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February 2, 2022

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Mr. Bernard Logan, Clerk
c/o Document Control Center
State Corporation Commission
1300 East Main Street
Tyler Building – 1st Floor
Richmond, Virginia 23219

Application of Virginia Electric and Power Company for approval and certification of electric transmission facilities: Aviator 230 kV Line Loop and Aviator Substation
Case No. PUR-2022-00012

Dear Mr. Logan:

Please find enclosed for electronic filing in the above-captioned proceeding the application for approval of electric facilities on behalf of Virginia Electric and Power Company (the "Company"). This filing contains the Application, Appendix, Direct Testimony, and DEQ Supplement, including attachments.

As indicated in Section II.A.12.b of the Appendix, an electronic copy of the map of the Virginia Department of Transportation "General Highway Map" for Loudoun County, as well as the digital geographic information system ("GIS") map required by § 56-46.1 of the Code of Virginia, which is Attachment II.A.2 to the Appendix, were provided via an e-room to the Commission's Division of Energy Regulation on February 1, 2022.

Please do not hesitate to call if you have any questions in regard to the enclosed.

Very truly yours,

Vishwa B. Link

Enclosures

cc: William H. Chambliss, Esq.
Dr. David Essah (without enclosures)
Mr. Neil Joshipura (without enclosures)

Mr. Michael A. Cizenski (without enclosures)
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Dominion Energy®

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

Before the State Corporation Commission of Virginia

Aviator 230 kV Line Loop and Aviator Substation

Application No. 313

Case No. PUR-2022-00012

Filed: February 2, 2022

Volume 1 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

Aviator 230 kV Line Loop and Aviator Substation

Application No. 313

Case No. PUR-2022-00012

Filed: February 2, 2022

COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

APPLICATION OF	)	
	)	
VIRGINIA ELECTRIC AND POWER COMPANY	)	Case No. PUR-2022-00012
	)	
For approval and certification of electric transmission facilities: Aviator 230 kV Line Loop and Aviator Substation	)	

APPLICATION OF VIRGINIA ELECTRIC AND POWER COMPANY FOR APPROVAL AND CERTIFICATION OF ELECTRIC TRANSMISSION FACILITIES: AVIATOR 230 kV LINE LOOP AND AVIATOR SUBSTATION

Pursuant to § 56-46.1 of the Code of Virginia ("Va. Code") and the Utility Facilities Act, Va. Code § 56-265.1 *et seq.*, Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company"), by counsel, files with the State Corporation Commission of Virginia (the "Commission") this application for approval and certification of electric transmission facilities (the "Application"). In support of its Application, Dominion Energy Virginia respectfully states as follows:

1. Dominion Energy Virginia is a public service corporation organized under the laws of the Commonwealth of Virginia furnishing electric service to the public within its Virginia service territory. The Company also furnishes electric service to the public in portions of North Carolina. Dominion Energy Virginia's electric system—consisting of facilities for the generation, transmission, and distribution of electric energy—is interconnected with the electric systems of neighboring utilities and is a part of the interconnected network of electric systems serving the continental United States. By reason of its operation in two states and its interconnections with other utilities, the Company is engaged in interstate commerce.

2. In order to perform its legal duty to furnish adequate and reliable electric service, Dominion Energy Virginia must, from time to time, replace existing transmission facilities or

construct new transmission facilities in its system. The electric facilities proposed in this Application are necessary so that Dominion Energy Virginia can continue to provide reliable electric service to its customers, consistent with applicable reliability standards.

3. In this Application, in order to provide service requested by a retail electric service customer (the "Customer"), to maintain reliable service for the overall growth in the area, and to comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, Dominion Energy Virginia proposes in Loudoun County, Virginia, to:

(i) Construct a new approximately 0.9-mile overhead 230 kV double circuit transmission line loop on new 100-foot-wide right-of-way by cutting existing 230 kV overhead Poland Road-Shellhorn[1] Line #2137 (Brambleton-Poland Road Line #2183) at Structures #2137/133-134 (Structures #2183/58-57), resulting in (i) 230 kV Aviator-Shellhorn[2] Line #2137, and (ii) 230 kV Aviator-Poland Road Line #2221 (the "Aviator Loop"). The 0.9-mile proposed route of the Aviator Loop includes removal of one existing overhead span of double circuit 230 kV line located entirely within existing right-of-way between existing Structures #2137/133-134 (Structures #2183/58-57), and installation of a new overhead double circuit 230 kV line in new right-of-way for approximately 0.1 mile from existing Structure #2137/133 (Structure #2183/58) to a proposed new triple circuit steel pole located along Route 50 across from the existing Poland Road Substation (the "Aviator Junction"), and for approximately 0.06 mile from the Aviator Junction to existing Structure #2137/134 (Structure #2183/57) at Poland Road Substation;[3] and

[1] The Company's future Sojourner Switching Station is anticipated to be in service by the end of 2022. Once in service, the Poland Road-Shellhorn Line #2137 will be renamed Poland Road-Sojourner. *See* Appendix Attachment I.A.2. As the Company's future Sojourner Switching Station is not in service as of the date of this filing, references in this filing will be to existing Poland Road-Shellhorn Line #2137.

[2] At the time the proposed Aviator-Shellhorn Line #2137 is energized, the Company's future Sojourner Switching Station is anticipated to be in service. *See supra* n. 1. At that time, proposed Aviator-Shellhorn Line #2137 will be renamed Aviator-Sojourner. *See* Appendix Attachment I.A.3. As the Company's future Sojourner Switching Station is not in service as of the date of this filing, references in this filing will be to the proposed Aviator-Shellhorn Line #2137.

[3] The Company considers the work associated with Brambleton-Poland Road Line #2183—which includes removal of one span of existing transmission line between Structures #2183/58-57, and installation of new conductor and shield wire from existing Structure #2183/58 for 0.1 mile to a proposed new triple circuit steel pole located at the Aviator Junction, and for 0.06 mile from the Aviator Junction to Structure #2183/57 at Poland Road Substation—to qualify as "ordinary extensions or improvements in the usual course of business" pursuant to Va. Code § 56-265.2 A 1 and, therefore, does not require approval pursuant to Va. Code § 56-46.1 B or a certificate of public convenience and necessity ("CPCN") from the Commission. Notably, removal of the existing span will take place by Virginia Department of Transportation ("VDOT") permit, in existing right-of-way. As the Company considers this work to be ordinary course, detailed supporting documentation has not been provided in the Appendix. However, costs associated with this work on Line #2183 have been included for the Commission's consideration. Should the

(ii) Construct a new 230-34.5 kV substation located on land purchased by the Company from the Customer along Willard Road (the "Aviator Substation") and upgrade line protection at the Company's existing Poland Road Substation and future Sojourner Switching Station.

The Aviator Loop, Aviator Substation, and related substation work are collectively referred to as the "Project."

4. The Project is necessary to assure that Dominion Energy Virginia can maintain and improve reliable electric service to the load area surrounding the Company's existing Poland Road Substation ("Poland Road Load Area") in Loudoun County.

5. The Customer has requested retail electric service from Dominion Energy Virginia to support the future build-out of its three data center campuses (Campuses A, B, and C) totaling 485 MVA[4] of power. The Company plans to serve the Customer's build-out of Campus A (totaling 140 MVA) and build-out of Campus B (totaling 105 MVA) from the existing Poland Road Substation, and to serve the Customer's future Campus C (totaling 240 MVA) from the proposed Aviator Substation; however, the Company will be providing temporary bridging power of up to 36 MVA until Aviator Substation is built. Accordingly, the proposed Project is needed to meet the load requirements of the Customer's Campus C, along with future load growth in the Poland Road Load Area.

6. The Company identified an approximately 0.9-mile proposed overhead route for the Aviator Loop ("Overhead Route 1A" or "Proposed Route"), as well as an approximately 0.6-

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Commission determine that a CPCN is required for the work associated with Line #2183 as described in the Appendix, the Company requests that the Commission grant such CPCN as part of its final order in this proceeding. *See* Appendix Sections I.F, I.I, and III.I.

[4] Apparent power, measured in megavolt amperes ("MVA"), is made up of real power (megawatt or "MW") and reactive power megavolt ampere reactive ("MVAR"). The power factor ("pf") is the ratio of real power to apparent power. For loads with a high pf (approaching unity), real power will approach apparent power and the two can be used interchangeably. Load loss criteria specify real power (MW) units because that represents the real power that will be dropped; however, MVA is used to describe the equipment ratings to handle the apparent power, which includes the real and reactive load components.

mile overhead alternative route ("Overhead Alternative Route 1B" or "Alternative Route"), both of which the Company is proposing for Commission consideration and notice. Discussion of the Proposed and Alternative Routes, as well as other underground and overhead routes that the Company studied, but ultimately rejected, is provided in Section II of the Appendix and in Sections 2.4 and 2.5 of the Environmental Routing Study included with the Application.

7. The proposed Aviator Substation will initially be constructed with four 230 kV, 4000 amps circuit breakers in a ring bus arrangement; two 230 kV line terminals; five 230-34.5 kV transformers (four 112 MVA and one 84 MVA); ten 34.5 kV distribution circuits, and other associated equipment. In total, it will be designed to accommodate future growth in the area with a build-out of six 230 kV, 4000 amps circuit breakers; two additional 230 kV line terminals; and up to twenty-five 34.5 kV distribution circuits. Additionally, a new control enclosure will be installed to accommodate the protective relay and communications cabinets. The total area required to build the Aviator Substation is approximately 12.481 acres. A more detailed description of the proposed Project, including the Aviator Loop and Aviator Substation, is provided in Sections I and II of the Appendix attached to this Application.

8. The Company's desired in-service target date for the Project is September 30, 2024. The Company estimates it will take approximately 22 months for detailed engineering, scheduled outages, materials procurement, permitting, and construction of the Project after a final order from the Commission. Accordingly, to support this estimated construction timeline and construction plan, the Company respectfully requests a final order on the Project by November 30, 2022. Should the Commission issue a final order by November 30, 2022, the Company estimates that construction of the Project should begin around May 31, 2023, and be completed by September 30, 2024. This construction timeline will enable the Company to meet

the targeted in-service date for the Project. This schedule is contingent upon obtaining the necessary permits. Dates may need to be adjusted based on permitting delays or design modifications to comply with additional agency requirements identified during the permitting application process, as well as unpredictable delays due to the COVID-19 pandemic, labor shortages, materials/supply issues, or work to relocate distribution and telecommunications facilities.

9. The estimated conceptual cost of the proposed Project is approximately $79.25 million, which includes approximately $24.1 million for transmission-related work, approximately $53.4 million for substation-related work, and approximately $1.75 million for distribution-related work (2021 dollars).

10. Overhead Route 1A would have the fewest impacts to the current and future operation of the Chantilly Crushed Stone ("CCS") quarry, one of the property owners impacted by the Project. While Overhead Alternative Route 1B is shorter than Overhead Route 1A and has fewer environmental impacts (forested land, wetlands, waterbody crossings), Overhead Route 1A was determined to be the preferred route by the primary landowner impacted by the Project as it would not impede the operation and future expansion of the quarry. Overhead Route 1A parallels Route 50 and extends north across an area of CCS property that is outside of the current Virginia Energy (formerly Virginia Department of Mines, Minerals, and Energy) permit extent for the quarry, whereas Overhead Route 1B crosses portions of CCS property within the extent of the Virginia Energy permit. Overhead Route 1A also would have the least predicted visual impact on the residential properties along Willard Road and on travelers on Route 50 as a result of the replacement of the existing diagonal crossing of Route 50 with a perpendicular crossing and the collocation of the route with Route 50. Additionally, Overhead

Route 1A takes advantage of collocation opportunities along Route 50 and is located further from the two residences in the Project area. For these reasons, the Company has selected Overhead Route 1A as its Proposed Route.

11. Based on consultations with the Virginia Department of Environmental Quality ("DEQ"), the Company has developed a supplement ("DEQ Supplement") containing information designed to facilitate review and analysis of the proposed facilities by the DEQ and other relevant agencies. The DEQ Supplement is attached to this Application.

12. Based on the Company's experience, the advice of consultants, and a review of published studies by experts in the field, the Company believes that there is no causal link to harmful health or safety effects from electric and magnetic fields generated by the Company's existing or proposed facilities. Section IV of the Appendix provides further details on Dominion Energy Virginia's consideration of the health aspects of electric and magnetic fields.

13. Section V of the Appendix provides a proposed route description for public notice purposes and a list of federal, state, and local agencies and officials that the Company has or will notify about the Application.

14. In addition to the information provided in the Appendix, the DEQ Supplement, and the Environmental Routing Study, this Application is supported by the pre-filed direct testimony of Company Witnesses Harrison S. Potter, Robert C. Moorhead III, Jared R. Williams, Santosh Bhattarai, Greg R. Baka, and Jon M. Berkin.

WHEREFORE, Dominion Energy Virginia respectfully requests that the Commission:

(a) direct that notice of this Application be given as required by § 56-46.1 of the Code of Virginia;

(b) approve pursuant to § 56-46.1 of the Code of Virginia the construction of the Project; and,

(c) grant a certificate of public convenience and necessity for the Project under the Utility Facilities Act, § 56-265.1 *et seq.* of the Code of Virginia.

VIRGINIA ELECTRIC AND POWER COMPANY

By: *[s] Vishwa B. Link*
Counsel for Applicant

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February 2, 2022

COMMONWEALTH OF VIRGINIA
BEFORE THE
STATE CORPORATION COMMISSION

APPLICATION OF

VIRGINIA ELECTRIC AND POWER COMPANY

FOR APPROVAL AND CERTIFICATION
OF ELECTRIC TRANSMISSION FACILITIES

Aviator 230 kV Line Loop and Aviator Substation

Application No. 313

Appendix

Containing Information in Response to
"Guidelines for Transmission Line Applications Filed Under Title 56 of the Code of Virginia"

Case No. PUR-2022-00012

Filed: February 2, 2022

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EXECUTIVE SUMMARY

In order to provide service requested by a retail electric service customer (the "Customer"), to maintain reliable service for the overall growth in the area, and to comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company") proposes in Loudoun County, Virginia, to:

(i) Construct a new approximately 0.9-mile overhead 230 kV double circuit transmission line loop on new 100-foot-wide right-of-way by cutting existing 230 kV overhead Poland Road-Shellhorn[1] Line #2137 (Brambleton-Poland Road Line #2183) at Structures #2137/133-134 (Structures #2183/58-57), resulting in (i) 230 kV Aviator-Shellhorn[2] Line #2137, and (ii) 230 kV Aviator-Poland Road Line #2221 (the "Aviator Loop"). The 0.9-mile proposed route of the Aviator Loop includes removal of one existing overhead span of double circuit 230 kV line located entirely within existing right-of-way between existing Structures #2137/133-134 (Structures #2183/58-57), and installation of a new overhead double circuit 230 kV line in new right-of-way for approximately 0.1 mile from existing Structure #2137/133 (Structure #2183/58) to a proposed new triple circuit steel pole located along Route 50 across from the existing Poland Road Substation (the "Aviator Junction"), and for approximately 0.06 mile from the Aviator Junction to existing Structure #2137/134 (Structure #2183/57) at Poland Road Substation;[3] and

(ii) Construct a new 230-34.5 kV substation located on land purchased by the Company from the Customer along Willard Road (the "Aviator Substation") and upgrade line

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[1] The Company's future Sojourner Switching Station is anticipated to be in service by the end of 2022. Once in service, the Poland Road-Shellhorn Line #2137 will be renamed Poland Road-Sojourner. See Attachment I.A.2. As the Company's future Sojourner Switching Station is not in service as of the date of this filing, references in this Appendix will be to existing Poland Road-Shellhorn Line #2137.

[2] At the time the proposed Aviator-Shellhorn Line #2137 is energized, the Company's future Sojourner Switching Station is anticipated to be in service. *See supra* n. 1. At that time, proposed Aviator-Shellhorn Line #2137 will be renamed Aviator-Sojourner. See Attachment I.A.3. As the Company's future Sojourner Switching Station is not in service as of the date of this filing, references in this Appendix will be to the proposed Aviator-Shellhorn Line #2137.

[3] The Company considers the work associated with Brambleton-Poland Road Line #2183—which includes removal of one span of existing transmission line between Structures #2183/58-57, and installation of new conductor and shield wire from existing Structure #2183/58 for 0.1 mile to a proposed new triple circuit steel pole located at the Aviator Junction, and for 0.06 mile from the Aviator Junction to Structure #2183/57 at Poland Road Substation—to qualify as "ordinary extensions or improvements in the usual course of business" pursuant to § 56-265.2 A 1 of the Code of Virginia ("Va. Code") and, therefore, does not require approval pursuant to Va. Code § 56-46.1 B or a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission (the "Commission"). Notably, removal of the existing span will take place by Virginia Department of Transportation ("VDOT") permit, in existing right-of-way. As the Company considers this work to be ordinary course, detailed supporting documentation has not been provided in this Appendix. However, costs associated with this work on Line #2183 have been included for the Commission's consideration. Should the Commission determine that a CPCN is required for the work associated with Line #2183 as described herein, the Company requests that the Commission grant such CPCN as part of its final order in this proceeding. See Sections I.F, I.I, and III.I.

protection at the Company's existing Poland Road Substation and future Sojourner Switching Station.

The Aviator Loop, Aviator Substation and related substation work are collectively referred to as the "Project."

The Project is necessary to assure that Dominion Energy Virginia can maintain and improve reliable electric service to the load area surrounding the Company's existing Poland Road Substation ("Poland Road Load Area") in Loudoun County. The Customer has requested retail electric service from Dominion Energy Virginia to support the future build-out of its three data center campuses (Campuses A, B, and C) totaling 485 MVA[4] of power. The Company plans to serve the Customer's build-out of Campus A (totaling 140 MVA) and build-out of Campus B (totaling 105 MVA) from the existing Poland Road Substation, and to serve the Customer's future Campus C (totaling 240 MVA) from the proposed Aviator Substation; however, the Company will be providing temporary bridging power of up to 36 MVA until Aviator Substation is built. Accordingly, the proposed Project is needed to meet the load requirements of the Customer's Campus C, along with future load growth in the Poland Road Load Area.

The Company identified an approximately 0.9-mile proposed overhead route for the Aviator Loop ("Overhead Route 1A" or "Proposed Route"), as well as an approximately 0.6-mile overhead alternative route ("Overhead Alternative Route 1B" or "Alternative Route"), both of which the Company is proposing for Commission consideration and notice. Discussion of the Proposed and Alternative Routes, as well as other underground and overhead routes that the Company studied, but ultimately rejected, is provided in Section II of the Appendix and in Sections 2.4 and 2.5 of the Environmental Routing Study included with the Application.

The proposed Aviator Substation will initially be constructed with four 230 kV, 4000 amps circuit breakers in a ring bus arrangement; two 230 kV line terminals; five 230-34.5 kV transformers (four 112 MVA and one 84 MVA); ten 34.5 kV distribution circuits, and other associated equipment. In total, it will be designed to accommodate future growth in the area with a build-out of six 230 kV, 4000 amps circuit breakers; two additional 230 kV line terminals; and up to twenty-five 34.5 kV distribution circuits. Additionally, a new control enclosure will be installed to accommodate the protective relay and communications cabinets. The total area required to build the Aviator Substation is approximately 12.481 acres.

The estimated conceptual cost of the proposed Project is approximately $79.25 million, which includes approximately $24.1 million for transmission-related work, approximately $53.4 million for substation-related work, and approximately $1.75 million for distribution-related work (2021 dollars).

[4] Apparent power, measured in megavolt amperes ("MVA"), is made up of real power (megawatt or "MW") and reactive power megavolt ampere reactive ("MVAR"). The power factor ("pf") is the ratio of real power to apparent power. For loads with a high pf (approaching unity), real power will approach apparent power and the two can be used interchangeably. Load loss criteria specify real power (MW) units because that represents the real power that will be dropped; however, MVA is used to describe the equipment ratings to handle the apparent power, which includes the real and reactive load components.

The Company's desired in-service target date for the Project is September 30, 2024. The Company estimates it will take approximately 22 months for detailed engineering, scheduled outages, materials procurement, permitting, and construction of the Project after a final order from the Commission. Accordingly, to support this estimated construction timeline and construction plan, the Company respectfully requests a final order on the Project by November 30, 2022. Should the Commission issue a final order by November 30, 2022, the Company estimates that construction of the Project should begin around May 31, 2023, and be completed by September 30, 2024. This construction timeline will enable the Company to meet the targeted in-service date for the Project. This schedule is contingent upon obtaining the necessary permits. Dates may need to be adjusted based on permitting delays or design modifications to comply with additional agency requirements identified during the permitting application process, as well as unpredictable delays due to the COVID-19 pandemic, labor shortages, materials/supply issues, or work to relocate distribution and telecommunications facilities.

I. NECESSITY FOR THE PROPOSED PROJECT

A. State the primary justification for the proposed project (for example, the most critical contingency violation including the first year and season in which the violation occurs). In addition, identify each transmission planning standard(s) (of the Applicant, regional transmission organization ("RTO"), or North American Electric Reliability Corporation) projected to be violated absent construction of the facility.

Response: The Project is necessary in order to provide service requested by the Customer in Loudoun County, Virginia, to maintain reliable service for the overall growth in the Project area, and to comply with mandatory NERC Reliability Standards.

Dominion Energy Virginia's transmission system is responsible for providing transmission service: (i) for redelivery to the Company's retail customers; (ii) to Appalachian Power Company, Old Dominion Electric Cooperative, Northern Virginia Electric Cooperative, Central Virginia Electric Cooperative, and Virginia Municipal Electric Association for redelivery to their retail customers in Virginia; and, (iii) to North Carolina Electric Membership Corporation and North Carolina Eastern Municipal Power Agency for redelivery to their customers in North Carolina (collectively, the "Dominion Energy Zone" or the "Dom Zone").

Dominion Energy Virginia is part of the PJM Interconnection, L.L.C. ("PJM") regional transmission organization ("RTO"), which provides service to a large portion of the eastern United States. PJM is currently responsible for ensuring the reliability of, and coordinating the movement of, electricity through all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia. This service area has a population of approximately 65 million and, on August 2, 2006, set a record high of 166,929 megawatts ("MW") for summer peak demand, of which Dominion Energy Virginia's load portion was approximately 19,256 MW. On July 20, 2020, the Company set a record high of 20,087 MW for summer peak demand. On February 20, 2015, the Company set a winter and all-time record demand of 21,651 MW. Based on the 2022 PJM Load Forecast, the Dominion Energy Zone is expected to grow with average growth rates of 2.2% summer and 2.6% winter over the next 10 years compared to the PJM average of 0.4% and 0.7% over the same period for the summer and winter, respectively.

Dominion Energy Virginia is also part of the Eastern Interconnection transmission grid, meaning its transmission system is interconnected, directly or indirectly, with all of the other transmission systems in the United States and Canada between the Rocky Mountains and the Atlantic Coast, except for Quebec and most of Texas. All of the transmission systems in the Eastern Interconnection are dependent on each other for moving bulk power through the transmission system and for reliability support. Dominion Energy Virginia's service to its customers is extremely reliant on a robust and reliable regional transmission system.

NERC has been designated by the Federal Energy Regulatory Commission ("FERC") as the electric reliability organization for the United States. Accordingly, NERC requires that the planning authority and transmission planner develop planning criteria to ensure compliance with NERC Reliability Standards. Mandatory NERC Reliability Standards require that a transmission owner ("TO") develop facility interconnection requirements that identify load and generation interconnection minimum requirements for a TO's transmission system, as well as the TO's reliability criteria.[5]

Federally mandated NERC Reliability Standards constitute minimum criteria with which all public utilities must comply as components of the interstate electric transmission system. Moreover, the Energy Policy Act of 2005 mandates that electric utilities follow these NERC Reliability Standards and imposes fines for noncompliance of approximately $1.3 million per day per violation.

Currently, the Customer has a five-building data center campus ("Campus A") located along John Mosby Highway in Loudoun County that has two additional buildings yet to be built, and a three-building data center campus ("Campus B") located along John Mosby Highway in Loudoun County that has one additional building yet to be built. The Customer is also developing one additional data center campus in the Project area, which is located on approximately 100 acres along Willard Road where a four-building campus is planned ("Campus C"). The Customer has requested retail electric service from Dominion Energy Virginia to support the future build-out of its three campuses. See Attachment I.A.1 for a map of the Poland Road Load Area, including the Customers' campuses.

Specifically, the Customer is requesting a total of 485 MVA of power (140 MVA at Campus A, 105 MVA at Campus B, and 240 MVA at Campus C). The Company plans to serve the Customer's build-out of Campus A and build-out of Campus B from the existing Poland Road Substation, and to serve the Customer's future Campus C from the proposed Aviator Substation; however, the Company will be providing bridging power of up to 36 MVA until Aviator Substation is built.

The Customer's request for 240 MVA of power for normal service at Campus C will overload the existing distribution substation equipment if all of it were to be connected to the existing Poland Road Substation. Connecting the Customer's requested load to Poland Road Substation alone would result in (i) substation transformer thermal overloads, (ii) substation transformer contingency plan overloads, and (iii) violation of NERC transmission system reliability criteria. Further, without the proposed Aviator Substation, the build-out of Campus A and build-out of Campus B, and future Campus C would theoretically be served from the existing Poland Road Substation, even though it is impractical to construct the necessary new distribution circuits from Poland Road Substation to Campus C.

[5] *See* FAC-001-3 (R1, R3) (effective April 1, 2021), which can be found at https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/virginia/parallel-generation/facility-interconnection-requirements-signed.pdf?la=en&rev=38f51ffb04b1489f921b32a41d9887c8.

Campus A is directly adjacent to Poland Road Substation, so that is the logical substation to use to serve that data center campus. Section I.C. of this Appendix describes these violations in further detail.

The Customer will have a redundant breaker for each normal service that will be fed from the same substation bus for Campus A at Poland Road Substation. The Customer has requested that each of its data center buildings at Campus C include a totally independent, redundant distribution feed, which is referred to as an alternate feed. At any customer's request, the Company will endeavor to design a distribution system that provides a back-up source of power should their normal feed have an outage. The cost of this alternate feed arrangement is compared to the normal arrangement of service, and the difference in cost is collected through an excess facilities charge. The Customer's business plan counts on the requested alternate feed plan to meet the non-outage demands of its data center clients. Therefore, the Company plans to serve the Customer's future Campus C with both normal feed circuits and alternate feed circuits. This essentially doubles the required substation transformer capacity that the Customer will contract for and double the number of distribution circuits required compared to providing normal feed service only. See Section I.C, noting that Attachments I.C.1.a, I.C.1.b, and I.C.1.c include only the normal feed circuits to the Customer's three data center campuses.

As described above, the Company plans to serve the Customer, as well as other area existing and planned customers, from the proposed Aviator Substation and the existing Poland Road Substation. The proposed Aviator Substation will provide capacity into the existing 34.5 kV distribution system served by Brambleton Substation, Poland Road Substation, and Walney Substation, as shown in Attachment I.G.1. This interconnection into the existing distribution grid will provide increased reliability to the Company's existing and future customers. Accordingly, the proposed Project is needed to meet the load requirements of the Customer's proposed new campus along with future load growth in the Poland Road Load Area.

As part of the Project, the Company proposes to construct the new approximately 0.9-mile 230 kV Aviator Loop on new 100-foot-wide right-of-way by cutting existing 230 kV overhead Poland Road-Shellhorn Line #2137 (Brambleton-Poland Road Line #2183) at Structures #2137/133-134 (Structures #2183/58-57), resulting in (i) 230 kV Aviator-Shellhorn Line #2137, and (ii) 230 kV Aviator-Poland Road Line #2221. The 0.9-mile proposed route of the Aviator Loop includes removal of one existing overhead span of double circuit 230 kV line located entirely within existing right-of-way between existing Structures #2137/133-134 (Structures #2183/58-57), and installation of a new overhead double circuit 230 kV line in new right-of-way for approximately 0.1 mile from existing Structure #2137/133 (Structure #2183/58) to a proposed new triple circuit steel pole located at the Aviator Junction along Route 50 across from the existing Poland Road Substation, and for approximately 0.06 mile from the Aviator Junction to existing Structure 2137/134 (Structure #2183/57) at Poland Road Substation. Discussion of the

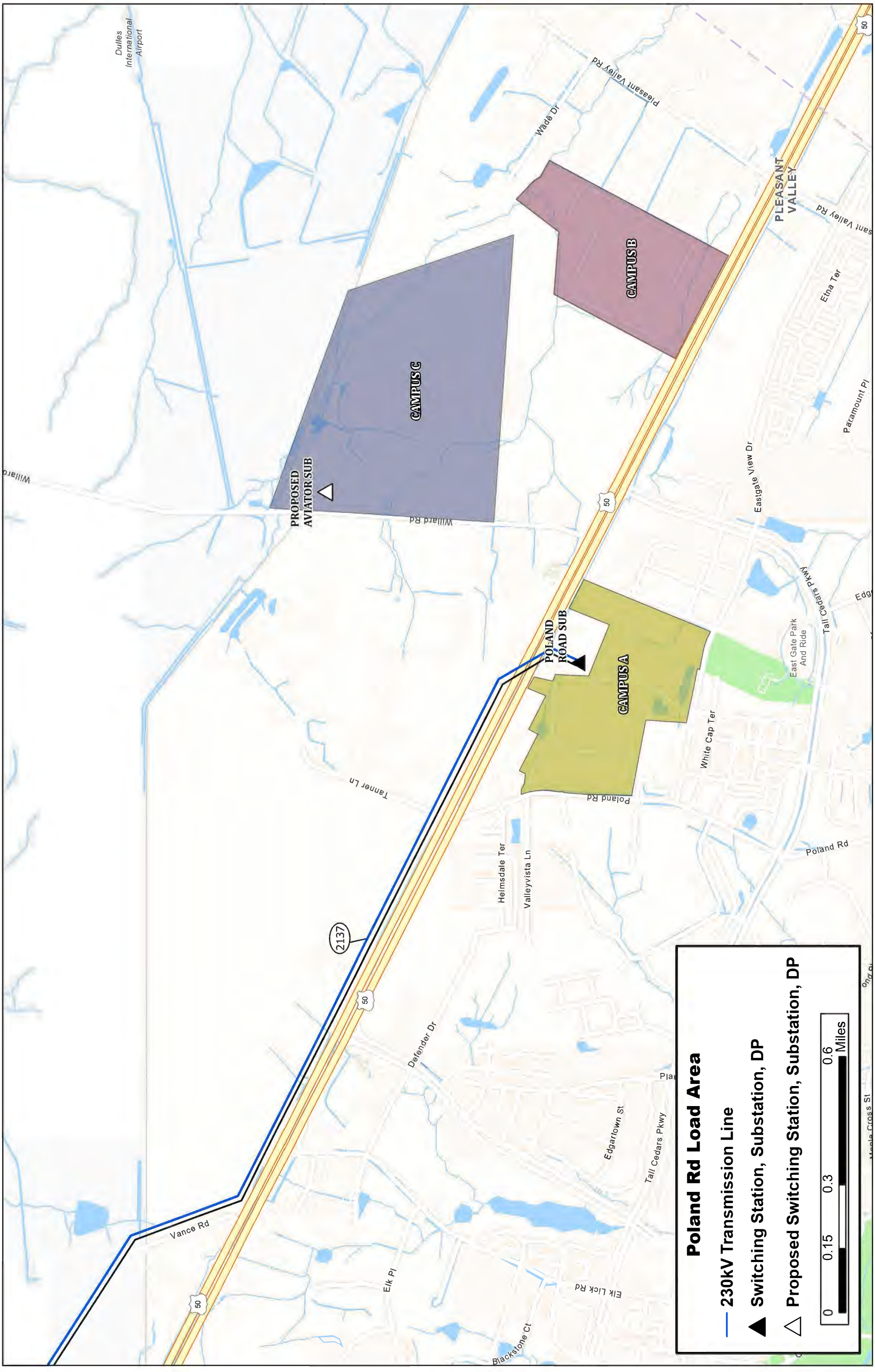
Proposed and Alternative Routes for the Aviator Loop, as well as other underground and overhead routes that the Company studied, but ultimately rejected, is provided in Section II of this Appendix and in Sections 2.4 and 2.5 of the Environmental Routing Study included with the Application.

