



**Dominion  
Energy<sup>®</sup>**

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

**Before the State Corporation  
Commission of Virginia**

**500-230 kV Wishing Star  
Substation, 500 kV and 230 kV  
Mars-Wishing Star Lines, 500-230  
kV Mars Substation, and Mars 230  
kV Loop**

**Application No. 318**

**Case No. PUR-2022-00183**

**Filed: October 27, 2022**

**Volume 2 of 3**

COMMONWEALTH OF VIRGINIA  
BEFORE THE  
STATE CORPORATION COMMISSION

APPLICATION OF  
VIRGINIA ELECTRIC AND POWER COMPANY  
FOR APPROVAL AND CERTIFICATION  
OF ELECTRIC TRANSMISSION FACILITIES

500-230 kV Wishing Star Substation, 500 kV and 230 kV  
Mars-Wishing Star Lines, 500-230 kV Mars Substation,  
and Mars 230 kV Loop

Application No. 318

DEQ Supplement

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Based on consultations with the Department of Environmental Quality (“DEQ”), Virginia Electric and Power Company (“Dominion Energy Virginia” or the “Company”) has developed this DEQ Supplement to facilitate review and analysis of the proposed Project by DEQ and other relevant agencies.

## 1. Project Description

In order to relieve identified violations of mandatory North American Electric Reliability Corporation (“NERC”) Reliability Standards beginning in the summer 2025 timeframe brought on by significant increases in electrical demand as well as expected demand growth projected for the future, and to maintain the structural integrity and reliability of its transmission system, Dominion Energy Virginia proposes in Loudoun County, Virginia, to:

- (i) Construct a new 500-230 kV substation in Loudoun County, Virginia, within existing Company-owned right-of-way and on property obtained by the Company (“Wishing Star Substation”). The 500-230 kV source to the Wishing Star Substation will be created by cutting the Company’s existing 500 kV Brambleton-Mosby Lines #546 and #590 into the Wishing Star Substation at Structures #546/26 and #590/1893 just south of the Company’s existing Brambleton Substation. The tie-in of Lines #546 and #590 to the Wishing Star Substation will result in (i) 500 kV Brambleton-Wishing Star Line #589, (ii) 500 kV Brambleton-Wishing Star Line #501, (iii) Mosby-Wishing Star Line #546, and (iv) Mosby-Wishing Star Line #590.
- (ii) Construct a new approximately 3.55-mile overhead 500 kV single circuit transmission line with a 230 kV single circuit transmission line underbuilt on predominantly new right-of-way. The new transmission lines will originate at the 500 kV and 230 kV buses of the proposed Wishing Star Substation and continue east to the proposed 500-230 kV Mars Substation, resulting in (i) 500 kV Mars-Wishing Star Line #527, and (ii) 230 kV Mars-Wishing Star Line #2291 (the “Mars-Wishing Star Lines”). From the proposed Wishing Star Substation, the Mars-Wishing Star Lines will extend generally east to the proposed Mars Substation, where the Mars-Wishing Star Lines will terminate. The proposed Mars-Wishing Star Lines will be constructed on new right-of-way predominantly 150 feet in width (approximately 2.67 miles of the 3.55-mile total length)<sup>1</sup> to support a

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<sup>1</sup> There are three segments along the proposed Mars-Wishing Star Lines that will require additional right-of-way. For one segment of three spans (approximately 1,500 feet), the right-of-way will be 200 feet wide where the proposed Mars-Wishing Star Lines cross over the Company’s existing 230 kV Line #2213/#2137 transmission corridor and Old Ox Road (State Route 606), at which point the circuits will be separated onto six separate single circuit structures (four structures carrying the 230 kV circuits and two structures carrying the 500 kV circuits) in order to maintain appropriate clearance from the existing lines but also conform to height restrictions at Washington Dulles International Airport (“Dulles Airport”). See Attachment II.B.3.iv (500 kV) and Attachment II.B.3.v (230 kV) of the Appendix. For one segment of one span (approximately 1,400 feet), the right-of-way will be 200 feet wide where the proposed Mars-Wishing Star Lines span Broad Run in order to maintain clearance for conductor blow-out. See Attachments II.B.3.ii-iii of the Appendix. For one segment of three spans where the Mars-Wishing Star lines enter into the proposed Mars Substation, the 5/2 configured 150-foot-wide right-of-way will split into two separate rights-of-way, with a 150-foot-wide right-of-way for Line #527 and a 100-foot-wide right-of-way for Line #2291. See Attachment II.B.3.iii (500 kV) and Attachments vi-vii (230 kV) of the Appendix. Note that the length of this 150-foot-wide right-of-way for the 500 kV line from the split to the Mars Substation is included in the total 2.67 miles of 150-foot-wide right-of-

5-2 configuration primarily on dulled galvanized steel double circuit three-pole or two-pole H-frame structures. The new 500 kV line will utilize three-phase triple-bundled 1351.5 ACSR conductors with a summer transfer capability of 4,357 MVA; the new 230 kV line will utilize three-phase twin-bundled 768.2 ACSS/TW/HS type conductor with a summer transfer capability of 1,573 MVA.

- (iii) Construct a new 500-230 kV substation in Loudoun County, Virginia on property obtained by the Company (“Mars Substation”).
- (iv) Construct two new approximately 0.57-mile overhead 230 kV double circuit lines on two sets of double circuit structures from Mars Substation to cut in locations on the Company’s existing 230 kV Cabin Run-Shellhorn Road Line #2095 and 230 kV Poland Road-Shellhorn Road Line #2137, between Structures #2095/72 / #2137/82 and #2095/73 / #2137/83 resulting in (i) 230 kV Cabin Run-Mars Line #2287, (ii) 230 kV Celestial-Mars Line #2261, (iii) 230 kV Mars-Shellhorn Road Line #2095, and (iv) 230 kV Mars-Sojourner Line #2292 (the “Mars 230 kV Loop”). Where the Mars 230 kV Loop cuts into Lines #2095 and #2137, two new two-pole double circuit structures will be installed within existing right-of-way in order to loop the new lines into the Mars Substation and then back to the existing Lines #2095/#2137 corridor. While the cut-in location is within existing right-of-way, the proposed Mars 230 kV Loop will be constructed on new 160-foot-wide right-of-way supported by a combination of dulled galvanized steel double circuit monopoles and two-pole structures situated side-by-side in the right-of-way and will utilize three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA.
- (v) Conduct line protection upgrades at the Company’s existing remote end substations, including the Company’s existing Brambleton, Cabin Run, Mosby, and Shellhorn Road Substations, as well as the future Celestial and Sojourner Substations.

The Wishing Star Substation, Mars-Wishing Star Lines, Mars Substation, Mars 230 kV Loop and related substation work are collectively referred to as the “Project.”

There is an immediate need for the Project to maintain and improve electric service to customers in the eastern Loudoun load area (“Eastern Loudoun Load Area”), which is generally to the north and west of the Dulles Airport and is inclusive of Data Center Alley; to address significant load growth in the Eastern Loudoun Load Area; and to resolve identified NERC reliability violations.

The proposed Wishing Star Substation initially will be constructed with eight 500 kV 5000 ampere

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way discussed above. Line #527 will continue along a 150-foot-wide right-of-way into a terminal located on the west side of Mars Substation. Line #2291 will continue along a 100-foot-wide right-of-way for approximately 0.34 mile into a terminal located on the south side of Mars Substation. See Attachment II.A.1 of the Appendix for the location of these three segments with varying right-of-way widths.

(“amp” or “A”) circuit breakers, three 230 kV 4000A circuit breakers, five 500 kV line terminals, one 230 kV line terminal, two 230 kV feeds to Northern Virginia Electric Cooperative (“NOVEC”), one 500-230 kV transformer bank (4-480 MVA, single-phase units, including a spare) and other associated equipment. The Wishing Star Substation will be designed to accommodate future growth in the area with a build-out of seventeen 500 kV 5000A circuit breakers, thirteen 230 kV 4000A circuit breakers, five 500 kV line terminals, six 230 kV line terminals, two 500-230 kV transformer banks (7-480 MVA, single-phase units, including a spare), one 500 kV capacitor bank and two 230 kV capacitor banks. The 500 kV and 230 kV infrastructure will be Gas Insulated Substation (“GIS”). Additionally, two control enclosures will be installed to accommodate the protective relay and communications cabinets. The total area of the Wishing Star Substation is approximately 41 acres.

The proposed Mars Substation initially will be constructed with three 500 kV 5000A circuit breakers, ten 230 kV 4000A circuit breakers, one 500 kV line terminal, five 230 kV line terminals, two 500-230 kV transformer banks (7-480 MVA, single-phase units, including a spare) and other associated equipment. The Mars Substation will be designed to accommodate future growth in the area with a build-out of thirteen 500 kV 5000A circuit breakers, nineteen 230 kV 4000A circuit breakers, three 500 kV line terminals, eight 230 kV line terminals, three 500-230 kV transformer banks (11-480 MVA, single-phase units, including two spares), one 500 kV capacitor bank and two 230 kV capacitor banks. The 500 kV and 230 kV infrastructure will be GIS. Additionally, two control enclosures will be installed to accommodate the protective relay and communications cabinets. The total area of the Mars Substation is approximately 22 acres.

For this Project, the Company retained the services of Environmental Resources Management (“ERM”) to help collect information within the study area, identify potential routes, perform a routing analysis comparing the route alternatives, and document the routing efforts in an Environmental Routing Study.

The Company identified an approximately 3.55-mile overhead proposed route for the Mars-Wishing Star Lines (“Mars-Wishing Star Lines Proposed Route” or “Route 5”), as well as five overhead alternative routes (“Mars-Wishing Star Lines Alternative Routes 1, 2, 3, 4 and 6”). For the Mars 230 kV Loop, the Company identified one approximately 0.57-mile overhead proposed route (“Mars 230 kV Loop Proposed Route”). The Company is proposing all of these routes for notice and Commission consideration. Discussion of the Project Proposed and Alternative Routes, as well as other overhead and underground route options that the Company studied but ultimately rejected, is provided in Section II of the Appendix and in the Environmental Routing Study included with the Application. A description of the Project Proposed and Alternative Routes is as follows.

### **Mars-Wishing Star Lines**

#### **Proposed Route (Route 5)**

This route would construct an overhead 500 kV single circuit transmission line with a 230 kV single circuit transmission line underbuilt between the proposed Wishing Star

Substation and the proposed Mars Substation. The Proposed Route is approximately 3.55 miles in length.

Beginning at the proposed Wishing Star Substation, Route 5 travels east for about 0.3 mile along the south side of Broad Run before crossing a future Virginia Department of Transportation (“VDOT”) right-of-way associated with the Northstar Boulevard extension project.<sup>2</sup> The Proposed Route then continues east for 0.3 mile along an undeveloped parcel before crossing Belmont Ridge Road and paralleling the south side of the Company’s existing right-of-way of Lines #2172 and #2183. Continuing along an undeveloped parcel for 0.5-mile, the route then turns north to cross the Company’s existing right-of-way then east to parallel the north side of the existing right-of-way. For approximately 0.5 mile, the route continues east along Broad Run, paralleling the north side of the existing right-of-way.

Prior to crossing Loudoun County Parkway, the Proposed Route turns slightly northeast away from the existing right-of-way to avoid land owned by the Metropolitan Washington Airports Authority (“MWAA”). After crossing Loudoun County Parkway, the Proposed Route turns southeast for 0.3 mile along the southwestern edge undeveloped parcel before rejoining the existing right-of-way for Lines #2137 and #2213. The route continues 0.2 mile across NOVEC-owned land before crossing Old Ox Road and spanning the Company’s Lines #2137 and #2213. The Proposed Route then continues southeast for 0.7 mile across a surface parking lot, paralleling the north side of MWAA’s West Perimeter Road.

Approximately 0.2 mile west of the proposed Mars Substation, the Proposed Route splits into two separate rights-of-way, one for the 500 kV line and the other for the 230 kV line. The 500 kV right-of-way turns east for 0.2 mile before crossing Carters School Road and terminating on the west side of the proposed Mars Substation. The 230 kV right-of-way continues southeast for 0.3 mile before crossing Carters School Road and turning north to terminate on the south side of the proposed Mars Substation.

#### Alternative Route (Route 1)

This route would construct an overhead 500 kV single circuit transmission line with a 230 kV single circuit transmission line underbuilt between the proposed Wishing Star Substation and Mars Substation. Alternative Route 1 is approximately 3.63 miles in length.

Beginning at the proposed Wishing Star Substation, Alternative Route 1 travels east for about 0.3 mile along the south side of Broad Run before crossing a future VDOT right-of-way associated with the Northstar Boulevard extension project. Alternative Route 1 continues east for 0.3 mile along an undeveloped parcel before crossing Belmont Ridge Road. After crossing Belmont Ridge Road, Alternative Route 1 parallels the south side of

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<sup>2</sup> See <https://www.loudoun.gov/5209/Northstar-Boulevard-Shreveport-Drive-to->.

the Company's existing right-of-way for Lines #2172 and #2183 for 0.2 mile on an undeveloped parcel. Alternative Route 1 then turns north, crossing the existing right-of-way and Broad Run, and continues another 0.2 mile onto an undeveloped parcel. Alternative Route 1 then turns east for 0.5 mile along the south side of a stormwater detention pond before turning slightly to the northeast. Alternative Route 1 heads northeast for 0.3 mile and crosses a parcel dedicated as an open space proffer for the Brambleton Community Association.

At a point just south of the intersection of Evergreen Mills Road and Loudoun County Parkway, Alternative Route 1 crosses Loudoun County Parkway before turning southeast and continuing across Broad Run. Alternative Route 1 continues southeast along the southwestern edge of an undeveloped tract for 0.3 mile, rejoining the Company's existing right-of-way for Lines #2137 and #2213. Alternative Route 1 then continues 0.2 mile across NOVEC-owned land before crossing Old Ox Road and spanning the Company's Lines #2137 and #2213. Alternative Route 1 continues southeast for 0.7 mile across a surface parking lot, paralleling the north side of MWAA's West Perimeter Road.

Approximately 0.2 mile west of the proposed Mars Substation, Alternative Route 1 splits into two separate rights-of-way, one for the 500 kV line and the other for the 230 kV line. The 500 kV right-of-way turns east for 0.2 mile before crossing Carters School Road and terminating on the west side of the proposed Mars Substation. The 230 kV right-of-way continues southeast for 0.2 mile before crossing Carters School Road, then turns north to terminate on the south side of the proposed Mars Substation.

#### Alternative Route (Route 2)

This route would construct an overhead 500 kV single circuit transmission line with a 230 kV single circuit transmission line underbuilt between the proposed Wishing Star Substation and Mars Substation. Alternative Route 2 is approximately 3.64 miles in length.

Beginning at the proposed Wishing Star Substation, Alternative Route 2 travels east for about 0.3 mile along the south side of Broad Run before crossing a future VDOT right-of-way associated with the Northstar Boulevard extension project. The route continues east for 0.3 mile along an undeveloped parcel before crossing Belmont Ridge Road. After crossing Belmont Ridge Road, Alternative Route 2 parallels the south side of the Company's existing right-of-way for Lines #2172 and #2183 for 0.2 mile across an undeveloped tract. Alternative Route 2 then turns north, crossing Lines #2172 and #2183 and Broad Run, before continuing about 0.2 mile onto another undeveloped parcel. The route then turns east for 0.5 mile along the south side of a stormwater detention pond before turning to the southeast and crossing Broad Run again. After crossing Broad Run, Alternative Route 2 turns east for 0.3 mile to parallel the north side of the existing right-of-way for Lines #2137 and #2213.

Prior to crossing Loudoun County Parkway, Alternative Route 2 turns slightly northeast away from the Company's existing right-of-way to avoid land owned by MWAA. The



route then turns southeast and continues about 0.3 mile along the southwestern edge of an undeveloped parcel before rejoining the existing Company's existing right-of-way for Lines #2137 and #2213. Alternative Route 2 then continues for 0.2 mile across NOVEC-owned land before crossing Old Ox Road and spanning Lines #2137 and #2213. The route continues southeast for 0.7 mile across a surface parking lot, paralleling the north side of MWAA's West Perimeter Road.

Approximately 0.2 mile west of the proposed Mars Substation, Alternative Route 2 splits into two separate rights-of-way, one for the 500 kV line and the other for the 230 kV line. The 500 kV right-of-way turns east for 0.2 mile before crossing Carters School Road and terminating on the west side of the proposed Mars Substation. The 230 kV right-of-way continues southeast for 0.2 mile before crossing Carters School Road and turning north to terminate on the south side of the proposed Mars Substation.

### Alternative Route (Route 3)

This route would construct an overhead 500 kV single circuit transmission line with a 230 kV single circuit transmission line underbuilt between the proposed Wishing Star Substation and Mars Substation. Alternative Route 3 is approximately 3.62 miles in length.

Beginning at the proposed Wishing Star Substation, Alternative Route 3 travels east for about 0.3 mile along the south side of Broad Run before crossing a future VDOT right-of-way associated with the Northstar Boulevard extension project. Alternative Route 3 continues east for 0.3 mile along an undeveloped parcel before crossing Belmont Ridge Road and paralleling the south side of the Company's existing right-of-way for Lines #2172 and #2183. Continuing along an undeveloped parcel for 0.5-mile, Alternative Route 3 turns northeast for 0.7 mile, crossing the existing Company right-of-way for Lines #2172 and #2183, Broad Run, and a parcel dedicated as the open space proffer for the neighboring homeowners' association.

At a point just south of the intersection of Evergreen Mills Road and Loudoun County Parkway, Alternative Route 3 crosses Loudoun County Parkway before turning southeast and crossing Broad Run. Alternative Route 3 continues southeast for 0.3 mile along the southwestern edge undeveloped parcel before rejoining the existing right-of-way for Lines #2137 and #2213. The route continues 0.2 mile across NOVEC-owned land before crossing Old Ox Road and spanning the Company's Lines #2137 and #2213. Alternative Route 3 continues southeast for 0.7 mile across a surface parking lot, paralleling the north side of MWAA's West Perimeter Road.

Approximately 0.2 mile west of the proposed Mars Substation, Alternative Route 3 splits into two separate rights-of-way, one for the 500 kV line and the other for the 230 kV line. The 500 kV right-of-way turns east for 0.2 mile before crossing Carters School Road and terminating on the west side of the proposed Mars Substation. The 230 kV right-of-way continues southeast for 0.2 mile before crossing Carters School Road and turning north to terminate on the south side of the proposed Mars Substation.



#### Alternative Route (Route 4)

This route would construct an overhead 500 kV single circuit transmission line with a 230 kV single circuit transmission line underbuilt between the proposed Wishing Star Substation and Mars Substation. Alternative Route 4 is approximately 3.63 miles in length.

Beginning at the proposed Wishing Star Substation, Alternative Route 4 travels east for about 0.3 mile along the south side of Broad Run before crossing a future VDOT right-of-way associated with the Northstar Boulevard extension project. Alternative Route 4 continues east for 0.3 mile along an undeveloped parcel before crossing Belmont Ridge Road and paralleling the south side of the Company's existing right-of-way for Lines #2172 and #2183. Continuing along an undeveloped parcel for 0.5-mile, Alternative Route 4 turns northeast for 0.4 mile, crossing the existing Company right-of-way, Broad Run, and an undeveloped parcel. The route then turns back to the southeast for 0.2 mile, again crossing Broad Run, then turns east for 0.3 mile to parallel the north side of the existing right-of-way for Lines #2137 and #2213.

Before crossing Loudoun County Parkway, Alternative Route 4 turns slightly northeast away from the existing right-of-way to avoid land owned by MWAA. The route then turns and continues southeast for 0.3 mile along the southwestern edge of an undeveloped parcel before rejoining the existing right-of-way for another 0.3 mile. Alternative Route 4 then continues 0.2 mile across NOVEC-owned land before crossing Old Ox Road and spanning the Company's Lines #2137 and #2213. The route continues southeast for 0.7 mile across a surface parking lot, paralleling the north side of MWAA's West Perimeter Road.

Approximately 0.2 mile west of the proposed Mars Substation, Alternative Route 4 splits into two separate rights-of-way, one for the 500 kV line and the other for the 230 kV line. The 500 kV right-of-way turns east for 0.2 mile before crossing Carters School Road and terminating on the west side of the proposed Mars Substation. The 230 kV right-of-way continues southeast for 0.2 mile before crossing Carters School Road and turning north to terminate on the south side of the proposed Mars Substation.

#### Alternative Route (Route 6)

This route would construct an overhead 500 kV single circuit transmission line with a 230 kV single circuit transmission line underbuilt between the proposed Wishing Star Substation and Mars Substation. Alternative Route 6 is approximately 3.56 miles in length.

Beginning at the proposed Wishing Star Substation, Alternative Route 6 travels east for about 0.3 mile along the south side of Broad Run before crossing a future VDOT right-of-way associated with the Northstar Boulevard extension project. Alternative Route 6 continues east for 0.3 mile along an undeveloped parcel before crossing Belmont Ridge Road and paralleling the south side of the Company's existing right-of-way for Lines #2172 and #2183. Continuing along an undeveloped parcel for 0.2-mile, Alternative Route 6 turns north to cross the existing Company right-of-way then turns east again to parallel the north side of the existing right-of-way. For approximately 0.9 mile, the route continues

east along Broad Run, paralleling the north side of the existing right-of-way.

Prior to crossing Loudoun County Parkway, Alternative Route 6 turns slightly northeast away from the existing right-of-way to avoid land owned by MWAA. After crossing Loudoun County Parkway, Alternative Route 6 turns southeast and continues for 0.3 mile along the southwestern edge undeveloped parcel before rejoining the existing Company right-of-way for Lines #2137 and #2213. The route continues 0.2 mile across NOVEC-owned land before crossing Old Ox Road and spanning the Company's Lines #2137 and #2213. Alternative Route 6 continues southeast for 0.7 mile across a surface parking lot, paralleling the north side of MWAA's West Perimeter Road.

Approximately 0.2 mile west of the proposed Mars Substation, Alternative Route 6 splits into two separate rights-of-way, one for the 500 kV line and the other for the 230 kV line. The 500 kV right-of-way turns east for 0.2 mile before crossing Carters School Road and terminating on the west side of the proposed Mars Substation. The 230 kV right-of-way continues southeast for 0.2 mile before crossing Carters School Road and turning north to terminate on the south side of the proposed Mars Substation.

### **Mars 230 kV Loop**

#### **Mars 230 kV Loop Proposed Route**

This route would construct two new overhead 230 kV double circuit lines on two sets of double circuit structures from Mars Substation to cut in locations on the Company's existing 230 kV Cabin Run-Shellhorn Road Line #2095 and 230 kV Poland Road-Shellhorn Road Line #2137. The Mars 230 kV Loop Proposed Route is approximately 0.57 mile in length.

Beginning at the proposed Mars Substation, the route travels north across forested land that is planned for future data center development. The route parallels Carters School Road for 0.5 mile before terminating at the cut location along the Company's existing Line #2095. The cut in location is located just east of the intersection of Carters School Road and Old Ox Road.

## **2. Environmental Analysis**

The Company solicited comments from all relevant state and local agencies about the proposed Project on September 23, 2022. Copies of these letters are included as Attachment 2. The DEQ responded to the Company's request for the proposed Project in an email dated September 27, 2022 (see Attachment 2.1), attaching the agency's Scoping Response Letter dated September 26, 2022 (see Attachment 2.2).

### **A. Air Quality**

For the Project, the Company will control fugitive dust during construction in accordance with DEQ regulations. During construction, if the weather is dry for an extended period of

time, there will be airborne particles from the use of vehicles and equipment within the right-of-way. However, minimal earth disturbance will take place and vehicle speed, which is often a factor in airborne particulate, will be kept to a minimum. Erosion and sedimentation control is addressed in Section 2.H of this Supplement. Equipment and vehicles that are powered by gasoline or diesel motors will be used during the construction of the line so there will be exhaust from those motors.

Tree clearing will be required as part of this Project along new rights-of-way. The Company does not expect to burn cleared material, but, if necessary, the Company will coordinate with the responsible locality to obtain these permits and will comply with any conditions set forth by the locality, or take actions as otherwise set forth in the Company's right-of-way easements. The Company's tree clearing methods are described in Section 2.L.

## **B. Water Source**

**(No water source is required for transmission lines so this discussion will focus on water bodies that will be crossed by the proposed transmission lines.)**

On behalf of the Company, ERM identified and mapped waterbodies in the study area using publicly available geographic information system databases, U.S. Geological Survey ("USGS") topographic maps (1:24,000), and recent (2017) digital aerial photography.

The Mars-Wishing Star Lines Proposed Route (Route 5) and Alternative Routes 1, 2, 3, 4, and 6 cross Broad Run and Cabin Branch. The Proposed Route and Alternative Route 6 also cross the South Fork Broad Run, as well as other unnamed perennial and intermittent tributaries to Broad Run. Routes 1 and 2 cross one open waterbody excavated between 2012 and 2014 based on historic aeriels. The Proposed Route (Route 5) and Alternative Routes 3 and 4 cross an open waterbody adjacent to Broad Run near its confluence with South Fork Broad Run, and the Proposed Route (Route 5) and Alternative Routes 2, 4, and 6 cross an open waterbody feature adjacent to Broad Run beneath Loudoun County Parkway.

The transmission line structures proposed by Dominion Energy Virginia would span the waterbodies identified along the Proposed and Alternative Routes of the Mars-Wishing Star Lines. However, tree clearing would be required within the forested riparian areas within the right-of-way. The Proposed and Alternative Routes could impact surface waters along these routes due to the removal of forested riparian areas adjacent to streams.

The Mars 230 kV Loop does not cross any perennial, intermittent, or open waterbody features.

According to the U.S. Army Corps of Engineers ("Corps") documentation, no waters considered navigable under Section 10 of the Rivers and Harbors Act are crossed by the Project. Waterbodies in the vicinity of the Project routes are shown on Figure 2 of Appendix D in the Environmental Routing Study.

## **Mars-Wishing Star Lines**

### Proposed Route (Route 5)

Based on ERM's review of remote sensing data sources including USGS National Hydrography Dataset ("NHD") and Loudoun County data, the Proposed Route crosses 11 waterbodies, including nine perennial and two intermittent streams. Waterbody crossings include two crossings of Broad Run, an open waterbody adjacent to Broad Run, and Cabin Branch.

### Alternative Route 1

Based on ERM's review of remote sensing data sources including USGS NHD and Loudoun County data, Alternative Route 1 crosses six waterbodies, including three perennial and three intermittent streams. Waterbody crossings include two crossings of Broad Run, an open waterbody, and Cabin Branch.

### Alternative Route 2

Based on ERM's review of remote sensing data sources including USGS NHD and Loudoun County data, Alternative Route 2 crosses nine waterbodies, including six perennial and three intermittent streams. Waterbody crossings include three crossings of Broad Run, an open waterbody, an open waterbody adjacent to Broad Run, and Cabin Branch.

### Alternative Route 3

Based on ERM's review of remote sensing data sources including USGS NHD and Loudoun County data, Alternative Route 3 crosses six waterbodies, including three perennial and three intermittent streams. Waterbody crossings include two crossings of Broad Run, an open waterbody, and Cabin Branch.

### Alternative Route 4

Based on ERM's review of remote sensing data sources including USGS NHD and Loudoun County data, Alternative Route 4 crosses nine waterbodies, including six perennial and three intermittent streams. Waterbody crossings include three crossings of Broad Run, an open waterbody, an open waterbody adjacent to Broad Run, an open waterbody, and Cabin Branch.

### Alternative Route 6

Based on ERM's review of remote sensing data sources including USGS NHD and Loudoun County data, Alternative Route 6 crosses 11 waterbodies, including nine perennial and two intermittent streams. Waterbody crossings include two crossings of Broad Run, an open waterbody adjacent to Broad Run, and Cabin Branch.

## **Mars 230 kV Loop**

### Mars 230 kV Loop Proposed Route

Based on ERM's review of remote sensing data sources including USGS NHD and Loudoun County data, the Mars 230 kV Loop Proposed Route does not cross any perennial, intermittent, or open waterbody features.

During construction, waterbodies will be maintained for proper drainage through the use of culverts or other crossing devices, as needed, according to the Company's standard policies. Where clearing of trees and/or woody shrubs is required, clearing within 100 feet of a stream will be conducted by hand. Vegetation will be at or slightly above ground level, and stumps will not be grubbed. To protect waterways from soil erosion and sedimentation during construction, the Company will use sediment barriers along waterways and steep slopes. If a section of route cannot be accessed from existing roads, the Company may need to install a culvert or temporary bridge to cross small streams. In such cases, temporary fill material may be required that would be placed on erosion control fabric and removed when work is completed, returning the surface to original contours.

In response to the Company's request for comments, Dominion Energy Virginia received an email from the Virginia Department of Health Office of Drinking Water dated September 29, 2022, regarding potential Project impacts to public water distribution systems or sanitary sewage collection systems. A copy of this email is included as Attachment 2.B.1.

The Company solicited comments from the Corps and the Virginia Marine Resources Commission ("VMRC") regarding the proposed Project on September 23, 2022. The Corps responded by email dated October 12, 2022 (see Attachment 2.B.2). VMRC responded by letter dated October 18, 2022, noting that the Project is within jurisdictional areas of the VMRC and may require a permit. A copy of this response is included as Attachment 2.B.3. If necessary, a Joint Permit Application will be submitted for review by the VMRC, DEQ, and the Corps to authorize jurisdictional crossings and for any impacts to jurisdictional features.

### **C. Discharge of Cooling Waters**

No discharge of cooling waters is associated with the Project.

### **D. Tidal and Non-tidal Wetlands**

No tidal wetlands were identified within the Project area. Non-tidal wetlands are summarized below.

On behalf of the Company, ERM has identified wetlands along the Project routes using remote sensing data sources to conduct an offsite desktop wetlands delineation. A copy of

ERM's Wetland and Waterbody Desktop Summary for Project is included in Attachment 2.D.1. Sources for this desktop summary include the USGS 7.5-minute series topographic quadrangle maps, the National Wetland Inventory Online Maps from the U.S. Fish and Wildlife Service ("FWS"), soils data from the Natural Resources Conservation Service Web Soil Survey, USGS Topographic Maps (2014), aerial photography dating between 2020 and 2021, and National Agricultural Imagery Program and Virginia Base Mapping Program Digital Ortho-Rectified Infrared Images dating from 2020. ERM did not field delineate wetlands within the Project area.

All wetlands will require protective matting to be installed to support construction vehicles and equipment and materials during construction. While most wetlands will be spanned, forested wetlands will be cleared but allowed to return to scrub-shrub wetlands after construction is completed.

ERM used a stepwise process to identify probable wetland and waterbody areas along the alternative transmission line routes as follows:

1. Infrared and natural color aerial photography was used in conjunction with USGS topographic maps, soils maps, and other data sources to identify potential wetland areas. Boundaries were assigned to the areas that appeared to exhibit wetland signatures based on this review (referred to here as "Interpreted Wetlands"), and a cover type was determined based on aerial photo interpretation.
2. To further determine the probability of a wetland occurring within a given location, polygon shapefiles for Interpreted Wetlands were digitally layered with NWI and NHD mapping and hydric soils information from the NRCS soil survey database.
3. ERM assigned a probability of wetland occurrence based on the number of overlapping data layers (i.e., indicators of potential wetland presence) in any given area (Table D-1).

<b>Table D-1</b>	
<b>Wetland Probability Criteria</b>	
<b>Probability Class</b>	<b>Criteria</b>
High	Areas where layers of hydric soils, Interpreted Wetlands, and NWI data overlap
Medium/High	Areas where NWI data overlaps hydric soils; or NWI data overlaps Interpreted Wetlands with or without partially hydric soils; or hydric soils overlap Interpreted Wetlands
Medium	Interpreted Wetlands with or without overlap by partially hydric soils
Medium/Low	Hydric soils only; or NWI data with or without overlap by partially hydric soils
Low	Partially hydric soils only
Very Low	Non-hydric soils only



Using the above criteria, wetland and waterbody occurrence probabilities ranging from very low to high were identified for each Project route, with acres of affected wetland calculated by probability class and cover type. The probability of wetland and waterbody occurrence increases as multiple indicators overlap toward the “high” end of the probability spectrum as shown in Table D-1. The medium to high probability categories were selected as the most reliable representation of in-situ conditions due to overlapping data sets. Results for these wetland probability classes are presented by Project route below.

## **Mars-Wishing Star Lines**

### Proposed Route (Route 5)

Based on ERM’s Desktop Wetland Analysis data, the centerline of the Proposed Route will require the clearing and/or disturbance of up to approximately 17.61 acres of wetland area. Of the 17.61 acres of wetland habitat that could be disturbed along this route, approximately 6.50 acres consist of palustrine forested (“PFO”) wetland area, 6.70 acres consist of palustrine emergent (“PEM”) wetland, 0.44 acre consist of palustrine scrub-shrub (“PSS”) wetlands, and 3.35 acres consist of riverine/stream wetland areas.

### Alternative Route 1

Based on ERM’s Desktop Wetland Analysis data, Alternative Route 1 will require the clearing and/or disturbance of up to approximately 22.03 acres of wetland area. Of the 22.03 acres of wetland habitat that could be disturbed along this route, approximately 11.05 acres consist of PFO wetland area, 1.55 acres consist of PSS wetlands, 7.06 acres consist of PEM wetland, and 1.20 acres consist of riverine/stream wetland areas.

### Alternative Route 2

Based on ERM’s Desktop Wetland Analysis data, Alternative Route 2 will require the clearing and/or disturbance of up to approximately 21.92 acres of wetland area. Of the 21.92 acres of wetland habitat that could be disturbed along this route, approximately 9.78 acres consist of PFO wetland area, 1.55 acres consist of PSS wetlands, 6.89 acres consist of PEM wetland, and 1.91 acres consist of riverine/stream wetland areas.

### Alternative Route 3

Based on ERM’s Desktop Wetland Analysis data, Alternative Route 3 will require the clearing and/or disturbance of up to approximately 19.09 acres of wetland area. Of the 19.09 acres of wetland habitat that could be disturbed along this route, approximately 9.66 acres consist of PFO wetland area, 0.44 acre consist of PSS wetlands, 6.83 acres consist of PEM wetland, and 1.32 acres consist of riverine/stream wetland areas.

#### Alternative Route 4

Based on ERM's Desktop Wetland Analysis data, Alternative Route 4 will require the clearing and/or disturbance of up to approximately 18.98 acres of wetland area. Of the 18.98 acres of wetland habitat that could be disturbed along this route, approximately 8.40 acres consist of PFO wetland area, 0.44 acre consist of PSS wetlands, 6.66 acres consist of PEM wetland, and 2.03 acres consist of riverine/stream wetland areas.

#### Alternative Route 6

Based on ERM's Desktop Wetland Analysis data, Alternative Route 6 will require the clearing and/or disturbance of up to approximately 19.56 acres of wetland area. Of the 19.56 acres of wetland habitat that could be disturbed along this route, approximately 7.71 acres consist of PFO wetland area, 0.44 acre consist of PSS wetlands, 7.03 acres consist of PEM wetland, and 3.77 acres consist of riverine/stream wetland areas.

### **Mars 230 kV Loop**

#### Mars 230 kV Loop Proposed Route

Based on ERM's Desktop Wetland Analysis data, the Mars 230 kV Loop Proposed Route will require the clearing and/or disturbance of up to approximately 2.35 acres of wetland area. Of the 2.35 acres of wetland habitat that could be disturbed along this route, approximately 2.24 acres consist of PFO wetland area and 0.11 acre consist of riverine/stream wetland areas.

Prior to construction, the Company will delineate wetlands and other waters of the United States using the *Routine Determination Method*, as outlined in the *1987 Corps of Engineers Wetland Delineation Manual* and methods described in the *2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region* (Version 2.0). The Company will obtain any necessary permits to impact jurisdictional resources. While most wetlands will be spanned, forested wetlands and scrub-shrub wetlands will require at least initial vegetation clearing. All wetlands will require protective matting to be installed to support construction vehicles and equipment and materials during construction.

The Company solicited comments from the DEQ Office of Wetlands and Stream Protection and the Corps on September 23, 2022. The Company has sited structures to avoid wetlands and streams to the extent practicable. Temporary impacts will be restored to pre-existing conditions, and permanent impacts will be compensated for in accordance with all applicable state regulations and laws. The Project is expected to require a Virginia Water Protection general permit and a Nationwide Permit 57. A Joint Permit Application ("JPA") will be submitted for further evaluation and final permit need determination by DEQ.



## E. Floodplains

As depicted on the Federal Emergency Management Agency’s online Flood Insurance Rate Maps #51059C0100E (effective date 9/17/2010) and #51107C03603 (effective date 2/17/2017), the Project study area lies within Zone X, areas of minimal flood hazard and Zone AE, base flood elevation and 100-year floodplain. The Company will coordinate with the local floodplain coordinators as required.

## F. Solid and Hazardous Waste

Environmentally regulated sites in the study area have been identified using publicly available geographic information system databases obtained from the U.S. Environmental Protection Agency (“EPA”) and the DEQ. These databases provide “information about facilities, sites, or places subject to environmental regulation or of environmental interest.” These include sites that use and/or store hazardous materials; waste-producing facilities operating under permits from the EPA or other regulatory authorities; Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA” or “Superfund”) sites; Resource Conservation and Recovery Act (“RCRA”) sites; Brownfield sites; petroleum storage and petroleum release sites; and solid waste sites. The identification of a site in the databases does not mean that the site necessarily has contaminated soil or groundwater.

A summary of the information from the EPA and DEQ databases within a 1.0-mile buffer of the centerlines of the Project’s Proposed Routes and Alternative Routes is provided in Table F-1 and F-2 below. The locations of the sites are depicted in Attachment 2.F.1.

<p align="center"><b>TABLE F-1</b>  <b>500-230 kV Wishing Star Substation, 500-230 kV Mars Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Project</b></p> <p align="center"><b>Environmental Regulated Facilities and Hazardous Waste/Petroleum Release Sites within 1.0 Mile</b></p>							
Database	Mars-Wishing Star Proposed Route (Route 5)	Mars-Wishing Star Alternative Route 1	Mars-Wishing Star Alternative Route 2	Mars-Wishing Star Alternative Route 3	Mars-Wishing Star Alternative Route 4	Mars-Wishing Star Alternative Route 6	Mars 230 kV Loop
Waste	8	9	8	8	8	8	2
Toxics	0	0	0	0	0	0	0
Land	1	1	1	1	1	1	1
Air	11	10	11	10	11	11	8
Water	4	4	4	4	4	4	1
Solid Waste Facilities	0	0	0	0	0	0	0
Petroleum Facilities	2	2	2	2	2	2	3
Petroleum Releases	9	9	9	9	9	9	2
Pollution Response Program Sites	6	6	6	6	6	6	2
Total <sup>a</sup>	<b>41</b>	<b>40</b>	<b>41</b>	<b>40</b>	<b>41</b>	<b>41</b>	<b>19</b>

<b>TABLE F-1</b> <b>500-230 kV Wishing Star Substation, 500-230 kV Mars Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Project</b>  <b>Environmental Regulated Facilities and Hazardous Waste/Petroleum Release Sites within 1.0 Mile</b>							
Database	Mars-Wishing Star Proposed Route (Route 5)	Mars-Wishing Star Alternative Route 1	Mars-Wishing Star Alternative Route 2	Mars-Wishing Star Alternative Route 3	Mars-Wishing Star Alternative Route 4	Mars-Wishing Star Alternative Route 6	Mars 230 kV Loop
<sup>a</sup>	Note that a single facility may be associated with multiple environmental permits; as such, the total number reflects the number of permits and releases within the specified distance from the Project.						
<b>Notes</b>	Waste (Facilities that handle or generate hazardous wastes) Toxics (Facilities that release toxic substances to the environment) Land (Site cleanup under RCRA, Superfund, or Brownfield programs, and/or DEQ VRP ) Air (Facilities with a release of pollutants to the air) Water (Facilities that discharge storm or process water to surface water) Solid Waste Facilities (Former and existing landfills) Petroleum Facilities (Regulated petroleum storage) Petroleum Releases (Typically associated with storage tank releases)						

No Brownfield or Superfund sites identified in the reviewed databases were located within 1.0 mile of the Project Proposed Routes or Alternative Routes. The Project Proposed Routes, Alternative Routes, and proposed Mars Substation are located adjacent to the Dulles Airport RCRA Corrective Action site boundary; the area of concern (“AOC”) within the RCRA Corrective Action boundary situated closest to the Project area is located approximately 2.2 miles to the southeast of the Project. Finally, based on EPA files, contaminated groundwater migration at the site is listed as “under control.” Due to the distance between the closest AOC and the Project, and available information from the EPA, it is unlikely that the RCRA Corrective Action site impacted soil and/or groundwater in the Project area.

To evaluate the potential impact to the routes, ERM further assessed the sites within 1,000 feet of the Project’s Proposed and Alternative Routes (Table F-2).

<b>TABLE F-2</b> <b>500-230 kV Wishing Star Substation, 500-230 kV Mars Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Project</b>  <b>Environmental Regulated Facilities and Hazardous Waste/Petroleum Release Sites within 1,000 Feet</b>							
Database	Mars-Wishing Star Proposed Route (Route 5)	Mars-Wishing Star Alternative Route 1	Mars-Wishing Star Alternative Route 2	Mars-Wishing Star Alternative Route 3	Mars-Wishing Star Alternative Route 4	Mars-Wishing Star Alternative Route 6	Mars 230 kV Loop
Waste	1	1	1	1	1	1	0
Toxics	0	0	0	0	0	0	0
Land	1	1	1	1	1	1	1
Air	4	4	4	4	4	4	1
Water	0	0	0	0	0	0	0
Solid Waste Facilities	0	0	0	0	0	0	0
Petroleum Facilities	0	0	0	0	0	0	0
Petroleum Releases	1	1	1	1	1	1	0

Pollution Response Program				0	0	0	1
Sites	0	0	0				
Total <sup>a</sup>	7	7	7	7	7	7	3
<sup>a</sup>	Note that a single facility may be associated with multiple environmental permits; as such, the total number reflects the number of permits and releases within the specified distance from the Project.						
<b>Notes</b>	Waste (Facilities that handle or generate hazardous wastes) Toxics (Facilities that release toxic substances to the environment) Land (Site cleanup under RCRA, Superfund, or Brownfield programs, and/or DEQ VRP ) Air (Facilities with a release of pollutants to the air) Water (Facilities that discharge storm or process water to surface water) Solid Waste Facilities (Former and existing landfills) Petroleum Facilities (Regulated petroleum storage) Petroleum Releases (Typically associated with storage tank releases)						

Based on a review of sites listed in the EPA and DEQ databases within 1,000 feet of the various route centerlines and the estimated depth to groundwater and flow direction, ERM did not identify any petroleum releases that may have impacted soil and/or groundwater at the Wishing Star Substation and Mars Substation, or along the Mars-Wishing Star Proposed and Alternative Routes or the Mars 230 kV Loop Proposed Route. The closest petroleum release is located approximately 800 feet southeast of the Mars Substation and is hydraulically separated from the Project area by surficial waterbodies.

Care will be taken to operate and maintain construction equipment to prevent any fuel or oil spills. Any waste created by the construction crews will be disposed of in a proper manner and recycled where appropriate and will be further detailed in the Company's stormwater pollution prevention plan, a component of the Virginia Stormwater Management Program, which will be submitted to the Virginia Department of Conservation and Recreation ("VDCR").

## G. Natural Heritage, Threatened and Endangered Species

On behalf of the Company, ERM conducted online database searches for threatened and endangered species in the vicinity of the Project, including the VDCR Natural Heritage Data Explorer ("NHDE"). The NHDE includes three components: Conservation Sites ("CS"), Stream Conservation Units, and General Location Areas for Natural Heritage Resources. ERM also obtained query results from the Virginia Department of Wildlife Resources ("VDWR") Fish and Wildlife Information Service ("VaFWIS"), and the FWS Information for Planning and Consultation ("IPaC") System to identify federally- and state-listed species that may occur within the study area. Digital data were obtained from the VDCR NHDE to identify locations within the study area that potentially support protected species.

To obtain the most current eagle nest data, ERM reviewed the Center for Conservation Biology ("CCB") Virginia Eagle Nest Locator mapping portal, which provides information about the Virginia Bald eagle population including the results of the CCB's annual eagle nest survey. The agency lists of threatened and endangered species were reviewed and are

described in Section 3.3.4 of the Environmental Routing Study. A total of four federal and state-listed species have the potential to occur within the Project area.

The USFWS IPaC review identified two federally listed species protected under the Endangered Species Act (“ESA”) and one candidate species that potentially occur or have been documented within the proposed Project area. These species include Northern long-eared bat (*Myotis septentrionalis*), Dwarf wedgemussel (*Alasmidonta heterodon*), and Monarch butterfly (*Danaus plexippus* – candidate species). The VDWR operates a *Northern Long-eared Bat Winter Habitat and Roost Trees* online mapping system, which shows general locations of known Northern long-eared bat hibernacula and roost trees. A review of this system did not show a hibernaculum or roost trees in Loudoun County. Given the lack of confirmed species presence of Dwarf wedgemussel and Monarch butterfly, impacts are not anticipated.

Based on VDCR and VDWR queries, in addition to the two federally listed species and one candidate species discussed above identified by the USFWS IPaC review (which is also state-listed), there are two more state-listed species that have been identified as potentially occurring within the proposed Project area. These state-listed species are the Wood turtle (*Glyptemys insculpta*) and Henslow’s sparrow (*Ammodramus henslowii*). A summary of the four federally or state listed species with potential habitat within the Project area are listed in Table G-2 below. Of the four species identified, none have been historically documented by state agencies in areas adjacent to or crossed by any of the Project routes.

<b>TABLE G-2</b> <b>500-230 kV Wishing Star Substation, 500 kV and 230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Project</b> <b>Potential Federal-and State-Listed Species in the Project Area</b>				
Species	Status	Database	Habitat	Results
Northern long-eared bat ( <i>Myotis septentrionalis</i> )	FT, ST	IPaC VDWR Winter Habitat and Roost Tree Map	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.	Summer foraging habitat present, but no hibernacula or roost trees identified within a 0.5-mile radius of the route alternatives. No impacts are anticipated if trees are cleared during the winter.
Dwarf wedgemussel ( <i>Alasmidonta heterodon</i> )	FE, SE	IPaC	Deep quick running water on cobble, fine gravel, or on firm silt or sandy bottoms.	No impacts are anticipated as no instream work is anticipated.
Wood turtle ( <i>Glyptemys insculpta</i> )	ST	VaFWIS	Forested floodplains, fields, wet meadows, and farmland with a perennial stream nearby.	Confirmed as “potential” in VAFWIS Search Report. No instream work would be performed, but forested floodplains may be cleared. Coordination with the VDWR will be needed to determine if surveys and/or construction timing windows are warranted for the Project.

<p align="center"><b>TABLE G-2</b>  <b>500-230 kV Wishing Star Substation, 500 kV and 230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation,</b>  <b>and Mars 230 kV Loop Project</b>  <b>Potential Federal-and State-Listed Species in the Project Area</b></p>				
Species	Status	Database	Habitat	Results
Henslow's sparrow ( <i>Ammodramus henslowii</i> )	ST	VaFWIS	Open grasslands with few or no woody plants and tall dense grasses and litter layer	Confirmed as "Potential" in VaFWIS Search Report. Coordination with the VDWR will be needed to determine if surveys and/or construction timing windows are warranted for the Project.
<p><i>Federal/State Status:</i></p> <p>FE      Federally listed as endangered.</p> <p>FT      Federally listed as threatened.</p> <p>SE      State listed as endangered.</p> <p>ST      State listed as threatened.</p>				

A copy of the database search results can be found in [Attachment 2.G.1](#). Additionally, the Company requested comments from the USFWS, VDWR and VDCR regarding the proposed Project on September 23, 2022. On behalf of the Company, ERM submitted the Project to the VDCR Division of Natural Heritage ("DNH") for review. The DNH completed this request on July 1, 2022. The results of DNH's official review are provided in [Attachment 2.G.1](#).

According to the official review conducted on July 1, 2022, the VDCR DNH concluded that the Project routes would not affect any documented state-listed plants or insects and does not cross any State Natural Area Preserves under VDCR's jurisdiction. However, according to a VDCR biologist, several rare plants, which are typically associated with prairie vegetation and inhabit semi-open diabase glades in Virginia, may occur in the Project area if suitable habitat is present. Diabase glades are characterized by historically fire-dominated grassland vegetation on relatively nutrient-rich soils underlain by Triassic bedrock. Diabase flatrock, a hard, dark-colored volcanic rock, is found primarily in northern Virginia counties and is located within the geologic formation known as the Triassic Basin. Where the bedrock is exposed, a distinctive community type of drought-tolerant plants occurs. Diabase flatrocks are extremely rare natural communities that are threatened by activities such as quarrying and road construction.

Due to the potential for this site to support populations of natural heritage resources, VDCR recommends an inventory for rare plants associated with diabase glades in the study area. With the survey results, the VDCR indicates that it can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources.

For context, diabase refers to unique plant communities that form in certain circumstances in the presence of underlying igneous diabase rock. Diabase associated plant species, whose occurrence in Virginia is often associated with diabase derived soils, are not formally listed as endangered or threatened. These plants and associated habitat, while considered rare by VDCR DNH, are not protected by any regulations.

Based on VDCR review, the impacts to the Diabase Flatrocks are primarily associated with quarrying and road construction, which have a very direct permanent impact to the habitats within a potential defined project area. Electric transmission lines, as proposed in this Application, typically do not have a significant permanent impact outside of the structure foundation locations. Habitat conversion is possible, but the right-of-way will be maintained as a natural emergent/scrub shrub habitat that resembles successional conditions that would allow for natural communities to exist within this converted habitat regime. The permanent impacts associated with this Project are discrete and limited to the structure foundation locations only.

Diabase communities are most likely to occur in semi-open areas that have a disturbance regime similar to that of pre-settlement wildfires, and that also have not been heavily infested by invasive plants. Areas that do not receive this type of intermediate disturbance (including areas that are subject to intense disturbance) typically do not provide high-quality habitat for the diabase associated species.

Dominion Energy Virginia strives to be in compliance with local, state, and federal regulations. Rare species are not classified as endangered or threatened, so are not protected by any regulations, and a requirement to inventory these resources prior to construction would result in significant delay to the construction schedule, potentially increasing Project costs.

Due to the low likelihood of diabase plants in the Project area, and the lack of any legal status via federal or state law, the Company concludes that VDHR DNH's recommendation for an inventory for rare plants associated with diabase glades in the Project area is not required. In lieu of conducting an inventory of these resources prior to construction, Dominion Energy Virginia suggests that it provide the Company's construction team with information about the rare diabase plant species and coordinate with VDCR DNH if a species of concern is observed.<sup>3</sup>

The VDCR review identified two Ecological Core map units (Core IDs 33546 and 33299, 515 acres and 98 acres respectively) adjacent to the Proposed Route. However, upon further review of aerial imagery, two additional ecological cores (Core ID 33643 and ID 33785) were observed within the study area. The right-of-way of the Proposed Route does not cross any of the Core map units. The areas of forested habitat are ranked by the VDCR as C4 'Moderate' (ID 33546) and C5 'General' (IDs 33299, 33643, 33785) for ecological core value (on a scale of C1 for outstanding value to C5 for general value). Given that the

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<sup>3</sup> This approach is consistent with the Commission's directive in prior proceedings. See, e.g., *Application of Virginia Electric and Power Company For approval and certification of electric transmission facilities: DTC 230 kV Line Loop and DTC Substation*, Case No. PUR-2021-00280, Final Order at 15 ("Based on the record developed herein, the Commission agrees with Dominion [Energy Virginia] that customers should not bear the costs of the recommended survey. The Commission therefore declines to adopt VDCR's recommendation but directs the Company to educate its construction personnel regarding the plant species prior to the commencement of construction activities and to coordinate with VDCR if the species is found within the Project area") (internal citations omitted).



Proposed Route only borders two Cores and does not fragment any of the Cores, impacts are expected to be minimal. The Mars 230 kV Loop does not cross or fragment any Ecological Cores.

The Project routes do not intersect with any secondary buffers of currently documented Bald eagle nests as identified in The Bald Eagle Protection Guidelines for Virginia (2012). The nearest Bald eagle nest (CCB ID: LD1901) is located approximately 4.19 miles northeast of the northernmost segment of the Mars-Wishing Star Lines (Routes 1 and 3) and about 3.86 miles northeast of the northernmost segment of the Mars 230 kV Loop. The nest was documented to be occupied in 2019. None of the Project routes are within the 660-foot management buffer for the nest. The Company will work with the appropriate jurisdictional agencies to minimize impacts on this species.

Construction and maintenance of the new transmission line facilities could have some minor effects on wildlife; however, impacts on most species will be short-term in nature, and limited to the period of construction.

## **Mars-Wishing Star Lines**

### Proposed Route (Route 5)

Of the four species identified above, none have been confirmed as present within 2.0 miles of the Project by the VaFWIS database. The Proposed Route requires approximately 42.84 acres of tree clearing based on existing land use/land cover, which is greater than the amount of tree clearing required for Alternative Route 1 (33.98 acres). To provide a more accurate estimate of direct Project impacts, *future* land tree clearing impacts were calculated to account for pending and approved development likely to occur prior to Project construction. Per the future land use/land cover estimates, the Proposed Route would require approximately 34.35 acres of tree clearing, the second highest amount of tree clearing among the routes, after Alternative Route 6 at 39.54 acres. Tree clearing associated with the Proposed Route could have a slightly greater impact to bird or bat habitat compared to Alternative Routes 1-4 and slightly less than Alternative Route 6. The Proposed Route has two intermittent waterbody crossings and nine perennial waterbody crossings. As the crossings would be spanned by the transmission line, direct impacts to aquatic species are not anticipated. Potential indirect impacts to aquatic species associated with construction would be temporary. Required tree removal adjacent to waterbodies would reduce riparian buffer functions and habitat in those locations. According to the CCB, this route does not cross a primary or secondary buffer zone of a documented Bald eagle nest.

### Alternative Route 1

Impacts of Alternative Route 1 to threatened and endangered species are similar to those described above for the Proposed Route. Alternative Route 1 requires less forested land clearing than the Proposed Route (33.98 acres versus 42.84 acres based

on existing land use/land cover and 29.72 versus 34.35 based on future land use/land cover), resulting in fewer impacts to wildlife habitat. Alternative Route 1 has three intermittent waterbody crossings and three perennial waterbody crossings (six total crossings versus 11 total crossings for the Proposed Route). Impacts to aquatic species are expected to be similar to those described for the Proposed Route (Route 5). According to the CCB, Alternative Route 1 does not cross a primary or secondary buffer zone of a documented Bald eagle nest.

#### Alternative Route 2

Impacts of Alternative Route 2 to threatened and endangered species are similar to those described above for the Proposed Route. Alternative Route 2 requires less forested land clearing than the Proposed Route (34.96 acres versus 42.84 acres based on existing land use/land cover and 31.50 versus 34.35 based on future land use/land cover), resulting in fewer impacts to wildlife habitat. Alternative Route 2 has three intermittent waterbody crossings and six perennial waterbody crossings (nine total crossings versus 11 total crossings for the Proposed Route). Impacts to aquatic species are expected to be similar to those described for the Proposed Route (Route 5). According to the CCB, Alternative Route 2 does not cross a primary or secondary buffer zone of a documented Bald eagle nest.

#### Alternative Route 3

Impacts of Alternative Route 3 to threatened and endangered species are similar to those described above for the Proposed Route. Alternative Route 3 requires slightly less forested land clearing than the Proposed Route (40.69 acres versus 42.84 acres based on existing land use/land cover and 31.37 versus 34.35 based on future land use/land cover), resulting in fewer impacts to wildlife habitat. Alternative Route 3 has three intermittent waterbody crossings and three perennial waterbody crossings (six total crossings versus 11 total crossings for the Proposed Route). Impacts to aquatic species are expected to be similar to those described for the Proposed Route (Route 5). According to the CCB, Alternative Route 3 does not cross a primary or secondary buffer zone of a documented Bald eagle nest.

#### Alternative Route 4

Impacts of Alternative Route 4 to threatened and endangered species are similar to those described above for the Proposed Route. Alternative Route 4 requires slightly less forested land clearing than the Proposed Route (41.66 acres versus 42.84 acres based on existing land use/land cover and 33.14 versus 34.35 based on future land use/land cover), resulting in fewer impacts to wildlife habitat. Alternative Route 4 has three intermittent waterbody crossings and six perennial waterbody crossings (nine total crossings versus 11 total crossings for the Proposed Route). Impacts to aquatic species are expected to be similar to those described for the Proposed Route (Route 5).



According to the CCB, Alternative Route 4 does not cross a primary or secondary buffer zone of a documented Bald eagle nest.

#### Alternative Route 6

Impacts of Alternative Route 6 to threatened and endangered species are similar to those described above for the Proposed Route. Alternative Route 6 requires slightly more forested land clearing than the Proposed Route (42.96 acres versus 42.84 acres based on existing land use/land cover and 39.54 versus 34.35 based on future land use/land cover). Alternative Route 6 has two intermittent waterbody crossings and nine perennial waterbody crossings (the same number of crossings as the Proposed Route). Impacts to aquatic species are expected to be similar to those described for the Proposed Route (Route 5). According to the CCB, Alternative Route 6 does not cross a primary or secondary buffer zone of a documented Bald eagle nest.

### **Mars 230 kV Loop**

#### Mars 230 kV Loop Proposed Route

The Mars 230 kV Loop Proposed Route requires 8.84 acres of forested land to be cleared, reducing forested habitat in this right-of-way. Because no viable alternative route was identified, future land use/land cover was not calculated for the Mars 230 kV Loop. No waterbodies are crossed by the Mars 230 kV Loop Proposed Route, so no impacts to aquatic species are anticipated. According to the CCB, the route does not cross a primary or secondary buffer zone of a documented Bald eagle nest.

New and updated information is continually added to VDCR's Biotics database. The Company shall re-submit Project information and a map for an update on this natural heritage information if the scope of the Project changes and/or six months have passed before this information is utilized.<sup>4</sup>

### **H. Erosion and Sediment Control**

The DEQ approved the Company's *Standards & Specification for Erosion & Sediment Control and Stormwater Management for Construction of Linear Electric Transmission Facilities (TE VEP 8000)*. These specifications are given to the Company's contractors and require erosion and sediment control measures to be in place before construction of the line begins and specifies the requirements for rehabilitation of the right-of-way. A copy of the current DEQ approval letter dated August 13, 2019, is provided as Attachment 2.H.1.

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<sup>4</sup> The Company updated this commitment consistent with discussions held between Company and VDCR representatives on August 23, 2022.

According to the approval letter, coverage was effective through August 12, 2020. The Company submitted the renewal application on August 3, 2020, and is awaiting approval.

## **I. Archaeological, Historic, Scenic, Cultural or Architectural Resources**

ERM conducted a Stage I Pre-Application Analysis (“Stage I Analysis”) of potential impacts on cultural resources for the Project Proposed Routes and Alternative Routes 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* (VDHR 2008). This analysis was completed in October 2022 and submitted to VDHR on October 27, 2022. The report is included as Attachment 2.I.1. For each route, the analysis identified and considered previously recorded resources within the following study tiers as specified in the Guidelines:

- National Historic Landmark (“NHL”) properties located within a 1.5-mile radius of each route centerline.
- National Register of Historic Places (“NRHP”)-listed properties, NHLs, battlefields, and historic landscapes within a 1.0-mile radius of each route centerline.
- NRHP-eligible and -listed properties, NHLs, battlefields, and historic landscapes within a 0.5-mile radius of each route centerline.
- Qualifying architectural resources and archaeological sites located within the right-of-way for each alternative route.
- Information on cultural resources within each of the above study tiers was obtained from the Virginia Cultural Resource Information System (“VCRIS”).
- ERM also collected information from Loudon Preservation Society to find locally significant resources within a 1.0-mile radius of each centerline. No additional resources were identified through this source. ERM additionally collected information on battlefields surveyed and assessed by the National Park Service’s American Battlefield Protection Program (“ABPP”). No additional ABPP study areas, core areas, or potential NRHP boundaries for battlefields were identified within the relevant study tiers for the various route options through this source.

Along with a records review, ERM conducted field assessments of known NRHP-eligible or -listed architectural resources along the Project Proposed Routes and Alternative Routes in accordance with the Guidelines. Digital photographs of each resource and views to the proposed transmission line were taken. Photo simulations were prepared to assess visual effects on considered resources within the tiered study area. For previously recorded archaeological sites under consideration, aerial photographs were examined to assess the current land condition and the spatial relationship between the sites and any existing or proposed transmission line structures.

A summary of the considered resources identified in the vicinity of each route and recommendations concerning Project effects are provided in the following discussion. The information presented here derives from existing records and does not purport to

encompass the entire suite of historic and archaeological resources that may ultimately be affected by the Project.

The resources located within the right-of-way of the transmission line routes may be subject to both direct impacts from placement of the transmission line across the property as well as visual impacts from changes to the viewshed introduced by the new transmission infrastructure. Resources in the 0-0.5-mile study tier would not be directly impacted but would likely be visually impacted unless topography or vegetation obscures the view from the resource to the transmission line. At a distance over 0.5 mile, it becomes less likely that a resource would be within line-of-sight of the new transmission facilities. Beyond 1.0 mile, it becomes even less likely that a given resource would be within line-of-sight of the Project. However, a full architectural survey (to be completed following the selection of a route) is necessary to determine which resources would be visually impacted and to survey for additional unrecorded resources.

