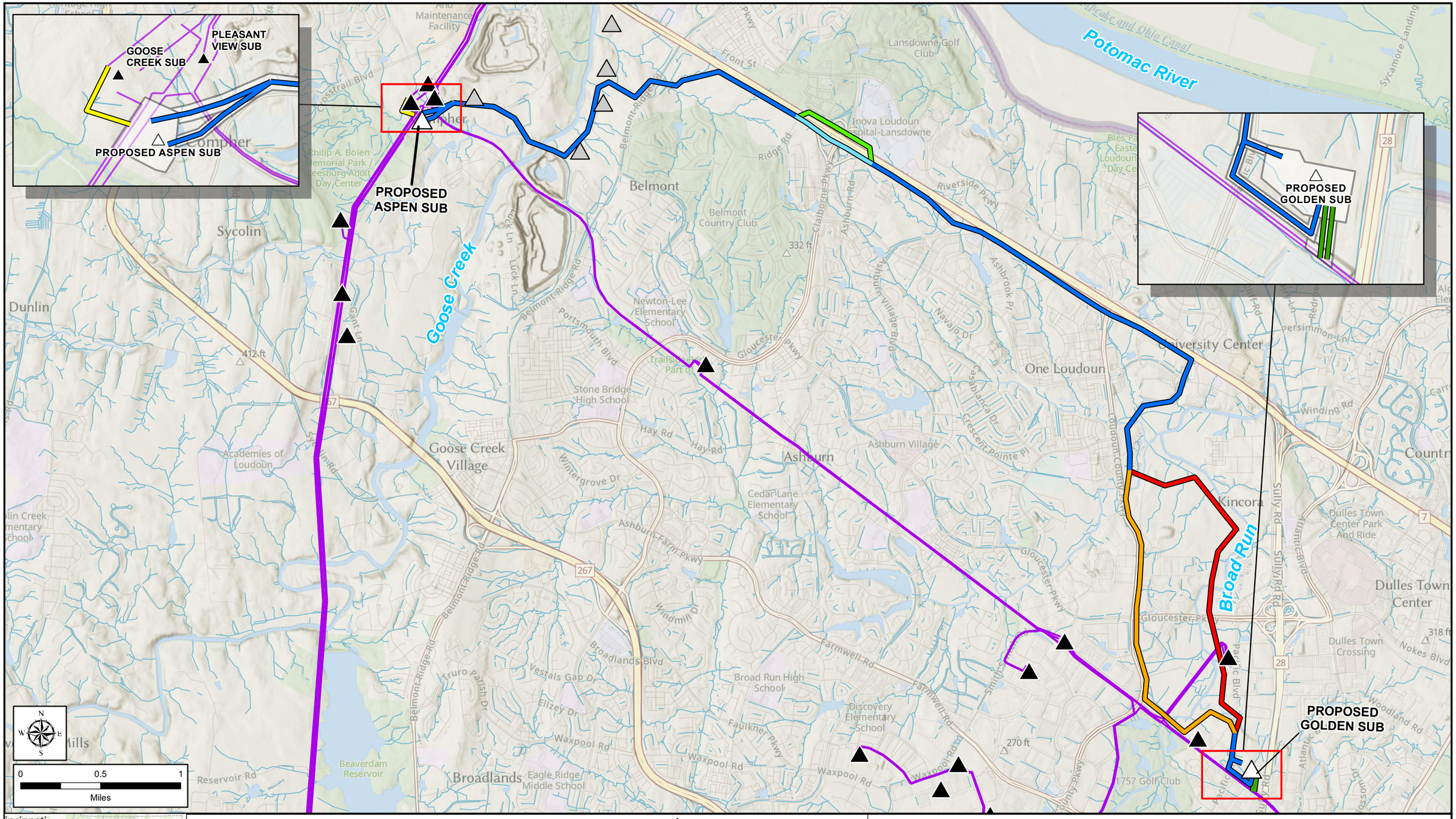

Figure 5.1-2
Topographic Overview
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