The proposed Aviator Substation will initially be constructed with four 230 kV, 4000 amps circuit breakers in a ring bus arrangement; two 230 kV line terminals; five 230-34.5 kV transformers (four 112 MVA and one 84 MVA); ten 34.5 kV distribution circuits, and other associated equipment. In total, it will be designed to accommodate future growth in the area with a build-out of six 230 kV, 4000 amps circuit breakers; two additional 230 kV line terminals; and up to twenty-five 34.5 kV distribution circuits. Additionally, a new control enclosure will be installed to accommodate the protective relay and communications cabinets. The total area required to build the Aviator Substation is approximately 12.481 acres. See Section II.C.

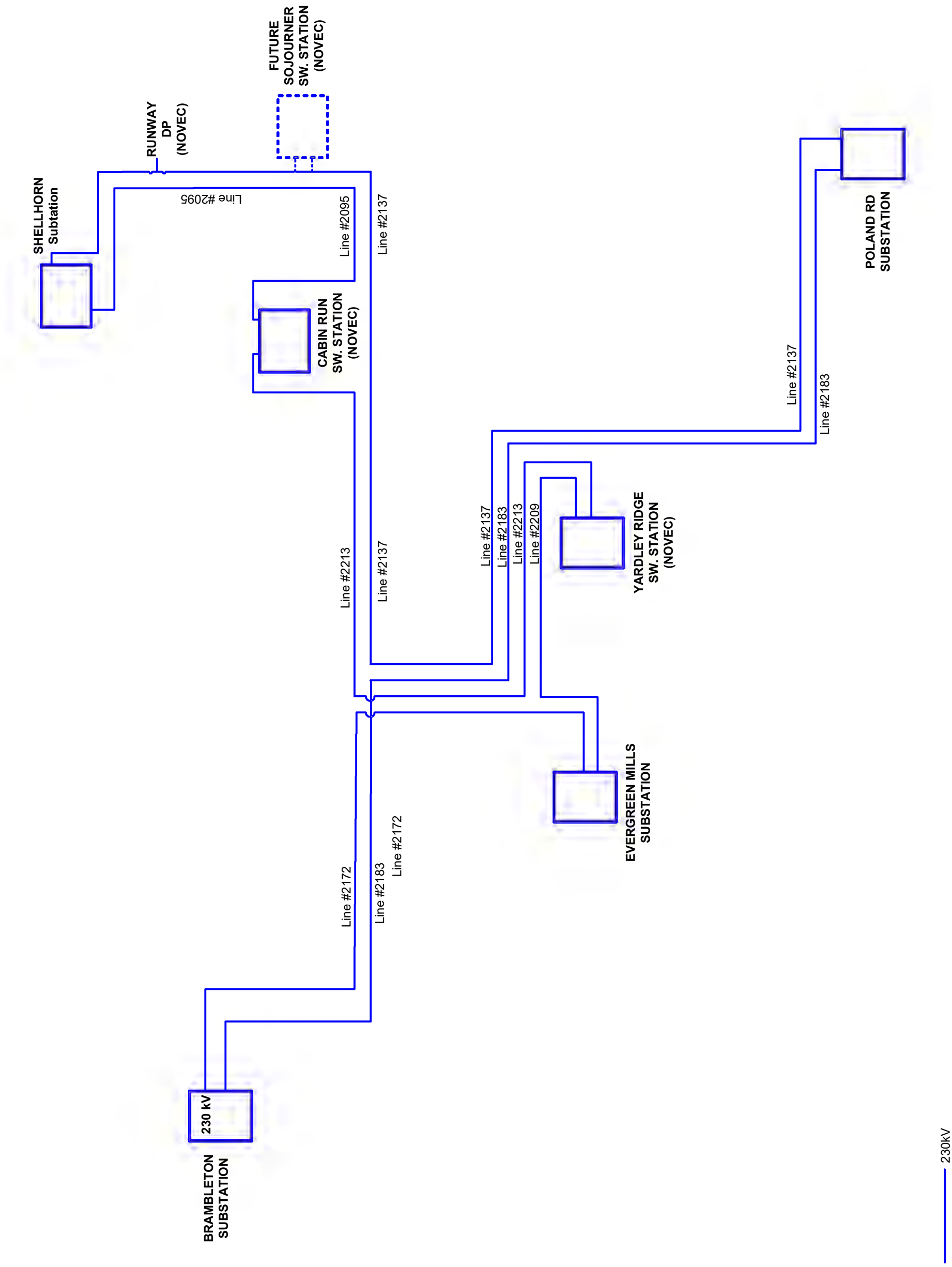
Attachments I.A.2 and I.A.3 are one-line diagrams of the area transmission system before and after construction of the Project, respectively. See Attachment II.A.2 for a map depicting the proposed Project.

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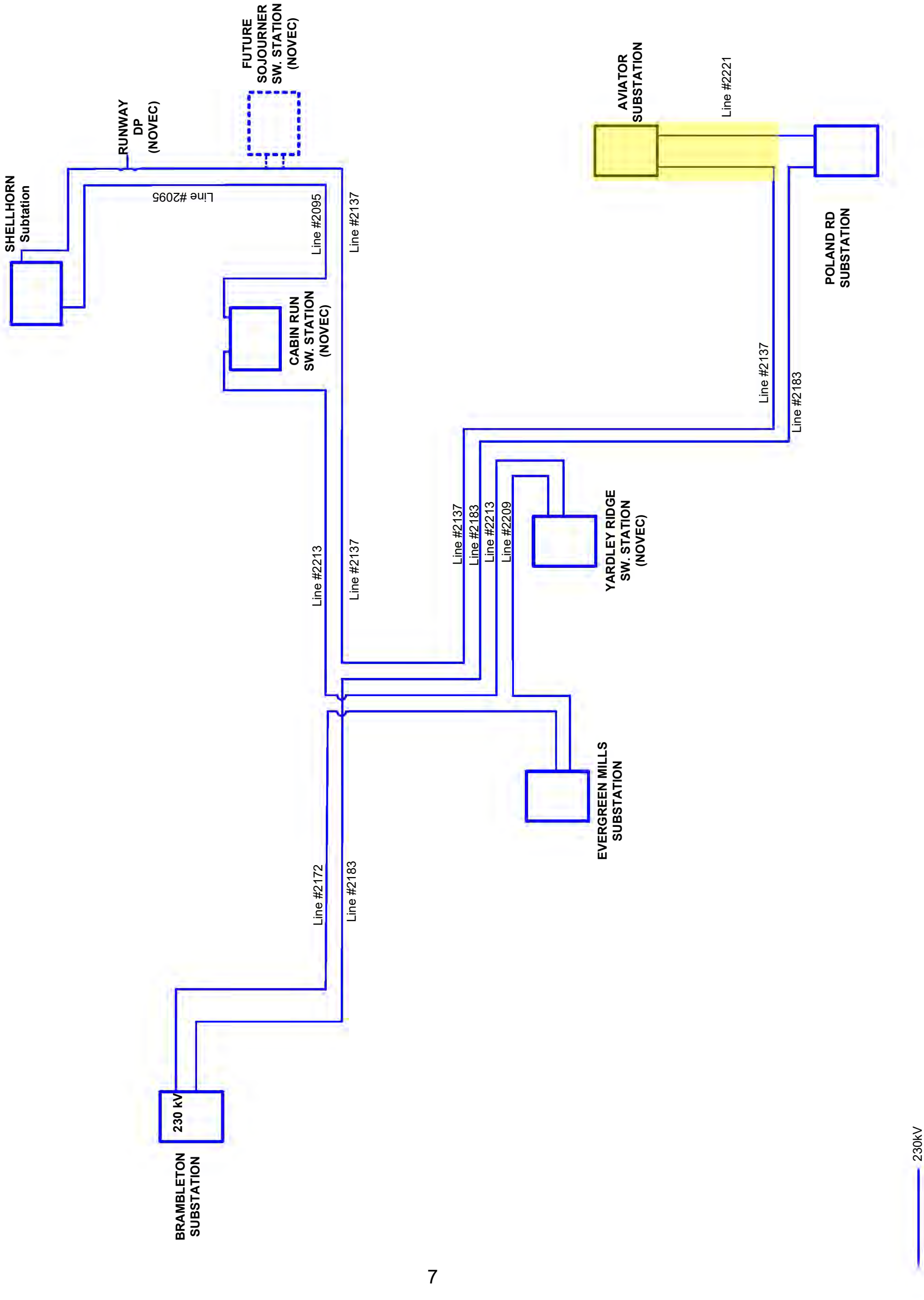
In summary, the proposed Project will provide service requested by the Customer in Loudoun County, Virginia, maintain reliable service for the overall growth in the Project area, and comply with mandatory NERC Reliability Standards.


Dulles International Airport
Pleasant Valley Rd
Wade Dr
PLEASANT VALLEY
50
CAMPUS B
CAMPUS C
PROPOSED AVIATOR SUB
Willard Rd
Eastgate View Dr
Paramount Pl
Etna Ter
POLAND ROAD SUB
CAMPUS A
East Gate Park And Ride
Tall Cedars Pkwy
White Cap Ter
Poland Rd
Tanner Ln
Helmsdale Ter
Valleyvista Ln
2137
Defender Dr
Edgartown St
Elk Pl
Elk Lick Rd
Blackstone Ct
Vance Rd
Poland Rd Load Area
230kV Transmission Line
Switching Station, Substation, DP
Proposed Switching Station, Substation, DP
0
0.15
0.3
0.6
Miles

EXISTING ARRANGEMENT



PROPOSED SOLUTION



I. NECESSITY FOR THE PROPOSED PROJECT

B. Detail the engineering justifications for the proposed project (for example, provide narrative to support whether the proposed project is necessary to upgrade or replace an existing facility, to significantly increase system reliability, to connect a new generating station to the Applicant's system, etc.). Describe any known future project(s), including but not limited to generation, transmission, delivery point or retail customer projects, that require the proposed project to be constructed. Verify that the planning studies used to justify the need for the proposed project considered all other generation and transmission facilities impacting the affected load area, including generation and transmission facilities that have not yet been placed into service. Provide a list of those facilities that are not yet in service.

Response: **(1) <u>Engineering Justification for Project</u>**

Detail the engineering justifications for the proposed project (for example, provide narrative to support whether the proposed project is necessary to upgrade or replace an existing facility, to significantly increase system reliability, to connect a new generating station to the Applicant's system, etc.).

See Section I.A of the Appendix.

(2) <u>Known Future Projects</u>

Describe any known future project(s), including but not limited to generation, transmission, delivery point or retail customer projects, that require the proposed project to be constructed.

The proposed Project is needed to serve future data center development in the Project area as described in Section I.A. See <u>Attachment I.A.1</u> for existing and future retail customer projects in the affected load area that require the proposed Project to be constructed. The Company anticipates that the Project will accommodate future load growth in the area, to the extent necessary.

(3) <u>Planning Studies</u>

Verify that the planning studies used to justify the need for the proposed project considered all other generation and transmission facilities impacting the affected load area, including generation and transmission facilities that have not yet been placed into service.

For this Project, the Company's Distribution Planning group first used the Customer's load projection information for its Campuses A, B, and C and other load growth information for the Poland Road Load Area to create a composite load projection. Starting with the scenario to feed the entire projected load from an existing substation (*i.e.*, Poland Road Substation), Distribution Planning determined that overloads would occur on equipment and loading criteria would

be violated. When the projected load was divided between existing Poland Road Substation and the proposed Aviator Substation, the overloads and violations are avoided.

Distribution Planning then conferred with the Company's Transmission Planning group to analyze the effects of the projected growth and the addition of Aviator Substation on the transmission system.

Dominion Energy Virginia's Transmission Planning group performs planning studies to ensure delivery of bulk power to a continuously changing customer demand under a wide variety of operating conditions. Studies are performed in coordination with the Company's RTO (*i.e.*, PJM) and in accordance with NERC Reliability Standards. In completing these studies, the Company considered all other known generation and transmission facilities impacting the affected load area.

In order to maintain reliable service to customers of the Company and to comply with mandatory NERC Reliability Standards, specifically Facility Connection ("FAC") standard FAC-001,[6] the Company's Facility Interconnection Requirements ("FIR")[7] document addresses the interconnection requirements of generation, transmission, and electricity end-user facilities. The purpose of the NERC FAC standards is to avoid adverse impacts on reliability by requiring each TO establish facility connection and performance requirements in accordance with FAC-001, and the TO's and end-users meet and adhere to the established facility connection and performance requirements in accordance with FAC-002.[8]

NERC Reliability Standards TPL-001 requirements R2, R5, and R6 require PJM, the Planning Coordinator ("PC") and the TO, to have reliability criteria. PJM's planning criteria outlined in Attachment D of Manual 14B requires the Company, as a TO, to follow NERC and Regional Planning Standards and criteria as well as the TO Standards filed in Dominion Energy Virginia's FERC 715 filings. The Company's FERC 715 filing contains the Dominion Energy Virginia Transmission Planning Criteria in Exhibit A of the FIR document.

The four major criteria considered as part of this Project were:

1) Ring bus arrangement is required for load interconnections in excess of 100 MW (Company's FIR, Section 6.2);

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[6] *See supra* n. 5.

[7] The Company's FIR document (effective Apr. 1, 2021) is available at: https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/virginia/parallel-generation/facility-connection-requirements.pdf?la=en&rev=f280781e90cf47f69ea526c944c9c347&hash=82DD2567D0B033C47536134B8C4D5C5E.

[8] Please see the following link for FAC-002: https://www.nerc.com/pa/Stand/Reliability%20Standards/FAC-002-2.pdf.

2) The amount of direct-connected load at any substation is limited to 300 MW (Company's Transmission Planning Criteria Exhibit A, Section C.2.8);

3) N-1-1 contingencies load loss is limited to 300 MW (PJM Manual 14B Section 2.3.8, Attachment D, Attachment D-1, Attachment F); and

4) The minimum load levels within a 10-year planning horizon for the direct interconnection to existing transmission lines is 30 MW for a 230 kV delivery (Company's FAC-001 Section 6, Load Criteria – End User).

The Project is being constructed as a double circuit loop instead of a single circuit tap to comply with Section 6.2 of the Company's FIR, which requires a ring bus arrangement for load interconnections in excess of 100 MW.

(4) <u>Facilities List</u>

Provide a list of those facilities that are not yet in service.

See subparts (2) and (3) above and Section I.C.

I. NECESSITY FOR THE PROPOSED PROJECT

C. Describe the present system and detail how the proposed project will effectively satisfy present and projected future electrical load demand requirements. Provide pertinent load growth data (at least five years of historical summer and winter peak demands and ten years of projected summer and winter peak loads where applicable). Provide all assumptions inherent within the projected data and describe why the existing system cannot adequately serve the needs of the Applicant (if that is the case). Indicate the date by which the existing system is projected to be inadequate.

Response: The existing Poland Road Load Area is located in Loudoun County and is generally bounded by Poland Road to the west, Pleasant Valley Road to the east, Dulles International Airport property to the north, and Eastgate View Drive to the south. See Attachment I.G.1 for the portion of the Company's transmission facilities in the area of the Project. The existing Poland Road Substation is the primary source of distribution power to the load area. The projected load at the Customer's three campuses combined in 10 years is projected to be approximately 388 MVA. Adding this load from the Customer's planned new and built-out data center campuses (*i.e.*, Campuses A, B, and C) to Poland Road Substation would result in overload conditions and NERC transmission system reliability criteria violations.

Attachment I.C.1 shows loading (MVA), as follows:

- Attachment I.C.1.a shows loading at Poland Road Substation with only the Customer's projects at Campus A and B (as fully built out).
- Attachment I.C.1.b shows loading at Poland Road Substation for the Customer's A and B Campuses (as fully built out), the addition of the Customer's project at future Campus C, and without Aviator Substation.
- Attachment I.C.1.c shows loading at Poland Road Substation with Campuses A, B, and C load until Aviator Substation is energized. Future Campus C load will then move to Aviator Substation.

As discussed in Section I.A, it is important to note that Attachments I.C.1.a, I.C.1.b and I.C.1.c include only the normal feed circuits to the Customer's three data center campuses. Additionally, note that the load tables show actual and projected peak loading in MVA.

Poland Road Substation is designed to have ultimately four 84 MVA, 230-34.5 kV transformers. Each of these transformers has a normal overload ("NOL") rating of 90 MVA. Each of the four substation transformers has a number of feeder circuits connected to it that ultimately connect to customers through distribution facilities. These distribution circuits each have a thermal overload rating that is based on the type of equipment and the configuration of the equipment in the field. To prevent

overloads that could damage or fail equipment, the maximum capacity limits of the distribution circuits and the substation transformers cannot be exceeded.

To ensure reliability to its customers, the Company maintains a substation transformer contingency plan. Because of the negative impact to customers due to the outage duration if a substation transformer were to fail, the Company creates a switching plan that allows customer load to be picked up on other equipment for loss of any substation transformer. There are various switching methods that can be used for these substation transformer contingency plans. If the contingency plan creates overloads in other equipment because of the switching, new substation capacity, such as constructing a new substation like the proposed Aviator Substation, is necessary.

NERC criteria restricts total substation loading to no more than 300 MW. If the projected load inside a given substation will exceed 300 MW, the Company must create a project that eliminates the overload, such as constructing a new substation like the proposed Aviator Substation.

As shown in Attachment I.C.1.b, the Poland Road Substation is projected to have TX #1 overload starting in summer 2023 (with Customer Campuses A, B, C, and without Aviator Substation). TX #2 and TX #6 are projected to overload starting in summer 2024.

The Poland Road Substation distribution transformer contingency plans overload starting in summer 2023. See Section I.D.

The NERC Criteria for 300 MW total substation loading is exceeded starting in summer 2024 at Poland Road Substation. In summer 2023, the total substation load is projected to be at 287 MW (95% of criteria), and, in summer 2024, the total substation load is projected to be at 370 MW (123% of criteria).

As shown in Attachment I.C.1.c, the Poland Road Substation is projected to have TX #1 overloads starting in summer 2023 (with Customer Campuses A, B, and C, and without Aviator Substation). TX #2 and TX #6 are projected to overload starting in summer 2024. These overloads will be avoided by limiting the Customer's bridging capacity to 36 MVA until Aviator Substation is energized in order to feed Campus C load.

Based on all the stated projected overloads and criteria violations above, the Company needs to construct the Aviator Substation by summer 2023. To address these issues until the Project comes online in September 2024, the Company's Distribution Planning group has arranged to provide bridging power to the Customer, as discussed in Section I.A.

Table I.C.1.a																	
Poland Rd Load Area			(Load and Ratings in MVA)														
Poland Rd Substation (Loads contain Customer Campuses A & B loads only)																	
			2016 Actual Peak Loading (MVA)	2017 Actual Peak Loading (MVA)	2018 Actual Peak Loading (MVA)	2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Projected Peak Loading (MVA)	2023 Projected Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)
Substation Total			0	0	0	41.8	71.2	128.7	154.1	198.2	201.6	201.6	201.6	201.6	201.6	201.6	201.6
Substation Total Calculation for 300MW NERC Limit			0	0	0	39.7	67.6	122.3	146.4	188.3	191.5	191.5	191.5	191.5	191.5	191.5	191.5
Transformer	Nameplate	NOL															
TX #3	84	90	0	0	0	41.8	68.6	40.2	35	35	35	35	35	35	35	35	35
TX #2	84	90	0	0	0	0	0	51.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5
TX #1	84	90	0	0	0	0	2.6	37	66.6	63.6	63	63	63	63	63	63	63
TX #6	84	90	0	0	0	0	0	0	0	47.1	51.1	51.1	51.1	51.1	51.1	51.1	51.1

Table I.C.1.b																	
Poland Rd Load Area			(Load and Ratings in MVA)														
Poland Rd Substation (Loads contain Customer's Campus A, B & C fed from Poland Rd Sub, No Aviator Sub)																	
			2016 Actual Peak Loading (MVA)	2017 Actual Peak Loading (MVA)	2018 Actual Peak Loading (MVA)	2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Projected Peak Loading (MVA)	2023 Projected Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)
Substation Total			0	0	0	41.8	71.2	128.7	162.1	302.24	390.24	418.7	418.7	418.7	418.7	418.7	418.7
Substation Total Calculation for 300MW NERC Limit			0	0	0	39.7	67.6	122.3	154	287.1	370.7	397.8	397.8	397.8	397.8	397.8	397.8
Transformer	Nameplate	NOL															
TX #3	84	90	0	0	0	41.8	68.6	40.2	45	69	89	89	89	89	89	89	89
TX #2	84	90	0	0	0	0	0	51.5	52.5	70.5	92.5	107	107	107	107	107	107
TX #1	84	90	0	0	0	0	2.6	37	64.6	97.6	117.6	117.6	117.6	117.6	117.6	117.6	117.6
TX #6	84	90	0	0	0	0	0	0	0	65.14	91.14	105.1	105.1	105.1	105.1	105.1	105.1

Table I.C.1.c																	
Poland Rd Load Area			(Load and Ratings in MVA)														
Poland Rd Sub (Loads contain Customer's Campus A, B and C from Poland Road Sub until Aviator is Energized, Customer's Campus C fed from Aviator Sub)																	
			2016 Actual Peak Loading (MVA)	2017 Actual Peak Loading (MVA)	2018 Actual Peak Loading (MVA)	2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Projected Peak Loading (MVA)	2023 Projected Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)
Substation Total			0	0	0	41.8	71.2	128.7	162.1	302.24	390.24	202.29	201.6	201.6	201.6	201.6	201.6
Substation Total Calculation for 300MW NERC Limit			0	0	0	39.7	67.6	122.3	146.4	188.3	191.5	191.5	191.5	191.5	191.5	191.5	191.5
Transformer	Nameplate	NOL															
TX #3	84	90	0	0	0	41.8	68.6	40.2	45	69	89	35	35	35	35	35	35
TX #2	84	90	0	0	0	0	0	51.5	52.5	70.5	92.5	52.55	52.5	52.5	52.5	52.5	52.5
TX #1	84	90	0	0	0	0	2.6	37	64.6	97.6	117.6	63.6	63	63	63	63	63
TX #6	84	90	0	0	0	0	0	0	0	65.14	91.14	51.14	51.1	51.1	51.1	51.1	51.1
***Note**: These overloads will be avoided by limiting the Customer's bridging capacity to 36 MVA until Aviator Substation is energized in order to feed Campus C load.*																	
Aviator Sub (Loads contain with Customer C Campus only)																	
			2016 Actual Peak Loading (MVA)	2017 Actual Peak Loading (MVA)	2018 Actual Peak Loading (MVA)	2019 Actual Peak Loading (MVA)	2020 Actual Peak Loading (MVA)	2021 Actual Peak Loading (MVA)	2022 Projected Peak Loading (MVA)	2023 Projected Peak Loading (MVA)	2024 Projected Peak Loading (MVA)	2025 Projected Peak Loading (MVA)	2026 Projected Peak Loading (MVA)	2027 Projected Peak Loading (MVA)	2028 Projected Peak Loading (MVA)	2029 Projected Peak Loading (MVA)	2030 Projected Peak Loading (MVA)
Substation Total			0	0	0	0	0	0	0	0	0	216.45	216.45	216.45	216.45	216.45	216.45
Substation Total Calculation for 300MW NERC Limit			0	0	0	0	0	0	0	0	0	205.6	205.6	205.6	205.6	205.6	205.6
Transformer	Nameplate	NOL															
TX #1	112	120	0	0	0	0	0	0	0	0	0	54.45	54.45	54.45	54.45	54.45	54.45
TX #2	112	120	0	0	0	0	0	0	0	0	0	54	54	54	54	54	54
TX #3	112	120	0	0	0	0	0	0	0	0	0	54	54	54	54	54	54
TX #4	112	120	0	0	0	0	0	0	0	0	0	54	54	54	54	54	54
TX #5	84	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

I. NECESSITY FOR THE PROPOSED PROJECT

D. If power flow modeling indicates that the existing system is, or will at some future time be, inadequate under certain contingency situations, provide a list of all these contingencies and the associated violations. Describe the critical contingencies including the affected elements and the year and season when the violation(s) is first noted in the planning studies. Provide the applicable computer screenshots of single-line diagrams from power flow simulations depicting the circuits and substations experiencing thermal overloads and voltage violations during the critical contingencies described above.

Response: See Section I.C for the substation transformer contingency planning rationale from a distribution system perspective. For the Poland Road Substation transformer contingencies review in summer 2023, for the loss of Poland Road TX #1, Poland Road TX #2 shows an overload (110 MVA of load on a 90 MVA rating or 122% overload); and for loss of Poland Road TX #6, Poland Road TX #1 shows an overload (111 MVA of load on a 90 MVA rating or 122% overload).

For the Poland Road Substation transformer contingencies review in summer 2024, Poland Road TX #1 and TX #6 continue to have violations. For the loss of Poland Road TX #3, Poland Road TX #2 shows an overload (102 MVA of load on a 90 MVA rating or 113% overload); and for the loss of Poland Road TX #2, Poland Road TX #3 shows an overload (102 MVA of load on a 90 MVA rating or 113% overload). For these contingency scenarios, load is transferred to other busses and transformers within Poland Road Substation, resulting in the overloads of equipment rating.

I. NECESSITY FOR THE PROPOSED PROJECT

E. Describe the feasible project alternatives, if any, considered for meeting the identified need including any associated studies conducted by the Applicant or analysis provided to the RTO. Explain why each alternative was rejected.

Response: The Company considered the following electrical distribution alternatives to the proposed Project, including the use of existing and planned substations to serve the need for the Project. The Company did not identify any viable electrical transmission alternatives to the proposed Project.

Distribution Alternatives:

Distribution Alternative (1): *Feed the Poland Road Load Area growth from Poland Road Substation*

Under this distribution alternative scenario, Aviator Substation would not be constructed and the projected load growth, including the Customer's three data center campuses, would be connected to Poland Road Substation. The Poland Road Substation is approximately 0.25 straight-line mile from Campus C.

Distribution Alternative (1) was rejected for four key reasons. First, if the load from Campus C (240 MVA) is added to Poland Road Substation, the total projected Poland Road Substation load would exceed 300 MW, in violation of NERC Reliability Standards. Second, two Poland Road Substation transformers would overload. Third, transformer contingencies are not possible to maintain due to no available capacity in the substation to effectively transfer all load for the loss of any one transformer. Fourth, it is not practical to construct distribution circuits from Poland Road Substation to Campus C. Campus C will require four normal feeder circuits and four redundant feeder circuits. The existing distribution corridors to get from Poland Road Substation to Campus C are already filled with existing Poland Road Substation circuits feeding existing customers in the area.

Distribution Alternative (2): *Feed the Poland Road Load Area growth from Brambleton Substation*

This distribution alternative scenario assumes all of Customer's Campus C would be fed to Brambleton Substation.

Distribution Alternative (2) was rejected because of three key reasons. First, if the load from Campus C (240 MVA) is added to Brambleton Substation, the total projected Brambleton Substation load would exceed 300 MW, in violation of NERC Reliability Standards. Second, there is not sufficient capacity or room at Brambleton Substation to add the required transformation. Third, Brambleton Substation is approximately 4.3 straight line miles from Campus C and there are no adequate distribution routes to allow for adequate circuitry to meet the Customer's Campus C load.

Distribution Alternative (3): *Feed the Poland Road Load Area growth from Walney Substation*

This distribution alternative scenario is similar to Distribution Alternative (2) but assumes all of Customer's Campus C would be fed to Walney Substation.

Distribution Alternative (3) was rejected because of three key reasons. First, if the load from Campus C (240 MVA) is added to Walney Substation, the total projected Walney Substation load would exceed 300 MW, in violation of NERC Reliability Standards. Second, there is not sufficient capacity or room at Walney Substation to add the required transformation. Third, Walney Substation is approximately 2.75 straight line miles from Campus C and there are no adequate distribution routes to allow for adequate circuitry to meet the Customer's Campus C load.

Analysis of Demand-Side Resources:

Pursuant to the Commission's November 26, 2013, Order entered in Case No. PUE-2012-00029, and its November 1, 2018, Final Order entered in Case No. PUR-2018-00075 ("2018 Final Order"), the Company is required to provide analysis of demand-side resources ("DSM") incorporated into the Company's planning studies. DSM is the broad term that includes both energy efficiency ("EE") and demand response ("DR"). In this case, PJM and the Company have identified a need for the proposed Project in order to comply with mandatory NERC Reliability Standards, while maintaining the overall long-term reliability of its transmission system.[9] Notwithstanding, when performing an analysis based on PJM's 50/50 load forecast, there is no adjustment in load for DR programs that are bid into the PJM reliability pricing model ("RPM") auction because PJM only dispatches DR when the system is under stress (*i.e.*, a system emergency). Accordingly, while existing DSM is considered to the extent the load forecast accounts for it, DR that has been bid into PJM's RPM market is not a factor in this particular application because of the identified need for the Project. Based on these considerations, the evaluation of the Project demonstrated that despite accounting for DSM consistent with PJM's methods, the Project is necessary.

Incremental DSM also will not absolve the need for the Project. As reflected in Attachment I.C.1.b, the projected load at Poland Road Substation without the Project and with all three Customers' data center campuses fully built out is 397.8 MVA. By way of comparison, statewide, the Company achieved demand savings of 120.4 MW from its DSM Programs in 2020.

[9] While the PJM load forecast does not directly incorporate DR, its load forecast incorporates variables derived from Itron that reflect EE by modeling the stock of end-use equipment and its usages. Further, because P JM's load forecast considers the historical non-coincident peak ("NCP") for each load serving entity ("LSE") within PJM, it reflects the actual load reductions achieved by DSM programs to the extent an LSE has used DSM to reduce its NCPs.

I. NECESSITY FOR THE PROPOSED PROJECT

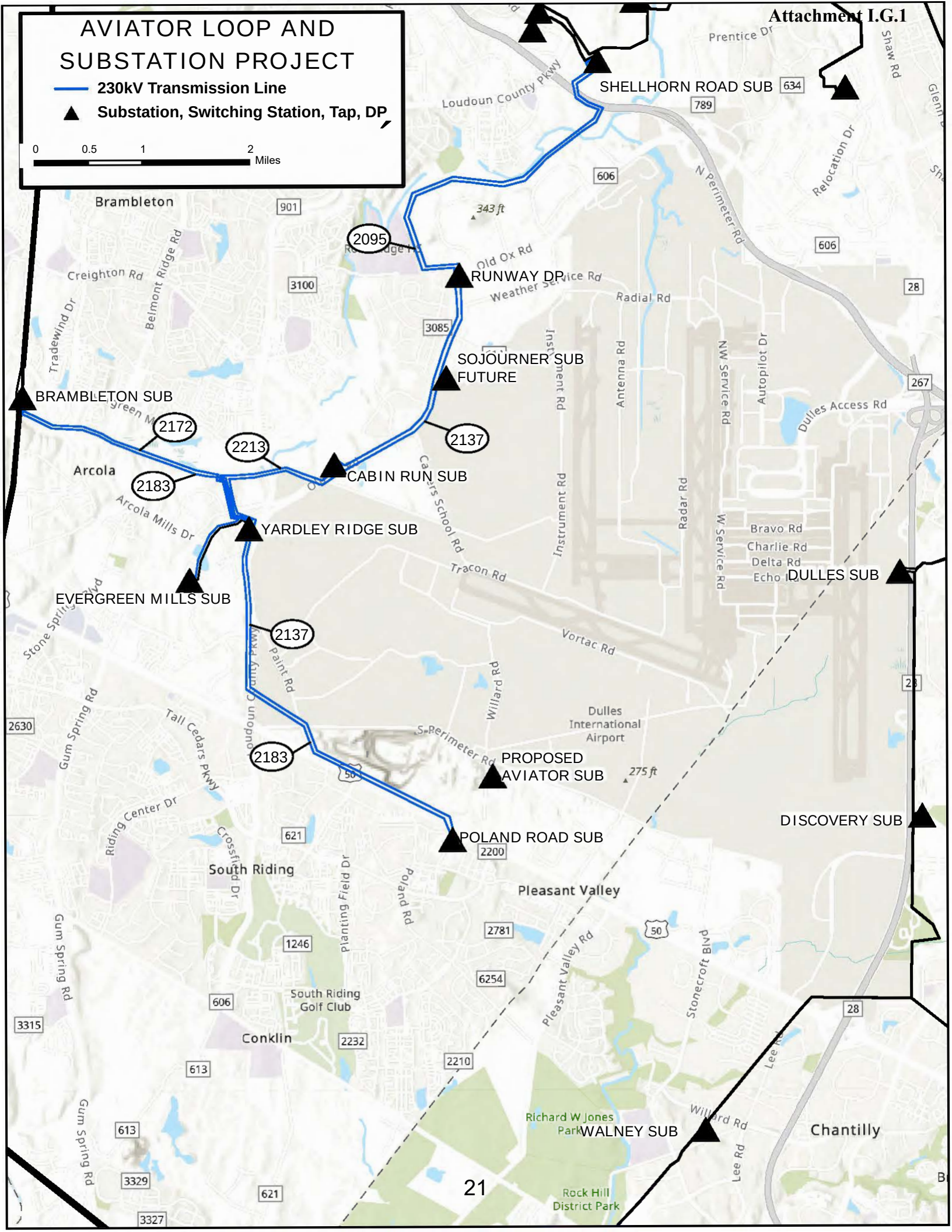
F. Describe any lines or facilities that will be removed, replaced, or taken out of service upon completion of the proposed project, including the number of circuits and normal and emergency ratings of the facilities.