Because portions of some routes use common alignments, many of the same cultural resources would be impacted regardless of the routes selected for the Project. The nature of those impacts, while estimated in this study with the assistance of photo simulations, would depend on the final Project design in which the exact placement and height of transmission line structures is confirmed. As part of the forthcoming full architectural survey, Project impacts on these and any newly identified resources would be assessed. The study area for the survey would be defined based on the height of the transmission line structures, topography, tree cover, and other factors impacting line-of-sight from resources to the route.

The Company solicited comments from VDHR regarding the proposed Project on September 23, 2022. VDHR responded by letter dated October 21, 2022, recommending that full archaeological and architectural surveys be performed once the route alternatives are finalized. A copy of this response is included as Attachment 2.I.2.

## **Mars-Wishing Star Lines**

### Proposed Route (Route 5)

Three aboveground historic resources were identified within the VDHR study tiers for the Proposed Route (Table I-1). Construction and operation of the new facilities associated with these routes would have no impact on two resources (053-0982 and 053-0984) and a minimal impact on one resource (053-0008).

Arcola Elementary School (053-0982) is located in Loudoun County, approximately 0.64 mile to the south of approximate MP 1.1 of Route 5. Arcola Slave Quarters (053-0984) is located in Loudoun County, approximately 0.55 mile to the south of MP 1.1 of the Proposed Route. Neither the school nor slave quarters would have a view to the route due to distance and intervening vegetation.

The Dulles International Airport Historic District (053-0008) is located in Loudoun and Fairfax Counties, approximately 0.38 mile to the south of approximate MP 0.2 of the 230 kV split. The area between the resource and the Proposed Route is densely wooded, so the route would not be visible from most of the resource. However, the Proposed Route would be visible from the airport runway. Here, only the tops of the poles would be visible from the tree line, and are likely to be visible only during leaf-off seasons. In addition, the recorded boundary for the resource encompasses 1,726.60 acres, and only a small portion of the district is located in the half-mile study tier for the route. Furthermore, mature vegetation surrounding the district blocks visibility of the transmission line structures from many vantage points. Thus, ERM recommends that the Proposed Route would have a minimal impact on the Dulles International Airport Historic District.

<b>TABLE I-1</b> <b>500-230 kV Wishing Star Substation, 500-230 kV Mars Wishing Star Lines, 500-230 kV Mars Substation, and Mars kV Loop Project</b>				
<b>Resources in VDHR Tiers for Proposed Route (Route 5)</b>				
Buffer (miles)	Considered Resources	VDHR #	Description	Impact
1.0-1.5	National Historic Landmarks	NA	NA	NA
0.5-1.0	National Register—Listed	053-0982	Arcola Elementary School	None
		053-0984	Arcola Slave Quarters	None
0.0- 0.5	National Register—Eligible	053-0008	Dulles International Airport Historic District	Minimal
0.0 (within right-of-way)	NA	NA	NA	NA

The Stage I Analysis also considered the potential effects to archaeological resources. Five archaeological sites lie within the new right-of-way associated with the Proposed Route (44LD0168, 44LD0173, 44LD0174, 44LD0609, and 44LD0970).

Three of these sites (44LD0168, 44LD0173, and 44LD0174) have been determined not eligible for the NRHP and require no further consideration. The right-of-way for the Proposed Route crosses the southwestern portion of 44LD0168's. The site is a Pre-Contact temporary camp that primarily consists of a quartz lithic scatter. 44LD0173 consists of a Pre-Contact temporary camp and lithic scatter that includes a quartzite late stage biface fragment, a quartz early to middle stage biface fragment, quartz flakes, rhyolite flakes, a quartz cobble fragment, a stoneware sherd, and a glass shard. The Proposed Route crosses the northern section of the site. Finally, 44LD0174 is a Pre-Contact temporary camp containing a lithic scatter with two stemmed points suggesting a Late Archaic component. The right-of-way for the Proposed Route crosses a very small portion of the northern the northern boundary of 44LD0174.

The Proposed Route also crosses 44LD0609 and 44LD0970. 44LD0609 is an Early Woodland base camp consisting of a Susquehanna broadspear point, a chert bifacial tool, a grit-tempered Marcey Creek variant ceramic sherd, and five quartz flakes. The integrity of 44LD0609 is unknown, and it has not been formally evaluated for NRHP eligibility. The right-of-way for the Proposed Route abuts the northern boundary of 44LD0609. The clearing of the right-of-way and associated construction activities could impact the site. Because the resource has not been formally evaluated, further survey would need to occur in order to determine the NRHP eligibility of the site. If the site is found to be eligible, the alignment of the route may need to be modified to protect the site or the site might require further archaeological investigation to recover information that could be lost as a result of construction impacts. 44LD0970 is a Late Archaic period lithic scatter consisting of two quartz flakes, a quartzite projectile point fragment, two rhyolite flakes, and a chert flake. The site has suffered significant disturbance, but has not been formally evaluated for the NRHP. The southern half of the right-of-way crosses 44LD0970. The clearing of the right-of-way and associated construction activities could impact the site. However, since the site has been previously disturbed, it is anticipated that the construction of the Proposed Route would have minimal impacts on the site.

#### Alternative Route 1

Three aboveground historic resources were identified within the VDHR study tiers for Alternative Route 1 (Table I-2). Construction and operation of the new facilities associated with this route would have no impact on two resources (053-0982 and 053-0984) and a minimal impact on one resource (053-0008).

Arcola Elementary School (053-0982) is located in Loudoun County, approximately 0.66 mile to the south of approximate MP 0.8 of Alternative Route 1. Arcola Slave Quarters (053-0984) is located in Loudoun County, approximately 0.71 mile to the south of approximate MP 1.2 for Alternative Route 1. Neither the school nor slave quarters would have a view to the route due to distance and intervening vegetation.

The Dulles International Airport Historic District (053-0008) is located in Loudoun County, approximately 0.38 mile to the south of approximate MP 0.2 of the 230 kV split. The area between the resource and the alternative transmission line routes is densely wooded, so the route would not be visible from most of the resource. However, Alternative Route 1 would be visible from the airport runway. Here, only the tops of the poles would be visible from the tree line, and are likely to be visible only during leaf-off seasons. In addition, the recorded boundary for the resource encompasses 1,726.60 acres, and only a small portion of the district is located in the half-mile study tier for the route. Furthermore, mature vegetation surrounding the district blocks visibility of the transmission line structures from many vantage points. Thus, ERM recommends that Alternative Route 1 would have a minimal impact on the Dulles International Airport Historic District.

<b>TABLE I-2</b> <b>500-230 kV Wishing Star Substation, 500-230 kV Mars Wishing Star Lines, 500-230 kV Mars Substation, and Mars kV Loop Project</b> <b>Resources in VDHR Tiers for Alternative Route 1</b>				
Buffer (miles)	Considered Resources	VDHR #	Description	Impact
1.0-1.5	National Historic Landmarks	NA	NA	NA
0.5-1.0	National Register—Listed	053-0982	Arcola Elementary School	None
		053-0984	Arcola Slave Quarters	None
0.0- 0.5	National Register—Eligible	053-0008	Dulles International Airport Historic District	Minimal
0.0 (within right-of-way)	NA	NA	NA	NA

The Stage I Analysis also considered the potential effects to archaeological resources. Two archaeological sites lie within the new right-of-way associated with Alternative Route 1 (44LD0167 and 44LD0168).

Alternative Route 1 crosses the southwestern half of 44LD0168. 44LD0168 is a Pre-Contact temporary camp, primarily consisting of a quartz lithic scatter. The site has been determined not eligible for the NRHP and, therefore, requires no further consideration. 44LD0167 is a Pre-Contact temporary camp site, consisting of one quartz shallow side-notched point. The site has not been formally evaluated for NRHP and the overall integrity of the site is unknown. Alternative Route 1 extends across the length of 44LD0167 (approximately 719 feet). The construction of Alternative Route 1 would include clearing of the right-of-way and the placement of a structure in the boundary of the site. Because the resource has not been formally evaluated, further survey would need to occur in order to determine NRHP eligibility of the resource. If the site is found to be eligible, the route or structure placement may need to be altered protect the site, or the site might require further archaeological investigation to recover information that could be lost as a result of construction impacts.

### Alternative Route 2

Three aboveground historic resources were identified within the VDHR study tiers for Alternative Route 2 (Table I-3). Construction and operation of the new facilities associated with this route would have no impact on two resources (053-0982 and 053-0984) and a minimal impact on one resource (053-0008).

Arcola Elementary School (053-0982) is located in Loudoun County, approximately 0.66 mile to the south of approximate MP 0.8 of Alternative Route 2. Arcola Slave Quarters (053-0984) is located in Loudoun County, approximately 0.64 mile to the



southwest of approximate MP 1.7 for Alternative Route 2. Neither the school nor slave quarters would have a view to the alternative route due to distance and intervening vegetation.

The Dulles International Airport Historic District (053-0008) is located in Loudoun County, approximately 0.38 mile to the south of approximate MP 0.2 of the 230 kV split. The area between the resource and the alternative transmission line route is densely wooded, so the route would not be visible from most of the resource. However, Alternative Route 2 would be visible from the airport runway. Here, only the tops of the poles would be visible from the tree line, and are likely to be visible only during leaf-off seasons. In addition, the recorded boundary for the resource encompasses 1,726.60 acres, and only a small portion of the district is located in the half-mile study tier for the route. Furthermore, mature vegetation surrounding the district blocks visibility of the transmission line structures from many vantage points. Thus, ERM recommends that Alternative Route 2 would have a minimal impact on the Dulles International Airport Historic District.

<b>TABLE I-3</b> <b>500-230 kV Wishing Star Substation, 500-230 kV Mars Wishing Star Lines, 500-230 kV Mars Substation, and Mars kV Loop Project</b> <b>Resources in VDHR Tiers for Alternative Route 2</b>				
Buffer (miles)	Considered Resources	VDHR #	Description	Impact
1.0-1.5	National Historic Landmarks	NA	NA	NA
0.5-1.0	National Register—Listed	053-0982	Arcola Elementary School	None
		053-0984	Arcola Slave Quarters	None
0.0- 0.5	National Register—Eligible	053-0008	Dulles International Airport Historic District	Minimal
0.0 (within right-of-way)	NA	NA	NA	NA

The Stage I Analysis also considered the potential effects to archaeological resources. Four archaeological sites lie within the new right-of-way associated with Alternative Route 2 (44LD0167, 44LD0168, 44LD0173, and 44LD0970).

Two of these sites (44LD0168 and 44LD0173) have been determined not eligible for the NRHP and require no further consideration. 44LD0168 is a Pre-Contact temporary camp that primarily consists of a quartz lithic scatter. Alternative Route 2 crosses the southwestern half of the site. 44LD0173 consists of a Pre-Contact temporary camp and lithic scatter that included a quartzite late stage biface fragment, a quartz early to middle stage biface fragment, quartz flakes, rhyolite flakes, a quartz cobble fragment, a stoneware sherd, and a glass shard. Alternative Route 2 intersects the northern section

of 44LD0173's boundary. The current design of the route would include the placement of a transmission structure within the site.

Alternative Route 2 also crosses 44LD0167 and 44LD0970. 44LD0167 is a Pre-Contact temporary camp site, consisting of one quartz shallow side-notched point. The overall integrity of the site is unknown and it has not been formally evaluated for NRHP eligibility. Alternative Route 2 crosses the length of 44LD0167 (approximately 719 feet). The construction of Alternative Route 2 would include clearing of the right-of-way, which could impact the archaeological deposits at the site. However, because the resource is not evaluated for NRHP eligibility, further survey will need to occur in order to determine its eligibility. If the site is found to be eligible, the route may need to be altered in order to protect the site, or the site might require further archaeological investigation to recover information that could be lost as a result of construction impacts. 44LD0970 is a Late Archaic period lithic scatter consisting of two quartz flakes, a quartzite projectile point fragment, two rhyolite flakes, and a chert flake. The site has suffered significant disturbance, but has not been formally evaluated for NRHP eligibility. The southern half of the right-of-way for Alternative Route 2 crosses 44LD0970. The site could be impacted by the clearing of the right-of-way and associated construction activities. However, since the site has been previously disturbed, it is anticipated that the construction of Alternative Route 2 would have minimal impacts on the site.

### Alternative Route 3

Three aboveground historic resources were identified within the VDHR study tiers for Alternative Route 3 (Table I-4). Construction and operation of the new facilities associated with this route would have no impact on two resources (053-0982 and 053-0984) and a minimal impact on one resource (053-0008).

Arcola Elementary School (053-0982) is located in Loudoun County, approximately 0.64 mile to the south-southwest of approximate MP 1.1 of Alternative Route 3. Arcola Slave Quarters (053-0984) is located in Loudoun County, approximately 0.55 mile to the south of approximate MP 1.1 for Alternative Route 3. Neither the school nor slave quarters would have a view to the alternative route due to distance and intervening vegetation.

The Dulles International Airport Historic District (053-0008) is located in Loudoun County, approximately 0.38 mile to the south of approximate MP 0.2 of the 230 kV split. The area between the resource and the alternative transmission line route is densely wooded, so the route would not be visible from most of the resource. However, Alternative Route 3 would be visible from the airport runway. Here, only the tops of the poles would be visible from the tree line, and are likely to be visible only during leaf-off seasons. In addition, the recorded boundary for the resource encompasses 1,726.60 acres, and only a small portion of the district is located in the half-mile study tier for the route. Furthermore, mature vegetation surrounding the district blocks



visibility of the transmission line structures from many vantage points. Thus, ERM recommends that Alternative Route 3 would have a minimal impact on the Dulles International Airport Historic District.

<b>TABLE I-4</b> <b>500-230 kV Wishing Star Substation, 500-230 kV Mars Wishing Star Lines, 500-230 kV Mars Substation, and Mars kV Loop Project</b> <b>Resources in VDHR Tiers for Alternative Route 3</b>				
Buffer (miles)	Considered Resources	VDHR #	Description	Impact
1.0-1.5	National Historic Landmarks	NA	NA	NA
0.5-1.0	National Register—Listed	053-0982	Arcola Elementary School	None
		053-0984	Arcola Slave Quarters	None
0.0- 0.5	National Register—Eligible	053-0008	Dulles International Airport Historic District	Minimal
0.0 (within right-of-way)	NA	NA	NA	NA

The Stage I Analysis also considered the potential effects to archaeological resources. One archaeological site lies within the new right-of-way associated with Alternative Route 3 (44LD0168).

Alternative Route 3 crosses the southwestern half of 44LD0168. The site is a Pre-Contact temporary camp that primarily consists of a quartz lithic scatter. As the site has been determined not eligible for the NRHP, it requires no further consideration.

#### Alternative Route 4

Three aboveground historic resources were identified within the VDHR study tiers for Alternative Route 4 (Table I-5). Construction and operation of the new facilities associated with this route would have no impact on two resources (053-0982 and 053-0984) and a minimal impact on one resource (053-0008).

Arcola Elementary School (053-0982) is located in Loudoun County, approximately 0.64 mile to the south-southwest of approximate MP 1.1 of Alternative Route 4. Arcola Slave Quarters (053-0984) is located in Loudoun County, approximately 0.55 mile to the south of approximate MP 1.1 for Alternative Route 4. Neither the school nor slave quarters would have a view to the alternative route due to distance and intervening vegetation.

The Dulles International Airport Historic District (053-0008) is located in Loudoun County, approximately 0.38 mile to the south of approximate MP 0.2 of the 230 kV

split. The area between the resource and Alternative Route 4 is densely wooded, so the route would not be visible from most of the resource. However, Alternative Route 4 would be visible from the airport runway. Here, only the tops of the poles would be visible from the tree line, and are likely to be visible only during leaf-off seasons. In addition, the recorded boundary for the resource encompasses 1,726.60 acres, and only a small portion of the district is located in the half-mile study tier for the route. Furthermore, mature vegetation surrounding the district blocks visibility of the transmission line structures from many vantage points. Thus, ERM recommends that Alternative Route 4 would have a minimal impact on the Dulles International Airport Historic District.

<b>TABLE I-5</b> <b>500-230 kV Wishing Star Substation, 500-230 kV Mars Wishing Star Lines, 500-230 kV Mars Substation, and Mars kV Loop Project</b> <b>Resources in VDHR Tiers for Alternative Route 4</b>				
Buffer (miles)	Considered Resources	VDHR #	Description	Impact
1.0-1.5	National Historic Landmarks	NA	NA	NA
0.5-1.0	National Register—Listed	053-0982	Arcola Elementary School	None
		053-0984	Arcola Slave Quarters	None
0.0- 0.5	National Register—Eligible	053-0008	Dulles International Airport Historic District	Minimal
0.0 (within right-of-way)	NA	NA	NA	NA

The Stage I Analysis also considered the potential effects to archaeological resources. Three archaeological sites lie within the new right-of-way associated with Alternative Route 4 (44LD0168, 44LD0173, and 44LD0970).

Two of these sites (44LD0168 and 44LD0173) have been determined not eligible for the NRHP and require no further consideration. Alternative Route 4 crosses the southwestern half of 44LD0168. The site is a Pre-Contact temporary camp that primarily consists of a quartz lithic scatter. 44LD0173 consists of a Pre-Contact temporary camp and lithic scatter that includes a quartzite late stage biface fragment, a quartz early to middle stage biface fragment, quartz flakes, rhyolite flakes, a quartz cobble fragment, a stoneware sherd, and a glass shard. Alternative Route 4 crosses the northern portion of the site.

44LD0970 is a Late Archaic period lithic scatter consisting of two quartz flakes, a quartzite projectile point fragment, two rhyolite flakes, and a chert flake. The site has suffered significant disturbance, but has not been formally evaluated for NRHP eligibility. The southern half of the right-of-way for Alternative Route 4 crosses

44LD0970. The site could be impacted by clearing of the right-of-way and associated construction activities. However since the site has been previously disturbed, it is anticipated that the construction of Alternative Route 4 would have minimal impacts on the site.

### Alternative Route 6

Three aboveground historic resources were identified within the VDHR study tiers for Alternative Route 6 (Table I-6). Construction and operation of the new facilities associated with this route would have no impact on two resources (053-0982 and 053-0984) and a minimal impact on one resource (053-0008).

Arcola Elementary School (053-0982) is located in Loudoun County, approximately 0.66 mile to the south of approximate MP 0.8 of Alternative Route 6. Arcola Slave Quarters (053-0984) is located in Loudoun County, approximately 0.57 mile to the south of approximate MP 1.3 of Alternative Route 6. Neither the school nor slave quarters would have a view to the alternative route due to distance and intervening vegetation.

The Dulles International Airport Historic District (053-0008) is located in Loudoun County, approximately 0.38 mile to the south of approximate MP 0.2 of the 230 kV split. The area between the resource and the alternative transmission line route is densely wooded, so the route would not be visible from most of the resource. However, Alternative Route 6 would be visible from the airport runway. Here, only the tops of the poles would be visible from the tree line, and are likely to be visible only during leaf-off seasons. In addition, the recorded boundary for the resource encompasses 1,726.60 acres, and only a small portion of the district is located in the half-mile study tier for the route. Furthermore, mature vegetation surrounding the district blocks visibility of the transmission line structures from many vantage points. Thus, ERM recommends that Alternative Route 6 would have a minimal impact on the Dulles International Airport Historic District.

<b>TABLE I-6</b> <b>500-230 kV Wishing Star Substation, 500-230 kV Mars Wishing Star Lines, 500-230 kV Mars Substation, and Mars kV Loop Project</b>				
<b>Resources in VDHR Tiers for Alternative Route 6</b>				
Buffer (miles)	Considered Resources	VDHR #	Description	Impact
1.0-1.5	National Historic Landmarks	NA	NA	NA
0.5-1.0	National Register—Listed	053-0982	Arcola Elementary School	None
		053-0984	Arcola Slave Quarters	None
0.0- 0.5	National Register—Eligible	053-0008	Dulles International Airport Historic District	Minimal

0.0 (within right-of-way)	NA	NA	NA	NA
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The Stage I Analysis also considered the potential effects to archaeological resources. Five archaeological sites lie within the new right-of-way associated with Alternative Route 6 (44LD0168, 44LD0173, 44LD0174, 44LD0609, and 44LD0970).

Three of these sites (44LD0168, 44LD0173, and 44LD0174) have been determined not eligible for the NRHP and require no further consideration. The right-of-way for Alternative Route 6 crosses the southwestern half of 44LD0168's. The site is a Pre-Contact temporary camp that primarily consists of a quartz lithic scatter. 44LD0173 consists of a Pre-Contact temporary camp and lithic scatter that includes a quartzite late stage biface fragment, a quartz early to middle stage biface fragment, quartz flakes, rhyolite flakes, a quartz cobble fragment, a stoneware sherd, and a glass shard. Alternative Route 6 crosses the northern section of the site. 44LD0174 is a Pre-Contact temporary camp containing a lithic scatter with two stemmed points suggesting a Late Archaic component. The right-of-way for Alternative Route 6 crosses a very small portion of the northern portion of 44LD0174.

Alternative Route 6 also crosses 44LD0609 and 44LD0970. 44LD0609 is an Early Woodland base camp consisting of a Susquehanna broadspear point, a chert bifacial tool, a grit-tempered Marcey Creek variant ceramic sherd, and five quartz flakes. The integrity of 44LD0609 is unknown, and it has not been formally evaluated for NRHP eligibility. The right-of-way for Alternative Route 6 abuts the northern boundary of the site. The clearing of the right-of-way and associated construction activities could impact the site. Because the resource has not been formally evaluated, further survey would need to occur in order to determine the NRHP eligibility of the site. The alignment of the route may need to be modified to protect the site or the site might require further archaeological investigation to recover information that could be lost as a result of construction impacts. 44LD0970 is a Late Archaic period lithic scatter consisting of two quartz flakes, a quartzite projectile point fragment, two rhyolite flakes, and a chert flake. The site has suffered significant disturbance, but has not been formally evaluated for NRHP eligibility. The southern half of the right-of-way for Alternative Route 6 crosses 44LD0970. The clearing of the right-of-way and associated construction activities could impact the site. The site could be impacted by construction traffic or clearing within the new right-of-way or structure placement. However since the site has been previously disturbed, it is anticipated that the construction of Alternative Route 6 would have minimal impacts on the site.

## **Mars 230 kV Loop**

### Mars 230 kV Loop Proposed Route

No architectural resources were identified within the VDHR study tiers for the Mars 230 kV Loop Proposed Route (Table I-7).

<b>TABLE I-7</b> <b>500-230 kV Wishing Star Substation, 500-230 kV Mars Wishing Star Lines, 500-230 kV Mars Substation, and Mars kV Loop Project</b> <b>Resources in VDHR Tiers for Mars 230 kV Loop Proposed Route</b>				
Buffer (miles)	Considered Resources	VDHR #	Description	Impact
1.0-1.5	National Historic Landmarks	NA	NA	NA
0.5-1.0	National Register—Listed	NA	NA	NA
0.0- 0.5	National Register—Eligible	NA	NA	NA
0.0 (within right-of-way)	NA	NA	NA	NA

The Stage I Analysis also considered the potential effects to archaeological resources. One archaeological site lies within the new right-of-way associated with the Mars 230 kV Loop Proposed Route (44LD1742).

Site 44LD1742, the Carter Schoolhouse, consists of the burned remains of the school building built ca. 1920 and closed between 1936 and 1939. The remains consist of a stone rubble foundation and brick chimney fall. A total of 385 artifacts are reported from previous investigations, including porcelain, whiteware, glass fragments, metal nails, and a decorative plate. The right-of-way for the Mars 230 kV Loop Proposed Route crosses the site. However, as the site has been determined not eligible for the NRHP, it requires no further consideration.

## Substations

### Wishing Star Substation

One aboveground historic resource was identified within the VDHR study tiers for the Wishing Star Substation (Table I-8). Construction and operation of the new substation would have no impact on the resource.

Arcola Elementary School (053-0982) is located approximately 0.83 mile to the southeast of the proposed Wishing Star Substation. Due to intervening vegetation, residential development, and distance, there would be no view to the substation from this resource.

<b>TABLE I-8</b> <b>500-230 kV Wishing Star Substation, 500-230 kV Mars Wishing Star Lines, 500-230 kV Mars Substation, and Mars kV Loop Project</b> <b>Resources in VDHR Tiers for Wishing Star Substation</b>				
Buffer (miles)	Considered Resources	VDHR #	Description	Impact
1.0-1.5	National Historic Landmarks	NA	NA	NA
0.5-1.0	National Register—Listed	053-0982	Arcola Elementary School	None
0.0- 0.5	National Register—Eligible	NA	NA	NA
0.0 (within right-of-way)	NA	NA	NA	NA

The Stage I Analysis also considered the potential effects to archaeological resources. One archaeological site lies within the footprint associated with the Wishing Star Substation (44LD1280). Site 44LD1280 is a historic railroad bed. The site is approximately 1.7 miles long and consists of cuts and berms associated with the proposed Loudoun Branch of the Manassas Gap Rail Company. Construction of the railroad began in 1853, but was abandoned prior to the Civil War and never completed. An approximately 0.21-mile segment of the railroad crosses the northern portion of the proposed Wishing Star Substation. However, as the site has been determined not eligible for the NRHP, it requires no further consideration.

### Mars Substation

One aboveground historic resource was identified within the VDHR study tiers for the Mars Substation (Table I-9). Construction and operation of the new substation would have a minimal impact on the resource.

Dulles International Airport Historic District (053-0008) is located in Loudoun County, approximately 0.42 mile to the south of the proposed Mars Substation. The area between the resource and the substation is densely wooded, so the substation would not be visible from the resource. However, as the Mars Substation would be built in conjunction with the Project routes, both the substation and the associated lines must be included in the analysis of viewshed impacts for the Project routes. The routes are the same in the area surrounding the substation, and thus, impacts from the substation and transmission line collectively are reviewed here. It is the case that Mars-Wishing Star Alternative Routes 1 through 6 all present equal, albeit minimal, potential for viewshed impacts. While all of the routes would be visible from the runway, only the tops of the poles would be visible from the tree line. However, they are likely to be visible only during off-leaf seasons. In addition, the recorded boundary for the resource encompasses 1,726.60 acres, and only a small portion of the district is located in the

half-mile study tier for the routes. Furthermore, mature vegetation surrounding the district blocks visibility of the transmission line structures from many vantage points. Thus, ERM recommends that the proposed Mars Substation and any associated transmission lines under consideration would have a minimal impact on the Dulles International Airport Historic District.

<b>TABLE I-9</b> <b>500-230 kV Wishing Star Substation, 500-230 kV Mars Wishing Star Lines, 500-230 kV Mars Substation, and Mars kV Loop Project</b> <b>Resources in VDHR Tiers for Mars Substation</b>				
Buffer (miles)	Considered Resources	VDHR #	Description	Impact
1.0-1.5	National Historic Landmarks	NA	NA	NA
0.5-1.0	National Register—Listed	NA	NA	NA
0.0- 0.5	National Register—Eligible	053-0008	Dulles International Airport Historic District	Minimal
0.0 (within right-of-way)	NA	NA	NA	NA

The Stage I Analysis also considered the potential effects to archaeological resources. No archaeological sites were identified within the footprint associated with the Mars Substation

## **J. Chesapeake Bay Preservation Areas**

The Project is located in a locality that is not subject to the Chesapeake Bay Preservation Act. Construction, installation, operation and maintenance of electric transmission lines are conditionally exempt from the Chesapeake Bay Act as stated in the exemption for public utilities, railroads, public roads and facilities in 9 VAC 25-830-150. The Company will meet those conditions.

## **K. Wildlife Resources**

Relevant agency databases were reviewed and requests for comments from the USFWS, VDWR, and VDCR were submitted to determine if the proposed Project has the potential to affect any threatened or endangered species. As discussed in Section 2.G and identified in Attachment 2.G.1, certain federal and state listed species were identified as potentially occurring in the Project area. The Company will coordinate with the USFWS, VDWR, and VDCR as appropriate to determine whether additional surveys are necessary and to minimize impacts on wildlife resources. In general, the Project area includes a combination of undeveloped forested land (deciduous species with scattered pine), open space, and



developed land consisting of public roads, industrial, and commercial use. Native grasses can be used during revegetation to maintain a healthy plant species diversity.

Dominion Energy Virginia would further minimize potential effects by avoiding trees favorable for bat maternity roosting locations and cutting trees and vegetation during the time-of-year restriction from April 15–August 15 to avoid nesting birds and bat maternity roosting locations, to the extent practicable.

The potential impacts of the Project are discussed further below. For comparison purposes, each of the Mars-Wishing Star Lines routes includes the potential impacts associated with the Wishing Star and Mars Substation footprints. The potential impacts associated with the Mars 230 kV Loop are limited to the proposed transmission line right-of-way.

### **Mars-Wishing Star Lines**

#### Proposed Route (Route 5)

The Proposed Route crosses undeveloped forested land (42.84 acres), developed land (18.81 acres), and areas of open space (28.91 acres). Based on review of recent (2022) aerial photography, a total of approximately 42.84 acres of trees would need to be cleared within the right-of-way for the transmission lines (25.21 acres), Wishing Star Substation footprint (15.91 acres), and Mars Substation footprint (1.71 acres).

#### Alternative Route 1

Alternative Route 1 crosses undeveloped forested land (33.98 acres), developed land (18.88 acres), and areas of open space (37.73 acres). Based on review of recent (2022) aerial photography, a total of approximately 33.98 acres of trees would need to be cleared within the right-of-way for the transmission lines (16.36 acres), Wishing Star Substation footprint (15.91 acres), and Mars Substation footprint (1.71 acres).

#### Alternative Route 2

Alternative Route 2 crosses undeveloped forested land (34.96 acres), developed land (18.81 acres), and areas of open space (36.21 acres). Based on review of recent (2022) aerial photography, a total of approximately 34.96 acres of trees would need to be cleared within the right-of-way for the transmission lines (17.33 acres), Wishing Star Substation footprint (15.91 acres), and Mars Substation footprint (1.71 acres).

#### Alternative Route 3

Alternative Route 3 crosses undeveloped forested land (40.69 acres), developed land (18.88 acres), and areas of open space (30.94 acres). Based on review of recent (2022) aerial photography, a total of approximately 40.69 acres of trees would need to be cleared within the right-of-way for the transmission lines (23.07 acres), Wishing Star Substation footprint (15.91 acres), and Mars Substation footprint (1.71 acres).

#### Alternative Route 4

Alternative Route 4 crosses undeveloped forested land (41.66 acres), developed land (18.81 acres), and areas of open space (29.42 acres). Based on review of recent (2022) aerial photography, a total of approximately 41.66 acres of trees would need to be cleared within the right-of-way for the transmission lines (24.04 acres), Wishing Star Substation footprint (15.91 acres), and Mars Substation footprint (1.71 acres).

#### Alternative Route 6

Alternative Route 6 crosses undeveloped forested land (42.96 acres), developed land (18.81 acres), and areas of open space (28.36 acres). Based on review of recent (2022) aerial photography, a total of approximately 42.96 acres of trees would need to be cleared within the right-of-way for the transmission lines (25.34 acres), Wishing Star Substation footprint (15.91 acres), and Mars Substation footprint (1.71 acres).

### **Mars 230 kV Loop**

#### Mars 230 kV Loop Proposed Route

The Mars 230 kV Loop Proposed Route crosses undeveloped forested land (8.84 acres), developed land (1.50 acres), and no areas of open space. Based on review of recent (2022) aerial photography, a total of approximately 8.84 acres of trees would need to be cleared within the right-of-way for the transmission lines.

## **L. Recreation, Agricultural, and Forest Resources**

The Project is expected to have minimal to no long-term impacts to recreation, no impacts to agricultural resources, and a moderate impact to forested resources in the proximity to Broad Run.

The Proposed Route for the Mars-Wishing Star Lines would impact forested habitat adjacent to the Company's existing transmission right-of-way for Lines #2172 and #2183. Unlike Alternative Routes 1, 2, 3, and 4, the Proposed Route (and Alternative Route 6) is collocated for a greater distance along the existing right-of-way and decreases fragmentation of forest habitat along Broad Run by not requiring two north-south spans of the riparian corridor. The Proposed Route for the Mars 230 kV Loop would also impact forested land, however much of the effected forest would be impacted by development of the property.

The Virginia Scenic Rivers Act seeks to identify, designate, and protect rivers and streams that possess outstanding scenic, recreational, historic, and natural characteristics of statewide significance for future generations. No state scenic rivers are crossed by the Mars-Wishing Star Lines and the Mars 230 kV Loop. The Mars-Wishing Star Lines cross Broad Run, a tributary of the Potomac River. Broad Run has not been designated, nor identified as a qualified or potential scenic river by the VDCR.

The Virginia Agricultural and Forestal Districts Act provides for the creation of conservation districts designed to conserve, protect, and encourage the development and improvement of a locality's agricultural and forested lands. According to the Virginia Department of Forestry ("VDOF"), the Project affects no Agricultural and Forestal Districts ("AFDs"). The Proposed Routes for the Mars-Wishing Star Lines and the Mars 230 kV Loop cross a total of 51.65 acres of prime farmlands soils and 5.36 acres of soils classified as farmlands of state importance.

Under the Virginia Open-Space Land Act, any public body can acquire title or rights to real property to provide means of preservation of open-space land. Such conservation easements must be held for no less than five years in duration and can be held in perpetuity. According to the VDCR's NHDE, the Project would not impact Virginia Outdoors Foundation ("VOF") easements, Loudoun County Conservation Easements, or any other easements identified by the VDCR.

The Mars-Wishing Star Lines Proposed Route and Alternative Routes cross proffers and preservation areas associated with the forested and riparian habitat within and along the Broad Run corridor. These areas include the open space proffer associated with Birchwood Community Association at Brambleton (Stream Valley Park) as well as Restrictive Preservation Areas and Wetland Mitigation Areas located on the Brambleton Shreveport property. The Restrictive Preservation Areas and Wetland Mitigation Areas were granted as restrictive covenants on the Brambleton Shreveport property tied directly to previously issued permits from the Corps and Virginia DEQ. The restrictive covenants were established, in part, to mitigate impacts from residential development to the north of Evergreen Mills Road.

Any tree along the right-of-way that is tall enough to endanger the conductors if it were to break at the stump or uproot and fall directly toward the conductors and exhibits signs or symptoms of disease or structural defect that make it an elevated risk for falling will be designated as a "danger tree" and may be removed. The Company's arborist will contact the property owner if possible before any danger trees are cut, except in emergency situations. The Company's Forestry Coordinator will field inspect the right-of-way and designate any danger trees present. Qualified contractors working in accordance with the Company's Electric Transmission specifications will perform all danger tree cutting.

## **Mars-Wishing Star Lines**

### Proposed Route (Route 5)

The Proposed Route would be collocated for a total of 1.73 miles with existing overhead lines. The Proposed Route would impact 42.84 acres of forested land.

A review of NRCS Data soils data indicates that approximately 5.35 acres of the footprint of the Proposed Route are classified as farmland of statewide importance and approximately 43.19 acres of the footprint of the Proposed Route are classified as prime farmland. According to a review of recent 2022 aerial photography and site visits, no

land being used for agricultural purposes within or near the right-of-way of the Proposed Route. The Proposed Route crosses no AFDs or agricultural lands, nor does the route run parallel to or cross any Virginia Byways, Scenic Rivers, Resource Protection Areas, or Virginia Birding and Wildlife Trails.

The Proposed Route impacts 4.84 acres of the Stream Valley Park open space proffer and 5.06 acres of Restrictive Preservation Areas. The Proposed Route does not impact Wetland Mitigation Areas.

#### Alternative Route 1

Alternative Route 1 would be collocated for a total of 0.57 mile with existing overhead lines. Alternative Route 1 would impact 33.98 acres of forested land.

A review of NRCS soils data indicates that approximately 49.01 acres of the area of disturbance of Alternative Route 1 are classified as prime farmland and 4.04 acres are classified as farmland of statewide importance. According to a review of recent 2022 aerial photography and site visits, no land being used for agricultural purposes within or near the right-of-way of Alternative Route 1. Alternative Route 1 crosses no AFDs or agricultural lands nor does the route run parallel to or cross any Virginia Byways, Scenic Rivers, Resource Protection Areas, or Virginia Birding and Wildlife Trails.

Alternative Route 1 impacts 5.14 acres of the Stream Valley Park open space proffer, 2.68 acres of Restrictive Preservation Areas, and 4.32 acres of Wetland Mitigation Areas.

#### Alternative Route 2

Alternative Route 2 would be collocated for a total of 0.96 mile with existing overhead lines. Alternative Route 2 would impact 34.96 acres of forested land.

A review of NRCS soils data indicates that approximately 44.52 acres of the area of disturbance of Alternative Route 2 are classified as prime farmland and 6.60 acres are classified as farmland of statewide importance. According to a review of recent 2022 aerial photography and site visits, no land being used for agricultural purposes within or near the right-of-way of Alternative Route 2. Alternative Route 2 crosses no AFDs or agricultural lands nor does the route run parallel to or cross any Virginia Byways, Scenic Rivers, Resource Protection Areas, or Virginia Birding and Wildlife Trails.

Alternative Route 2 impacts 4.93 acres of the Stream Valley Park open space proffer, 4.32 acres of Restrictive Preservation Areas, and 4.11 acres of Wetland Mitigation Areas.

### Alternative Route 3

Alternative Route 3 would be collocated for a total of 0.95 mile with existing overhead lines. Alternative Route 3 would impact 40.69 acres of forested land.

A review of NRCS soils data indicates that approximately 50.07 acres of the area of disturbance of Alternative Route 3 are classified as prime farmland and 1.74 acres are classified as farmland of statewide importance. According to a review of recent 2022 aerial photography and site visits, no land being used for agricultural purposes within or near the right-of-way of Alternative Route 3. Alternative Route 3 crosses no AFDs or agricultural lands nor does the route run parallel to or cross any Virginia Byways, Scenic Rivers, Resource Protection Areas, or Virginia Birding and Wildlife Trails.

Alternative Route 3 impacts 5.14 acres of the Stream Valley Park open space proffer, 3.27 acres of Restrictive Preservation Areas, and 2.20 acres of Wetland Mitigation Areas.

### Alternative Route 4

Alternative Route 4 would be collocated for a total of 1.33 miles with existing overhead lines. Alternative Route 4 would impact 41.66 acres of forested land.

A review of NRCS soils data indicates that approximately 45.28 acres of the area of disturbance of Alternative Route 4 are classified as prime farmland and 4.30 acres are classified as farmland of statewide importance. According to a review of recent 2022 aerial photography and site visits, no land being used for agricultural purposes within or near the right-of-way of Alternative Route 4. Alternative Route 4 crosses no AFDs or agricultural lands nor does the route run parallel to or cross any Virginia Byways, Scenic Rivers, Resource Protection Areas, or Virginia Birding and Wildlife Trails.

Alternative Route 4 impacts 4.93 acres of the Stream Valley Park open space proffer, 4.17 acres of Restrictive Preservation Areas, and 2.20 acres of Wetland Mitigation Areas.

### Alternative Route 6

Alternative Route 6 would be collocated for a total of 1.73 miles with existing overhead lines. Alternative Route 6 would impact 42.96 acres of forested land.

A review of NRCS soils data indicates that approximately 40.93 acres of the area of disturbance of the Alternative Route 6 are classified as prime farmland and 5.35 acres are classified as farmland of statewide importance. According to a review of recent 2022 aerial photography and site visits, no land being used for agricultural purposes within or near the right-of-way of Alternative Route 6. Alternative Route 6 crosses no AFDs or agricultural lands nor does the route run parallel to or cross any Virginia

Byways, Scenic Rivers, Resource Protection Areas, or Virginia Birding and Wildlife Trails.

Alternative Route 6 impacts 4.84 acres of the Stream Valley Park open space proffer and 10.93 acres of Restrictive Preservation Areas. Alternative Route 6 does not impact Wetland Mitigation Areas.

## **Mars 230 kV Loop**

### Mars 230 kV Loop Proposed Route

The Mars 230 kV Loop Proposed Route would be collocated for a total of 0.47 mile with Carters School Road. The Proposed Route would impact 8.84 acres of forested land.

A review of NRCS Data soils data indicates that approximately 3.12 acres of the footprint of the Proposed Route are classified as farmland of statewide importance and 0.00 acre of the footprint of the Proposed Route are classified as prime farmland. According to a review of recent 2022 aerial photography and site visits, no land being used for agricultural purposes within or near the right-of-way of the Proposed Route. The Proposed Route crosses no AFDs or agricultural lands nor does the route run parallel to or cross any Virginia Byways, Scenic Rivers, Resource Protection Areas, or Virginia Birding and Wildlife Trails.

The Mars 230 kV Loop Proposed Route does not cross open space proffers, Restrictive Preservation Areas, or Wetland Mitigation Areas

In September 2022, the Company solicited VDCR, VOF and VDOF for comments on the proposed Project. On October 3, 2022, VOF responded and based on their review, no existing or proposed VOF open-space easements are in the immediate proximity to the Project area. A copy of this correspondence is included as Attachment 2.L.1.

## **M. Use of Pesticides and Herbicides**

Of the techniques available, selective foliar is the preferred method of herbicide application. The Company typically maintains transmission line right-of-way by means of selective, low volume applications of EPA-approved, non-restricted use herbicides. The goal of this method is to exclude tall growing brush species from right-of-way by establishing early successional plant communities of native grasses, forbs, and low growing woody vegetation. “Selective” application means the Company sprays only the undesirable plant species (as opposed to broadcast applications). “Low volume” application means the Company uses only the volume of herbicide necessary to remove the selected plant species. The mixture of herbicides used varies from one cycle to the next to avoid the development of resistance by the targeted plants. There are four means of dispersal available to the Company, including by-hand application, backpack, fixed nozzle-radiarc, and aerial. Very little right-of-way maintenance incorporates aerial



equipment. The Company uses licensed contractors to perform this work that are either certified applicators or registered technicians in the Commonwealth of Virginia.

DEQ has previously requested that only herbicides approved for aquatic use by the EPA or the USFWS be used in or around any surface water. The Company intends to comply with this request.

Additionally, based on a discussion between Company and VDCR DNH representatives on August 23, 2022, the Company will review 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 will submit its updated IVMP to VDCR DNH for review once it is complete.<sup>5</sup>

## **N. Geology and Mineral Resources**

The Proposed Route and Alternative Routes are located within the Piedmont geologic province, which is characterized by strongly weathered bedrock due to the humid climate, thick soils overlying saprolite (weathered bedrock), and rolling topography that becomes more rugged to the west near the Blue Ridge mountains. In general, the Piedmont province consists of several complex geologic terranes where faults separate rock units with differing igneous and metamorphic histories. Based on review of the Geologic Map of Virginia, the Project area is located within a basin that formed as the Atlantic Ocean began opening during the early Mesozoic Era. Within this Mesozoic-age basin, the bedrock underlying the Project area comprises Triassic-age sandstones, shales, and siltstones that were deposited between approximately 225 and 190 million years ago and were subsequently intruded by fine-grained, dark-colored igneous dikes (Virginia Department of Energy 2022a; William and Mary Department of Geology 2022).

ERM reviewed publicly available Virginia Department of Energy datasets (2022b), USGS topographic quadrangles, and recent (2021) digital aerial photographs to identify mineral resources in the Project area. Based on the review, no active mineral resources were identified within 0.25 mile of any of the Project routes. The closest active mineral resource is the Chantilly Crushed Stone, Inc. trap rock quarry, which is located approximately 1.5 miles south of the Project area.

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<sup>5</sup> 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 VDCR DNH’s recommendation regarding an invasive species management plan (“ISMP”), but directed the Company to meet with VDCR 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 VDCR DNH’s ISMP; however, recommending that the Company meet with VDCR DNH regarding its IVMP and report the results of the meeting in the next transmission CPCN filing*).



## **O. Transportation Infrastructure**

### ***Road Transportation***

Temporary closures of roads or traffic lanes would be required during construction of the Project. No long-term impacts to roads are anticipated. The Company will comply with VDOT requirements for access to the rights-of-way from public. At the appropriate time, the Company will obtain the necessary VDOT permits as required and comply with permit conditions. The Company will work with Loudoun County to ensure the planned roads and proposed transmission facilities can co-exist.

On September 23, 2022, the Company solicited comments from VDOT and DTCI on the proposed Mars-Wishing Star Lines heading east out of the Wishing Star Substation. The Proposed Route and Alternative Routes all cross the future Northstar Boulevard expansion before crossing Arcola Mills Drive. On October 3, 2022, Mr. Tyler K. Brown of Shirley Contracting (VDOT's the civil construction contractor) replied via email that Mr. William Turner, the Utilities Relocation Coordinator for VDOT, was not concerned with the proposed alignment but requested that VDOT Maintenance Division be kept informed of the of the Project and that detailed plans be shared once available. See Attachment 2.O.1 for a copy of the email.

#### **Mars-Wishing Star Lines**

Existing roads crossed by the Mars-Wishing Star Lines routes are SR 857 (Carters School Road, SR 606 (Old Ox Road), SR 607 (Loudoun County Parkway), SR 649 (Belmont Ridge Road), and SR 621 (Arcola Mills Drive). Loudoun County plans to widen Belmont Ridge Road from Arcola Mills Drive to Evergreen Mills Road; however, this Project is identified in the Loudoun County FY 2022 Amended Capital Improvement Program as a "future road project," indicating that its funding is completely within "Future Funding Years" or at least four years beyond the planning period of FY 2023 through FY 2028 (Loudoun County 2022b).

The Proposed Route and Alternative Routes would also cross Northstar Boulevard Extension, a 1.6-mile extension of Northstar Boulevard that is planned as a four-lane divided highway from Evergreen Mills Road (formerly Shreveport Drive) to U.S. Route 50 with a 10-foot-wide shared use path on both sides of the roadway. At the northern end of the extension, a new bridge will carry Northstar Boulevard over the North Fork of Broad Run. Evergreen Mills Road will then be realigned to the south to intersect with Northstar Boulevard. The extension is expected to be completed in mid-2024 with construction underway in mid-2022.

The Proposed Route and all five Alternative Routes would cross Carters School Road, Old Ox Road, Belmont Ridge Road, Arcola Mills Drive, and the proposed Northstar Boulevard at the same location; these road crossings occur in areas where all routes follow a common alignment.

Alternative Routes 1 and 3 would cross Loudoun County Parkway at the same location, south of Evergreen Mills Road and north of Broad Run. The Proposed Route (Route 5) as well as Alternative Routes 2, 4, and 6 would cross Loudoun County Parkway north of Old Ox Road where the road spans Broad Run.

#### Mars 230 kV Loop

No existing roads are crossed by the Proposed Route for the Mars 230 kV Loop.

#### *Airports*

The design of the proposed Project must prevent interference with pilots' safe ingress and egress at airports in the vicinity of the Project. Such hazard or impediments include interference with navigation and communication equipment and glare from materials and external lights.

ERM reviewed the Federal Aviation Administration's ("FAA") website to identify public use airports, airports operated by a federal agency or the U.S. Department of Defense, airports or heliports with at least one FAA-approved instrument approach procedure, and public use or military airports under construction (FAA 2021). Based on this review, there are nine air facilities located within 10 nautical miles of the Project facilities.

- Dulles International Airport, approximately 0.1 mile south of Mars Substation;
- Stonesprings Heliport, approximately 1.2 miles south of Wishing Star Substation;
- Goose Hunt Farm Airport, 6.2 miles northwest of Wishing Star Substation;
- Reston Hospital Heliport, approximately 6.9 miles east of Mars Substation;
- Leesburg Executive Airport, approximately 7.6 miles north of Wishing Star Substation;
- Inova Fair Oaks Hospital, approximately 7.6 miles southeast of Mars Substation;
- Inova Loudoun Hospital Heliport, approximately 8.2 miles north of Mars-Wishing Star Lines Alternative Routes 1 and 3;
- Fairfax County Police Heliport, approximately 9.3 miles southeast of Mars Substation; and
- Crippen's Heliport, approximately 9.5 miles northeast of Mars Substation.

Of these air facilities, it was determined that the Dulles Airport was the only facility located in close enough proximity to potentially impact navigable airspace. FAA has defined imaginary surfaces for all runways associated with the Dulles Airport. The imaginary surfaces were developed to prevent existing or proposed objects from extending from the

ground into navigable airspace. Based on current plans, the proposed Project would require FAA notification only for Dulles Airport.

The Project conducted a preliminary evaluation of the route heights and locations using the FAA-defined Civil and Department of Defense Airport Imaginary Surfaces and applied standard geographic information system tools, including ESRI's ArcMap 3D and Spatial Extension software. This software was used to create and georeference the imaginary surfaces in space and in relationship to the transmission structures. Height limitations for the Project routes were analyzed along with FAA Part 77 airspace surfaces, to determine whether any of the transmission line heights associated with the routes for the Project would penetrate any of the relevant flight surfaces for any of the runways. The most critical airspace restrictions are associated with Dulles Airport Runway 12. The approach and departure surfaces associated with Runway 12 have a 50:1 slope ratio. Mars-Wishing Star Lines Routes 2, 4, 5 and 6 would be below this surface approximately 8,600 feet from the end of the runway, limiting structure heights in this area to 188 feet. Additionally, the horizontal surface for the runway covers most of the eastern half of all Project routes. This limits maximum structure heights west of the Mars Substation to 150 feet. Given structure heights for the Project will range from 90 feet to 190 feet, and can stay under 150 feet tall in the area west of Mars Substation, no Project route would penetrate the restricted Part 77 Airspace surface. Temporary construction equipment must also be cognizant of Part 77 airspace surfaces. All routes would require filing FAA Form 7460-1 in accordance with 14 CFR Part 77.9.

As part of the D2 Dulles Development Project for the airport, a fifth runway is proposed at the airport (D2 Dulles Development). The future runway would be located south and parallel to the existing Runway 12/30. Dominion Energy Virginia has incorporated this future runway into the analysis for this report.

On September 23, 2022, the Company solicited comments from the Virginia Department of Aviation ("DOAv") regarding the proposed Project. It was determined that the Project is located within 20,000 feet of the Dulles Airport and would therefore require submission of FAA form 7460 indicating the location, elevation and height of the Project. If no penetration of the Part 77 approach minimums would result, the department would not object to the Project. This response is included as Attachment 2.O.2.

## **ATTACHMENTS**

Dominion Energy Services, Inc.  
120 Tredegar Street  
Richmond, VA 23219  
DominionEnergy.com



September 23, 2022

**BY EMAIL**

**RE: Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop in Loudoun County, Virginia.**

To Whom it may Concern,

Dominion Energy Virginia (the "Company") is proposing to construct a new 500-230 kV substation (the "Wishing Star Substation"), a new overhead 500 kV single circuit transmission line with a 230 kV single circuit transmission line underbuilt (the "Mars-Wishing Star Lines"), a new 500-230 kV substation (the "Mars Substation"), and two new overhead 230 kV double circuit transmission lines (the "Mars 230 kV Loop") in Loudoun County, Virginia. Collectively, the Wishing Star Substation, the Mars-Wishing Star Lines, the Mars substation, the Mars 230 kV Loop and related substation work are referred to as the "Project." The Company has identified proposed and alternative routes in new right-of-way for the Mars-Wishing Star Lines and Mars 230 kV Loop, as shown on the attached map.

The Project is needed in response to significant increases in electrical demand over recent years as well as expected demand growth projected for the future, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is in the process of preparing an application for a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). At this time, in advance of filing an application for a CPCN from the Commission, the Company respectfully requests that you submit any comments or additional information that would have bearing on the proposed Project within 30 days of the date of this letter.

Enclosed is a Project Overview Map depicting the proposed and alternative routes of the Mars-Wishing Star Lines and Mars 230 kV Loop, as well as the general Project location. If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact James P. Young at (804) 426-6648 or [james.p.young@dominionenergy.com](mailto:james.p.young@dominionenergy.com).

We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

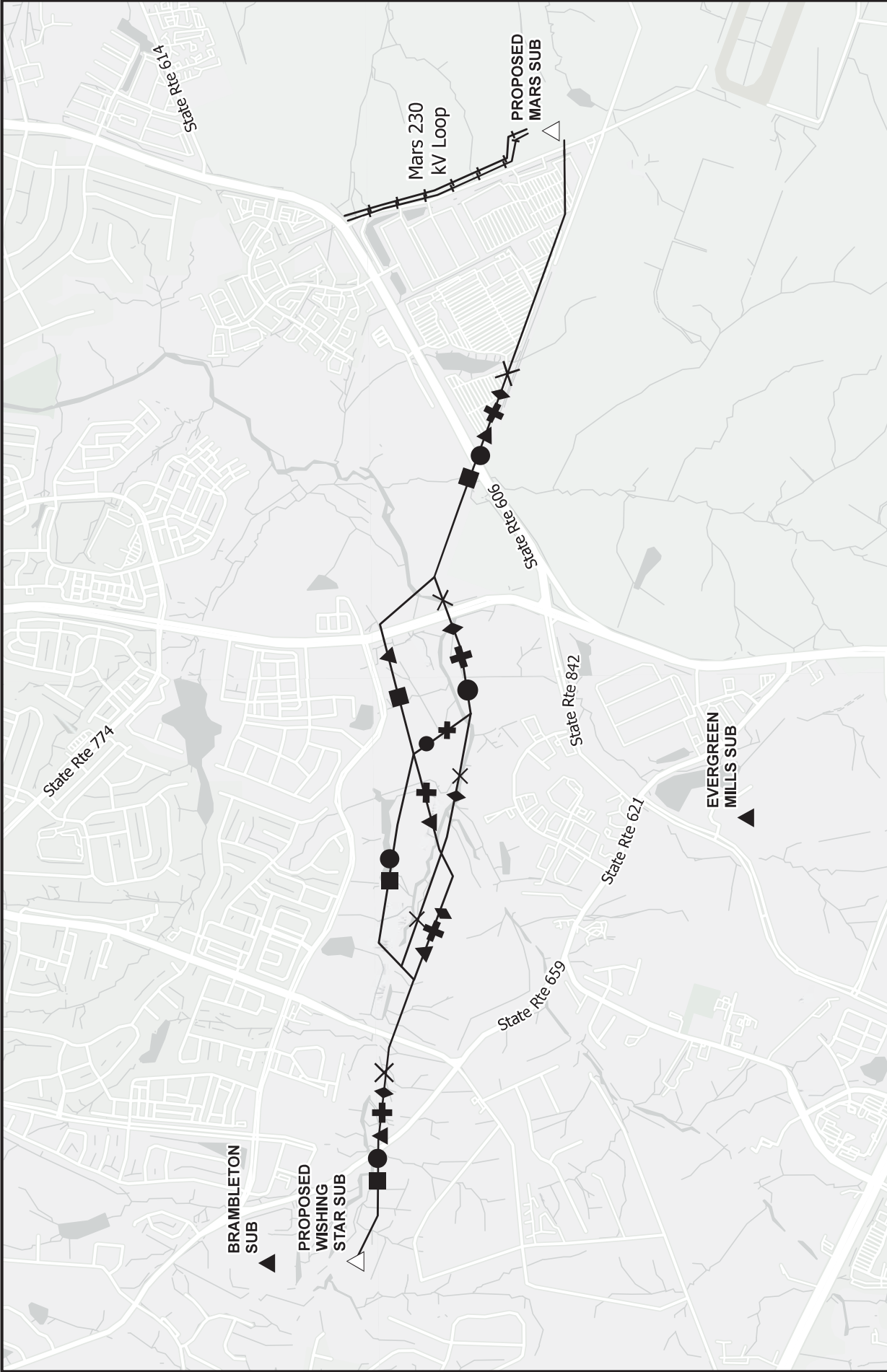
Sincerely,

**Dominion Energy Virginia**

A handwritten signature in black ink, appearing to read "DRS", with a horizontal line extending from the end.

Darrell R. Shier  
Manager, Environmental

Attachment: Project Notice Map



**Project Overview Map**

**500-230 kV Wishing Star Substation, 500-230 kV Mars Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Project**

Dominion Energy Virginia  
Loudoun County, VA

▲ Existing Substation

△ Proposed Substation

■ Mars-Wishing Star Route 1

● Mars-Wishing Star Route 2

▲ Mars-Wishing Star Route 3

✚ Mars-Wishing Star Route 4

◆ Mars-Wishing Star Route 5

✕ Mars-Wishing Star Route 6

— Mars 230 kV Loop

0 500 1,000 Feet

1:24,000

North Arrow



Dominion Energy Services, Inc.  
120 Tredegar Street  
Richmond, VA 23219  
DominionEnergy.com



September 23, 2022

**BY EMAIL**

Ms. Michelle Henicheck  
Office of Wetlands and Streams  
Department of Environmental Quality  
1111 East Main Street, Suite 1400  
Richmond, Virginia 23219

**RE: Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop in Loudoun County, Virginia.**

Dear Ms. Henicheck,

Dominion Energy Virginia (the "Company") is proposing to construct a new 500-230 kV substation (the "Wishing Star Substation"), a new overhead 500 kV single circuit transmission line with a 230 kV single circuit transmission line underbuilt (the "Mars-Wishing Star Lines"), a new 500-230 kV substation (the "Mars Substation"), and two new overhead 230 kV double circuit transmission lines ("Mars 230 kV Loop") in Loudoun County, Virginia. Collectively, the Wishing Star Substation, the Mars-Wishing Star Lines, the Mars Substation, the Mars 230 kV Loop and related substation work are referred to as the "Project." The Company has identified proposed and alternative routes in new right-of-way for the Mars-Wishing Star Lines and Mars 230 kV Loop, as shown on the attached map.

The Project is needed in response to significant increases in electrical demand over recent years as well as expected demand growth projected for the future, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is preparing an application for a Certificate of Public Convenience and Necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). Pursuant to the July 2003 Memorandum Wetlands Impact Consultation between the Company and the Department of Environmental Quality (the "DEQ"), Dominion Energy Virginia is sending this letter to initiate consultation with the DEQ prior to filing an application for a CPCN from the Commission.

A wetland delineation has not been conducted at this time. However, Environmental Resources Management conducted a wetland desktop study to identify probable wetlands based on a review of multiple data sources. The tables below provide a summary of the medium to high probability wetlands expected to be affected within the proposed Project right-of-way.

**Table 1: Summary of the Probabilities of Wetland and Waterbody Occurrence along Wishing Stars – Mars Project Route Alternatives <sup>a, b</sup>**

Probability	Total right-of-way Acres <sup>b</sup>	Wetland and Waterbody type (acres)				
		PEM Emergent	PFO Forested	PSS Scrub-shrub	PUB Freshwater pond	Riverine Stream
Wishing Star to Mars South 1						
High	0.9	0.0	0.6	0.0	NA	0.2



September 23, 2022  
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Probability	Total right-of-way Acres <sup>b</sup>	Wetland and Waterbody type (acres)				
		PEM Emergent	PFO Forested	PSS Scrub-shrub	PUB Freshwater pond	Riverine Stream
Medium/High	7.9	4.2	2.4	0.8	0.1	0.4
Medium	27.9	NA	NA	NA	NA	NA
Medium Low	10.9	2.9	5.9	0.7	1.0	0.4
Low	4.6	NA	NA	NA	NA	0.1
Very Low	2.4	NA	NA	NA	NA	NA
<b>Wishing Star to Mars South 2</b>						
High	0.9	0.0	0.6	0.0	NA	0.2
Medium/High	7.1	4.2	1.4	0.8	0.2	0.5
Medium	11.5	2.7	5.6	0.7	1.6	1.0
Medium Low	4.5	NA	NA	NA	NA	0.1
Low	27.4	NA	NA	NA	NA	NA
Very Low	10.6	NA	NA	NA	NA	NA
<b>Wishing Star to Mars South 3</b>						
High	0.8	0.0	0.6	0.0	NA	0.2
Medium/High	7.7	3.8	3.1	0.2	0.3	0.3
Medium	8.1	3.0	3.8	0.2	0.5	0.5
Medium Low	3.6	NA	NA	NA	NA	0.2
Low	34.5	NA	NA	NA	NA	NA
Very Low	6.9	NA	NA	NA	NA	NA
<b>Wishing Star to Mars South 4</b>						
High	0.8	0.0	0.6	0.0		0.2
Medium/High	7.0	3.8	2.2	0.2	0.4	0.4
Medium	8.8	2.8	3.5	0.2	1.0	1.1
Medium Low	3.5	NA	NA	NA	NA	NA
Low	31.6	NA	NA	NA	NA	NA
Very Low	10.2	NA	NA	NA	NA	NA
<b>Wishing Star to Mars South 5</b>						
High	1.2	0.0	0.9	0.0	NA	0.3
Medium/High	6.2	3.8	1.2	0.2	0.1	0.9
Medium	7.8	2.8	2.3	0.2	0.5	1.9
Medium Low	4.0	NA	0.0	NA	NA	0.5
Low	32.2	NA	NA	NA	NA	NA
Very Low	11.3	NA	NA	NA	NA	NA
<b>Wishing Star to Mars South 6</b>						
High	1.2	0.0	0.9	0.0	NA	0.3
Medium/High	8.2	4.3	2.3	0.2	0.1	1.2
Medium	7.8	2.7	2.3	0.2	0.5	2.0
Medium Low	7.7	NA	0.0	NA	NA	0.5
Low	28.8	NA	NA	NA	NA	NA
Very Low	9.2	NA	NA	NA	NA	NA

NA Not applicable due to absence of wetland or waterbody type within the alternative route  
a The numbers in this table have been rounded for presentation purposes; as a result, the totals may not reflect the sum of the addends.  
b Substation wetlands and waterbodies are included within each route rather than individually.  
c Total acres may not total the sum of wetland and waterbody types. This is due to the fact that some of the lower probability rankings do not overlap with NWI or interpreted wetlands, and therefore do not have a wetland/waterbody type associated with them.