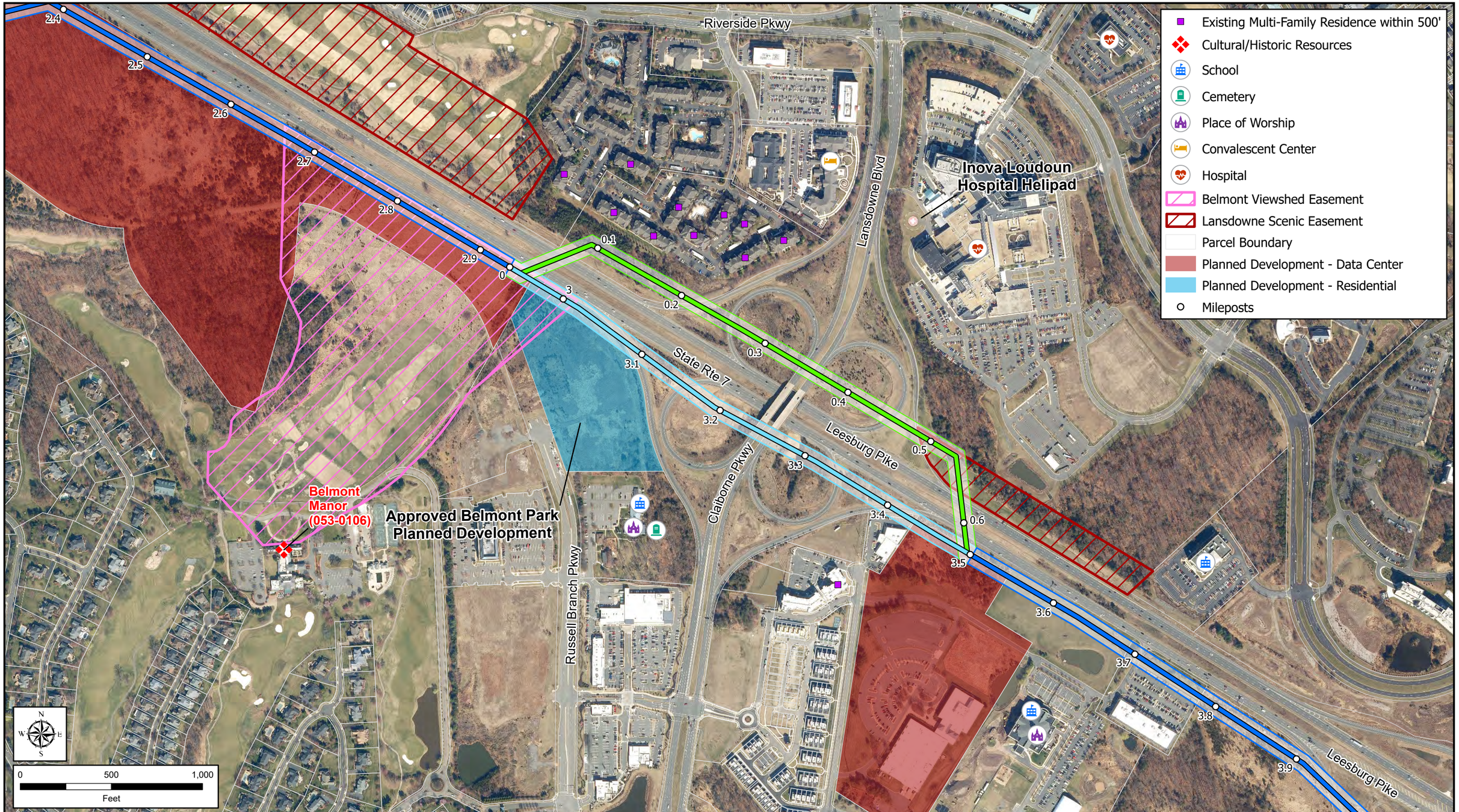

Figure 5.2.2-1
Belmont Park Route Variations
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