Response: One span of double circuit 230 kV line located between Structures #2137/133-134 (Structures #2183/58-57) will be removed. A new double circuit 230 kV line will be installed between Structures #2137/133-134 (Structures #2183/58-57) to relocate the lines from Structure #2137/133 (Structure #2183/58) to the proposed triple circuit steel pole at Aviator Junction, and from the Aviator Junction to existing Structure #2137/134 (Structure #2183/57) at the Poland Road Substation. This section of Line #2137 will be renumbered to Line #2221 between the proposed triple circuit steel pole at Aviator Junction and Poland Road Substation. The existing Line #2137 and #2183 3-phase twin-bundled 795 ACSR conductors have a normal/emergency transfer capability of 1225 MVA.

I. NECESSITY FOR THE PROPOSED PROJECT

G. Provide a system map, in color and of suitable scale, showing the location and voltage of the Applicant's transmission lines, substations, generating facilities, etc., that would affect or be affected by the new transmission line and are relevant to the necessity for the proposed line. Clearly label on this map all points referenced in the necessity statement.

Response: See Attachment I.G.1.


AVIATOR LOOP AND SUBSTATION PROJECT
230kV Transmission Line
Substation, Switching Station, Tap, DP
0 0.5 1 2 Miles
SHELLHORN ROAD SUB
RUNWAY DP
SOJOURNER SUB FUTURE
BRAMBLETON SUB
CABIN RUN SUB
YARDLEY RIDGE SUB
EVERGREEN MILLS SUB
PROPOSED AVIATOR SUB
POLAND ROAD SUB
DULLES SUB
DISCOVERY SUB
WALNEY SUB
2095
2172
2213
2183
2137
2137
2183
Brambleton
Arcola
South Riding
Conklin
Pleasant Valley
Chantilly
Dulles International Airport
South Riding Golf Club
Richard W Jones Park
Rock Hill District Park
Loudoun County Pkwy
Prentice Dr
Shaw Rd
Relocation Dr
N Perimeter Rd
Old Ox Rd
Radial Rd
Creighton Rd
Belmont Ridge Rd
Tradewind Dr
Arcola Mills Dr
Caters School Rd
Instrument Rd
Antenna Rd
NW Service Rd
Autopilot Dr
Dulles Access Rd
Radar Rd
W Service Rd
Bravo Rd
Charlie Rd
Delta Rd
Tracon Rd
Vortac Rd
Willard Rd
S Perimeter Rd
Paint Rd
Gum Spring Rd
Tall Cedars Pkwy
Riding Center Dr
Crossfield Dr
Planting Field Dr
Poland Rd
Pleasant Valley Rd
Stonecroft Blvd
Lee Rd
Stone Spring Blvd
343 ft
275 ft
901
606
789
634
3100
3085
28
267
2630
621
2200
2781
1246
6254
606
3315
2232
2210
613
613
3329
621
3327
50
50

I. NECESSITY FOR THE PROPOSED PROJECT

H. Provide the desired in-service date of the proposed project and the estimated construction time.

Response: The Company's desired in-service target date for the Project is September 30, 2024. See Section I.A.

The Company estimates it will take approximately 22 months for detailed engineering, scheduled outages, materials procurement, permitting, and construction of the Project after a final order from the Commission. Accordingly, to support this estimated construction timeline and construction plan, the Company respectfully requests a final order on the Project by November 30, 2022. Should the Commission issue a final order by November 30, 2022, the Company estimates that construction of the Project should begin around May 31, 2023, and be completed by September 30, 2024. This construction timeline will enable the Company to meet the targeted in-service date for the Project. This schedule is contingent upon obtaining the necessary permits. Dates may need to be adjusted based on permitting delays or design modifications to comply with additional agency requirements identified during the permitting application process, as well as unpredictable delays due to the COVID-19 pandemic, labor shortages, materials/supply issues, or work to relocate distribution and telecommunications facilities.

I. NECESSITY FOR THE PROPOSED PROJECT

I. Provide the estimated total cost of the project as well as total transmission-related costs and total substation-related costs. Provide the total estimated cost for each feasible alternative considered. Identify and describe the cost classification (e.g. "conceptual cost," "detailed cost," etc.) for each cost provided.

Response: The estimated conceptual cost of the proposed Project is approximately $79.25 million, which includes approximately $24.1 million for transmission-related work, approximately $53.4 million for substation-related work, and approximately $1.75 million for distribution-related work[10] (2021 dollars). The costs associated with the distribution-related work are high-level conceptual costs.

The estimated conceptual cost for the transmission-related work associated with Overhead Alternative Route 1B is provided in Section II.A.9. The substation-related costs associated with that route are the same as the Proposed Route, as indicated above. The distribution-related work referenced above and in Section II.A.6 is not required by Overhead Alternative Route 1B.

[10] *See* Section II.A.6.

I. NECESSITY FOR THE PROPOSED PROJECT

J. If the proposed project has been approved by the RTO, provide the line number, regional transmission expansion plan number, cost responsibility assignments, and cost allocation methodology. State whether the proposed project is considered to be a baseline or supplemental project.

Response: The Project is classified as a supplemental project (Supplemental Project DOM-2020-0003) initiated by the TO to interconnect new customer load. The need for the Project was submitted to PJM on March 10, 2020, and the solution slide was submitted to PJM on May 12, 2020. See Attachments I.J.1 and I.J.2, respectively. The Project has been assigned Supplemental Project No. s2324.1 and was accepted into the 2020 Local Plan. See Attachment I.J.3. The Company plans to present revised slides to PJM as to Project cost and in-service date updates that are reflected in this Appendix. As this is a supplemental project, the Company anticipates that these revisions will have no impact, and the Project will be included in the RTEP.

The Project is presently 100% cost allocated to the DOM Zone.

Dominion Supplemental Projects

Transmission Expansion Advisory Committee
March 10, 2020

Attachment I.J.1

Needs

Stakeholders must submit any comments within 10 days of this meeting in order to provide time necessary to consider these comments prior to the next phase of the M-3 process

Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2020-0003

Process Stage: Need Meeting 03/10/2020

Project Driver: Customer Service

Specific Assumption References:

Customer load request will be evaluated per Dominion's Facility Interconnection Requirements Document and Dominion's Transmission Planning Criteria.

Problem Statement:

DEV Distribution has submitted a DP Request for a new substation (Aviator) to accommodate a new datacenter campus in Loudoun County with a total load in excess of 100MW. Requested in-service date is 6/01/2023.

Initial In-Service Load	Projected 2025 Load
Summer: 27.0 MW	Summer: 116.0 MW



Dominion Supplemental Projects

28

Transmission Expansion Advisory Committee
May 12, 2020

Solutions

Stakeholders must submit any comments within 10 days of this meeting in order to provide time necessary to consider these comments prior to the next phase of the M-3 process

29

Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2020-0003

Process Stage: Solutions Meeting 05/12/2020

Previously Presented: Need Meeting 04/14/2020

Project Driver: Customer Service

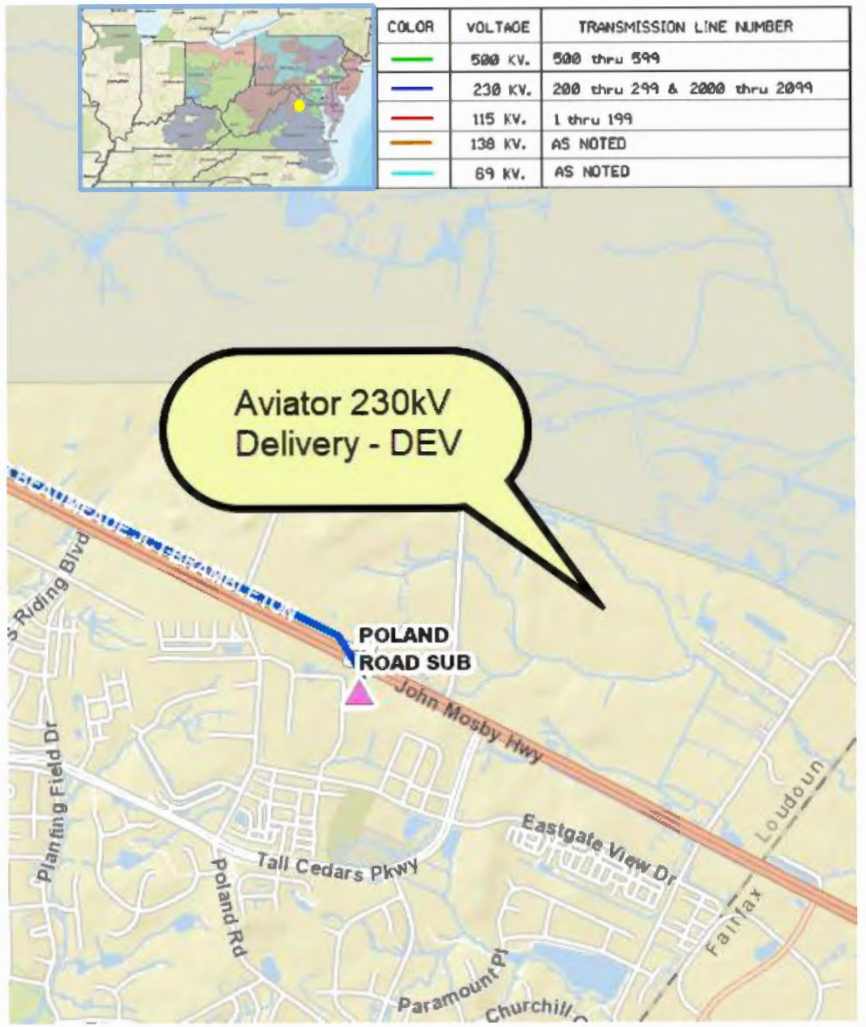
Specific Assumption References:

Customer load request will be evaluated per Dominion's Facility Interconnection Requirements Document and Dominion's Transmission Planning Criteria.

Problem Statement:

DEV Distribution has submitted a DP Request for a new substation (Aviator) to accommodate a new datacenter campus in Loudoun County with a total load in excess of 100MW. Requested in-service date is 6/01/2023.

Initial In-Service Load	Projected 2025 Load
Summer: 27.0 MW	Summer: 116.0 MW



Dominion Transmission Zone: Supplemental Aviator 230kV Delivery - DEV

Need Number: DOM-2020-0003

Process Stage: Solutions Meeting 05/12/2020

Proposed Solution:

Interconnect the new substation by cutting and extending Line #2137 (Poland-Shellhorn) approximately 0.5 miles to the proposed Aviator Substation. Terminate both ends into a four-breaker ring arrangement to create an Aviator-Poland line and an Aviator-Shellhorn line. Dominion's standard high ampacity conductor (bundled 768 ACSS; normal summer rating = 1572 MVA) will be used for the line extension.



31

Estimated Project Cost: $22.0 M

Alternatives Considered:

No feasible alternatives

Projected In-service Date: 06/01/2023

Project Status: Engineering

Model: 2025 RTEP

Submission of Supplemental Projects for Inclusion in the Local Plan

Attachment I.J.3

Aviator 230kV Delivery - DEV

Need Number: DOM-2020-0003

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan – 11/04/2020

Previously Presented:

Need – 04/14/2020

Solution – 05/12/2020

Project Driver:

Customer Load Request

Specific Assumption Reference:

Customer load request will be evaluated per Dominion's Facility Interconnection Requirements Document and Dominion's Transmission Planning Criteria.

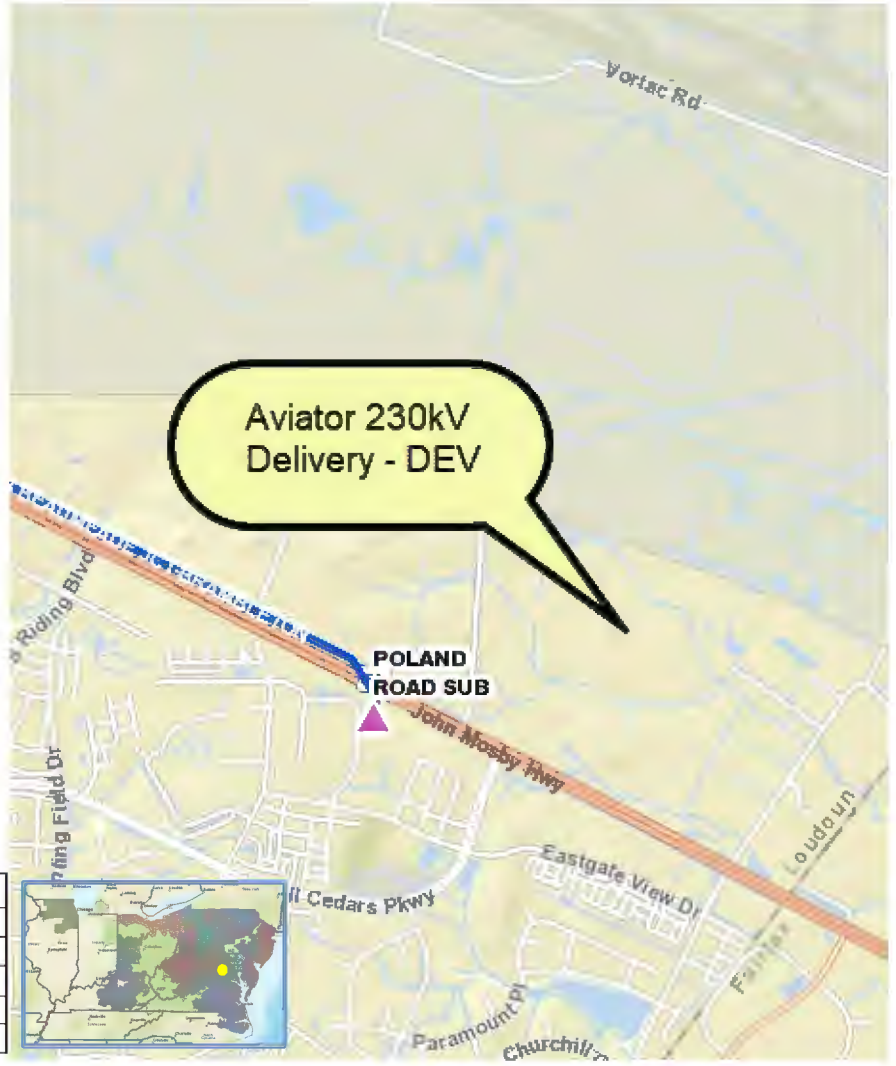
Problem Statement:

DEV Distribution has submitted a DP Request for a new substation (Aviator) to accommodate a new datacenter campus in Loudoun County with a total load in excess of 100MW. Requested in-service date is 6/01/2023.

Projected 2025 load

Summer: 116.0 MW

Winter: 110.0 MW



COLOR	VOLTAGE	TRANSMISSION LINE NUMBER
	500 KV.	500 thru 599
	230 KV.	200 thru 299 & 2000 thru 2099
	115 KV.	1 thru 199
	138 KV.	AS NOTED
	69 KV.	AS NOTED

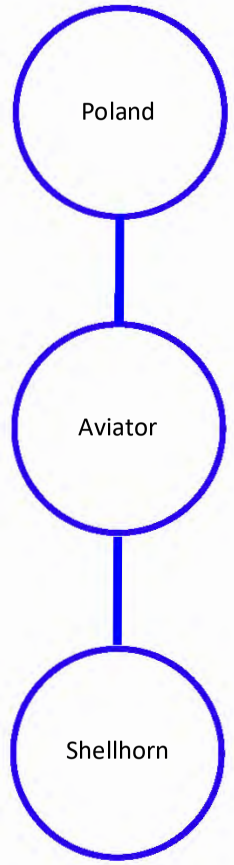
Aviator 230kV Delivery - DEV

Need Number: DOM-2020-0003

Process Stage: Submission of Supplemental Project for Inclusion in the Local Plan – 11/04/2020

Selected Solution:

Interconnect the new substation by cutting and extending Line #2137 (Poland-Shellhorn) approximately 0.5 miles to the proposed Aviator Substation. Terminate both ends into a four-breaker ring arrangement to create an Aviator-Poland line and an Aviator-Shellhorn line. Dominion's standard high ampacity conductor (bundled 768 ACSS; normal summer rating = 1572 MVA) will be used for the line extension.



34

Estimated Cost: $22.0 M

Projected In-Service: 06/01/2023

Supplemental Project ID: s2324.1

Project Status: Engineering

Model: 2025 RTEP

I. NECESSITY FOR THE PROPOSED PROJECT

K. If the need for the proposed project is due in part to reliability issues and the proposed project is a rebuild of an existing transmission line(s), provide five years of outage history for the line(s), including for each outage the cause, duration and number of customers affected. Include a summary of the average annual number and duration of outages. Provide the average annual number and duration of outages on all Applicant circuits of the same voltage, as well as the total number of such circuits. In addition to outage history, provide five years of maintenance history on the line(s) to be rebuilt including a description of the work performed as well as the cost to complete the maintenance. Describe any system work already undertaken to address this outage history.

Response: Not applicable.

I. NECESSITY FOR THE PROPOSED PROJECT

L. If the need for the proposed project is due in part to deterioration of structures and associated equipment, provide representative photographs and inspection records detailing their condition.

Response: Not applicable.

I. NECESSITY FOR THE PROPOSED PROJECT

M. In addition to the other information required by these guidelines, applications for approval to construct facilities and transmission lines interconnecting a Non-Utility Generator ("NUG") and a utility shall include the following information:

1. The full name of the NUG as it appears in its contract with the utility and the dates of initial contract and any amendments;

2. A description of the arrangements for financing the facilities, including information on the allocation of costs between the utility and the NUG;

3. a. For Qualifying Facilities ("QFs") certificated by Federal Energy Regulatory Commission ("FERC") order, provide the QF or docket number, the dates of all certification or recertification orders, and the citation to FERC Reports, if available;

b. For self-certificated QFs, provide a copy of the notice filed with FERC;

4. Provide the project number and project name used by FERC in licensing hydroelectric projects; also provide the dates of all orders and citations to FERC Reports, if available; and

5. If the name provided in 1 above differs from the name provided in 3 above, give a full explanation.

Response: Not applicable.

I. NECESSITY FOR THE PROPOSED PROJECT

N. Describe the proposed and existing generating sources, distribution circuits or load centers planned to be served by all new substations, switching stations and other ground facilities associated with the proposed project.

Response: The Aviator Substation will serve the Poland Road Load Area described in Section I.C. See also Attachment I.A.1. The Project may be used to support future load centers in the area.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

1. Provide the length of the proposed corridor and viable alternatives.

Response: The approximate lengths of the Proposed and Alternative Routes of the Aviator Loop are as follows:

Overhead Route 1A (Proposed Route): 0.90 mile

Overhead Alternative Route 1B: 0.58 mile

See Section II.A.9 of this Appendix for further discussion of the Proposed and Alternative Routes.

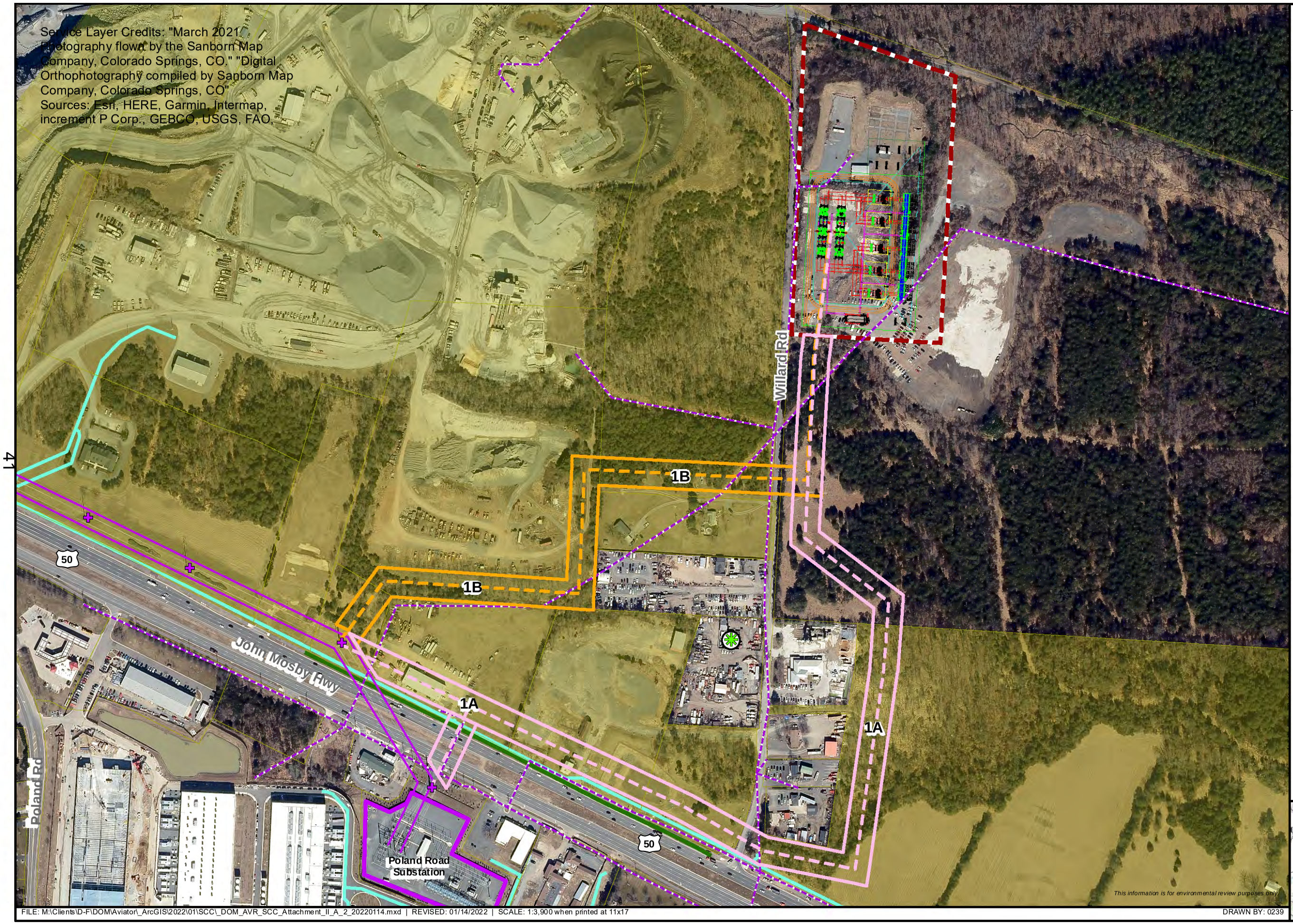
II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

2. Provide color maps of suitable scale (including both general location mapping and more detailed GIS-based constraints mapping) showing the route of the proposed line and its relation to: the facilities of other public utilities that could influence the route selection, highways, streets, parks and recreational areas, scenic and historic areas, open space and conservation easements, schools, convalescent centers, churches, hospitals, burial grounds/cemeteries, airports and other notable structures close to the proposed project. Indicate the existing linear utility facilities that the line is proposed to parallel, such as electric transmission lines, natural gas transmission lines, pipelines, highways, and railroads. Indicate any existing transmission ROW sections that are to be quitclaimed or otherwise relinquished. Additionally, identify the manner in which the Applicant will make available to interested persons, including state and local governmental entities, the digital GIS shape file for the route of the proposed line.

Response: See Attachment II.A.2. There are no existing transmission line rights-of-way that are proposed to be quitclaimed or relinquished.

The Company will make the digital Geographic Information Systems ("GIS") shape file available to interested persons upon request to the Company's legal counsel as listed in the Project Application.



Dominion Energy®

Attachment II.A.2
Transmission Line Route Alternatives
Aviator 230 kV Line Loop and Aviator Substation
Loudoun County, Virginia

- Proposed Route
- Overhead Route 1A (0.90 Miles - 100 ft ROW)
- Alternative Route
- Overhead Route 1B (0.58 Miles - 100 ft ROW)
- Proposed Aviator Substation (Approximately 12.48 Acres)
- Telecomunication Tower
- Loudoun Water Line
- Natural Gas Pipeline
- Parcel Boundary
- Chantilly Crushed Stone Property

Existing Dominon Infrastructure

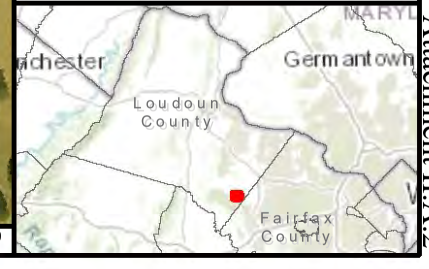
- Transmission Structure
- Transmission Line
- Distribution Line
- Poland Road Substation

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Feet

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N W E S



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II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

3. Provide a separate color map of a suitable scale showing all the Applicant's transmission line ROWs, either existing or proposed, in the vicinity of the proposed project.

Response: See Attachment I.G.1.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

4. To the extent the proposed route is not entirely within existing ROW, explain why existing ROW cannot adequately service the needs of the Applicant.

Response: There is no existing Company-owned right-of-way that serves the Customer's Campus C.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

5. Provide drawings of the ROW cross section showing typical transmission line structure placements referenced to the edge of the ROW. These drawings should include:

a. ROW width for each cross section drawing;

b. Lateral distance between the conductors and edge of ROW;

c. Existing utility facilities on the ROW; and

d. For lines being rebuilt in existing ROW, provide all of the above (i) as it currently exists, and (ii) as it will exist at the conclusion of the proposed project.

Response: See Attachment II.A.5.a.

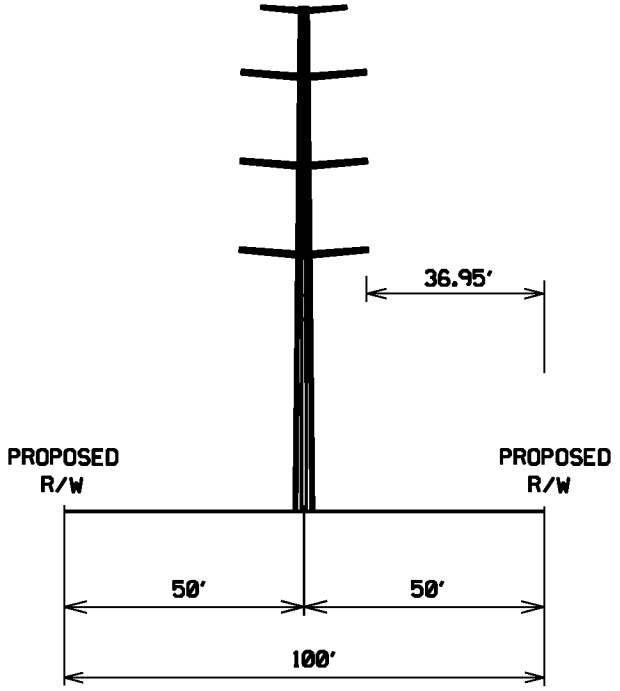
For additional information on the structure, see Section II.B.3.

AVIATOR DP

PRELIMINARY

PROPOSED
230KV CIRCUIT
(LINE #2137)

PROPOSED
230KV CIRCUIT
(LINE #2221)



PROPOSED CONFIGURATION
TYPICAL CORRIDOR LOOKING TO AVIATOR

NOTE: Information contained on drawing is to be considered preliminary in nature and subject to change based on final design.

$DGNSPEC$

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

6. Detail what portions of the ROW are subject to existing easements and over what portions new easements will be needed.

Response: As discussed in Section II.A.4, there is no existing Company-owned right-of-way that serves the Customer's Campus C. Therefore, the entire right-of-way for the Project will require easements for a new-build transmission line. However, portions of the routes will parallel existing, non-transmission line easements, as discussed below.

The portion of the Proposed Route that parallels Route 50 will be collocated with a variety of existing utility infrastructure, including a Dominion Energy Virginia overhead distribution line right-of-way, a Loudoun County Sanitation Authority ("Loudoun Water") utility line, a natural gas pipeline, and storm/sewer management lines for a total of approximately 0.32 mile. The Proposed Route will also cross existing overhead distribution line rights-of-way in three locations, and will cross storm sewer/management easements, water line easements, and natural gas easements. See Attachment II.A.6.

The Company's Distribution Planning group is working to underground the electric distribution lines and the attached telecommunications equipment, as needed, along the north side of Route 50 where the Proposed Route is located.

Overhead Alternative Route 1B will parallel an existing Dominion Energy Virginia overhead electric distribution line right-of-way for approximately 0.16 mile. The route will cross existing overhead distribution lines rights-of-way in four locations as well as crossing storm sewer/management easements and water line easements. See Attachment II.A.6.

The Company will purchase the property from the Customer for the Aviator Substation.

Service Layer Credits: "March 2021 Photography flown by the Sanborn Map Company, Colorado Springs, CO." "Digital Orthophotography compiled by Sanborn Map Company, Colorado Springs, CO"
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO,

Willard Rd

1B

1B

1A

1A

50

50

SEE PAGE 2

John Mosby Hwy

Poland Road Substation

Poland Rd

47

Easement Type

- Electric
- Natural Gas
- Phone/Communications
- Sanitary Sewer
- Storm Sewer/Management
- Utility
- Water

This information is for environmental review purposes only.