September 23, 2022  
Page 3 of 4

**Table 2: Summary of the Probabilities of Wetland and Waterbody Occurrence along Project Mars 230 kV Loop Route <sup>a, b</sup>**

Probability	Total right-of-way Acres <sup>b</sup>	Wetland and Waterbody type (acres)				
		PEM Emergent	PFO Forested	PSS Scrub-shrub	PUB Freshwater pond	Riverine Stream
Mars 230 kV Loop						
High	NA	NA	NA	NA	NA	NA
Medium/High	1.0	0.2	0.6	NA	NA	0.1
Medium	1.6	NA	1.6	NA	NA	NA
Medium Low	7.2	NA	NA	NA	NA	NA
Low	3.9	NA	NA	NA	NA	NA
Very Low	NA	NA	NA	NA	NA	NA

NA Not applicable due to absence of wetland or waterbody type within the alternative route

a The numbers in this table have been rounded for presentation purposes; as a result, the totals may not reflect the sum of the addends.

b Substation wetlands and waterbodies are included within each route rather than individually.

c Total acres may not total the sum of wetland and waterbody types. This is due to the fact that some of the lower probability rankings do not overlap with NWI or interpreted wetlands, and therefore do not have a wetland/waterbody type associated with them.

The full Wetland Desktop Study will be submitted once finalized. Subsequently, a wetland delineation will be conducted and the limits of wetlands of other waters of the United States will be submitted to the U.S. Army Corps of Engineers for confirmation.

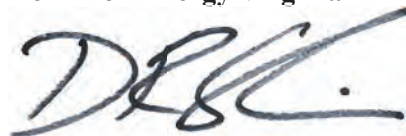
At this time, in advance of filing an application with the Commission, the Company respectfully requests that you submit any comments or additional information you feel would have bearing on the Project within 30 days of the date of this letter.

Enclosed is a Project Overview Map depicting the proposed and alternative routes of the Mars-Wishing Star Lines and Mars 230 kV Loop, as well as the general Project location. If you would like to receive a GIS shapefile of the route to assist in your project review or if you have any questions, please do not hesitate to contact James P. Young at (804) 426-6648 or [James.P.Young@dominionenergy.com](mailto:James.P.Young@dominionenergy.com).

The Company appreciates your assistance with this project review and looks forward to any additional information you may have to offer.

Sincerely,

**Dominion Energy Virginia**



Darrell R. Shier  
Manager, Environmental

Attachment: Project Map



**Project Overview Map**

**500-230 kV Wishing Star Substation, 500-230 kV Mars Wishing Star Lines,  
500-230 kV Mars Substation, and Mars 230 kV Loop Project**  
Dominion Energy Virginia  
Loudoun County, VA



Dominion Energy Virginia  
10900 Nuckols Rd, 4<sup>th</sup> Floor  
Glen Allen, VA 23060  
DominionEnergy.com



September 23, 2022

**Mr. Tony Buffington, Jr.**  
**Blue Ridge District Supervisor**  
**PO Box 7000**  
**Leesburg, Virginia 20177**

**Reference: Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Loudoun County, Virginia**  
**Notice Pursuant to Va. Code §15.2-2202 E**

Dear Mr. Buffington,

Dominion Energy Virginia (the "Company") is proposing to construct a new 500-230 kV substation (the "Wishing Star Substation"), a new overhead 500 kV transmission line with a 230 kV transmission line underbuilt (the "Mars-Wishing Star Lines"), a new 500-230 kV substation (the "Mars Substation"), and two new overhead 230 kV transmission lines (the "Mars 230 kV Loop") in Loudoun County, Virginia. Collectively, the Wishing Star Substation, the Mars-Wishing Star Lines, the Mars Substation, the Mars 230 kV Loop, and related substation work are referred to as the "Project." The Company has identified proposed and alternative routes in new right-of-way for the Mars-Wishing Star Lines and Mars 230 kV Loop, as shown on the attached map.

The Project is needed in response to significant increases in electrical demand over recent years as well as expected demand growth projected for the future, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is in process of preparing an application for a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). In advance of the filing an application for a CPCN from the Commission, the Company respectfully requests that you submit any comments or additional information that would have bearing on the proposed Project within 30 days of the date of this letter. Enclosed is a Project Overview Map depicting the proposed and alternative routes of the Mars-Wishing Star Lines and Mars 230 kV Loop, as well as the general Project location.

If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact Laura Meadows at (804) 239-8246 or [Laura.P.Meadows@dominionenergy.com](mailto:Laura.P.Meadows@dominionenergy.com). We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Regards,

*Christine F. Conrad*

Christine F. Conrad, Ph.D.  
Director Environmental Services, C2 Environmental, Inc.

Attachment: Project Location Map

Dominion Energy Virginia  
10900 Nuckols Rd, 4<sup>th</sup> Floor  
Glen Allen, VA 23060  
DominionEnergy.com



September 23, 2022

**Mr. Matthew Letourneau**  
**Dulles District Supervisor**  
**PO Box 7000**  
**Leesburg, Virginia 20177**

**Reference: Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Loudoun County, Virginia**  
**Notice Pursuant to Va. Code §15.2-2202 E**

Dear Mr. Letourneau,

Dominion Energy Virginia (the "Company") is proposing to construct a new 500-230 kV substation (the "Wishing Star Substation"), a new overhead 500 kV transmission line with a 230 kV transmission line underbuilt (the "Mars-Wishing Star Lines"), a new 500-230 kV substation (the "Mars Substation"), and two new overhead 230 kV transmission lines (the "Mars 230 kV Loop") in Loudoun County, Virginia. Collectively, the Wishing Star Substation, the Mars-Wishing Star Lines, the Mars Substation, the Mars 230 kV Loop, and related substation work are referred to as the "Project." The Company has identified proposed and alternative routes in new right-of-way for the Mars-Wishing Star Lines and Mars 230 kV Loop, as shown on the attached map.

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If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact Laura Meadows at (804) 239-8246 or [Laura.P.Meadows@dominionenergy.com](mailto:Laura.P.Meadows@dominionenergy.com). We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Regards,

*Christine F. Conrad*

Christine F. Conrad, Ph.D.  
Director Environmental Services, C2 Environmental, Inc.

Attachment: Project Location Map

Dominion Energy Virginia  
10900 Nuckols Rd, 4<sup>th</sup> Floor  
Glen Allen, VA 23060  
DominionEnergy.com



September 23, 2022

**Mr. Mike Helvey**  
**Obstruction Evaluation Group Manager**  
**Federal Aviation Administration, FAA Eastern Regional Office**  
**800 Independence Ave, SW, Room 400 East**  
**Washington, DC 20591**

**Reference: Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Loudoun County, Virginia**  
**Notice Pursuant to Va. Code §15.2-2202 E**

Dear Mr. Helvey,

Dominion Energy Virginia (the "Company") is proposing to construct a new 500-230 kV substation (the "Wishing Star Substation"), a new overhead 500 kV transmission line with a 230 kV transmission line underbuilt (the "Mars-Wishing Star Lines"), a new 500-230 kV substation (the "Mars Substation"), and two new overhead 230 kV transmission lines (the "Mars 230 kV Loop") in Loudoun County, Virginia. Collectively, the Wishing Star Substation, the Mars-Wishing Star Lines, the Mars Substation, the Mars 230 kV Loop, and related substation work are referred to as the "Project." The Company has identified proposed and alternative routes in new right-of-way for the Mars-Wishing Star Lines and Mars 230 kV Loop, as shown on the attached map.

The Project is needed in response to significant increases in electrical demand over recent years as well as expected demand growth projected for the future, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

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If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact Laura Meadows at (804) 239-8246 or [Laura.P.Meadows@dominionenergy.com](mailto:Laura.P.Meadows@dominionenergy.com). We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Regards,

*Christine F. Conrad*

Christine F. Conrad, Ph.D.  
Director Environmental Services, C2 Environmental, Inc.

Attachment: Project Location Map



Dominion Energy Virginia  
10900 Nuckols Rd, 4<sup>th</sup> Floor  
Glen Allen, VA 23060  
DominionEnergy.com



September 23, 2022

Mr. Tim Hemstreet  
Loudoun County Administrator  
PO Box 7000  
Leesburg, Virginia 20177

**Reference: Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Loudoun County, Virginia  
Notice Pursuant to Va. Code §15.2-2202 E**

Dear Mr. Hemstreet,

Dominion Energy Virginia (the "Company") is proposing to construct a new 500-230 kV substation (the "Wishing Star Substation"), a new overhead 500 kV transmission line with a 230 kV transmission line underbuilt (the "Mars-Wishing Star Lines"), a new 500-230 kV substation (the "Mars Substation"), and two new overhead 230 kV transmission lines (the "Mars 230 kV Loop") in Loudoun County, Virginia. Collectively, the Wishing Star Substation, the Mars-Wishing Star Lines, the Mars Substation, the Mars 230 kV Loop, and related substation work are referred to as the "Project." The Company has identified proposed and alternative routes in new right-of-way for the Mars-Wishing Star Lines and Mars 230 kV Loop, as shown on the attached map.

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Regards,

*Christine F. Conrad*

Christine F. Conrad, Ph.D.  
Director Environmental Services, C2 Environmental, Inc.

Attachment: Project Location Map



Dominion Energy Virginia  
10900 Nuckols Rd, 4<sup>th</sup> Floor  
Glen Allen, VA 23060  
DominionEnergy.com



September 23, 2022

Mr. Stephen Thompson  
Archaeologist, Loudoun County  
PO Box 7000  
Leesburg, Virginia 20177

**Reference: Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Loudoun County, Virginia  
Notice Pursuant to Va. Code §15.2-2202 E**

Dear Mr. Thompson,

Dominion Energy Virginia (the "Company") is proposing to construct a new 500-230 kV substation (the "Wishing Star Substation"), a new overhead 500 kV transmission line with a 230 kV transmission line underbuilt (the "Mars-Wishing Star Lines"), a new 500-230 kV substation (the "Mars Substation"), and two new overhead 230 kV transmission lines (the "Mars 230 kV Loop") in Loudoun County, Virginia. Collectively, the Wishing Star Substation, the Mars-Wishing Star Lines, the Mars Substation, the Mars 230 kV Loop, and related substation work are referred to as the "Project." The Company has identified proposed and alternative routes in new right-of-way for the Mars-Wishing Star Lines and Mars 230 kV Loop, as shown on the attached map.

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Regards,

*Christine F. Conrad*

Christine F. Conrad, Ph.D.  
Director Environmental Services, C2 Environmental, Inc.

Attachment: Project Location Map

Dominion Energy Virginia  
10900 Nuckols Rd, 4<sup>th</sup> Floor  
Glen Allen, VA 23060  
DominionEnergy.com



September 23, 2022

**Mr. Sunil Rabindranath**  
**Project Manager, Engineering Division**  
**Metropolitan Washington Airports Authority**  
**PO Box 17045, MA-224**  
**Washington, DC 20041**

**Reference: Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Loudoun County, Virginia Notice Pursuant to Va. Code §15.2-2202 E**

Dear Mr. Rabindranath,

Dominion Energy Virginia (the "Company") is proposing to construct a new 500-230 kV substation (the "Wishing Star Substation"), a new overhead 500 kV transmission line with a 230 kV transmission line underbuilt (the "Mars-Wishing Star Lines"), a new 500-230 kV substation (the "Mars Substation"), and two new overhead 230 kV transmission lines (the "Mars 230 kV Loop") in Loudoun County, Virginia. Collectively, the Wishing Star Substation, the Mars-Wishing Star Lines, the Mars Substation, the Mars 230 kV Loop, and related substation work are referred to as the "Project." The Company has identified proposed and alternative routes in new right-of-way for the Mars-Wishing Star Lines and Mars 230 kV Loop, as shown on the attached map.

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Regards,

*Christine F. Conrad*

Christine F. Conrad, Ph.D.  
Director Environmental Services, C2 Environmental, Inc.

Attachment: Project Location Map

Dominion Energy Virginia  
10900 Nuckols Rd, 4<sup>th</sup> Floor  
Glen Allen, VA 23060  
DominionEnergy.com



**September 23, 2022**

**Mr. Mike DePue**  
**Land Manager**  
**Northern Virginia Regional Park Authority**  
**5400 Ox Road**  
**Fairfax Station, Virginia 22039**

**Reference: Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Loudoun County, Virginia Notice Pursuant to Va. Code §15.2-2202 E**

Dear Mr. DePue,

Dominion Energy Virginia (the "Company") is proposing to construct a new 500-230 kV substation (the "Wishing Star Substation"), a new overhead 500 kV transmission line with a 230 kV transmission line underbuilt (the "Mars-Wishing Star Lines"), a new 500-230 kV substation (the "Mars Substation"), and two new overhead 230 kV transmission lines (the "Mars 230 kV Loop") in Loudoun County, Virginia. Collectively, the Wishing Star Substation, the Mars-Wishing Star Lines, the Mars Substation, the Mars 230 kV Loop, and related substation work are referred to as the "Project." The Company has identified proposed and alternative routes in new right-of-way for the Mars-Wishing Star Lines and Mars 230 kV Loop, as shown on the attached map.

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Regards,

*Christine F. Conrad*

Christine F. Conrad, Ph.D.  
Director Environmental Services, C2 Environmental, Inc.

Attachment: Project Location Map

Dominion Energy Virginia  
10900 Nuckols Rd, 4<sup>th</sup> Floor  
Glen Allen, VA 23060  
DominionEnergy.com



September 23, 2022

**Mr. Brian Nolan**  
**Planning & Development Director**  
**Northern Virginia Regional Park Authority**  
**5400 Ox Road**  
**Fairfax Station, Virginia 22039**

**Reference: Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Loudoun County, Virginia Notice Pursuant to Va. Code §15.2-2202 E**

Dear Mr. Nolan,

Dominion Energy Virginia (the "Company") is proposing to construct a new 500-230 kV substation (the "Wishing Star Substation"), a new overhead 500 kV transmission line with a 230 kV transmission line underbuilt (the "Mars-Wishing Star Lines"), a new 500-230 kV substation (the "Mars Substation"), and two new overhead 230 kV transmission lines (the "Mars 230 kV Loop") in Loudoun County, Virginia. Collectively, the Wishing Star Substation, the Mars-Wishing Star Lines, the Mars Substation, the Mars 230 kV Loop, and related substation work are referred to as the "Project." The Company has identified proposed and alternative routes in new right-of-way for the Mars-Wishing Star Lines and Mars 230 kV Loop, as shown on the attached map.

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Regards,

*Christine F. Conrad*

Christine F. Conrad, Ph.D.  
Director Environmental Services, C2 Environmental, Inc.

Attachment: Project Location Map

Dominion Energy Virginia  
10900 Nuckols Rd, 4<sup>th</sup> Floor  
Glen Allen, VA 23060  
DominionEnergy.com



September 23, 2022

Mr. Scott Denny  
Virginia Department of Aviation  
5702 Gulfstream Road  
Richmond, Virginia 23250

**Reference: Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Loudoun County, Virginia  
Notice Pursuant to Va. Code §15.2-2202 E**

Dear Mr. Denny,

Dominion Energy Virginia (the "Company") is proposing to construct a new 500-230 kV substation (the "Wishing Star Substation"), a new overhead 500 kV transmission line with a 230 kV transmission line underbuilt (the "Mars-Wishing Star Lines"), a new 500-230 kV substation (the "Mars Substation"), and two new overhead 230 kV transmission lines (the "Mars 230 kV Loop") in Loudoun County, Virginia. Collectively, the Wishing Star Substation, the Mars-Wishing Star Lines, the Mars Substation, the Mars 230 kV Loop, and related substation work are referred to as the "Project." The Company has identified proposed and alternative routes in new right-of-way for the Mars-Wishing Star Lines and Mars 230 kV Loop, as shown on the attached map.

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Regards,

*Christine F. Conrad*

Christine F. Conrad, Ph.D.  
Director Environmental Services, C2 Environmental, Inc.

Attachment: Project Location Map

Dominion Energy Virginia  
10900 Nuckols Rd, 4<sup>th</sup> Floor  
Glen Allen, VA 23060  
DominionEnergy.com



September 23, 2022

**Mr. Roger Kirchen**  
**Review and Compliance Division**  
**Virginia Department of Historic Resources**  
**2801 Kensington Avenue**  
**Richmond, Virginia 23221**

**Reference: Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Loudoun County, Virginia Notice Pursuant to Va. Code §15.2-2202 E**

Dear Mr. Kirchen,

Dominion Energy Virginia (the "Company") is proposing to construct a new 500-230 kV substation (the "Wishing Star Substation"), a new overhead 500 kV transmission line with a 230 kV transmission line underbuilt (the "Mars-Wishing Star Lines"), a new 500-230 kV substation (the "Mars Substation"), and two new overhead 230 kV transmission lines (the "Mars 230 kV Loop") in Loudoun County, Virginia. Collectively, the Wishing Star Substation, the Mars-Wishing Star Lines, the Mars Substation, the Mars 230 kV Loop, and related substation work are referred to as the "Project." The Company has identified proposed and alternative routes in new right-of-way for the Mars-Wishing Star Lines and Mars 230 kV Loop, as shown on the attached map.

The Project is needed in response to significant increases in electrical demand over recent years as well as expected demand growth projected for the future, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is in process of preparing an application for a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). In advance of the filing an application for a CPCN from the Commission, the Company respectfully requests that you submit any comments or additional information that would have bearing on the proposed Project within 30 days of the date of this letter. Enclosed is a Project Overview Map depicting the proposed and alternative routes of the Mars-Wishing Star Lines and Mars 230 kV Loop, as well as the general Project location.

If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact Laura Meadows at (804) 239-8246 or [Laura.P.Meadows@dominionenergy.com](mailto:Laura.P.Meadows@dominionenergy.com). We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Regards,

*Christine F. Conrad*

Christine F. Conrad, Ph.D.  
Director Environmental Services, C2 Environmental, Inc.

Attachment: Project Location Map



Dominion Energy Virginia  
10900 Nuckols Rd, 4<sup>th</sup> Floor  
Glen Allen, VA 23060  
DominionEnergy.com



September 23, 2022

**Mr. John D. Lynch, P.E.**  
**District Engineer, Northern Virginia District**  
**Virginia Department of Transportation**  
**4975 Alliance Drive**  
**Farifax, Virginia 22030**

**Reference: Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Loudoun County, Virginia Notice Pursuant to Va. Code §15.2-2202 E**

Dear Mr. Lynch,

Dominion Energy Virginia (the "Company") is proposing to construct a new 500-230 kV substation (the "Wishing Star Substation"), a new overhead 500 kV transmission line with a 230 kV transmission line underbuilt (the "Mars-Wishing Star Lines"), a new 500-230 kV substation (the "Mars Substation"), and two new overhead 230 kV transmission lines (the "Mars 230 kV Loop") in Loudoun County, Virginia. Collectively, the Wishing Star Substation, the Mars-Wishing Star Lines, the Mars Substation, the Mars 230 kV Loop, and related substation work are referred to as the "Project." The Company has identified proposed and alternative routes in new right-of-way for the Mars-Wishing Star Lines and Mars 230 kV Loop, as shown on the attached map.

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Regards,

*Christine F. Conrad*

Christine F. Conrad, Ph.D.  
Director Environmental Services, C2 Environmental, Inc.

Attachment: Project Location Map



Dominion Energy Virginia  
10900 Nuckols Rd, 4<sup>th</sup> Floor  
Glen Allen, VA 23060  
DominionEnergy.com



September 23, 2022

**Mr. Kamal Suliman**  
**Regional Operations Director, Northern Virginia District**  
**Virginia Department of Transportation**  
**4975 Alliance Drive**  
**Farifax, Virginia 22030**

**Reference: Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Loudoun County, Virginia Notice Pursuant to Va. Code §15.2-2202 E**

Dear Mr. Suliman,

Dominion Energy Virginia (the "Company") is proposing to construct a new 500-230 kV substation (the "Wishing Star Substation"), a new overhead 500 kV transmission line with a 230 kV transmission line underbuilt (the "Mars-Wishing Star Lines"), a new 500-230 kV substation (the "Mars Substation"), and two new overhead 230 kV transmission lines (the "Mars 230 kV Loop") in Loudoun County, Virginia. Collectively, the Wishing Star Substation, the Mars-Wishing Star Lines, the Mars Substation, the Mars 230 kV Loop, and related substation work are referred to as the "Project." The Company has identified proposed and alternative routes in new right-of-way for the Mars-Wishing Star Lines and Mars 230 kV Loop, as shown on the attached map.

The Project is needed in response to significant increases in electrical demand over recent years as well as expected demand growth projected for the future, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is in process of preparing an application for a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). In advance of the filing an application for a CPCN from the Commission, the Company respectfully requests that you submit any comments or additional information that would have bearing on the proposed Project within 30 days of the date of this letter. Enclosed is a Project Overview Map depicting the proposed and alternative routes of the Mars-Wishing Star Lines and Mars 230 kV Loop, as well as the general Project location.

If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact Laura Meadows at (804) 239-8246 or [Laura.P.Meadows@dominionenergy.com](mailto:Laura.P.Meadows@dominionenergy.com). We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Regards,

*Christine F. Conrad*

Christine F. Conrad, Ph.D.  
Director Environmental Services, C2 Environmental, Inc.

Attachment: Project Location Map

Dominion Energy Virginia  
10900 Nuckols Rd, 4<sup>th</sup> Floor  
Glen Allen, VA 23060  
DominionEnergy.com



September 23, 2022

Ms. Martha Little  
Virginia Outdoors Foundation  
600 East Main Street, Suite 402  
Richmond, Virginia 23219

**Reference: Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Loudoun County, Virginia  
Notice Pursuant to Va. Code §15.2-2202 E**

Dear Ms. Little,

Dominion Energy Virginia (the "Company") is proposing to construct a new 500-230 kV substation (the "Wishing Star Substation"), a new overhead 500 kV transmission line with a 230 kV transmission line underbuilt (the "Mars-Wishing Star Lines"), a new 500-230 kV substation (the "Mars Substation"), and two new overhead 230 kV transmission lines (the "Mars 230 kV Loop") in Loudoun County, Virginia. Collectively, the Wishing Star Substation, the Mars-Wishing Star Lines, the Mars Substation, the Mars 230 kV Loop, and related substation work are referred to as the "Project." The Company has identified proposed and alternative routes in new right-of-way for the Mars-Wishing Star Lines and Mars 230 kV Loop, as shown on the attached map.

The Project is needed in response to significant increases in electrical demand over recent years as well as expected demand growth projected for the future, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is in process of preparing an application for a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission of Virginia (the "Commission"). In advance of the filing an application for a CPCN from the Commission, the Company respectfully requests that you submit any comments or additional information that would have bearing on the proposed Project within 30 days of the date of this letter. Enclosed is a Project Overview Map depicting the proposed and alternative routes of the Mars-Wishing Star Lines and Mars 230 kV Loop, as well as the general Project location.

If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact Laura Meadows at (804) 239-8246 or [Laura.P.Meadows@dominionenergy.com](mailto:Laura.P.Meadows@dominionenergy.com). We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Regards,

*Christine F. Conrad*

Christine F. Conrad, Ph.D.  
Director Environmental Services, C2 Environmental, Inc.

Attachment: Project Location Map

## James P Young (Services - 6)

---

**From:** Fulcher, Valerie <valerie.fulcher@deq.virginia.gov>  
**Sent:** Tuesday, September 27, 2022 9:10 AM  
**To:** rr dgif-ESS Projects; Keith Tignor; rr DCR-PRR Environmental Review; odwreview (VDH); Carlos Martinez; Kotur Narasimhan; Lawrence Gavan; Mark Miller; Roger Kirchen; Terrance Lasher; Karl Didier; rr EIR Coordination; ImpactReview; Bob Lazaro; David Spears; coadmin@loudoun.gov; Michelle Henicheck; Scott Kudlas  
**Cc:** James P Young (Services - 6)  
**Subject:** [EXTERNAL] NEW SCOPING Wishing Star Substation  
**Attachments:** Scoping Response Wishing Star.pdf; Agency Letter - General (Wishing Star)\_Signed.pdf

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

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Good morning—attached is a **request for scoping comments** on the following:

**Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop in Loudoun County, Virginia.**

If you choose to make comments, please send them directly to the project sponsor ([james.p.young@dominionenergy.com](mailto:james.p.young@dominionenergy.com)) and copy the DEQ Office of Environmental Impact Review: [eir@deq.virginia.gov](mailto:eir@deq.virginia.gov). We will coordinate a review when the environmental document is completed.

DEQ-OEIR's scoping response is also attached.

If you have any questions regarding this request, please email our office at [eir@deq.virginia.gov](mailto:eir@deq.virginia.gov).

Valerie

--

Valerie A. Fulcher, CAP, OM, Admin/Data Coordinator Senior

Department of Environmental Quality

Environmental Enhancement - Office of Environmental Impact Review

1111 East Main Street

Richmond, VA 23219

**NEW PHONE NUMBER:** [REDACTED]

Email: [Valerie.Fulcher@deq.virginia.gov](mailto:Valerie.Fulcher@deq.virginia.gov)

<https://www.deq.virginia.gov/permits-regulations/environmental-impact-review>

**OUR ENFORCEABLE POLICIES HAVE BEEN UPDATED FOR 2021:** <https://www.deq.virginia.gov/permits-regulations/environmental-impact-review/federal-consistency>

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*Commonwealth of Virginia*

***VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY***

1111 E. Main Street, Suite 1400, Richmond, Virginia 23219

P.O. Box 1105, Richmond, Virginia 23218

(800) 592-5482 FAX (804) 698-4178

[www.deq.virginia.gov](http://www.deq.virginia.gov)

Travis A. Voyles  
Acting Secretary of Natural and Historic Resources

Michael S. Rolband, PE, PWD, PWS Emeritus  
Director  
(804) 698-4020

September 26, 2022

Darrell R. Shier  
Dominion Energy Services, Inc.  
120 Tredegar Street  
Richmond, VA 23219  
DominionEnergy.com

RE: Dominion Energy Virginia's 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop in Loudoun County, Virginia

Dear Mr. Shier:

This letter is in response to the scoping request for the above-referenced project.

As you may know, the Department of Environmental Quality, through its Office of Environmental Impact Review (DEQ-OEIR), is responsible for coordinating Virginia's review of environmental impacts for electric power generating projects and power line projects in conjunction with the licensing process of the State Corporation Commission.

**DOCUMENT SUBMISSIONS**

In order to ensure an effective coordinated review of the environmental impact analysis may be sent directly to OEIR. We request that you submit one electronic to [eir@deq.virginia.gov](mailto:eir@deq.virginia.gov) (25 MB maximum) or make the documents available for download at a website, file transfer protocol (ftp) site or the VITA LFT file share system (Requires an "invitation" for access. An invitation request should be sent to [eir@deq.virginia.gov](mailto:eir@deq.virginia.gov)). The required "Wetlands Impact Consultation" can be sent directly to Michelle Henicheck at [michelle.henicheck@deq.virginia.gov](mailto:michelle.henicheck@deq.virginia.gov) or at the address above.

**ENVIRONMENTAL REVIEW UNDER VIRGINIA CODE 56-46.1**

While this Office does not participate in scoping efforts beyond the advice given herein, other agencies are free to provide scoping comments concerning the preparation of the environmental impact analysis document. Accordingly, we have coordinated your request with the following state agencies and those localities and Planning District Commissions, including but not limited to:

Department of Environmental Quality:

- DEQ Regional Office
- Air Division
- Office of Wetlands and Stream Protection
- Office of Local Government Programs
- Division of Land Protection and Revitalization
- Office of Stormwater Management

Department of Conservation and Recreation

Department of Health

Department of Agriculture and Consumer Services

Department of Wildlife Resources

Virginia Marine Resources Commission

Department of Historic Resources

Department of Mines, Minerals, and Energy

Department of Forestry

Department of Transportation

## DATA BASE ASSISTANCE

Below is a list of databases that may assist you in the preparation of a NEPA document:

- DEQ Online Database: Virginia Environmental Geographic Information Systems

Information on Permitted Solid Waste Management Facilities, Impaired Waters, Petroleum Releases, Registered Petroleum Facilities, Permitted Discharge (Virginia Pollution Discharge Elimination System Permits) Facilities, Resource Conservation and Recovery Act (RCRA) Sites, Water Monitoring Stations, National Wetlands Inventory:

- [www.deq.virginia.gov/ConnectWithDEQ/VEGIS.aspx](http://www.deq.virginia.gov/ConnectWithDEQ/VEGIS.aspx)

- DEQ Virginia Coastal Geospatial and Educational Mapping System (GEMS)

Virginia's coastal resource data and maps; coastal laws and policies; facts on coastal resource values; and direct links to collaborating agencies responsible for current data:

- <http://128.172.160.131/gems2/>

- MARCO Mid-Atlantic Ocean Data Portal

The Mid-Atlantic Ocean Data Portal is a publicly available online toolkit and resource center that consolidates available data and enables users to visualize and analyze ocean resources and human use information such as fishing grounds, recreational areas, shipping lanes, habitat areas, and energy sites, among others.

<http://portal.midatlanticocean.org/visualize/#x=-73.24&y=38.93&z=7&logo=true&controls=true&basemap=Ocean&tab=data&legends=false&layers=true>

- DHR Data Sharing System.

Survey records in the DHR inventory:

- [www.dhr.virginia.gov/archives/data\\_sharing\\_sys.htm](http://www.dhr.virginia.gov/archives/data_sharing_sys.htm)
- DCR Natural Heritage Search  
  
Produces lists of resources that occur in specific counties, watersheds or physiographic regions:
  - [www.dcr.virginia.gov/natural\\_heritage/dbsearchtool.shtml](http://www.dcr.virginia.gov/natural_heritage/dbsearchtool.shtml)
- DWR Fish and Wildlife Information Service  
  
Information about Virginia's Wildlife resources:
  - <http://vafwis.org/fwis/>
- Total Maximum Daily Loads Approved Reports
  - <https://www.deq.virginia.gov/programs/water/waterqualityinformationtmdls/tmdl/tmdldevelopment/approvedtmdlreports.aspx>
- Virginia Outdoors Foundation: Identify VOF-protected land
  - <http://vof.maps.arcgis.com/home/index.html>
- Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Database: Superfund Information Systems  
  
Information on hazardous waste sites, potentially hazardous waste sites and remedial activities across the nation, including sites that are on the National Priorities List (NPL) or being considered for the NPL:
  - [www.epa.gov/superfund/sites/cursites/index.htm](http://www.epa.gov/superfund/sites/cursites/index.htm)
- EPA RCRAInfo Search  
  
Information on hazardous waste facilities:
  - [www.epa.gov/enviro/facts/rcrainfo/search.html](http://www.epa.gov/enviro/facts/rcrainfo/search.html)
- Total Maximum Daily Loads Approved Reports
  - <https://www.deq.virginia.gov/programs/water/waterqualityinformationtmdls/tmdl/tmdldevelopment/approvedtmdlreports.aspx>
- EPA Envirofacts Database  
  
EPA Environmental Information, including EPA-Regulated Facilities and Toxics Release Inventory Reports:
  - [www.epa.gov/enviro/index.html](http://www.epa.gov/enviro/index.html)
- EPA NEPAassist Database  
  
Facilitates the environmental review process and project planning:  
<http://nepaassisttool.epa.gov/nepaassist/entry.aspx>



If you have questions about the environmental review process, please feel free to contact me (telephone (804) 659-1915 or e-mail [bettina.rayfield@deq.virginia.gov](mailto:bettina.rayfield@deq.virginia.gov)).

I hope this information is helpful to you.

Sincerely,

A handwritten signature in black ink, appearing to read "Bettina Rayfield". The signature is fluid and cursive, with a long horizontal stroke extending from the end.

Bettina Rayfield, Program Manager  
Environmental Impact Review and  
Long-Range Priorities

## James P Young (Services - 6)

**From:** Warren, Arlene <arlene.warren@vdh.virginia.gov>  
**Sent:** Thursday, September 29, 2022 12:30 PM  
**To:** James P Young (Services - 6)  
**Cc:** rr Environmental Impact Review  
**Subject:** [EXTERNAL] Re: NEW SCOPING Wishing Star Substation

**CAUTION! This message was NOT SENT from DOMINION ENERGY**

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**Project Name:** Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop

**Project #:** N/A

**UPC #:** N/A

**Location:** Loudoun Co.

VDH – Office of Drinking Water has reviewed the above project. Below are our comments as they relate to proximity to **public drinking water sources** (groundwater wells, springs and surface water intakes). Potential impacts to public water distribution systems or sanitary sewage collection systems **must be verified by the local utility.**

The following public groundwater wells are located within a 1 mile radius of the project site (wells within a 1,000 foot radius are formatted in **bold**):

PWS ID Number	City/County	System Name	Facility Name
<b>6107175</b>	<b>Loudoun Co.</b>	<b>ADESA WASHINGTON DC</b>	<b>WELL</b>

There are no surface water intakes located within a 5-mile radius of the project site.

The project is within the watershed of the following public surface water sources:

PWS ID Number	System Name	Facility Name
6059501	FAIRFAX COUNTY WATER AUTHORITY	INTAKE (POTOMAC RIVER)

Best Management Practices should be employed, including Erosion & Sedimentation Controls and Spill Prevention Controls & Countermeasures on the project site.

*The Virginia Department of Health – Office of Drinking Water appreciates the opportunity to provide comments. If you have any questions, please let me know.*

Best Regards,

Arlene F. Warren  
GIS Program Support Technician  
Virginia Department of Health, Office of Drinking Water  
109 Governor Street, 6th Floor  
Richmond, VA 23219  
[REDACTED] (office/cell/text)

On Tue, Sep 27, 2022 at 9:10 AM Fulcher, Valerie <[valerie.fulcher@deq.virginia.gov](mailto:valerie.fulcher@deq.virginia.gov)> wrote:

**Good morning—attached is a request for scoping comments on the following:**

**Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop in Loudoun County, Virginia.**

If you choose to make comments, please send them directly to the project sponsor ([james.p.young@dominionenergy.com](mailto:james.p.young@dominionenergy.com)) and copy the DEQ Office of Environmental Impact Review: [eir@deq.virginia.gov](mailto:eir@deq.virginia.gov). We will coordinate a review when the environmental document is completed.

DEQ-OEIR's scoping response is also attached.

If you have any questions regarding this request, please email our office at [eir@deq.virginia.gov](mailto:eir@deq.virginia.gov).

Valerie

--

Valerie A. Fulcher, CAP, OM, Admin/Data Coordinator Senior

Department of Environmental Quality

Environmental Enhancement - Office of Environmental Impact Review

1111 East Main Street

Richmond, VA 23219

**NEW PHONE NUMBER:** [REDACTED]

Email: [Valerie.Fulcher@deq.virginia.gov](mailto:Valerie.Fulcher@deq.virginia.gov)

<https://www.deq.virginia.gov/permits-regulations/environmental-impact-review>

**OUR ENFORCEABLE POLICIES HAVE BEEN UPDATED FOR 2021:** <https://www.deq.virginia.gov/permits-regulations/environmental-impact-review/federal-consistency>

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## James P Young (Services - 6)

---

**From:** Bronson, Regena D CIV USARMY CENAO (USA) <Regena.D.Bronson@usace.army.mil>  
**Sent:** Wednesday, October 12, 2022 9:20 AM  
**To:** James P Young (Services - 6)  
**Cc:** Bronson, Regena D CIV USARMY CENAO (USA)  
**Subject:** [EXTERNAL] Wishing Star Lines, 500-230 kV Mars Substation  
**Attachments:** Agency Letter - General (Wishing Star)\_Signed.pdf

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Mr. Young,

This is in response to your September 23, 2022 email in which you requested input from the United States Army Corps of Engineers (USACE) on the proposed 500-230 kV substation (the Wishing Star Substation ), a new overhead 500 kV single circuit transmission line with a 230 kV single circuit transmission line underbuilt (the Mars-Wishing Star Lines ), a new 500-230 kV substation (the Mars Substation ), and two new overhead 230 kV double circuit transmission lines (the Mars 230 kV Loop ) in Loudoun County, Virginia.

As you are probably aware, both temporary and permanent discharges of dredged and/or fill material into waters of the United States are subject to the permitting requirements of Section 404 of the Clean Water Act (33 CFR 323). We would recommend an assessment of the presence of Corps jurisdictional areas be conducted. In addition.

Our regulations require that we consider a full range of public interest factors and conduct an alternatives analysis in order to identify the least environmentally damaging practicable alternative (LEDPA), which is the only alternative we can authorize. In addition to wetland and waters impacts, we must consider factors such as land use (including displacements of homes and businesses), floodplain hazards and values, water supply and conservation, water quality, safety, cost, economics, threatened and endangered species, historic and cultural resources, and environmental justice.

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966 and Section 7 of the Endangered Species Act.

Please note that our review time may exceed 90+ days due to an increased workload.  
<https://www.nao.usace.army.mil/Media/Public-Notices/Article/2845067/cenao-wrr/>

V/r,

Regena Bronson

Fredericksburg Field Office  
10300 Spotsylvania Avenue, Suite 230  
Fredericksburg, VA 22408

  
[Regena.d.bronson@usace.army.mil](mailto:Regena.d.bronson@usace.army.mil)

Regulator of the Day (ROD) Help: (757) 201-7652

The Norfolk District is committed to providing the highest level of support to the public. In order for us to better serve you, we would appreciate you completing our Customer Satisfaction Survey located at:

<https://regulatory.ops.usace.army.mil/customer-service-survey/>

HELPFUL LINKS:

- Direct Link to Norfolk District Regulatory Website: <https://www.nao.usace.army.mil/Missions/Regulatory/>
- Direct Link to Joint Permit Application: <https://www.nao.usace.army.mil/Missions/Regulatory/JPA.aspx>
- Direct Link to Commonly Used Forms (i.e. Pre-Application Request Form, Pre-Application Jurisdictional Determination Checklist): <https://www.nao.usace.army.mil/Missions/Regulatory/Commonly-Used-Forms/>



## COMMONWEALTH of VIRGINIA

*Marine Resources Commission*  
380 Fenwick Road  
Bldg 96  
Fort Monroe, VA 23651-1064

Travis A. Voyles  
Acting Secretary of Natural and  
Historic Resources

Jamie L. Green  
Commissioner

October 18, 2022

Dominion Energy Services, Inc.  
Attn: James Young  
120 Tredegar Street  
Richmond, VA 23219

Re: Dominion Energy Virginia's Proposed 500-230 kV  
Wishing Star Substation, 500-230 kV Mars Wishing Star  
Lines, 500-230 kV Mars Substation, and Mars 230 kV  
Loop

Dear Mr. Young,

This will respond to the request for comments regarding Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop, prepared by Dominion Energy. Specifically, Dominion Energy has proposed to construct two (2) new 500-230 kV substations, a new overhead 500 kV single circuit transmission line with a 230 kV single circuit transmission line underbuilt, and two new overhead 230 kV double circuit transmission lines in Loudoun County, Virginia.

We reviewed the provided project documents and found the proposed project is within the jurisdictional areas of the Virginia Marine Resources Commission (VMRC) and may require a permit from this agency. Please be advised that the VMRC, pursuant to §28.2-1200 et seq of the Code of Virginia, has jurisdiction over encroachments in, on, or over the beds of the bays, ocean, rivers, streams, or creeks which are the property of the Commonwealth. Accordingly, if any portion of the subject project involves any encroachments channelward of ordinary high water along non-tidal, natural rivers and streams with a drainage area greater than 5-square miles, a permit may be required from our agency. Any jurisdictional impacts will be reviewed by the VMRC during the JPA process.

Please contact me at (757) 247-2285 or by email at [claire.gorman@mrc.virginia.gov](mailto:claire.gorman@mrc.virginia.gov) if you have questions. Thank you for the opportunity to comment.

Sincerely,

A handwritten signature in blue ink, appearing to read "Claire Gorman".

Claire Gorman  
Environmental Engineer, Habitat Management

*An Agency of the Natural Resources Secretariat*  
[www.mrc.virginia.gov](http://www.mrc.virginia.gov)

Telephone (757) 247-2200 (757) 247-2292 V/TDD Information and Emergency Hotline 1-800-541-4646 V/TDD

Dominion Energy Services, Inc.  
October 18, 2022  
Page Two

CG  
HM





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October 27, 2022

Ms. Bettina Rayfield, Manager  
Virginia Department of Environmental Quality  
Office of Environmental Impact Review  
P.O. Box 1105  
Richmond, Virginia 23218



Subject: Wetland and Waterbody Desktop Summary  
500-230 kV Wishing Star Substation, 500 kV and 230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Project  
New SCC Filing

Dear Ms. Rayfield:

Environmental Resources Management ("ERM"), on behalf of Virginia Electric and Power Company ("Dominion Energy Virginia," "Dominion" or the "Company"), conducted a desktop wetland and waterbody review of publicly available information for the proposed 500-230 kV Wishing Star Substation, 500 kV and 230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Project (Project) located within Loudoun County, Virginia. Field delineations were not performed as part of this analysis and would be required to verify the accuracy and extent of aquatic resource boundaries. Attachment 1 depicts the general location of the proposed Project. Attachment 2 illustrates the wetland boundaries that were identified as part of the desktop review.

Dominion Energy Virginia is filing an application with the State Corporation Commission (SCC) for the following:

- Construct a new 500-230 kV substation in Loudoun County, Virginia, within existing Company-owned right-of-way and on property obtained by the Company ("Wishing Star Substation"). The 500-230 kV source to the Wishing Star Substation will be created by cutting the Company's existing 500 kV Brambleton-Mosby Lines #546 and #590 into the Wishing Star Substation at Structures #546/26 and #590/1893 just south of the Company's existing Brambleton Substation. The tie-in of Lines #546 and #590 to the Wishing Star Substation will result in (i) 500 kV Brambleton-Wishing Star Line #589 and (ii) 500 kV Brambleton-Wishing Star Line #501.
- Construct a new approximately 3.55-mile overhead 500 kV single circuit transmission line with a 230 kV single circuit transmission line underbuilt on predominantly new right-of-way. The new transmission lines will originate at the 500 kV and 230 kV buses of the proposed Wishing Star Substation and continue east to a new 500-230 kV Mars Substation, resulting in (i) 500 kV Mars-Wishing Star Line #527, and (ii) 230 kV Mars-Wishing Star Line #2291 (the "Mars-Wishing Star Lines"). From the proposed Wishing Star Substation, the Mars-Wishing Star Lines will extend generally east to the proposed Mars Substation, where the Mars-Wishing Star Lines will terminate. The proposed Mars-Wishing Star Lines will be constructed on new right-of-way predominantly 150 feet in width (approximately 2.67 miles of the 3.55-mile total length) to support a 5-2 configuration primarily on dulled galvanized steel double circuit three-pole or two-pole H-frame structures. The new 500 kV line will utilize three-phase triple-bundled 1351.5 ACSR conductors with a summer

transfer capability of 4,357 MVA; the new 230 kV line will utilize three-phase twin-bundled 768.2 ACSS/TW/HS type conductor with a summer transfer capability of 1,573 MVA.

- Construct a new 500-230 kV substation in Loudoun County, Virginia on property obtained by the Company (“Mars Substation”).
- Construct two new approximately 0.57-mile overhead 230 kV double circuit lines on two sets of double circuit structures from Mars Substation to cut in locations on the Company’s existing 230 kV Cabin Run-Shellhorn Road Line #2095 and 230 kV Poland Road-Shellhorn Road Line #2137, between Structures #2095/72 / #2137/82 and #2095/73 / #2137/83 resulting in (i) 230 kV Cabin Run-Mars Line #2287, (ii) 230 kV Celestial-Mars Line #2261, (iii) 230 kV Mars-Shellhorn Road Line #2095, and (iv) 230 kV Mars-Sojourner Line #2292 (the “Mars 230 kV Loop”). Where the Mars 230 kV Loop cuts into Lines #2095 and #2137, two new two-pole double circuit structures will be installed within existing right-of-way in order to loop the new lines into the Mars Substation and then back to the existing Lines #2095/#2137 corridor. While the cut-in location is within existing right-of-way, the proposed Mars 230 kV Loop will be constructed on new 160-foot-wide right-of-way supported by a combination of dulled galvanized steel double circuit monopoles and two-pole structures situated side-by-side in the right-of-way and will utilize three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA.

There is an immediate need for the Project to maintain and improve electric service to customers in the eastern Loudoun load area (“Eastern Loudoun Load Area”), which is generally to the north and west of the Dulles Airport and is inclusive of Data Center Alley (“DCA”); to address significant load growth in the Eastern Loudoun Load Area; and to resolve identified NERC reliability violations. The Company considered the facilities required to construct and operate the Project, the length of new rights-of-way that will be required, the amount of existing development in each area, the potential for environmental impacts on communities, and the relative cost of the Project.

The purpose of this desktop analysis was to identify and evaluate potential impacts of the Project on wetlands and waterbodies (streams, creeks, runs, and open water features). In accordance with Virginia Department of Environmental Quality (“DEQ”) and the SCC’s Memorandum of Agreement, the evaluation was conducted using various data sets that may indicate wetland location and type. The information summarized in this report is being submitted to the DEQ as part of the DEQ Wetland Impacts Consultation.

This assessment did not include the field investigations required for wetland delineations in accordance with the U.S. Army Corps of Engineers Wetland Delineation Manual (Environmental Laboratory, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0).

### ***Project Study Area and Potential Routes***

The Project lies within a part of Loudoun County just west of the Dulles Airport. A study area was developed encompassing an area containing the Project origin and termination points: Wishing Star Substation to the west and the new 500-230 kV Mars Substation to the east. The study area is bounded by the following features:

- Brambleton Substation, Evergreen Mills Road, and Old Ox Road to the north;

- Route 50 (formerly John Mosby Highway; renamed Little River Turnpike in 2020) to the south;
- Dulles Airport to the east; and
- The Company's existing 500 kV Brambleton-Mosby Line #546 and 230 kV Brambleton-Loudoun Line #2094 to the west.

The study area is shown in Attachment 1.

Dominion identified an approximately 3.55-mile overhead proposed route for the Mars-Wishing Star Lines ("Mars-Wishing Star Lines Proposed Route" or "Route 5"), as well as five overhead alternative routes ("Mars-Wishing Star Lines Alternative Routes 1, 2, 3, 4 and 6"). For the Mars 230 kV Loop, the Company identified one approximately 0.57-mile overhead proposed route ("Mars 230 kV Loop Proposed Route").

## ***Proposed Route Alternatives***

### ***Mars-Wishing Star Lines***

#### ***Alternative Route 1***

Alternative Route 1 of the proposed Mars-Wishing Star Lines is approximately 3.63 miles in length. Route 1 originates at the proposed Wishing Star Substation located on the east side of the 500 kV Brambleton-Mosby Lines #546 and #590 at a junction located between Structures #546/26 / 2094/220 and #590/1893 / 2045/25 just south of the Company's existing Brambleton Substation. The route heads east for about 0.6 mile just south Broad Run, crossing Arcola Mills Road then Belmont Ridge Road. After crossing Belmont Ridge Road, the route turns slightly to the southeast where it meets the south side of the existing right-of-way of Dominion Energy Virginia's Lines #2172 and #2183. Continuing east, the route parallels the existing right-of-way for about 0.2 mile before turning northeast and crossing over the existing right-of-way and Broad Run. Approximately 0.1 mile after crossing Broad Run, the route turns east for 0.5 mile before turning northeast and paralleling the south side of Evergreen Mills Road for 0.3 mile. The route then crosses Loudoun County Parkway just south of the intersection with Evergreen Mills Road before turning south-southeast for 0.2 where it crosses Broad Run again. The route turns southeast for 0.3 mile before crossing Old Ox Road then continues southeast for 0.7 mile, paralleling the north side of Dulles International Airport's West Perimeter Road. The route then splits in two with the 500 kV line heading east for 0.2 mile where it crosses Carters School Road and enters the west side of the proposed Mars Substation. The 230 kV line continues southeast for 0.2 mile where it crosses Carters School Road and then turns north entering the south side of the proposed Mars Substation.

#### ***Alternative Route 2***

Alternative Route 2 of the proposed Mars-Wishing Star Lines is approximately 3.64 miles in length. Route 2 originates at the proposed Wishing Star Substation located on the east side of the 500 kV Brambleton-Mosby Lines #546 and #590 at a junction located between Structures #546/26 / 2094/220 and #590/1893 / 2045/25 just south of the Company's existing Brambleton Substation. The route heads east for about 0.6 mile just south Broad Run, crossing Arcola Mills Road then Belmont Ridge Road. After crossing Belmont Ridge Road, the route turns slightly to the southeast where it meets the south side of the existing right-of-way of Dominion Energy Virginia's Lines #2172 and #2183. Continuing east, the route parallels the existing right-of-way for about 0.2 mile before turning northeast and crossing over the existing right-of-way and

Broad Run. Approximately 0.1 mile after crossing Broad Run, the route turns east for 0.5 mile before turning southeast. The route continues southeast for 0.2 mile, crossing Broad Run again, then turning east to parallel the north side of the existing right-of-way for 0.3 mile. Before crossing Loudoun County Parkway, the route turns northeast for 0.1 mile. The route turns southeast for 0.4 mile and crosses Old Ox Road and continues southeast for 0.7 mile, paralleling the north side of Dulles International Airport's West Perimeter Road. The route then splits in two with the 500 kV line heading east for 0.2 mile where it crosses Carters School Road and enters the west side of the proposed Mars Substation. The 230 kV line continues southeast for 0.2 mile where it crosses Carters School Road and then turns north entering the south side of the proposed Mars Substation.

### *Alternative Route 3*

Alternative Route 3 of the proposed Mars-Wishing Star Lines is approximately 3.62 miles in length. Route 3 originates at the proposed Wishing Star Substation located on the east side of the 500 kV Brambleton-Mosby Lines #546 and #590 at a junction located between Structures #546/26 / 2094/220 and #590/1893 / 2045/25 just south of the Company's existing Brambleton Substation. The route heads east for about 0.6 mile just south Broad Run, crossing Arcola Mills Road then Belmont Ridge Road. After crossing Belmont Ridge Road, the route turns slightly to the southeast where it meets the south side of the existing right-of-way of Dominion Energy Virginia's Lines #2172 and #2183. Continuing east, the route parallels the existing right-of-way for about 0.5 mile before turning northeast and crossing over the existing right-of-way. After crossing the existing right-of-way, the route crosses Broad Run continues northeast for 0.7 mile and parallels the south side of Evergreen Mills Road. The route then crosses Loudoun County Parkway just south of the intersection with Evergreen Mills Road before turning south-southeast for 0.2 where it crosses Broad Run again. The route turns southeast for 0.3 mile before crossing Old Ox Road and southeast for 0.7 mile, paralleling the north side of Dulles International Airport's West Perimeter Road. The route then splits in two with the 500 kV line heading east for 0.2 mile where it crosses Carters School Road and enters the west side of the proposed Mars Substation. The 230 kV line continues southeast for 0.2 mile where it crosses Carters School Road and then turns north entering the south side of the proposed Mars Substation.

### *Alternative Route 4*

Alternative Route 4 of the proposed Mars-Wishing Star Lines is approximately 3.63 miles in length. Route 4 originates at the proposed Wishing Star Substation located on the east side of the 500 kV Brambleton-Mosby Lines #546 and #590 at a junction located between Structures #546/26 / 2094/220 and #590/1893 / 2045/25 just south of the Company's existing Brambleton Substation. The route heads east for about 0.6 mile just south Broad Run, crossing Arcola Mills Road then Belmont Ridge Road. After crossing Belmont Ridge Road, the route turns slightly to the southeast where it meets the south side of the existing right-of-way of Dominion Energy Virginia's Lines #2172 and #2183. Continuing east, the route parallels the existing right-of-way for about 0.5 mile before turning northeast and crossing over the existing right-of-way. After crossing the existing right-of-way, the route crosses Broad Run continues northeast for 0.4 mile before turning southeast. The route then continues southeast for 0.2 mile, crossing Broad Run again, then turning east to parallel the north side of the existing right-of-way for 0.3 mile. Before crossing Loudoun County Parkway, the route turns northeast for 0.1 mile then southeast for 0.4 mile and crosses Old Ox Road. After crossing Old Ox Road, the continues southeast for 0.7 mile, paralleling the north side of Dulles International Airport's West Perimeter Road. The route then splits in two with the 500 kV line heading east for 0.2 mile where it crosses Carters School Road and enters the west side of the proposed Mars Substation. The 230

kV line continues southeast for 0.2 mile where it crosses Carters School Road and then turns north entering the south side of the proposed Mars Substation.

### *Alternative Route 5*

Alternative Route 5 of the Mars-Wishing Star Lines is approximately 3.55 miles in length. Route 5 originates at the proposed Wishing Star Substation located on the east side of the 500 kV Brambleton-Mosby Lines #546 and #590 at a junction located between Structures #546/26 / 2094/220 and #590/1893 / 2045/25 just south of the Company's existing Brambleton Substation. The route heads east for about 0.6 mile just south Broad Run, crossing Arcola Mills Road then Belmont Ridge Road. After crossing Belmont Ridge Road, the route turns slightly to the southeast where it meets the south side of the existing right-of-way of Dominion Energy Virginia's Lines #2172 and #2183. Continuing east, the route parallels the existing right-of-way for about 0.5 mile before turning northeast and crossing over the existing right-of-way. After crossing the existing right-of-way, the route turns east and parallels the north side of the right-of-way for 0.6 mile. Before crossing Loudoun County Parkway, the route turns to the northeast for 0.1 mile. The route then turns southeast for 0.4 mile and crosses Old Ox Road. After crossing Old Ox Road, the route continues southeast for 0.7 mile, paralleling the north side of Dulles Airport's West Perimeter Road. The route then splits in two with the 500 kV line heading east for 0.2 mile where it crosses Carters School Road and enters the west side of the proposed Mars Substation. The 230 kV line continues southeast for 0.2 mile where it crosses Carters School Road and then turns north entering the south side of the proposed Mars Substation.

### *Alternative Route 6*

Alternative Route 6 of the proposed Mars-Wishing Star Lines is approximately 3.56 miles in length. Route 6 originates at the proposed Wishing Star Substation located on the east side of the 500 kV Brambleton-Mosby Lines #546 and #590 at a junction located between Structures #546/26 / 2094/220 and #590/1893 / 2045/25 just south of the Company's existing Brambleton Substation. The route heads east for about 0.6 mile just south Broad Run, crossing Arcola Mills Road then Belmont Ridge Road. After crossing Belmont Ridge Road, the route turns slightly to the southeast where it meets the south side of the existing right-of-way of Dominion Energy Virginia's Lines #2172 and #2183. Continuing east, the route parallels the existing right-of-way for about 0.2 mile before turning northeast and crossing over the existing right-of-way. After crossing the existing right-of-way, the route turns east and parallels the north side of the right-of-way for 0.9 mile. Before crossing Loudoun County Parkway, the route turns northeast for 0.1 mile then southeast for 0.4 mile and crosses Old Ox Road. After crossing Old Ox Road, the continues southeast for 0.7 mile, paralleling the north side of Dulles International Airport's West Perimeter Road. The route then splits in two with the 500 kV line heading east for 0.2 mile where it crosses Carters School Road and enters the west side of the proposed Mars Substation. The 230 kV line continues southeast for 0.2 mile where it crosses Carters School Road and then turns north entering the south side of the proposed Mars Substation.

### *Mars 230 kV Loop*

The Mars 230 kV Loop is approximately 0.57 mile in length. Beginning at the proposed Mars Substation, the route travels north across forested land that is planned for future data center development. The route parallels Carters School Road for 0.5 mile before terminating at the cut location along the Company's existing Cabin Run-Shellhorn Road Line #2095. The cut in location is located just east of the intersection of Carters School Road and Old Ox Road.

The Mars 230 kV Loop will be constructed on new 160-foot-wide right-of-way supported by primarily a combination of double circuit monopoles and two-pole structures situated side-by-side in the right-of-way



with a minimum structure height of approximately 100 feet, a maximum structure height of approximately 115 feet, and an average proposed structure height of approximately 103 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

## Desktop Evaluation Methodology

The area of effect considered for this study consists of the proposed rights-of-way identified above within which the electric transmission lines would be constructed and operated. Data sources used for this review include the following, each of which is described briefly below:

- USA National Agricultural Imagery Program (NAIP) Natural Color Images, Virginia, 1-meter pixel resolution, photo date 2020 (NAIP 2022a)
- USA NAIP Imagery: Color Infrared NAIP Infrared Images, Virginia, 1-meter pixel resolution, photo date 2020 (NAIP 2022b)
- U.S. Geological Survey (USGS) 7.5-minute current (USGS 2022a)
- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) mapping (2021) (USFWS 2022)
- U.S. Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) Soil Survey Geographic (SSURGO) database (NRCS 2022)
- USGS National Hydrography Dataset (NHD; USGS 2022b)

## Natural Color and Infrared Aerial Photography

Recent (2018-2020) natural color aerial photography was used to provide a visual overview of the Project area and to assist in evaluating current conditions. Infrared aerial photography was used to identify the potential presence of wetlands based on signatures associated with the levels of reflectance. For example, areas that are inundated with water appear very dark (almost black) due to the low level of reflectance in the infrared spectrum. The presence of these dark colors can be used as a potential indicator of hydric or inundated soils that are likely associated with wetlands (NAIP 2022a and NAIP 2022b).

## USGS Topographic Maps

The recent (2014) USGS topographic maps show the topography of the area. The USGS topographic maps also depict other important landscape features such as forest cover, development, buildings, agricultural areas, streams, lakes, and wetlands (USGS 2022a).

## USFWS National Wetland Inventory Mapping

NWI maps provide the boundaries and classifications of potential wetland areas as mapped by the USFWS (USFWS 2022). However, NWI data is based primarily on aerial photo interpretations with limited ground-truthing and may represent incorrect boundaries or wetland cover types. NWI data can be unreliable in some areas, especially in forested landscapes, when aerial photography is used as the major data source. The classifications of the majority of the NWI polygons in the study area appear to be accurate based on a review of the cover types observed in the aerial photography. However, in areas where there was an obvious discrepancy between the NWI classification and the aerial photography, ERM modified the

classification to more accurately reflect current conditions. In order to acknowledge ERM's adjustment of NWI classifications where appropriate, all of the wetland types referenced in this assessment are referred to as "assigned wetland cover types" regardless of whether the cover type was actually modified from the NWI classification.

### **USDA-NRCS Soils Data**

Soils in the study area were identified and assessed using the SSURGO database, which is a digital version of the original county soil surveys (NRCS 2022). The attribute data within the SSURGO database provides the proportionate extent of the component soils and their properties (e.g., hydric rating) for each soil map unit. The soils in the study area were grouped into three categories based on the hydric rating of the component soils within each map unit: hydric, partially hydric, and non-hydric. Hydric soils were defined as those where the major component soils, and minor components in some cases, are designated as hydric. Hydric components in these map units account for more than 80 percent of the map unit. Partially hydric soils include map units that only contain minor component soils that are designated as hydric. The partially hydric map units in the Project area contain 10 percent or less hydric soils. The remaining map units do not contain any component soils that are designated as hydric. Areas mapped as hydric or partially hydric have a higher probability of containing wetlands than areas with no hydric soils.

### **USGS National Hydrography Dataset**

The National Hydrography Dataset (NHD) dataset contain features such as lakes, ponds, streams, rivers, and canals (USGS 2022b). The waterbodies mapped by the NHD appeared generally consistent with those visible on the USGS maps and aerial photography.

### **Probability Analysis**

ERM used a stepwise process to identify probable wetland areas along the proposed routes, as follows:

1. Infrared and natural color aerial photography was used in conjunction with USGS topographic maps and soils maps to identify potential wetland areas. Boundaries were assigned to the areas that appeared to exhibit wetland signatures based on this review and a cover type was determined based on aerial photo interpretation. For the purpose of the study, these areas are referred to as Interpreted Wetlands.
2. To further determine the probability of a wetland occurring within a given location, the Interpreted Wetland polygon shape files were digitally layered with the NWI mapping and soils information from the SSURGO database.
3. The probability of a wetland occurring was assigned based on the number of overlapping data layers (i.e., indicators of potential wetland presence) that occurred in a particular area.

The criteria assigned to each probability are outlined in Table 1.

**Table 1: Criteria Used to Rank the Probability of Wetland Occurrence**

<b>Probability</b>	<b>Criteria</b>
High	Areas where layers of hydric soils, Interpreted Wetlands, and NWI data overlap
Medium/High	NWI data overlaps hydric soils; or NWI data overlaps Interpreted Wetlands with or without partially hydric soils; or



	Hydric soils overlap Interpreted Wetlands
Medium	Interpreted Wetlands with or without overlap by partially hydric soils
Medium/Low	Hydric soils only; or NWI data with or without overlap by partially hydric soils
Low	Partially hydric soils only
Very Low	Non-hydric soils only

## Wetland and Waterbody Crossings

The desktop analysis provides a probability of wetlands and waterbody occurrence within each route. As stated above, field delineations were not performed and would be required to verify the accuracy and extent of aquatic resource boundaries. A range of wetland occurrence probabilities are reported by this study from very low to high. The probability of wetland occurrence increases as multiple indicators begin to overlap towards the “high” end of the spectrum. The medium, medium-high and high probability category are the most reliable representation of in-situ conditions, due to overlapping data sets, and these categories are reported in the summary below as a percentage of the total acreage of each route. Attachment 2 depicts the interpreted wetlands displayed on color base map images.