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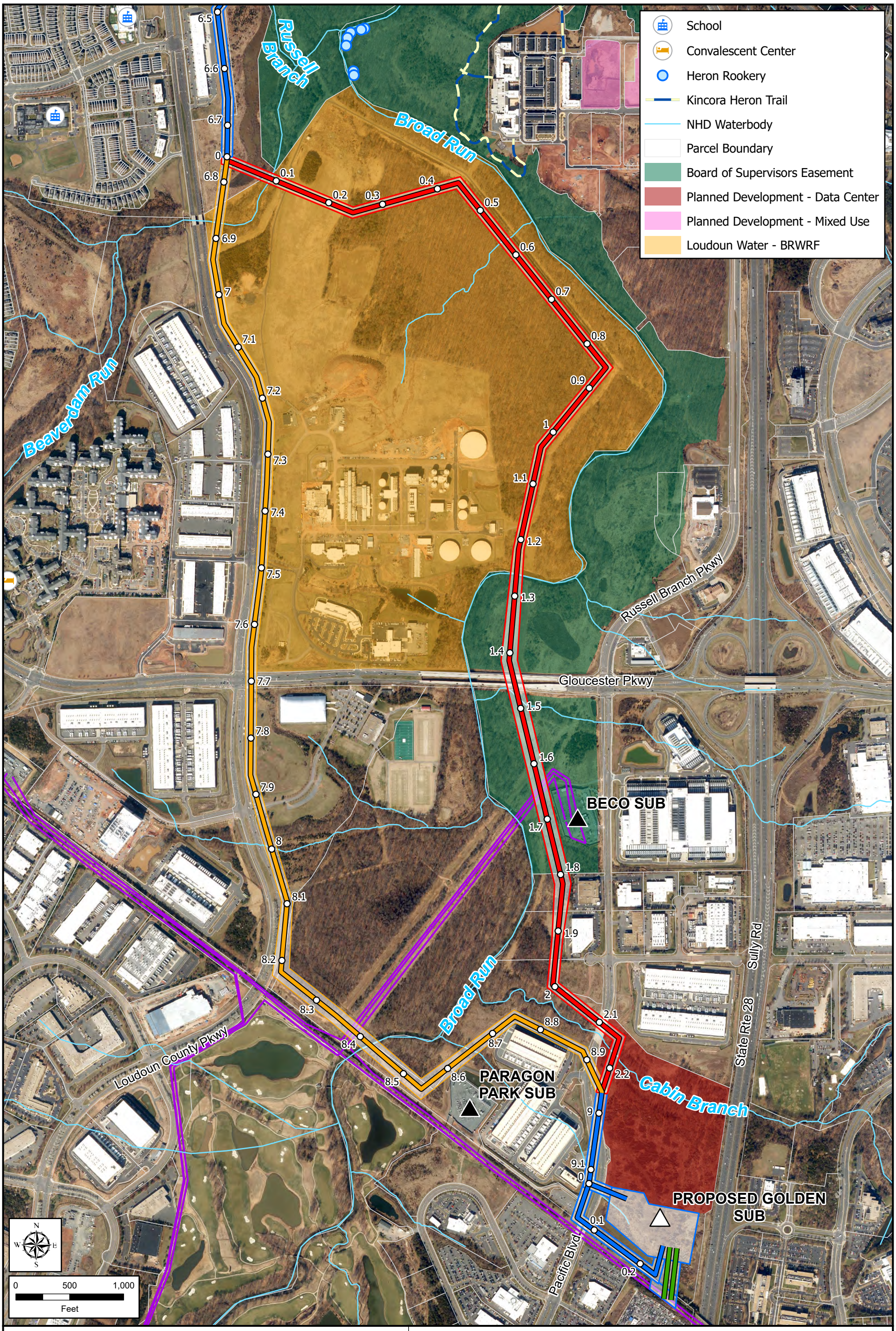

Figure 5.2.3-1
Broad Run Route Variations
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia

ERM

Dominion Energy

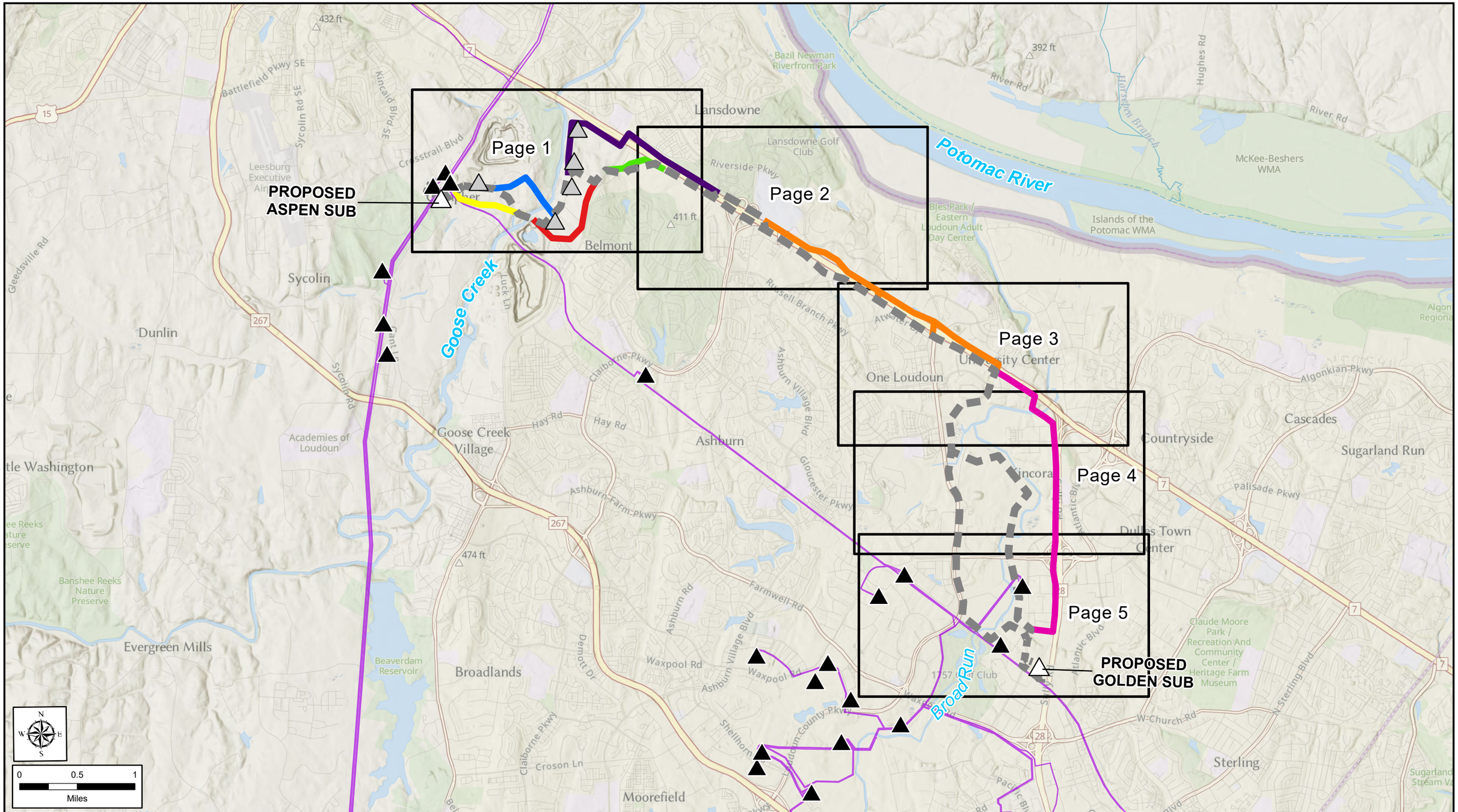

Figure 5.3-1
Routes Rejected
Aspen-Golden 500-230 kV Electric Transmission Project
Dominion Energy Virginia
Loudoun County, Virginia
Page Index

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