Dominion Energy®

Attachment II.A.6
Existing Easements
Aviator 230 kV Line Loop and Aviator Substation
Loudoun County, Virginia
PAGE 1

- Proposed Route
- Overhead Route 1A (0.90 Miles - 100 ft ROW)
- Alternative Route
- Overhead Route 1B (0.58 Miles - 100 ft ROW)
- Proposed Aviator Substation (Approximately 12.48 Acres)
- Telecomunication Tower
- Loudoun Water Line
- Natural Gas Pipeline
- Parcel Boundary

Existing Dominon Infrastructure

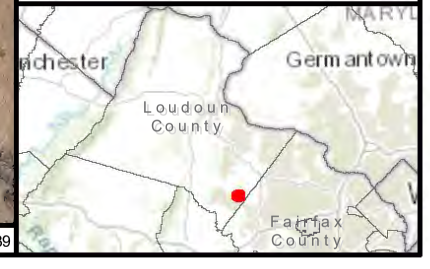
- Transmission Structure
- Transmission Line
- Distribution Line
- Poland Road Substation

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Feet

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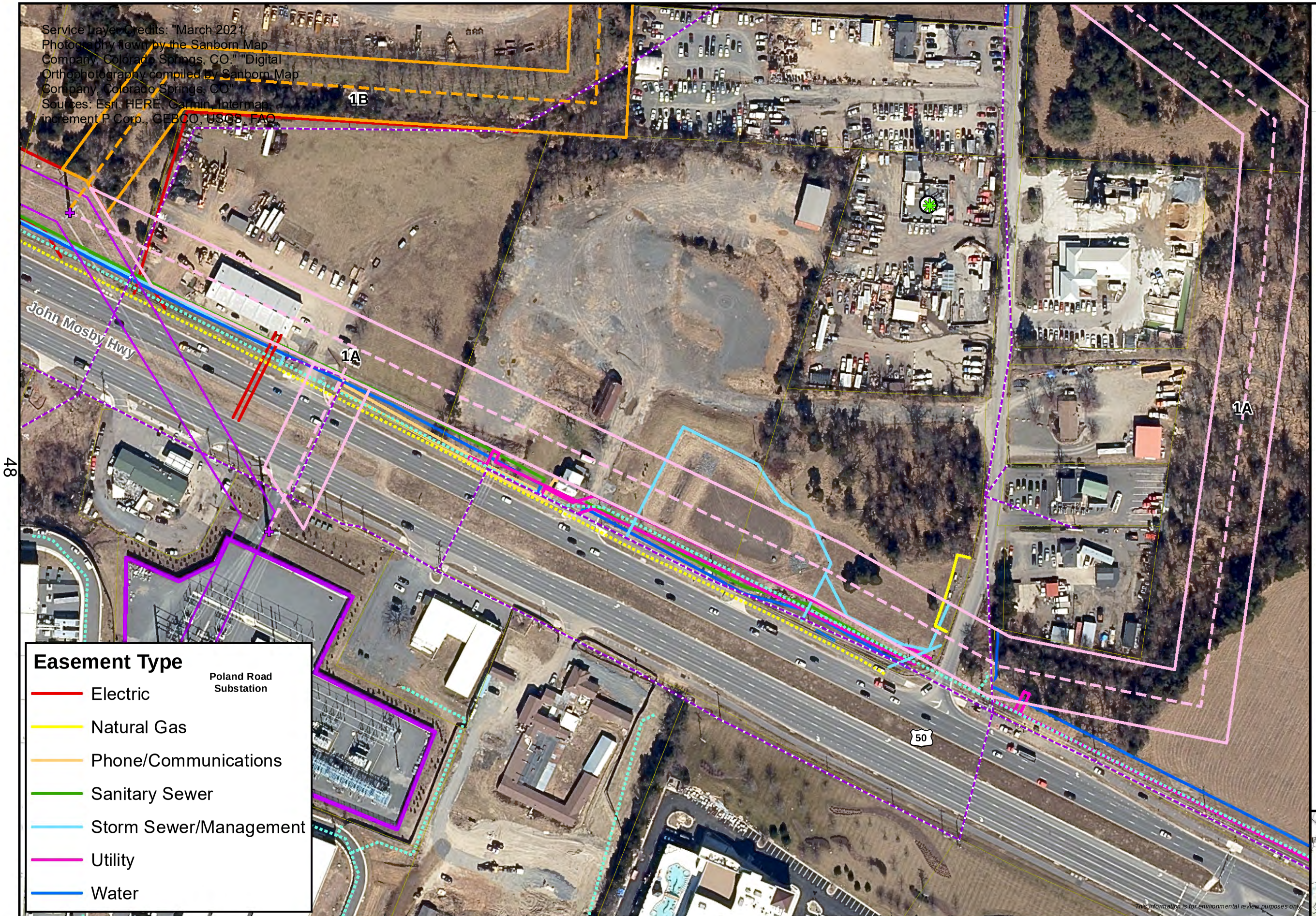
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Attachment II.A.6



Dominion Energy®

Attachment II.A.6
Existing Easements
Aviator 230 kV Line Loop and Aviator Substation
Loudoun County, Virginia
PAGE 2

- Proposed Route
- Overhead Route 1A (0.90 Miles - 100 ft ROW)
- Alternative Route
- Overhead Route 1B (0.58 Miles - 100 ft ROW)
- Telecomunication Tower
- Loudoun Water Line
- Natural Gas Pipeline
- Parcel Boundary

Existing Dominon Infrastructure

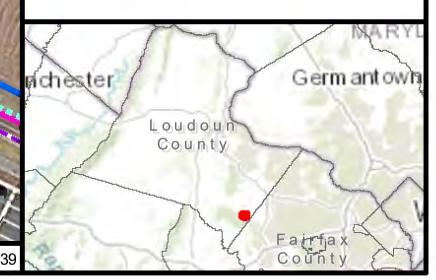
- Transmission Structure
- Transmission Line
- Distribution Line
- Poland Road Substation

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Feet

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N W E S



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II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

7. Detail the proposed ROW clearing methods to be used and the ROW restoration and maintenance practices planned for the proposed project.

Response: The right-of-way width for the overhead Proposed Route and Overhead Alternative Route 1B will be 100 feet. In general, the entire right-of-way for either route would require clearing; however, based on existing conditions, clearing would not be required over certain portions of the Proposed Route that overlap existing maintained rights-of-way. The locations of these existing rights-of-way are discussed in Section II.A.6.

Trimming of tree limbs along the edge of the right-of-way may be conducted to support construction activities for the Project. For any such minimal clearing within the right-of-way, trees will be cut to no more than three inches above ground level. Trees located outside of the right-of-way that are tall enough to potentially impact the transmission facilities, commonly referred to as "danger trees," may also need to be cut. Danger trees will be cut to be no more than three inches above ground level, limbed, and will remain where felled. Debris that is adjacent to homes will be disposed of by chipping or removal. In other areas, debris may be mulched or chipped as practicable. Danger tree removal will be accomplished by hand in wetland areas and within 100 feet of streams, if applicable. Care will be taken not to leave debris in streams or wetland areas. Matting will be used for heavy equipment in these areas. Erosion control devices will be used on an ongoing basis during all clearing and construction activities accompanied by weekly Virginia Stormwater Management Program inspections.

Erosion control will be maintained and temporary stabilization for all soil disturbing activities will be used until the right-of-way has been restored. Upon completion of the Project, the Company will restore the right-of-way utilizing site rehabilitation procedures outlined in the Company's *Standards & Specifications for Erosion & Sediment Control and Stormwater Management for Construction and Maintenance of Linear Electric Transmission Facilities* that was approved by the Virginia Department of Environmental Quality ("DEQ"). Time of year and weather conditions may affect when permanent stabilization takes place.

This right-of-way will continue to be maintained on a regular cycle to prevent interruptions to electric service and provide ready access to the right-of-way in order to patrol and make emergency repairs. Periodic maintenance to control woody growth will consist of hand cutting, machine mowing, and herbicide application.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

8. Indicate the permitted uses of the proposed ROW by the easement landowner and the Applicant.

Response: Any non-transmission use will be permitted that:

- Is in accordance with the terms of the easement agreement for the right-of-way;
- Is consistent with the safe maintenance and operation of the transmission lines;
- Will not restrict future line design flexibility; and
- Will not permanently interfere with future construction.

Subject to the terms of the easement, examples of typical permitted uses include but are not limited to:

- Agriculture,
- Hiking Trails,
- Fences,
- Perpendicular Road Crossings,
- Perpendicular Utility Crossings,
- Residential Driveways, and
- Wildlife / Pollinator Habitat.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

9. Describe the Applicant's route selection procedures. Detail the feasible alternative routes considered. For each such route, provide the estimated cost and identify and describe the cost classification (e.g. "conceptual cost," "detailed cost," etc.). Describe the Applicant's efforts in considering these feasible alternatives. Detail why the proposed route was selected and other feasible alternatives were rejected. In the event that the proposed route crosses, or one of the feasible routes was rejected in part due to the need to cross, land managed by federal, state, or local agencies or conservation easements or open space easements qualifying under §§ 10.1-1009 – 1016 or §§ 10.1-1700 – 1705 of the Code (or a comparable prior or subsequent provision of the Code), describe the Applicant's efforts to secure the necessary ROW.

Response: The Company's route selection for a new transmission line typically begins with identification of the project "origin" and "termination" points provided by the Company's Transmission Planning group. This is followed by the development of a study area for the project. The study area represents a circumscribed geographic area from which potential routes that may be suitable for a transmission line can be identified.

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. After investigating various electrical solutions, the Company identified one viable electrical solution for the Project: a 230 kV overhead or underground route that would cut the existing Line #2137 out of Poland Road Substation and extend northeast to the proposed Aviator Substation. ERM then developed a study area for this solution that encompassed the area surrounding the proposed Aviator Substation and potential junction locations with Line #2137.

ERM originally identified eight potential route alternatives between Line #2137 and the Aviator Substation, which included the identification of six overhead and two underground routes. Of the six overhead routes, one overhead route (Overhead Route 1A) was identified as the Proposed Route and one overhead route (Overhead Route 1B) was identified as a potentially viable alternative to the Proposed Route.

One overhead route (Overhead Route 1C) was dismissed due to landowner impacts. Two overhead routes (Overhead Routes 1D and 1E) were rejected following consultation with Loudoun County based on visual impacts of these routes to Route 50, as the routes would parallel the southern side of Route 50 and also would require a new overhead crossing of Route 50. Finally, the remaining overhead route

(Overhead Route 2A) would cross Metropolitan Washington Airports Authority ("MWAA") property. This route was rejected due to multiple concerns expressed by MWAA, including impacts to a live fire training facility, critical height restrictions for the transmission line structures, the presence of several existing and proposed utility and road corridors, and conflicts with maintenance and security operations at the airport.

Potential underground routes were investigated for the Project. The underground alternative routes required either the construction of a transition station at the Aviator Junction on the north side of Route 50 across from the Poland Road Substation, or installation of transition equipment at the existing Poland Road Substation on the south side of Route 50. Two potential routes were identified (Underground Routes A and B) from a transition station on the north side of Route 50 to Aviator Substation. These two routes were rejected primarily due to Loudoun County's concerns about the visual impacts of a new aboveground facility (transition station) on the north side of Route 50, as well as the landowner's objection that the development of the transition station would preclude their ability to develop their frontage property along Route 50.

In investigating the option for an underground route starting on the south side of Route 50 (at Poland Road Substation), this option was rejected due to lack of space at the substation. Consequently, no underground routes were developed for this solution. The equipment required for an underground route to terminate at the Poland Road Substation would have required an expansion of the Poland Road Substation to the west.[11] There is not adequate space to expand the Poland Road Substation to the west without taking an existing business. Expansion to the east cannot be accommodated either, in light of the planned distribution expansion of the Poland Road Substation to provide service to the planned data centers on the eastern adjacent property.

The route development process for the Project is described in more detail in the Environmental Routing Study. The Proposed and Alternative Routes are discussed below. Refer to Section 2.5 of the Environmental Routing Study for additional information on the rejected routes.

PROPOSED AND ALTERNATIVE ROUTES

Overhead Route 1A (Proposed Route)

This route would construct an overhead double circuit 230 kV line from the proposed cut-in of existing Line #2137 (Line #2183) at Structures #2137/133-134

[11] The underground routes would require cutting Line #2137 and constructing two overhead to underground transition terminals at Poland Road Substation. Each line terminal would have a 230 kV backbone structure, four sets of 230 kV switches, arresters, current transformers, rigid busses, and overhead to underground bushings. This equipment would require an approximate 150' x 400' area fence-to-fence.

(Structures #2183/58-57) on the north side of Route 50, to the proposed Aviator Substation. See Section I.I for the estimated conceptual cost of the Proposed Route.

The length of the corridor for Overhead Route 1A is approximately 0.90 mile. Beginning from the cut-in location, the route heads southeast for about 0.32 mile, paralleling the northern side of Route 50 and crossing Willard Road. This portion of the route also parallels portions of existing Dominion Energy Virginia distribution line rights-of-way and a Loudoun Water right-of-way. The Company's Distribution Planning group is working to underground the electric distribution lines and the attached telecommunications equipment, as needed, along the north side of Route 50 where Overhead Route 1A is located. After crossing Willard Road, the route pivots slightly to the northeast for 0.06 mile before turning north through a wooded area behind industrial businesses for approximately 0.18 mile. The route continues northwest for about 0.07 mile before turning north and paralleling the east side of Willard Road for the remaining 0.21 mile before terminating at the substation location. The 0.9-mile Overhead Route 1A includes removal of one existing overhead span of double circuit 230 kV line located entirely within existing right-of-way between existing Structures #2137/133-134 (Structures #2183/58-57), and installation of a new overhead double circuit 230 kV line in new right-of-way for approximately 0.1 mile from existing Structure #2137/133 (Structure #2183/58) to the Aviator Junction, and for approximately 0.06 mile from the Aviator Junction to existing Structure #2137/134 (Structure #2183/57) at Poland Road Substation.

Construction of Overhead Route 1A will cross a total of 0.90 mile of land affecting 22.08 acres of right-of-way (including 12.481 acres for the proposed Aviator Substation). All seven parcels crossed are privately owned. Land use along the Overhead Route 1A right-of-way consists of 8.63 acres of forested land, 8.91 acres of developed land, and 4.53 acres of open space. Overhead Route 1A crosses 0.53 mile of Chantilly Crushed Stone ("CCS") property. While this route would require the removal/relocation of several existing industrial/commercial buildings associated with the quarry, CCS has indicated that this overhead route would be preferable to minimize impacts to existing quarry operations. See Attachment II.A.9.a. Based on discussions with CCS, and the attached letter from Mr. Hoy on its behalf (Attachment II.A.9.a), CCS plans to provide the easement to cross the CCS property along Overhead Route 1A, subject to the parties' negotiations regarding compensation. The Company has been working with Loudoun County and CCS and is committed to developing a landscaping plan that will mitigate visual impacts of the Proposed Route along Route 50 and CCS property. The Company has also worked with Capital Sealing and Paving Company regarding mitigation of visual impacts of the Proposed Route along that property, and has agreed to install a 12-foot screening fence along the property line.

Based on ERM's desktop wetland and waterbody analysis, the right-of-way of Overhead Route 1A will encompass approximately 15.31 percent (3.38 acres) of land with a medium or higher probability of containing wetlands and waterbodies. Of these 3.38 acres, the majority (3.19 acres) consist of palustrine forested ("PFO")

wetlands. Overhead Route 1A will cross four waterbodies having intermittent flow. All four waterbodies are unnamed tributaries to Sand Branch. The route also crosses one stormwater retention facility that is not identified by National Wetland Inventory ("NWI") or National Hydrography Dataset ("NHD"), located just north of Route 50. It appears to function as a "dry" stormwater facility that was constructed in uplands, designed to hold water for a short period of time before allowing water to discharge into a nearby wetland. Aerial imagery shows that the facility is regularly maintained within the limits of existing exclusion fencing. As such, no open waterbody features (*e.g.*, reservoirs, lakes, and ponds) are crossed by this route. Lastly, Overhead Route 1A will require the clearing of about 8.63 acres of forested land.

Overhead Route 1A will be collocated for a total 0.53 of mile, including 0.02 mile of existing overhead line collocation, 0.32 mile of paralleled road, distribution and underground utilities, and 0.18 mile of planned access road collocation (as part of a planned data center development).

Overhead Route 1A would have the fewest impacts to the current and future operation of the CCS quarry. CCS has expressed significant concerns regarding the development of a transmission line on its property in proximity to the quarry operations. In particular, CCS has stated that certain overhead route options would negatively impact its business operations, specifically the ability to operate cranes and other large construction vehicles within the transmission line right-of-way and potentially limit any future expansion of the quarry. While Overhead Alternative Route 1B is shorter than Overhead Route 1A and has fewer environmental impacts (forested land, wetlands, waterbody crossings), Overhead Route 1A was determined to be the preferred route by the primary landowner impacted by the Project as it would not impede the operation and future expansion of the quarry. Overhead Route 1A parallels Route 50 and extends north across an area of CCS property that is outside of the current Virginia Energy (formerly Virginia Department of Mines, Minerals, and Energy) permit extent for the quarry, whereas Overhead Alternative Route 1B crosses portions of CCS property within the extent of the Virginia Energy permit. Overhead Route 1A also would have the least predicted visual impact on the residential properties along Willard Road and on travelers on Route 50 as a result of the replacement of the existing diagonal crossing of Route 50 with a perpendicular crossing and the collocation of the route with Route 50. Additionally, Overhead Route 1A takes advantage of collocation opportunities along Route 50 and is located further from the two residences in the Project area. For these reasons, the Company has selected Overhead Route 1A as its Proposed Route.

Overhead Alternative Route 1B

This route would construct an overhead double circuit 230 kV line from the proposed cut-in of existing Line #2137 (Line #2183) at Structure #2137/133 on the north side of Route 50, to the proposed Aviator Substation. The estimated

conceptual cost of Overhead Alternative Route 1B is approximately $19.1 million (2021 dollars).

The length of the corridor for the Overhead Alternative Route 1B is approximately 0.58 mile. Beginning from the cut-in location, the route heads northeast for 0.05 mile across an undeveloped CCS parcel. The route then heads east for 0.13 mile and turns north for an additional 0.08 mile following the parcel boundary of a CCS owned parcel that is part of active business operation. The route then continues east for 0.13 mile across Willard Road and an undeveloped CCS parcel. Heading into the substation parcel, the route turns to the north and continues for 0.19 mile before terminating at the proposed Aviator Substation.

Construction of Overhead Alternative Route 1B will cross a total of 0.58 mile of land affecting 18.60 acres of right-of-way (including 12.481 acres for the proposed substation). All four parcels crossed are privately owned. Land use along the Overhead Alternative Route 1B right-of-way consists of 8.06 acres of forested land, 7.35 acres of developed land, and 3.20 acres of open space. The majority (0.39 mile) of privately owned land crossed by Overhead Alternative Route 1B is owned by CCS. CCS has expressed concerns regarding the impacts of the development of an overhead transmission line across its property. In particular, CCS has stated that this overhead route would negatively impact its business operations, specifically the ability to operate cranes and other large construction vehicles within the transmission line right-of-way. Additionally, this route crosses land closer to the existing excavated portion of the quarry, and would therefore have the potential to cause impacts on future expansion of the quarry.

Based on ERM's desktop wetland and waterbody analysis, the right-of-way of Overhead Alternative Route 1B will encompass approximately 11.29 percent (2.10 acres) of land with a medium or higher probability of containing wetlands and waterbodies. Of this 2.10 acres, the majority (1.61 acres) consist of PFO wetlands. Overhead Alternative Route 1B will cross three waterbodies having intermittent flow. All three waterbodies are unnamed tributaries to Sand Branch. Lastly, Overhead Alternative Route 1B will require the clearing of about 8.06 acres of forested land.

Overhead Alternative Route 1B will be collocated for a total of 0.24 mile, including 0.16 mile of existing overhead distribution line collocation and 0.08 mile of planned access road collocation (as part of a planned data center development).

When comparing Overhead Alternative Route 1B with Proposed Route 1A, Route 1B would have fewer environmental impacts (forested land, wetlands, waterbody crossings) and greater landowner impacts associated with the crossing of CCS property. CCS has expressed significant concerns regarding the development of a transmission line on its property in proximity to the quarry operations. In particular, CCS has stated that certain overhead route options would negatively impact its business operations, specifically the ability to operate cranes and other large construction vehicles within the transmission line right-of-way and potentially limit

any future expansion of the quarry. Additionally, Overhead Alternative Route 1B would have greater visual impacts on the local residents/workers using Willard Road because of the amount of tree clearing and associated open views into the existing quarry operation. The retention of the existing diagonal crossing of Route 50 for this route does not take advantage of improvements from the perpendicular design associated with Overhead Route 1A and the limited visual contrast from such a crossing. While acknowledging the impacts of Overhead Route 1B, the Company proposes Overhead Route 1B as a viable alternative to Overhead Route 1A.

CHANTILLY CRUSHED STONE

January 20, 2022

Mr. Chris A. Lybolt
Electric T&D Projects Manager II
Dominion Energy Virginia
2400 Grayland Avenue
Richmond, VA 23220

Re: Dominion Easement/Right of Way for Transmission Line for the Aviator Project

Dear Mr. Lybolt:

On behalf of Chantilly Crushed Stone, Inc. ("CCS"), I am writing to summarize and confirm the discussions and negotiations among CCS, Dominion, and Loudoun County officials. CCS appreciates the extensive time the parties have devoted regarding the routing of a new transmission line for the above referenced Aviator Project. As we have discussed, there is an existing line located on CCS property on the north side of Route 50, which currently leads into the Poland Road substation. CCS understands Dominion's need to tap into that existing transmission line on the north side of Route 50 and run a line over CCS's property to provide power to the new Aviator substation.

The parties have reviewed numerous routes from the tap point over CCS property, in both overhead and underground options. The parties have worked to identify the route that results in the least impact on CCS's current and planned mining operations, as well as planned development opportunities, and also mitigates visual impacts for the public along Route 50. Based on these extensive discussions among the three parties, CCS believes that the route identified by Dominion as Route 1A is preferred by CCS, as having the least impact to its current and future land use. Further, as part of Route 1A, the parties have agreed to certain mitigation measures (*e.g.*, adding some fencing to be located along the property line), which CCS understands are acceptable to the County to lessen potential visual impacts along Route 50. CCS agrees with these measures. CCS also has reviewed Route 1B, which it understands will be reviewed by the State Corporation Commission, and believes that route would disrupt current and planned mining operations, as well as future development, significantly, including greatly limiting CCS's ability to mine a significant portion of its property. These disruptions and limitations would come at great financial loss and impact to CCS, and its employees.

With the above in mind, CCS provides this letter to serve as its support for Route 1A over its property. CCS notes further that based on these negotiations, and pending futures discussions on compensation, at the appropriate time, it intends to grant Dominion the necessary easement and right of way for the construction, operation, maintenance, and reconstruction of Route 1A, voluntarily. Further, consistent with Route 1A, CCS intends to work with Dominion and the County to hone and implement the agreed upon visual mitigation measures.

Please feel free to contact me with any questions, and I look forward to our continued cooperation.

Sincerely,



Edward J. Hoy
President of Chantilly Crushed Stone, Inc.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

10. Describe the Applicant's construction plans for the project, including how the Applicant will minimize service disruption to the affected load area. Include requested and approved line outage schedules for affected lines as appropriate.

Response: The Company plans to construct the Aviator Loop in a manner that minimizes outage time on Line #2137. Assuming construction commences around May 31, 2023, the cut-in of the lines going to Aviator Substation should start in summer 2024. The cut-in process will require a PJM outage eDart ticket on Poland Road-Shellhorn Line #2137. The line cut-in should require a 45-day outage. Additionally, the Project will require a PJM outage eDart ticket on Brambleton-Poland Road Line #2183 to relocate the conductor for the Proposed Route (Overhead Route 1A), which should require a 10-day outage. Assuming a final order from the Commission by November 30, 2022, as requested in Section I.H. of this Appendix, the Company estimates that construction of the new Project will commence around May 31, 2023, and be completed by September 30, 2024.

The Company will request this outage from PJM prior to the date of such outages. It is customary for PJM not to grant approval of outages until shortly before the outages are expected to occur and, therefore, it may be subject to change.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

11. Indicate how the construction of this transmission line follows the provisions discussed in Attachment 1 of these Guidelines.

Response: Attachment 1 of these Guidelines contains a tool routinely used by the Company in routing its transmission line projects.

The Company utilized Guideline #1 (existing rights-of-way should be given priority when adding additional facilities) by siting portions the route for the proposed Project along an existing overhead electric distribution line right-of-way for about 0.20 mile. In addition, the Proposed Route also would parallel a Loudoun Water line, natural gas pipeline, other underground utility lines, and Route 50 for the same 0.20 mile and an additional 0.13 mile. The Proposed Route would also parallel a planned access road as part of a planned data center development for about 0.18 mile. Collocation distances for Overhead Alternative Route 1B are presented in Section III.D.

The proposed Project will have no impact to any site listed on the National Register of Historic Places ("NRHP"). Thus, it is consistent with Guideline #2 (where practical, rights of-way should avoid sites listed on the NRHP). A Stage I Pre-Application Analysis prepared by ERM on behalf of the Company, which is included as Attachment F of the Environmental Routing Study. The Company submitted the Stage I Pre-Application Analysis to the Virginia Department of Historic Resources ("VDHR") on January 27, 2022.

The Company follows recommended construction methods in the Guidelines on a site-specific basis for typical construction projects (Guidelines #8, #10, #11, #15, #16, #18, and #22).

The Company also utilizes recommended guidelines in clearing right-of-way, constructing facilities, and maintaining rights-of-way after construction. Moreover, secondary uses of right-of-way that are consistent with the safe maintenance and operation of facilities are permitted.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way ("ROW")

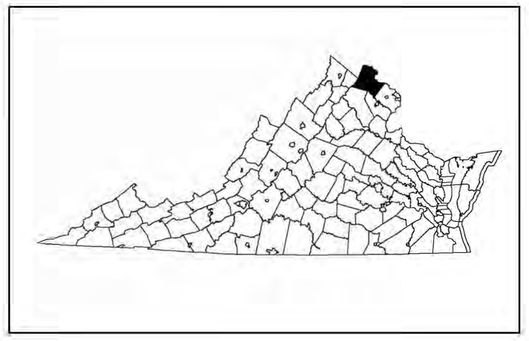
12. a. Detail counties and localities through which the line will pass. If any portion of the line will be located outside of the Applicant's certificated service area: (1) identify each electric utility affected; (2) state whether any affected electric utility objects to such construction; and (3) identify the length of line(s) proposed to be located in the service area of an electric utility other than the Applicant; and

b. Provide three (3) color copies of the Virginia Department of Transportation "General Highway Map" for each county and city through which the line will pass. On the maps show the proposed line and all previously approved and certificated facilities of the Applicant. Also, where the line will be located outside of the Applicant's certificated service area, show the boundaries between the Applicant and each affected electric utility. On each map where the proposed line would be outside of the Applicant's certificated service area, the map must include a signature of an appropriate representative of the affected electric utility indicating that the affected utility is not opposed to the proposed construction within its service area.

Response: a. The Project traverses through Loudoun County, Virginia for a total of approximately 0.90 mile, and is located entirely within the Company's certificated service territory.

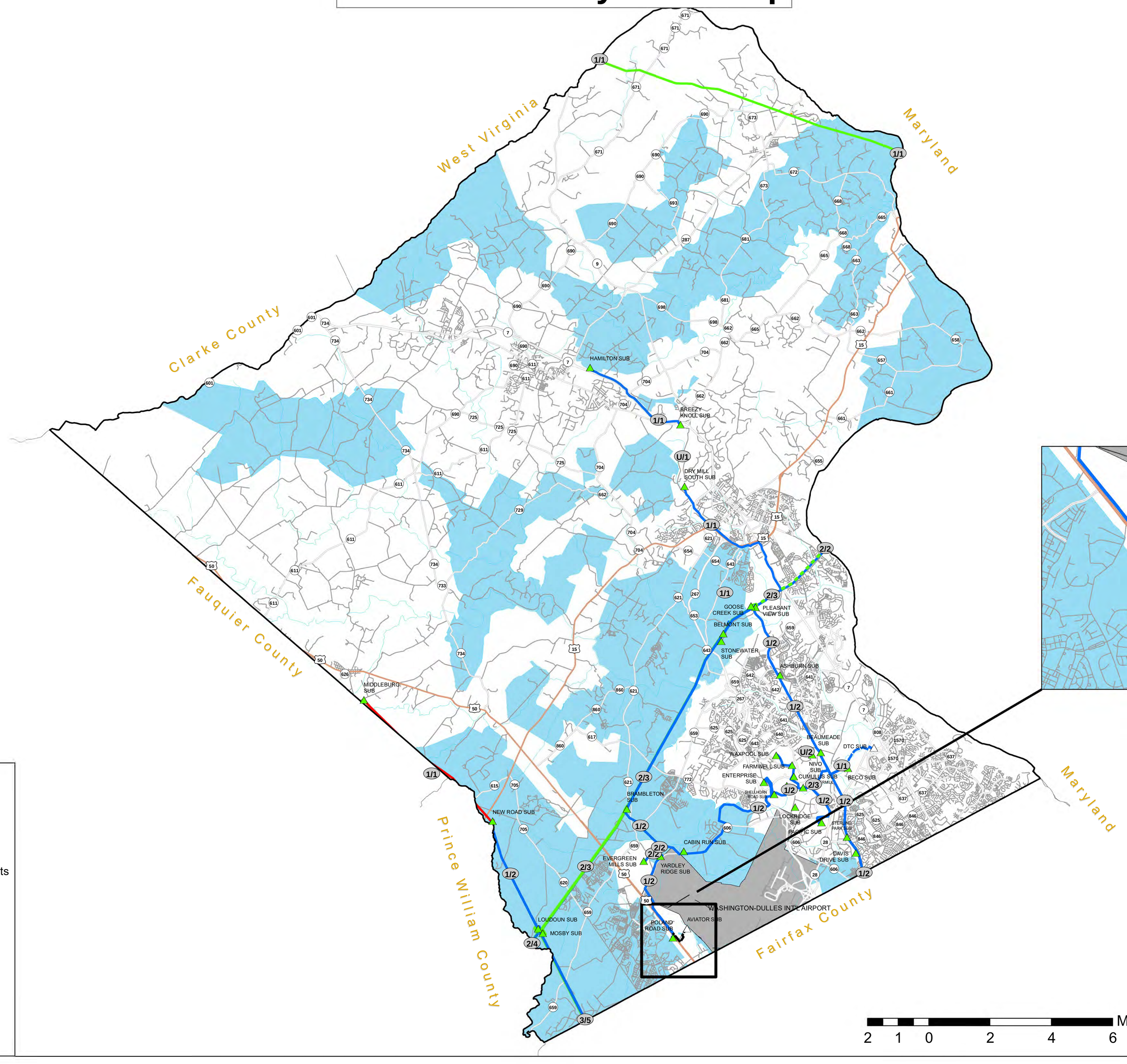
b. An electronic copy of the Virginia Department of Transportation "General Highway Map" for Loudoun County has been marked as required and submitted with the Application. A reduced copy of the map is provided as Attachment II.A.12.b.

Loudoun County Road Map



This digital map depicts the Virginia Electric and Power Company ("Company") transmission facilities in this county as approved by the Virginia State Corporation Commission ("SCC"), and any proposed transmission facilities in this county, as of January 27, 2022. Other Company facilities previously authorized by the SCC may be depicted on prior SCC approved county maps.

VIRGINIA ELECTRIC AND POWER COMPANY PLANS TO BUILD TRANSMISSION LINES AND SUBSTATIONS AS SHOWN IN BLACK DASHES ON THIS MAP.



Legend

- Proposed Project
- 500kV Under Consideration by SCC
- 230kV Under Consideration by SCC
- 1/1 Number of Lines of Structures/Number of Circuits
- △ Proposed Substation
- ▲ Existing Substation
- 115 kV
- 230 kV
- 500 kV

Provider Service Territory

- NOVEC
- VEPCO

*VDOT and other road data obtained from Navteq and County data, current as of June 2016.

Loudoun

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Attachment II.A.12.b

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

1. Detail the number of circuits and their design voltage, initial operational voltage, any anticipated voltage upgrade, and transfer capabilities.

Response: The proposed double circuit 230 kV line will be designed and operated at 230 kV with no anticipated voltage upgrade and have a transfer capability of 1,573 MVA.

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

2. Detail the number, size(s), type(s), coating and typical configurations of conductors. Provide the rationale for the type(s) of conductor(s) to be used.

Response: The proposed double circuit 230 kV line will include 3-phase twin-bundled 768.2 ACSS/TW/HS conductors arranged as shown in Attachments II.B.3.i-iii. The twin-bundled 768.2 ACSS/TW/HS conductors are a Company standard for new 230 kV construction.

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

3. With regard to the proposed supporting structures over each portion of the ROW for the preferred route, provide diagrams (including foundation reveal) and descriptions of all the structure types, to include:

a. mapping that identifies each portion of the preferred route;

b. the rationale for the selection of the structure type;

c. the number of each type of structure and the length of each portion of the ROW;

d. the structure material and rationale for the selection of such material;

e. the foundation material;

f. the average width at cross arms;

g. the average width at the base;

h. the maximum, minimum and average structure heights;

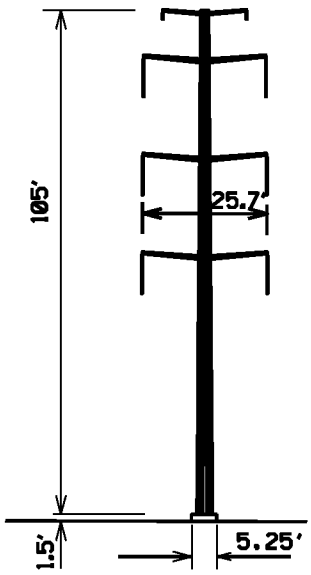
i. the average span length; and

j. the minimum conductor-to-ground clearances under maximum operating conditions.

Response: See Attachments II.B.3.i-iii. For subpart (a), see Attachment II.B.3.iv.