## Results

Results of the probability analysis are presented in Table 2 below. Summaries of impacts by route are provided in the sections following the table. Impacts associated with the proposed Mars and Wishing Star Substations are included in the impacts for the routes 1-6.

**Table 2: Summary of the Probabilities of Wetland and Waterbody Occurrence along Project Route Alternatives <sup>a, b</sup>**

Probability	Total right-of-way Acres <sup>c</sup>	Wetland and Waterbody type (acres)				
		PEM Emergent	PFO Forested	PSS Scrub-	PUB Freshwater	Riverine Stream
MARS-WISHING STAR LINES						
Alternative Route 1						
High	0.86	0.02	0.61	0.03	NA	0.20
Medium/High	9.47	4.18	3.99	0.81	0.12	0.37
Medium	11.70	2.87	6.45	0.70	1.04	0.64
Medium/Low	0.05	NA	NA	NA	NA	0.05
Low	NA	NA	NA	NA	NA	NA
Very Low	NA	NA	NA	NA	NA	NA
Alternative Route 2						
High	0.86	0.02	0.61	0.03	NA	0.20
Medium/High	8.70	4.18	3.02	0.81	0.20	0.50
Medium	12.27	2.70	6.06	0.70	1.58	1.22
Medium/Low	0.14	NA	NA	NA	NA	0.14
Low	NA	NA	NA	NA	NA	NA
Very Low	NA	NA	NA	NA	NA	NA
Alternative Route 3						
High	0.84	0.02	0.57	0.03	NA	0.22
Medium/High	9.34	3.81	4.73	0.16	0.35	0.29
Medium	8.91	3.00	4.37	0.49	0.50	0.55

WETLAND AND WATERBODY DESKTOP SUMMARY – 500-230 KV WISHING STAR SUBSTATION, 500 KV AND 230 KV MARS-WISHING STAR LINES, 500-230 KV MARS SUBSTATION, AND MARS 230 KV LOOP TRANSMISSION LINE PROJECT  
OCTOBER 27, 2022

Probability	Total right-of-way Acres <sup>c</sup>	Wetland and Waterbody type (acres)				
		PEM Emergent	PFO Forested	PSS Scrub-	PUB Freshwater	Riverine Stream
Medium/Low	0.17	NA	NA	NA	NA	0.17
Low	NA	NA	NA	NA	NA	NA
Very Low	NA	NA	NA	NA	NA	NA
Alternative Route 4						
High	0.84	0.02	0.57	0.03	NA	0.22
Medium/High	8.57	3.81	3.76	0.16	0.42	0.42
Medium	9.57	2.83	4.07	0.49	1.04	1.13
Medium/Low	0.26	NA	NA	NA	NA	0.26
Low	NA	NA	NA	NA	NA	NA
Very Low	NA	NA	NA	NA	NA	NA
Alternative Route 5						
High	1.24	0.02	0.91	0.03	NA	0.27
Medium/High	7.78	3.85	2.77	0.16	0.08	0.92
Medium	8.60	2.83	2.82	0.49	0.55	1.91
Medium/Low	0.50	NA	0.00	NA	NA	0.49
Low	NA	NA	NA	NA	NA	NA
Very Low	NA	NA	NA	NA	NA	NA
Alternative Route 6						
High	1.24	0.02	0.91	0.03	NA	0.28
Medium/High	9.69	4.30	3.93	0.16	0.08	1.23
Medium	8.62	2.71	2.86	0.49	0.55	2.01
Medium/Low	0.59	NA	0.05	NA	NA	0.55
Low	NA	NA	NA	NA	NA	NA
Very Low	NA	NA	NA	NA	NA	NA
MARS 230 kV LOOP						
Proposed Route						
High	NA	NA	NA	NA	NA	NA
Medium/High	0.87	NA	0.76	NA	NA	0.11
Medium	1.59	NA	1.59	NA	NA	NA
Medium/Low	NA	NA	NA	NA	NA	NA
Low	NA	NA	NA	NA	NA	NA
Very Low	NA	NA	NA	NA	NA	NA

NA Not applicable due to absence of wetland or waterbody type within the alternative route

a The numbers in this table have been rounded for presentation purposes; as a result, the totals may not reflect the sum of the addends.

b Substation wetlands and waterbodies and the 230 kV split are included within each route

c Total acres may not total the sum of wetland and waterbody types because some of the lower probability rankings do not overlap with NWI or interpreted wetlands, and therefore do not have a wetland/waterbody type associated with them.

## Wetland Crossings

## Mars-Wishing Star Lines

### Alternative Route 1

The length of the corridor for Route 1 is approximately 3.63 miles and encompasses a total of approximately 91.87 acres (including the 0.34 mile and 3.36 acres of the Wishing Star to Mars 230 kV split and 30 acres

for the proposed Wishing Star and Mar Substations). Based on the methodology discussed above, the right-of-way and substation footprint will encompass approximately 23.98 percent (22.03 acres) of land with a medium or higher probability of containing wetlands and waterbodies.

### *Alternative Route 2*

The length of the corridor for Route 2 is approximately 3.64 miles and encompasses a total of approximately 92.08 acres (including the 0.34 mile and 3.36 acres of the Wishing Star to Mars 230 kV split and 30 acres for the proposed Wishing Star and Mar Substations). Based on the methodology discussed above, the right-of-way and Substation footprint will encompass approximately 23.80 percent (21.92 acres) of land with a medium or higher probability of containing wetlands and waterbodies.

### *Alternative Route 3*

The length of the corridor for Route 3 is approximately 3.62 miles and encompasses a total of approximately 91.68 acres (including the 0.34 mile and 3.36 acres of the Wishing Star to Mars 230 kV split and 30 acres for the proposed Wishing Star and Mar Substations). Based on the methodology discussed above, the right-of-way and Substation footprint will encompass approximately 20.83 percent (19.09 acres) of land with a medium or higher probability of containing wetlands and waterbodies.

### *Alternative Route 4*

The length of the corridor for Route 4 is approximately 3.63 miles and encompasses a total of approximately 91.90 acres (including the 0.34 mile and 3.36 acres of the Wishing Star to Mars 230 kV split and 30 acres for the proposed Wishing Star and Mar Substations). Based on the methodology discussed above, the right-of-way and Substation footprint will encompass approximately 20.66 percent (19.0 acres) of land with a medium or higher probability of containing wetlands and waterbodies.

### *Alternative Route 5*

The length of the corridor for Route 5 is approximately 3.55 miles and encompasses a total of approximately 92.77 acres (including the 0.34 mile and 3.36 acres of the Wishing Star to Mars 230 kV split and 30 acres for the proposed Wishing Star and Mar Substations). Based on the methodology discussed above, the right-of-way and Substation footprint will encompass approximately 18.98 percent (17.61 acres) of land with a medium or higher probability of containing wetlands and waterbodies.

### *Alternative Route 6*

The length of the corridor for Route 6 is approximately 3.56 miles and encompasses a total of approximately 92.88 acres (including the 0.34 mile and 3.36 acres of the Wishing Star to Mars 230 kV split and 30 acres for the proposed Wishing Star and Mar Substations). Based on the methodology discussed above, the right-of-way and substation footprint will encompass approximately 21.06 percent (19.56 acres) of land with a medium or higher probability of containing wetlands and waterbodies.

### *Mars 230 kV Loop*

#### *Proposed Route*

The length of the corridor for the 230 kV Loop is approximately 0.57 miles and encompasses a total of approximately 10.34 acres of right-of-way. Based on the methodology discussed above, the right-of-way

will encompass approximately 22.70 percent (2.35 acres) of land with a medium or higher probability of containing wetlands and waterbodies

### ***Waterbody Crossings***

ERM identified and mapped waterbodies in the study area using similar publicly available GIS databases as those used to identify and map wetlands. All proposed routes would cross perennial and intermittent waterbodies. The majority of waterbodies are tributaries to the perennial Broad Run. Mars-Wishing Star routes 1-6 cross perennial Broad Run and Cabin Branch. Routes 5 and 6 also cross the South Fork Broad Run, as well as other unnamed perennial and intermittent tributaries to Broad Run. There are three open waterbodies crossed by the routes. Routes 1 and 2 cross one open waterbody excavated between 2012 and 2014 based on historic aerials. Routes 3, 4, and 5 cross an open waterbody adjacent to Broad Run near its confluence with South Fork Broad Run, and routes 2, 4, 5, and 6 cross an open waterbody feature adjacent to Broad Run beneath Loudoun County Parkway.

### ***Mars-Wishing Star Lines***

#### ***Alternative Route 1***

Based on the NHD and the wetland desktop delineation methodology described above, there are a total of 6 waterbody crossings, including 3 perennial and 3 intermittent streams, within the Route 1 right-of-way. Waterbodies crossed by the right-of-way include two crossings of Broad Run, an open waterbody, and Cabin Branch.

#### ***Alternative Route 2***

Based on the NHD and the wetland desktop delineation methodology described above, there are a total of 9 waterbody crossings, including 6 perennial and 3 intermittent streams, within the Route 2 right-of-way. Waterbodies crossed by the right-of-way include three crossings of Broad Run, an open waterbody, an open waterbody adjacent to Broad Run, and Cabin Branch.

#### ***Alternative Route 3***

Based on the NHD and the wetland desktop delineation methodology described above, there are a total of 6 waterbody crossings, including 3 perennial and 3 intermittent streams, within the Route 3 right-of-way. Waterbodies crossed by the right-of-way include two crossings of Broad Run, open waterbody, and Cabin Branch.

#### ***Alternative Route 4***

Based on the NHD and the wetland desktop delineation methodology described above, there are a total of 9 waterbody crossings, including 6 perennial and 3 intermittent streams, within the Route 4 right-of-way. Waterbodies crossed by the right-of-way include three crossings of Broad Run, an open waterbody, an open waterbody adjacent to Broad Run, and Cabin Branch.

#### ***Alternative Route 5***

Based on the NHD and the wetland desktop delineation methodology described above, there are a total of 11 waterbody crossings, including 9 perennial and 2 intermittent streams, within the Route 5 right-of-way.

Waterbodies crossed by the right-of-way include two crossings of Broad Run, an open waterbody adjacent to Broad Run, and Cabin Branch.

### *Alternative Route 6*

Based on the NHD and the wetland desktop delineation methodology described above, there are a total of 11 waterbody crossings, including 9 perennial and 2 intermittent streams, within the Route 6 right-of-way. Waterbodies crossed by the right-of-way include two crossings of Broad Run, an open waterbody adjacent to Broad Run, and Cabin Branch.

### *Mars 230 kV Loop*

#### *Proposed Route*

Based on the NHD and the wetland desktop delineation methodology described above, there are no mapped waterbody crossings within the Mars 230 kV Loop right-of-way.

## **Project Impacts**

Avoiding or minimizing new impacts on wetlands and streams was among the criteria Dominion Energy Virginia used in developing routes for the Project. To minimize impacts on wetland areas and streams, the transmission lines have been designed to span or avoid wetlands where possible. Most of the wetlands in the area are associated with streams and rivers, and it is anticipated that these features can be spanned, keeping structure locations outside of wetlands to the extent practicable.

Where the removal of trees or shrubby vegetation occurs within wetlands, Dominion Energy Virginia would use the least intrusive method reasonably possible to clear the corridor. Hand-cutting of vegetation would be conducted, where needed, to avoid and minimize impacts on streams and/or wetlands. There would be no change in contours or redirection of water flow, and the amount of spoil from foundation installation and structure placement would be minimal. Excess soil in wetlands generated through foundation construction would be removed from the wetland.

Mats would be used for construction equipment to travel over wetlands, as appropriate. Due to the absence of an existing right-of-way in some areas along the routes, new temporary access roads may be necessary. Additionally, if a route section cannot be accessed from existing roads, Dominion may need to install a culvert, ford, or temporary bridge along the ROW to cross small streams, where present. In such cases, temporary fill material in wetlands adjacent to the crossings may be required. This fill would be placed on erosion control fabric and removed when work is completed, returning ground elevations to original contours. Potential direct impacts on wetlands associated with construction would be temporary in nature. Where tree clearing within wetlands is necessary, forested wetlands would be permanently converted to scrub-shrub or emergent type wetlands after construction. Forested wetlands provide functions such as peak flood flow reduction, nutrient and sediment capture, filtration of pollutants to adjacent waterbodies, and diversity of habitat. The conversion of forested wetlands may reduce or eliminate some of these functions. Required 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 modification from shading. Vegetation within the right-of-way would be allowed to return to maintained grasses and shrubs after construction, which would provide some filtration stabilization to help protect waterbodies from pollutants. Within the immediate stream buffer (100 feet), all trees will be hand felled with stumps left in place to reduce the potential for erosion. Shrubs and

trees with a diameter at breast height (DBH) of less than three inches will be left in place unless it impedes temporary access where they would be clipped leaving roots in place which will be able to naturally regenerate.

## Summary

This Wetland and Waterbody Summary report was prepared in accordance with the Memorandum of Agreement between the DEQ and the SCC for purposes of initiating a Wetlands Impact Consultation. Please note that a formal onsite wetland delineation was not conducted as part of this review.

In addition, there is a Project website where the SCC application will be available after filing, as well as maps and discussions about the Project. It can be accessed by going to [www.dominionenergy.com/NOVA](http://www.dominionenergy.com/NOVA). If you have any questions regarding this wetland assessment, please contact me at 612-347-7178 or by email at [mariah.weitzenkamp@erm.com](mailto:mariah.weitzenkamp@erm.com).

Sincerely,

Mariah Weitzenkamp  
Environmental Resources Management

cc: Laura Meadows, Dominion Energy Virginia  
James Young, Dominion Energy Virginia

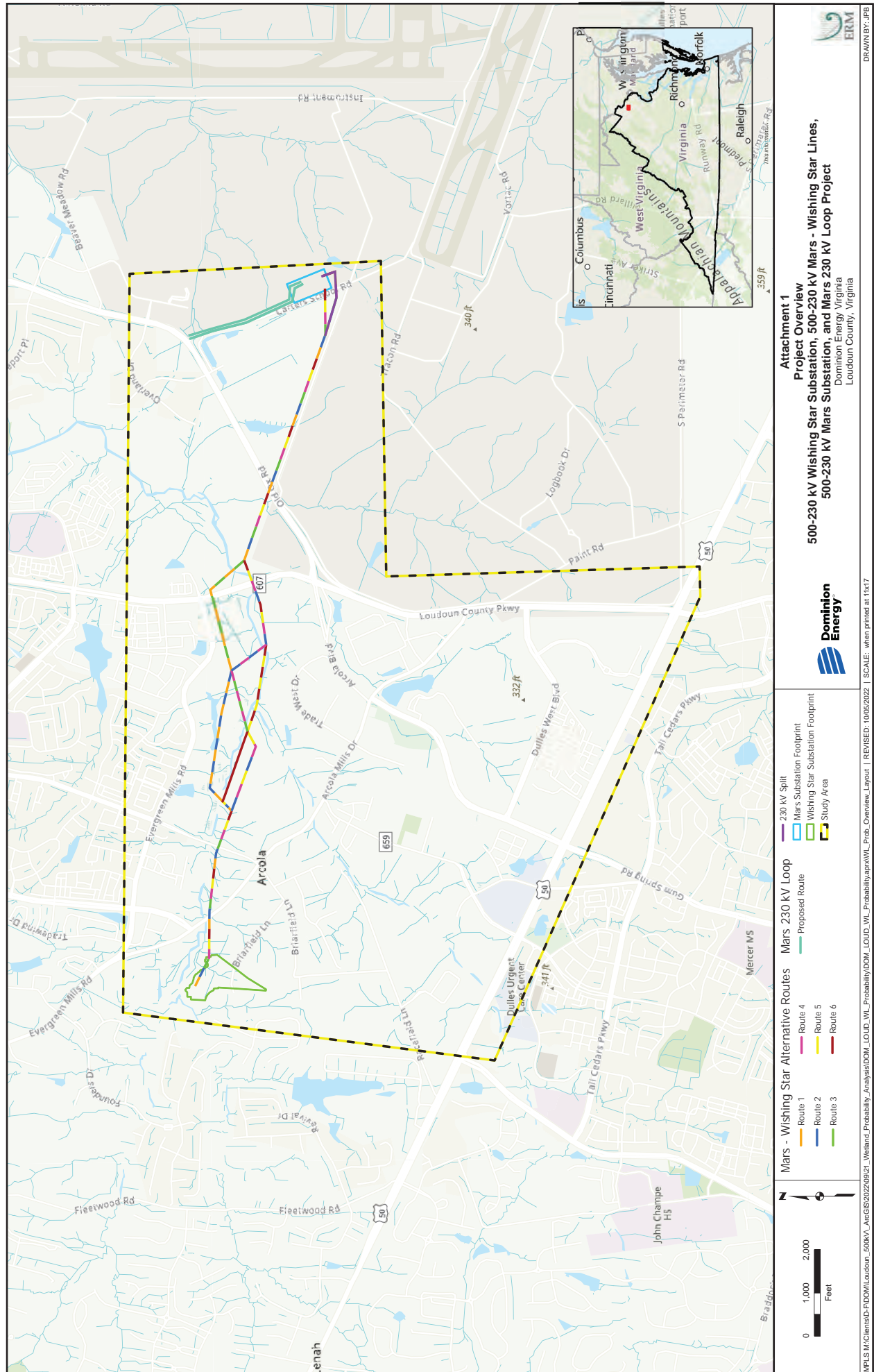
Enclosures: Attachments 1 and 2

## References

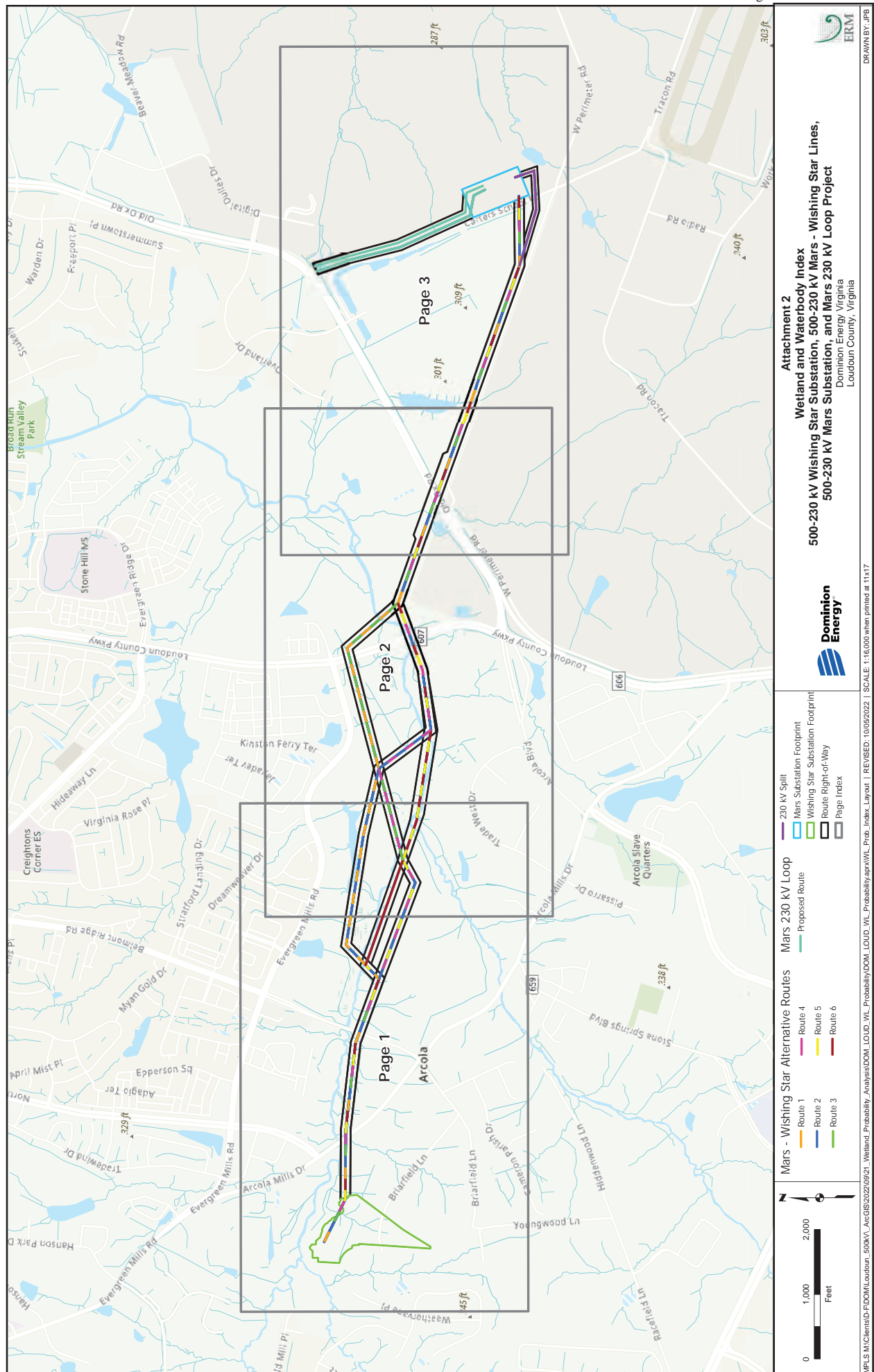
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## **ATTACHMENT 1**



## **ATTACHMENT 2**



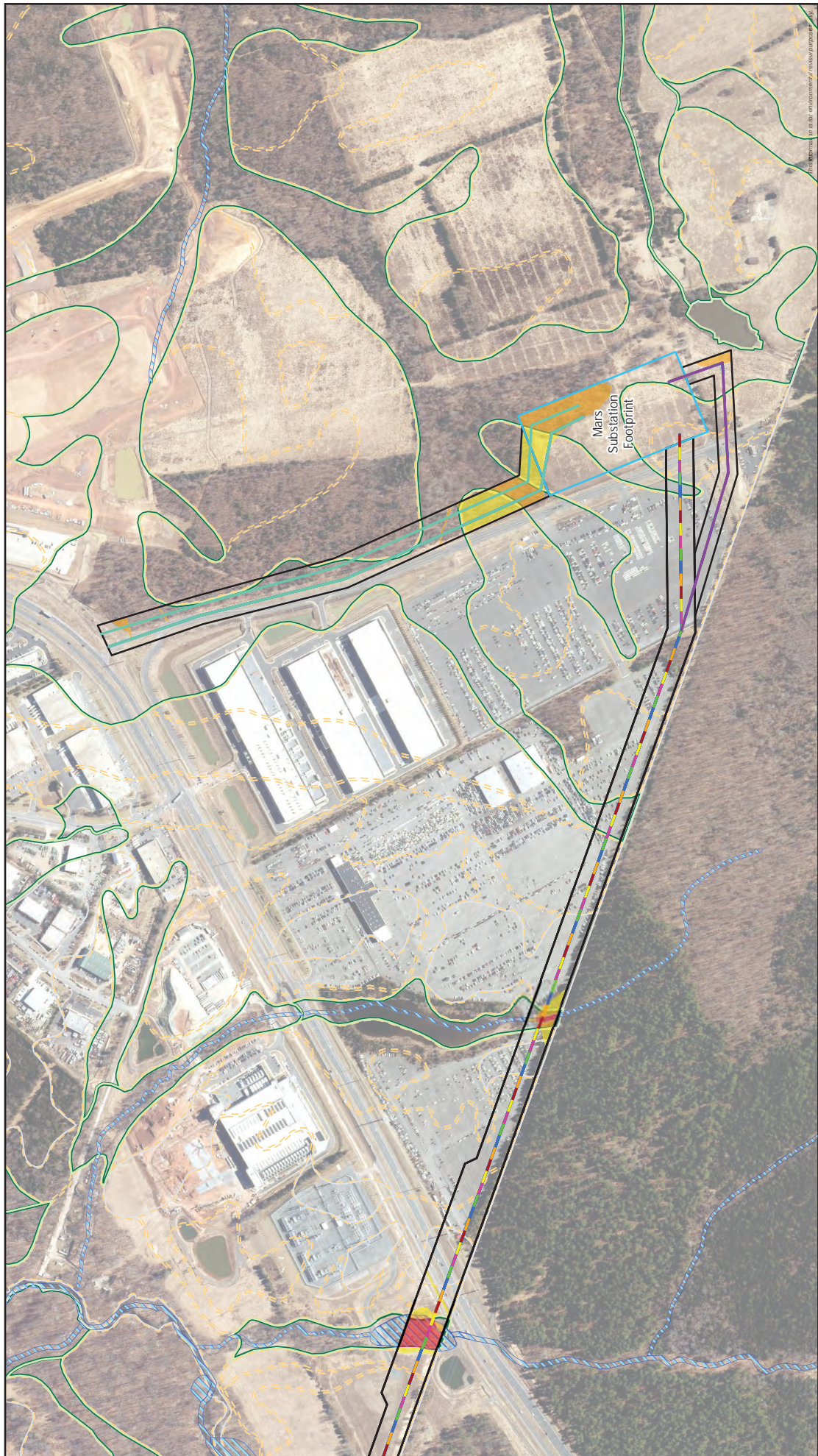












**Attachment 2**  
**Wetland and Waterbody Mapset**  
**500-230 kV Wishing Star Substation, 500-230 kV Mars - Wishing Star Lines,**  
**500-230 kV Mars Substation, and Mars 230 kV Loop Project**  
Dominion Energy Virginia  
Loudoun County, Virginia

**Dominion Energy**

**ERM**

Page 3 of 3

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## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Virginia Ecological Services Field Office  
6669 Short Lane  
Gloucester, VA 23061-4410  
Phone: (804) 693-6694 Fax: (804) 693-9032



In Reply Refer To:  
Project Code: 2023-0006425  
Project Name: Mars to Wishing Star

October 19, 2022

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

### To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

**Migratory Birds:** In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see <https://www.fws.gov/birds/policies-and-regulations.php>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see <https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Project Code in the header of this

letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds

## Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Virginia Ecological Services Field Office**

6669 Short Lane  
Gloucester, VA 23061-4410  
(804) 693-6694

## Project Summary

Project Code: 2023-0006425  
Project Name: Mars to Wishing Star  
Project Type: Transmission Line - New Constr - Above Ground  
Project Description: This request is part of a pre-permitting routing study for overhead transmission lines.

### Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@38.9463915,-77.53517792037852,14z>



Counties: Loudoun County, Virginia



## Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

- 
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

### Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>	Threatened

### Clams

NAME	STATUS
Dwarf Wedgemussel <i>Alasmodonta heterodon</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/784">https://ecos.fws.gov/ecp/species/784</a>	Endangered

### Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9743">https://ecos.fws.gov/ecp/species/9743</a>	Candidate

### Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

## **USFWS National Wildlife Refuge Lands And Fish Hatcheries**

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

## Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

**The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\)](#) list or warrant special attention in your project location.** To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
<b>Bald Eagle <i>Haliaeetus leucocephalus</i></b> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Jul 31
<b>Chimney Swift <i>Chaetura pelagica</i></b> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
<b>Kentucky Warbler <i>Oporornis formosus</i></b> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20

NAME	BREEDING SEASON
<b>Prairie Warbler <i>Dendroica discolor</i></b> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
<b>Prothonotary Warbler <i>Protonotaria citrea</i></b> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
<b>Red-headed Woodpecker <i>Melanerpes erythrocephalus</i></b> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
<b>Rusty Blackbird <i>Euphagus carolinus</i></b> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
<b>Wood Thrush <i>Hylocichla mustelina</i></b> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

## Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

### Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12

(0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is  $0.25/0.25 = 1$ ; at week 20 it is  $0.05/0.25 = 0.2$ .

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

### Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

### Survey Effort (|)

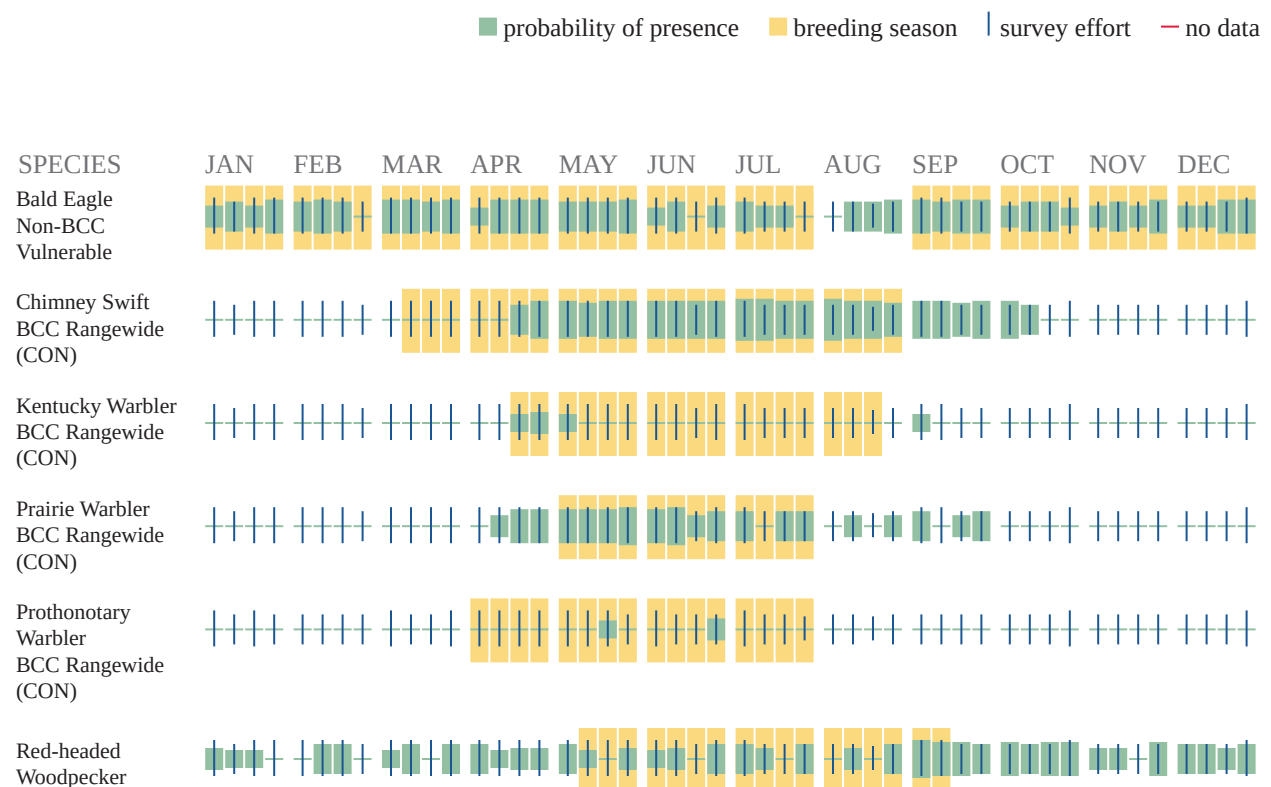
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

**No Data (—)**

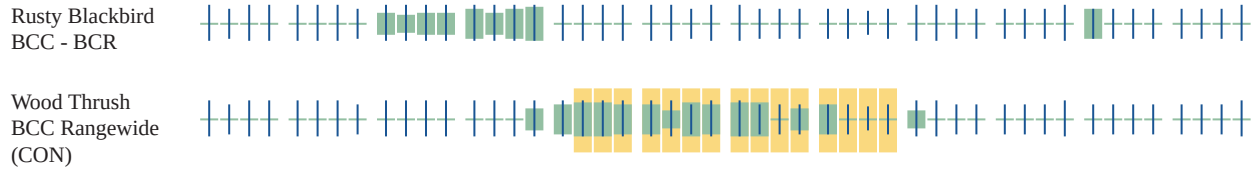
A week is marked as having no data if there were no survey events for that week.

## Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



BCC Rangewide  
(CON)



Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

## Migratory Birds FAQ

**Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

**What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?**

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).



### **What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?**

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

### **How do I know if a bird is breeding, wintering or migrating in my area?**

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

### **What are the levels of concern for migratory birds?**

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

### **Details about birds that are potentially affected by offshore projects**

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

### **What if I have eagles on my list?**

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

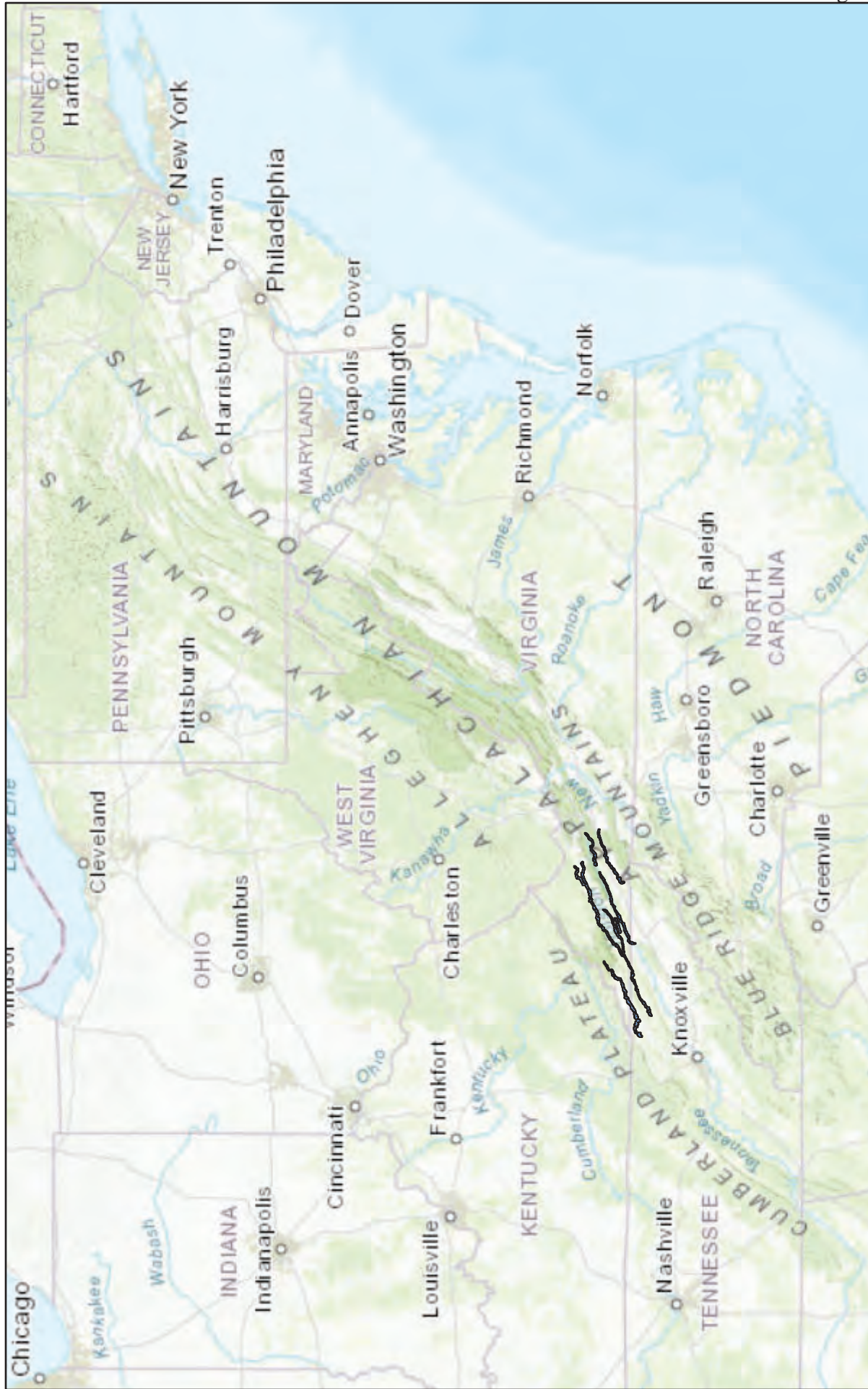
### **Proper Interpretation and Use of Your Migratory Bird Report**

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

## **IPaC User Contact Information**

Agency: ERM Group  
Name: Kathlynn Lewis  
Address: 919 E. Main St.  
Address Line 2: Suite 1701  
City: Richmond  
State: VA  
Zip: 23219  
Email: kathlynn.lewis@erm.com  
Phone: 8047837556

# Critical Habitat in Virginia



6/27/2022

Virginia Critical Habitat (published)



**COMMONWEALTH of VIRGINIA**  
**DEPARTMENT OF CONSERVATION AND RECREATION**

Darryl Glover  
Deputy Director for  
Dam Safety,  
Floodplain Management and  
Soil and Water Conservation

Laura Ellis  
Interim Deputy Director for  
Administration and Finance

July 1, 2022

Kathlynn Lewis  
Environmental Resources Management, Inc.  
919 E. Main St.  
Richmond, VA 23219

Re: 0505584, Loudoun South 500kV-230kV

Dear Ms. Lewis:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, natural heritage resources have not been documented within the project area including a 100ft buffer. However, several rare plants, which are typically associated with prairie vegetation and inhabit semi-open diabase glades in Virginia, may occur at this location if suitable habitat is present. Diabase glades are characterized by historically fire-dominated grassland vegetation on relatively nutrient-rich soils underlain by Triassic bedrock. Diabase flatrock, a hard, dark-colored volcanic rock, is found primarily in northern Virginia counties and is located within the geologic formation known as the Triassic Basin. Where the bedrock is exposed, a distinctive community type of drought-tolerant plants occurs. Diabase flatrocks are extremely rare natural communities that are threatened by activities such as quarrying and road construction (Rawinski, 1995).

In Northern Virginia, diabase supports occurrences of several global and state rare plant species: Earleaf False foxglove (*Agalinis auriculata*, G3/S1/NL/NL), Purple milkweed (*Asclepias purpurascens*, G5?/S2/NL/NL), American bluehearts (*Buchnera americana*, G5?/S1S2/NL/NL), Downy phlox (*Phlox pilosa*, G5/S1/NL/NL), Torrey's Mountain-mint (*Pycnanthemum torreyi*, G2/S2/NL/NL), Stiff goldenrod (*Solidago rigida* var. *rigida*, G5T5/S2/NL/NL), and Hairy hedgenettle (*Stachys arenicola*, G4?/S1/NL/NL).

Due to the potential for this site to support populations of natural heritage resources, DCR recommends an inventory for rare plants associated with diabase glades in the study area. With the survey results we can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources.

DCR-Division of Natural Heritage biologists are qualified to conduct inventories for rare, threatened, and endangered species. Please contact Anne Chazal, Natural Heritage Chief Biologist, at [anne.chazal@dcr.virginia.gov](mailto:anne.chazal@dcr.virginia.gov) or 804-786-9014 to discuss availability and rates for field work.



In addition, if tree removal is proposed the project may impact Ecological Cores (**C4 and C5**) as identified in the Virginia Natural Landscape Assessment (<https://www.dcr.virginia.gov/natural-heritage/vaconvisvnl>). Mapped cores in the project area can be viewed via the Virginia Natural Heritage Data Explorer, available here: <http://vanhde.org/content/map>.

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 utilize marsh, dune, and beach habitats. Interior core areas begin 100 meters inside core edges and continue to the deepest parts of cores. Cores also provide the natural, economic, and quality of life benefits of open space, recreation, thermal moderation, water quality (including drinking water recharge and protection, and erosion prevention), and air quality (including sequestration of carbon, absorption of gaseous pollutants, and production of oxygen). Cores are ranked from C1 to C5 (C5 being the least significant) using nine prioritization criteria, including the habitats of natural heritage resources they contain.

Impacts to cores occur when their natural cover is partially or completely converted permanently to developed land uses. Habitat conversion to development causes reductions in ecosystem processes, native biodiversity, and habitat quality due to habitat loss; less viable plant and animal populations; increased predation; and increased introduction and establishment of invasive species.

DCR recommends avoidance of impacts to cores. When avoidance cannot be achieved, DCR recommends minimizing the area of impacts overall and concentrating the impacted area at the edges of cores, so that the most interior remains intact.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please re-submit a completed order form and project map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

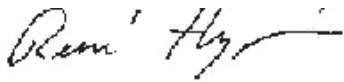
A fee of \$1000.00 has been assessed for the service of providing this information. Please find attached an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, DCR Finance, 600 East Main Street, 24<sup>th</sup> Floor, Richmond, VA 23219. Payment is due within thirty days of the invoice date. Please note late payment may result in the suspension of project review service for future projects.

The Virginia Department of Wildlife Resources (VDWR) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from <http://vafwis.org/fwis/> or contact Amy Martin at 804-367-2211 or [amy.martin@dwr.virginia.gov](mailto:amy.martin@dwr.virginia.gov).

Should you have any questions or concerns, feel free to contact me at 804-371-2708. Thank you for the opportunity to comment on this project.



Sincerely,

A handwritten signature in black ink, appearing to read "René Hypes", with a stylized flourish extending to the right.

S. René Hypes  
Natural Heritage Project Review Coordinator

#### Literature Cited

Rawinski, T.J. 1995. Natural communities and ecosystems: Conservation priorities for the future. Unpublished report for DCR-DNH.

**VaFWIS Search Report** Compiled on 10/5/2022, 10:08:57 AM[Help](#)

Known or likely to occur within a **2 mile radius around point 38,57,24.5 -77,31,08.4**  
in **107 Loudoun County, VA**

[View Map of  
Site Location](#)

501 Known or Likely Species ordered by Status Concern for Conservation  
(displaying first 32) (32 species with Status\* or Tier I\*\* )

<a href="#">BOVA Code</a>	<a href="#">Status*</a>	<a href="#">Tier**</a>	<a href="#">Common Name</a>	<a href="#">Scientific Name</a>	<a href="#">Confirmed</a>	<a href="#">Database(s)</a>
060003	FESE	Ia	<a href="#">Wedgemussel, dwarf</a>	Alasmidonta heterodon		BOVA
050022	FTST	Ia	<a href="#">Bat, northern long-eared</a>	Myotis septentrionalis		BOVA
060029	FTST	IIa	<a href="#">Lance, yellow</a>	Elliptio lanceolata		BOVA,HU6
050020	SE	Ia	<a href="#">Bat, little brown</a>	Myotis lucifugus		BOVA
050027	FPSE	Ia	<a href="#">Bat, tri-colored</a>	Perimyotis subflavus		BOVA
060006	SE	Ib	<a href="#">Floater, brook</a>	Alasmidonta varicosa		BOVA
030062	ST	Ia	<a href="#">Turtle, wood</a>	Glyptemys insculpta	<a href="#">Potential</a>	BOVA,Habitat,HU6
040096	ST	Ia	<a href="#">Falcon, peregrine</a>	Falco peregrinus		BOVA
040293	ST	Ia	<a href="#">Shrike, loggerhead</a>	Lanius ludovicianus		BOVA
040379	ST	Ia	<a href="#">Sparrow, Henslow's</a>	Centronyx henslowii	<a href="#">Potential</a>	BOVA,BBA,HU6
100155	ST	Ia	<a href="#">Skipper, Appalachian grizzled</a>	Pyrgus wyandot		HU6
060081	ST	IIa	<a href="#">Floater, green</a>	Lasmigona subviridis		BOVA
040292	ST		<a href="#">Shrike, migrant loggerhead</a>	Lanius ludovicianus migrans		BOVA
100079	FC	IIIa	<a href="#">Butterfly, monarch</a>	Danaus plexippus		BOVA
030063	CC	IIIa	<a href="#">Turtle, spotted</a>	Clemmys guttata		BOVA,HU6
030012	CC	IVa	<a href="#">Rattlesnake, timber</a>	Crotalus horridus		BOVA
040092		Ia	<a href="#">Eagle, golden</a>	Aquila chrysaetos		BOVA
040040		Ia	<a href="#">Ibis, glossy</a>	Plegadis falcinellus		HU6
040306		Ia	<a href="#">Warbler, golden-winged</a>	Vermivora chrysoptera		BOVA
100248		Ia	<a href="#">Fritillary, regal</a>	Speyeria idalia idalia		BOVA,HU6
040213		Ic	<a href="#">Owl, northern saw-whet</a>	Aegolius acadicus		BOVA,HU6
040052		IIa	<a href="#">Duck, American black</a>	Anas rubripes		BOVA,HU6
040036		IIa	<a href="#">Night-heron, yellow-crowned</a>	Nyctanassa violacea violacea		BOVA
040181		IIa	<a href="#">Tern, common</a>	Sterna hirundo		HU6

040320		IIa	<a href="#">Warbler, cerulean</a>	Setophaga cerulea		Page 21 of 27 BOVA,HU6
040140		IIa	<a href="#">Woodcock, American</a>	Scolopax minor		BOVA,HU6
060071		IIa	<a href="#">Lampmussel, yellow</a>	Lampsilis cariosa		BOVA
040203		IIb	<a href="#">Cuckoo, black-billed</a>	Coccyzus erythrophthalmus		BOVA
040105		IIb	<a href="#">Rail, king</a>	Rallus elegans		BOVA
040304		IIc	<a href="#">Warbler, Swainson's</a>	Limnothlypis swainsonii		HU6
100154		IIc	<a href="#">Butterfly, Persius duskywing</a>	Erynnis persius persius		HU6
100166		IIc	<a href="#">Skipper, Dotted</a>	Hesperia attalus slossonae		BOVA,HU6

To view **All 501 species** [View 501](#)

\*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; CC=Collection Concern

\*\*I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need  
Virginia Wildlife Action Plan Conservation Opportunity Ranking:  
a - On the ground management strategies/actions exist and can be feasibly implemented.;  
b - On the ground actions or research needs have been identified but cannot feasibly be implemented at this time.;  
c - No on the ground actions or research needs have been identified or all identified conservation opportunities have been exhausted.

## Species Observations ( 9 records )

[View Map of All Query Results](#)  
[Species Observations](#)

obsID	class	Date Observed	Observer	N Species			View Map
				Different Species	Highest TE*	Highest Tier**	
<a href="#">615990</a>	SppObs	Oct 9 2012	Jason; Cessna	17			<a href="#">Yes</a>
<a href="#">605575</a>	SppObs	Feb 25 2008	Claudia; Thompson-Diehl	1			<a href="#">Yes</a>
<a href="#">425216</a>	SppObs	Sep 6 2005	VCU - INSTAR	17			<a href="#">Yes</a>
<a href="#">302377</a>	SppObs	Oct 8 2003	Robert Ballantine	4			<a href="#">Yes</a>
<a href="#">300696</a>	SppObs	Jul 8 2001	ROGER B. CLAPP	1			<a href="#">Yes</a>
<a href="#">58721</a>	SppObs	Aug 2 1998	JOHN WHITE	1			<a href="#">Yes</a>
<a href="#">58728</a>	SppObs	May 24 1998	JOHN WHITE	2			<a href="#">Yes</a>
<a href="#">58736</a>	SppObs	May 3 1998	JOHN WHITE	1			<a href="#">Yes</a>
<a href="#">363955</a>	SppObs	Jan 1 1900		1			<a href="#">Yes</a>

Displayed 9 Species Observations

## Public Holdings:

N/A

USGS National 6th Order Watersheds Summary of Wildlife Action Plan Tier I, II, III, and IV Species:

HU6 Code	USGS 6th Order Hydrologic Unit	Different Species	Highest TE	Highest Tier
PL17	<a href="#">Broad Run-Lenah Run</a>	49	ST	I
PL18	<a href="#">Horsepen Run</a>	61	ST	I
PL45	<a href="#">Cub Run</a>	70	FTST	I

Compiled on 10/5/2022, 10:08:57 AM 11411897.0 report=Options searchType= R dist= 3218 poi= 38,57,24.5 -77,31,08.4  
PixelSize=64; Anadromous=0.018678; BBA=0.027851; BECAR=0.017211; Bats=0.017043; Buffer=0.060532; County=0.047131; HU6=0.041767; Impediments=0.016695; Init=0.091851; PublicLands=0.01983; Quad=0.023254; SppObs=0.152225; TEWaters=0.020448; TierReaches=0.038634; TierTerrestrial=0.028225; Total=0.835157; Tracking\_BOVA=0.228059; Trout=0.018328; huva=0.023542

Site Location

38,57,24.5 - 77,31,08.4

is the Search Point

Show Position Rings

☒ Yes ☐ No

1 mile and 1/4 mile at the Search Point

Show Search Area

☒ Yes ☐ No

2 Search distance miles radius

Search Point is at map center

Base Map Choices

Color Aerial Photography ▼

Map Overlay Choices

Current List: Position, Search, BECAR, BAEANests, TEWaters, TierII, Habitat, Trout, Anadromous

Map Overlay Legend

back

38,57,56.8 - 77,30,15.6

Map Click

pan

id

m

Map Scale

Refresh Browser Page

in

Zoom

Out


Screen Size


Small

Size

Big

Help











**T & E Waters**  
**Federal**  
**State**

**Predicted Habitat**  
**WAP Tier I & II**

**Aquatic**  
**Terrestrial**

**Trout Waters**  
**Class I - IV**  
**Class V - VI**

**Anadromous Fish Reach**  
**Confirmed**  
**Potential**

**Impediment**

**Position Rings**  
**1 mile and 1/4 mile at the Search Point**

**2 mile radius Search Area**

**Bald Eagle Concentration Areas and Roosts**

Point of Search 38,57,24.5 -77,31,08.4  
Map Location 38,57,24.5 -77,31,08.4

- Select **Coordinate System**:
- ☒ Degrees,Minutes,Seconds Latitude - Longitude
  - ☐ Decimal Degrees Latitude - Longitude
  - ☐ Meters UTM NAD83 East North Zone
  - ☐ Meters UTM NAD27 East North Zone

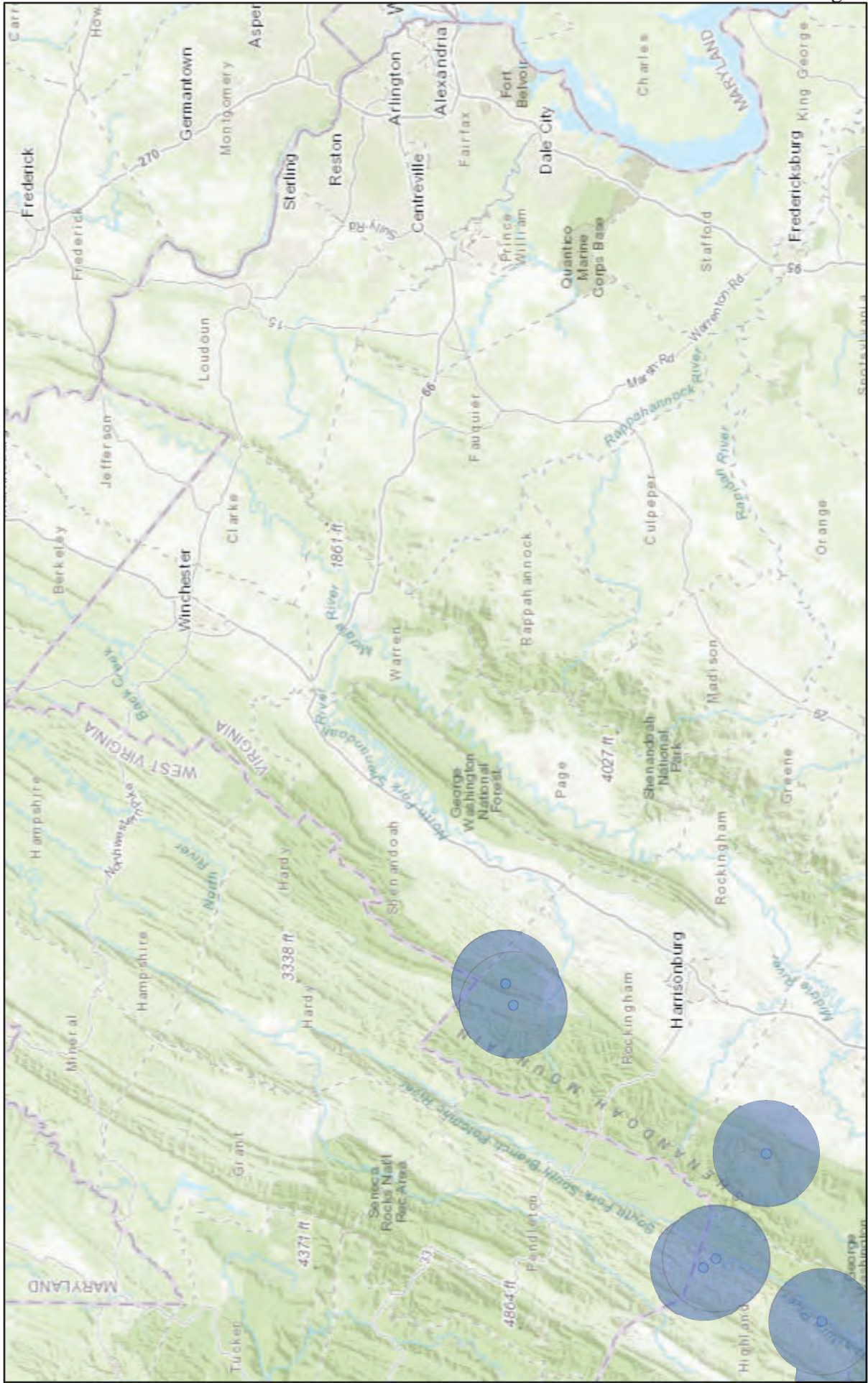
Base Map source: Color Aerial Photography 2002 - Virginia Base Mapping Program, Virginia Geographic Information Network

Map projection is UTM Zone 18 NAD 1983 with left 276929 and top 4319802. Pixel size is 16 meters . Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixles. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.1 square kilometers. The map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.5 square miles.

Topographic maps and Black and white aerial photography for year 1990+- are from the United States Department of the Interior, United States Geological Survey. Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia Geographic Information Network. Shaded topographic maps are from TOPO! ©2006 National Geographic <http://www.national.geographic.com/topo> All other map products are from the Commonwealth of Virginia Department of Game and Inland Fisheries.

map assembled 2022-10-04 11:35:37 (qa/qc March 21, 2016 12:20 - tn=1411658.0 dist=3218 I )  
\$poi=38.9568100 -77.5190093

# NLEB Locations and Roost Trees



6/27/2022, 4:04:35 PM

- NLEB Hibernaculum 5.5 Mile Buffer
- NLEB Hibernaculum Half Mile Buffer

1:1,155,581

0 5 10 20 mi

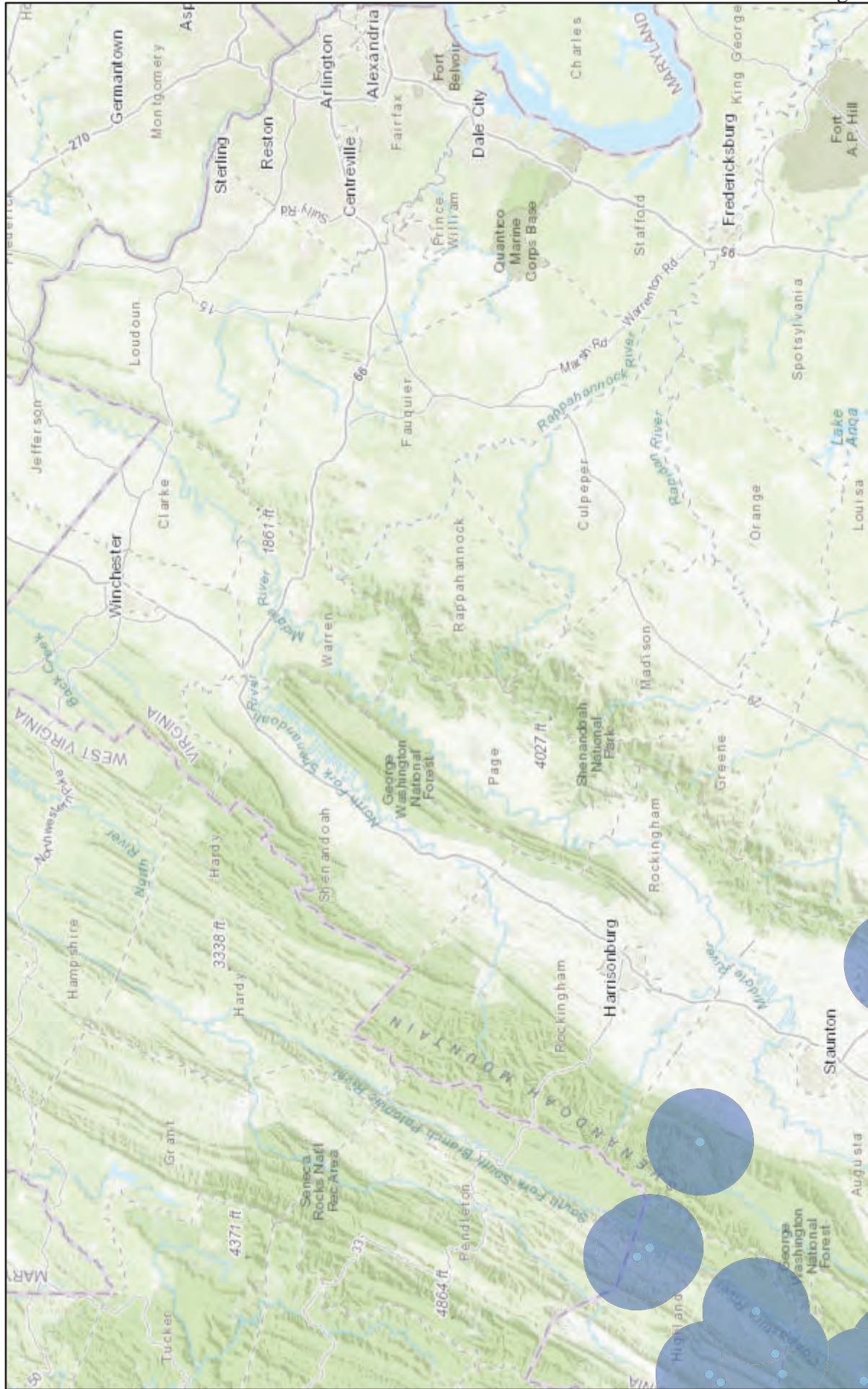
0 12.5 25 50 km

Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS

VA Dept. Game & Inland Fisheries  
Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS



# ArcGIS Web Map



6/27/2022, 4:03:27 PM

Tri-colored and Little Brown Hibernaculum Half Mile Buffer

Tri-colored and Little Brown Hibernaculum 5.5 Mile Buffer

1:1,155,581

0 5 10 20 mi

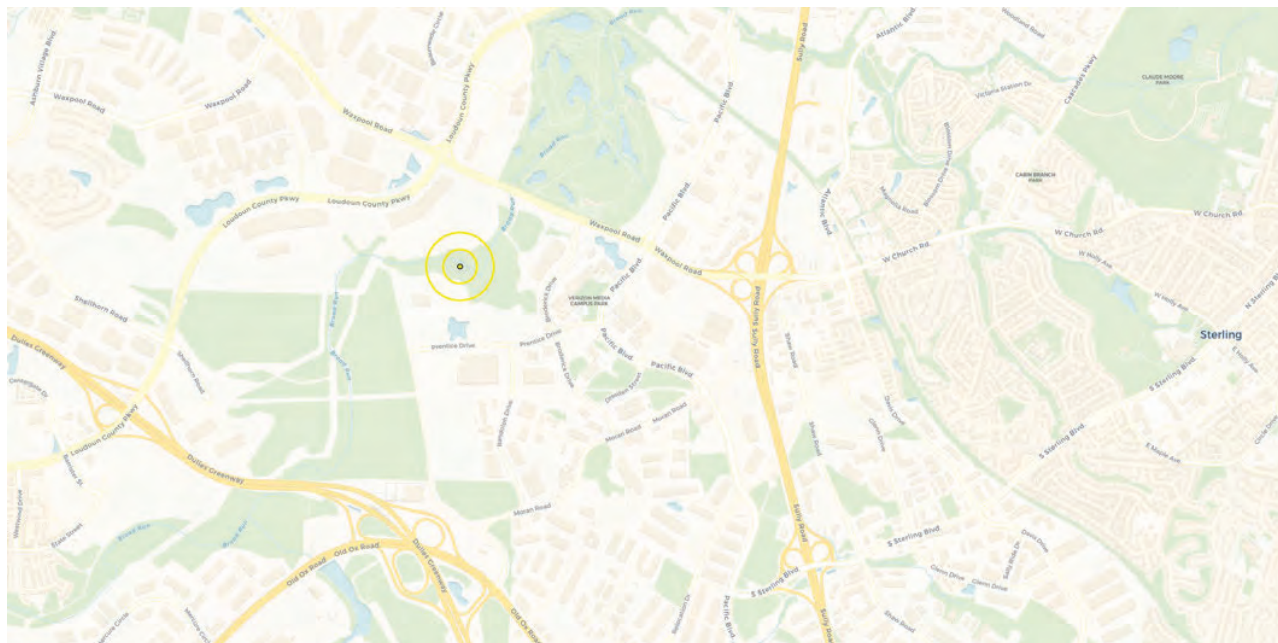
0 12.5 25 50 km

Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS

Dept. Game and Inland Fisheries  
Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS



# CCB Mapping Portal



**Layers:** VA Eagle Nest Locator, VA Eagle Nest Buffers

**Map Center [longitude, latitude]:** [-77.44790554046631, 39.004711589754166]

**Map Link:**

[https://ccbbirds.org/maps/#layer=VA+Eagle+Nest+Locator&layer=VA+Eagle+Nest+Buffers&zoom=15&lat=39.004711589754166&lng=-77.44790554046631&legend=legend\\_tab\\_7c321b7e-e523-11e4-aaa0-0e0c41326911&base=Street+Map+%28OSM%2FCarto%29](https://ccbbirds.org/maps/#layer=VA+Eagle+Nest+Locator&layer=VA+Eagle+Nest+Buffers&zoom=15&lat=39.004711589754166&lng=-77.44790554046631&legend=legend_tab_7c321b7e-e523-11e4-aaa0-0e0c41326911&base=Street+Map+%28OSM%2FCarto%29)

**Report Generated On:** 06/27/2022

The Center for Conservation Biology (CCB) provides certain data online as a free service to the public and the regulatory sector. CCB encourages the use of its data sets in wildlife conservation and management applications. These data are protected by intellectual property laws. All users are reminded to view the [Data Use Agreement](#) to ensure compliance with our data use policies. For additional data access questions, view our [Data Distribution Policy](#), or contact our Data Manager, Marie Pitts, at [mlpitts@wm.edu](mailto:mlpitts@wm.edu) or 757-221-7503.