DOUBLE CIRCUIT SUSPENSION STEEL POLE

PRELIMINARY



PROPOSED STRUCTURES

a. MAPPING THAT IDENTIFIES EACH PORTION OF THE PREFERRED ROUTE: SEE ATTACHMENT II.B.3.iv

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE: THE SINGLE SHAFT STEEL POLE ALLOWS THE INSTALLATION OF THE DOUBLE CIRCUIT LINE IN A 100' R/W AND REDUCES THE FOOTPRINT OF THE STRUCTURE

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W: 2 AND 0.72 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL: GALVANIZED STEEL TO MATCH EXISTING STRUCTURES

e. FOUNDATION MATERIAL: CONCRETE

f. AVERAGE WIDTH AT CROSSARM: 25.7'

G. AVERAGE WIDTH AT BASE: 5.25' DIAMETER

h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 110 FEET, 100', AND 105' (DOES NOT INCLUDE FOUNDATION REVEAL)

i. AVERAGE SPAN LENGTH: 382 FEET (RANGE 193 - 662 FEET)

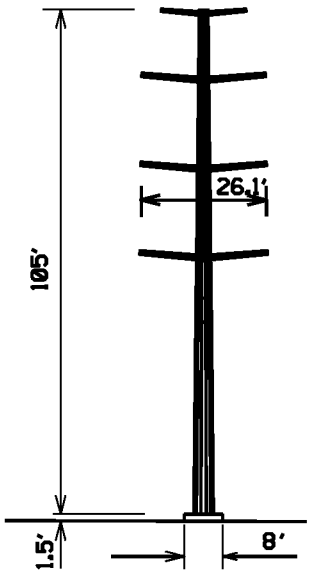
j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS: 22.5'

NOTE: Information contained on drawing is to be considered preliminary in nature and subject to change based on final design.

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DOUBLE CIRCUIT DOUBLE DEADEND STEEL POLE

PRELIMINARY



PROPOSED STRUCTURES

a. MAPPING THAT IDENTIFIES EACH PORTION OF THE PREFERRED ROUTE: SEE ATTACHMENT II.B.3.iv

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE: THE SINGLE SHAFT STEEL POLE ALLOWS THE INSTALLATION OF THE DOUBLE CIRCUIT LINE IN A 100' R/W AND REDUCES THE FOOTPRINT OF THE STRUCTURE

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W: 7 AND 0.72 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL: GALVANIZED STEEL TO MATCH EXISTING STRUCTURES

e. FOUNDATION MATERIAL: CONCRETE

f. AVERAGE WIDTH AT CROSSARM: 26.1'

G. AVERAGE WIDTH AT BASE: 8' DIAMETER

h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 115 FEET, 100', AND 102' (DOES NOT INCLUDE FOUNDATION REVEAL)

i. AVERAGE SPAN LENGTH: 382 FEET (RANGE 193 - 662 FEET)

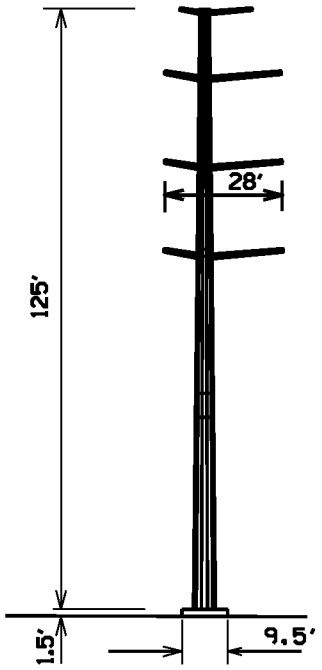
j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS: 22.5'

NOTE: Information contained on drawing is to be considered preliminary in nature and subject to change based on final design.

$DGNSPEC$

TRIPLE CIRCUIT DOUBLE DEADEND STEEL POLE

PRELIMINARY



PROPOSED STRUCTURES

a. MAPPING THAT IDENTIFIES EACH PORTION OF THE PREFERRED ROUTE:
SEE ATTACHMENT II.B.3.iv

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE: ALLOWS THE EXISTING LINE TO BE CUT TO LOOP TO AVIATOR AND MINIMIZES FOOTPRINT OF STRUCTURE

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:
1 AND 0.72 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:
GALVANIZED STEEL TO MATCH EXISTING STRUCTURES

e. FOUNDATION MATERIAL: CONCRETE

f. AVERAGE WIDTH AT CROSSARM: 28'

G. AVERAGE WIDTH AT BASE: 9.5' DIAMETER

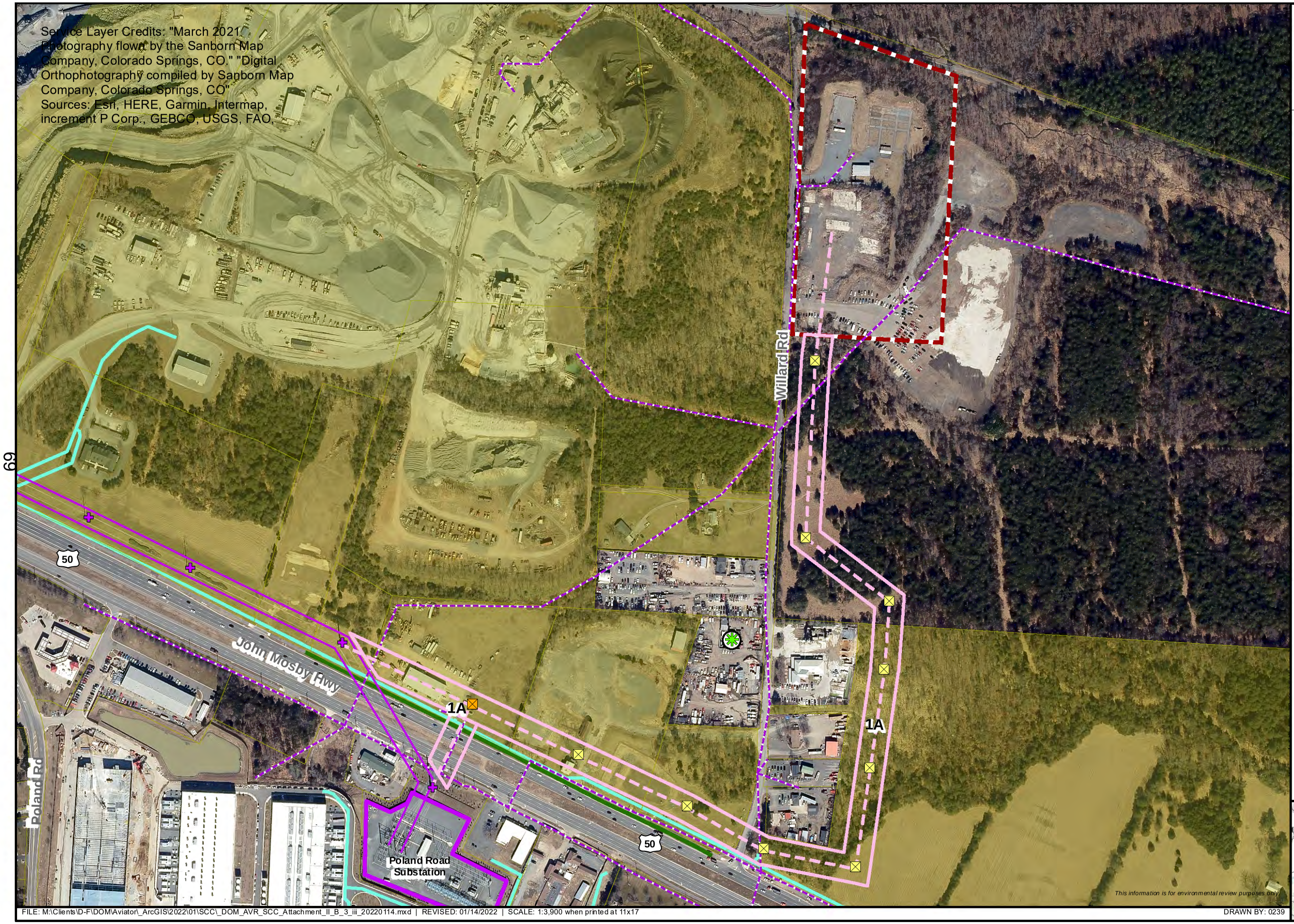
h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 125 FEET, 125', AND 125'
(DOES NOT INCLUDE FOUNDATION REVEAL)

i. AVERAGE SPAN LENGTH: 382 FEET (RANGE 193 - 662 FEET)

j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS: 22.5'

NOTE: Information contained on drawing is to be considered preliminary in nature and subject to change based on final design.

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Attachment II.B.3.iv
Proposed Structure Locations
Aviator 230 kV Line Loop and Aviator Substation
Loudoun County, Virginia

- Proposed Double Circuit Structure Location
- Proposed Triple Circuit Structure Location
- Proposed Route
- Overhead Route 1A (0.90 Miles - 100 ft ROW)
- Proposed Aviator Substation (Approximately 12.48 Acres)
- Telecomunication Tower
- Loudoun Water Line
- Natural Gas Pipeline
- Parcel Boundary
- Chantilly Crushed Stone Property

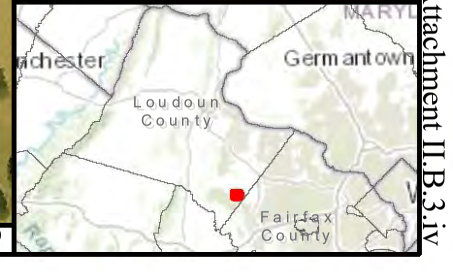
Existing Dominon Infrastructure

- Transmission Structure
- Transmission Line
- Distribution Line
- Poland Road Substation

0 162.5 325
Feet

1:3,900

ERM



FILE: M:\Clients\D-F\DOM\Aviator_ArcGIS\2022\01\SCC_DOM_AVR_SCC_Attachment_II_B_3_iii_20220114.mxd | REVISED: 01/14/2022 | SCALE: 1:3,900 when printed at 11x17 DRAWN BY: 0239

Attachment II.B.3.iv

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

4. With regard to the proposed supporting structures for all feasible alternate routes, provide the maximum, minimum and average structure heights with respect to the whole route.

Response: The approximate structure heights along the Proposed and Alternative Routes are provided in the table below. These heights are based on preliminary conceptual design, do not include foundation reveal, and are subject to change based on final engineering design.

Route	Minimum (ft.)	Maximum (ft.)	Average (ft.)
Overhead Route 1A (Proposed Route)	100	125	105
Overhead Alternative Route 1B	90	115	99

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

5. For lines being rebuilt, provide mapping showing existing and proposed structure heights for each individual structure within the ROW, as proposed in the application.

Response: Not applicable.

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

6. Provide photographs for [a] typical existing facilities to be removed, [b] comparable photographs or representations for proposed structures, and [c] visual simulations showing the appearance of all planned transmission structures at identified historic locations within one mile of the proposed centerline and in key locations identified by the Applicant.

Response: [a] Not applicable.

[b] See Attachment II.B.6.b.

[c] There are no historic locations within 1 mile of the proposed centerline. Visual renderings taken from several key locations are included in Appendix F of the Environmental Routing Study. See also Attachment III.B.4 for visual simulations from key locations.



230 kV Triple Circuit
Double Deadend Steel Pole



230 kV Double Circuit
Double Deadend Steel Pole



230 kV Double Circuit
Suspension Steel Pole

II. DESCRIPTION OF THE PROPOSED PROJECT

C. Describe and furnish plan drawings of all new substations, switching stations, and other ground facilities associated with the proposed project. Include size, acreage, and bus configurations. Describe substation expansion capability and plans. Provide one-line diagrams for each.

Response: The proposed Project requires construction of the new 230-34.5 kV Aviator Substation in Loudoun County, Virginia. As part of the Project, the line protection will be upgraded at Company's existing Poland Road Substation and future Sojourner Switching Station.

The proposed Aviator Substation will initially be constructed with four 230 kV, 4000 amps circuit breakers in a ring bus arrangement; two 230 kV line terminals; five 230-34.5 kV transformers (four 112 MVA and one 84 MVA); ten 34.5 kV distribution circuits, and other associated equipment. In total, it will be designed to accommodate future growth in the area with a build-out of six 230 kV, 4000 amps circuit breakers; two additional 230 kV line terminals; and up to twenty-five 34.5 kV distribution circuits. Additionally, a new control enclosure will be installed to accommodate the protective relay and communications cabinets. The total area required to build the Aviator Substation is approximately 12.481 acres.

The one-line and general arrangement for the proposed Aviator Substation are provided as Attachment II.C.1 and Attachment II.C.2, respectively.

ATTACHMENT II.C 1

LEGEND

CIRCUIT BREAKER

POWER TREANSFOREMR

DISCONNECT SWITCH

DISCONNECT SWITCH WITH MOTOR OPERATOR

CIRCUIT SWITCHER

230KV LINE 2137
SOJOURNER SUB

230kV LINE 2221
TO POLAND ROAD SUB

FUTURE

FUTURE

230-34.5 KV
TRANSFORMER #5

230-34.5 KV
TRANSFORMER #4

230-34.5 KV
TRANSFORMER #3

230-34.5 KV
TRANSFORMER #2

230-34.5 KV
TRANSFORMER #1

TO 34.5 KV
DISTRIBUTION BUS #5

TO 34.5 KV
DISTRIBUTION BUS #4

TO 34.5 KV
DISTRIBUTION BUS #3

TO 34.5 KV
DISTRIBUTION BUS #2

TO 34.5 KV
DISTRIBUTION BUS #1

PRELIMINARY
NOT FOR CONSTRUCTION

By:	Approval
Date	
Project No.	
BM No.	
Description	

Revisions

Dominion Energy

One Line Diagram

Drawn By:	Date 11-30-2021	Substation AVIATOR
Approval	Date	Drawing No.

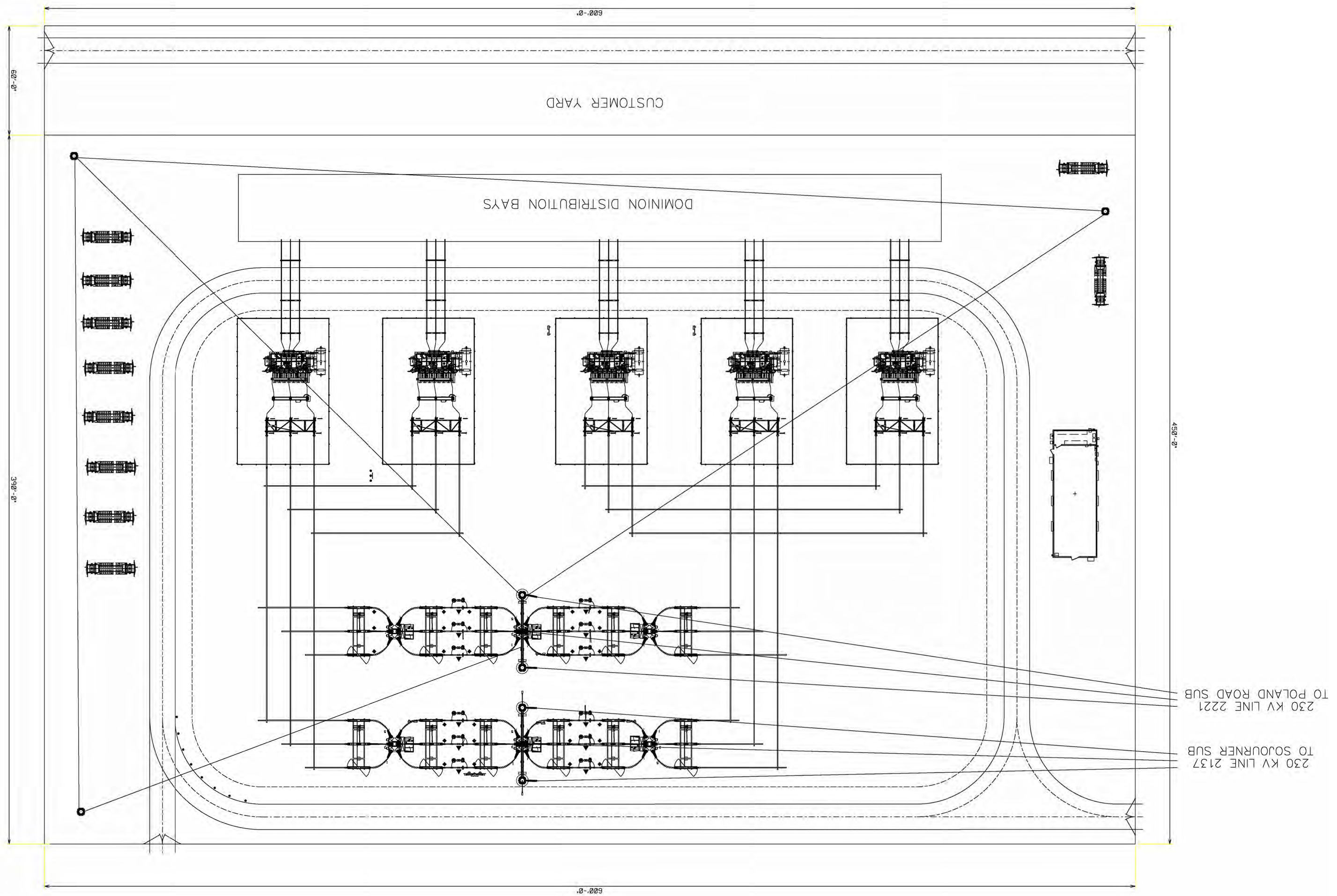
$USERNAME$

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Attachment II.C.2

PRELIMINARY
NOT FOR CONSTRUCTION

Typical Drawing Information	Library Location	Cell Name	B/M Assembly	Pipe Stand Foundation Cells (Pier)	Pipe Stand Foundation Cells (Spread)	Foundation Cells for Other Typical Structures	Steel Detail & Assembly
						(Pier) (Spread)	



ATTACHMENT II C 2

78

No.	Date	By	Description	Project Number B/M	Checked/Appr.

Revisions

Dominion Energy

GENERAL ARRANGEMENT–ULTIMATE
AVIATOR SUBSTATION
LOUDOUN COUNTY, VIRGINIA

Designed by:	Name	Date	Project No.	Sheet No.
	SB	11/30/21	992779/4330454	1 OF 1
Approvals			Scale	
Approvals				
Approvals				

		B/M No.	Revisions

Cad File Name: $$$$$$$$$$$STIME

Drawing No.: GEN ARR

PLOTTED: $$$$$$$$$$$$$$$$$$$$$STIME

$FILENAME$

PLOTTED: $$$$$$$$$$$$$$$$$$$$$STIME

$USERNAME$

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

A. Describe the character of the area that will be traversed by this line, including land use, wetlands, etc. Provide the number of dwellings within 500 feet, 250 feet and 100 feet of the centerline, and within the ROW for each route considered. Provide the estimated amount of farmland and forestland within the ROW that the proposed project would impact.

Response: **Proposed Route (Overhead Route 1A)**

Land Use

The Proposed Route traverses approximately 0.90 mile through Loudoun County in an area that is largely characterized by industrial and commercial development, undeveloped forested areas planned for data center development, and the expansion of the CCS quarry. The area is surrounded by existing data centers, scattered light industrial and other business/commercial land use.

Dwellings

According to the Loudoun County GIS parcel and zoning data and aerial photo analysis, there is one dwelling located within 500 feet of the Proposed Route and no dwellings are located within 250 feet or 100 feet or within the right-of-way of the Proposed Route.

Farmland/Forests

A review of Natural Resources Conservation Service Data ("NRCS") soils data indicates that approximately 19.1 acres of the footprint of the Proposed Route are classified as farmland of statewide importance. According to a review of recent 2021 aerial photography, there is no land being used for agricultural purposes within or near the right-of-way of the Proposed Route. About 8.63 acres of existing forestland will be impacted by the construction of the Proposed Route. See Attachment III.A.1.

Wetlands

Based on an analysis of the U.S. Geological Survey ("USGS") 7.5-minute current (2014-2017) and historic (1988-2012) topographic mapping, USGS National Hydrography Dataset ("NHD"), Loudoun County Hydrology (water feature lines) and Hydrology (water feature polygons) Datasets (Loudoun County Streams), and Loudoun County Wetlands (wetland feature polygons) Dataset (Loudoun County Wetlands), the Proposed Route does not cross perennial waterbodies and crosses four intermittent waterbodies. Approximately 0.06 acre of palustrine scrub shrub ("PSS") wetlands, 3.19 acres of PFO wetlands, 0.14 acre of riverine stream

channels, and <0.01 acre of palustrine emergent ("PEM") wetlands occur within the right-of-way of the Proposed Route.

Historic Features

A review of the VDHR Virginia Cultural Resource Information System ("VCRIS") indicates that no archaeological sites fall within or adjacent to the rights-of-way for the Proposed or Alternative Routes. No known historic resources that conform to the categories in VDHR's tiered study area model were identified within the review area for any of the Project route alternatives. Therefore, the Project will have no impact on any previously recorded historic resources requiring consideration by VDHR. See Appendix F of the Environmental Routing Study for additional information on the review of historic resources.

Wildlife

The Virginia Fish and Wildlife Information Service ("VaFWIS") database query identified four federally listed species: northern long-eared bat (*Myotis septentrionalis*), dwarf wedgemussel (*Alasmidonta heterodon*), Atlantic Sturgeon (*Acipenser oxyrinchus*), and yellow lance (*Elliptio lanceolata*) within 2 miles of the geographic center of the Project study area. Of these, the U.S. Fish and Wildlife Service ("FWS") Information for Planning and Consultation ("IPaC") system only includes the northern long-eared bat in the list of federally listed species that may occur within the Project study area.

The Virginia Department of Conservation and Recreation ("DCR") and Virginia Department of Wildlife Resources ("DWR") database queries identified 14 state-listed species (which includes the four federally listed species previously mentioned) that have the potential to occur within 2 miles of the geographic center of the natural resources Project area. The 10 state only listed species include: little brown bat (*Myotis lucifugus*), tri-colored bat (*Perimyotis subflavus*), brook floater *(Alasmidonta varicosa*), green floater (*Lasmigona subviridis*), Appalachian grizzled skipper (*Pyrgus centaureae Wyandot*), wood turtle (*Glyptemys insculpta*), Henslow's sparrow (*Ammodramus henslowii*), loggerhead shrike (*Lanius ludovicianus*), migrant loggerhead shrike, (*Lanius ludovicianus migrans*), and peregrine falcon (*Falco peregrinus*).

Based on landscape and vegetation within the Project area, each route alternative crosses a variety of potential habitat types. These habitats include forested land, shrub land, grass land, and waterbodies with intermittent and perennial stream flow. Within the Proposed Route and Overhead Alternative Route 1B, these habitat types each could have potential to provide suitable habitat for one or more of the species listed above.

Of the 14 species identified, only the Wood turtle historically has been documented by state agencies in areas adjacent to or crossed by any of the routes. No instream work will be performed for the Project, however forested floodplains will be cleared

during construction. Dominion Energy Virginia will coordinate with state and federal agencies as needed.

Overhead Alternative Route 1B

Land Use

Overhead Alternative Route 1B traverses approximately 0.58 mile through Loudoun County in an area that is largely characterized by industrial and commercial development, undeveloped forested areas planned for data center development, and the expansion of the CCS quarry. The area is surrounded by existing data centers, scattered light industrial and other business/commercial land use.

Dwellings

According to the Loudoun County GIS parcel and zoning data and aerial photo analysis, there are two dwellings located within 500 feet and 250 feet of the centerline of the Overhead Alternative Route 1B and no dwellings are located within 100 feet of the centerline of the route. Additionally, no dwellings are located within the right-of-way for Overhead Alternative Route 1B.

Farmland/Forests

A review of NRCS soils data indicates that approximately 17.5 acres of the footprint of the Overhead Alternative Route 1B are classified as farmland of statewide importance. According to a review of recent 2021 aerial photography, there is no land being used for agricultural purposes within or near the right-of-way of the Overhead Alternative Route 1B. About 8.06 acres of existing forestland will be impacted by the construction of the Overhead Alternative Route 1B. See Attachment III.A.1.

Wetlands

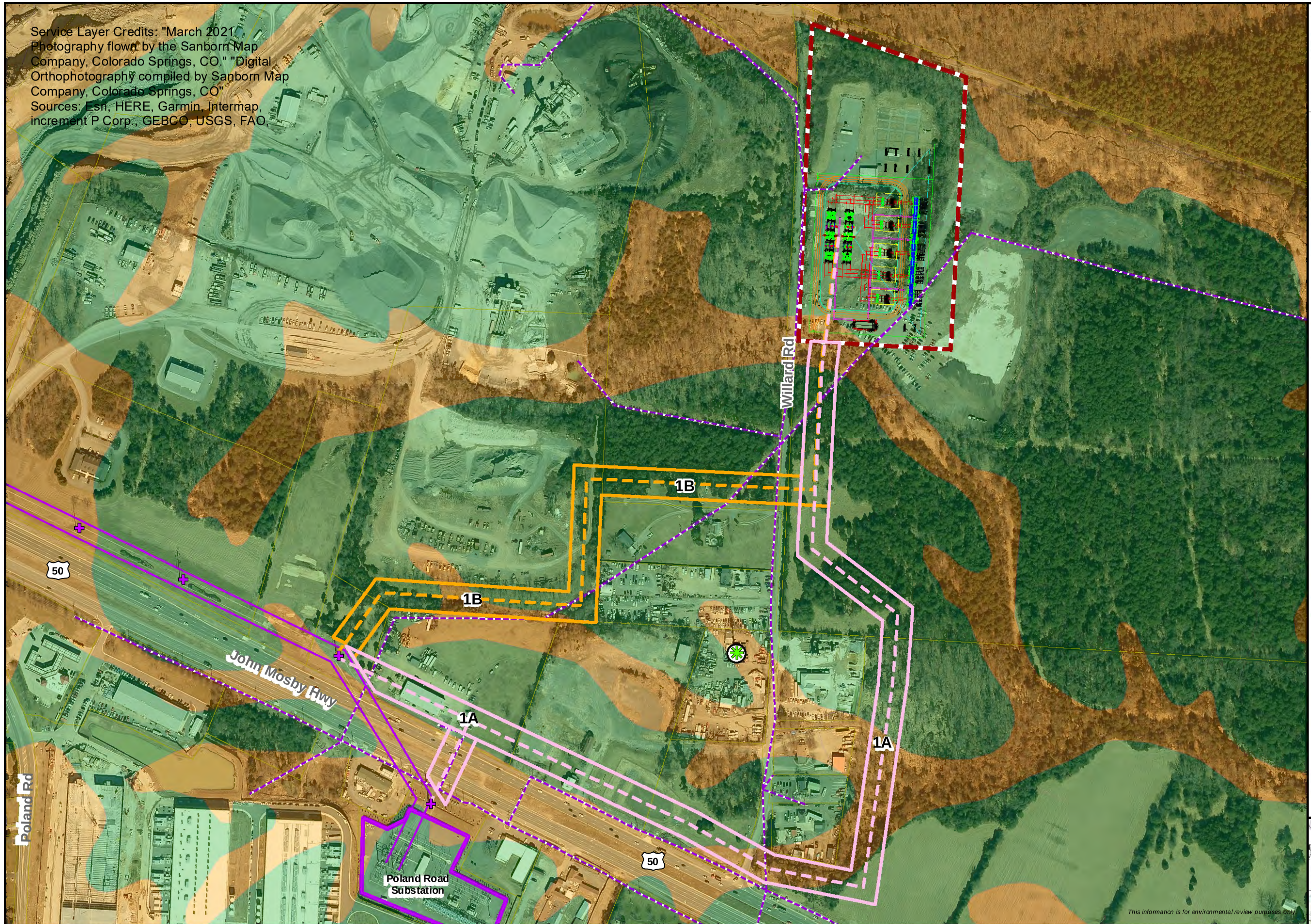
Based on an analysis of the USGS 7.5-minute current (2014-2017) and historic (1988-2012) topographic mapping, USGS NHD, Loudoun County Hydrology (water feature lines) and Hydrology (water feature polygons) Datasets (Loudoun County Streams), and Loudoun County Wetlands (wetland feature polygons) Dataset (Loudoun County Wetlands), the Overhead Alternative Route 1B does not cross perennial waterbodies and crosses 3 intermittent waterbodies. Approximately 0.17 acre consist of PEM wetlands, 0.22 acre consist of PSS wetlands, 1.61 acres consist of PFO wetlands, and 0.11 acre consist of riverine stream channels.

Historic Features

Impacts on historic features would be the same for Overhead Alternative Route 1B as those for the Proposed Route discussed above.

Wildlife

Impacts on wildlife would be the same for Overhead Alternative Route 1B as those for the Proposed Route discussed above.



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Attachment III.A.1
NRCS Farmland Classification
Aviator 230 kV Line Loop and Aviator Substation
Loudoun County, Virginia

- Proposed Route
- Overhead Route 1A (0.90 Miles - 100 ft ROW)
- Alternative Route
- Overhead Route 1B (0.58 Miles - 100 ft ROW)
- Proposed Aviator Substation (Approximately 12.48 Acres)
- Telecomunication Tower
- Parcel Boundary

Existing Dominon Infrastructure

- Transmission Structure
- Transmission Line
- Distribution Line
- Poland Road Substation

NRCS Farmland Classification

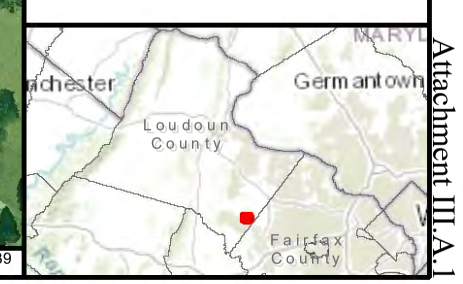
- Farmland of statewide importance
- Not prime farmland

0 162.5 325
Feet

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N
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III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

B. Describe any public meetings the Applicant has had with neighborhood associations and/or officials of local, state or federal governments that would have an interest or responsibility with respect to the affected area or areas.

Response: In July 2021, the Company launched an internet website dedicated to the proposed Project: www.dominionenergy.com/aviator. The website includes a description and benefits of the proposed Project, an explanation of need, route map, photo simulations, a recording of the virtual open house meeting and information on the Commission review process.

In December 2021, the Company sent project announcement postcards to approximately 967 property owners and residents within 1,000 feet of the Project. Each postcard included information about the Project and an overview map. The postcard also advised that due to COVID-19, the Company would not host a traditional in-person open house event, but would host a virtual community meeting. In addition, the communication indicated that detailed materials would be posted to the dedicated Project website and how to contact the Project team to provide any feedback or questions. An example of the postcard is included as Attachment III.B.1.

Newspaper print advertisements regarding the Project and virtual open house were placed in Loudoun Now and Loudoun Times. The advertisements ran on December 30, 2021, in Loudoun Now and December 31, 2021, in the Loudoun Times. A copy of the advertisement placed in the Loudoun papers is included as Attachment III.B.2.

From December 31, 2021 to January 4, 2022, the Company used paid digital and social media campaigns to drive awareness of the Project and the virtual open house. A copy of those digital advertisements is included as Attachment III.B.3. The event campaigns ran within Google AdWords, Google Display, Google Video, Facebook and Twitter. All phases urged local residents to visit the www.dominionenergy.com/aviator website to learn more about the meeting and to participate virtually. Campaign results include 662,087 Impressions Delivered, .61% Click Thru Rate, 1,489 Link Clicks, and 27,651 ad engagements including reactions, likes, comments, shares, and saves.

A virtual open house was held on January 6, 2022, at 5:00 p.m. At the virtual open house, the Company made available details about construction, project timing, and the Commission approval process. Traditional open house materials have been posted on the website for the proposed Project, including simulations of the proposed Project from key locations . The key location simulations are included as Attachment III.B.4.

In addition, the Company researched the demographics of the surrounding communities using the 2014-2018 U.S. Census American Community Survey data to determine that there are eight Census Block Groups ("CBGs") within the Project area that fall within a mile of the proposed transmission line, one of which would be crossed by the Project. A review of minority, income, and education census data identified populations within the study area that meet the U.S. Environmental Protection Agency defined threshold for Environmental Justice protections ("EJ Communities").

Of the eight CBGs, one CBG within one mile of the Project has a low-income percentage greater than or equal to 30 percent. Additionally, one CBG within one mile of the Project met both the minority and low-income definitions. No low-income populations are crossed by the routes. One CBG is crossed by both routes and this CBG is also identified as a community of color. No low-income communities or combination minority and low-income communities are crossed by the routes.

When compared to the reference population, none of the CBGs in the screening area contains elderly or under age 5 populations, linguistically isolated populations, or populations with less than a high school education that exceeds 20 percentage points.

During operation, the long-term presence of new structures along overhead routes are not expected to result in disproportionately high or adverse impacts on EJ populations because they cross primarily developed areas, commercial/industrial land, and existing road rights-of-way rather than visually sensitive areas.

Indirect impacts on property value caused by direct visual impacts of high-voltage transmission lines (*i.e.*, lines carrying more than 69 kV) depend on proximity, visibility, size and type of transmission structures, easement landscaping, and surrounding topography. Based on a review of peer-reviewed and industry research published in peer-reviewed journals and trade journals, residential property values and sales prices are primarily affected by factors unrelated to the presence of a transmission line. Other factors, such as location, type and condition of improvements to the property, neighborhood, and local real estate market conditions, are shown through research to have greater influence on the value of residential property than the presence of a transmission line.

Because the Project crosses developed areas and commercial/industrial land, and the two residential dwellings near the route alternatives are already in close proximity of CCS mining operations and other industrial businesses, the Project is unlikely to result in property devaluation.

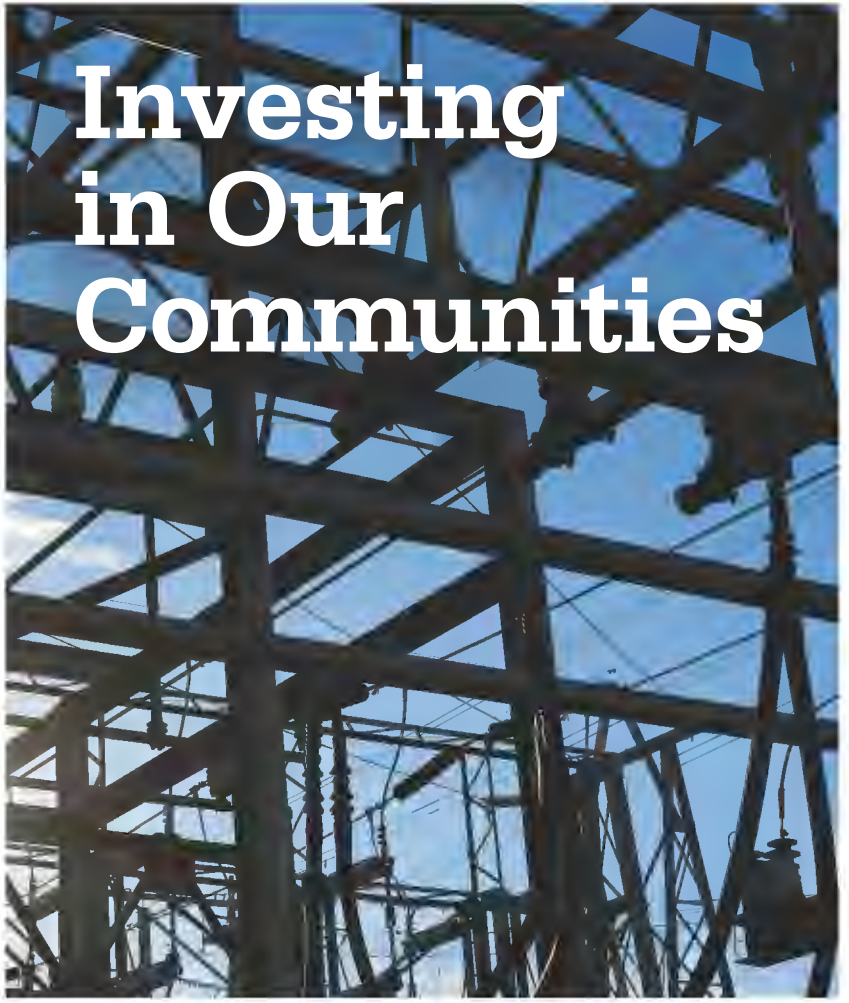
As discussed in more detail in Section IV.B, scientific evidence does not show that common sources of electric and magnetic fields ("EMF") in the environment, including transmission lines and other parts of the electric system, are a cause of

any adverse health effects. As such, the impacts of constructing and operating any of the proposed alternatives on the natural and human environments are not anticipated to be significant.

Based on the analysis of the Project, the Company does not anticipate disproportionately high or adverse impacts to the surrounding community and the EJ Communities located within the study area, consistent with the Project design to reasonably minimize such impacts. See Sections 3.1.10 and 4.1.7 of the Environmental Routing Study for the results of the Company's EJ analysis.

In addition to its evaluation of impacts, the Company has and will continue to engage the EJ Communities in a manner that allows them to meaningfully participate in the Project development and approval process so that the Company can take their views and input into consideration. See Attachment III.B.5 for a copy of the Company's Environmental Justice Policy.

Investing in Our Communities



Dominion Energy image. Not project specific.

Electric Transmission
P.O. Box 26666
Richmond, VA 23261

Dominion Energy®

Actions Speak Louder

YOU'RE INVITED TO A VIRTUAL COMMUNITY MEETING!

DETAILS ENCLOSED

<<NAME>>
<<ADDRESS>>

IMPORTANT

Local Power Line Project Information

Use your iPhone camera or the QR reader app on other smartphones to visit the project page on our website.

Aviator 230 kV Electric Transmission Line Project

AT DOMINION ENERGY, we are committed to continually reviewing and analyzing our energy infrastructure to provide safe, reliable, and affordable electricity to our neighbors. You are receiving this postcard because we would like to invite you to our virtual community meeting for the upcoming Aviator 230 kV Electric Transmission Project.

This project is necessary due to rapid growth in electrical demand in Loudoun County. We are studying several overhead routes, with most of the work taking place on property north of Route 50. The length of this proposed route is less than one mile.

You can access our virtual community meeting for free using a mobile device, tablet, computer, or you can simply dial-in with your telephone. Please visit DominionEnergy.com/aviator for details.

In addition, we want to inform you that in the wake of ongoing public health concerns from the spread of the coronavirus, we are mindful of our activities and maintaining property owner interactions with the appropriate social distancing.

At Dominion Energy, we know many of our customers are facing challenges due to the COVID-19 pandemic. We're here to help. In accordance with the law recently passed in Virginia, we're offering flexible payment arrangements up to 24 months. To set up a payment plan, or view additional assistance options, please visit DominionEnergy.com or call 1-866-366-4357.

VIRTUAL COMMUNITY MEETING

Live Via Webex Events

Thursday, Jan. 6, 2022 • 5 – 6 p.m.

First 20 minutes will be a project overview presentation.

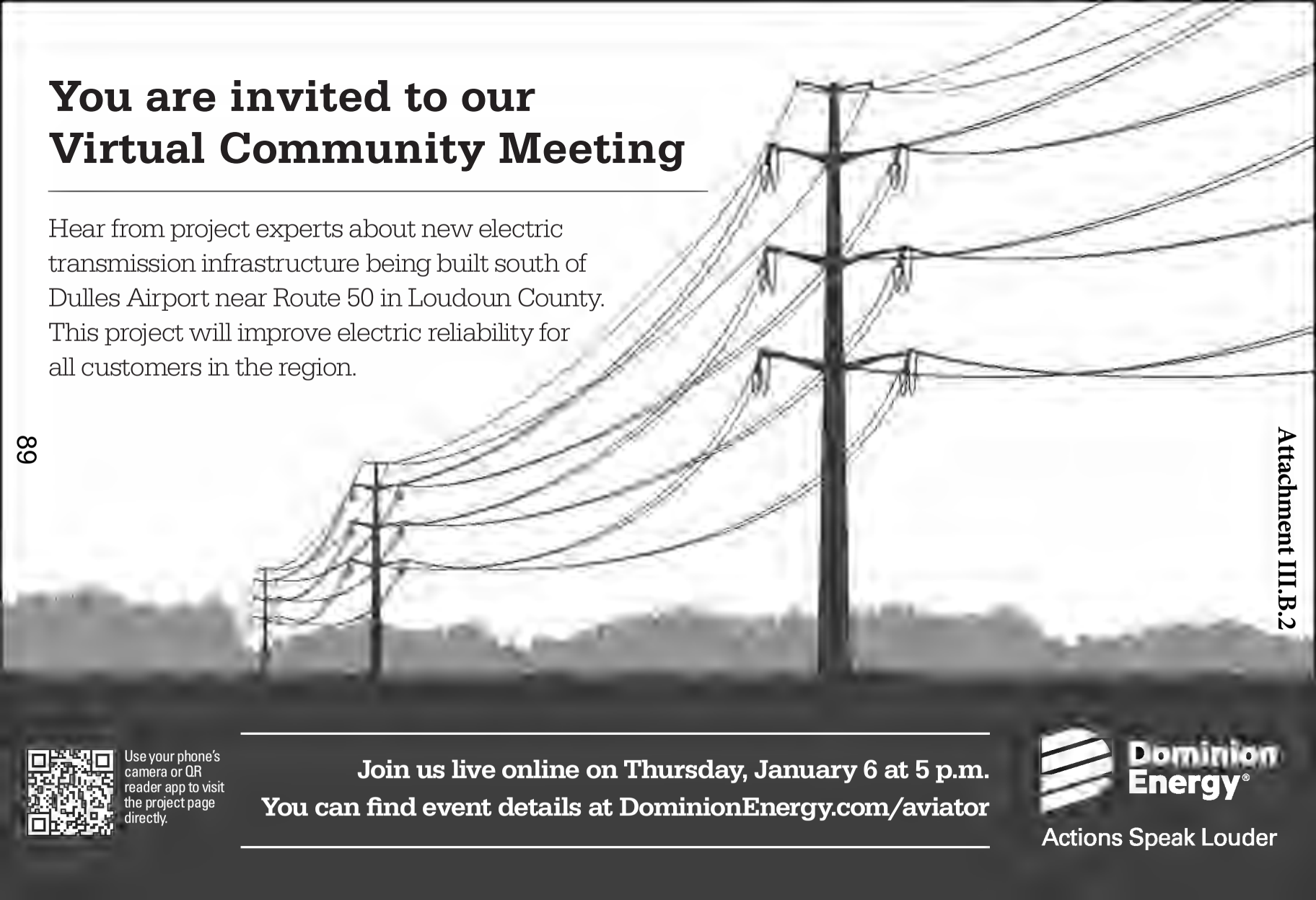
Visit DominionEnergy.com/aviator for more information.



This map is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

CONTACT US

Visit our website at DominionEnergy.com/aviator for project updates. Or contact us by calling 888-291-0190 or sending an email to powerline@dominionenergy.com.


You are invited to our
Virtual Community Meeting
Hear from project experts about new electric transmission infrastructure being built south of Dulles Airport near Route 50 in Loudoun County. This project will improve electric reliability for all customers in the region.
89
Attachment III.B.2
Use your phone's camera or QR reader app to visit the project page directly.
Join us live online on Thursday, January 6 at 5 p.m.
You can find event details at DominionEnergy.com/aviator
Dominion Energy®
Actions Speak Louder

charles ryan associates

Dominion Energy
Electric Transmission

Aviator Awareness Display









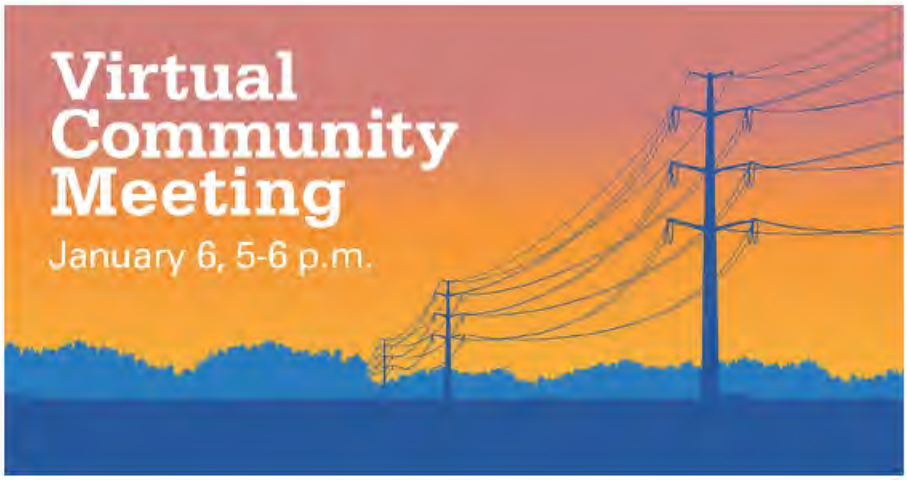




Dominion Energy Electric Transmission

Aviator Nextdoor Imagery

Event Post Image:



Awareness Post Image:



AVIATOR

230kV LINE/SUBSTATION

VIEWPOINT MAP

Attachment III.B.4

PROPOSED AVIATOR SUBSTATION

Chantilly Crushed Stone Inc. (CCS)

Willard Road

Highway 50

EXISTING POLAND ROAD SUBSTATION

1

2

3

4

5

N

Dominion Energy®

THIS IMAGE IS INTENDED TO SERVE AS A REPRESENTATION OF THE PROJECT AREA AND IS NOT INTENDED FOR DETAILED ENGINEERING PURPOSES.

AVIATOR
230kV LINE/SUBSTATION

EXISTING CONDITIONS

Willard Road

Highway 50

EXISTING
POLAND ROAD
SUBSTATION

N

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THIS IMAGE IS INTENDED TO SERVE AS A REPRESENTATION OF THE PROJECT AREA AND IS NOT INTENDED FOR DETAILED ENGINEERING PURPOSES.

AVIATOR
230kV LINE/SUBSTATION

OVERHEAD
ROUTE
1A

PROPOSED
AVIATOR
SUBSTATION

Chantilly Crushed
Stone Inc. (CCS)

Willard Road

Highway 50

EXISTING
POLAND ROAD
SUBSTATION

N

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THIS IMAGE IS INTENDED TO SERVE AS A REPRESENTATION OF THE PROJECT AREA AND IS NOT INTENDED FOR DETAILED ENGINEERING PURPOSES.

AVIATOR
230kV LINE/SUBSTATION

OVERHEAD
ROUTE
1B

PROPOSED
AVIATOR
SUBSTATION

Chantilly Crushed
Stone Inc. (CCS)

Willard Road

Highway 50

EXISTING
POLAND ROAD
SUBSTATION

N

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AVIATOR

230kV LINE/SUBSTATION

VIEWPOINT MAP



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AVIATOR

230kV LINE/SUBSTATION

EXISTING CONDITIONS

97

Dominion Energy®

VP1

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AVIATOR

230kV LINE/SUBSTATION

OVERHEAD

ROUTE

1A

Dominion Energy®

VP1

THIS IMAGE IS INTENDED TO SERVE AS A REPRESENTATION OF THE PROJECT AREA AND IS NOT INTENDED FOR DETAILED ENGINEERING PURPOSES.

AVIATOR

230kV LINE/SUBSTATION

OVERHEAD

ROUTE

1B

Dominion Energy®

VP1

THIS IMAGE IS INTENDED TO SERVE AS A REPRESENTATION OF THE PROJECT AREA AND IS NOT INTENDED FOR DETAILED ENGINEERING PURPOSES.

AVIATOR

230kV LINE/SUBSTATION

VIEWPOINT MAP



100

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AVIATOR

230kV LINE/SUBSTATION

EXISTING CONDITIONS

Dominion Energy®

VP2

THIS IMAGE IS INTENDED TO SERVE AS A REPRESENTATION OF THE PROJECT AREA AND IS NOT INTENDED FOR DETAILED ENGINEERING PURPOSES.

AVIATOR
230kV LINE/SUBSTATION

OVERHEAD
ROUTE
1A
SCREENING
FENCE

Dominion Energy®

VP2

THIS IMAGE IS INTENDED TO SERVE AS A REPRESENTATION OF THE PROJECT AREA AND IS NOT INTENDED FOR DETAILED ENGINEERING PURPOSES.

AVIATOR

230kV LINE/SUBSTATION

OVERHEAD

ROUTE

1A

Dominion Energy®

VP2

THIS IMAGE IS INTENDED TO SERVE AS A REPRESENTATION OF THE PROJECT AREA AND IS NOT INTENDED FOR DETAILED ENGINEERING PURPOSES.

AVIATOR

230kV LINE/SUBSTATION

OVERHEAD

ROUTE

1B

104

Dominion Energy®

VP2

THIS IMAGE IS INTENDED TO SERVE AS A REPRESENTATION OF THE PROJECT AREA AND IS NOT INTENDED FOR DETAILED ENGINEERING PURPOSES.

AVIATOR

230kV LINE/SUBSTATION

VIEWPOINT MAP

PROPOSED AVIATOR SUBSTATION

Chantilly Crushed Stone Inc. (CCS)

Willard Road

Highway 50

3

EXISTING POLAND ROAD SUBSTATION

N

Dominion Energy®

THIS IMAGE IS INTENDED TO SERVE AS A REPRESENTATION OF THE PROJECT AREA AND IS NOT INTENDED FOR DETAILED ENGINEERING PURPOSES.

AVIATOR

230kV LINE/SUBSTATION

EXISTING CONDITIONS

Dominion Energy®

VP3

THIS IMAGE IS INTENDED TO SERVE AS A REPRESENTATION OF THE PROJECT AREA AND IS NOT INTENDED FOR DETAILED ENGINEERING PURPOSES.

AVIATOR

230kV LINE/SUBSTATION

OVERHEAD

ROUTE

1A

Dominion Energy®

VP3

THIS IMAGE IS INTENDED TO SERVE AS A REPRESENTATION OF THE PROJECT AREA AND IS NOT INTENDED FOR DETAILED ENGINEERING PURPOSES.

AVIATOR
230kV LINE/SUBSTATION

OVERHEAD
ROUTE
1B

Dominion Energy®

VP3

THIS IMAGE IS INTENDED TO SERVE AS A REPRESENTATION OF THE PROJECT AREA AND IS NOT INTENDED FOR DETAILED ENGINEERING PURPOSES.

AVIATOR

230kV LINE/SUBSTATION

VIEWPOINT MAP

PROPOSED AVIATOR SUBSTATION

Chantilly Crushed Stone Inc. (CCS)

Willard Road

Highway 50

4

EXISTING POLAND ROAD SUBSTATION

N

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AVIATOR

230kV LINE/SUBSTATION

EXISTING CONDITIONS

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VP4

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AVIATOR

230kV LINE/SUBSTATION

OVERHEAD

ROUTE

1A

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VP4

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AVIATOR

230kV LINE/SUBSTATION

OVERHEAD

ROUTE

1B

Dominion Energy®

VP4

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AVIATOR

230KV LINE/SUBSTATION

VIEWPOINT MAP

PROPOSED AVIATOR SUBSTATION

Chantilly Crushed Stone Inc. (CCS)

Willard Road

5

Tail Cedars Pkwy

Highway 50

EXISTING POLAND ROAD SUBSTATION

N

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AVIATOR

230kV LINE/SUBSTATION

OVERHEAD ROUTE 1A



EXISTING CONDITIONS



PROPOSED CONDITIONS

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AVIATOR
230kV LINE/SUBSTATION

OVERHEAD ROUTE 1A

EXISTING CONDITIONS

WITH 12' SCREENING FENCE

PROPOSED CONDITIONS

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AVIATOR
230kV LINE/SUBSTATION

OVERHEAD ROUTE 1B



EXISTING CONDITIONS



PROPOSED CONDITIONS

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Environmental Justice: Ongoing Commitment to Our Communities

At Dominion Energy, we are committed to providing reliable, affordable, clean energy in accordance with our values of safety, ethics, excellence, embrace change and team work. This includes listening to and learning all we can from the communities we are privileged to serve.

Our values also recognize that environmental justice considerations must be part of our everyday decisions, community outreach and evaluations as we move forward with projects to modernize the generation and delivery of energy.

To that end, communities should have a meaningful voice in our planning and development process, regardless of race, color, national origin, or income. Our neighbors should have early and continuing opportunities to work with us. We pledge to undertake collaborative efforts to work to resolve issues. We will advance purposeful inclusion to ensure a diversity of views in our public engagement processes.

Dominion Energy will be guided in meeting environmental justice expectations of fair treatment and sincere involvement by being inclusive, understanding, dedicated to finding solutions, and effectively communicating with our customers and our neighbors. We pledge to be a positive catalyst in our communities.

November 2018

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

C. Detail the nature, location, and ownership of each building that would have to be demolished or relocated if the project is built as proposed.

Response: Proposed Route (Overhead Route 1A)

Two privately-owned industrial/commercial buildings and one outbuilding are located in the right-of-way of the Proposed Route. These buildings would either be relocated or removed if the Proposed Route were to be constructed. The Company is coordinating with the property owner of the identified structures. See Attachment II.A.9.a.

Overhead Alternative Route 1B

No buildings are located within the right-of-way of Overhead Alternative Route 1B.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

D. Identify existing physical facilities that the line will parallel, if any, such as existing transmission lines, railroad tracks, highways, pipelines, etc. Describe the current use and physical appearance and characteristics of the existing ROW that would be paralleled, as well as the length of time the transmission ROW has been in use.

Response: The Proposed Route would be collocated for a total of about 0.53 mile. This includes paralleling 0.02 mile of existing overhead line collocation, 0.32 mile of paralleled road, distribution and underground utilities, and 0.18 mile of planned access road collocation. The distribution and underground utility rights-of-way currently are maintained cleared of large trees for the entire length. The Proposed Route would also parallel a planned access road as part of a planned data center development. The characteristics of this planned access road are unknown at this time.

Overhead Alternative Route 1B would be collocated a total of about 0.24 mile. This includes paralleling an existing overhead distribution line right-of-way for about 0.16 mile. This right-of-way currently is maintained cleared of large trees for its entire length. Overhead Alternative Route 1B would also parallel a planned access road as part of a planned data center development for about 0.08 mile. The characteristics of this planned access road are unknown at this time.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

E. Indicate whether the Applicant has investigated land use plans in the areas of the proposed route and indicate how the building of the proposed line would affect any proposed land use.

Response: The Loudoun County 2019 General Plan ("General Plan")[12] and the Loudoun County 2019 Countywide Transportation Plan ("2019 CTP")[13] were reviewed to evaluate the potential effect the Proposed Route could have on future development. The General Plan and 2019 CTP do not address electric transmission lines within their land use policies and strategies explicitly; however, the General Plan recognizes that the area in proximity to the Proposed Route north of Washington Dulles International Airport is expected to continue to be a key location for industrial uses, airport-related businesses, and data center development. Future demand for data centers will need to be accommodated in places that have access to utilities, including electricity. The General Plan acknowledges that electrical demand in the County has grown dramatically in recent years with the development of data centers in eastern Loudoun County. Demand is expected to continue to grow with new data center construction, the operation of the Silver Line Metrorail, and other land development near the Proposed Route.

Review of publicly available information (including the 2019 CTP) and consultations with the Loudoun County Department of Transportation and Capital Infrastructure ("DTCI") staff were conducted to determine the impact of the Proposed Route on future road projects. Two future road projects were identified near the Proposed Route: the Route 50 North Collector Road and Willard Road Expansion. The Route 50 North Collector Road is still in the design study phase and it is estimated to be completed in the next five years. The preliminary design shows the road extending west from Route 28 crossing the southern border of the MWAA property and then heading south on the east side of Willard Road to intersect with Route 50. The preliminary design would parallel a portion of the Proposed Route for approximately 0.2 mile. Because of the potential for the Proposed Route to affect this planned road, the Company consulted with Loudoun County DTCI to ensure that the routes developed for the Company's proposed Project would not conflict with the County's road development plans. Given the preliminary design status of the Route 50 North Collector Road, DTCI could not confirm potential impacts at this time. Willard Road is an existing road in the Project area and has appeared on various development plans as slated for widening. DTCI has indicated that there are no plans for widening Willard Road in the CTP for the next five years. See Appendix Section II.A.9 and Section 3.1.8 of the Environmental Routing Study.

[12] *See* https://www.loudoun.gov/DocumentCenter/View/152285/General-Plan---Combined-with-small-maps-bookmarked.

[13] *See* https://www.loudoun.gov/DocumentCenter/View/152287/CTP---Combined-with-small-maps-bookmarked.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

F. Government Bodies

1. Indicate if the Applicant determined from the governing bodies of each county, city and town in which the proposed facilities will be located whether those bodies have designated the important farmlands within their jurisdictions, as required by § 3.2-205 B of the Code.

2. If so, and if any portion of the proposed facilities will be located on any such important farmland:

a. Include maps and other evidence showing the nature and extent of the impact on such farmlands;

b. Describe what alternatives exist to locating the proposed facilities on the affected farmlands, and why those alternatives are not suitable; and

c. Describe the Applicant's proposals to minimize the impact of the facilities on the affected farmland.

Response: (1) Through coordination with Loudoun County, the Company has concluded that no land is designated as important farmlands within the study area.

(2) Not applicable.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

G. Identify the following that lie within or adjacent to the proposed ROW:

1. **Any district, site, building, structure, or other object included in the National Register of Historic Places maintained by the U.S. Secretary of the Interior;**

2. **Any historic architectural, archeological, and cultural resources, such as historic landmarks, battlefields, sites, buildings, structures, districts or objects listed or determined eligible by the Virginia Department of Historic Resources ("DHR");**

3. **Any historic district designated by the governing body of any city or county;**

4. **Any state archaeological site or zone designated by the Director of the DHR, or its predecessor, and any site designated by a local archaeological commission, or similar body;**

5. **Any underwater historic assets designated by the DHR, or predecessor agency or board;**

6. **Any National Natural Landmark designated by the U.S. Secretary of the Interior;**

7. **Any area or feature included in the Virginia Registry of Natural Areas maintained by the Virginia Department of Conservation and Recreation ("DCR");**

8. **Any area accepted by the Director of the DCR for the Virginia Natural Area Preserves System;**

9. **Any conservation easement or open space easement qualifying under §§ 10.1-1009 – 1016, or §§ 10.1-1700 – 1705, of the Code (or a comparable prior or subsequent provision of the Code);**

10. **Any state scenic river;**

11. **Any lands owned by a municipality or school district; and**

12. **Any federal, state or local battlefield, park, forest, game or wildlife preserve, recreational area, or similar facility. Features, sites, and the like listed in 1 through 11 above need not be identified again.**

Response:

1. None
2. None
3. None
4. None
5. None
6. None
7. None
8. None
9. None
10. None
11. None
12. None

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

H. List any registered aeronautical facilities (airports, helipads) where the proposed route would place a structure or conductor within the federally-defined airspace of the facilities. Advise of contacts, and results of contacts, made with appropriate officials regarding the effect on the facilities' operations.

Response: The Federal Aviation Administration ("FAA") is responsible for overseeing air transportation in the United States. The FAA manages air traffic in the United States and evaluates physical objects that may affect the safety of aeronautical operations through an obstruction evaluation. The prime objective of the FAA in conducting an obstruction evaluation is to ensure the safety of air navigation and the efficient utilization of navigable airspace by aircraft.

The Company has reviewed the FAA's website[14] to identify airports within 10 miles of the proposed Project. Based on this review, the following FAA-restricted airports are located within 10 miles of the Project. Distances provided below are from the nearest Project facility (Aviator Loop or Aviator Substation) to the nearest airport runway:

- Leesburg Executive Airport, approximately 9.5 miles north of the Project
- Dulles International Airport, approximately 1.2 miles north of the Project

The Leesburg Executive Airport is located far enough away from the Project area that there is no potential to impact the airports federally defined airspace.

The Project would be in close proximity to the Dulles International Airport and within 0.5 mile of the proposed future fifth runway at the Dulles International Airport. The Project does propose to have structures located below some of these surfaces but will not penetrate any of the surfaces. Due to the Project being adjacent to the side of the future runway and west of the north/south runways, the routes are not located within any of the approach surfaces for any of the runways. The Project is also located far enough away from the all approach surfaces so that the adjacent transitional surfaces would not be impacted by the Project. The Project would be completely within the horizontal surface of the Dulles International Airport, which will restrict the maximum tower heights, as some of the proposed routes are located in areas with higher ground elevations than the 313 above mean sea level ("AMSL") of the airport.

[14] *See* https://oeaaa.faa.gov/oeaaa/external/portal.jsp.

Since the FAA manages air traffic in the United States, it will evaluate any physical objects that may affect the safety of aeronautical operations through an obstruction evaluation. If required during the permitting process, the Company will submit an FAA Form 7460-1 Notice pursuant to 14 CFR Part 77, for any tower locations that meet the review criteria. See also Section 2.N of the DEQ Supplement.

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

I. Advise of any scenic byways that are in close proximity to or that will be crossed by the proposed transmission line and describe what steps will be taken to mitigate any visual impacts on such byways. Describe typical mitigation techniques for other highways' crossings.

Response: No scenic byways are in close proximity to the Project study area. Perpendicular road crossings, which are preferred by VDOT and Loudoun County, will be utilized at other road crossings.

While not considered a scenic byway, Loudoun County has classified Route 50 as a gateway to Loudoun County, linking the Washington metropolitan area with southern Loudoun County and visitor destinations in western Loudoun County (Loudoun County, 2007). The County established a task force, the Route 50 Task Force, to identify issues and make recommendations to help create an attractive entrance gateway.

During the early stages of the Project, Loudoun County requested that the Company not develop an alignment for an overhead transmission line that would parallel Route 50 and create visual impacts to the roadway and the surrounding area. The Company coordinated with CCS and Loudoun County to develop a route (the Proposed Route – Overhead Route 1A) that parallels Route 50, but only for a short distance, which satisfied both the County and landowner preferences. Additionally, as part of the Proposed Route, the Company will remove and relocate one span one existing Lines #2137 and #2183,[15] which will remove the diagonal crossing of Route 50 by the Company's existing transmission lines and replace them with a perpendicular crossing to minimize visual impacts in the Project area, consistent with VDOT's preference for perpendicular road crossings.[16]

[15] *See supra*, n. 3 and related text.

[16] *See* 24 VAC 30-151-310 (8) and 24 VAV 30-151-330 (1).

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

J. Identify coordination with appropriate municipal, state, and federal agencies.

Response: Below is a list of coordination that has occurred to date with municipal, state, and federal agencies:

- In-person contact with Loudoun County:
  - On January 21, 2021, Dominion Energy Virginia representatives met with Loudoun County Department of Planning and Zoning ("DPZ") representatives to discuss the routing options for the Project.
  - On May 13, 2021, Dominion Energy Virginia representatives met with Loudoun County DPZ representatives to discuss the routing options for the Project.
  - On May 25, 2021, Dominion Energy Virginia representatives met with Loudoun County DTCI representatives to review the proposed routes and discuss the County's planned transportation projects in the vicinity of the Project.
- On July 22, 2020, and December 21, 2020, Dominion Energy Virginia representatives met with MWAA representatives to discuss a possible route on MWAA property that was rejected. See Attachment III.J.1.
- The Company also requested comments from VDHR. See Attachment III.J.2 for a response dated September 16, 2021, from VDHR.
- As part of the proposed Project, on December 20, 2021, the Company solicited comments via letter from several federally recognized Native American tribes, including:

  Cheroenhaka (Nottoway) Indian Tribe

  Chickahominy Indian Tribe

  Chickahominy Indian Tribe Eastern Division

  Mattaponi Tribe

  Monacan Indian Nation

  Nansemond Indian Nation

  Nottoway Indian Tribe

  Pamunkey Indian Tribe

  Patawomeck Indian Tribe of Virginia

Rappahannock Tribe

Upper Mattaponi Indian Tribe

A copy of the letter template is included as Attachment III.J.3.

See also Sections III.B, III.K and V.D of this Appendix, as well as the DEQ Supplement.

From: Rabindranath, Sunil <Sunil.Rabindranath@MWAA.com>
Sent: Tuesday, August 25, 2020 5:41 PM
To: Greg R Baka (DEV Trans Distribution - 1) <Greg.R.Baka@dominionenergy.com>; Dean Obaugh (DEV Trans Distribution - 1) <dean.obaugh@dominionenergy.com>; Chris A Lybolt (Services - 6) <Chris.A.Lybolt@dominionenergy.com>
Cc: Spera, Johnna <Johnna.Spera@MWAA.com>
Subject: [EXTERNAL] RE: Aviator 230kV Line & Substation -- request to consider 100' r-o-w

Gentlemen,

Attached herewith please find comments generated through several Airports Authority departments' review of the Dominion Energy proposed transmission lines denoted as Route 1 and Route 2 under the Dominion Aviator 230 kV Line and Substation project at Washington Dulles International Airport. Also attached is a graphic which displays critical air navigation surfaces Above Mean Sea Level (AMSL) relevant to comments generated.

The Airports Authority appreciates the opportunity for assessment of the proposed routes which runs through property owned and maintained by the airport.

Please feel free to reach out to me should there be any need for clarifications or should you have any questions. We look forward to your responses and to receiving additional information as warranted.