Report generated by [The Center for Conservation Biology Mapping Portal](#).

To learn more about CCB visit [ccbbirds.org](http://ccbbirds.org) or contact us at [info@ccbbirds.org](mailto:info@ccbbirds.org)



*Commonwealth of Virginia*

**VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY**

1111 E. Main Street, Suite 1400, Richmond, Virginia 23219

P.O. Box 1105, Richmond, Virginia 23218

(800) 592-5482

[www.deq.virginia.gov](http://www.deq.virginia.gov)

Matthew J. Strickler  
Secretary of Natural Resources

David K. Paylor  
Director  
(804) 698-4000

August 13, 2019

Mr. Jason E. Williams  
Director Environmental Services  
Dominion Energy  
5000 Dominion Boulevard  
Glen Allen, VA 23060

*Transmitted electronically:* [jason.e.william@dominionenergy.com](mailto:jason.e.william@dominionenergy.com)

Subject: Dominion Energy (Electric Transmission) – Annual Standards and Specifications for Erosion & Sediment Control and Stormwater Management (AS&S for ESC and SWM)

Dear Mr. Williams:

The Virginia Department of Environmental Quality ("DEQ") hereby approves the Annual Standards and Specifications for Erosion & Sediment Control and Stormwater Management for Dominion Energy (Electric Transmission) dated "May 29, 2019". This coverage is effective from August 13, 2019 to August 12, 2020.

To ensure compliance with approved specifications, the Virginia Erosion and Sediment Control Law and the Virginia Stormwater Management Act, DEQ staff will conduct random site inspections, respond to complaints, and provide on-site technical assistance with specific erosion and sediment control and stormwater management measures and plan implementation.

Please note that your approved Annual Standards and Specifications include the following requirements:

1. Variance, exception, and deviation requests must be submitted separately from this Annual Standards and Specifications submission to DEQ. DEQ may require project-specific plans associated with variance requests to be submitted for review and approval.
2. The following information must be submitted to DEQ for each project at least two weeks in advance of the commencement of regulated land-disturbing activities. Notifications shall be sent by email to: [StandardsandSpecs@deq.virginia.gov](mailto:StandardsandSpecs@deq.virginia.gov)
  - i: Project name or project number;
  - ii: Project location (including nearest intersection, latitude and longitude, access point);
  - iii: On-site project manager name and contact info;
  - iv: Responsible Land Disturber (RLD) name and contact info;
  - v: Project description;



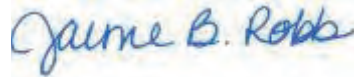
Dominion Energy (Electric Transmission) – AS&S for ESC and SWM  
August 12, 2019  
Page 2 of 2

- vi: Acreage of disturbance for project;
  - vii: Project start and finish date; and
  - viii: Any variances/exceptions/waivers associated with this project.
3. Project tracking of all regulated land disturbing activities (LDA) must be submitted to the DEQ on a bi-annual basis. Project tracking records shall contain the same information as required in the two week e-notifications for each regulated LDA.
  4. Erosion & Sediment Control and Stormwater Management plan review and approval must be conducted by DEQ-Certified plan reviewers and documented in writing.

To ensure an efficient information exchange and response to inquiries, the DEQ Central Office is your primary point of contact. Central Office staff will coordinate with our Regional Office staff as appropriate.

Thank you very much for your submission and continued efforts to conserve and protect Virginia's precious natural resources.

Sincerely,



Jaime B. Robb, Manager  
Office of Stormwater Management

Cc: Amelia Boschen, [Amelia.h.boschen@dominionenergy.com](mailto:Amelia.h.boschen@dominionenergy.com)  
Elizabeth Hester, [Elizabeth.l.hester@dominionenergy.com](mailto:Elizabeth.l.hester@dominionenergy.com)  
Stacey Ellis, [Stacey.t.ellis@dominionenergy.com](mailto:Stacey.t.ellis@dominionenergy.com)

Case Decision Information:

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have thirty days from the date of service (the date you actually received this decision or the date it was mailed to you, whichever occurred first) within which to appeal this decision by filing a notice of appeal in accordance with the Rules of the Supreme Court of Virginia with the Director, Department of Environmental Quality. In the event that this decision is served on you by mail, three days are added to that period.





**Dominion  
Energy®**

## 500-230 kV Wishing Star Substation, 500 kV and 230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop

Pre-Application Analysis

Archaeology Site  
Locations Redacted

21 October 2022

Project No.: 0505584

Signature page

21 October 2022

# 500-230 kV Wishing Star Substation, 500 kV and 230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop

## Pre-Application Analysis



Mary Beth Derrick  
Senior Architectural Historian



Jeffrey L. Holland  
Senior Historian



Jeremy Mastroianni  
Data Analytics and Visualization Specialist



Emily Dodson  
Architectural Historian

ERM  
3300 Breckinridge Boulevard  
Suite 300  
Duluth, GA 30096

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## Executive Summary

This report presents the findings of the pre-application analysis for Dominion Energy Virginia's proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars - Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Project in Loudoun County, Virginia. For this Project, Virginia Electric and Power Company (Dominion Energy Virginia or the Company) is proposing to construct and operate the following new facilities:

- a new 500-230 kV substation, referred to as Wishing Star Substation, to be built east of and adjacent to Dominion's existing 500 kV Brambleton-Mosby Lines (#546 and #590) and 230 kV Brambleton-Loudoun Lines (#2094 and #2045), south of the existing Brambleton Substation, within existing Company-owned right-of-way and on property obtained by the Company;
- a new 500-230 kV substation, referred to as Mars Substation, to be built near the intersection of Carters School and West Perimeter roads on property obtained by the Company northwest of Washington Dulles International Airport (Dulles Airport);
- a new overhead 500 kV single circuit transmission line (#527) with a new 230 kV single circuit transmission line (#2291) underbuilt on the same structures, referred to as the Mars-Wishing Star Lines, between the proposed Wishing Star and Mars Substations; and
- two new 230 kV double circuit transmission lines, referred to as the Mars 230 kV Loop, from the proposed Mars Substation to the Company's existing 230 kV Cabin Run-Shellhorn Road Line (#2095) and 230 kV Poland Road-Shellhorn Road Line (#2137).

The Wishing Star Substation, Mars-Wishing Star Lines, Mars Substation, Mars 230 kV Loop and related substation work are collectively referred to as the "Project."

For the Mars to Wishing Star Lines, the Company identified six alternative routes (Routes 1 through 6). For the Mars 230 kV Loop the Company identified one route (Mars 230 kV Loop).

This pre-application analysis assesses and compares potential impacts on previously recorded historic and archaeological resources in relation to each alternative route. Environmental Resources Management, Inc. (ERM) conducted the analysis on behalf of Dominion Energy Virginia to assist in the development of a feasible Project design that minimizes impacts to historic resources. The pre-application analysis is a required study for transmission line projects regulated by the Virginia State Corporation Commission (SCC). The study was completed in accordance with the Virginia Department of Historic Resources' *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* (VDHR 2008) (Guidelines).

Eight known archaeological sites are located in the right-of-way of the alternative routes for the Mars to Wishing Star Lines discussed in this study. Two sites fall within the right-of-way for Route 1, four sites fall within the right-of-way for Route 2, one site falls within the right-of-way for Route 3, three sites fall within the right-of-way for Route 4, and five sites fall within the right-of-way for Routes 5 and 6. Additionally, the Mars 230 kV Loop and the Wishing Star Substation each contain one archaeological site within their boundaries. A confident determination regarding the nature of archaeological deposits at each site and impacts on the sites from prior land use activities would require a survey to verify the results for this desktop analysis.

Three previously recorded historic architectural resources meeting criteria specified in the Guidelines fall within study tiers defined by the VDHR for identifying aboveground historic sites along and near transmission line routes. Since portions of some alternative routes use common alignments, impacts on

several resources would be identical regardless of the route option selected for the Project. The likely impacts on individual historic resources associated with each route are presented in the table below.

For the Mars to Wishing Star Lines, all three previously recorded historic architectural resources are located in the same VDHR study tiers for all six routes. For Routes 1 through 6, ERM recommends a finding of no impact on two resources, and a minimal impact on one resource. The substations are near one resource each. ERM recommends a finding of no impact for the resource associated with the Wishing Star Substation. However, ERM recommends a minimal impact on the resource associated with the Mars Substation. There are no considered resources along the Mars 230 kV Loop.

## Executive Summary of Status of Archaeological Resources in the Study Area of the Proposed Routes

Considered Resource	Mars to Wishing Star Alternative Routes						Mars 230 kV Loop	Substations	
	Route 1	Route 2	Route 3	Route 4	Route 5	Route 6		Wishing Star	Mars
44LD0167	Not Evaluated	Not Evaluated	-	-	-	-	-		-
44LD0168	Not Eligible	Not Eligible	Not Eligible	Not Eligible	Not Eligible	Not Eligible	-		-
44LD0173	-	Not Eligible		Not Eligible	Not Eligible	Not Eligible	-		-
44LD0174	-	-	-	-	Not Eligible	Not Eligible	-		-
44LD0609	-	-	-	-	Not Evaluated	Not Evaluated	-		-
44LD0970	-	Not Evaluated	-	Not Evaluated	Not Evaluated	Not Evaluated	-		-
44LD1280	-	-	-	-	-	-	-	Not Eligible	-
44LD1742	-	-		-	-	-	Not Eligible		-

## Executive Summary of Project Impacts to Considered Aboveground Historic Resources in the Study Area of the Alternative Routes

Considered Resource	Mars to Wishing Star Alternative Routes						Mars 230 kV Loop	Substations	
	Route 1	Route 2	Route 3	Route 4	Route 5	Route 6		Wishing Star	Mars
053-0008	Minimal	Minimal	Minimal	Minimal	Minimal	Minimal	-	-	Minimal
053-0982	None	None	None	None	None	None	-	None	-
053-0984	None	None	None	None	None	None	-	-	-



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**500-230 KV WISHING STAR SUBSTATION, 500 KV AND 230 KV MARS-WISHING  
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## ATTACHMENT 1 LOCATIONS OF CONSIDERED HISTORIC RESOURCES ASSOCIATED WITH PROPOSED PROJECT ALTERNATIVES

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## 500-230 KV WISHING STAR SUBSTATION, 500 KV AND 230 KV MARS-WISHING STAR LINES, 500-230 KV MARS SUBSTATION, AND MARS 230 KV LOOP

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Pre-Application Analysis

### Acronyms and Abbreviations

Name	Description
3D	three dimensional
ABPP	American Battlefield Protection Program
CMOS	complementary metal–oxide–semiconductor
ERM	Environmental Resources Management
ESRI	Environmental Systems Research Institute
GNSS	Global Navigation Satellite System
ISO	International Organization for Standardization
JPEG	Joint Photographic Experts Group format
kV	kilovolt
MP	milepost
NHL	National Historic Landmark
NPS	National Park Service
NRHP	National Register of Historic Places
PBR	physically based rendering
PDF	portable document format
Project	Mars to Wishing Star 500 kV Transmission Line Project
PWA	Public Works Administration
RAW	an unprocessed image
ROW	right-of-way
SCC	State Corporation Commission
SLR	single-lens reflex
SP	Simulation Point
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
V-CRIS	Virginia Cultural Resource Information System
VDHR	Virginia Department of Historic Resources
VLR	Virginia Landmarks Register

## 1. INTRODUCTION

This report presents the findings of the pre-application analysis prepared by Environmental Resources Management, Inc. (ERM) on behalf of Virginia Electric and Power Company (Dominion Energy Virginia or the Company) for the proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars - Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Project in Loudoun County, Virginia. For this Project, Virginia Electric and Power Company (Dominion Energy Virginia or the Company) is proposing to construct and operate the following new facilities:

- a new 500-230 kV substation, referred to as Wishing Star Substation, to be built east of and adjacent to Dominion's existing 500 kV Brambleton-Mosby Lines (#546 and #590) and 230 kV Brambleton-Loudoun Lines (#2094 and #2045), south of the existing Brambleton Substation, within existing Company-owned right-of-way and on property obtained by the Company;
- a new 500-230 kV substation, referred to as Mars Substation, to be built near the intersection of Carters School and West Perimeter roads on property obtained by the Company northwest of Washington Dulles International Airport (Dulles Airport);
- a new overhead 500 kV single circuit transmission line (#527) with a new 230 kV single circuit transmission line (#2291) underbuilt on the same structures, referred to as the Mars-Wishing Star Lines, between the proposed Wishing Star and Mars Substations; and
- two new 230 kV double circuit transmission lines, referred to as the Mars 230 kV Loop, from the proposed Mars Substation to the Company's existing 230 kV Cabin Run-Shellhorn Road Line (#2095) and 230 kV Poland Road-Shellhorn Road Line (#2137).

The Wishing Star Substation, Mars-Wishing Star Lines, Mars Substation, Mars 230 kV Loop and related substation work are collectively referred to as the "Project." As discussed in more detail below, several alternative routes are currently under consideration for the Mars to Wishing Star Lines, while only one route has been deemed feasible for the Mars 230 kV Loop.

The pre-application analysis assesses potential impacts on previously recorded historic and archaeological resources relative to each alternative route. ERM conducted the pre-application analysis on behalf of Dominion Energy Virginia to assist in the development of a feasible Project design that minimizes impacts on historic resources. The study was completed in accordance with the Virginia Department of Historic Resources' (VDHR's) *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* (VDHR 2008) (Guidelines).

### 1.1 Overview

A number of route options are currently under consideration for the new overhead transmission lines associated with the Project. For the Mars to Wishing Star Lines, the Company identified six alternative routes (Routes 1 through 6). For the Mars 230 kV Loop the Company identified one route (Mars 230 kV Loop). A map depicting each alternative route and the proposed Wishing Star and Mars substations is provided as Figure 1.1-1.

The Mars to Wishing Star Lines will consist of a single-circuit 500 kilovolt (kV) overhead transmission line and 230 kV single-circuit transmission line underbuilt on the same structures, extending from the proposed Wishing Star Substation to the Mars Substation. The Mars 230 kV Loop will be a double-circuit 230 kV overhead transmission line running from the proposed Mars Substation to the Company's existing 230 kV Cabin Run-Shellhorn Road Line (#2095) and 230 kV Poland Road-Shellhorn Road Line (#2137).



All required materials for the Project's 500-230 kV structures would be delivered and assembled at each structure location in the proposed right-of-way. Detailed foundation design would 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 would be erected with a crane and anchored to the foundation during final assembly. If there is excess soil from foundation construction, it would be evenly distributed at each structure, and the soil would be replanted and stabilized. In wetland areas, excess soil would be removed and evenly distributed on an upland site within Dominion's proposed 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 would be strung under tension. This system involves stringing a "lead line" between structures for the conductors and ground wires. The rope 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 the wires from possible damage should they be allowed to touch the ground, fences, or other objects.

Maintaining the right-of-way under the transmission lines is essential for the reliable operation of the line, as well as for public safety. Operation and maintenance of the Project would 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 and potentially impact the transmission line. Periodic inspections would use both aerial and walking patrols. Normal operation and maintenance would require only infrequent visits by Dominion Energy Virginia or its contractors.

### 1.1.1 Route 1

This route would construct an overhead 500 kV single circuit transmission line with a 230 kV single circuit transmission line underbuilt between the proposed Wishing Star Substation and Mars Substation.

Beginning at the proposed Wishing Star Substation site, Route 1 travels east for about 0.3 mile along the south side of Broad Run before crossing a future VDOT right-of-way associated with the Northstar Boulevard extension project. The route then continues east for 0.3 mile along an undeveloped parcel before crossing Belmont Ridge Road. After crossing the road, Route 1 parallels the south side of the Company's existing right-of-way for Lines #2172 and #2183 for 0.2 mile to the east on an undeveloped tract. The route then turns north, crossing the existing right-of-way and Broad Run, and continues another 0.2 mile onto an undeveloped parcel. Route 1 then turns east for 0.5 mile along the south side of a stormwater retention pond before turning slightly to the northeast and continuing for 0.3 mile, crossing a parcel dedicated as an open space proffer for the Brambleton Community Association.

At a point just south of the intersection of Evergreen Mills Road and Loudoun County Parkway, Route 1 crosses the parkway before turning southeast and continuing across Broad Run. The route then continues southeast along the southwestern edge of an undeveloped tract for 0.3 mile, rejoining the Company's existing right-of-way for Lines #2137 and #2213. Route 1 then continues 0.2 mile across NOVEC-owned land before crossing Old Ox Road and spanning Lines #2137 and #2213. The route then continues southeast for 0.7 mile across a surface parking lot, paralleling the north side of MWAA's West Perimeter Road.

About 0.2 mile west of the proposed Mars Substation site, Route 1 splits into two separate rights-of-way, one for the 500 kV line and the other for the 230 kV line. The right-of-way for the 500 kV line turns east for 0.2 mile before crossing Carters School Road and terminating on the west side of the proposed Mars Substation site. The right-of-way for the 230 kV line continues southeast for 0.2 mile before crossing

Carters School Road, then turns north to terminate on the south side of the proposed Mars Substation site.

Route 1 measures 3.63 miles in length, including the approximately 0.34-mile-long split of the 230 kV line from the 500 kV line in the approach to the Mars Substation site.

### 1.1.2 Route 2

This route would construct an overhead 500 kV single circuit transmission line with a 230 kV single circuit transmission line underbuilt between the proposed Wishing Star Substation and Mars Substation.

Beginning at the proposed Wishing Star Substation site, Route 2 travels east for about 0.3 mile along the south side of Broad Run before crossing a future VDOT right-of-way associated with the Northstar Boulevard extension project. The route then continues east for 0.3 mile along an undeveloped parcel before crossing Belmont Ridge Road. After crossing the road, Route 2 parallels the south side of the Company's existing right-of-way for Lines #2172 and #2183 for 0.2 mile across an undeveloped tract. It then turns north, crossing Lines #2172 and #2183 and Broad Run, before continuing about 0.2 mile onto another undeveloped parcel. The route then turns east for 0.5 mile along the south side of stormwater retention pond before turning to the southeast and again crossing Broad Run. The route then turns east for 0.3 mile to parallel the north side of the existing right-of-way for Lines #2137 and #2213.

Prior to crossing Loudoun County Parkway, Route 2 turns slightly northeast away from the existing Dominion right-of-way to avoid land owned by MWAA. It then turns southeast and continues about 0.3 mile along the southwestern edge of an undeveloped parcel before rejoining the existing Company's existing right-of-way for Lines #2137 and #2213. Route 2 then continues for 0.2 mile across NOVEC-owned land before crossing Old Ox Road and spanning Lines #2137 and #2213. The route continues southeast for another 0.7 mile across a surface parking lot, paralleling the north side of MWAA's West Perimeter Road.

About 0.2 mile west of the proposed Mars Substation site, Route 2 splits into two separate rights-of-way, one for the 500 kV line and the other for the 230 kV line. The right-of-way for the 500 kV line turns east for 0.2 mile before crossing Carters School Road and terminating on the west side of the Mars Substation site. The right-of-way for the 230 kV line continues southeast for 0.2 mile before crossing Carters School Road and turning north to terminate on the south side of the proposed Mars Substation site.

Route 2 measures 3.64 miles in length, including the approximately 0.34-mile-long split of the 230 kV line from the 500 kV line in the approach to the Mars Substation site.

### 1.1.3 Route 3

This route would construct an overhead 500 kV single circuit transmission line with a 230 kV single circuit transmission line underbuilt between the proposed Wishing Star Substation and Mars Substation.

Beginning at the proposed Wishing Star Substation site, Route 3 travels east for about 0.3 mile along the south side of Broad Run before crossing a future VDOT right-of-way associated with the Northstar Boulevard extension project. Route 3 then continues east for 0.3 mile along an undeveloped parcel before crossing Belmont Ridge Road and paralleling the south side of the Company's existing right-of-way for Lines #2172 and #2183. Continuing along an undeveloped parcel for about 0.5 mile, Route 3 then turns northeast for 0.7 mile, crossing the existing Company right-of-way for Lines #2172 and #2183, Broad Run, and a parcel dedicated as open space proffer for the neighboring homeowners' association.

At a point just south of the intersection of Evergreen Mills Road and Loudoun County Parkway, Route 3 crosses the parkway before turning southeast and crossing Broad Run. It then continues southeast for 0.3 mile along the southwestern edge of an undeveloped parcel before rejoining the existing right-of-way

for Lines #2137 and #2213. The route continues another 0.2 mile across NOVEC-owned land before crossing Old Ox Road and spanning Lines #2137 and #2213. Route 3 then continues southeast for 0.7 mile across a surface parking lot, paralleling the north side of MWAA's West Perimeter Road.

About 0.2 mile west of the proposed Mars Substation site, Route 3 splits into two separate rights-of-way, one for the 500 kV line and the other for the 230 kV line. The right-of-way for the 500 kV line turns east for 0.2 mile before crossing Carters School Road and terminating on the west side of the Mars Substation site. The right-of-way for the 230 kV line continues southeast for 0.2 mile before crossing Carters School Road and turning north to terminate on the south side of the proposed Mars Substation site.

Route 3 measures 3.62 miles in length, including the split of the proposed 500 kV and 230 kV lines into separate corridors in the approach to the Mars Substation site.

### 1.1.4 Route 4

This route would construct an overhead 500 kV single circuit transmission line with a 230 kV single circuit transmission line underbuilt between the proposed Wishing Star Substation and Mars Substation.

Beginning at the proposed Wishing Star Substation site, Route 4 travels east for about 0.3 mile along the south side of Broad Run before crossing a future VDOT right-of-way associated with the Northstar Boulevard extension project. The route then continues east for 0.3 mile along an undeveloped parcel before crossing Belmont Ridge Road and paralleling the south side of the Company's existing right-of-way for Lines #2172 and #2183. Continuing along an undeveloped parcel for 0.5 mile, Route 4 then turns northeast for 0.4 mile, crossing the existing Company right-of-way, Broad Run, and an undeveloped parcel. The route then turns back to the southeast for 0.2 mile, again crossing Broad Run, then turns east for 0.3 mile to parallel the north side of the existing right-of-way for Lines #2137 and #2213.

Before crossing Loudoun County Parkway, Route 4 turns slightly northeast away from the existing right-of-way to avoid land owned by MWAA. The route then turns and continues southeast for 0.3 mile along the southwestern edge of an undeveloped parcel before rejoining the Company's existing right-of-way for another 0.3 mile. Route 4 then continues 0.2 mile across NOVEC-owned land before crossing Old Ox Road and spanning Lines #2137 and #2213. The route then continues southeast for 0.7 mile across a surface parking lot, paralleling the north side of MWAA's West Perimeter Road.

About 0.2 mile west of the proposed Mars Substation site, Route 4 splits into two separate rights-of-way, one for the 500 kV line and the other for the 230 kV line. The right-of-way for the 500 kV line turns east for 0.2 mile before crossing Carters School Road and terminating on the west side of the Mars Substation site. The right-of-way for the 230 kV line continues southeast for 0.2 mile before crossing Carters School Road and turning north to terminate on the south side of the proposed Mars Substation site.

Route 4 measures 3.63 miles in length, including the split of the proposed 500 kV and 230 kV lines into separate corridors in the approach to the Mars Substation site.

### 1.1.5 Route 5

This route would construct an overhead 500 kV single circuit transmission line with a 230 kV single circuit transmission line underbuilt between the proposed Wishing Star Substation and the proposed Mars Substation.

Beginning at the proposed Wishing Star Substation, Route 5 travels east for about 0.3 mile along the south side of Broad Run before crossing a future VDOT right-of-way associated with the Northstar Boulevard extension project. Route 5 then continues east for 0.3 mile along an undeveloped parcel before crossing Belmont Ridge Road and paralleling the south side of the Company's existing right-of-way of Lines #2172 and #2183. Continuing along an undeveloped parcel for 0.5 mile, the route then turns

north to cross the Company's existing right-of-way then east to parallel the north side of the existing right-of-way. For approximately 0.5 mile, the route continues east along Broad Run, paralleling the north side of the Company's existing transmission corridor.

Before crossing Loudoun County Parkway, the route turns slightly northeast away from the existing right-of-way to avoid crossing land owned by MWAA. After crossing the parkway, Route 5 turns southeast for 0.3 along the southwestern edge of an undeveloped parcel, rejoining the existing right-of-way for Lines #2137 and #2213. The route then continues 0.2 mile across NOVEC-owned land before crossing Old Ox Road and spanning Lines #2137 and #2213. Route 5 then continues southeast for 0.7 mile across a surface parking lot, paralleling the north side of MWAA's West Perimeter Road.

About 0.2 mile west of the proposed Mars Substation site, Route 5 splits into two separate rights-of-way, one for the 500 kV line and the other for the 230 kV line. The right-of-way for the 500 kV line turns east for 0.2 mile before crossing Carters School Road and terminating on the west side of the Mars Substation site. The right-of-way for the 230 kV line continues southeast for 0.2 mile before crossing Carters School Road and turning north to terminate on the south side of the proposed Mars Substation site.

Route 5 measures 3.55 miles in length, including the split of the proposed 500 kV and 230 kV lines into separate corridors in the approach to the Mars Substation site.

### 1.1.6 Route 6

This route would construct an overhead 500 kV single circuit transmission line with a 230 kV single circuit transmission line underbuilt between the proposed Wishing Star Substation and Mars Substation.

Beginning at the proposed Wishing Star Substation, Route 6 travels east for about 0.3 mile along the south side of Broad Run before crossing a future VDOT right-of-way associated with the Northstar Boulevard extension project. Route 6 then continues east for 0.3 mile along an undeveloped parcel before crossing Belmont Ridge Road and paralleling the south side of the Company's existing right-of-way for Lines #2172 and #2183. Continuing along an undeveloped parcel for 0.2 mile, Route 6 turns north to cross the existing right-of-way then east again to parallel the north side of the existing right-of-way. For approximately 0.9 mile, the route continues east along Broad Run, paralleling the north side of the existing right-of-way.

Before crossing Loudoun County Parkway, Route 6 turns slightly northeast away from the Company's existing right-of-way to avoid land owned by MWAA. After crossing the parkway, Route 6 turns southeast and continues for 0.3 mile along the southwestern edge of undeveloped parcel, then rejoins the existing Company right-of-way for Lines #2137 and #2213. The route continues 0.2 mile across NOVEC-owned land before crossing Old Ox Road and spanning the Lines #2137 and #2213. Route 6 then continues southeast for 0.7 mile across a surface parking lot, paralleling the north side of MWAA's West Perimeter Road.

About 0.2 mile west of the proposed Mars Substation site, Route 5 splits into two separate rights-of-way, one for the 500 kV line and the other for the 230 kV line. The right-of-way for the 500 kV line turns east for 0.2 mile before crossing Carters School Road and terminating on the west side of the Mars Substation site. The right-of-way for the 230 kV line continues southeast for 0.2 mile before crossing Carters School Road and turning north to terminate on the south side of the proposed Mars Substation site.

Route 6 measures 3.56 miles in length, including the split of the proposed 500 kV and 230 kV lines into separate corridors in the approach to the Mars Substation site.

### 1.1.7 Mars 230 kV Loop

This route would construct two new overhead 230 kV double circuit lines on two sets of double circuit structures from Mars Substation to cut in locations on the Company's existing 230 kV Cabin Run-Shellhorn Road Line #2095 and 230 kV Poland Road-Shellhorn Road Line #2137.

The proposed Mars 230 kV Loop measures approximately 0.57 mile in length. It originates at proposed cut-in locations on the Company's existing 230 kV Cabin Run-Shellhorn Lines #2095 and Poland Road-Shellhorn Line #2137 at the southeast corner of the intersection of Old Ox Road and Carters School Roads. From here, the route heads south paralleling the east side of Carters School Road, crossing mostly forested lands between Old Ox Road and terminating at the proposed Mars Substation site.

The route uses a greenfield alignment and the new right-of-way would be 160 feet.

### 1.1.8 Wishing Star Substation

The proposed Wishing Star Substation site is located east and north of the intersection of Briarfield and Youngwood Lanes and about 0.5 mile south of the Company's existing Brambleton Substation. The site is adjacent to (east of) and partially overlaps the Company's existing right-of-way for Lines #546, #590, #2045, and #2094. The existing right-of-way also contains two natural gas transmission pipelines: a 24-inch-diameter pipeline owned by Berkshire Hathaway and operated by Eastern Gas Transmission and Storage, Inc., and a 36-inch-diameter pipeline owned by Dominion Energy and operated by Cove Point LNG, LP. The substation footprint encompasses approximately 20 acres of a 41-acre parcel. About 85 percent of the site is forested, with the remainder consisting of maintained Company right-of-way.

### 1.1.9 Mars Substation

The Mars Substation site is located just east of Carters School Road, approximately 0.5 mile south of the intersection of Carters School and Old Ox Roads. The substation footprint occupies approximately 10 acres (of a 22-acre parcel) of which about 20 percent is forested and 80 percent is open space. An existing parking lot is located west of the site on the west side of Carters School Road.

## 1.2 Management Recommendations

Eight known archaeological sites are located in the right-of-way of the alternative routes for the Mars to Wishing Star Lines discussed in this study. Two sites fall within the right-of-way for Route 1, four sites fall within the right-of-way for Route 2, one site falls within the right-of-way for Route 3, three sites fall within the right-of-way for Route 4, and five sites fall within the right-of-way for Routes 5 and 6. Additionally, the Mars 230 kV Loop and the Wishing Star Substation each contain one archaeological site within their boundaries. Proposed transmission structures for the Project alternative routes are planned to be placed within three of the eight sites, and thus, the archaeological deposits at the sites could be impacted by construction of the poles or clearing within the right-of-way. However, a confident determination regarding the nature of archaeological deposits at each site and impacts on the sites from prior land use activities would require field survey.

Three previously recorded historical architectural resources meeting criteria specified in the Guidelines fall within study tiers established by the VDHR for identifying aboveground historic sites along and near the transmission line routes and proposed substations. For the Mars to Wishing Star Lines, ERM recommends that all six routes (Routes 1 through 6) would result in a finding of no impact on two resources, and a minimal impact on one resource. Although the routes would result in the same impact finding, Route 1, in comparison to the other routes, is farthest away from two of the resources.



ERM recommends a finding of no impact for the resource associated with the Wishing Star Substation and a minimal impact on the resource associated with the Mars Substation. There are no resources along the Mars 230 kV Loop.

Based on the above discussion, Mars to Wishing Star Route 1 would have the least impact on previously recorded historical architectural resources meeting criteria specified in the Guidelines compared to its respective alternative routes. The Mars 230 kV Loop is the only option extending from the Company's existing transmission lines to the Mars Substation. Likewise, the two substations have no alternative options.

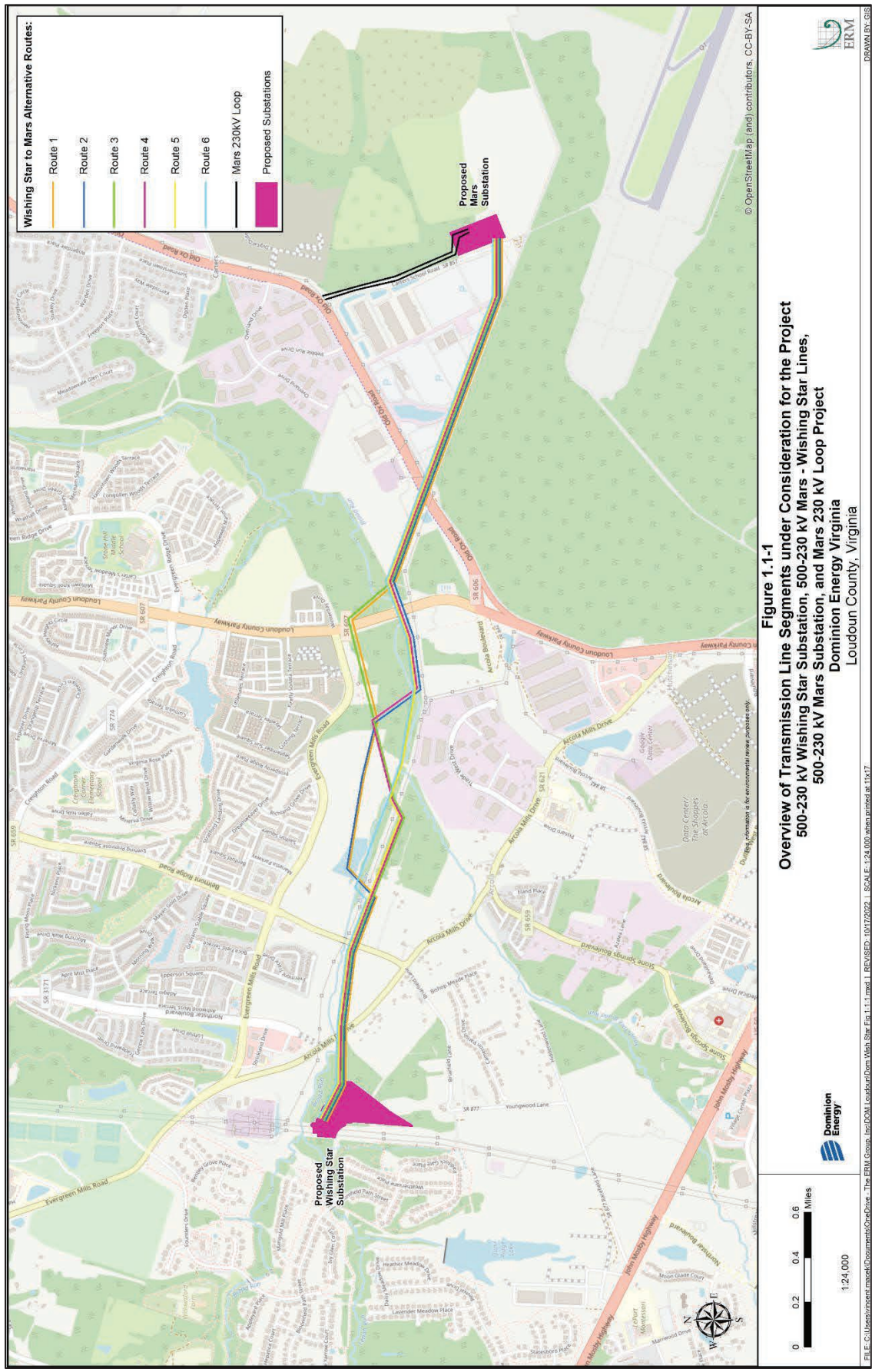


Figure 1.1-1: Overview of Transmission Line Segments under Consideration for the Project Alternative Routes

## 2. RECORDS REVIEW

### 2.1 Data Collection Approach

ERM conducted an analysis of potential cultural resource impacts for the alternative routes under consideration in accordance with the VDHR Guidelines. For each route, this analysis identified and considered the following previously recorded resources:

- National Historic Landmarks (NHLs) within a 1.5-mile radius of each centerline;
- National Register of Historic Places (NRHP)-listed properties, NHLs, battlefields, and historic landscapes within a 1.0-mile radius of each centerline;
- NRHP-eligible and NRHP-listed properties, NHLs, battlefields, and historic landscapes within a 0.5-mile radius of each centerline; and
- All of the above qualifying resources as well as archaeological sites within the right-of-way for each alternative route.

Information on the considered resources in each study tier was collected from the Virginia Cultural Resource Information System (V-CRIS).

In addition to the V-CRIS, ERM collected information from the Loudoun Preservation Society (2022) to find locally significant resources within a 1.0-mile radius of each centerline. ERM also collected information on battlefields surveyed and assessed by the National Park Service's (NPS) American Battlefield Protection Program (ABPP) (NPS 1995, 2022). No additional resources (locally significant sites and ABPP study areas, core areas, or potential NRHP boundaries for battlefields) were identified within the relevant study tiers for the various alternative routes.

Along with the records review, ERM conducted field assessments of the considered aboveground resources along each alternative route in accordance with the Guidelines. Digital photographs of each architectural resource and views to the proposed transmission line were taken, except in the case of the Dulles International Airport Historic District (053-0008), as photo permission was not granted. Photosimulations were then prepared to assess the potential for visual impacts of the new transmission infrastructure on the resources. For previously recorded archaeological sites under consideration, aerial photographs were examined to assess the current land condition and the spatial relationship between the sites and any existing or planned transmission lines.

### 2.2 Archaeological Resources

Crossings of archaeological sites were considered a constraint in this study due to the potential for an electric transmission line to impact archaeological deposits in these areas (for example, due to transmission structure placement, tree clearing, or heavy equipment traffic within a site). The known archaeological sites in the right-of-way for each alternative transmission line route are summarized in Table 2.2-1 and their locations are depicted on Figure 2.2-1. Individual maps for each proposed alternative route are provided in Attachment 1. The sites are presented in the order they occur from the Mars to Wishing Star Alternative routes to the Mars 230 kV Line Loop, and lastly the substations. Because portions of the alternative routes use common alignments, the same resources may be subject to potential impacts from more than one route.

Out of the eight archaeological resources within the rights-of-way for the various alternative routes, five have been determined not eligible for the NRHP, while three have not been evaluated for NRHP eligibility. However, a confident and complete assessment of the integrity of each site would require archaeological field investigations, which will take place pursuant to SCC review and their approval of a route.

**Table 2.2-1: Archaeological Resources in the Right-of-Way for Each Alternate Route**

Route Alternative/ Substation	ROW Description	Site Number	Description	NRHP Status
Mars to Wishing Star Alternative Routes and Facilities				
Route 1	Greenfield	44LD0167	Temporary camp (Pre-Contact)	Not Evaluated
	Greenfield	44LD0168	Temporary camp (Pre-Contact)	Not Eligible
Route 2	Greenfield	44LD0167	Temporary camp (Pre-Contact)	Not Evaluated
	Greenfield	44LD0168	Temporary camp (Pre-Contact)	Not Eligible
	Greenfield	44LD0173	Temporary camp and Lithic scatter (Pre-Contact)	Not Eligible
	Greenfield	44LD0970	Lithic scatter (Late Archaic Period)	Not Evaluated
Route 3	Greenfield	44LD0168	Temporary camp (Pre-Contact)	Not Eligible
Route 4	Greenfield	44LD0168	Temporary camp (Pre-Contact)	Not Eligible
	Greenfield	44LD0173	Temporary camp and Lithic scatter (Pre-Contact)	Not Eligible
	Greenfield	44LD0970	Lithic scatter (Late Archaic Period)	Not Evaluated
Route 5	Greenfield	44LD0168	Temporary camp (Pre-Contact)	Not Eligible
	Greenfield	44LD0173	Temporary camp and Lithic scatter (Pre-Contact)	Not Eligible
	Greenfield	44LD0174	Temporary camp (Pre-Contact)	Not Eligible
	Greenfield	44LD0609	Base camp (Early Woodland)	Not Evaluated
	Greenfield	44LD0970	Lithic scatter (Late Archaic Period)	Not Evaluated
Route 6	Greenfield	44LD0168	Temporary camp (Pre-Contact)	Not Eligible
	Greenfield	44LD0173	Temporary camp and Lithic scatter (Pre-Contact)	Not Eligible
	Greenfield	44LD0174	Temporary camp (Pre-Contact)	Not Eligible
	Greenfield	44LD0609	Base camp (Early Woodland)	Not Evaluated
	Greenfield	44LD0970	Lithic scatter (Late Archaic Period)	Not Evaluated
Mars 230 kV Loop	Greenfield	44LD1742	Carter Schoolhouse (World War I to World War II)	Not Eligible
Wishing Star Substation	Greenfield	44LD1280	Railroad bed (Antebellum Period, Civil War, Early National Period, Reconstruction and Growth)	Not Eligible
Mars Substation	-	-	-	-



**Figure 2.2-1: Locations of Archaeological Resources in the Right-of-Way for Each Alternative Route**



## 2.3 Historic Resources

Each alternative under consideration has the potential to impact a number of historic and architectural resources. The following discussion summarizes the known resources in the vicinity of each Project alternative according to VDHR's tiered study area model defined in the Guidelines. The locations of the considered architectural resources and the proposed alternative routes are shown in Figure 2.3-1. Individual maps for each proposed alternative are located in Attachment 1.

The resources located within the right-of-way of a proposed route may be subject to both direct impacts from placement of the line across the property as well as visual impacts from changes to the viewshed introduced by the new transmission line structures and conductors. Resources in the 0.5-mile tier would not be directly impacted, but are likely to be visually impacted, unless topography, vegetation, or the built environment obscures the view to the transmission line. At a distance of over 0.5 mile, it becomes less likely that a resource would be within line-of-sight of the proposed transmission line. However, the full architectural survey mandated in the second stage of VDHR's transmission line review process would determine which resources actually would be visually impacted. Beyond 1.0 mile, it becomes less likely that a given resource would be within line-of-sight of the proposed Project.

Because parts of several routes share common alignments, some of the same resources would be impacted regardless of the alternative selected. The nature of the impacts, while estimated in this study with the assistance of photosimulations, will depend on the final Project design in which the exact placement and height of transmission structures is determined. Once a route is selected for the Project, that route will be subject to a full architectural survey, actual Project impacts will be assessed, and additional (as of yet, unrecorded) historic properties may be identified in the survey area. The survey area will be defined based on the height of the proposed transmission line structures, topography, tree cover, and other factors impacting the line-of-sight to the Project.

### 2.3.1 Route 1

The considered resources that lie within the VDHR study tiers for Wishing Star–Mars Route 1 are presented in Table 2.3-1 and depicted in Attachment 1, Sheet 1. Three aboveground historic properties were identified within the VDHR tiers for Route 1. The three considered resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

**Table 2.3-1: Historic Resources in the VDHR Study Tiers for Route 1**

Buffer (miles)	Resource Category	Resource Number	Description
0.5 to 1.0	National Register Properties (Listed)	053-0982	Arcola Elementary School
		053-0984	Arcola Slave Quarters
0.0 to 0.5	National Register Properties (Eligible)	053-0008	Dulles International Airport Historic District

### 2.3.2 Route 2

The considered resources that lie within the VDHR study tiers for Route 2 are presented in Table 2.3-2 and depicted in Attachment 1, Sheet 2. Three aboveground historic properties were identified within the VDHR tiers for Route 2. The three considered resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

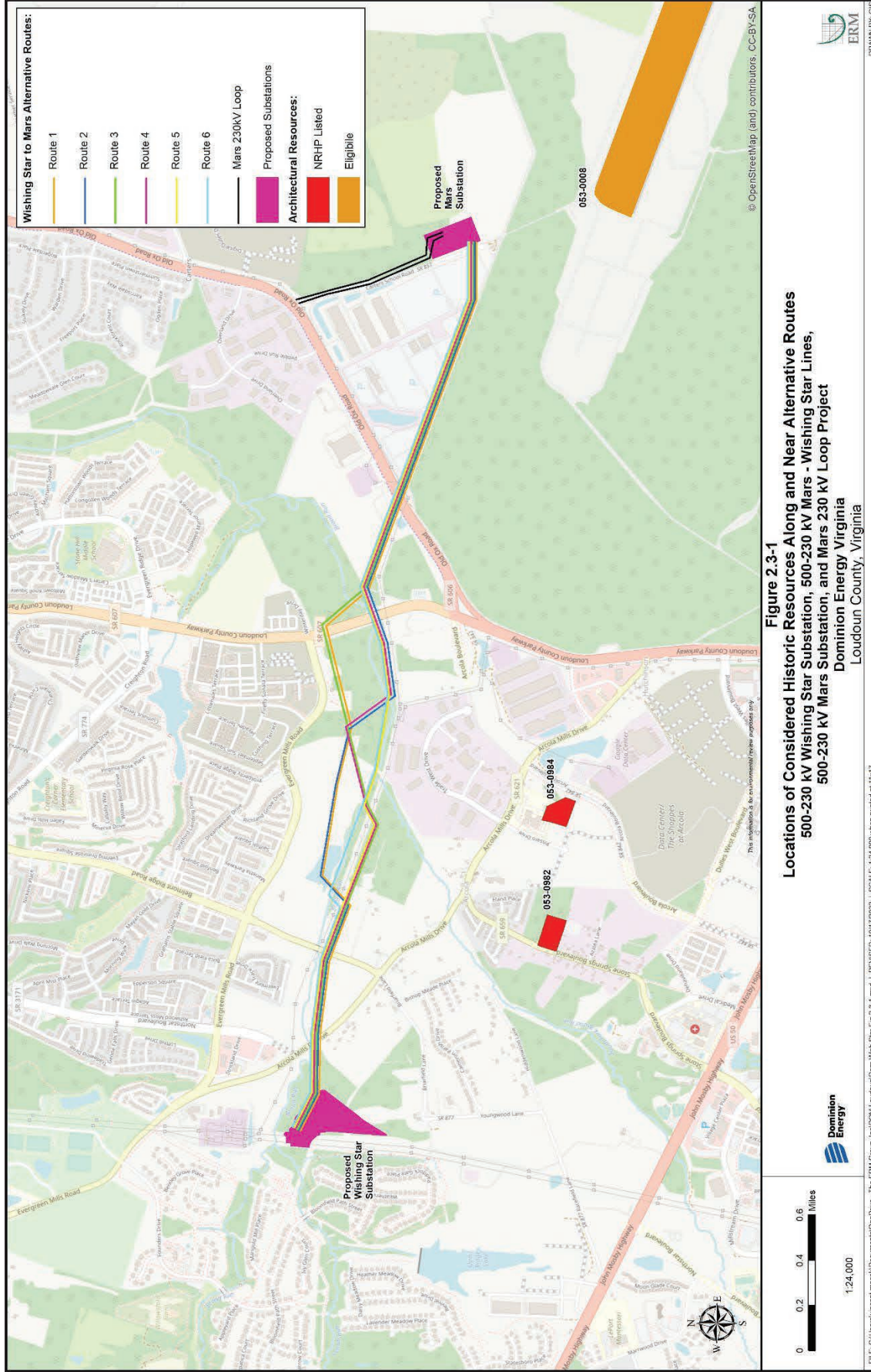


Figure 2.3-1: Locations of Considered Historic Resources Along and Near Alternative Routes

**Table 2.3-2: Historic Resources in the VDHR Study Tiers for Route 2**

Buffer (miles)	Resource Category	Resource Number	Description
0.5 to 1.0	National Register Properties (Listed)	053-0982	Arcola Elementary School
		053-0984	Arcola Slave Quarters
0.0 to 0.5	National Register Properties (Eligible)	053-0008	Dulles International Airport Historic District

**2.3.3 Route 3**

The considered resources that lie within the VDHR study tiers for Route 3 are presented in Table 2.3-3 and depicted in Attachment 1, Sheet 3. Three aboveground historic properties were identified within the VDHR tiers for Route 3. The three considered resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

**Table 2.3-3: Historic Resources in the VDHR Study Tiers for Route 3**

Buffer (miles)	Resource Category	Resource Number	Description
0.5 to 1.0	National Register Properties (Listed)	053-0982	Arcola Elementary School
		053-0984	Arcola Slave Quarters
0.0 to 0.5	National Register Properties (Eligible)	053-0008	Dulles International Airport Historic District

**2.3.4 Route 4**

The considered resources that lie within the VDHR study tiers for Route 4 are presented in Table 2.3-4 and depicted in Attachment 1, Sheet 4. Three aboveground historic properties were identified within the VDHR tiers for Route 4. The three considered resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

**Table 2.3-4 Historic Resources in the VDHR Study Tiers for Route 4**

Buffer (miles)	Resource Category	Resource Number	Description
0.5 to 1.0	National Register Properties (Listed)	053-0982	Arcola Elementary School
		053-0984	Arcola Slave Quarters
0.0 to 0.5	National Register Properties (Eligible)	053-0008	Dulles International Airport Historic District

**2.3.5 Route 5**

The considered resources that lie within the VDHR study tiers for Route 5 are presented in Table 2.3-5 and depicted in Attachment 1, Sheet 5. Three aboveground historic properties were identified within the VDHR tiers for Route 5. The three considered resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

**Table 2.3-5: Historic Resources in the VDHR Study Tiers for Route 5**

Buffer (miles)	Resource Category	Resource Number	Description
0.5 to 1.0	National Register Properties (Listed)	053-0982	Arcola Elementary School
		053-0984	Arcola Slave Quarters
0.0 to 0.5	National Register Properties (Eligible)	053-0008	Dulles International Airport Historic District

### 2.3.6 Route 6

The considered resources that lie within the VDHR study tiers for Route 6 are presented in Table 2.3-6 and depicted in Attachment 1, Sheet 6. Three aboveground historic properties were identified within the VDHR tiers for Route 6. The three considered resources were subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

**Table 2.3-6: Historic Resources in the VDHR Study Tiers for Route 6**

Buffer (miles)	Resource Category	Resource Number	Description
0.5 to 1.0	National Register Properties (Listed)	053-0982	Arcola Elementary School
		053-0984	Arcola Slave Quarters
0.0 to 0.5	National Register Properties (Eligible)	053-0008	Dulles International Airport Historic District

### 2.3.7 Mars 230 kV Loop

No historic architectural resources fall within the study tiers for this route (Attachment 1, Sheet 7).

### 2.3.8 Wishing Star Substation

The one considered resource that lies within the VDHR study tiers for the Wishing Star Substation is presented in Table 2.3-7 and depicted in Attachment 1, Sheet 8. This considered resource was subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.

**Table 2.3-7: Historic Resources in the VDHR Study Tiers for the Wishing Star Substation**

Buffer (miles)	Resource Category	Resource Number	Description
0.5 to 1.0	National Register Properties (Listed)	053-0982	Arcola Elementary School

### 2.3.9 Mars Substation

The one considered resource that lies within the VDHR study tiers for the Mars Substation is presented in Table 2.3-8 and depicted in Attachment 1, Sheet 9. This considered resource was subjected to field reconnaissance and a preliminary assessment of impacts, discussed in the next chapter.



**Table 2.3-8: Historic Resources in the VDHR Study Tiers for the Mars Substation**

Buffer (miles)	Resource Category	Resource Number	Description
0.0 to 0.5	National Register Properties (Eligible)	053-0008	Dulles International Airport Historic District

## 2.4 Previous Surveys

Portions of the various alternative routes have previously been surveyed for cultural resources. Fourteen previous cultural resource surveys intersect at least one of the alternative routes under consideration. Information on these previous surveys—including VDHR survey number, report title, report authors, and report date—is provided in Table 2.4-1. The extent of the previous survey coverage is depicted on maps provided in Attachment 2. Below is a summary of the survey coverage as it pertains to the alternative routes discussed in the study:

- Several surveys overlap portions of Wishing Star-Mars Routes 1, 2, and 3 (Fuess and Butina 2003; Parson's Management Consultants 1989; Gardner et al. 1999; Gardner, et al. 2001; Mueller 1979; Goode and Traum 2012; Goode and Traum 2013; Buchanan 2005).
- One survey, associated with the Brambleton-Greenway Transmission Line in Loudoun County, crosses through Routes 1, 2, 3, and the Mars 230 kV Loop (Butler et al. 2006).
- Two surveys overlap portions of Wishing Star-Mars Routes 1, 2, and 3, as well as the Wishing Star Substation. The surveys were completed in 2013 and 2018. The 2013 survey is an environmental assessment for the Dulles Air Cargo, Passenger, and Metro Access Highway (Deetz et al. 2013). The other survey is for the Northstar Boulevard Project (Callaway et al. 2018).
- A 2013 survey and a 2005 survey overlap the Mars 230 kV Loop. The survey completed in 2013 was a supplemental survey for the Dulles Loop-Route 606 Project (Goode and Traum 2013). The survey completed in 2005 is a Phase I archeological investigation of 82.9 acres on Old Ox Road in Loudoun County (Buchanan 2005).
- A survey for the CNG Natural Gas Pipeline and Facilities within Prince William and Loudoun counties crosses through the footprint of the Wishing Star Substation (Rosenthal et al. 1992). A second survey for the improvements to the Dominion Power 500 kV transmission line from the Brambleton Substation to the Loudoun Substation also overlaps the substation (Stewart et al. 2014).
- One survey crosses through the Mars Substation (Parsons Management Consultants 1989). The survey took place in 1989 and covered portions of Loudoun and Fairfax counties.
- A survey from 2016 intersects all three Wishing Star-Mars routes, the Mars 230 kV Loop, and the Mars Substation. That project included Phase I and II archaeological investigations conducted for Washington Dulles International Airport (Ward et al. 2016).



**Table 2.4-1: Cultural Resource Surveys Covering Portions of the Marsh to  
Wishing Star Alternative Routes and Mars 230 kV Loop**

VDHR Survey #	Title	Author	Date
LD-144	Phase I Archaeological Survey of the Washington Dulles International Airport Portion of the Proposed W-132, Route 606 Water Main, Route 50 to Dulles Trade Center II	Fuess and Butina	2003
LD-191	Cultural Resource Survey of the Proposed 230 kV Brambleton-Greenway Transmission Line, Loudoun County, Virginia	Butler, Moore, and Rupnik	2006
LD-053	Historic and Archaeological Survey Report Washington Dulles International Airport, Loudoun and Fairfax Counties, VA.	Parsons Management Consultants	1989
LD-249	A Phase I Archeological Study of Circa 119 Acres Proposed for Development as Wetland Mitigation Area, Loudoun County, Virginia	Gardner, Clem, and Hurst	1999
LD-250	A Phase I Archeological Study of Circa 1300 Acres Proposed for Development as Part of the Brambleton Planned Community, Loudoun County, Virginia	Gardner, Snyder, and Hurst	2001
LD-027	A Phase I Cultural Resources Reconnaissance of the Route 621 Modernization Project, Loudoun County, Virginia	Mueller	1979
LD-323	Cultural Resources Survey for the Dulles Loop-Route 606 Project, Loudoun County, Virginia	Goode and Traum	2012
LD-333	Supplemental Cultural Resources Survey for the Dulles Loop-Route 606 Project, Loudoun County, Virginia	Goode and Traum	2013
LD-334	Cultural Resources Survey Environmental Assessment for the Proposed Dulles Air Cargo, Passenger, and Metro Access Highway, Loudoun County, Virginia	Deetz, van den Hurk, Flood, D. Poyner, Keeny, and Bamann	2013
LD-472	Cultural Resources Survey of Unsurveyed Portion of the Northstar Boulevard Project, Loudoun County, Virginia	Callaway, Monroe, and Hanbury	2018
LD-365	Phase I Archeological Investigations of the 82.9 Acre Property at 43461 Old Ox Road, Loudoun County, Virginia	Buchanan	2005
LD-356	A Phase I Cultural Resources Survey of Approximately 5.0 Miles of Proposed Improvements to the Dominion Virginia Power 500 kV Transmission Line From the Brambleton Substation to the Loudoun Substation, Loudoun County, Virginia	Stewart, DeChard, and Brady	2014
LD-420	Phase I and Phase II Archeological Investigations for Western Lands Area, Washington Dulles International Airport, Loudoun County, Virginia	Ward, Read, Wanner, and Seiter	2016
PW-174	Phase I Survey and Phase II Testing Along the CNG Natural Gas Pipeline (TL-465) and Facilities, Prince William and Loudoun Counties, Virginia	Rosenthal, Elena, Petraglia, Pappas, and Martin	1992

Route 50 = U.S. Route 50; VDHR = Virginia Department of Historic Resources

### 3. STAGE I PRE-APPLICATION ANALYSIS FINDINGS

#### 3.1 Methods for Analysis

Fieldwork for the pre-application analysis was conducted by Secretary of the Interior Qualified architectural historians Emily Dodson and MacKenzie Carroll on August 12, 2022. The fieldwork involved photographing three resources requiring visual assessment according to the Guidelines and examining potential line-of-sight views from each resource toward the alternative routes. For resources where property owner approval was granted for historic resource documentation, photographs were taken toward the proposed transmission line(s) from the property at the most prominent view of the landscape. When such permission was not available, photographs were taken from the public right-of-way (typically a road) nearest to the resource facing toward the applicable route(s). However, Dulles International Airport Historic District (053-0008) serves as an exception. Due to restrictions that limit photographing an airport, photographs documenting the historic district itself were not possible at the time of the survey.

Panoramic photographs were taken from each resource, with an effort to capture the direction with the clearest, most unobstructed view toward the applicable route or routes. The precise location of the photograph was captured with a mobile tablet device connected to a sub-meter accurate Global Navigation Satellite System (GNSS) receiver, the Trimble DA2. The locations where photographs were taken were noted as Simulation Points (SP). Site visits to the SPs were prioritized based on their location relative to the resource, so that viewpoints east of the resource were visited in the morning and viewpoints west of the resource were visited in the afternoon. This helped ensure, where possible, that the sun was behind the photographer at the time the viewpoint photography was captured. Additionally, minor adjustments to position were made to obtain as clear a view to the site center as possible, avoiding trees, landscaping, or built obstructions. Tablets recorded the center bearing, angle of view, altitude, and camera lens height. Upon receipt of the viewpoint location information, the viewpoints were plotted onto open source mapping from the Environmental Systems Research Institute (ESRI) using the Universal Transverse Mercator (UTM) 18N coordinate system.

The process of taking panoramas included setting up the tripod and camera. The camera was placed on the panoramic head in a portrait orientation where its lens height was confirmed and set at 1.5 meters (note: a portrait camera orientation was sometimes used in situations where the viewpoint is very close to a development so that the top of the development is not cut off by the image boundaries). The tripod head and camera combination was then leveled. With the camera's viewfinder centered on the perceived site center, exposure and focus settings were taken. These were then fixed manually on the camera so that they could not be inadvertently altered. The head was rotated 90 degrees to the left where the first frame of the 360-degree sequence was then taken. Each subsequent frame was taken using a 50 percent overlap of the previous frame until the full 360-degree sequence was captured. The camera was then removed from the tripod and a viewpoint location photograph was captured showing the tripod in its position.

The following camera and tripod configuration was used:

- Camera body: Nikon D800 professional specification digital SLR (full frame CMOS sensor)
- Camera lens: Nikkor AF 50mm f1.8 prime
- Tripod: Manfrotto 055MF4 with Manfrotto 438 ball leveller
- Panoramic head: Manfrotto 303SPH

- The following camera settings were used for all photography:
- Camera mode: Manual Priority
- ISO: 100
- Aperture: f13
- Image format: RAW

After the photos were complete, they were uploaded to a server to begin the simulation/visualization process. The single-frame photographs were opened in Adobe Photoshop CC 2022, where they were checked and any camera sensor dust spots were removed before being saved as high-resolution JPEG images. If required, discrete color and tonal adjustments were made to each frame before they were saved. The single-frame photographs were stitched together in PTGui Pro version 12.11 professional photographic stitching software using cylindrical projection settings. The camera locations were plotted in Global Mapper version 23.1. Digital models of the transmission line structures were provided by Dominion, then cleaned up and textured in Autodesk 3DS Max 2021. The positions of each structure were provided by Dominion for all routes. The transmission structures along each route were rendered in Vray version 5.2 from each SP camera location. 3D imagery was produced at the field of view using camera matching. Renderings for each route and each tower combination were then exported for use as an overlay.

Detailed, correctly dimensioned 3D computer models of the transmission structures along each route were generated using Autodesk 3DS Max 2021 and iToo RailClone. The virtual 3D model of the structures was created using real-world measurements and elevation drawings provided by the Company. These were textured using Vray PBR materials to simulate the weathering steel texture. The detailed, textured models were rendered to a digital image using a simulated physical camera and a sun and sky simulation lighting model in the computer software consistent with conditions within the original viewpoint photography.

Photomontages were produced by overlaying the rendered image on the photograph, using known control points and the wireline imagery showing the tower columns at the correct height and distance. Final adjustments were then made to the brightness and contrast of the rendered images to match them to the photograph. Final photomontages were prepared from each viewpoint for each route. These were then opened in Adobe Photoshop CC 2022 where minor changes were made such as placing relevant tree/building/hedge screening or telegraph wires over the proposed development renders where necessary. Finally, the final images were cropped to the proportions required for the visual simulation figures, and the visualization figures were prepared in Adobe InDesign CC2022 and exported in a PDF format.

One simulation was completed through 3D rendering, as the location of the simulation could not be accessed due to lack of permission. An existing conditions 3D model of the study area, including terrain, vegetation, and structures, was created from Google Earth data. The 3D model was geo-referenced and compiled with aerial imagery and available lidar data to create a polymodal from RGB colored point cloud information to ensure spatial accuracy. Structures, vegetation clusters, and skylines were cross referenced with lidar data and reference imagery to ensure accurate representation of scale and placement within the 3D rendering. In addition, atmospheric data were imported into the 3D model to develop a sun and atmospheric system that matches the location specific reference data. Based on computer aided design, GIS, and power line systems computer-aided design data provided by the client, a 3D model of the Project was constructed. All information was imported into the 3D existing conditions model using the same geo-reference and projection and then validated for accuracy. 3D materials and associated specular reflectance information were applied to the proposed 3D information. Easement right-of-way (ROW) expansion was created by deleting 3D trees from the existing conditions model that

fall within this expansion. After all of the information was properly aligned, atmospherics checked, and materials applied, the 3D information was then rendered using highly accurate raytraced render engines. Finally, photo editing software was used to color correct the final images and export them out in a PDF format.