Best Regards,
Sunil Rabindranath

From: Greg.R.Baka@dominionenergy.com [Greg.R.Baka@dominionenergy.com]
Sent: Monday, July 27, 2020 5:34 PM
To: Spera, Johnna
Cc: dean.obaugh@dominionenergy.com; Chris.A.Lybolt@dominionenergy.com
Subject: Aviator 230kV Line & Substation -- request to consider 100' r-o-w

CAUTION: This email originated from outside of Airports Authority. Do not click links or open attachments unless you recognize the sender and have verified the authenticity of the message.

Johnna Spera,

Thanks again to you and your team for your time to discuss the Aviator 230kV Line and Substation

project with us last week.

As part of our due diligence to consider all possible routes from an adequate existing 230kV power source to the proposed Aviator Substation located on east side of the Willard and just south of the MWAA property line, it is important for us to carefully consider all reasonable routing options that seek to minimize overall impacts.

As we discussed, we respectfully are seeking to determine whether it may be feasible for us to acquire r-o-w to extend an electric transmission corridor (100' wide) for a distance of:

- approximately 1.5 miles from the west along MWAA's southern property line to the proposed Aviator Substation (Route #1); and/or
- approximately 3.5 miles from the east mostly along MWAA's southern property line to the proposed Aviator Substation (Route #2)

Please see DRAFT map attached – routes are subject to change. We also ran a basic review of the maximum allowable structure height based on FAA restrictions for the horizontal and approach conical planes and it appears that 230kV structures (with an average approximate height of 110' – individual heights can vary, usually by as much as 10' - 20') could safely be constructed along MWAA's southern boundary without interfering with current air traffic.

We are respectfully requesting your review and comments within one month by August 27, 2020, if possible. Should you have any questions or need further clarification, plz don't hesitate to contact either Dean Obaugh or me. We look forward to this opportunity to work with you to provide a successful electrical solution.

Thank you,

Greg Baka
Electric Transmission – Local Permitting Consultant
Dominion Energy
10900 Nuckols Road; 4th Floor
Glen Allen, VA 23060
804-201-3053 cell
greg.r.baka@dominionenergy.com

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DOMINION ENERGY AVIATOR 230kV TRANSMISSION LINE & SUBSTATION –
Route 1 & 2 MWAA Review Comments and Concerns (Engineering, Planning, IAD Administration, Airport Operations)

Date: August 25, 2020

Route 1

1 - Critical Height Restrictions-

a) Please refer to the attached graphic which displays critical air navigation surfaces Above Mean Sea Level (AMSL). Proposed structures (power-lines and associated infrastructure) must not penetrate any of these surfaces.

2 - Live Fire Training Facility (LFTF) Impacts -

a) The existing and future LFTF footprint are adversely impacted by proposed Route 1. The proposed alignment's 100-foot wide Right-Of-Way (ROW) touches the southernmost edge of the existing propane-fueled trainers, equipment storage area and overall site boundary.
b) The ROW impacts a long-term trainer and its adjacent training pad.
c) This facility burns flammable liquid, emitting flames, smoke and heat into the local atmosphere. Firefighters routinely spray water and sometimes from elevated positions on fire trucks. All of these activities are not ideally compatible with the electrical nature of the proposed power-lines. The question about open fuel and gas flames so close to the Dominion overhead lines is being studied by Dominion.
d) Route 1 will impact the LFTF Upgrades and Master Plan project timelines and budget. The current project for improvements to the LFTF to bring it to an operational state is already underway and a more comprehensive (expensive) master plan for the expansion of the facility has incurred considerable cost and man-hours for site selection, A/E research, and planning.
e) The new LFTF master plan proposed to build facilities just outside the limits of the operational surfaces of the planned fifth runway. Route 1 will severely impact these plans.
f) Compatibility of the Dominion transmission line and the LFTF location is not likely. Dominion would have to bear the costs of relocation and bringing utilities to the new location for any consideration of moving the fire training facility. Relocation would be a last resort and would entail a considerable financial impact to both MWAA and Dominion. MWAA has expended a lot of cost and man-hours for site selection and A/E research and planning for the LFTF Master Plan at the current location.

3 - Loudoun County Water Main Route-

a) Loudoun County once proposed an alignment that travelled along the existing Perimeter Road. *This route is still active in Loudoun Water's master plan.* This line is

anticipated to support future Airport development. The proposed alignment's 100 feet ROW for Route 1 must preserve in perpetuity the ability for Loudoun County to introduce a new water main route bordering the Airport's southern boundary.

4- Maintenance and Security Operations –

a) Assuming Dominion Energy requires access to its ROW, airport security protocol will need to be followed. The integrity of the Airport's security system must not be comprised.
b) Both Routes 1 and 2 potentially impact the airport's perimeter security roadways. Dominion will have to consider these roadways in any proposed alignment along the airport's security fence. This may require Dominion to either place their lines further inland from these roads thereby taking up more land space and encroach the 5th runway operational surfaces, or require Dominion to rebuild the perimeter security roads 100 feet away outside the Dominion ROW from the airport's fence line. The latter would make security inspections more inconvenient and require constantly accessing Dominion ROW to inspect fencing.

5- Utility Corridor –

a) The route along the north end of Willard Road extending to the Airport's property line has a good probability to become a vital utility corridor for water and sewer (and possibly other utilities e.g. telecommunications) infrastructure that serves the Airport. This corridor should not be adversely impacted by this development.

6- Willard Road/Airport Property Line Intersection –

a) Willard Road has the potential to be widened and improved and be a major point of access to the Airport's property at this location. In the long-term the live fire training facility is envisioned to have an enhanced entrance at this location. Therefore, Dominion Energy structures must not impede this future expansion/enhancement.

7 – Dulles Solar Project Impacts -

a) MWAA has entered into a 3-year study period lease with Dominion for a solar farm, some of which arrays are located just east of Dominion's Poland Road transmission line on Vance Road and along the north portion of the airport boundary fence running easterly from Vance Road. Route 1 will interfere with the plans for the solar farm here.

8- Inter-Agency and Property Owner Coordination efforts –

a) Dominion should submit to MWAA a report on the various different routes that have been considered and the reason for not choosing other routes, for instance the path from the Poland Road substation up Willard Road would seem to be the shortest, cheapest option yet two longer routes on airport property are being proposed.
b) It is not clear if any coordination efforts have been made with VDOT and/or Loudoun County for consideration of a path along Route 50 for portions of both lines. Both

Routes 1 and 2 have huge impacts to development of the areas along the airport's southern border and on the NASM ground lease area.

Route 2

1-Critical Height Restrictions-

a) Please refer to the attached graphic which displays critical air navigation surfaces Above Mean Sea Level (AMSL). Proposed structures (power-lines and associated infrastructure) must not penetrate any of these surfaces.

2- Route 50 North Collector Distributor (Tall Cedars Extension)-

a) Route 2 conflicts with a planned by-pass highway connecting U.S. Route 50 with Route 28. The Airports Authority has already committed a portion of Route 2 for this road. The Airports Authority will not consider an easement that is north of the road ROW.

3- National Air and Space Museum, Udvar-Hazy Center (NASM) Ground Lease Area-

a) Route 2 appears to impact the Smithsonian Institution's (SI) NASM leasehold. If that is the case, we will need to engage with them and obtain approval with respect to that portion of the line. Before doing so, we would require additional details about exactly what is being constructed, the extent of the easement, any temporary construction easement needs, effects on perimeter security, and any other restrictions that might affect the leasehold.

b) Route 2 appears to run inside the Airport's property line in the vicinity of Udvar Hazy and impacts this leasehold(s). Coordination is required between Udvar Hazy and Dulles Airport. There is a high possibility that Dominion will place all of their 100-foot easement for Route 2 within the NASM ground lease being this is a single property coordination. This route shall require Smithsonian Institution (SI) review and approval.

c) It is difficult at this early stage to tell exactly how much the Dominion line would encroach into the NASM leased area, but measuring east from the airport's westernmost boundary fence towards the edge of the concrete taxiway pavement is approximately 204 feet of distance. A 100-foot wide easement would leave SI with only 104 feet of clearance from the transmission line pylons. The SI will probably not approve this restriction. The electric pylons and transmission lines will permanently mar the aesthetics surrounding the museum. (Dominion has mentioned that the reason the quarry folks rejected a path through their property was for aesthetic reasons as well).

d) Dominion has a policy regarding "danger trees" – anything that may potentially fall onto their transmission lines even outside the 100-foot easement will have to be cut down. We will potentially see a tremendous number of trees being felled within the locus of any Dominion easement and the grounds and landscaping below will be

permanently changed under the electrical lines. If Dominion considers this route as being feasible SI would have to be brought in early into any discussion.

e) IAD Airport Operations may be better able to address safety issues with the transmission towers being 50 feet away from the fence line and for taxiing aircraft heading towards the museum. Also it is not known if SI or Dominion would require a fence between their ROWs. That may constrict aircraft movement with wide wing-spans such as a Group 6 aircraft. If Dominion considers this route as being feasible SI would have to be brought in early into any discussion.
f) SI has shared with MWAA a master plan for the ground lease area to the south of the existing facilities closer to Route 50 which will be impacted by this transmission line. They intend to develop all of the areas south of the current museum campus. Again it is hard to say how much will be impacted as both plans have to be overlaid and a comparison made. If Dominion considers this route as being feasible SI would have to be brought in early into any discussion.
g) There is a "kink" in the Airport/NASM westernmost boundary/fence line at the Cain Branch stream location that could either push the Dominion ROW further into the ground lease area or would require Dominion to go the adjacent property owner for a ROW for the line to be kept straight. If Dominion considers this route as being feasible SI would have to be brought in early into any discussion.
h) The proposed line intrudes on the Hazy Center premises and would have to be negotiated with Smithsonian to agree to placement (and to request access each time anyone needed access to their premises for construction or maintenance of the line). If this impacts their perimeter security or requires that they allow Dominion access to SI property to service any lines, this will be through a negotiation. The SI tends to be very particular about allowing access to or through its property.
i) An easement plat needs to be sent to SI that superimposes the proposed Dominion Right of Way on SI's boundary. It would also be helpful to understand exactly what that Right of Way really entails: how wide is it, how much does it encroach on SI's property line, and how will the installation of that line actually impact SI (e.g. will the installation of the line require a wider and more intrusive construction zone around the ROW?) More details are required and the overlay is most important.

4- NASM Airport Operations Comment –

a) As to wingspan issues, it is uncertain what FAA standards would apply at the Smithsonian as it is probably considered a private ramp. If that is so, the SI could certainly dictate the distances required to the transmission towers based on delivery of any type of aircraft or spacecraft anticipated to/from the museum. Dominion has already indicated maximum allowable heights of the transmission structures per FAA standards and will also need to address any potential issues regarding airspace impacts.

5 -Maintenance/Security –

a) Assuming Dominion Energy requires access to its ROW, airport security protocol will need to be followed. The integrity of the Airport's security system must not be comprised.
b) Both Routes 1 and 2 will potentially impact the airport's perimeter security roads. Dominion will have to consider these roadways in their alignment along the airport's security fence. This may either require Dominion to place their lines further inland from these roads thereby taking up more land space, or require Dominion to rebuild the perimeter security roads 100 feet away from the airport's fence line. The latter would make security inspections more inconvenient and require accessing any Dominion ROW to inspect fencing.

6- Utility Corridor –

a) The route along the north end of Willard Road extending to the Airport's property line has a good probability to become a vital utility corridor for water and sewer (and possibly other utilities e.g. telecommunications) infrastructure that serves the Airport. This corridor should not be adversely impacted by this development.

7- Willard Road/Airport Property Line Intersection –

a) Willard Road/Airport Property Line Intersection - Willard Road has the potential to be widened and improved and be a major point of access to the Airport's property at this location. In the long-term the live fire training facility is envisioned to have an enhanced entrance at this location. Therefore, Dominion Energy structures must not impede this future expansion/enhancement.

8- Columbia Gas Meter –

a) There is an existing underground gas service line along Stonecroft Boulevard and north onto existing Airport property. In addition, there is an above ground main meter at the intersection of Stonecroft Boulevard and the Airport's property line. Route 2 must not adversely affect this existing utility infrastructure.

9 - Inter-Agency and Property Owner Coordination efforts –

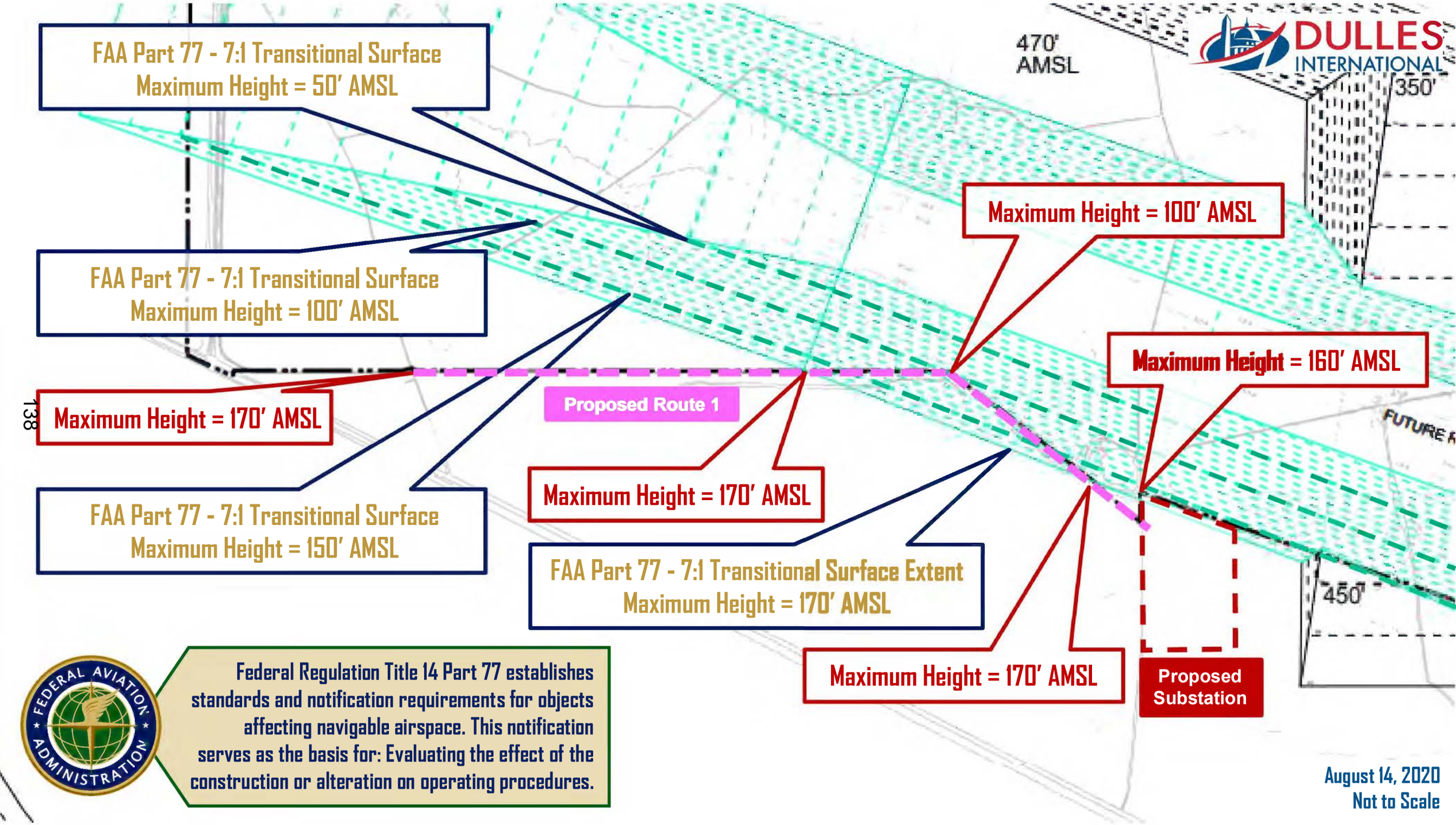
a) Dominion should submit to MWAA a report on the various different routes that have been considered and the reason for not choosing other routes, for instance the path from the Poland Road substation up Willard Road would seem to be the shortest, cheapest option yet two longer routes on airport property are being proposed. It is not clear if any coordination efforts have been made with VDOT for consideration of a path along Route 50 for portions of both lines. Both Routes 1 and 2 have huge impacts to development of the areas along the airport's southern border and on the NASM ground lease area.

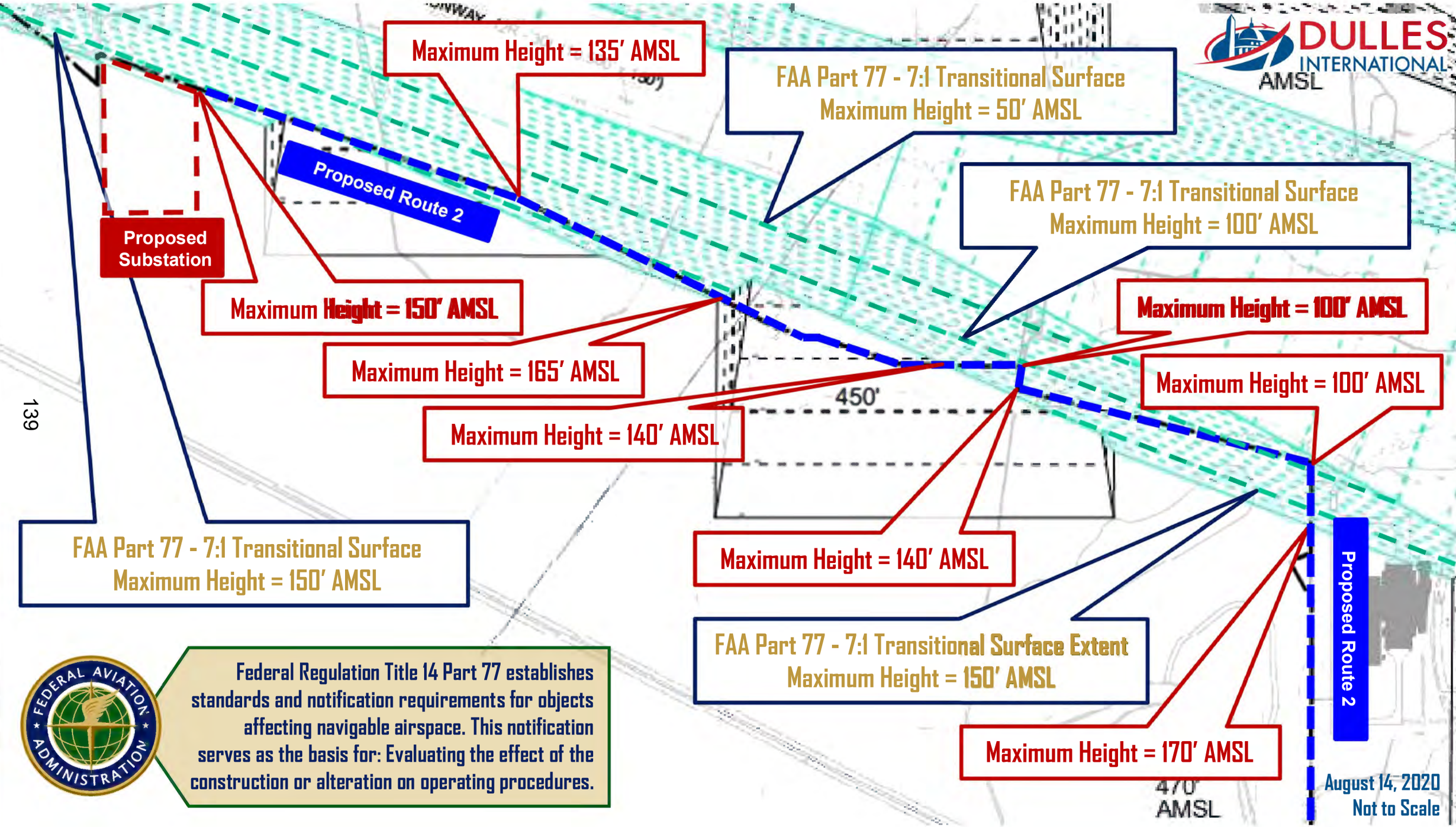
<u>MWAA Legal Counsel General Comments:</u>

1. The easement request will require FAA/NEPA/MWAA Board of Directors/DOT Secretary approvals.

2. The easement requires payment of fair market value as determined by appraisal done by the Authority's appraiser.
3. NASM approval will be required unless the route can go outside their leasehold.

4. The easement is subject to any and all existing licenses and easements in place.


FAA Part 77 - 7:1 Transitional Surface
Maximum Height = 50' AMSL
FAA Part 77 - 7:1 Transitional Surface
Maximum Height = 100' AMSL
Maximum Height = 170' AMSL
FAA Part 77 - 7:1 Transitional Surface
Maximum Height = 150' AMSL
Proposed Route 1
Maximum Height = 170' AMSL
FAA Part 77 - 7:1 Transitional Surface Extent
Maximum Height = 170' AMSL
Maximum Height = 170' AMSL
Maximum Height = 100' AMSL
Maximum Height = 160' AMSL
Proposed Substation
470' AMSL
350'
450'
DULLES INTERNATIONAL
138
Federal Regulation Title 14 Part 77 establishes standards and notification requirements for objects affecting navigable airspace. This notification serves as the basis for: Evaluating the effect of the construction or alteration on operating procedures.
August 14, 2020
Not to Scale



139

Federal Regulation Title 14 Part 77 establishes standards and notification requirements for objects affecting navigable airspace. This notification serves as the basis for: Evaluating the effect of the construction or alteration on operating procedures.

COMMONWEALTH of VIRGINIA

Matthew Strickler
Secretary of Natural Resources

Department of Historic Resources
2801 Kensington Avenue, Richmond, Virginia 23221

Julie V. Langan
Director

Tel: (804) 367-2323
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www.dhr.virginia.gov

September 16, 2021

Ken Custalow
Dominion Energy Virginia
Electric Transmission
P.O. Box 26666
Richmond, VA 23261

Re: Aviator 230 kV Electric Transmission Line
Loudoun County, Virginia
DHR File No. 2021-0240

Dear Mr. Custalow,

We have received your request for comments on the project referenced above. The undertaking, as presented, involves the installation of a new electric transmission line. 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.

We understand that the proposed project meets the requirements to be filed with the Virginia State Corporation Commission (SCC). 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.

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 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, 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.

Sincerely,



Jenny Bellville-Marrion, Project Review Archaeologist
Review and Compliance Division

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Fax: (540) 387-5446

Northern Region Office
5357 Main Street
PO Box 519
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Dominion Energy Virginia
Electric Transmission
P.O. Box 26666, Richmond, VA 23261-6666
DominionEnergy.com

Dec. 20, 2021

Aviator 230 kV Electric Transmission Line Project

Dear _____:

At Dominion Energy, we are dedicated to finding the best solution for our long-term needs in the communities we serve. As a valued stakeholder with a vested interest in the community, we invite you to participate in the development of a less than 1-mile 230 kilovolt (kV) electric transmission line project in Loudoun County, Virginia.

This project is near the Route 50 corridor and Willard Road. We are planning to build a new electric transmission line to connect our Poland Road Substation with our proposed Aviator Substation.

We are studying several overhead routes, with most of the work taking place on property north of Route 50.

Construction is scheduled to begin in May 2023 with an anticipated completion date of February 2025.

We are currently in the conceptual phase and are seeking input as we prepare to submit an application with the Virginia State Corporation Commission (SCC) in February 2022. Doing so allows us to hear any concerns you may have as we work to meet the needs of the project. To see a project overview map and photo simulations, please visit our webpage at DominionEnergy.com/aviator.

Please feel free to notify other relevant organizations that may have an interest in the project area. For reference, recipients of this letter include other county and statewide historic, cultural and scenic organizations and Native American Tribes.

Due to the ongoing public health concerns resulting from the spread of the coronavirus, we do not plan to host formal community open house events at this time. In lieu of our traditional in-person meetings, we will hold a virtual community meeting January 6, 2022 from 5-6 p.m. You can find meeting details as well as project information on our project webpage.

If you would like any additional information, have questions, or would like to set up a meeting to discuss the project, please do not hesitate to contact Ken Custalow, our Tribal Liaison. He can be reached by email at ken.custalow@dominionenergy.com. Thank you for your willingness to join us in our commitment to serving the community.

Sincerely,

Robert E Richardson

Robert Richardson
Communications Consultant
The Electric Transmission Project Team
Robert.E.Richardson@DominionEnergy.com

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

K. Identify coordination with any non-governmental organizations or private citizen groups.

Response: On December 20, 2021, the Company solicited comments via letter from the community leaders, environmental groups, and business groups identified below. A copy of the letter template is included as Attachment III.K.1.

Name	Organization
Ms. Elizabeth S. Kostelny	Preservation Virginia
Mr. Jack Gary	Council of Virginia Archaeologists
Ms. Leighton Powell	Scenic Virginia
Ms. Sharee Williamson	National Trust for Historic Preservation
Mr. Dan Holmes	Piedmont Environmental Council
Mr. Thomas Gilmore	American Battlefield Trust
Mr. Jim Campi	American Battlefield Trust
Mr. Adam Gillenwater	American Battlefield Trust
Ms. Kym Hall	Colonial National Historical Park
Mr. Alexander Macaulay	Attorney, Macaulay and Jamerson
Dr. Newby Alexander	Professor of History – Norfolk State University
Mary Frances Wilkerson	Cheroenhaka (Nottoway) Indian Tribe
Mr. Dave Dutton	Dutton and Associates, LLC

Dominion Energy Virginia
Electric Transmission
P.O. Box 26666, Richmond, VA 23261-6666
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Dec. 20, 2021

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If you would like any additional information, have questions, or would like to set up a meeting to discuss the project, please contact me by sending an email to Robert.E.Richardson@dominionenergy.com or calling 888-291-0190.

Thank you for your willingness to join us in our commitment to serving the community.

Sincerely,

Robert E. Richardson

Rob Richardson
Communications Consultant
The Electric Transmission Project Team

III. IMPACT OF LINE ON SCENIC, ENVIRONMENTAL AND HISTORIC FEATURES

L. Identify any environmental permits or special permissions anticipated to be needed.

Response: The permits or special permissions that are likely to be required for the proposed Project are listed below.

Activity	Potential Permit	Agency/Organization
Impacts to wetlands and other waters of the U.S.	Nationwide Permit 57	U.S. Army Corps of Engineers
Impacts to wetlands and other waters of the U.S.	Virginia Water Protection Permit	Virginia Department of Environmental Quality
Discharge of stormwater from construction	Construction General Permit	Virginia Department of Environmental Quality
Work within VDOT rights-of-way	Land Use Permit	Virginia Department of Transportation
Airspace obstruction evaluation	FAA 7460-1	Dulles International Airport

IV. HEALTH ASPECTS OF ELECTROMAGNETIC FIELDS ("EMF")

A. State the calculated maximum electric and magnetic field (EMF) levels that are expected to occur at the edge of the right-of-way. If the new transmission line is to be constructed on an existing electric transmission line right-of-way, provide the present EMF levels as well as the maximum levels calculated at the edge of right-of-way after the new line is operational.

Response: Public exposure to magnetic fields is best estimated by field levels from power lines calculated at annual average loading. For any day of the year, the EMF levels associated with average conditions provide the best estimate of potential exposure. Maximum (peak) values are less relevant as they may occur for only a few minutes or hours each year.

This section describes the levels of EMF associated with the proposed transmission lines. EMF levels are provided for future (2026) annual average and maximum (peak) loading conditions.

Proposed project – Projected average loading in 2026

EMF levels were calculated for the proposed Project at the ***projected average*** load condition (198.3 amps for Line #2137 and 300.8 amps for Line #2221) and at an operating voltage of 241.5 kV when supported on the proposed Project structures – see Attachment II.A.5.a.

These field levels were calculated at mid-span where the conductors are closest to the ground and the conductors are at a projected average load operating temperature.

EMF levels at the edge of the rights-of-way for the proposed Project at the projected average loading:

	Left Edge		**Right Edge**	
	Electric Field (kV/m)	Magnetic Field (mG)	Electric Field (kV/m)	Magnetic Field (mG)
Attachment II.A.5.a	0.694	6.562	0.693	14.40

Proposed project – Projected Peak loading in 2026

EMF levels were calculated for the proposed Project at the ***projected peak*** load condition (247.9 amps for Line #2137 and 376 amps for Line #2221) and at an

operating voltage of 241.5 kV when supported on the proposed Project structures – see Attachment II.A.5.a.

These field levels were calculated at mid-span where the conductors are closest to the ground and the conductors are at a projected peak load operating temperature.

EMF levels at the edge of the rights-of-way for the proposed Project at the projected peak loading:

	Left Edge		**Right Edge**	
	Electric Field (kV/m)	Magnetic Field (mG)	Electric Field (kV/m)	Magnetic Field (mG)
Attachment II.A.5.a	0.694	8.208	0.693	18.007

IV. HEALTH ASPECTS OF ELECTROMAGNETIC FIELDS ("EMF")

B. If the Applicant is of the opinion that no significant health effects will result from the construction and operation of the line, describe in detail the reasons for that opinion and provide references or citations to supporting documentation.

Response: The conclusions of multidisciplinary scientific review panels assembled by national and international scientific agencies during the past two decades are the foundation of the Company's opinion that no adverse health effects will result from the operation of the proposed Project. Each of these panels has evaluated the scientific research related to health and power-frequency EMF and provided conclusions that form the basis of guidance to governments and industries. The Company regularly monitors the recommendations of these expert panels to guide their approach to EMF.

Research on EMF and human health varies widely in approach. Some studies evaluate the effects of high, short-term EMF exposures not typically found in people's day-to-day lives on biological responses, while others evaluate the effects of common, lower EMF exposures found throughout communities. Studies also have evaluated the possibility of effects (*e.g.*, cancer, neurodegenerative diseases, and reproductive effects) of long-term exposure. Altogether, this research includes well over a hundred epidemiologic studies of people in their natural environment and many more laboratory studies of animals (*in vivo*) and isolated cells and tissues (*in vitro*). Standard scientific procedures, such as weight-of-evidence methods, were used by the expert panels assembled by agencies to identify, review, and summarize the results of this large and diverse research.

The reviews of EMF biological and health research have been conducted by numerous scientific and health agencies, including the European Health Risk Assessment Network on Electromagnetic Fields Exposure ("EFHRAN"), the International Commission on Non-Ionizing Radiation Protection ("ICNIRP"), the World Health Organization ("WHO"), the IEEE's International Committee on Electromagnetic Safety ("ICES"), the Scientific Committee on Emerging and Newly Identified Health Risks ("SCENIHR") of the European Commission, and the Swedish Radiation Safety Authority ("SSM") (formerly the Swedish Radiation Protection Authority ["SSI"]) (WHO, 2007; SCENIHR, 2009, 2015; EFHRAN, 2010, 2012; ICNIRP, 2010; SSM, 2015, 2016, 2018, 2019, 2020, 2021; ICES, 2019). The general scientific consensus of the agencies that have reviewed this research, relying on generally accepted scientific methods, is that the scientific evidence does not confirm that common sources of EMF in the environment, including transmission lines and other parts of the electric system, appliances, etc., are a cause of any adverse health effects.

The most recent reviews on this topic include the 2015 report by SCENIHR and annual reviews published by SSM (*e.g.*, for the years 2015 through 2021). These reports, similar to previous reviews, found that the scientific evidence does not

confirm the existence of any adverse health effects caused by environmental or community exposure to EMF.

The WHO has recommended that countries adopt recognized international standards published ICNIRP and ICES. Typical levels of EMF from Dominion's power lines outside its property and rights-of-way are far below the screening reference levels of EMF recommended for the general public and still lower than exposures equivalent to restrictions to limits on fields within the body (ICNIRP, 2010; ICES, 2019).

Thus, based on the conclusions of scientific reviews and the levels of EMF associated with the proposed Project, the Company has determined that no adverse health effects are anticipated to result from the operation of the proposed Project.

References

European Health Risk Assessment Network on Electromagnetic Fields Exposure (EFHRAN). Report on the Analysis of Risks Associated to Exposure to EMF: *In Vitro* and *In Vivo* (Animals) Studies. Milan, Italy: EFHRAN, 2010.

European Health Risk Assessment Network on Electromagnetic Fields Exposure (EFHRAN). Risk Analysis of Human Exposure to Electromagnetic Fields (Revised). Report D2 of the EFHRAN Project. Milan, Italy: EFHRAN, 2012.

International Commission on Non-ionizing Radiation Protection (ICNIRP). Guidelines for limiting exposure to time-varying electric and magnetic fields (1 Hz to 100 kHz). Health Phys 99: 818-36, 2010.