### 3.2 Structure Types and Right-of-Way Widths

Dominion Energy Virginia proposes to use several structure and right-of-way configurations for the Project. For the Mars-Wishing Star Lines, the routes will be constructed on new right-of-way predominantly 150 feet wide to support a 5-2 configuration primarily on double circuit three-pole or two-pole H-frame structures with a minimum structure height of approximately 90 feet, a maximum structure height of approximately 190 feet, and an average proposed structure height of approximately 148 feet.

The Mars 230 kV Loop will be constructed on new 160-foot-wide right-of-way supported by a combination of double circuit monopoles and 2-pole structures situated side-by-side in the right-of-way. The new right-of-way will support two double circuit configurations on twelve tubular pole structures with a minimum structure height of approximately 100 feet, a maximum structure height of approximately 115 feet, and an average proposed structure height of approximately 103 feet.

It should be noted that the planned structure design and locations are preliminary and subject to change pending final engineering. Final engineering will be completed after a Certificate for Public Convenience and Necessity is issued for the project by the Virginia State Corporation Commission.

### 3.3 Assessment of Potential Impacts

The assessment of potential Project impacts on individual resources made use of the visual assessment findings and categorized the severity level of impacts according to the following scale devised by VDHR:

- **None**—Project is not visible from the resource.
- **Minimal**—Viewsheds have existing transmission lines, there would be only a minor change in height, and/or other views are partially obscured by topography or vegetation.
- **Moderate**—Viewsheds have more expansive views of the transmission line, more dramatic changes in height are proposed, and/or the overall visibility of the Project would be greater.
- **Severe**—Existing viewshed contains no transmission line, the view to the Project would be relatively unobstructed, the new transmission line would introduce a significant change to the setting of historic properties, and/or a dramatic change in the height of an existing transmission line would take place in close proximity to historic properties.

### 3.4 Historic Resource Descriptions

#### 3.4.1 053-0008, Dulles International Airport Historic District

053-0008 is located on the west side of Sully Road/Route 28, and south of the Dulles Greenway (Toll Road)/Route 267 in the area of Dulles Airport. The resource encompasses 1,726.60 acres and is occupied by portions of the airport that were constructed in the late 1980s. At least one new runway as well as taxiways and other facilities have been constructed since the district was defined. These facilities are located outside the district boundaries to the west and south. Much of the area surrounding the district is occupied by residential, commercial, and light industrial development. However, some forested and agricultural land lie outside of the district to the south and west. Due to lack of access from airport security restrictions, ERM's architectural historians were not able to obtain photos of the historic district at the time

of the survey. Consequently, an aerial image is used for the purposes of this report (Attachment 4, Figure 1).

053-0008 originally was surveyed in 1978 by the Federal Aviation Administration (FAA). The resource subsequently was surveyed by Parsons Management Group in 1988 (FAA 1978; Parsons Management Group 1988). The district was determined eligible for listing in the NRHP by the FAA in 1978 under Criterion A, B, and C, referencing Criteria Consideration G for exceptional buildings less than 50 years old. The airport was designed by Eero Saarinen and is considered one of his most significant works. It represents the first airport designed for jet travel. The goal was to move people to planes, starting with their approach to the terminal, with the construction of a dedicated access road, through the onboarding and deplaning/baggage claim processes. The airport opened in 1962, and as of 1989, included the following contributing structures: 13 structures, 18 mobile lounges, the landscaping plan, and approach road.

Aerial imagery shows at least two runways that have been added or expanded at the airport since the time of the original survey and NRHP eligibility determination—likely between 2003 and 2008 (Google Earth 2022). However, due to lack of access and FAA policy, ERM could not photograph the airport or its ancillary structures. The district lies within the study area for Routes 1, 2, 3, 4, 5, and 6, as well as the Mars Substation.

### 3.4.2 053-0982, *Arcola Elementary School*

053-0982 is located at 24244 Gum Spring Road/Route 659 on the east side of the road in the town of Sterling. It is situated on a 10-acre parcel with dense woodlands bordering the northern, eastern, and southern edges of the parcel. The resource is located about 100 feet from the nearest public right-of-way, with a large gravel parking lot at the northwest corner of the structure and a long circular drive at the rear of the building.

053-0982 originally was recorded by David Edwards in 1982, and subsequently was revisited by Patrick Thompson with AECOM Germantown in 2019 (Thompson 2019a). Edwards described the school as a one-story, circa 1939, rectangular brick school with a hipped roof and projecting central pavilion. Edwards noted that the entrance was recessed within the central pavilion and was framed by a pedimented frontispiece, and the building corners featured quoining. The windows were described paired and tripled double-hung sashes, with six-over-six arrangements. Additionally, Edwards identified a ca. 1950 brick addition to the north elevation and another ca. 1956 addition that contained more classrooms and a gym/auditorium (Edwards 1982a).

The Arcola Elementary School was the fifth Public Works Administration (PWA) construction project in Loudoun County and the first all-white school with individual classrooms for the various grades. Prior to its opening, most of the schools in the area had been one-room schoolhouses. In 2013, Arcola Elementary School was recommended eligible for listing in the NRHP under Criterion A under the theme of Education for its association with the PWA's history of educational reform and Loudoun County's transition to modern educational standards (Covington 2012). The resource was also recommended eligible under Criterion C as an example of PWA architecture of the Colonial Revival style and as an example of the New Deal Public Works Administration building design at the time. It was formally listed in the NRHP in 2013.

ERM photographed the resource from the closest access point of the public right-of-way. ERM's observations are consistent with the findings of the 2019 survey, which found that the school remains mostly intact, other than plywood covering the windows, and no substantial changes have been noted (Attachment 4, Figures 2 and 3). The resource was determined eligible by the VDHR in 2012, listed in the NRHP in 2013. It lies within the study area for Routes 1, 2, 3, 4, 5, and 6, as well as the Wishing Star Substation.



### 3.4.3 053-0984, Arcola Slave Quarters

053-0982 is located at approximately 42575 Arcola Boulevard, on the northwest side of the road in the town of Sterling. It is situated on a 4.42-acre parcel with dense woodlands bordering the northern, western, and southern edges of the parcel. The resource is located at the end of a 396-foot-long dirt drive.

053-0982 was previously surveyed at least seven times between 1982 and 2020 and the historic context information for the resource was updated at least twice during that time (Andre 2007, 2008; Edwards 1982b; History Matters 2004; Taylor 2020; Thompson 2019b; URS Corporation 2003). Most recently, the resource was surveyed by Robert Taylor with Dutton + Associates, LLC in 2020. Taylor described the slave quarters as a one-and-one-half-story, circa 1800 structure with two attached double-pen blocks, each with a central chimney (Attachment 4, Figure 4). He also noted the exterior walls are random coursed stone on a continuous foundation, and the roof is side-gable, clad in rolled asphalt. Previous surveys examining the building's interior noted original split wood shakes beneath standing seam metal roofing added at a later date. At the time of the current survey, the roof was clad in wood shingles, representing an authentic restoration of the building's the original roofing material. Finally, all the openings had been covered with plywood (Taylor 2020), which remains the case to the present. The property is listed in the NRHP under Criterion A for its significance relating to local history, slavery, and African-American heritage; and under Criterion C as an embodiment of distinctive characteristics of both early Virginia architecture and methods of slave quarter construction. It is a rare example of a stone slave quarters in Virginia. The property is also listed on the Virginia Landmarks Register (VLR).

Physical evidence suggests that the stone slave quarters were constructed in the late eighteenth or early nineteenth century (Andre 2008). The original construction consisted of the westerly portion, with the easterly portion being added later. There is no passageway between the two blocks, suggesting separate functions, such as a kitchen space or housing for a separate family. The proximity of the building to the main house suggests that it served as a dwelling for the domestic house slaves. At some point, likely during the early twentieth century, the former slave quarters were used for various other functions, including storage for farm equipment, resulting in the changes in the eastern fenestration of the entry bay to accommodate the equipment entry and exit from the building (Andre 2008).

The other dwelling on the parcel, noted in the previous surveys as the "main house," is described as a two-and-one-half-story, ca. 1930 American Foursquare dwelling with a metal hipped roof, wood weatherboards, and a rough-cut, random rubble-stone foundation. The foundation originally belonged to a ca. 1820 central passage, double-pile dwelling; although no information is provided about the fate of the ca. 1820 dwelling, it was reported that the extant 1930 American Foursquare dwelling was constructed on the same foundation. Two corbeled brick chimneys and a wrap-around porch with Tuscan columns also were described in the 2007 survey. At the time that ERM architectural historians visited the site in 2022, all of the window and door openings were covered with plywood (Attachment 4, Figures 5 and 6).

ERM photographed the resource from multiple points within the parcel and determined there were no changes from the 2020 survey, other than a previously described shed that could not be located and is possibly no longer extant. The resource was determined eligible by the VDHR in 2007, listed in the NRHP in 2008. It lies within the study area for Wishing Star–Mars Routes 1, 2, and 3.

## 3.5 Historic Resource Findings for Route 1

The impacts to each resource in the Route 1 study tiers are discussed below. Photosimulations are provided in Attachment 5 and 3D renderings of the district are located in Attachment 6.

### 3.5.1 053-0008, Dulles International Airport Historic District

053-0008 is located approximately 0.38 mile to the south of Route 1 along a greenfield segment of the route (Attachment 5, Figure 1). One photosimulation was prepared from SP 3, which was located on Beaver Meadow Road, which represents the public road nearest to the resource in the vicinity of the route (Attachment 5, Figures 2 and 3). This point was chosen since Dulles Airport would not grant access for photography within the limits of the airport. However, this SP is located approximately 1.35 mile to the west of the district and only a portion of the proposed route is visible behind the trees, at the intersection of Beaver Meadow Road and the transmission line. The route is likely to only be visible during leaf-off seasons (fall and winter).

Given the absence of accessible viewpoints from the airport historic district, ERM created a simulated Google Earth 3D rendering of existing and future conditions (Attachment 6, Figure 1). While the proposed route would be visible from the runway, only the tops of the structures would be visible from the tree line (Attachment 6, Figures 2 and 3). However, they are likely to be visible only during leaf-off seasons. In addition, the recorded boundary for the resource encompasses 1,726.60 acres, and only a small portion of the district is located in the half-mile study tier for the route. Furthermore, mature vegetation surrounding the district blocks visibility of the transmission line structures from many vantage points. Thus, ERM recommends that the proposed route would have a **Minimal Impact** on the Dulles International Airport Historic District.

### 3.5.2 053-0982, Arcola Elementary School

053-0982 is located approximately 0.66 mile to the south of Route 1 along a greenfield segment of the route (Attachment 5, Figure 4). Due to intervening vegetation, residential development, and distance, there would be no view of the route from this resource as shown in the simulation from SP 1 (Attachment 5, Figure 5). Because the view from Arcola Elementary School would be entirely screened, there would be **No Impact** on this resource from Route 1.

### 3.5.3 053-0984, Arcola Slave Quarters

053-0984 is located approximately 0.71 mile to the south of Route 1 along a greenfield segment of the route (Attachment 5, Figure 6). Due to intervening vegetation, commercial development, and distance, there would be no view of the route from this resource as shown in the simulation from SP 5 (Attachment 5, Figure 7). Because the view from Arcola Slave Quarters would be entirely screened, there would be **No Impact** on this resource from Route 1.

## 3.6 Historic Resource Findings for Route 2

The impacts on each resource in the Route 2 study tiers are discussed below. Photosimulations are provided in Attachment 5 and 3D renderings of the district are located in Attachment 6.

### 3.6.1 053-0008, Dulles International Airport Historic District

053-0008 is located approximately 0.38 mile to the south of Route 2 along a greenfield segment of the route (Attachment 5, Figure 8). One photosimulation was prepared from SP 3, which was located on Beaver Meadow Road, which represents the public road nearest to the resource in the vicinity of the route (Attachment 5, Figures 9 and 10). This point was chosen since Dulles Airport would not grant access for photography within the limits of the airport. However, this SP is located approximately 1.35 mile to the west of the district and only a portion of the proposed route is visible behind the trees, at the intersection of Beaver Meadow Road and the transmission line. The route is likely to only be visible during leaf-off seasons (fall and winter).

Given the absence of accessible viewpoints from the airport historic district, ERM created a simulated Google Earth 3D rendering of existing and future conditions (Attachment 6, Figure 4). While the proposed route would be visible from the runway, only the tops of the structures would be visible from the tree line (Attachment 6, Figures 5 and 6). However, the structures are likely to be visible only during leaf-off seasons. In addition, the recorded boundary for the resource encompasses 1,726.60 acres, and only a small portion of the district is located in the half-mile study tier for the route. Furthermore, mature vegetation surrounding the district blocks visibility of the transmission line structures from many vantage points. Thus, ERM recommends that the proposed route would have a **Minimal Impact** on the Dulles International Airport Historic District.

### 3.6.2 053-0982, Arcola Elementary School

053-0982 is located approximately 0.66 mile to the south of Route 2 along a greenfield segment of the route (Attachment 5, Figure 11). Due to intervening vegetation, residential development, and distance, there would be no view to the route from this resource, as shown in the simulation from SP 1 (Attachment 5, Figure 12). Because the view from Arcola Elementary School would be entirely screened, there would be **No Impact** on this resource from Route 2.

### 3.6.3 053-0984, Arcola Slave Quarters

053-0984 is located approximately 0.64 mile to the southwest of Route 2 along a greenfield segment of the route (Attachment 5, Figure 13). Due to intervening vegetation, commercial development, and distance, there would be no view to the route from this resource, as shown in the simulation from SP 5 (Attachment 5, Figure 14). Because the view from Arcola Slave Quarters would be entirely screened, there would be **No Impact** on this resource from Route 2.

## 3.7 Historic Resource Findings for Route 3

The impacts to each resource in the Route 3 study tiers are discussed below. Photosimulations are provided in Attachment 5 and 3D renderings of the district are located in Attachment 6.

### 3.7.1 053-0008, Dulles International Airport Historic District

053-0008 is located approximately 0.38 mile to the south of Route 3 along a greenfield segment of the route (Attachment 5, Figure 15). One photosimulation was prepared from SP 3, which was located on Beaver Meadow Road, which represents the public road nearest to the resource in the vicinity of the route (Attachment 5, Figures 16 and 17). This point was chosen since Dulles Airport would not grant access for photography within the limits of the airport. However, this SP is located approximately 1.35 mile to the west of the district and only a portion of the proposed route is visible behind the trees, at the intersection of Beaver Meadow Road and the transmission line. The route is likely to only be visible during leaf-off seasons (fall and winter).

Given the absence of accessible viewpoints from the airport historic district, ERM created a simulated Google Earth 3D rendering of existing and future conditions (Attachment 6, Figure 7). While the proposed route would be visible from the runway, only the tops of the structures would be visible from the tree line (Attachment 6, Figures 8 and 9). However, the structures are likely to be visible only during leaf-off seasons. In addition, the recorded boundary for the resource encompasses 1,726.60 acres, and only a small portion of the district is located in the half-mile study tier for the route. Furthermore, mature vegetation surrounding the district blocks visibility of the transmission line structures from many vantage points. Thus, ERM recommends that the proposed route would have a **Minimal Impact** on the Dulles International Airport Historic District.

### 3.7.2 053-0982, Arcola Elementary School

053-0982 is located approximately 0.64 mile to the south-southwest of Route 3 along a greenfield segment of the route (Attachment 5, Figure 18). Due to intervening vegetation, residential development, and distance, there would be no view to the route from this resource, as shown in the simulation from SP 1 (Attachment 5, Figure 19). Because the view from Arcola Elementary School would be entirely screened, there would be **No Impact** on this resource from Route 3.

### 3.7.3 053-0984, Arcola Slave Quarters

053-0984 is located approximately 0.55 mile to the south of Route 3 along a greenfield segment of the route (Attachment 5, Figure 20). Due to intervening vegetation, commercial development, and distance, there would be no view to the route from this resource, as shown in the simulation from SP 5 (Attachment 5, Figure 21). Because the view from Arcola Slave Quarters would be entirely screened, there would be **No Impact** on this resource from Route 3.

## 3.8 Historic Resource Findings for Route 4

The impacts to each resource in the Route 4 study tiers are discussed below. Photosimulations are provided in Attachment 5 and 3D renderings of the district are located in Attachment 6.

### 3.8.1 053-0008, Dulles International Airport Historic District

053-0008 is located approximately 0.38 mile to the south of Route 4 along a greenfield segment of the route (Attachment 5, Figure 22). One photosimulation was prepared from SP 3, which was located on Beaver Meadow Road, which represents the public road nearest to the resource in the vicinity of the route (Attachment 5, Figures 23 and 24). This point was chosen since Dulles Airport would not grant access for photography within the limits of the airport. However, this SP is located approximately 1.35 mile to the west of the district and only a portion of the proposed route is visible behind the trees, at the intersection of Beaver Meadow Road and the transmission line. The route is likely to only be visible during leaf-off seasons (fall and winter).

Given the absence of accessible viewpoints from the airport historic district, ERM created a simulated Google Earth 3D rendering of existing and future conditions (Attachment 6, Figure 10). While the proposed route would be visible from the runway, only the tops of the structures would be visible from the tree line (Attachment 6, Figures 11 and 12). However, the structures are likely to be visible only during leaf-off seasons. In addition, the recorded boundary for the resource encompasses 1,726.60 acres, and only a small portion of the district is located in the half-mile study tier for the route. Furthermore, mature vegetation surrounding the district blocks visibility of the transmission line structures from many vantage points. Thus, ERM recommends that the proposed route would have a **Minimal Impact** on the Dulles International Airport Historic District.

### 3.8.2 053-0982, Arcola Elementary School

053-0982 is located approximately 0.64 mile to the south-southwest of Route 4 along a greenfield segment of the route (Attachment 5, Figure 25). Due to intervening vegetation, residential development, and distance, there would be no view to the route from this resource, as shown in the simulation from SP 1 (Attachment 5, Figure 26). Because the view from Arcola Elementary School would be entirely screened, there would be **No Impact** on this resource from Route 4.

### 3.8.3 053-0984, Arcola Slave Quarters

053-0984 is located approximately 0.55 mile to the south of Route 4 along a greenfield segment of the route (Attachment 5, Figure 27). Due to intervening vegetation, commercial development, and distance, there would be no view to the route from this resource, as shown in the simulation from SP 5 (Attachment 5, Figure 28). Because the view from Arcola Slave Quarters would be entirely screened, there would be **No Impact** on this resource from Route 4.

## 3.9 Historic Resource Findings for Route 5

The impacts to each resource in the Route 5 study tiers are discussed below. Photosimulations are provided in Attachment 5 and 3D renderings of the district are located in Attachment 6.

### 3.9.1 053-0008, Dulles International Airport Historic District

053-0008 is located approximately 0.38 mile to the south of Route 5 along a greenfield segment of the route (Attachment 5, Figure 29). One photosimulation was prepared from SP 3, which was located on Beaver Meadow Road, which represents the public road nearest to the resource in the vicinity of the route (Attachment 5, Figures 30 and 31). This point was chosen since Dulles Airport would not grant access for photography within the limits of the airport. However, this SP is located approximately 1.35 mile to the west of the district and only a portion of the proposed route is visible behind the trees, at the intersection of Beaver Meadow Road and the transmission line. The route is likely to only be visible during off-leaf seasons.

Given the absence of accessible viewpoints from the airport historic district, ERM created a simulated Google Earth 3D rendering of existing and future conditions (Attachment 6, Figure 13). While the proposed route would be visible from the runway, only the tops of the structures would be visible from the tree line (Attachment 6, Figures 14 and 15). However, the structures are likely to be visible only during leaf-off seasons. In addition, the recorded boundary for the resource encompasses 1,726.60 acres, and only a small portion of the district is located in the half-mile study tier for the route. Furthermore, mature vegetation surrounding the district blocks visibility of the transmission line structures from many vantage points. Thus, ERM recommends that the proposed route would have a **Minimal Impact** on the Dulles International Airport Historic District.

### 3.9.2 053-0982, Arcola Elementary School

053-0008 is located approximately 0.64 mile to the south-southwest of Route 5 along a greenfield segment of the route (Attachment 5, Figure 32). Due to intervening vegetation, existing infrastructure, and distance, there will be no view to the route from this resource, as shown in the simulation from SP 1 (Attachment 5, Figure 33). Because the view from Arcola Elementary School would be entirely screened, there would be **No Impact** on this resource from Route 5.

### 3.9.3 053-0984, Arcola Slave Quarters

053-0984 is located approximately 0.55 mile to the south of Route 5 along a greenfield segment of the route (Attachment 5, Figure 34). Due to intervening vegetation, commercial development, and distance, there would be no view to the route from this resource, as shown in the simulation from SP 5 (Attachment 5, Figure 35). Because the view from Arcola Slave Quarters would be entirely screened, there would be **No Impact** on this resource from Route 5.



### 3.10 Historic Resource Findings for Route 6

The impacts to each resource in the Route 6 study tiers are discussed below. Photosimulations are provided in Attachment 5 and 3D renderings of the district are located in Attachment 6.

#### 3.10.1 053-0008, *Dulles International Airport Historic District*

053-0008 is located approximately 0.38 mile to the south of Route 6 along a greenfield segment of the route (Attachment 5, Figure 36). One photosimulation was prepared from SP 3, which was located on Beaver Meadow Road, which represents the public road nearest to the resource in the vicinity of the route (Attachment 5, Figures 37 and 38). This point was chosen since Dulles Airport would not grant access for photography within the limits of the. However, this SP is located approximately 1.35 mile to the west of the district and only a portion of the proposed route is visible behind the trees, at the intersection of Beaver Meadow Road and the transmission line. The route is likely to only be visible during leaf-off seasons (fall and winter).

Given the absence of accessible viewpoints from the airport's historic district, ERM created a simulated Google Earth 3D rendering of existing and future conditions (Attachment 6, Figure 16). While the proposed route would be visible from the runway, only the tops of the structures would be visible from the tree line (Attachment 6, Figures 17 and 18). However, the structures are likely to be visible only during leaf-off seasons. In addition, the recorded boundary for the resource encompasses 1,726.60 acres, and only a small portion of the district is located in the half-mile study tier for the route. Furthermore, mature vegetation surrounding the district blocks visibility of the transmission line structures from many vantage points. Thus, ERM recommends that the proposed route would have a **Minimal Impact** on the Dulles International Airport Historic District.

#### 3.10.2 053-0982, *Arcola Elementary School*

053-0982 is located approximately 0.66 mile to the south of Route 6 along a greenfield segment of the route (Attachment 5, Figure 39). Due to intervening vegetation, residential development, and distance, there would be no view to the route from this resource, as shown in the simulation from SP 1 (Attachment 5, Figure 40). Because the view from Arcola Elementary School would be entirely screened, there would be **No Impact** on this resource from Route 6.

#### 3.10.3 053-0984, *Arcola Slave Quarters*

053-0984 is located approximately 0.57 mile to the south of Route 6 along a greenfield segment of the route (Attachment 5, Figure 41). Due to intervening vegetation, commercial development, and distance, there would be no view to the route from this resource, as shown in the simulation from SP 5 (Attachment 5, Figure 42). Because the view from Arcola Slave Quarters would be entirely screened, there would be **No Impact** on this resource from Route 6.

### 3.11 Historic Resource Findings for Mars 230 kV Loop

There are no historic architectural resources in the study tiers for this route.

### 3.12 Historic Resource Findings for Wishing Star Substation

The impact to the resource in the Wishing Star Substation study tiers is discussed below. Photosimulations are provided in Attachment 5

### 3.12.1 053-0982, Arcola Elementary School

053-0982 is located approximately 0.83 mile to the southeast of the proposed Wishing Star Substation (Attachment 5, Figure 43). Due to intervening vegetation, residential development, and distance, there would be no view to the substation from this resource, as shown in the simulation from SP 1 (Attachment 5, Figure 44). Because the view from Arcola Elementary School would be entirely screened, there would be **No Impact** on this resource from the Wishing Star Substation.

## 3.13 Historic Resource Findings for Mars Substation

The impact to the resource in the Mars Substation study tiers is discussed below. Photosimulations are provided in Attachment 5 and the 3D renderings for the district are located in Attachment 6.

### 3.13.1 053-0008, Dulles International Airport Historic District

053-0008 is located approximately 0.42 mile to the south of the proposed Mars Substation (Attachment 5, Figure 45). One photosimulation was prepared from SP 3, which was located on Beaver Meadow Road, the public road nearest to the resource in the vicinity of the substation (Attachment 5, Figures 46 and 47). This point was chosen since Dulles Airport would not grant access for photography within the limits of the airport. However, this SP is located approximately 1.35 mile to the west of the district and none of the proposed Mars Substation would be visible from this point. However, since the substation will be constructed along with one of the proposed transmission line routes, both the substation and the associated line must be included in the analysis of viewshed impacts for the Project alternatives. Routes 1 through 6 all present equal, albeit minimal, potential for viewshed impacts. Only a portion of each alternative route (Routes 1 through 6) is visible beyond the trees, at the intersection of Beaver Meadow Road and the proposed transmission line. The route is likely to be visible only during off-leaf seasons.

Given the absence of accessible viewpoints from the airport's historic district, ERM created a simulated Google Earth 3D rendering of existing and future conditions (Attachment 6, Figure 19). This rendering shows that the proposed substation would be visible from the runway. However, as stated previously, the substation would be built in conjunction with one of the routes (which are the same in the area surrounding the substation), and thus, impacts from the substation and transmission line collectively are reviewed here. While all of the alternative routes would be visible from the runway, only the tops of the structures would be visible from the tree line (Attachment 6, Figures 20 and 21). However, the structures are likely to be visible only during leaf-off seasons. In addition, the recorded boundary for the resource encompasses 1,726.60 acres, and only a small portion of the district is located in the half-mile study tier for the routes. Furthermore, mature vegetation surrounding the district blocks visibility of the transmission line structures from many vantage points. Thus, ERM recommends that the proposed Mars Substation and any associated transmission line under consideration would have a **Minimal Impact** on the Dulles International Airport Historic District.

## 3.14 Archaeology Findings

Eight known archaeological sites are located in the right-of-way for the proposed transmission line alternative routes and the proposed substations (Table 3.14-1). Only one site was recorded within the area of the proposed Wishing Star Substation (44LD1280), while no sites were present within the right-of-way of the proposed Mars Substation. Additionally, only one site was recorded within the right-of-way of the proposed Mars 230 kV Loop.

The sites that would be impacted by each alternative route are described below. The descriptions include information on the eligibility of each site for listing in the NRHP as well as an assessment of each site's condition based on desktop review. A confident determination about 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.

**Table 3.14-1: Archaeological Resources within the Right-of-way for the Alternative Routes**

Considered Resource	Proposed Mars to Wishing Star Alternative Routes <sup>a</sup>						Mars 230 kV Loop	Proposed Substations <sup>b</sup>	
	Route 1	Route 2	Route 3	Route 4	Route 5	Route 6		Wishing Star	Mars
44LD0167	X	X	-	-	-	-	-	-	-
44LD0168	X	X	X	X	X	X	-	-	-
44LD0173	-	X	-	X	X	X	-	-	-
44LD0174	-	-	-	-	X	X	-	-	-
44LD0609	-	-	-	-	X	X	-	-	-
44LD0970	-	X	-	X	X	X	-	-	-
44LD1280	-	-	-	-	-	-	-	X	-
44LD1742	-	-	-	-	-	-	X	-	-

<sup>a</sup> "X" indicates that the resource is within the right-of-way of the proposed route.

<sup>b</sup> "X" indicates that the resource is within the footprint of the proposed substation.

### 3.14.1 Route 1

Two archaeological sites are crossed by the right-of-way for Route 1: 44LD0167 and 44LD0168. Route 1 crosses the southwestern half of 44LD0168. 44LD0168 is a Pre-Contact temporary camp, primarily consisting of a quartz lithic scatter. The site has been determined not eligible for the NRHP and, therefore, requires no further consideration. 44LD0167 is a Pre-Contact temporary camp site, consisting of one quartz shallow side-notched point. The site has not been formally evaluated for NRHP and the overall integrity of the site is unknown. Route 1 extends across the length of 44LD0167 (approximately 719 feet). The construction of the proposed route would include clearing of the right-of-way and the placement of a structure in the boundary of the site. Because the resource has not been formally evaluated, further survey would need to occur in order to determine NRHP eligibility of the resource. If the site is found to be eligible, the route or structure placement may need to be altered protect the site, or the site might require further archaeological investigation to recover information that could be lost as a result of construction impacts.

### 3.14.2 Route 2

Four archaeological sites lie within the right-of-way for Route 2: 44LD0167, 44LD0168, 44LD0173, and 44LD0970. Two of these sites (44LD0168 and 44LD0173) have been determined not eligible for the NRHP and require no further consideration. 44LD0168 is a Pre-Contact temporary camp that primarily consists of a quartz lithic scatter. Route 2 crosses the southwestern half of the site. 44LD0173 consists of a Pre-Contact temporary camp and lithic scatter that included a quartzite late-stage biface fragment, a quartz early to middle stage biface fragment, quartz flakes, rhyolite flakes, a quartz cobble fragment, a stoneware sherd, and a glass shard. Route 2 intersects the northern section of 44LD0173's boundary. The current design of the route would include the placement of a transmission structure within the site.

The route also crosses 44LD0167 and 44LD0970. 44LD0167 is a Pre-Contact temporary camp site, consisting of one quartz shallow side-notched point. The overall integrity of the site is unknown and it has not been formally evaluated for NRHP eligibility. Route 2 crosses the length of 44LD0167 (approximately 719 feet). The construction of the proposed route would include clearing of the right-of-way which could impact the archaeological deposits at the site. However, because the resource is not evaluated for NRHP eligibility; further survey will need to occur in order to determine its eligibility. If the site is found to be eligible, the route may need to be altered in order to protect the site, or the site might require further archaeological investigation to recover information that could be lost as a result of construction impacts. 44LD0970 is a Late Archaic period lithic scatter consisting of two quartz flakes, a quartzite projectile point fragment, two rhyolite flakes, and a chert flake. The site has suffered significant disturbance but has not been formally evaluated for NRHP eligibility. The southern half of the right-of-way for Route 2 crosses 44LD0970. The site could be impacted by the clearing of the right-of-way and associated construction activities. However, since the site has been previously disturbed, it is anticipated that the construction of Route 2 would have minimal impacts on the site.

### 3.14.3 Route 3

One archaeological site lies within the right-of-way for Route 3: 44LD0168. Route 3 crosses the southwestern half of 44LD0168. The site is a Pre-Contact temporary camp that primarily consists of a quartz lithic scatter. As the site has been determined not eligible for the NRHP, it requires no further consideration.

### 3.14.4 Route 4

Three archaeological sites lie within the right-of-way for Route 4: 44LD0168, 44LD0173, and 44LD0970. Two of these sites (44LD0168 and 44LD0173) have been determined not eligible for the NRHP and require no further consideration. Route 4 crosses the southwestern half of 44LD0168. The site is a Pre-Contact temporary camp that primarily consists of a quartz lithic scatter. 44LD0173 consists of a Pre-Contact temporary camp and lithic scatter that includes a quartzite late-stage biface fragment, a quartz early to middle stage biface fragment, quartz flakes, rhyolite flakes, a quartz cobble fragment, a stoneware sherd, and a glass shard. Route 4 crosses the northern portion of the site.

44LD0970 is a Late Archaic period lithic scatter consisting of two quartz flakes, a quartzite projectile point fragment, two rhyolite flakes, and a chert flake. The site has suffered significant disturbance, but has not been formally evaluated for NRHP eligibility. The southern half of the right-of-way for Route 4 crosses 44LD0970. The site could be impacted by clearing of the right-of-way and associated construction activities. However since the site has been previously disturbed, it is anticipated that the construction of Route 4 would have minimal impacts on the site

### 3.14.5 Route 5

Five archaeological sites are crossed by the right-of-way for Route 5: 44LD0168, 44LD0173, 44LD0174, 44LD0609, and 44LD0970. Three of these sites (44LD0168, 44LD0173, and 44LD0174) have been determined not eligible for the NRHP and require no further consideration. The right-of-way for Route 5 crosses the southwestern portion of 44LD0168's. The site is a Pre-Contact temporary camp that primarily consists of a quartz lithic scatter. 44LD0173 consists of a Pre-Contact temporary camp and lithic scatter that includes a quartzite late-stage biface fragment, a quartz early to middle stage biface fragment, quartz flakes, rhyolite flakes, a quartz cobble fragment, a stoneware sherd, and a glass shard. Route 5 crosses the northern section of the site. Finally, 44LD0174 is a Pre-Contact temporary camp containing a lithic scatter with two stemmed points suggesting a Late Archaic component. The right-of-way for Route 5 crosses a very small portion of the northern boundary of 44LD0174.

Route 5 also crosses 44LD0609 and 44LD0970. 44LD0609 is an Early Woodland base camp consisting of a Susquehanna broadspear point, a chert bifacial tool, a grit-tempered Marcey Creek variant ceramic sherd, and five quartz flakes. The integrity of 44LD0609 is unknown, and it has not been formally evaluated for NRHP eligibility. The right-of-way for Route 5 abuts the northern boundary of 44LD0609. The clearing of the right-of-way and associated construction activities could impact the site. Because the resource has not been formally evaluated, further survey would need to occur in order to determine the NRHP eligibility of the site. If the site is found to be eligible, the alignment of the route may need to be modified to protect the site or the site might require further archaeological investigation to recover information that could be lost as a result of construction impacts. 44LD0970 is a Late Archaic period lithic scatter consisting of two quartz flakes, a quartzite projectile point fragment, two rhyolite flakes, and a chert flake. The site has suffered significant disturbance but has not been formally evaluated for the NRHP. The southern half of the right-of-way crosses 44LD0970. The clearing of the right-of-way and associated construction activities could impact the site. However, since the site has been previously disturbed, it is anticipated that the construction of Route 5 would have minimal impacts on the site.

### 3.14.6 Route 6

Five archaeological sites lie within the right-of-way for Route 6: 44LD0168, 44LD0173, 44LD0174, 44LD0609, and 44LD0970. Three of these sites (44LD0168, 44LD0173, and 44LD0174) have been determined not eligible for the NRHP and require no further consideration. The right-of-way for Route 6 crosses the southwestern half of 44LD0168's. The site is a Pre-Contact temporary camp that primarily consists of a quartz lithic scatter. 44LD0173 consists of a Pre-Contact temporary camp and lithic scatter that includes a quartzite late-stage biface fragment, a quartz early to middle stage biface fragment, quartz flakes, rhyolite flakes, a quartz cobble fragment, a stoneware sherd, and a glass shard. Route 6 crosses the northern section of the site. 44LD0174 is a Pre-Contact temporary camp containing a lithic scatter with two stemmed points suggesting a Late Archaic component. The right-of-way for Route 6 crosses a very small portion of the northern portion of 44LD0174.

Route 6 also crosses 44LD0609 and 44LD0970. 44LD0609 is an Early Woodland base camp consisting of a Susquehanna broadspear point, a chert bifacial tool, a grit-tempered Marcey Creek variant ceramic sherd, and five quartz flakes. The integrity of 44LD0609 is unknown, and it has not been formally evaluated for NRHP eligibility. The right-of-way for Route 6 abuts the northern boundary of the site. The clearing of the right-of-way and associated construction activities could impact the site. Because the resource has not been formally evaluated, further survey would need to occur in order to determine the NRHP eligibility of the site. If the alignment of the route may need to be modified to protect the site or the site might require further archaeological investigation to recover information that could be lost as a result of construction impacts. 44LD0970 is a Late Archaic period lithic scatter consisting of two quartz flakes, a quartzite projectile point fragment, two rhyolite flakes, and a chert flake. The site has suffered significant disturbance, but has not been formally evaluated for NRHP eligibility. The southern half of the right-of-way for Route 6 crosses 44LD0970. The clearing of the right-of-way and associated construction activities could impact the site. The site could be impacted by construction traffic or clearing within the new right-of-way or structure placement. However since the site has been previously disturbed, it is anticipated that the construction of Route 6 would have minimal impacts on the site.

### 3.14.7 Mars 230 kV Loop

One archaeological site lies within the right-of-way for Mars 230 kV Loop. Site 44LD1742, the Carter Schoolhouse, consists of the burned remains of the school building built ca. 1920 and closed between 1936 and 1939. The remains consist of a stone rubble foundation and brick chimney fall. A total of 385 artifacts are reported from previous investigations, including porcelain, whiteware, glass fragments, metal



nails, and a decorative plate. The right-of-way for the Mars 230 kV Loop crosses the site. However, as the site has been determined not eligible for the NRHP, it requires no further consideration.

### ***3.14.8 Wishing Star Substation***

One archaeological site lies within the footprint of the proposed Wishing Star Substation: 44LD1280. Site 44LD1280 is a historic railroad bed. The site is approximately 1.7 miles long and consists of cuts and berms associated with the proposed Loudoun Branch of the Manassas Gap Rail Company. Construction of the railroad began in 1853 but was abandoned prior to the Civil War and never completed. An approximately 0.21 mile segment of the railroad crosses the northern portion of the proposed substation site. However, as the site has been determined not eligible for the NRHP, it requires no further consideration.

### ***3.14.9 Mars Substation***

No archaeological sites fall within the footprint of the proposed Mars Substation.

## 4. CONCLUSIONS AND RECOMMENDATIONS

The pre-application analysis gathered information on archaeological and historic architectural resources that qualify for consideration according to the VDHR Guidelines for transmission line projects.

Eight known archaeological sites are located within the right-of-way of the proposed transmission line alternative routes. An assessment of the condition and research potential of those sites is contingent upon archaeological field investigations, which will be conducted at relevant sites once a preferred alternative is selected by the SCC. Potential impacts to sites along the preferred route will be assessed as part of the field survey.

Three aboveground historic resources fall within the VDHR study tiers for the alternative routes under consideration. Since portions of several routes use common alignments, some resources would be affected regardless of the alternative route selected by the SCC for the Project. A comparison of the number of resources impacted and the degree of impact for each alternative route is presented in Table 4-1. The specific resources affected by each alternative are covered in the subsections that follow.

**Table 4-1: Comparison of Project Impacts on Historic Resources in the Study Areas of the Alternative Routes**

Route Alternative	Number of Considered Resources in Each Impact Category				
	None	Minimal	Moderate	Severe	Total
Route 1	2	1	0	0	3
Route 2	2	1	0	0	3
Route 3	2	1	0	0	3
Route 4	2	1	0	0	3
Route 5	2	1	0	0	3
Route 6	2	1	0	0	3
Mars 230 kV Loop	0	0	0	0	0
Wishing Star Substation	1	0	0	0	1
Mars Substation	0	1	0	0	1

Final assessments of Project impacts will be dependent on the completion of identification-phase archaeological and historic structure surveys along the routes selected by the SCC and review of survey results by VDHR and other consulting parties. For any resources where the agencies concur in a finding of moderate or severe impact, the Company will propose treatments to avoid, minimize, or mitigate those impacts. Treatment options for archaeological sites could include selective structure placement to avoid direct impacts on sites, minor route adjustments to avoid crossing sites, or archaeological data recovery. Treatment options for aboveground historic resources could include detailed site documentation, historic research, and historic preservation studies; preparation of digital media or museum-type exhibits on sites for public interpretation; installation of historic markers or signs; installation of vegetative screening; or contributions to historical preservation organizations or specific preservation projects. Additional mitigation options could be identified through consultation with VDHR and other consulting parties.

## 4.1 Route 1

Three previously recorded historic architectural resources meet the criteria specified in the Guidelines and fall within the VDHR study tiers for Route 1 (Table 4.1-1), although the route would have no impact on two of these and a minimal impact on one.

**Table 4.1-1: Impacts to Historic Resources in the VDHR Study Tiers for Route 1**

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	-	-	-
0.5 to 1.0	National Register Properties (listed)	053-0982	Arcola Elementary School	None
		053-0984	Arcola Slave Quarters	None
0.0 to 0.5	National Register–eligible	053-0008	Dulles International Airport Historic District	Minimal
0.0 (within ROW)	National Historic Landmarks, National Register Properties (listed and eligible)	-	-	-

## 4.2 Route 2

Three previously recorded historic architectural resources meet the criteria specified in the Guidelines and fall within the VDHR study tiers for Route 2 (Table 4.2-1), although the route would have no impact on two of these and a minimal impact on one.

**Table 4.2-1: Impacts to Historic Resources in the VDHR Study Tiers for Route 2**

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	-	-	-
0.5 to 1.0	National Register Properties (listed)	053-0982	Arcola Elementary School	None
		053-0984	Arcola Slave Quarters	None
0.0 to 0.5	National Register–eligible	053-0008	Dulles International Airport Historic District	Minimal
0.0 (within ROW)	National Historic Landmarks, National Register Properties (listed and eligible)	-	-	-

## 4.3 Route 3

Three previously recorded historic architectural resources meet the criteria specified in the Guidelines and fall within the VDHR study tiers for Route 3 (Table 4.3-1), although the route would have no impact on two of these and a minimal impact on one.

**Table 4.3-1: Impacts to Historic Resources in the VDHR Study Tiers for Route 3**

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	-	-	-
0.5 to 1.0	National Register Properties (listed)	053-0982	Arcola Elementary School	None
		053-0984	Arcola Slave Quarters	None
0.0 to 0.5	National Register–eligible	053-0008	Dulles International Airport Historic District	Minimal
0.0 (within ROW)	National Historic Landmarks, National Register Properties (listed and eligible)	-	-	-

#### 4.4 Route 4

Three previously recorded historic architectural resources meet the criteria specified in the Guidelines and fall within the VDHR study tiers for Route 4 (Table 4.4-1), although the route would have no impact on two of these and a minimal impact on one.

**Table 4.4-1: Impacts to Historic Resources in the VDHR Study Tiers for Route 4**

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	-	-	-
0.5 to 1.0	National Register Properties (listed)	053-0982	Arcola Elementary School	None
		053-0984	Arcola Slave Quarters	None
0.0 to 0.5	National Register–eligible	053-0008	Dulles International Airport Historic District	Minimal
0.0 (within ROW)	National Historic Landmarks, National Register Properties (listed and eligible)	-	-	-

#### 4.5 Route 5

Three previously recorded historic architectural resources meet the criteria specified in the Guidelines and fall within the VDHR study tiers for Route 5 (Table 4.5-1), although the route would have no impact on two of these and a minimal impact on one.

**Table 4.5-1: Impacts to Historic Resources in the VDHR Study Tiers for Route 5**

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	-	-	-
0.5 to 1.0	National Register Properties (listed)	053-0982	Arcola Elementary School	None
		053-0984	Arcola Slave Quarters	None
0.0 to 0.5	National Register–eligible	053-0008	Dulles International Airport Historic District	Minimal

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Buffer (miles)	Resource Category	Resource Number	Description	Impact
0.0 (within ROW)	National Historic Landmarks, National Register Properties (listed and eligible)	-	-	-

#### 4.6 Route 6

Three previously recorded historic architectural resources meet the criteria specified in the Guidelines and fall within the VDHR study tiers for Route 6 (Table 4.6-1), although the route would have no impact on two of these and a minimal impact on one.

**Table 4.6-1: Impacts to Historic Resources in the VDHR Study Tiers for Route 6**

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	-	-	-
0.5 to 1.0	National Register Properties (listed)	053-0982	Arcola Elementary School	None
		053-0984	Arcola Slave Quarters	None
0.0 to 0.5	National Register–eligible	053-0008	Dulles International Airport Historic District	Minimal
0.0 (within ROW)	National Historic Landmarks, National Register Properties (listed and eligible)	-	-	-

#### 4.7 Mars 230 kV Loop

No previously recorded historic architectural resources meeting the criteria specified in the Guidelines were identified within the study tiers for this route.

#### 4.8 Wishing Star Substation

One previously recorded historic architectural resource meets the criteria specified in the Guidelines and falls within the VDHR study tiers for the proposed Wishing Star Substation (Table 4.8-1), although the route would have no impact on it.

**Table 4.8-1: Impacts to Historic Resources in the VDHR Study Tiers for the Wishing Star Substation**

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	-	-	-
0.5 to 1.0	National Register Properties (listed)	053-0982	Arcola Elementary School	None
0.0 to 0.5	National Register–eligible	-	-	-
0.0 (within ROW)	National Historic Landmarks, National Register Properties (listed and eligible)	-	-	-



## 4.9 Mars Substation

One previously recorded historic architectural resource meets the criteria specified in the Guidelines and falls within the VDHR study tiers for the proposed Mars Substation (Table 4.9-1), although the route would have a minimal impact on it.

**Table 4.9-1: Impacts to Historic Resources in the VDHR Study Tiers for the Mars Substation**

Buffer (miles)	Resource Category	Resource Number	Description	Impact
1.0 to 1.5	National Historic Landmarks	-	-	-
0.5 to 1.0	National Register Properties (listed)	-	-	-
0.0 to 0.5	National Register-eligible	053-0008	Dulles International Airport Historic District	Minimal
0.0 (within ROW)	National Historic Landmarks, National Register Properties (listed and eligible)	-	-	-

## 4.10 Future Investigations

The next stage of assessing impacts on historic resources will be to conduct an identification-phase field survey to identify and assess resources along the route selected by the SCC that could be impacted by the Project. Survey will be conducted in accordance with the following guidelines:

- Guidelines for Assessing Impacts of Proposed Electrical Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia (VDHR 2008);
- National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation (NPS 1995).

The survey teams will be led by individuals meeting the Secretary of the Interior's professional qualifications standards for architectural history. Teams will traverse the length of the Project corridor(s), revisiting previously recorded historic architectural resources and documenting additional as-of-yet unrecorded historic resources in the survey area. During the course of the survey, all structures determined to be of age will be photographed and marked on the applicable U.S. Geological Survey (USGS) quadrangle map. While the NPS Bulletin 15 (NPS 1995) defines a historic property as a resource that is 50 years or older, for the purposes of this Project, survey will include those 45 years or older to accommodate the length of time needed to complete the permitting phase for the Project. Furthermore, the survey will also record those resources that may have reached significance prior to the 50 (45) year age in accordance with NPS guidance, if they are integral parts of districts, or have merit to be considered eligible for the NRHP on their own.

Archaeological survey of the preferred alternative will be led by an individual meeting the Secretary of the Interior's professional qualifications standards for Archaeology. All areas that will be impacted by construction including the proposed right-of-way, towers, associated facilities, staging areas, etc. will be surveyed. In those cases where the right-of-way can be cleared without ground disturbance, archaeological survey will not be necessary, however a right-of-way clearing plan will need to be approved.

Cultural resources identified in the field effort will be reported to the VDHR. Sufficient information will be collected to make recommendations for each identified resource regarding eligibility for listing on the

NRHP. Any resources identified that have potential for listing on the NRHP may require intensive architectural inventory or phase II testing to assess project impacts. For any resource negatively impacted by the project, avoidance of the impact should be considered. If the impact cannot be avoided, then a mitigation plan will be needed. Both minimization and mitigation plans should be developed in consultation with the VDHR.

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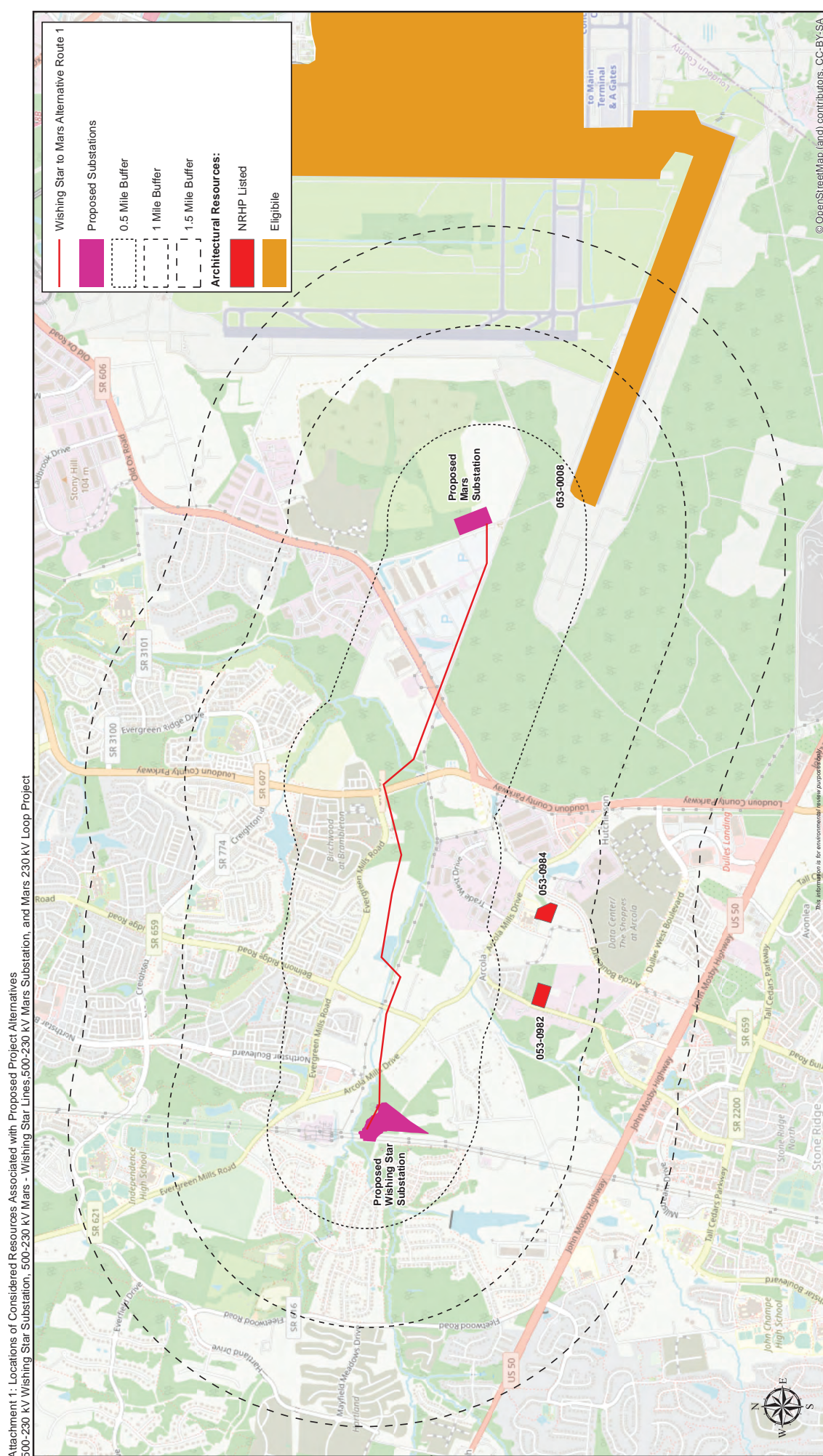
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500-230 KV WISHING STAR SUBSTATION, 500 KV AND 230 KV MARS-WISHING STAR LINES, 500-230 KV MARS SUBSTATION,  
AND MARS 230 KV LOOP

## **ATTACHMENT 1 LOCATIONS OF CONSIDERED HISTORIC RESOURCES ASSOCIATED WITH PROPOSED PROJECT ALTERNATIVES**



Attachment 1, Sheet 1

**Locations of Considered Historic Resources Associated with Project Alternatives**  
**500-230 kV Wishing Star Substation, 500-230 kV Mars - Wishing Star Lines,**  
**500-230 kV Mars Substation, and Mars 230 kV Loop Project**  
**Dominion Energy Virginia**  
Loudoun County, Virginia

 Dominion Energy

 Miles  
0 0.25 0.5 0.75 1

1:37,077

 ERM







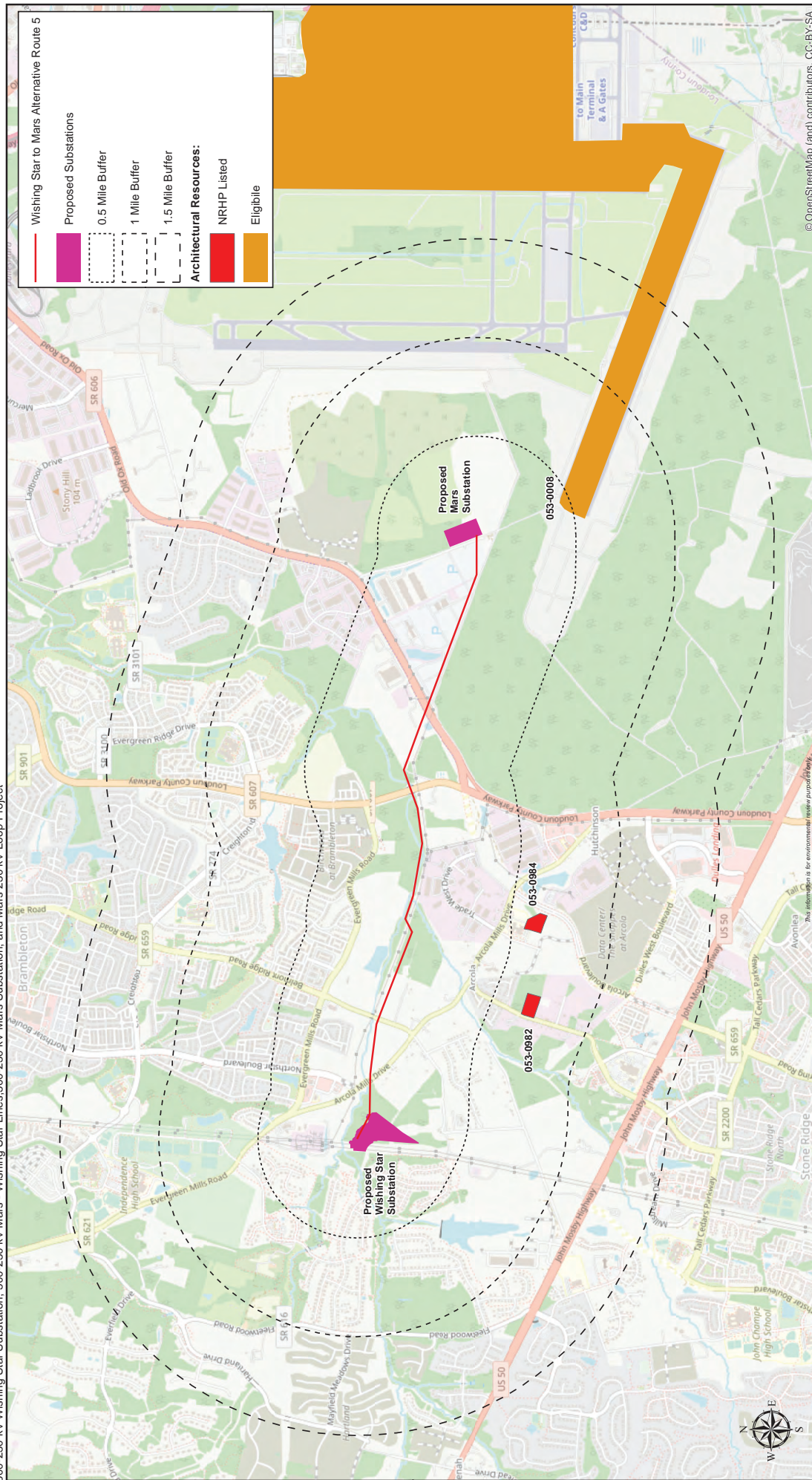








Attachment 1: Locations of Considered Resources Associated with Proposed Project Alternatives  
500-230 kV Wishing Star Substation, 500-230 kV Mars - Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Project



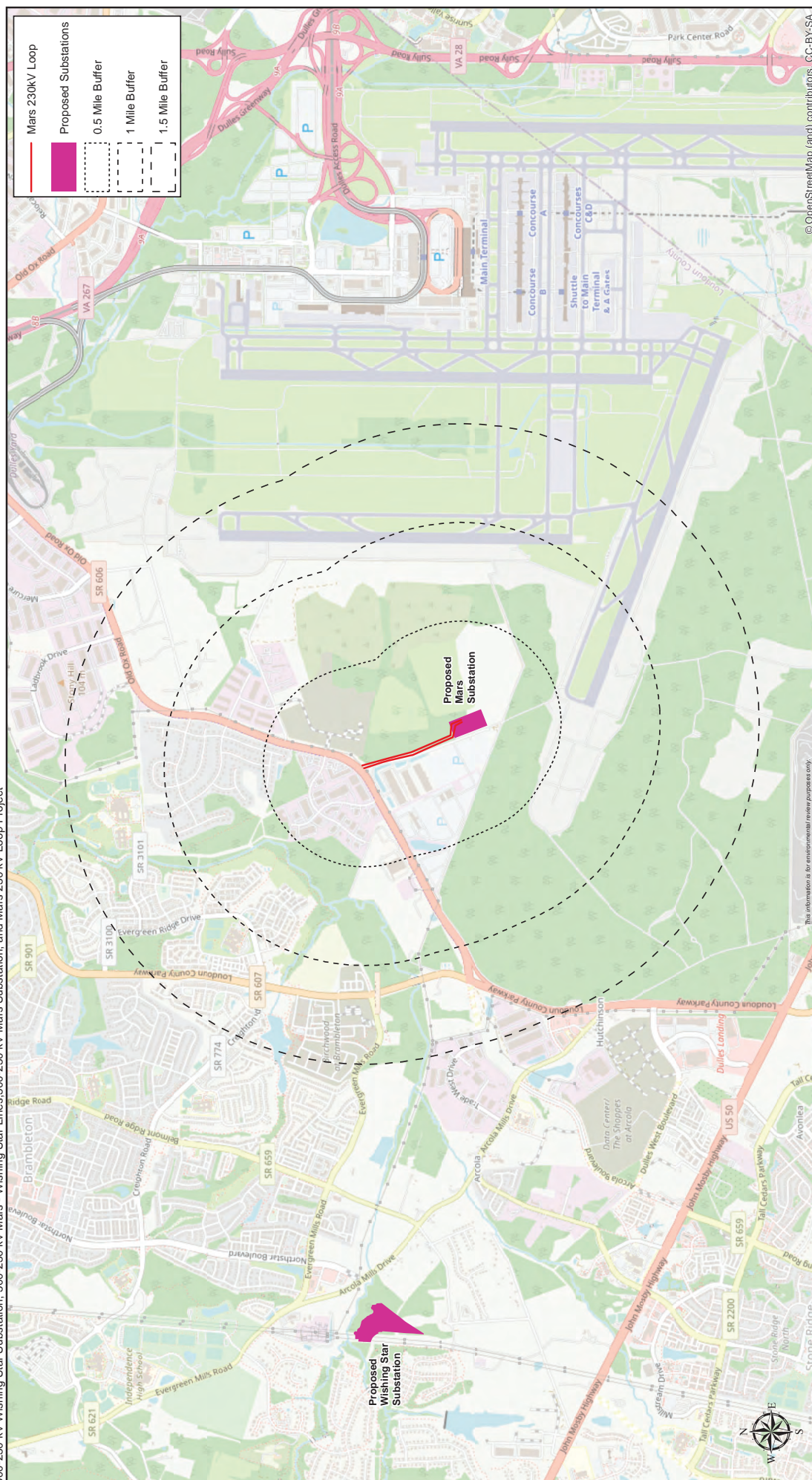
Attachment 1, Sheet 5  
Locations of Considered Historic Resources Associated with Project Alternatives  
500-230 kV Wishing Star Substation, 500-230 kV Mars - Wishing Star Lines,  
500-230 kV Mars Substation, and Mars 230 kV Loop Project  
Dominion Energy Virginia  
Loudoun County, Virginia











**Attachment 1, Sheet 7**  
**Locations of Considered Historic Resources Associated with Project Alternatives**  
**500-230 kV Wishing Star Substation, 500-230 kV Mars - Wishing Star Lines,**  
**500-230 kV Mars Substation, and Mars 230 kV Loop Project**  
**Dominion Energy Virginia**  
**Loudoun County, Virginia**



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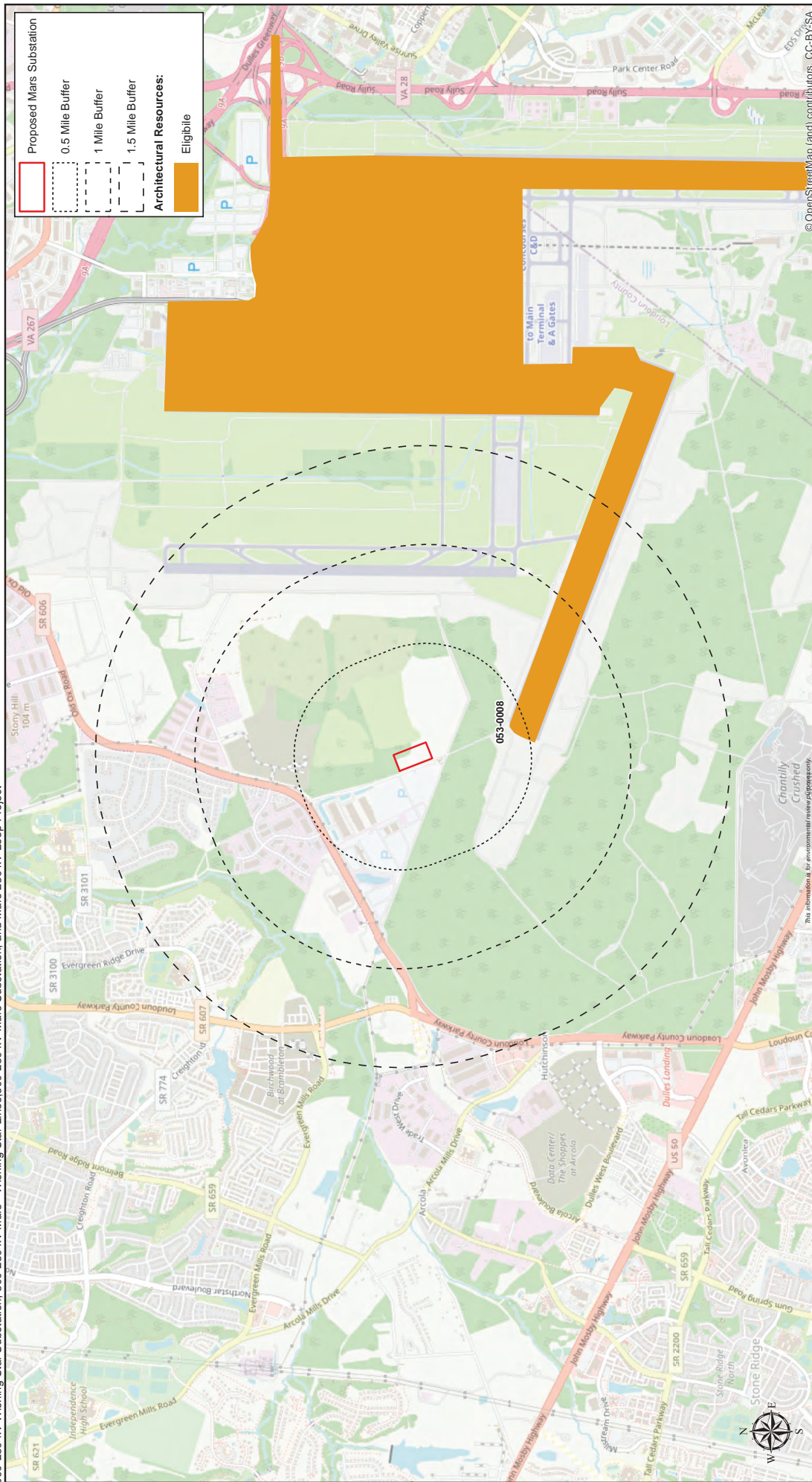


**Dominion  
Energy**





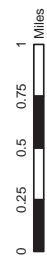
Attachment 1: Locations of Considered Resources Associated with Proposed Project Alternatives  
500-230 kV Wishing Star Substation, 500-230 kV Mars - Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Project



**Attachment 1, Sheet 9**  
**Locations of Considered Historic Resources Associated with Project Alternatives**  
**500-230 kV Wishing Star Substation, 500-230 kV Mars - Wishing Star Lines,**  
**500-230 kV Mars Substation, and Mars 230 kV Loop Project**  
**Dominion Energy Virginia**  
**Loudoun County, Virginia**



1:38,000

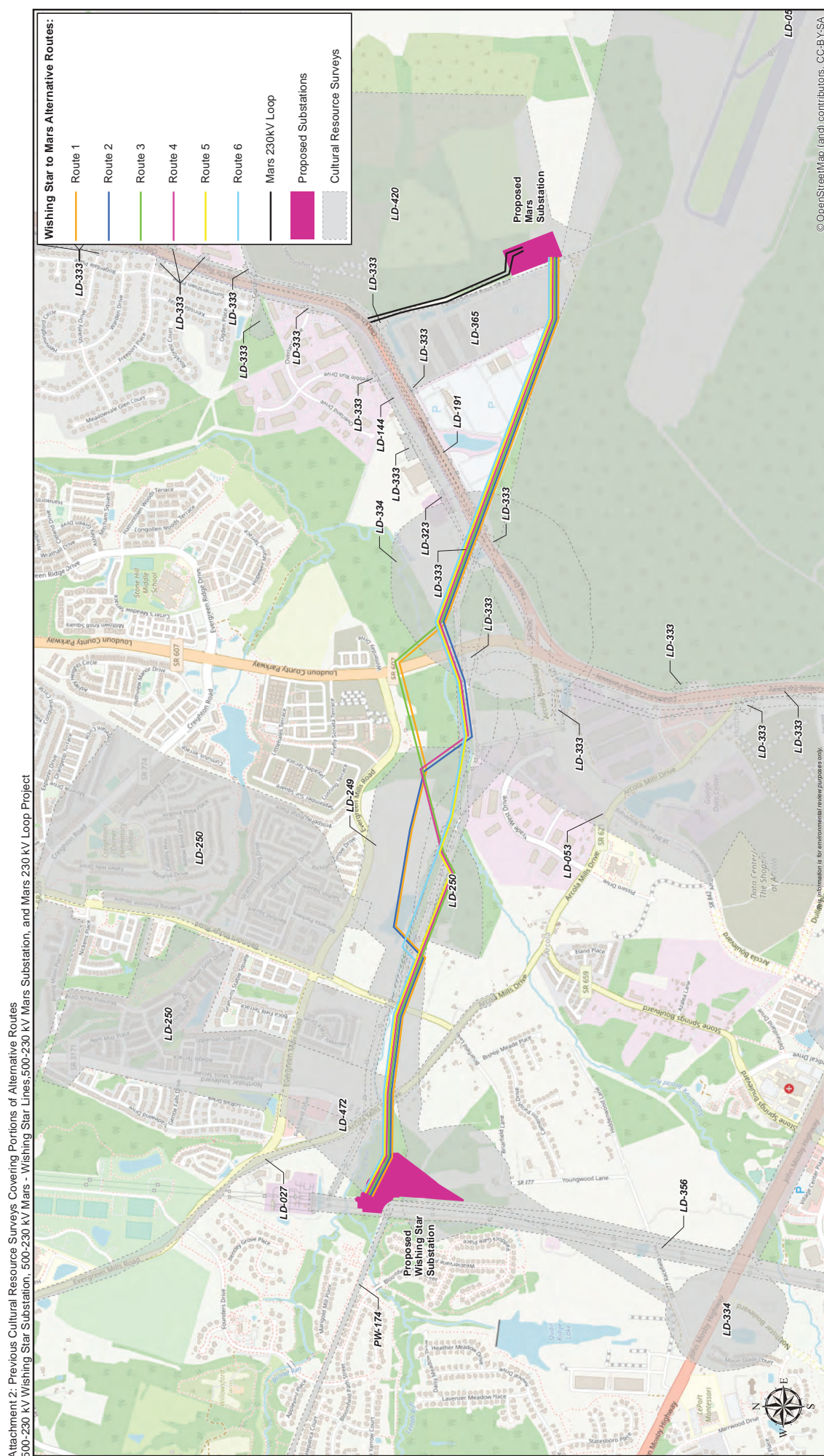




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500-230 KV WISHING STAR SUBSTATION, 500 KV AND 230 KV MARS-WISHING STAR LINES, 500-230 KV MARS SUBSTATION,  
AND MARS 230 KV LOOP

## **ATTACHMENT 2    CULTURAL RESOURCE SURVEYS COVERING PORTIONS OF ALTERNATIVE ROUTE**





0 0.2 0.4 0.6 Miles



## Attachment 2

# Previous Cultural Resource Surveys Covering Portions of Alternative Routes 500-230 kV Wishing Star Substation, 500-230 kV Mars - Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop Project

## Dominion Energy Virginia

### Loudoun County, Virginia



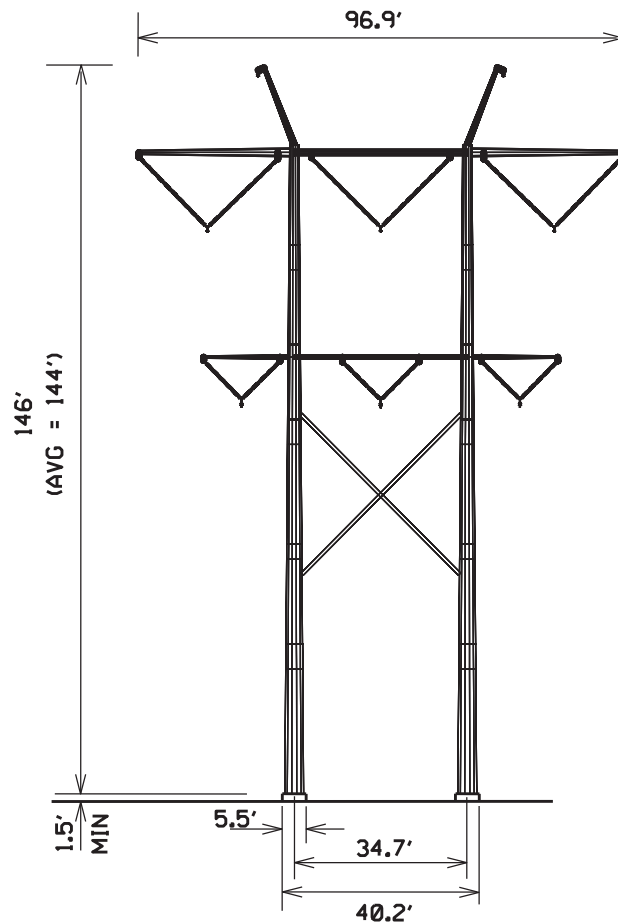
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500-230 KV WISHING STAR SUBSTATION, 500 KV AND 230 KV MARS-WISHING STAR LINES, 500-230 KV MARS SUBSTATION,  
AND MARS 230 KV LOOP

## ATTACHMENT 3 TYPICAL DESIGN AND LAYOUT

## DOUBLE CIRCUIT H-FRAME SUSPENSION

PRELIMINARY

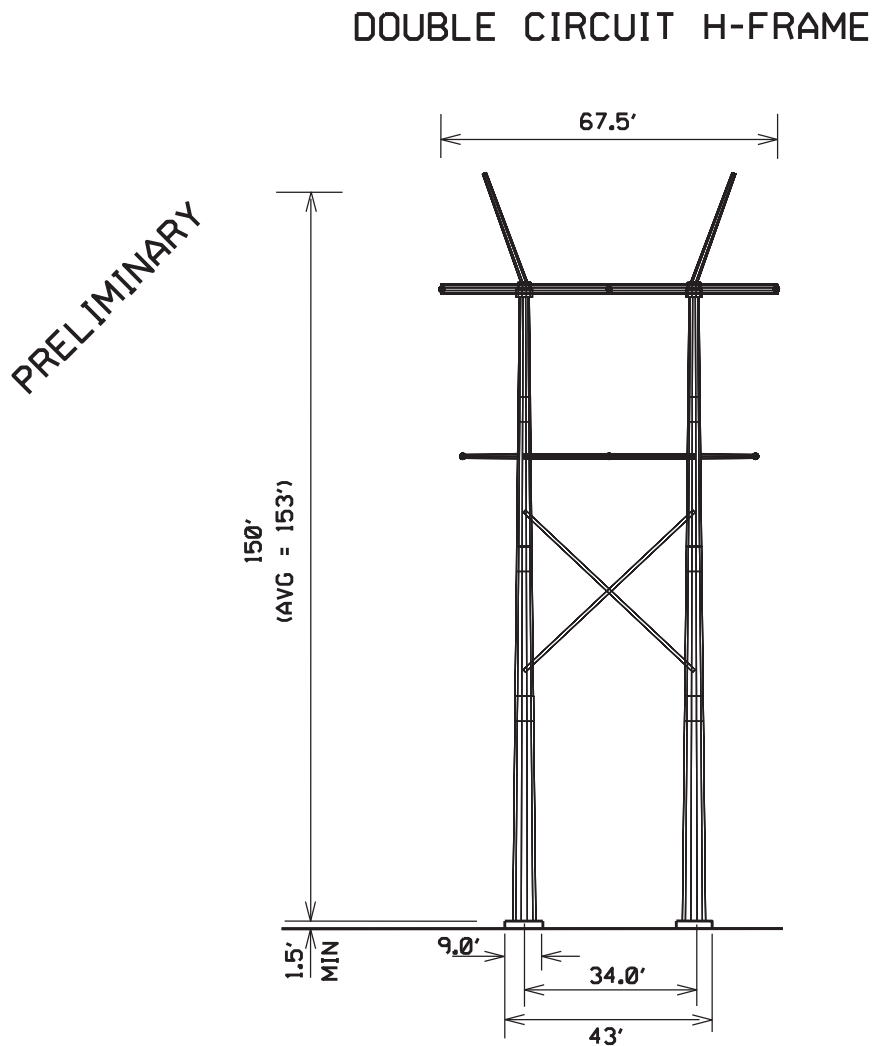


- c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:  
6 AND 3.2 MILES
- d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:  
DULLED GALVANIZED STEEL TO MATCH EXISTING COMPANY STANDARD STRUCTURES
- e. FOUNDATION MATERIAL: CONCRETE (REVEAL WILL VARY BASED ON TERRAIN)
- f. AVERAGE WIDTH AT CROSSARM: 96.9 FEET
- g. AVERAGE WIDTH AT BASE: 40.2 FEET
- h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 151 FEET, 136 FEET, AND 144 FEET  
MEASURED FROM GROUNDLINE AT STRUCTURE CENTERLINE AND DOES NOT INCLUDE  
FOUNDATION REVEAL
- i. AVERAGE SPAN LENGTH: 722 FEET (RANGE 158 - 1379 FEET)
- j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS: 22.5  
/27.9 FEET (230/500 KV) AND 64.7/32.2 FEET (230/500 KV) AT 120°F PER THE  
NATIONAL ELECTRICAL SAFETY CODE

NOTE: Information contained on drawing is to be considered preliminary  
in nature and subject to change based on final design.

\$DGNSPEC\$

Figure 1

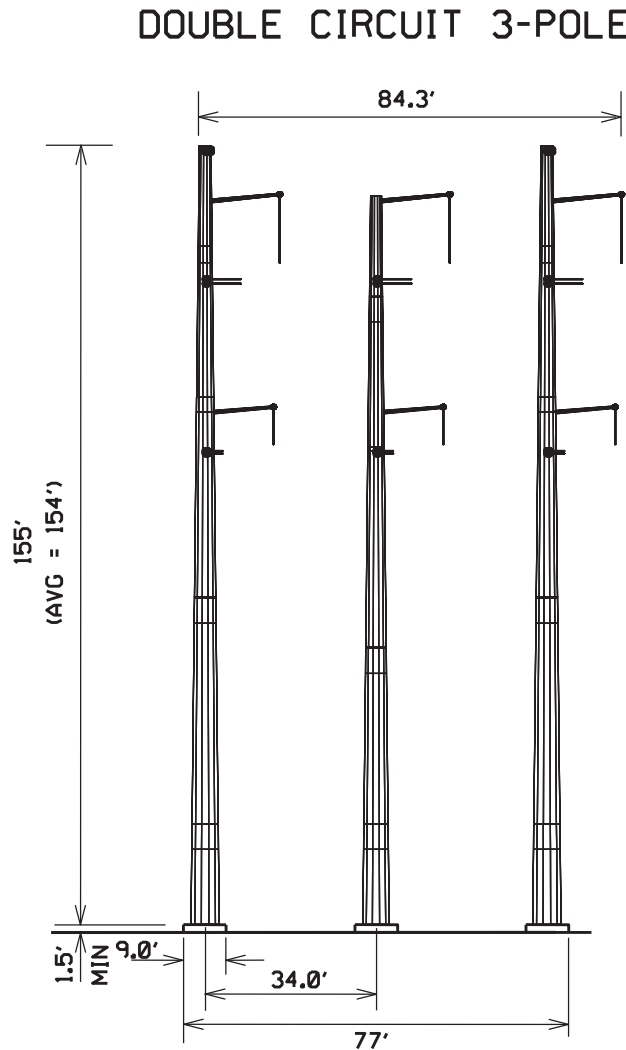


- c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:  
4 AND 3.2 MILES
- d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:  
DULLED GALVANIZED STEEL TO MATCH EXISTING COMPANY STANDARD STRUCTURES
- e. FOUNDATION MATERIAL: CONCRETE (REVEAL WILL VARY BASED ON TERRAIN)
- f. AVERAGE WIDTH AT CROSSARM: 67.5 FEET
- g. AVERAGE WIDTH AT BASE: 43.0 FEET
- h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 165 FEET, 135 FEET, AND 153 FEET  
MEASURED FROM GROUNDLINE AT STRUCTURE CENTERLINE AND DOES NOT INCLUDE  
FOUNDATION REVEAL
- i. AVERAGE SPAN LENGTH: 722 FEET (RANGE 158 - 1379 FEET)
- j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS: 22.5  
/27.9 FEET (230/500 KV) AND 64.7/32.2 FEET (230/500 KV) AT 120°F PER THE  
NATIONAL ELECTRICAL SAFETY CODE

NOTE: Information contained on drawing is to be considered preliminary  
in nature and subject to change based on final design.



PRELIMINARY

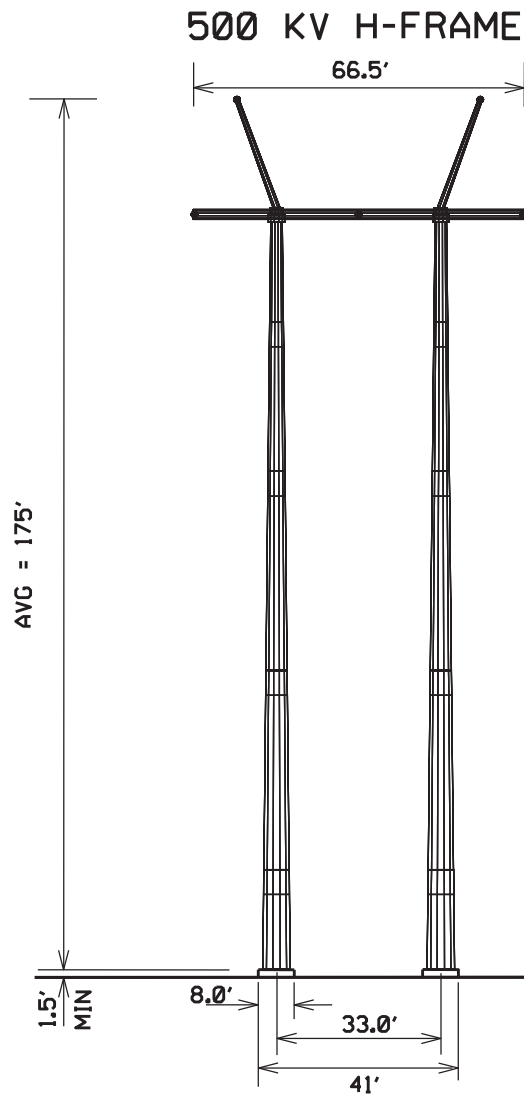


- c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:  
8 AND 3.2 MILES
- d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:  
DULLED GALVANIZED STEEL TO MATCH EXISTING COMPANY STANDARD STRUCTURES
- e. FOUNDATION MATERIAL: CONCRETE (REVEAL WILL VARY BASED ON TERRAIN)
- f. AVERAGE WIDTH AT CROSSARM: 84.3 FEET
- g. AVERAGE WIDTH AT BASE: 77.0 FEET
- h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 185 FEET, 130 FEET, AND 154 FEET  
MEASURED FROM GROUNDLINE AT STRUCTURE CENTERLINE AND DOES NOT INCLUDE  
FOUNDATION REVEAL
- i. AVERAGE SPAN LENGTH: 722 FEET (RANGE 158 - 1379 FEET)
- j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS: 22.5  
/27.9 FEET (230/500 KV) AND 64.7/32.2 FEET (230/500 KV) AT 120°F PER THE  
NATIONAL ELECTRICAL SAFETY CODE

NOTE: Information contained on drawing is to be considered preliminary  
in nature and subject to change based on final design.

Figure 3

PRELIMINARY



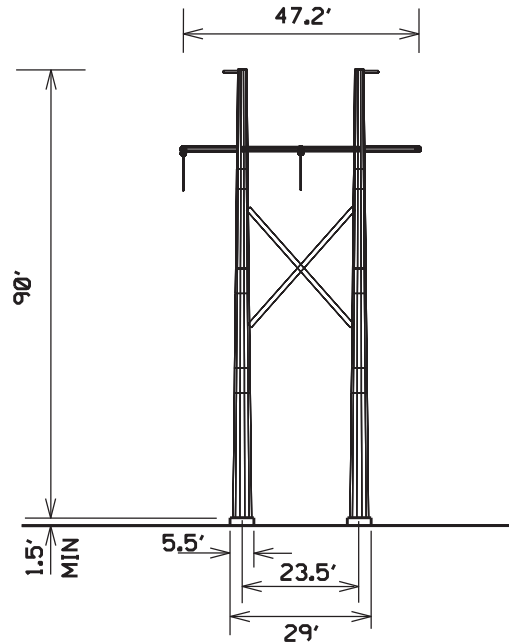
- c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:  
2 AND 3.2 MILES
- d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:  
DULLED GALVANIZED STEEL TO MATCH EXISTING COMPANY STANDARD STRUCTURES
- e. FOUNDATION MATERIAL: CONCRETE (REVEAL WILL VARY BASED ON TERRAIN)
- f. AVERAGE WIDTH AT CROSSARM: 66.5 FEET
- g. AVERAGE WIDTH AT BASE: 41.0 FEET
- h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 190 FEET, 160 FEET, AND 175 FEET  
MEASURED FROM GROUNDLINE AT STRUCTURE CENTERLINE AND DOES NOT INCLUDE  
FOUNDATION REVEAL
- i. AVERAGE SPAN LENGTH: 722 FEET (RANGE 158 - 1379 FEET)
- j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS:  
27.9 FEET (500 KV) AND 64.7 FEET (500 KV) AT 120°F PER THE NATIONAL  
ELECTRICAL SAFETY CODE

NOTE: Information contained on drawing is to be considered preliminary  
in nature and subject to change based on final design.

Figure 4

## 230 KV H-FRAME

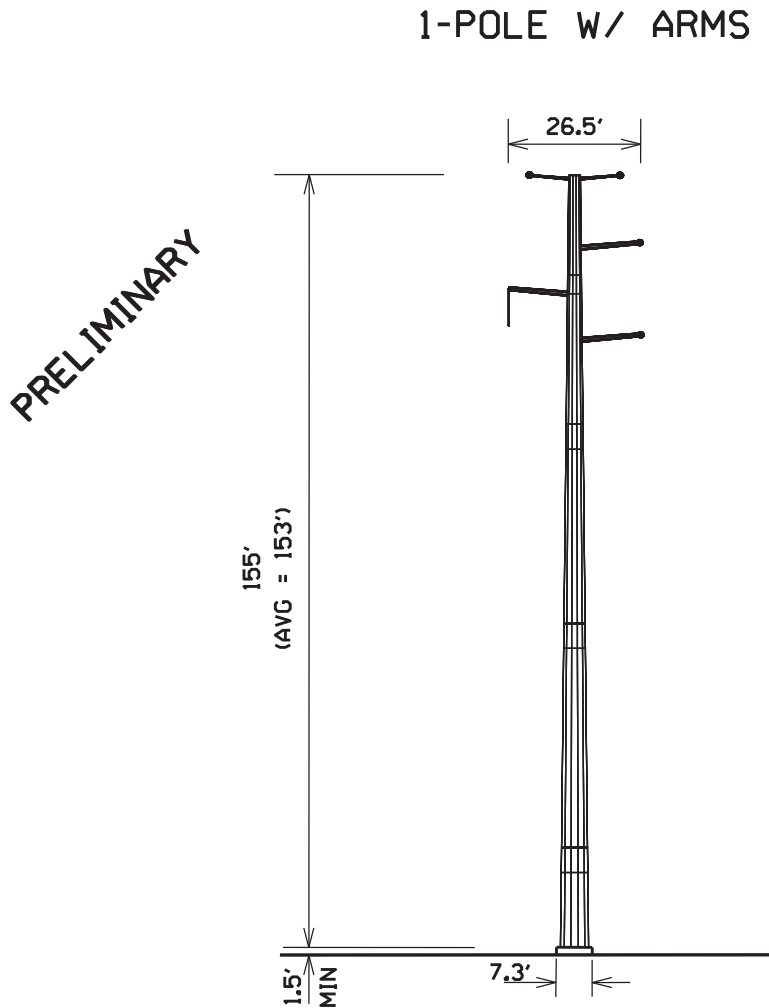
PRELIMINARY



- c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:  
1 AND 0.3 MILES (230 KV SPLIT AT MARS)
- d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:  
DULLED GALVANIZED STEEL TO MATCH EXISTING COMPANY STANDARD STRUCTURES
- e. FOUNDATION MATERIAL: CONCRETE (REVEAL WILL VARY BASED ON TERRAIN)
- f. AVERAGE WIDTH AT CROSSARM: 47.2 FEET
- g. AVERAGE WIDTH AT BASE: 29.0 FEET
- h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 90 FEET, 90 FEET, AND 90 FEET  
MEASURED FROM GROUNDLINE AT STRUCTURE CENTERLINE AND DOES NOT INCLUDE  
FOUNDATION REVEAL
- i. AVERAGE SPAN LENGTH: 722 FEET (RANGE 158 - 1379 FEET)
- j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS:  
22.5 FEET (230 KV) PER THE NATIONAL ELECTRICAL SAFETY CODE

NOTE: Information contained on drawing is to be considered preliminary  
in nature and subject to change based on final design.

Figure 5

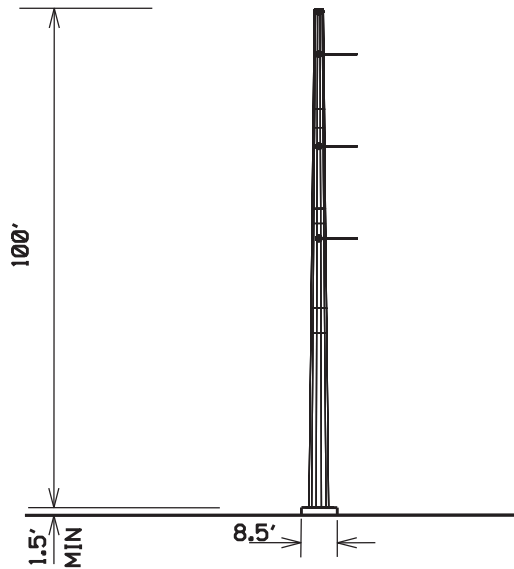


- c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:  
4 AND 3.2 MILES
- d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:  
DULLED GALVANIZED STEEL TO MATCH EXISTING COMPANY STANDARD STRUCTURES
- e. FOUNDATION MATERIAL: CONCRETE (REVEAL WILL VARY BASED ON TERRAIN)
- f. AVERAGE WIDTH AT CROSSARM: 26.5 FEET
- g. AVERAGE WIDTH AT BASE: 7.3 FEET
- h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 190 FEET, 130 FEET, AND 153 FEET  
MEASURED FROM GROUNDLINE AT STRUCTURE CENTERLINE AND DOES NOT INCLUDE  
FOUNDATION REVEAL
- i. AVERAGE SPAN LENGTH: 722 FEET (RANGE 158 - 1379 FEET)
- j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS:  
22.5 FEET (230 KV) PER THE NATIONAL ELECTRICAL SAFETY CODE

**NOTE:** Information contained on drawing is to be considered preliminary  
in nature and subject to change based on final design.

# 1-POLE

PRELIMINARY



- c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:  
1 AND 0.3 MILES (230 KV SPLIT AT MARS)
- d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:  
DULLED GALVANIZED STEEL TO MATCH EXISTING COMPANY STANDARD STRUCTURES
- e. FOUNDATION MATERIAL: CONCRETE (REVEAL WILL VARY BASED ON TERRAIN)
- f. AVERAGE WIDTH AT CROSSARM: 3 FEET
- g. AVERAGE WIDTH AT BASE: 8.5 FEET
- h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 100 FEET, 100 FEET, AND 100 FEET  
MEASURED FROM GROUNDLINE AT STRUCTURE CENTERLINE AND DOES NOT INCLUDE  
FOUNDATION REVEAL
- i. AVERAGE SPAN LENGTH: 722 FEET (RANGE 158 - 1379 FEET)
- j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS:  
22.5 FEET (230 KV) PER THE NATIONAL ELECTRICAL SAFETY CODE

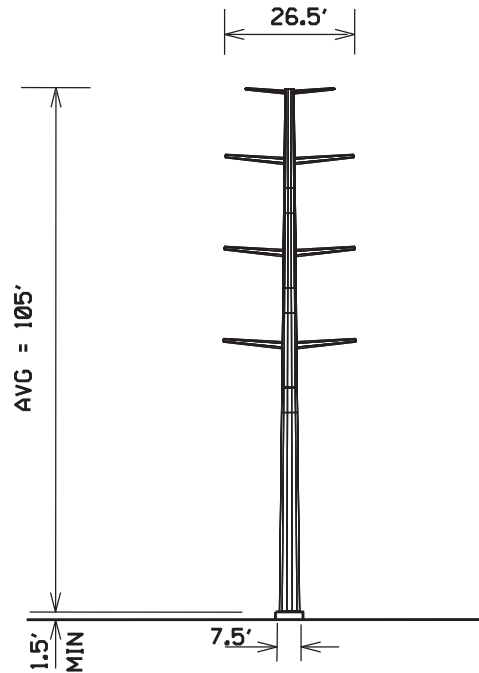
NOTE: Information contained on drawing is to be considered preliminary  
in nature and subject to change based on final design.

Figure 7



## DOUBLE CIRCUIT 1-POLE

PRELIMINARY

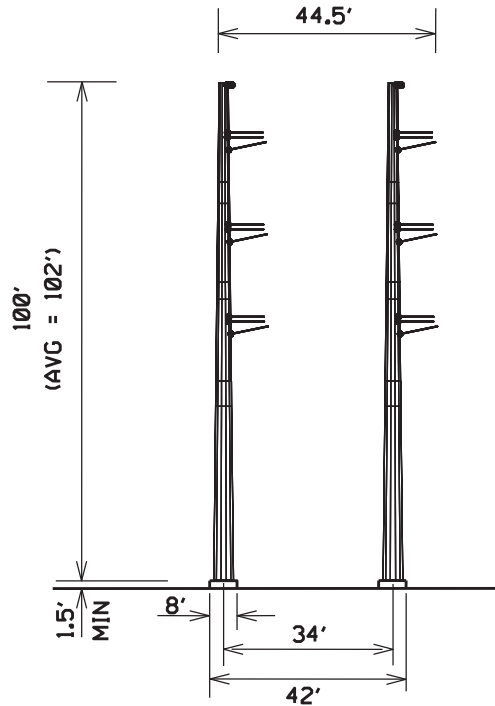


- c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:  
6 AND 0.6 MILES
- d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:  
DULLED GALVANIZED STEEL TO MATCH EXISTING COMPANY STANDARD STRUCTURES
- e. FOUNDATION MATERIAL: CONCRETE (REVEAL WILL VARY BASED ON TERRAIN)
- f. AVERAGE WIDTH AT CROSSARM: 26.5 FEET
- g. AVERAGE WIDTH AT BASE: 7.5 FEET
- h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 115 FEET, 100 FEET, AND 105 FEET  
MEASURED FROM GROUNDLINE AT STRUCTURE CENTERLINE AND DOES NOT INCLUDE  
FOUNDATION REVEAL
- i. AVERAGE SPAN LENGTH: 520 FEET (RANGE 171 - 794 FEET)
- j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS:  
22.5 FEET (230 KV) PER THE NATIONAL ELECTRICAL SAFETY CODE

NOTE: Information contained on drawing is to be considered preliminary  
in nature and subject to change based on final design.

## DOUBLE CIRCUIT 2-POLE

PRELIMINARY



- c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:  
6 AND 0.6 MILES
- d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:  
DULLED GALVANIZED STEEL TO MATCH EXISTING COMPANY STANDARD STRUCTURES
- e. FOUNDATION MATERIAL: CONCRETE (REVEAL WILL VARY BASED ON TERRAIN)
- f. AVERAGE WIDTH AT CROSSARM: 44.5 FEET
- g. AVERAGE WIDTH AT BASE: 42.0 FEET
- h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 105 FEET, 100 FEET, AND 102 FEET  
MEASURED FROM GROUNDLINE AT STRUCTURE CENTERLINE AND DOES NOT INCLUDE  
FOUNDATION REVEAL
- i. AVERAGE SPAN LENGTH: 520 FEET (RANGE 171 - 794 FEET)
- j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS:  
22.5 FEET (230 KV) PER THE NATIONAL ELECTRICAL SAFETY CODE

NOTE: Information contained on drawing is to be considered preliminary  
in nature and subject to change based on final design.

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500-230 KV WISHING STAR SUBSTATION, 500 KV AND 230 KV MARS-WISHING STAR LINES, 500-230 KV MARS SUBSTATION,  
AND MARS 230 KV LOOP

## ATTACHMENT 4    HISTORIC RESOURCE PHOTOS

Attachment 4:  
500-230 kV Wishing Star Substation, 500 kV and 230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation,  
and Mars 230 kV Loop



Figure 1: 053-0008, aerial view.



Attachment 4:  
500-230 kV Wishing Star Substation, 500 kV and 230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation,  
and Mars 230 kV Loop



Figure 2: 053-0982, Arcola Elementary, west elevation entrance, view to the southeast.



Figure 3. 053-0982, Arcola Elementary, west and south elevations, view to the northeast.



Attachment 4:  
500-230 kV Wishing Star Substation, 500 kV and 230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation,  
and Mars 230 kV Loop

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Figure 4. 053-0984, Arcola Slave Quarters, slave dwelling, south elevation, view to the north.



Figure 5. 053-0984, Arcola Slave Quarters, main dwelling, north and east elevation, view to the southwest.



Figure 6. 053-0984, Arcola Slave Quarters, parcel overview, view to the northwest.



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500-230 KV WISHING STAR SUBSTATION, 500 KV AND 230 KV MARS-WISHING STAR LINES, 500-230 KV MARS SUBSTATION,  
AND MARS 230 KV LOOP

## ATTACHMENT 5 PHOTOSIMULATIONS

## **PHOTOSIMULATIONS FOR MARS TO WISHING STAR LINES**

Route 1



1:32,000

0 2,500 5,000 7,500  
Feet

- Photo Point
- Route 1
- Architecture Resource



C:\Users\vincent.macek\Documents\OneDrive - The ERM Group, Inc\DOM Loudoun\Dom Wish Star Att 5 Fig 1.mxd | REVISED: 10/14/2022 | SCALE: 1:32,000

Figure 1: Aerial photograph depicting land use and photo view for 053-0008.





Existing View

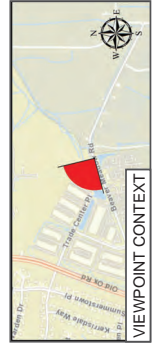


Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 284701E 4316196N  
View Direction: 300 degrees  
Viewpoint Elevation: 276 feet  
Distance to Development: 1764 feet  
Horizontal Field of View: 90 degrees

Date of Photography: 12th August 2022 11:38  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 2**  
**Viewpoint SP 03**  
Beaver Meadow Rd NE of Rock Haven Way  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**

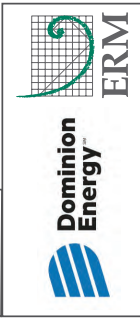




Existing View

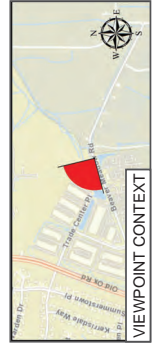


Proposed view showing location of transmission line structures



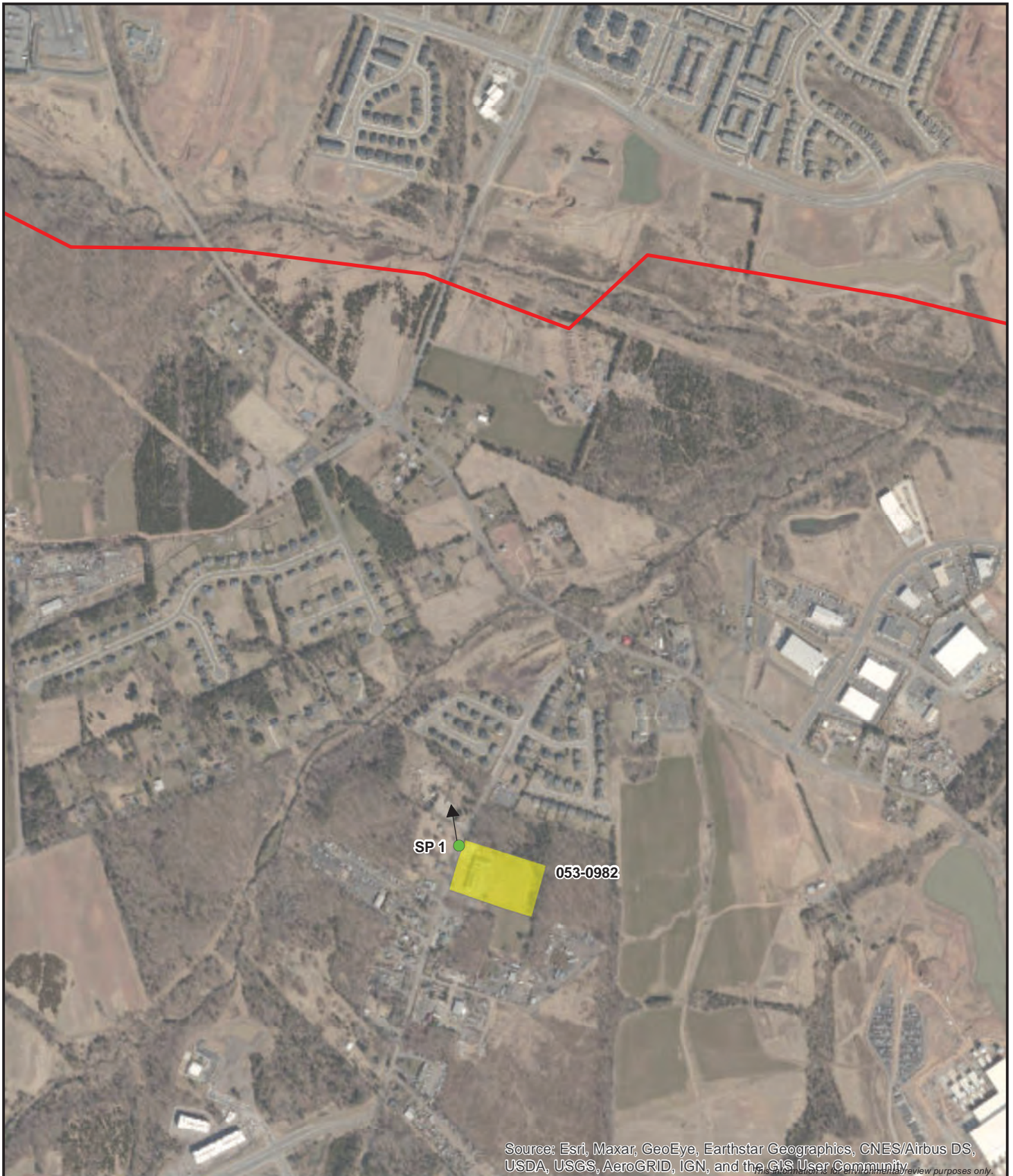
Viewpoint Location UTM Zone 18N: 284701E 4316196N  
View Direction: 300 degrees  
Viewpoint Elevation: 276 feet  
Distance to Development: 1764 feet  
Horizontal Field of View: 90 degrees

Date of Photography: 12th August 2022 11:38  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 3**  
**Viewpoint SP 03**  
Beaver Meadow Rd NE of Rock Haven Way  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**





1:14,000

0 1,000 2,000 3,000 Feet

- Photo Point
- Route 1
- Architecture Resource



C:\Users\vincent.macek\Documents\OneDrive - The ERM Group, Inc\DOM Loudoun\Dom Wish Star Att 5 Fig 4.mxd | REVISED: 10/12/2022 | SCALE: 1:14,000

Figure 4: Aerial photograph depicting land use and photo view for 053-0982.

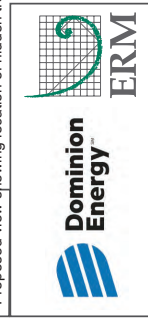




Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 280095E 4314092N  
View Direction: 350 degrees  
Viewpoint Elevation: 337 feet  
Distance to Development: 5173 feet  
Horizontal Field of View: 100 degrees

Date of Photography: 12th August 2022 09:33  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 5**  
**Viewpoint SP 01**  
Stone Springs Blvd SW of Ibox Dr  
053-0982  
**Pre-Application Analysis**  
**Wishing Star to Mars**





Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
For review purposes only.



1:14,000

0 1,000 2,000 3,000  
Feet

- Photo Point
- Route 1
- Architecture Resource



Figure 6: Aerial photograph depicting land use and photo view for 053-0984.

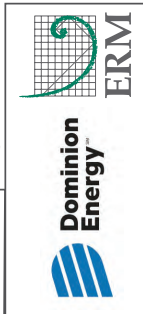




Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 280927E 4313853N  
View Direction: 70 degrees  
Viewpoint Elevation: 307 feet  
Distance to Development: 9787 feet  
Horizontal Field of View: 100 degrees

Date of Photography: 12th August 2022 10:34  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



VIEWPOINT CONTEXT

**Figure 7**  
**Viewpoint SP 05**  
Arcola Blvd N of Grand Fork Dr  
053-0984  
**Pre-Application Analysis**  
**Wishing Star to Mars**

## **PHOTOSIMULATIONS FOR MARS TO WISHING STAR LINES**

Route 2



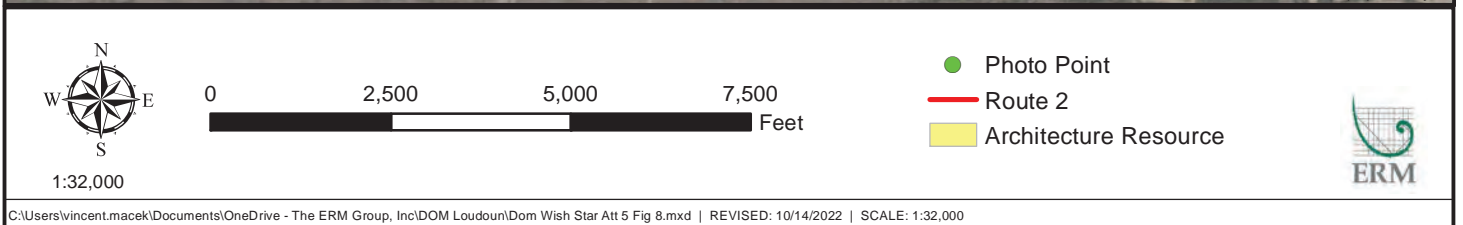


Figure 8: Aerial photograph depicting land use and photo view for 053-0008.





Existing View

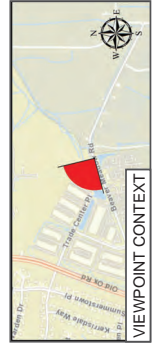


Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 284701E 4316196N  
View Direction: 300 degrees  
Viewpoint Elevation: 276 feet  
Distance to Development: 1764 feet  
Horizontal Field of View: 90 degrees

Date of Photography: 12th August 2022 11:38  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 9**  
**Viewpoint SP 03**  
Beaver Meadow Rd NE of Rock Haven Way  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**

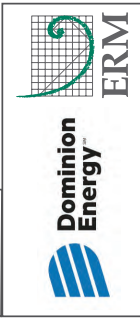




Existing View

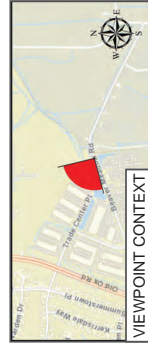


Proposed view showing location of transmission line structures



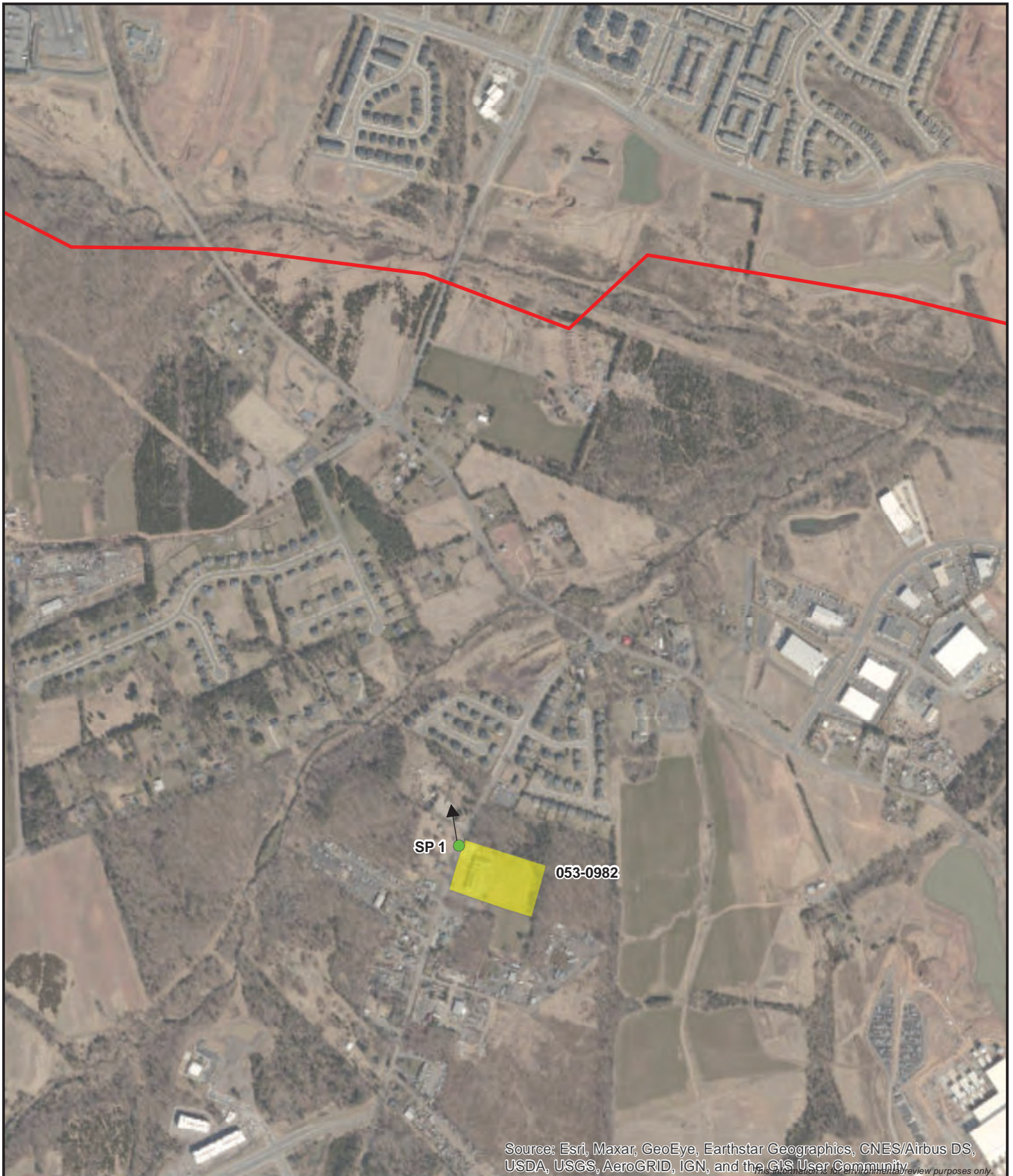
Viewpoint Location UTM Zone 18N: 284701E 4316196N  
View Direction: 300 degrees  
Viewpoint Elevation: 276 feet  
Distance to Development: 1764 feet  
Horizontal Field of View: 90 degrees

Date of Photography: 12th August 2022 11:38  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 10**  
**Viewpoint SP 03**  
Beaver Meadow Rd NE of Rock Haven Way  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**





1:14,000

0 1,000 2,000 3,000 Feet

- Photo Point
- Route 2
- Architecture Resource



C:\Users\vincent.macek\Documents\OneDrive - The ERM Group, Inc\DOM Loudoun\Dom Wish Star Att 5 Fig 11.mxd | REVISED: 10/12/2022 | SCALE: 1:14,000

Figure 11: Aerial photograph depicting land use and photo view for 053-0982.

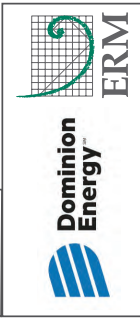




Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 280095E 4314092N  
View Direction: 350 degrees  
Viewpoint Elevation: 337 feet  
Distance to Development: 5173 feet  
Horizontal Field of View: 100 degrees

Date of Photography: 12th August 2022 09:33  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 12**  
**Viewpoint SP 01**  
Stone Springs Blvd SW of Ibox Dr  
053-0982  
**Pre-Application Analysis**  
**Wishing Star to Mars**





Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
For review purposes only.



1:14,000

0 1,000 2,000 3,000  
Feet

- Photo Point
- Route 2
- Architecture Resource



Figure 13: Aerial photograph depicting land use and photo view for 053-0984.

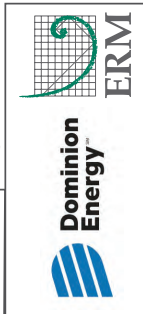




Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 280927E 4313853N  
View Direction: 70 degrees  
Viewpoint Elevation: 307 feet  
Distance to Development: 9787 feet  
Horizontal Field of View: 100 degrees

Date of Photography: 12th August 2022 10:34  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



VIEWPOINT CONTEXT

**Figure 14**  
**Viewpoint SP 05**  
Arlow Blvd N of Grand Fork Dr  
053-0984  
**Pre-Application Analysis**  
**Wishing Star to Mars**



## **PHOTOSIMULATIONS FOR MARS TO WISHING STAR LINES**

Route 3

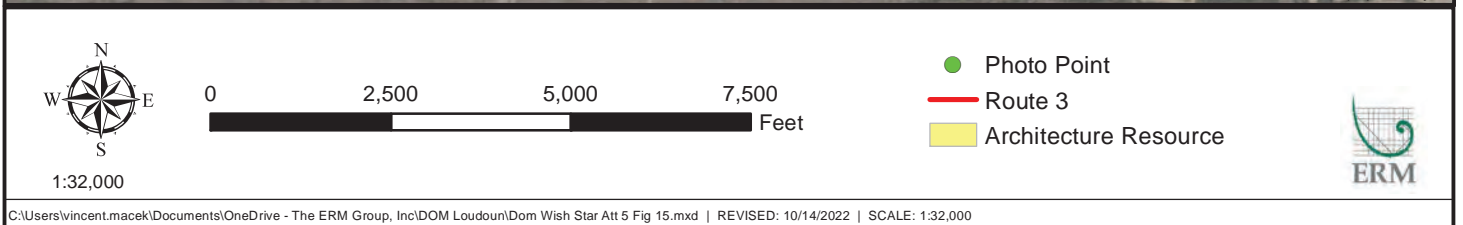


Figure 15: Aerial photograph depicting land use and photo view for 053-0008.

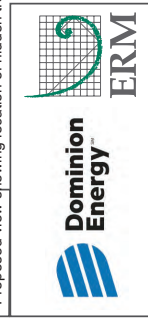




Existing View

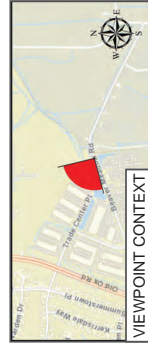


Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 284701E 4316196N  
View Direction: 300 degrees  
Viewpoint Elevation: 276 feet  
Distance to Development: 1764 feet  
Horizontal Field of View: 90 degrees

Date of Photography: 12th August 2022 11:38  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 16**  
**Viewpoint SP 03**  
Beaver Meadow Rd NE of Rock Haven Way  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**

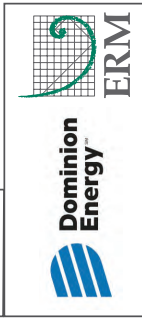




Existing View

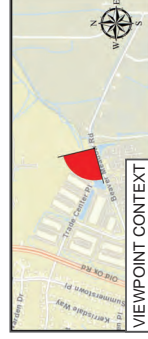


Proposed view showing location of transmission line structures



Viewpoint Location UTM Zone 18N: 284701E 4316196N  
View Direction: 300 degrees  
Viewpoint Elevation: 276 feet  
Distance to Development: 1764 feet  
Horizontal Field of View: 90 degrees

Date of Photography: 12th August 2022 11:38  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 17**  
**Viewpoint SP 03**  
Beaver Meadow Rd NE of Rock Haven Way  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**





1:14,000

0 1,000 2,000 3,000 Feet

● Photo Point

— Route 3

■ Architecture Resource



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Figure 18: Aerial photograph depicting land use and photo view for 053-0982.

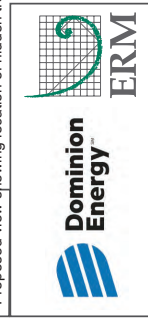




Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 280095E 4314092N  
View Direction: 350 degrees  
Viewpoint Elevation: 337 feet  
Distance to Development: 5173 feet  
Horizontal Field of View: 100 degrees

Date of Photography: 12th August 2022 09:33  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 19**  
**Viewpoint SP 01**  
Stone Springs Blvd SW of Ilex Dr  
053-0982  
**Pre-Application Analysis**  
**Wishing Star to Mars**





Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
For review purposes only.



1:14,000

0 1,000 2,000 3,000  
Feet

- Photo Point
- Route 3
- Architecture Resource



Figure 20: Aerial photograph depicting land use and photo view for 053-0984.

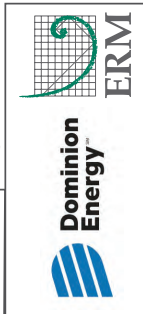




Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 280927E 4313853N  
View Direction: 70 degrees  
Viewpoint Elevation: 307 feet  
Distance to Development: 9787 feet  
Horizontal Field of View: 100 degrees

Date of Photography: 12th August 2022 10:34  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



VIEWPOINT CONTEXT

**Figure 21**  
**Viewpoint SP 05**  
Arlow Blvd N of Grand Fork Dr  
053-0984  
**Pre-Application Analysis**  
**Wishing Star to Mars**



## **PHOTOSIMULATIONS FOR MARS TO WISHING STAR LINES**

Route 4

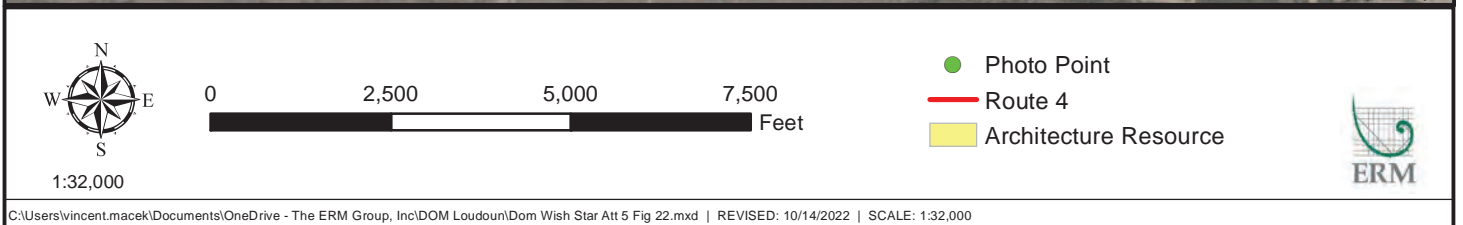


Figure 22: Aerial photograph depicting land use and photo view for 053-0008.

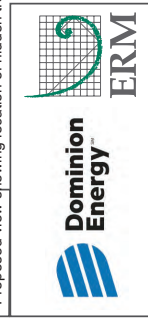




Existing View

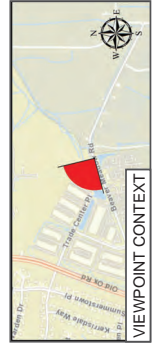


Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 284701E 4316196N  
View Direction: 300 degrees  
Viewpoint Elevation: 276 feet  
Distance to Development: 1764 feet  
Horizontal Field of View: 90 degrees

Date of Photography: 12th August 2022 11:38  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 23**  
**Viewpoint SP 03**  
Beaver Meadow Rd NE of Rock Haven Way  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**

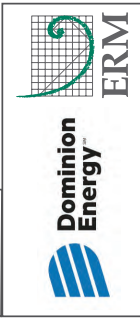




Existing View

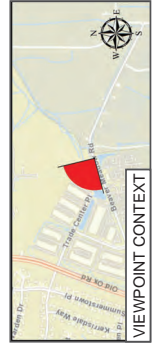


Proposed view showing location of transmission line structures



Viewpoint Location UTM Zone 18N: 284701E 4316196N  
View Direction: 300 degrees  
Viewpoint Elevation: 276 feet  
Distance to Development: 1764 feet  
Horizontal Field of View: 90 degrees

Date of Photography: 12th August 2022 11:38  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 24**  
**Viewpoint SP 03**  
Beaver Meadow Rd NE of Rock Haven Way  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**





1:14,000

0 1,000 2,000 3,000 Feet

- Photo Point
- Route 4
- Architecture Resource



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Figure 25: Aerial photograph depicting land use and photo view for 053-0982.

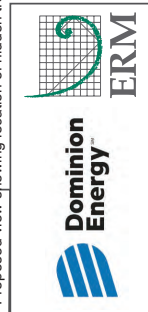




Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 280095E 4314092N  
View Direction: 350 degrees  
Viewpoint Elevation: 337 feet  
Distance to Development: 5173 feet  
Horizontal Field of View: 100 degrees

Date of Photography: 12th August 2022 09:33  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 26**  
**Viewpoint SP 01**  
Stone Springs Blvd SW of Ilex Dr  
053-0982  
**Pre-Application Analysis**  
**Wishing Star to Mars**





Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
For review purposes only.



1:14,000

0 1,000 2,000 3,000  
Feet

- Photo Point
- Route 4
- Architecture Resource



Figure 27: Aerial photograph depicting land use and photo view for 053-0984.

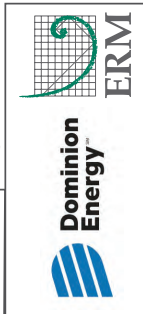




Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 280927E 4313853N  
View Direction: 70 degrees  
Viewpoint Elevation: 307 feet  
Distance to Development: 9787 feet  
Horizontal Field of View: 100 degrees

Date of Photography: 12th August 2022 10:34  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



VIEWPOINT CONTEXT

**Figure 28**  
**Viewpoint SP 05**  
Arcola Blvd N of Grand Fork Dr  
053-0984  
**Pre-Application Analysis**  
**Wishing Star to Mars**



## **PHOTOSIMULATIONS FOR MARS TO WISHING STAR LINES**

Route 5

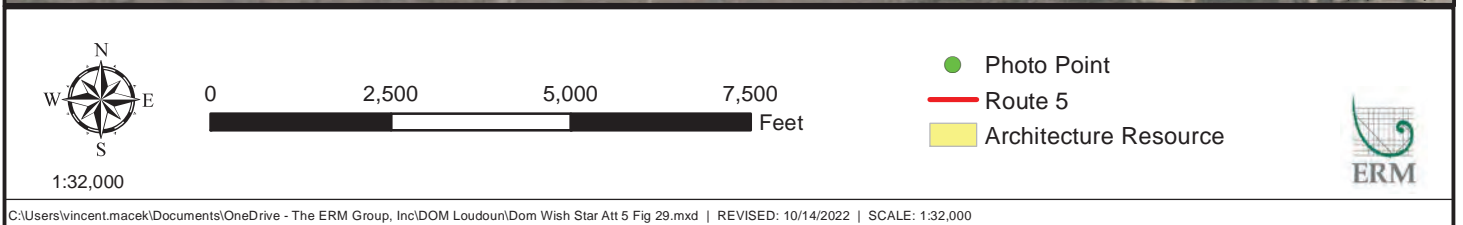


Figure 29: Aerial photograph depicting land use and photo view for 053-0008.

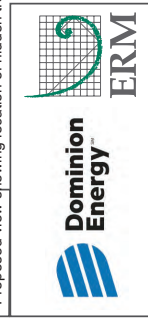




Existing View

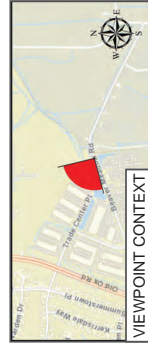


Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 284701E 4316196N  
View Direction: 300 degrees  
Viewpoint Elevation: 276 feet  
Distance to Development: 1764 feet  
Horizontal Field of View: 90 degrees

Date of Photography: 12th August 2022 11:38  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 30**  
**Viewpoint SP 03**  
Beaver Meadow Rd NE of Rock Haven Way  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**





Existing View

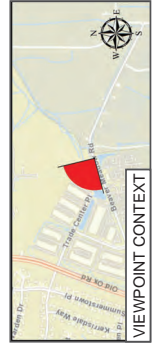


Proposed view showing location of transmission line structures



Viewpoint Location UTM Zone 18N: 284701E 4316196N  
View Direction: 300 degrees  
Viewpoint Elevation: 276 feet  
Distance to Development: 1764 feet  
Horizontal Field of View: 90 degrees

Date of Photography: 12th August 2022 11:38  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 31**  
**Viewpoint SP 03**  
Beaver Meadow Rd NE of Rock Haven Way  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**





1:14,000

0 1,000 2,000 3,000 Feet

- Photo Point
- Route 5
- Architecture Resource



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Figure 32: Aerial photograph depicting land use and photo view for 053-0982.

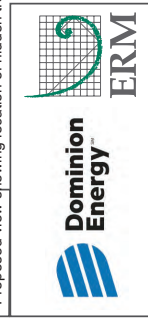




Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 280095E 4314092N  
View Direction: 350 degrees  
Viewpoint Elevation: 337 feet  
Distance to Development: 5173 feet  
Horizontal Field of View: 100 degrees

Date of Photography: 12th August 2022 09:33  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 33**  
**Viewpoint SP 01**  
Stone Springs Blvd SW of Ibox Dr  
053-0982  
**Pre-Application Analysis**  
**Wishing Star to Mars**





Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
For review purposes only.



1:14,000

0 1,000 2,000 3,000  
Feet

- Photo Point
- Route 5
- Architecture Resource

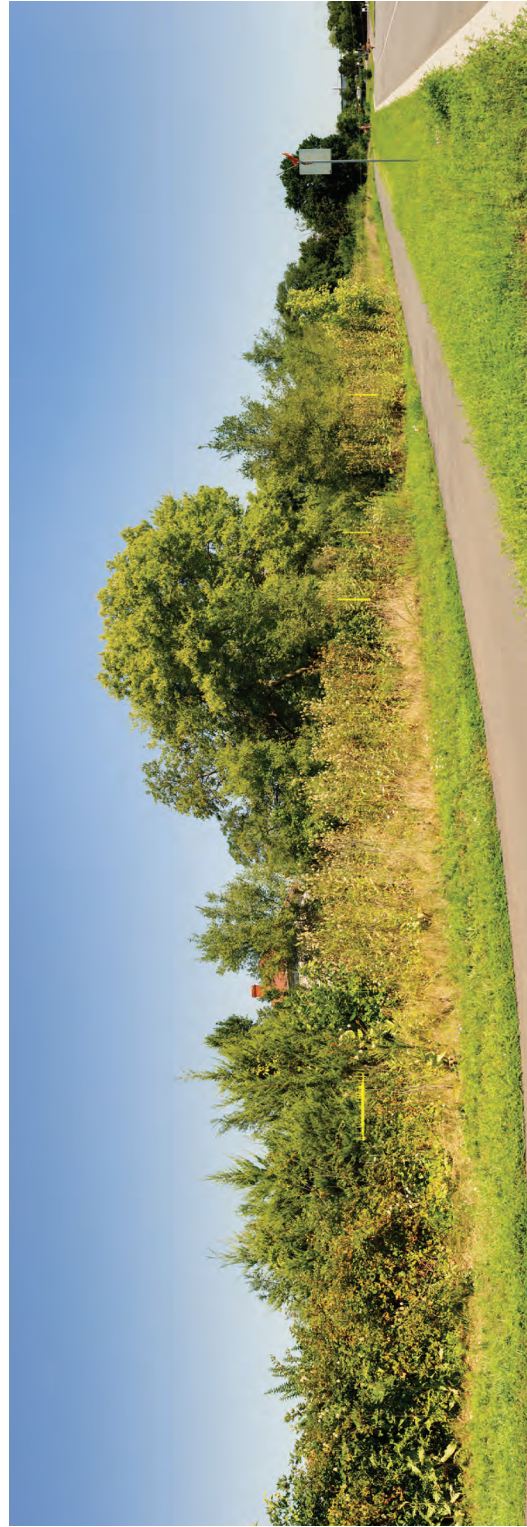


Figure 34: Aerial photograph depicting land use and photo view for 053-0984.

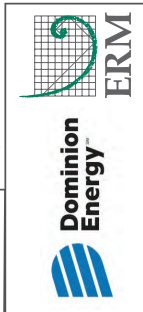




Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 280927E 4313853N  
View Direction: 70 degrees  
Viewpoint Elevation: 307 feet  
Distance to Development: 9787 feet  
Horizontal Field of View: 100 degrees

Date of Photography: 12th August 2022 10:34  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



VIEWPOINT CONTEXT

**Figure 35**  
**Viewpoint SP 05**  
Arcola Blvd N of Grand Fork Dr  
053-0984  
**Pre-Application Analysis**  
**Wishing Star to Mars**



## **PHOTOSIMULATIONS FOR MARS TO WISHING STAR LINES**

Route 6

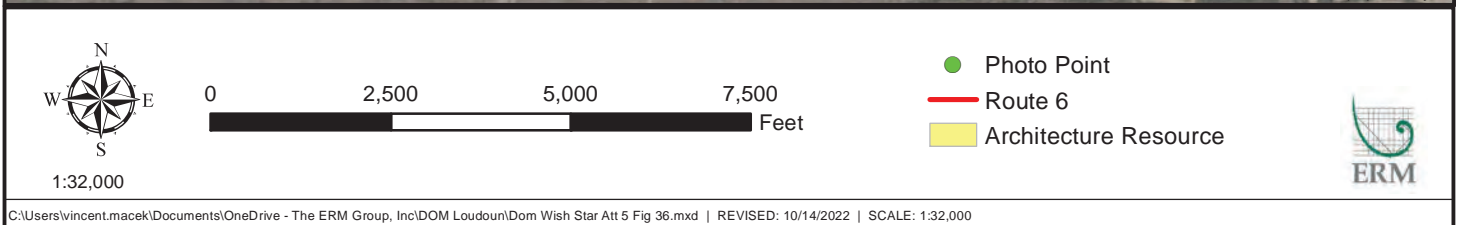


Figure 36: Aerial photograph depicting land use and photo view for 053-0008.

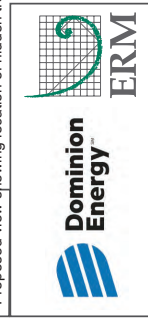




Existing View

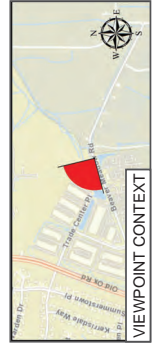


Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 284701E 4316196N  
View Direction: 300 degrees  
Viewpoint Elevation: 276 feet  
Distance to Development: 1764 feet  
Horizontal Field of View: 90 degrees

Date of Photography: 12th August 2022 11:38  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 37**  
**Viewpoint SP 03**  
Beaver Meadow Rd NE of Rock Haven Way  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**

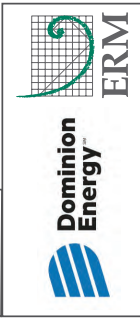




Existing View

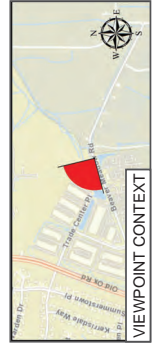


Proposed view showing location of transmission line structures



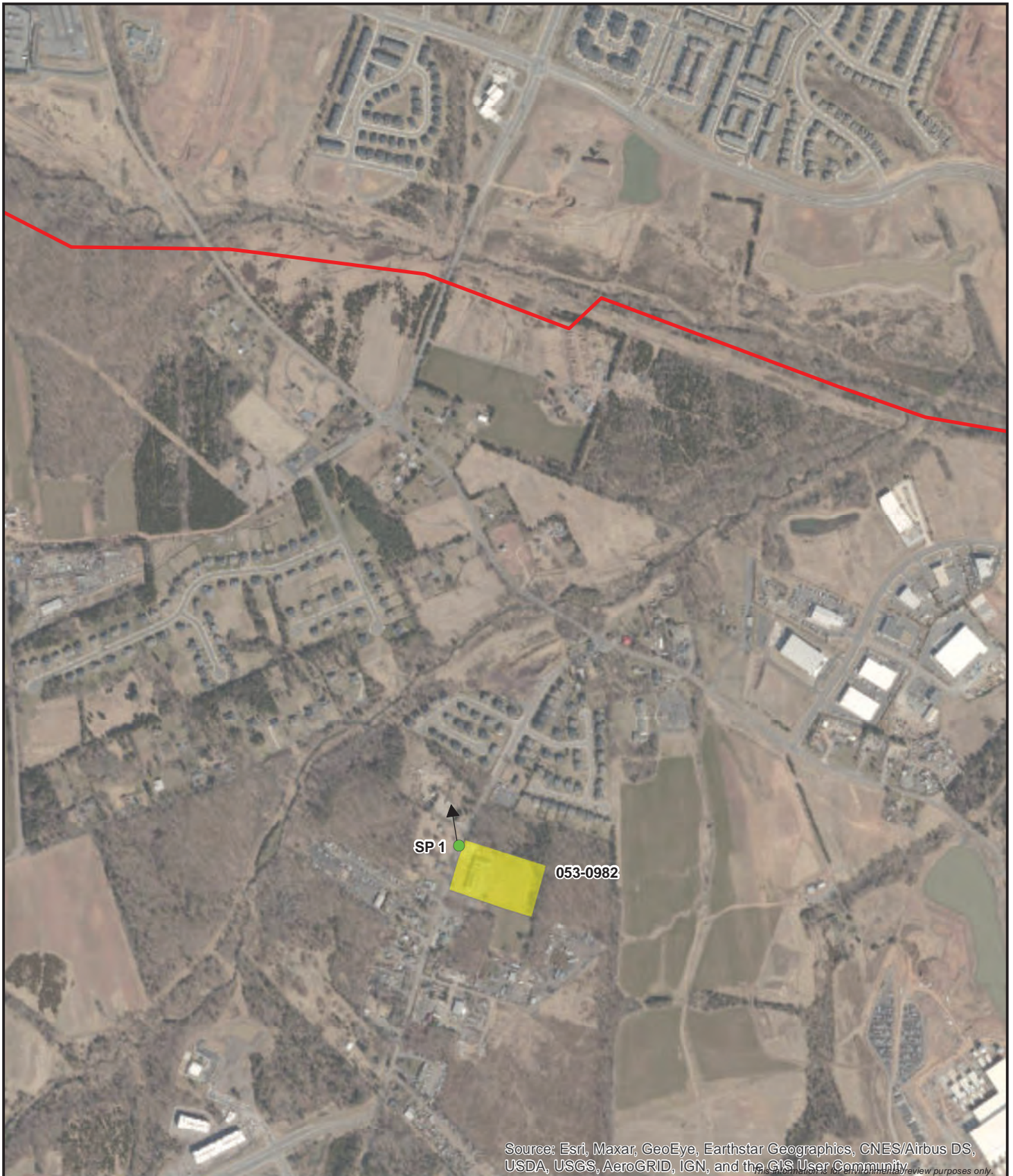
Viewpoint Location UTM Zone 18N: 284701E 4316196N  
View Direction: 300 degrees  
Viewpoint Elevation: 276 feet  
Distance to Development: 1764 feet  
Horizontal Field of View: 90 degrees

Date of Photography: 12th August 2022 11:38  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 38**  
**Viewpoint SP 03**  
Beaver Meadow Rd NE of Rock Haven Way  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**





1:14,000

0 1,000 2,000 3,000  
Feet

- Photo Point
- Route 6
- Architecture Resource



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Figure 39: Aerial photograph depicting land use and photo view for 053-0982.

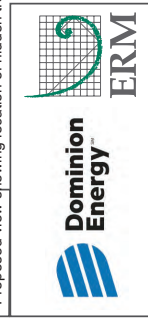




Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 280095E 4314092N  
View Direction: 350 degrees  
Viewpoint Elevation: 337 feet  
Distance to Development: 5173 feet  
Horizontal Field of View: 100 degrees

Date of Photography: 12th August 2022 09:33  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 40**  
**Viewpoint SP 01**  
Stone Springs Blvd SW of Ibox Dr  
053-0982  
**Pre-Application Analysis**  
**Wishing Star to Mars**





1:14,000

0 1,000 2,000 3,000 Feet

- Photo Point
- Route 6
- Architecture Resource



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Figure 41: Aerial photograph depicting land use and photo view for 053-0984.

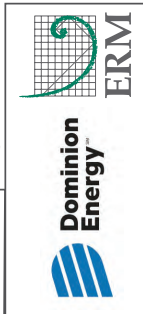




Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 280927E 4313853N  
View Direction: 70 degrees  
Viewpoint Elevation: 307 feet  
Distance to Development: 9787 feet  
Horizontal Field of View: 100 degrees

Date of Photography: 12th August 2022 10:34  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 42**  
**Viewpoint SP 05**  
Arlow Blvd N of Grand Fork Dr  
053-0984  
**Pre-Application Analysis**  
**Wishing Star to Mars**

## **PHOTOSIMULATIONS FOR SUBSTATIONS**

Wishing Star Substation





Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
This map is for informational purposes only and is not intended for review purposes only.



1:14,000

0 1,000 2,000 3,000  
Feet

- Photo Point
- Wishing Star Substation
- Architecture Resource



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Figure 43: Aerial photograph depicting land use and photo view for 053-0982.

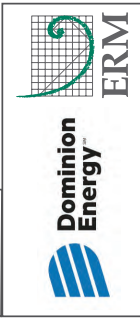




Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 280095E 4314092N  
View Direction: 350 degrees  
Viewpoint Elevation: 337 feet  
Distance to Development: 5173 feet  
Horizontal Field of View: 100 degrees

Date of Photography: 12th August 2022 09:33  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 44**  
**Viewpoint SP 01**  
Stone Springs Blvd SW of Ilex Dr  
053-0982  
**Pre-Application Analysis**  
**Wishing Star to Mars**

## **PHOTOSIMULATIONS FOR SUBSTATIONS**

Mars Substation





1:32,000

0 2,500 5,000 7,500  
Feet

- Photo Point
- Mars Substation
- Architecture Resource



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Figure 45: Aerial photograph depicting land use and photo view for 053-0008.





Existing View

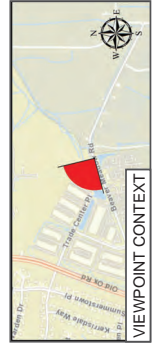


Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 284701E 4316196N  
View Direction: 300 degrees  
Viewpoint Elevation: 276 feet  
Distance to Development: 1764 feet  
Horizontal Field of View: 90 degrees

Date of Photography: 12th August 2022 11:38  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 46**  
**Viewpoint SP 03**  
Beaver Meadow Rd NE of Rock Haven Way  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**

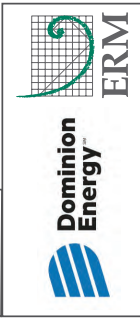




Existing View

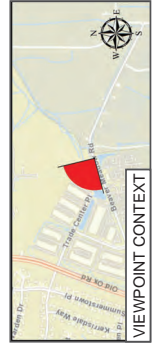


Proposed view showing location of transmission line structures



Viewpoint Location UTM Zone 18N: 284701E 4316196N  
View Direction: 300 degrees  
Viewpoint Elevation: 276 feet  
Distance to Development: 1764 feet  
Horizontal Field of View: 90 degrees

Date of Photography: 12th August 2022 11:38  
Camera: Nikon D800  
Lens: Nikkor 50mm 1.4  
Camera Height: 5 feet



**Figure 47**  
**Viewpoint SP 03**  
Beaver Meadow Rd NE of Rock Haven Way  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**



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500-230 KV WISHING STAR SUBSTATION, 500 KV AND 230 KV MARS-WISHING STAR LINES, 500-230 KV MARS SUBSTATION,  
AND MARS 230 KV LOOP

## ATTACHMENT 6 3D RENDERINGS

### **3D RENDERINGS FOR MARS TO WISHING STAR LINES**

Route 1



1:32,000

0 2,500 5,000 7,500  
Feet

- Rendering Point
- Route 1
- Architecture Resource



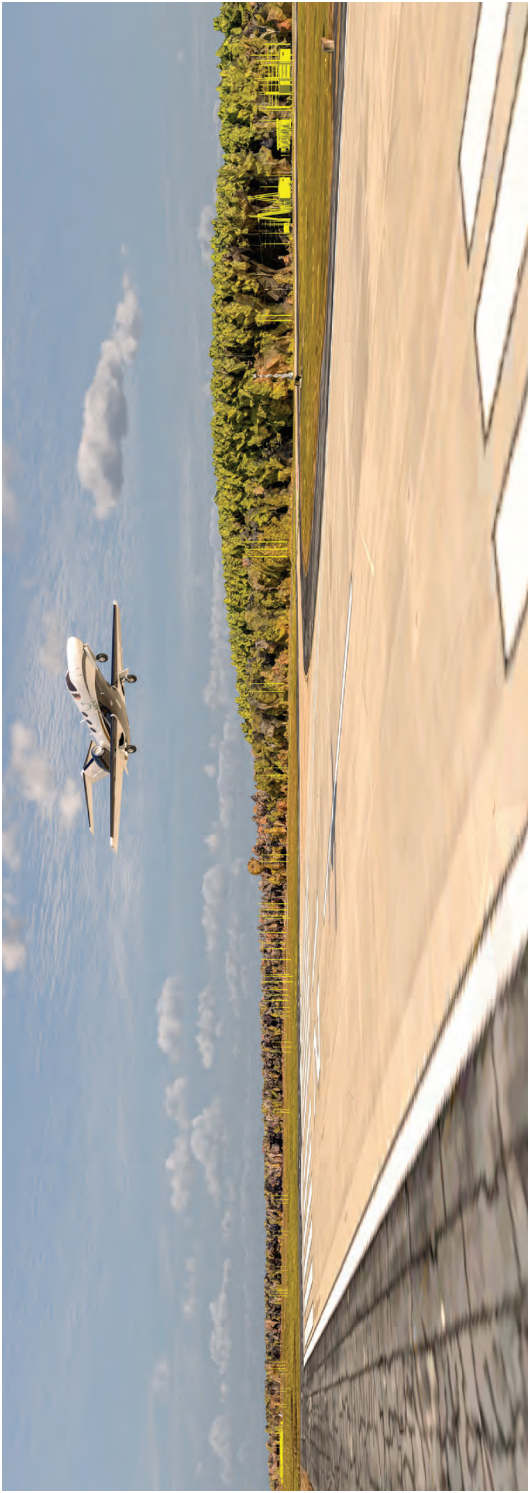
C:\Users\vincent.macek\Documents\OneDrive - The ERM Group, Inc\DOM Loudoun\Dom Wish Star Att 6 Fig 1.mxd | REVISED: 10/12/2022 | SCALE: 1:32,000

Figure 1: Aerial photograph depicting land use and photo view for 053-0008.





Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 284314E 4313395N  
View Direction: 319 degrees  
Viewpoint Elevation: 305 feet  
Distance to Development: 5553 feet  
Horizontal Field of View: 60 degrees

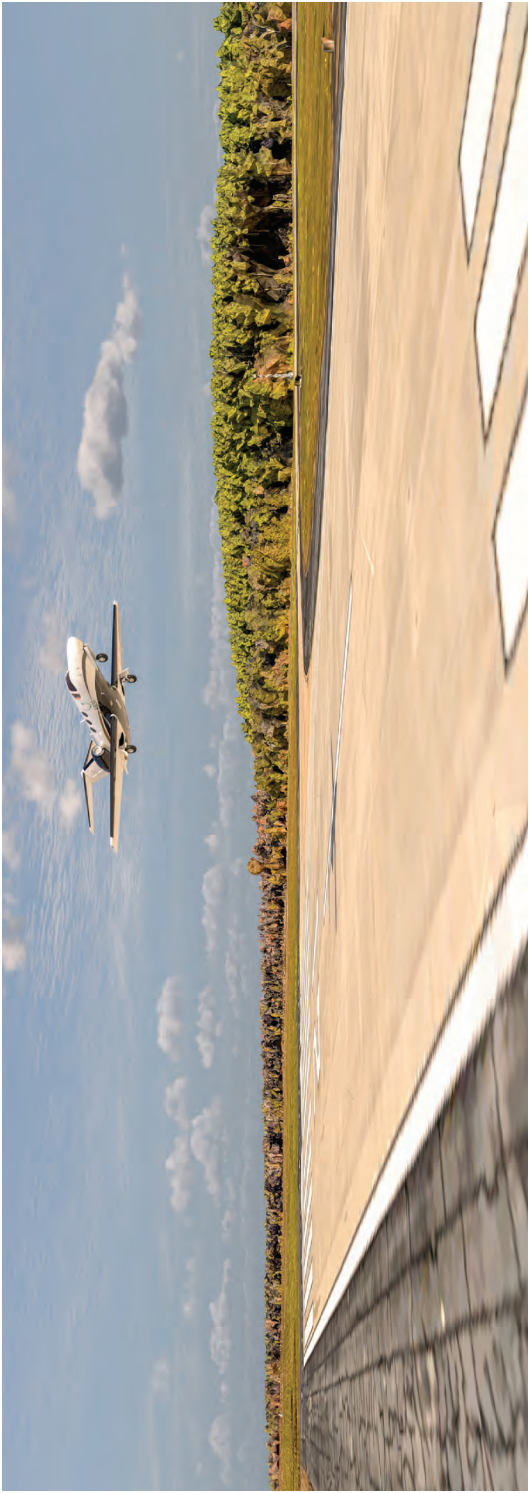
Date of Photography: N/A  
Camera: N/A  
Lens: N/A  
Camera Height: N/A



**Figure 2**  
**Viewpoint 3D Rendering**  
Washington Dulles International Airport  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**



Existing View



Proposed view showing location of transmission line structures



Viewpoint Location UTM Zone 18N: 284314E 4313395N  
View Direction: 319 degrees  
Viewpoint Elevation: 305 feet  
Distance to Development: 5553 feet  
Horizontal Field of View: 60 degrees

Date of Photography: N/A  
Camera: N/A  
Lens: N/A  
Camera Height: N/A



**Figure 3**  
**Viewpoint 3D Rendering**  
Washington Dulles International Airport  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**

## **PHOTOSIMULATIONS FOR MARS TO WISHING STAR LINES**

Route 2





Figure 4: Aerial photograph depicting land use and photo view for 053-0008.





Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 284314E 4313395N  
View Direction: 319 degrees  
Viewpoint Elevation: 305 feet  
Distance to Development: 5553 feet  
Horizontal Field of View: 60 degrees

Date of Photography: N/A  
Camera: N/A  
Lens: N/A  
Camera Height: N/A



**Figure 5**  
**Viewpoint 3D Rendering**  
Washington Dulles International Airport  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**



Existing View



Proposed view showing location of transmission line structures



Viewpoint Location UTM Zone 18N: 284314E 4313395N  
View Direction: 319 degrees  
Viewpoint Elevation: 305 feet  
Distance to Development: 5553 feet  
Horizontal Field of View: 60 degrees

Date of Photography: N/A  
Camera: N/A  
Lens: N/A  
Camera Height: N/A



**Figure 6**  
**Viewpoint 3D Rendering**  
Washington Dulles International Airport  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**



## **PHOTOSIMULATIONS FOR MARS TO WISHING STAR LINES**

Route 3

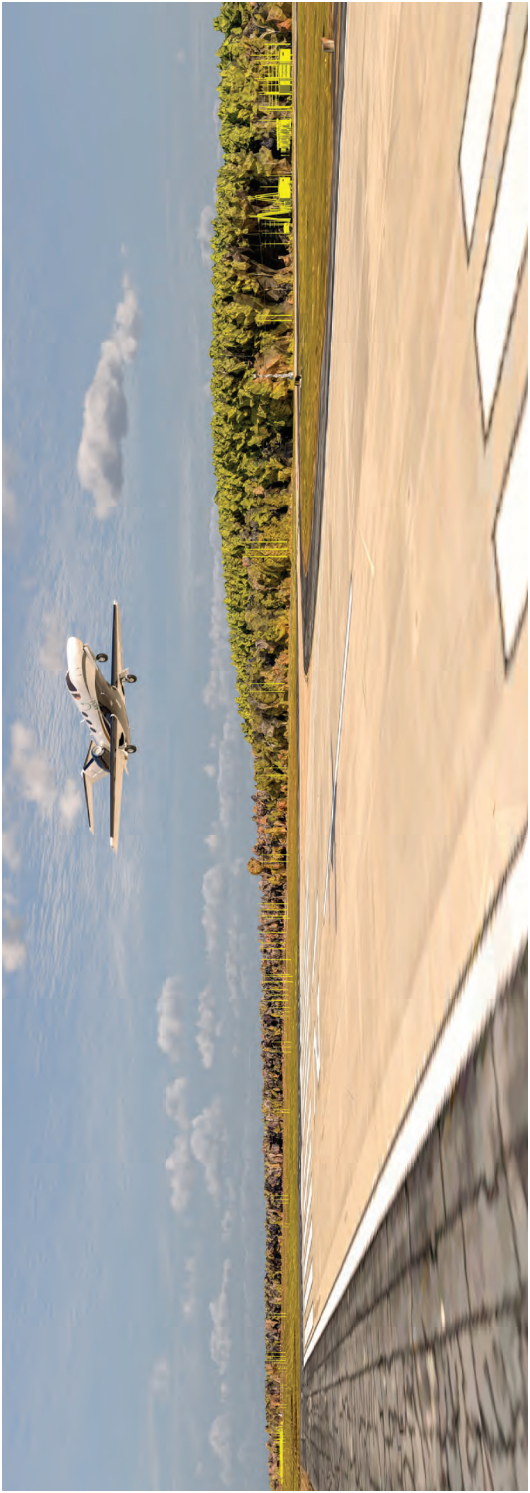


Figure 7: Aerial photograph depicting land use and photo view for 053-0008.





Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 284314E 4313395N  
View Direction: 319 degrees  
Viewpoint Elevation: 305 feet  
Distance to Development: 5553 feet  
Horizontal Field of View: 60 degrees

Date of Photography: N/A  
Camera: N/A  
Lens: N/A  
Camera Height: N/A



**Figure 8**  
**Viewpoint 3D Rendering**  
Washington Dulles International Airport  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**





Existing View



Proposed view showing location of transmission line structures



Viewpoint Location UTM Zone 18N: 284314E 4313395N  
View Direction: 319 degrees  
Viewpoint Elevation: 305 feet  
Distance to Development: 5553 feet  
Horizontal Field of View: 60 degrees

Date of Photography: N/A  
Camera: N/A  
Lens: N/A  
Camera Height: N/A



**Figure 9**  
**Viewpoint 3D Rendering**  
Washington Dulles International Airport  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**

## **PHOTOSIMULATIONS FOR MARS TO WISHING STAR LINES**

Route 4



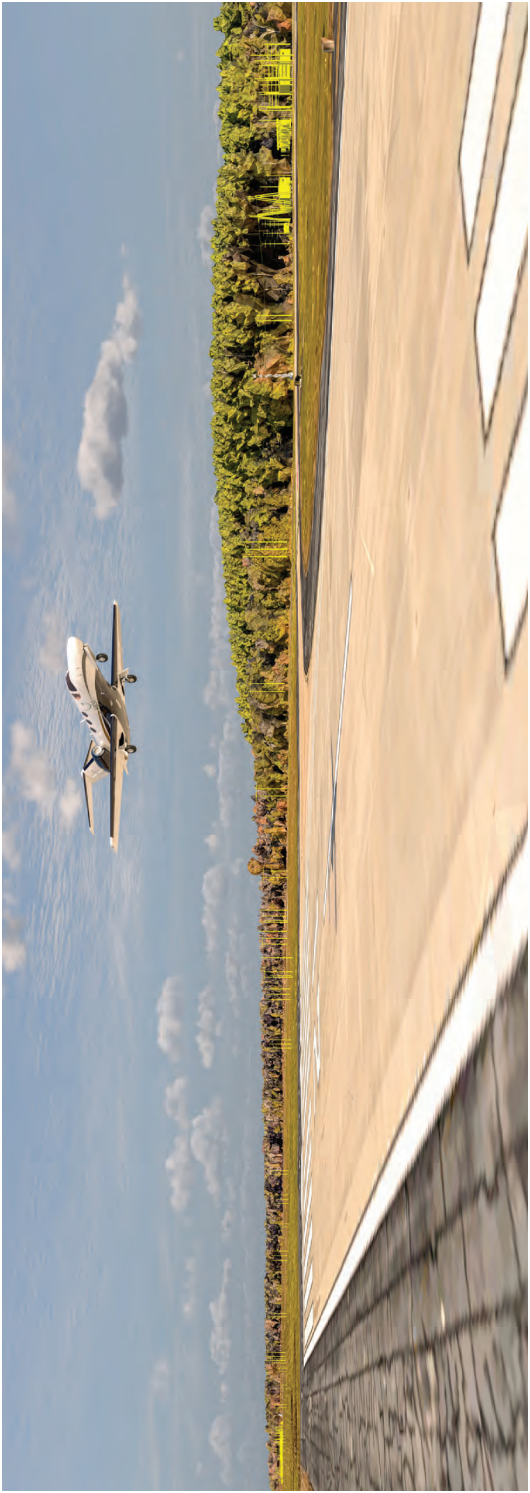


Figure 10: Aerial photograph depicting land use and photo view for 053-0008.





Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 284314E 4313395N  
View Direction: 319 degrees  
Viewpoint Elevation: 305 feet  
Distance to Development: 5553 feet  
Horizontal Field of View: 60 degrees

Date of Photography: N/A  
Camera: N/A  
Lens: N/A  
Camera Height: N/A



**Figure 11**  
**Viewpoint 3D Rendering**  
Washington Dulles International Airport  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**



Existing View



Proposed view showing location of transmission line structures



Viewpoint Location UTM Zone 18N: 284314E 4313395N  
View Direction: 319 degrees  
Viewpoint Elevation: 305 feet  
Distance to Development: 5553 feet  
Horizontal Field of View: 60 degrees

Date of Photography: N/A  
Camera: N/A  
Lens: N/A  
Camera Height: N/A



**Figure 12**  
**Viewpoint 3D Rendering**  
Washington Dulles International Airport  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**

## **PHOTOSIMULATIONS FOR MARS TO WISHING STAR LINES**

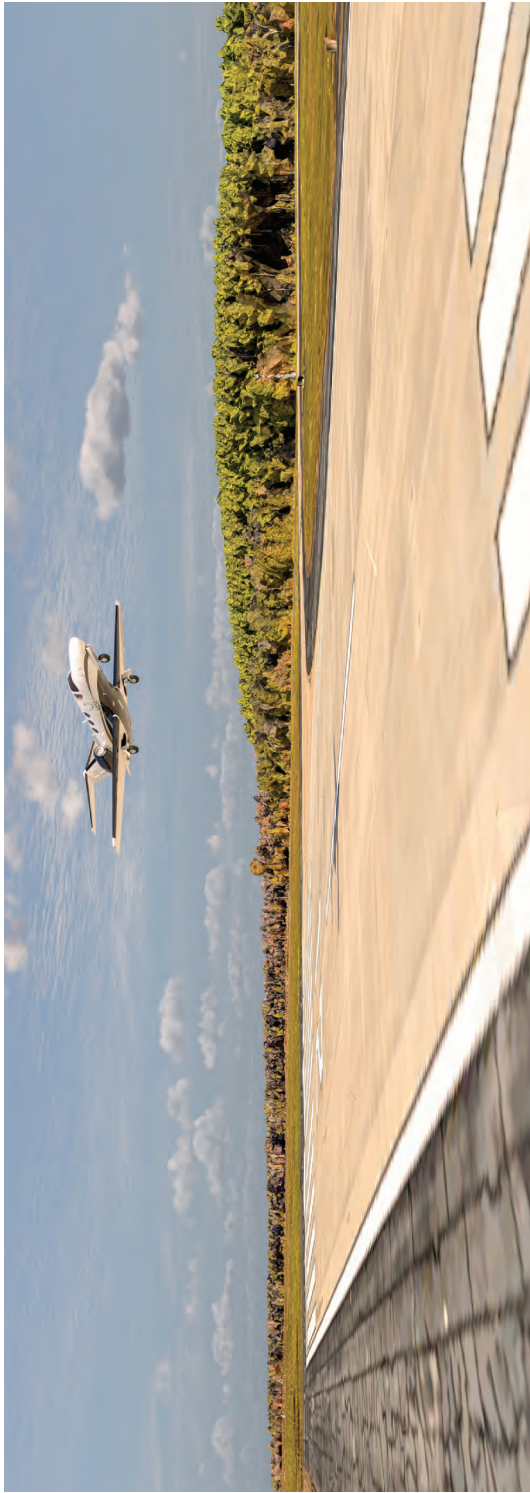
Route 5



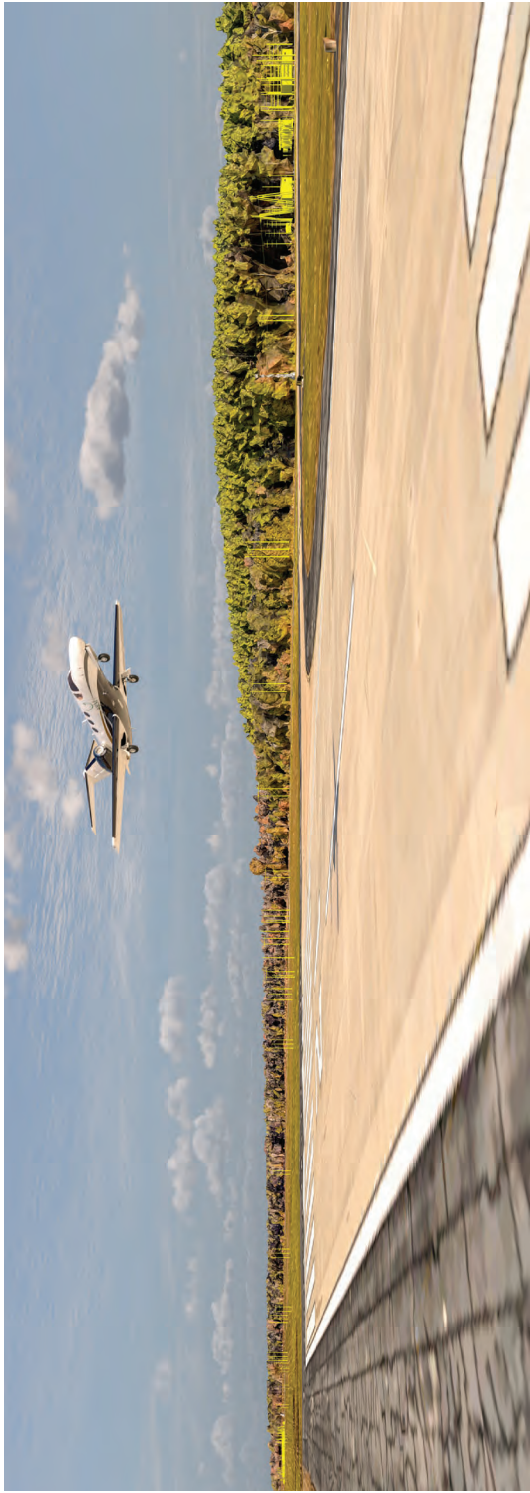


Figure 13: Aerial photograph depicting land use and photo view for 053-0008.

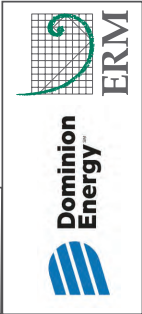




Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 284314E 4313395N  
View Direction: 319 degrees  
Viewpoint Elevation: 305 feet  
Distance to Development: 5553 feet  
Horizontal Field of View: 60 degrees

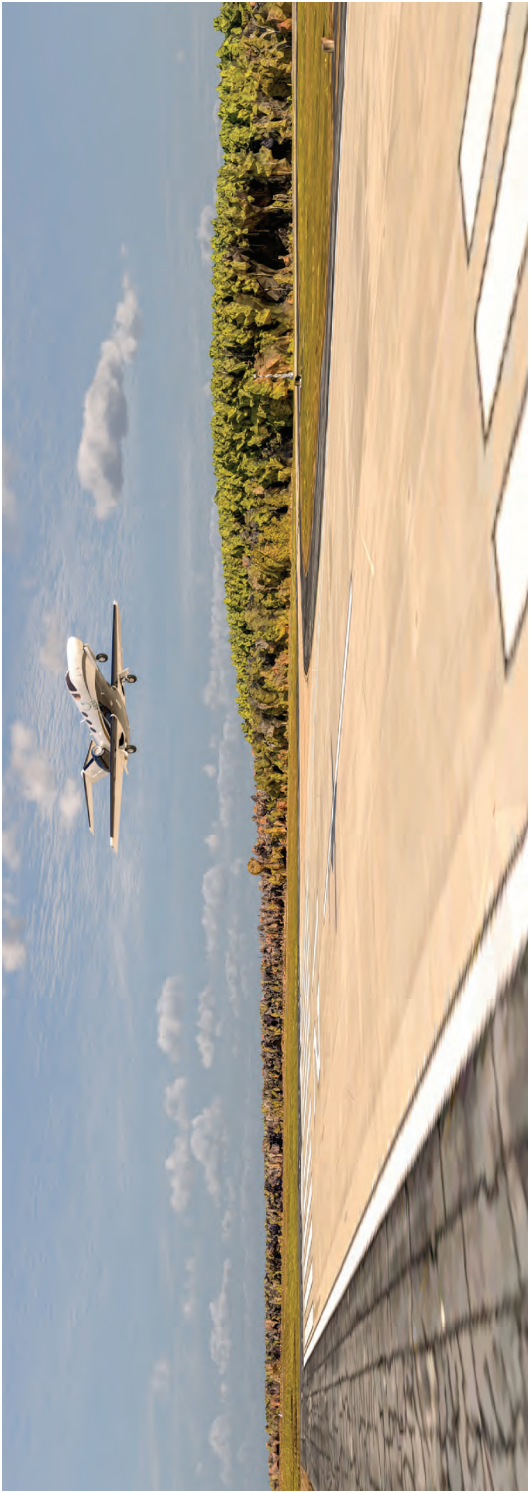
Date of Photography: N/A  
Camera: N/A  
Lens: N/A  
Camera Height: N/A



**Figure 14**  
**Viewpoint 3D Rendering**  
Washington Dulles International Airport  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**



Existing View



Proposed view showing location of transmission line structures



Viewpoint Location UTM Zone 18N: 284314E 4313395N  
View Direction: 319 degrees  
Viewpoint Elevation: 305 feet  
Distance to Development: 5553 feet  
Horizontal Field of View: 60 degrees

Date of Photography: N/A  
Camera: N/A  
Lens: N/A  
Camera Height: N/A



**Figure 15**  
**Viewpoint 3D Rendering**  
Washington Dulles International Airport  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**



## **PHOTOSIMULATIONS FOR MARS TO WISHING STAR LINES**

Route 6



Figure 16: Aerial photograph depicting land use and photo view for 053-0008.





Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 284314E 4313395N  
View Direction: 319 degrees  
Viewpoint Elevation: 305 feet  
Distance to Development: 5553 feet  
Horizontal Field of View: 60 degrees

Date of Photography: N/A  
Camera: N/A  
Lens: N/A  
Camera Height: N/A

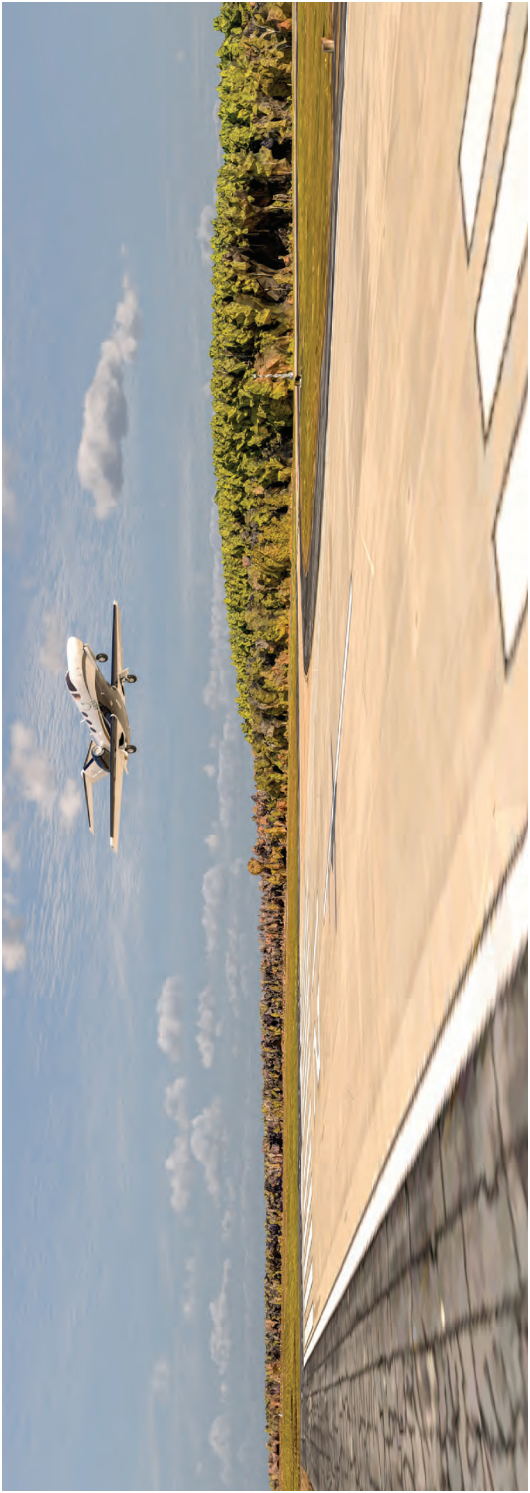


**Figure 17**  
**Viewpoint 3D Rendering**  
Washington Dulles International Airport  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**





Existing View



Proposed view showing location of transmission line structures



Viewpoint Location UTM Zone 18N: 284314E 4313395N  
View Direction: 319 degrees  
Viewpoint Elevation: 305 feet  
Distance to Development: 5553 feet  
Horizontal Field of View: 60 degrees

Date of Photography: N/A  
Camera: N/A  
Lens: N/A  
Camera Height: N/A



**Figure 18**  
**Viewpoint 3D Rendering**  
Washington Dulles International Airport  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**

## **PHOTOSIMULATIONS FOR SUBSTATION**

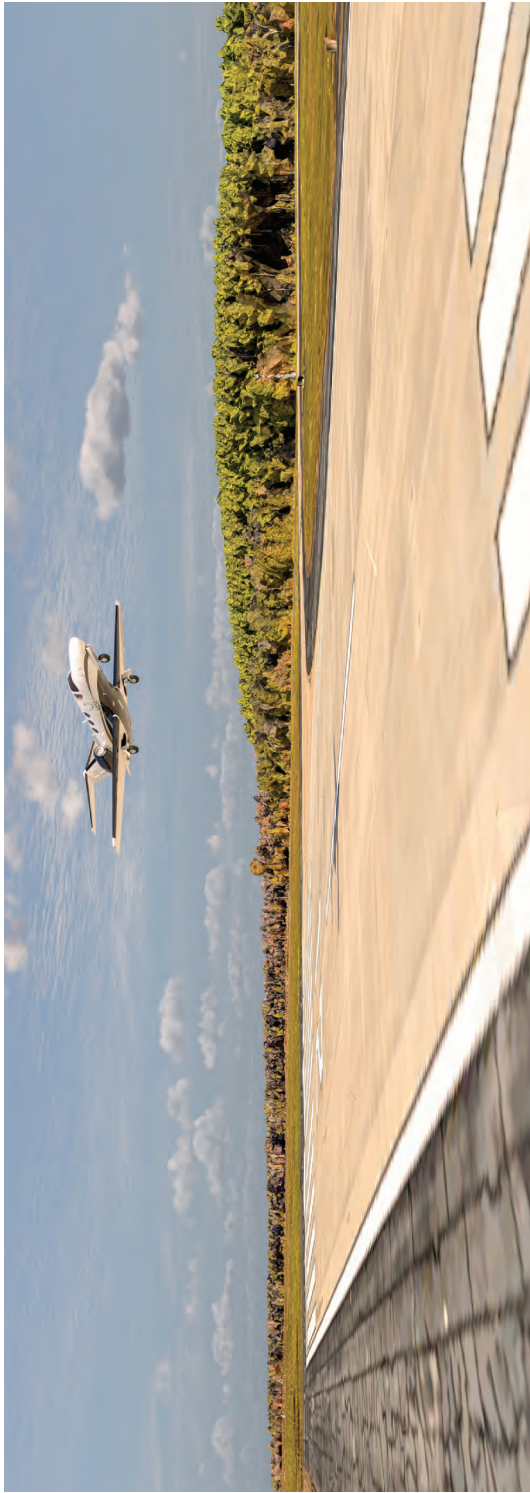
Mars Substation



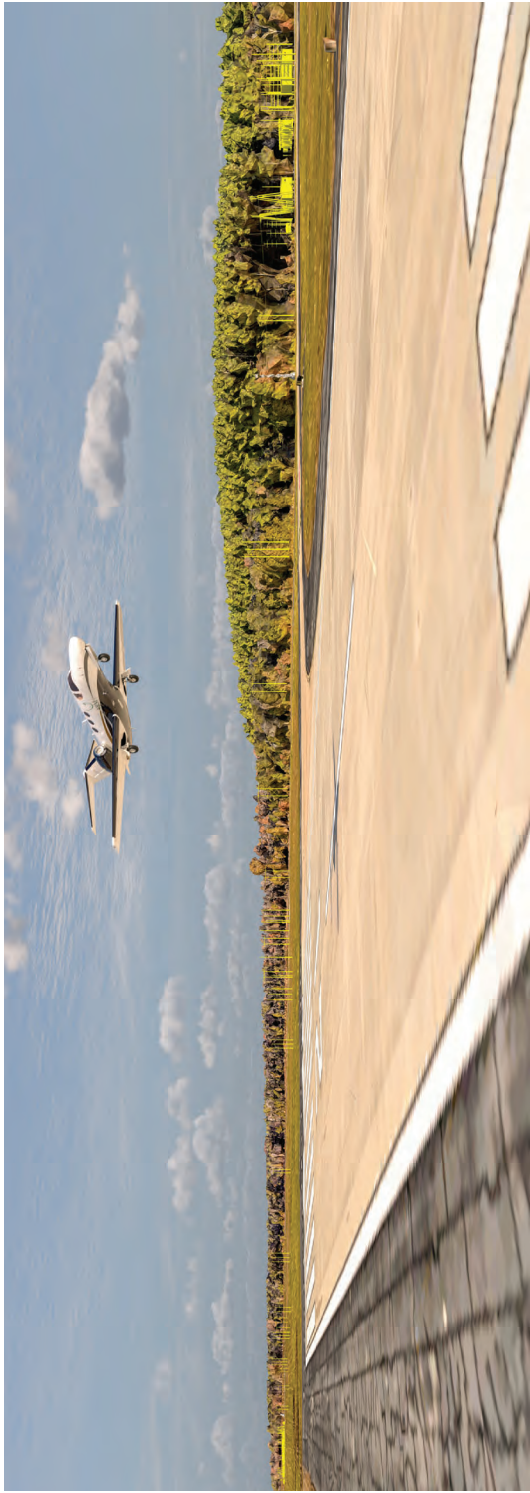


Figure 19: Aerial photograph depicting land use and photo view for 053-0008.





Existing View



Proposed view showing location of hidden transmission line structures (yellow)



Viewpoint Location UTM Zone 18N: 284314E 4313395N  
View Direction: 319 degrees  
Viewpoint Elevation: 305 feet  
Distance to Development: 5553 feet  
Horizontal Field of View: 60 degrees

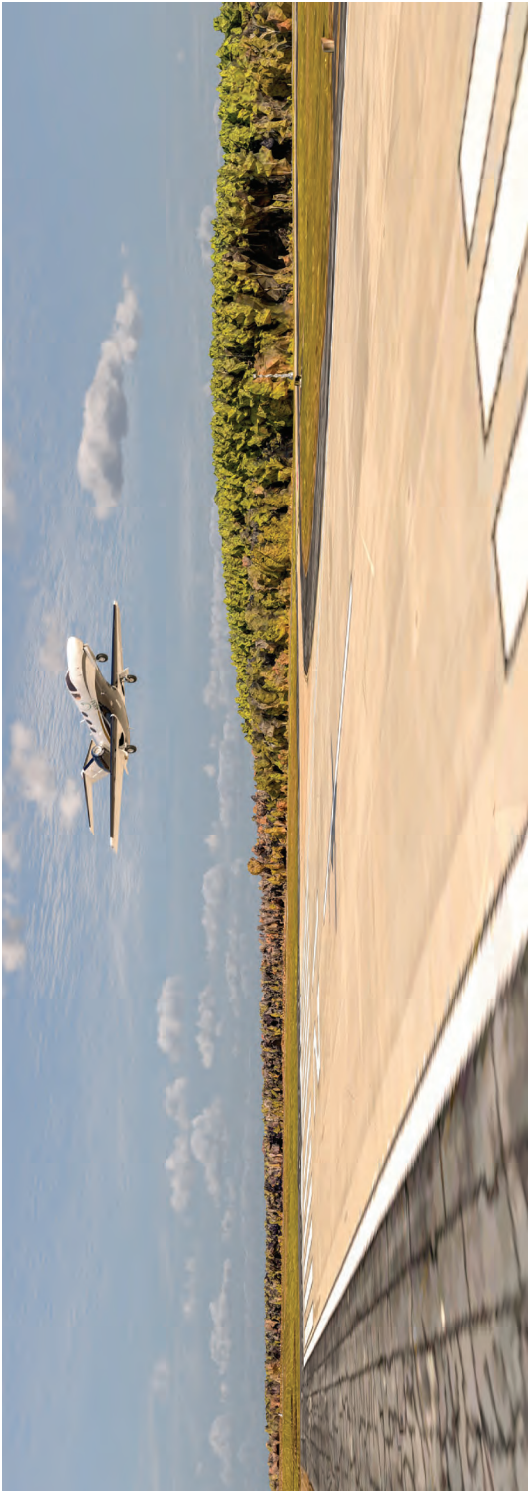
Date of Photography: N/A  
Camera: N/A  
Lens: N/A  
Camera Height: N/A



**Figure 20**  
**Viewpoint 3D Rendering**  
Washington Dulles International Airport  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**



Existing View



Proposed view showing location of transmission line structures



Viewpoint Location UTM Zone 18N: 284314E 4313395N  
View Direction: 319 degrees  
Viewpoint Elevation: 305 feet  
Distance to Development: 5553 feet  
Horizontal Field of View: 60 degrees

Date of Photography: N/A  
Camera: N/A  
Lens: N/A  
Camera Height: N/A



**Figure 21**  
**Viewpoint 3D Rendering**  
Washington Dulles International Airport  
053-0008  
**Pre-Application Analysis**  
**Wishing Star to Mars**

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# COMMONWEALTH of VIRGINIA

Travis A. Voyles  
*Acting Secretary of Natural  
and Historic Resources*

**Department of Historic Resources**  
2801 Kensington Avenue, Richmond, Virginia 23221

Julie V. Langan  
*Director*  
Tel: (804) 367-2323  
Fax: (804) 367-2391  
[www.dhr.virginia.gov](http://www.dhr.virginia.gov)

October 21, 2022

Christine F. Conrad  
Dominion Energy Virginia  
Electric Transmission  
P.O. Box 26666  
Richmond, VA 23261

Re: Dominion Energy Virginia's Proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop  
Loudoun County, Virginia  
DHR File No. 2022-5022

Dear Ms. Conrad

We have received your request for comments on the project referenced above. The undertaking, as presented, involves the construction of a new 500-230 kV substation (the "Wishing Star Substation"), a new overhead 500 kV transmission line with a 230 kV transmission line underbuilt (the "Mars-Wishing Star Lines"), a new 500-230 kV substation (the "Mars Substation"), and two new overhead 230 kV transmission lines (the "Mars 230 kV Loop") in Loudoun County, Virginia. Our comments are provided as technical assistance to Dominion. We have not been notified by any state or federal agency of their involvement in this project; however, we reserve the right to provide additional comment pursuant to the National Historic Preservation Act, if applicable.

The submission states that Dominion plans to prepare an application for a certificate of public convenience and necessity (CPCN) from the State Corporation Commission (SCC). Typically, we recommend that Dominion follows the *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia*, developed by DHR and the SCC to assist project proponents in developing transmission line projects that minimize impacts to historic resources.

Generally, we recommend that the project proponent establish a study area for each route alternative under consideration and gather information on known resources. A qualified cultural resources consultant in the appropriate discipline should perform an assessment of impact for each known historic resource present within the proposed study area.

Once the route alternatives have been finalized, DHR recommends that full archaeological and architectural surveys be performed to determine the effect of the project on all historic resources listed in or eligible for

Western Region Office  
962 Kime Lane  
Salem, VA 24153  
Tel: (540) 387-5443  
Fax: (540) 387-5446

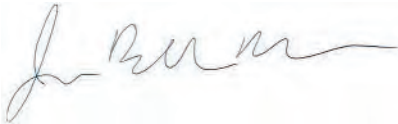
Northern Region Office  
5357 Main Street  
PO Box 519  
Stephens City, VA 22655  
Tel: (540) 868-7029  
Fax: (540) 868-7033

Eastern Region Office  
2801 Kensington Avenue  
Richmond, VA 23221  
Tel: (804) 367-2323  
Fax: (804) 367-2391

listing in the National Register. This process involves the identification and recordation of all archaeological sites and structures greater than 50 years of age, the evaluation of those resources for listing in the National Register of Historic Places (NRHP), determining the degree of impact of the project on eligible resources, and developing a plan to avoid, minimize, or mitigate any negative impacts. Comments received from the public or other stakeholder regarding impacts to specific historic resources should be addressed as part of this survey and assessment process.

Thank you for seeking our comments on this project. If you have any questions at this time, please do not hesitate to contact me at [jennifer.bellville-marrion@dhr.virginia.gov](mailto:jennifer.bellville-marrion@dhr.virginia.gov).

Sincerely,

A handwritten signature in dark ink, appearing to read "J. Bellville-Marrion", is written over a light blue rectangular background.

Jenny Bellville-Marrion, Project Review Archaeologist  
Review and Compliance Division

**From:** [ImpactReview](#)  
**To:** [Laura P Meadows \(DEV Trans Distribution - 1\)](#); [Christine Conrad](#)  
**Subject:** [EXTERNAL] RE: Dominion Energy Virginia's Proposed Mars-Wishing Star Project  
**Date:** Monday, October 3, 2022 10:51:10 AM  
**Attachments:** [image001.png](#)  
[image002.png](#)

**CAUTION! This message was NOT SENT from DOMINION ENERGY**

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Ms. Meadows,

The Virginia Outdoors Foundation has reviewed the project referenced below. As of October 3, 2022, there are not any existing nor proposed VOF open-space easements in the immediate vicinity of the project.

Please contact VOF again for further review if the project area changes or if this project does not begin within 24 months. Thank you for considering conservation easements.

Thanks,  
Baron

**Baron Lin** (*he/they*)

GIS Specialist

[Virginia Outdoors Foundation](#)

cell: [REDACTED]

other work #: [REDACTED]

email: [blin@vof.org](mailto:blin@vof.org)

---

**From:** Laura.P.Meadows@dominionenergy.com <Laura.P.Meadows@dominionenergy.com>

**Sent:** Wednesday, September 28, 2022 10:23 AM

**To:** ImpactReview <impactreview@vof.org>; cconrad@c2environmental.com

**Subject:** RE: Dominion Energy Virginia's Proposed Mars-Wishing Star Project

Alert: This email originated from outside VOF  
Good Morning,

Please see the shapefile, attached, with the routes.

Thank you,  
Laura

*Laura Meadows*

Supervisor - Siting and Permitting



Electric Transmission

Dominion Energy

10900 Nuckols Rd, 4<sup>th</sup> Floor, Glen Allen, VA 23060

C: [REDACTED]



---

**From:** ImpactReview <[impactreview@vof.org](mailto:impactreview@vof.org)>

**Sent:** Monday, September 26, 2022 10:51 AM

**To:** Christine Conrad <[cconrad@c2environmental.com](mailto:cconrad@c2environmental.com)>; Laura P Meadows (DEV Trans Distribution - 1) <[laura.p.meadows@dominionenergy.com](mailto:laura.p.meadows@dominionenergy.com)>

**Subject:** [EXTERNAL] RE: Dominion Energy Virginia's Proposed Mars-Wishing Star Project

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Hi Ms. Meadows and Dr. Conrad,

Please share a GIS shapefile of the transmission line routes. This will help with our review.

In the future, please direct all requests for VOF review to [ImpactReview@VOF.org](mailto:ImpactReview@VOF.org).

Thanks!

Baron

**Baron Lin** (*he/they*)

GIS Specialist

[Virginia Outdoors Foundation](https://www.virginiaoutdoorsfoundation.org/)

cell: [REDACTED]

other work #: [REDACTED]

email: [blin@vof.org](mailto:blin@vof.org)

---

**From:** Christine Conrad <[cconrad@c2environmental.com](mailto:cconrad@c2environmental.com)>

**Sent:** Friday, September 23, 2022 4:08:16 PM

**To:** Martha Little <[mlittle@vof.org](mailto:mlittle@vof.org)>

**Cc:** [Laura.P.Meadows@dominionenergy.com](mailto:Laura.P.Meadows@dominionenergy.com) <[laura.p.meadows@dominionenergy.com](mailto:laura.p.meadows@dominionenergy.com)>

**Subject:** Dominion Energy Virginia's Proposed Mars-Wishing Star Project

Alert: This email originated from outside VOF

Dear Ms. Little,  
Attached please find a request for comment for Dominion Energy Virginia's proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop project. Please contact Laura Meadows should you have any questions or require any additional information.

Regards,

**Christine F. Conrad, Ph.D.**  
**Director of Environmental Services**  
**C2 Environmental, Inc.**

11846 Rock Landing Drive, STE A  
Newport News, VA 23606



*C2 Environmental is a WBE and SWaM certified business*

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**From:** [Tyler Brown](#)  
**To:** [Jake Rosenberg](#)  
**Cc:** [Caraballo, Marie](#); [Todd Kief](#); [Zeller, James](#); [gregory.m.vozza@dominionenergy.com](#); [matthew.b.vinson@dominionenergy.com](#); [Glass, Susan](#); [Eric Preisendanz](#); [Hayzlett, Rodney](#); [Boeing, Dave](#); [james.p.young@dominionenergy.com](#); [cconrad@c2environmental.com](#); [Robert.F.Richardson@dominionenergy.com](#); [john.j.kascsak@dominionenergy.com](#); [Briana Cooney](#); [Jones, McKinley](#)  
**Subject:** Re: [External] Dominion Transmission Line Crossing of Northstar Boulevard  
**Date:** Monday, October 3, 2022 11:44:18 AM  
**Attachments:** [image001.png](#)  
[image002.png](#)  
[image003.png](#)

**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Jake,

Mr. Turner did not seem too concerned with DEV's proposed plan. I believe that whenever you guys request a permit for the work, your plan will be sent to us (the Design-Build Team) for review. And, because the O/H lines will be crossing a VDOT pond, it will also be reviewed by VDOT (specifically, VDOT Maintenance) to ensure adequate overhead clearances, etc. At this point, I see no issue coming from VDOT. It's just a matter of keeping them informed and sharing plans for review as they become available. That's basically sums up Mr. Turner's comments.

**Tyler K. Brown | Project Manager | Utilities**

**SHIRLEY CONTRACTING**

5160 Parkstone Dr. (Suite 160) | Chantilly, VA | 20151

p. [REDACTED]

m. [REDACTED]

[www.shirleycontracting.com](http://www.shirleycontracting.com)

On Sun, Oct 2, 2022 at 1:01 PM Jake Rosenberg <[jake.rosenberg@erm.com](mailto:jake.rosenberg@erm.com)> wrote:

Hey Tyler,

I want to follow up to see if Lindy Turner had any comments on the proposed Northstar Boulevard crossing.

Thanks again for your help!

Jake

**Jake Rosenberg**

Principal Consultant

**Environmental Resources Management (ERM)**

222 South 9th Street | Suite 2900 | Minneapolis, MN | 55402

M [REDACTED]

E [jake.rosenberg@erm.com](mailto:jake.rosenberg@erm.com) | W [www.erm.com](http://www.erm.com)



From: [Scott Denny](#)  
To: [Christine Conrad](#)  
Subject: Re: Dominion Energy Virginia's Proposed Mars-Wishing Star Project  
Date: Tuesday, September 27, 2022 8:57:41 AM  
Attachments: [image001.png](#)

---

Ms. Conrad:

Thank you for providing the Virginia Department of Aviation an opportunity to comment on Dominion's proposed transmission line. Following our review of the information package you provided, it appears as though the entire project site is within 20,000 linear feet of the Dulles International Airport. Therefore, a 7460 form will have to be submitted for the project to the Federal Aviation Administration. Provided the results of the airspace study determines there would be no increase in the approach minimums with any of the instrument approach procedures, the Department would not object to the project as it has been submitted. Please feel free to contact me if you have any questions regarding this matter.

Scot Denny  
Senior Aviation Planner  
Virginia Department of Aviation

On Fri, Sep 23, 2022 at 4:08 PM Christine Conrad <[cconrad@c2environmental.com](mailto:cconrad@c2environmental.com)> wrote:

Dear Mr. Denny,

Attached please find a request for comment for Dominion Energy Virginia's proposed 500-230 kV Wishing Star Substation, 500-230 kV Mars-Wishing Star Lines, 500-230 kV Mars Substation, and Mars 230 kV Loop project. Please contact Laura Meadows should you have any questions or require any additional information.

Regards,

**Christine F. Conrad, Ph.D.**

**Director of Environmental Services**

**C2 Environmental, Inc.**

11846 Rock Landing Drive, STE A

Newport News, VA 23606

[REDACTED]

[REDACTED]

[REDACTED]



*C2 Environmental is a WBE and SWaM certified business*

--

S. Scott Denny  
Senior Aviation Planner  
Virginia Department of Aviation  
[REDACTED]  
[scott.denny@doav.virginia.gov](mailto:scott.denny@doav.virginia.gov)