International Committee on Electromagnetic Safety (ICES). IEEE Standard for Safety Levels with Respect to Human Exposure to Electromagnetic Fields 0 to 300 GHz. IEEE Std C95.1-2019. New York, NY: IEEE, 2019.

Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR). Health Effects of Exposure to EMF. Brussels, Belgium: European Commission, 2009.

Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR). Opinion on Potential Health Effects of Exposure to Electromagnetic Fields (EMF). Brussels, Belgium: European Commission, 2015.

Swedish Radiation Safety Authority (SSM). Research 2015:19. Recent Research on EMF and Health Risk - Tenth report from SSM's Scientific Council on Electromagnetic Fields. Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2015.

Swedish Radiation Safety Authority (SSM). Research 2016:15. Recent Research on EMF and Health Risk - Eleventh report from SSM's Scientific Council on Electromagnetic Fields, 2016. Including Thirteen years of electromagnetic field

research monitored by SSM's Scientific Council on EMF and health: How has the evidence changed over time? Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2016.

Swedish Radiation Safety Authority (SSM). Research 2018:09. Recent Research on EMF and Health Risk - Twelfth report from SSM's Scientific Council on Electromagnetic Fields, 2017. Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2018.

Swedish Radiation Safety Authority (SSM). Research 2019:08. Recent Research on EMF and Health Risk – Thirteenth Report from SSM's Scientific Council on Electromagnetic Fields, 2018. Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2019.

Swedish Radiation Safety Authority (SSM). Research 2020:04. Recent Research on EMF and Health Risk – Fourteenth Report from SSM's Scientific Council on Electromagnetic Fields, 2019. Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2020.

Swedish Radiation Safety Authority (SSM). Research 2021:08. Recent Research on EMF and Health Risk – Fifteenth report from SSM's Scientific Council on Electromagnetic Fields, 2020. Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2021.

World Health Organization (WHO). Environmental Health Criteria 238: Extremely Low Frequency (ELF) Fields. Geneva, Switzerland: World Health Organization, 2007.

IV. HEALTH ASPECTS OF ELECTROMAGNETIC FIELDS ("EMF")

C. Describe and cite any research studies on EMF the Applicant is aware of that meet the following criteria:

1. Became available for consideration since the completion of the Virginia Department of Health's most recent review of studies on EMF and its subsequent report to the Virginia General Assembly in compliance with 1985 Senate Joint Resolution No. 126;

2. Include findings regarding EMF that have not been reported previously and/or provide substantial additional insight into findings; and

3. Have been subjected to peer review.

Response: The Virginia Department of Health ("VDH") conducted its most recent review and issued its report on the scientific evidence on potential health effects of extremely low frequency ("ELF") EMF in 2000: "[T]he Virginia Department of Health is of the opinion that there is no conclusive and convincing evidence that exposure to extremely low frequency EMF emanated from nearby high voltage transmission lines is causally associated with an increased incidence of cancer or other detrimental health effects in humans."[17]

The continuing scientific research on EMF exposure and health has resulted in many peer-reviewed publications since 2000. The accumulating research results have been regularly and repeatedly reviewed and evaluated by national and international health, scientific, and government agencies, including most notably:

- The WHO, which published one of the most comprehensive and detailed reviews of the relevant scientific peer-reviewed literature in 2007;
- SCENIHR, a committee of the European Commission, which published its assessments in 2009 and 2015;
- The SSM, which has published annual reviews of the relevant peer-reviewed scientific literature since 2003, with its most recent review published in 2021; and,
- EFHRAN, which published its reviews in 2010 and 2012.

The above reviews provide detailed analyses and summaries of relevant recent peer-reviewed scientific publications. The conclusions of these reviews that the evidence overall does not confirm the existence of any adverse health effects due to exposure to EMF below scientifically established guideline values are consistent with the conclusions of the VDH report. With respect to the statistical association observed in some of the childhood leukemia epidemiologic studies, the most recent

[17] *See* http://www.vdh.virginia.gov/content/uploads/sites/12/2016/02/highfinal.pdf.

comprehensive review of the literature by SCENIHR, published in 2015, concluded that "no mechanisms have been identified and no support is existing [*sic*] from experimental studies that could explain these findings, which, together with shortcomings of the epidemiological studies prevent a causal interpretation" (SCENIHR, 2015, p. 16).

While research is continuing on multiple aspects of EMF exposure and health, many of the recent publications have focused on an epidemiologic assessment of the relationship between EMF exposure and childhood leukemia and EMF exposure and neurodegenerative diseases. Of these, the following recent publications, published following the inclusion date (June 2014) for the SCENIHR (2015) report through May 2021, provided additional evidence and contributed to clarification of previous findings. Overall, new research studies have not provided evidence to alter the previous conclusions of scientific and health organizations, including the WHO and SCENIHR.

Recent epidemiologic studies of EMF and childhood leukemia include:

- Bunch et al. (2015) assessed the potential association between residential proximity to high-voltage underground cables and development of childhood cancer in the United Kingdom largely using the same epidemiologic data as in a previously published study on overhead transmission lines (Bunch et al., 2014). No statistically significant associations or trends were reported with either distance to underground cables or calculated magnetic fields from underground cables for any type of childhood cancers.

- Pedersen et al. (2015) published a case-control study that investigated the potential association between residential proximity to power lines and childhood cancer in Denmark. The study included all cases of leukemia (n=1,536), central nervous system tumor, and malignant lymphoma (n=417) diagnosed before the age of 15 between 1968 and 2003 in Denmark, along with 9,129 healthy control children matched on sex and year of birth. Considering the entire study period, no statistically significant increases were reported for any of the childhood cancer types.

- Salvan et al. (2015) compared measured magnetic-field levels in the bedroom for 412 cases of childhood leukemia under the age of 10 and 587 healthy control children in Italy. Although the statistical power of the study was limited because of the small number of highly exposed subjects, no consistent statistical associations or trends were reported between measured magnetic-field levels and the occurrence of leukemia among children in the study.

- Bunch et al. (2016) and Swanson and Bunch (2018) published additional analyses using data from an earlier study (Bunch et al., 2014). Bunch et al. (2016) reported that the association with distance to power lines observed in earlier years was linked to calendar year of birth or year of cancer diagnosis, rather than the age of the power lines. Swanson and Bunch (2018) re-analyzed

data using finer exposure categories (e.g., cut-points of every 50-meter distance) and broader groupings of diagnosis date (e.g., 1960-1979, 1980-1999, and 2000-on) and reported no overall associations between exposure categories and childhood leukemia for the later periods (1980 and on), and consistent pattern for the periods prior to 1980.

- Crespi et al. (2016) conducted a case-control epidemiologic study of childhood cancers and residential proximity to high-voltage power lines (60 kilovolts ["kV"] to 500 kV) in California. Childhood cancer cases, including 5,788 cases of leukemia and 3,308 cases of brain tumor, diagnosed under the age of 16 between 1986 and 2008, were identified from the California Cancer Registry. Controls, matched on age and sex, were selected from the California Birth Registry. Overall, no consistent statistically significant associations for leukemia or brain tumor and residential distance to power lines were reported.

- Kheifets et al. (2017) assessed the relationship between calculated magnetic-field levels from power lines and development of childhood leukemia within the same study population evaluated in Crespi et al. (2016). In the main analyses, which included 4,824 cases of leukemia and 4,782 controls matched on age and sex, the authors reported no consistent patterns, or statistically significant associations between calculated magnetic-field levels and childhood leukemia development. Similar results were reported in subgroup and sensitivity analyses. In two subsequent studies, Amoon et al. (2018a, 2019) examined the potential impact of residential mobility (i.e., moving residences between birth and diagnosis) on the associations reported in Crespi et al. (2016) and Kheifets et al. (2017). Amoon et al. (2018a) concluded that changing residences was not associated with either calculated magnetic-field levels or proximity to the power lines, while Amoon et al. (2019) concluded that while uncontrolled confounding by residential mobility had some impact on the association between EMF exposure and childhood leukemia, it was unlikely to be the primary driving force behind the previously reported associations in Crespi et al. (2016) and Kheifets et al. (2017).

- Amoon et al. (2018b) conducted a pooled analysis of 29,049 cases and 68,231 controls from 11 epidemiologic studies of childhood leukemia and residential distance from high-voltage power lines. The authors reported no statistically-significant association between childhood leukemia and proximity to transmission lines of any voltage. Among subgroup analyses, the reported associations were slightly stronger for leukemia cases diagnosed before 5 years of age and in study periods prior to 1980. Adjustment for various potential confounders (*e.g.*, socioeconomic status, dwelling type, residential mobility) had little effect on the estimated associations.

- Kyriakopoulou et al. (2018) assessed the association between childhood acute leukemia and parental occupational exposure to social contacts, chemicals, and electromagnetic fields. The study was conducted at a major pediatric hospital in Greece and included 108 cases and 108 controls matched for age, gender,

and ethnicity. Statistically non-significant associations were observed between paternal exposure to magnetic fields and childhood acute leukemia for any of the exposure periods examined (1 year before conception; during pregnancy; during breastfeeding; and from birth until diagnosis); maternal exposure was not assessed due to the limited sample size. No associations were observed between childhood acute leukemia and exposure to social contacts or chemicals.

- Auger et al. (2019) examined the relationship between exposure to EMF during pregnancy and risk of childhood cancer in a cohort of 784,000 children born in Quebéc. Exposure was defined using residential distance to the nearest high-voltage transmission line or transformer station. The authors reported statistically non-significant associations between proximity to transformer stations and any cancer, hematopoietic cancer, or solid tumors. No associations were reported with distance to transmission lines.

- Crespi et al. (2019) investigated the relationship between childhood leukemia and distance from high-voltage lines and calculated magnetic-field exposure, separately and combined, within the California study population previously analyzed in Crespi et al. (2016) and Kheifets et al. (2017). The authors reported that neither close proximity to high-voltage lines nor exposure to calculated magnetic fields alone were associated with childhood leukemia; an association was observed only for those participants who were both close to high-voltage lines (< 50 meters) and had high calculated magnetic fields (≥ 0.4 microtesla [i.e., ≥ 4 milligauss]). No associations were observed with low-voltage power lines (< 200 kV). In a subsequent study, Amoon et al. (2020) examined the potential impact of dwelling type on the associations reported in Crespi et al. (2019). Amoon et al. (2020) concluded that while the type of dwelling at which a child resides (e.g., single-family home, apartment, duplex, mobile home) was associated with socioeconomic status and race or ethnicity, it was not associated with childhood leukemia and did not appear to be a potential confounder in the relationship between childhood leukemia and magnetic-field exposure in this study population.

- Swanson et al. (2019) conducted a meta-analysis of 41 epidemiologic studies of childhood leukemia and magnetic-field exposure published between 1979 and 2017 to examine trends in childhood leukemia development over time. The authors reported that while the estimated risk of childhood leukemia initially increased during the earlier period, a statistically non-significant decline in estimated risk has been observed from the mid-1990s until the present (*i.e.*, 2019).

- Talibov et al. (2019) conducted a pooled analysis of 9,723 cases and 17,099 controls from 11 epidemiologic studies to examine the relationship between parental occupational exposure to magnetic fields and childhood leukemia. No statistically significant association was found between either paternal or

maternal exposure and leukemia (overall or by subtype). No associations were observed in the meta-analyses.

- Núñez-Enríquez et al. (2020) assessed the relationship between residential magnetic-field exposure and B-lineage acute lymphoblastic leukemia ("B-ALL") in children under 16 years of age in Mexico. The study included 290 cases and 407 controls matched on age, gender, and health institution; magnetic-field exposure was assessed through the collection of 24-hour measurements in the participants' bedrooms. While the authors reported some statistically significant associations between elevated magnetic-field levels and development of B-ALL, the results were dependent on the chosen cut-points.
- Seomun et al. (2021) performed a meta-analysis based on 33 previously published epidemiologic studies investigating the potential relationship between magnetic-field exposure and childhood cancers, including leukemia and brain cancer. For childhood leukemia, the authors reported statistically significant associations with some, but not all, of the chosen cut-points for magnetic-field exposure. The associations between magnetic-field exposure and childhood brain cancer were statistically non-significant. The study provided limited new insight as most of the studies included in the current meta-analysis, were included in previously conducted meta- and pooled analyses.

Recent epidemiologic studies of EMF and neurodegenerative diseases include:

- Seelen et al. (2014) conducted a population-based case-control study in the Netherlands and included 1,139 cases diagnosed with amyotrophic lateral sclerosis ("ALS") between 2006 and 2013 and 2,864 frequency-matched controls. The shortest distance from the case and control residences to the nearest high-voltage power line (50 to 380 kilovolts [kV]) was determined by geocoding. No statistically significant associations between residential proximity to power lines with voltages of either 50 to 150 kV or 220 to 380 kV and ALS were reported.

- Sorahan and Mohammed (2014) analyzed mortality from neurodegenerative diseases in a cohort of approximately 73,000 electricity supply workers in the United Kingdom. Cumulative occupational exposure to magnetic-fields was calculated for each worker in the cohort based on their job titles and job locations. Death certificates were used to identify deaths from neurodegenerative diseases. No associations or trends for any of the included neurodegenerative diseases (Alzheimer's disease, Parkinson's disease, and ALS) were observed with various measures of calculated magnetic fields.

- Koeman et al. (2015, 2017) analyzed data from the Netherlands Cohort Study of approximately 120,000 men and women who were enrolled in the cohort in 1986 and followed up until 2003. Lifetime occupational history, obtained through questionnaires, and job-exposure matrices on ELF magnetic fields and other occupational exposures were used to assign exposure to study subjects. Based on 1,552 deaths from vascular dementia, the researchers reported a

statistically not significant association of vascular dementia with estimated exposure to metals, chlorinated solvents, and ELF magnetic fields. However, because no exposure-response relationship for cumulative exposure was observed and because magnetic fields and solvent exposures were highly correlated with exposure to metals, the authors attributed the association with ELF magnetic fields and solvents to confounding by exposure to metals (Koeman et al., 2015). Based on a total of 136 deaths from ALS among the cohort members, the authors reported a statistically significant, approximately two-fold association with ELF magnetic fields in the highest exposure category. This association, however, was no longer statistically significant when adjusted for exposure to insecticides (Koeman et al., 2017).

- Fischer et al. (2015) conducted a population-based case-control study that included 4,709 cases of ALS diagnosed between 1990 and 2010 in Sweden and 23,335 controls matched to cases on year of birth and sex. The study subjects' occupational exposures to ELF magnetic fields and electric shocks were classified based on their occupations, as recorded in the censuses and corresponding job-exposure matrices. Overall, neither magnetic fields nor electric shocks were related to ALS.

- Vergara et al. (2015) conducted a mortality case-control study of occupational exposure to electric shock and magnetic fields and ALS. They analyzed data on 5,886 deaths due to ALS and over 58,000 deaths from other causes in the United States between 1991 and 1999. Information on occupation was obtained from death certificates and job-exposure matrices were used to categorize exposure to electric shocks and magnetic fields. Occupations classified as "electric occupations" were moderately associated with ALS. The authors reported no consistent associations for ALS, however, with either electric shocks or magnetic fields, and they concluded that their findings did not support the hypothesis that exposure to either electric shocks or magnetic fields explained the observed association of ALS with "electric occupations."

- Pedersen et al. (2017) investigated the occurrence of central nervous system diseases among approximately 32,000 male Danish electric power company workers. Cases were identified through the national patient registry between 1982 and 2010. Exposure to ELF magnetic fields was determined for each worker based on their job titles and area of work. A statistically significant increase was reported for dementia in the high exposure category when compared to the general population, but no exposure-response pattern was identified, and no similar increase was reported in the internal comparisons among the workers. No other statistically significant increases among workers were reported for the incidence of Alzheimer's disease, Parkinson's disease, motor neuron disease, multiple sclerosis, or epilepsy, when compared to the general population, or when incidence among workers was analyzed across estimated exposure levels.

- Vinceti et al. (2017) examined the association between ALS and calculated magnetic-field levels from high-voltage power lines in Italy. The authors included 703 ALS cases and 2,737 controls; exposure was assessed based on residential proximity to high-voltage power lines. No statistically significant associations were reported and no exposure-response trend was observed. Similar results were reported in subgroup analyses by age, calendar period of disease diagnosis, and study area.

- Checkoway et al. (2018) investigated the association between Parkinsonism[18] and occupational exposure to magnetic fields and several other agents (endotoxins, solvents, shift work) among 800 female textile workers in Shanghai. Exposure to magnetic fields was assessed based on the participants' work histories. The authors reported no statistically significant associations between Parkinsonism and occupational exposure to any of the agents under study, including magnetic fields.

- Gunnarsson and Bodin (2018) conducted a meta-analysis of occupational risk factors for ALS. The authors reported a statistically significant association between occupational exposures to EMF, estimated using a job-exposure matrix, and ALS among the 11 studies included. Statistically significant associations were also reported between ALS and jobs that involve working with electricity, heavy physical work, exposure to metals (including lead) and chemicals (including pesticides), and working as a nurse or physician. The authors reported some evidence for publication bias. In a subsequent publication, Gunnarsson and Bodin (2019) updated their previous meta-analysis to also include Parkinson's disease and Alzheimer's disease. A slight, statistically significant association was reported between occupational exposure to EMF and Alzheimer's disease; no association was observed for Parkinson's disease.

- Huss et al. (2018) conducted a meta-analysis of 20 epidemiologic studies of ALS and occupational exposure to magnetic fields. The authors reported a weak overall association; a slightly stronger association was observed in a subset analysis of six studies with full occupational histories available. The authors noted substantial heterogeneity among studies, evidence for publication bias, and a lack of a clear exposure-response relationship between exposure and ALS.

- Jalilian et al. (2018) conducted a meta-analysis of 20 epidemiologic studies of occupational exposure to magnetic fields and Alzheimer's disease. The authors reported a moderate, statistically significant overall association; however, they

[18] Parkinsonism is defined by Checkoway et al. (2018) as "*a syndrome whose cardinal clinical features are bradykinesia, rest tremor, muscle rigidity, and postural instability. Parkinson disease is the most common neurodegenerative form of [parkinsonism]"* (p. 887).

noted substantial heterogeneity among studies and evidence for publication bias.

- Röösli and Jalilian (2018) performed a meta-analysis using data from five epidemiologic studies examining residential exposure to magnetic fields and ALS. A statistically non-significant negative association was reported between ALS and the highest exposed group, where exposure was defined based on distance from power lines or calculated magnetic-field level.

- Gervasi et al. (2019) assessed the relationship between residential distance to overhead power lines in Italy and risk of Alzheimer's dementia and Parkinson's disease. The authors included 9,835 cases of Alzheimer's dementia and 6,810 cases of Parkinson's disease; controls were matched by sex, year of birth, and municipality of residence. A weak, statistically non-significant association was observed between residences within 50 meters of overhead power lines and both Alzheimer's dementia and Parkinson's disease, compared to distances of over 600 meters.

- Peters et al. (2019) examined the relationship between ALS and occupational exposure to both magnetic fields and electric shock in a pooled study of data from three European countries. The study included 1,323 ALS cases and 2,704 controls matched for sex, age, and geographic location; exposure was assessed based on occupational title and defined as low (background), medium, or high. Statistically significant associations were observed between ALS and ever having been exposed above background levels to either magnetic fields or electric shocks; however, no clear exposure-response trends were observed with exposure duration or cumulative exposure. The authors also noted significant heterogeneity in risk by study location.

- Filippini et al. (2020) investigated the associations between ALS and several environmental and occupational exposures, including electromagnetic fields, within a case-control study in Italy. The study included 95 cases and 135 controls matched on age, gender, and residential province; exposure to electromagnetic fields was assessed using the participants' responses to questions related to occupational use of electric and electronic equipment, occupational EMF exposure, and residential distance to overhead power lines. The authors reported a statistically significant association between ALS and residential proximity to overhead power lines and a statistically non-significant association between ALS and occupational exposure to EMF; occupational use of electric and electronic equipment was associated with a statistically non-significant decrease in ALS development.

- Huang et al. (2020) conducted a meta-analysis of 43 epidemiologic studies examining potential occupational risk factors for dementia or mild cognitive impairment. The authors included five cohort studies and seven case-control studies related to magnetic-field exposure. For both study types, the authors reported positive associations between dementia and work-related magnetic-

field exposures. The paper, however, provided no information on the occupations held by the study participants, their magnetic-field exposure levels, or how magnetic-field levels were assessed; therefore, the results are difficult to interpret. The authors also reported a high level of heterogeneity among studies. Thus, this analysis adds little, if any, to the overall weight of evidence on a potential association between dementia and magnetic fields.

- Jalilian et al. (2020) conducted a meta-analysis of ALS and occupational exposure to both magnetic fields and electric shocks within 27 studies from Europe, the United States, and New Zealand. A weak, statistically significant association was reported between magnetic-field exposure and ALS; however, the authors noted evidence of study heterogeneity and publication bias. No association was observed between ALS and electric shocks.

- Chen et al. (2021) conducted a case-control study to examine the association between occupational exposure to electric shocks, magnetic fields, and motor neuron disease ("MND") in New Zealand. The study included 319 cases with a MND diagnosis (including ALS) and 604 controls, matched on age and gender; exposure was assessed using the participants' occupational history questionnaire responses and previously developed job-exposure matrices for electric shocks and magnetic fields. The authors reported no associations between MND and exposure to magnetic fields; positive associations were reported between MND and working at a job with the potential for electric shock exposure.

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V. NOTICE

A. Furnish a proposed route description to be used for public notice purposes. Provide a map of suitable scale showing the route of the proposed project. For all routes that the Applicant proposed to be noticed, provide minimum, maximum and average structure heights.

Response: A map showing the overhead Proposed and Alternative Routes for the proposed 230 kV Aviator Loop and the location of the proposed Aviator Substation is provided as Attachment V.A. A written description of the Proposed and Alternative Routes is as follows:

Proposed Route (Overhead Route 1A)

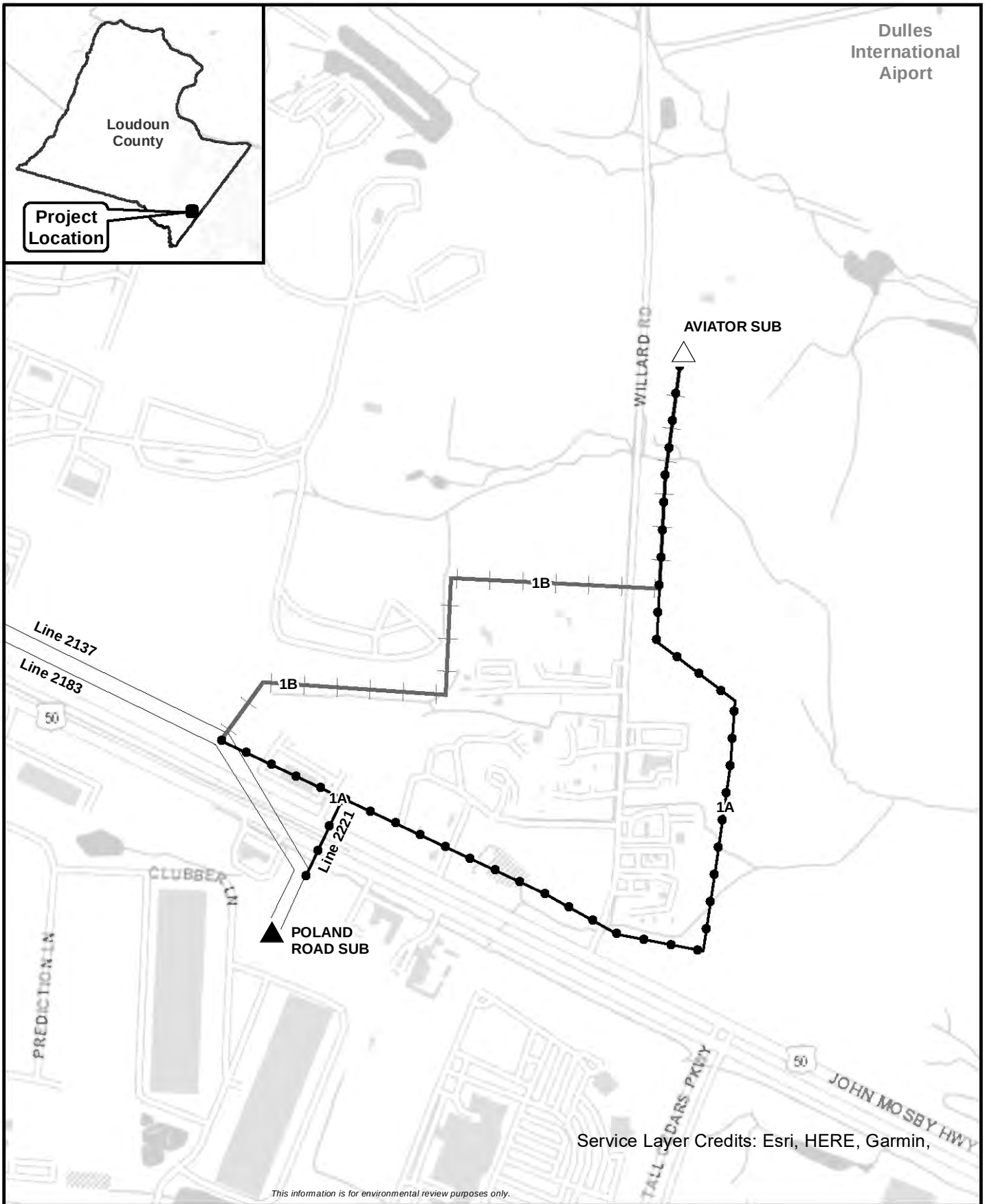
The Proposed Route (Overhead Route 1A) of the Aviator Loop is approximately 0.90 mile in length. Beginning from the cut-in of existing 230 kV overhead Poland Road-Shellhorn Line #2137 (Brambleton-Poland Road Line #2183) at Structures #2137/133-134 (Structure #2183/58-57), the route heads southeast for about 0.32 mile, paralleling the northern side of Route 50 and crossing Willard Road. This portion of the route runs parallel to Route 50 and is parallel to and overlaps with portions of existing Dominion Energy Virginia distribution line rights-of-way and a Loudoun County Sanitation Authority ("Loudoun Water") right-of-way. After crossing Willard Road, the route pivots slightly to the northeast for 0.06 mile before turning north through a wooded area behind industrial businesses for approximately 0.18 mile. The route continues northwest for about 0.07 mile before turning north and paralleling the east side of Willard Road for the remaining 0.21 mile before terminating at the substation location. The 0.9-mile Proposed Route includes removal of one existing overhead span of double circuit 230 kV line located entirely within existing right-of-way between existing Structures #2137/133-134 (Structures #2183/58-57), and installation of a new overhead double circuit 230 kV line in new right-of-way for approximately 0.1 mile from existing Structure #2137/133 (Structure #2183/58) to a proposed new triple circuit steel pole located along Route 50 across from the existing Poland Road Substation (the "Aviator Junction"), and for approximately 0.06 mile from the Aviator Junction to existing Structure #2137/134 (Structure #2183/57) at Poland Road Substation. This route effectively removes the existing diagonal span of Lines #2137/#2183 across Route 50, and replaces them with a new perpendicular crossing of Route 50.

The Proposed Route will be constructed on new right-of-way supported by nine double circuit poles and one triple circuit pole with a minimum structure height of approximately 100 feet, a maximum structure height of approximately 125 feet, and an average proposed structure height of approximately 105 feet. These heights are based on preliminary conceptual design, do not include foundation reveal, and are subject to change based on final engineering design.

Overhead Alternative Route 1B

Overhead Alternative Route 1B is approximately 0.58 mile long. Beginning from the cut-in of existing 230 kV overhead Poland Road-Shellhorn Line #2137 at Structure #2137/133 on the north side of Route 50, the route heads northeast for 0.05 mile across an undeveloped Chantilly Crushed Stone ("CCS") parcel. The route then heads east for 0.13 mile and turns north for an additional 0.08 mile following the parcel boundary of a CCS-owned parcel that is part of active business operation. Continuing east, the route continues for 0.13 mile across an undeveloped CCS parcel and Willard Road. Heading into the proposed substation parcel, the route turns to the north and continues for 0.19 mile before terminating at the proposed Aviator Substation. This route would not remove the existing diagonal span of Lines #2137/#2183 across Route 50.

Overhead Alternative Route 1B will be constructed on new right-of-way supported by seven double circuit poles and one double circuit two-pole structure with a minimum structure height of approximately 90 feet, a maximum structure height of approximately 115 feet, and an average proposed structure height of approximately 99 feet. These heights are based on preliminary conceptual design, do not include foundation reveal, and are subject to change based on final engineering design.



Notice Map
Aviator 230 kV Line Loop and Aviator Substation
Loudoun County, Virginia

V. NOTICE

B. List Applicant offices where members of the public may inspect the application. If applicable, provide a link to website(s) where the application may be found.

Response: Due to COVID-19, the Application will be made available electronically for public inspection at https://www.dominionenergy.com/aviator.

V. NOTICE

C. List all federal, state, and local agencies and/or officials that may reasonably be expected to have an interest in the proposed construction and to whom the Applicant has furnished or will furnish a copy of the application.

Response:

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

Ms. S. Rene Hypes
Virginia Department of Conservation and Recreation
Environmental Review Coordinator, Natural Heritage Program
600 East Main Street, Suite 1400
Richmond, Virginia 23219

Ms. Robbie Rhur
Department of Conservation and Recreation, Planning Bureau
600 East Main Street, 17th Floor
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Mr. Roger Kirchen
Department of Historic Resources
Review and Compliance Division
2801 Kensington Avenue
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Virginia Department of Wildlife Resources
P.O. Box 90778Henrico, Virginia 23228

Mr. Keith Tignor
Endangered Plant and Insect Species Program
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102 Governor Street
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Kamal Suliman
Regional Operations Director
Virginia Department of Transportation, Northern Virginia District Office
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Fairfax, Virginia 22030

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

V. NOTICE

D. If the application is for a transmission line with a voltage of 138 kV or greater, provide a statement and any associated correspondence indicating that prior to the filing of the application with the SCC the Applicant has notified the chief administrative officer of every locality in which it plans to undertake construction of the proposed line of its intention to file such an application, and that the Applicant gave the locality a reasonable opportunity for consultation about the proposed line (similar to the requirements of § 15.2-2202 of the Code for electric transmission lines of 150 kV or more).

Response: In accordance with Va. Code §15.2-2202 E, a letter dated December 21, 2021, was delivered to Mr. Tim Hemstreet, Administrator of Loudoun County, where the Project is located. The letter stated the Company's intention to file this Application and invited the County to consult with the Company about the Project. This letter is included as Attachment V.D.1.

Dominion Energy Virginia
10900 Nuckols Road, 4th Floor, Glen Allen, Virginia 23060

December 21, 2021

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

RE: Dominion Energy Virginia's Proposed Aviator 230kV Line Loop and Aviator Substation; Loudoun County, Virginia
Notice Pursuant to Va. Code § 15.2-2202 E

Dear Mr. Hemstreet:

Dominion Energy Virginia (the "Company") is proposing to build a new approximately 0.84-mile overhead 230 kV double circuit transmission line loop ("Aviator Loop") and 230-34.5 kV substation ("Aviator Substation") in Loudoun County, Virginia, in order to meet customer needs in the area ("Project"). The Project requires the construction of the Aviator Loop in new right-of-way along a proposed route that would cut the existing 230 kV transmission Line #2137 north of Route 50 across from the Company's existing Poland Road Substation, creating a loop that extends to Aviator Substation and terminates at Poland Road Substation ("Proposed Route 1A"). As part of Proposed Route 1A, the Company also intends to remove one existing overhead span across Route 50 (Lines #2137 and #2183) and relocate these lines to a new perpendicular crossing of Route 50, consisting of approximately 0.06 mile of new right-of-way from Poland Road Substation to the Proposed Route 1A.

In addition to Proposed Route 1A, the Company identified an approximately 0.58-mile overhead alternative route for the Aviator Loop for notice and consideration by the Commission ("Overhead Alternative Route 1B").

The Company is preparing an application for a Certificate of Public Convenience and Necessity ("CPCN") from the State Corporation Commission (SCC). Pursuant to Va. Code § 15.2-2202, the Company is writing to notify Loudoun County of the proposed project in advance of the SCC filing. We respectfully request 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 route and 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 me at (804) 201-3053 or greg.r.baka@dominionenergy.com.

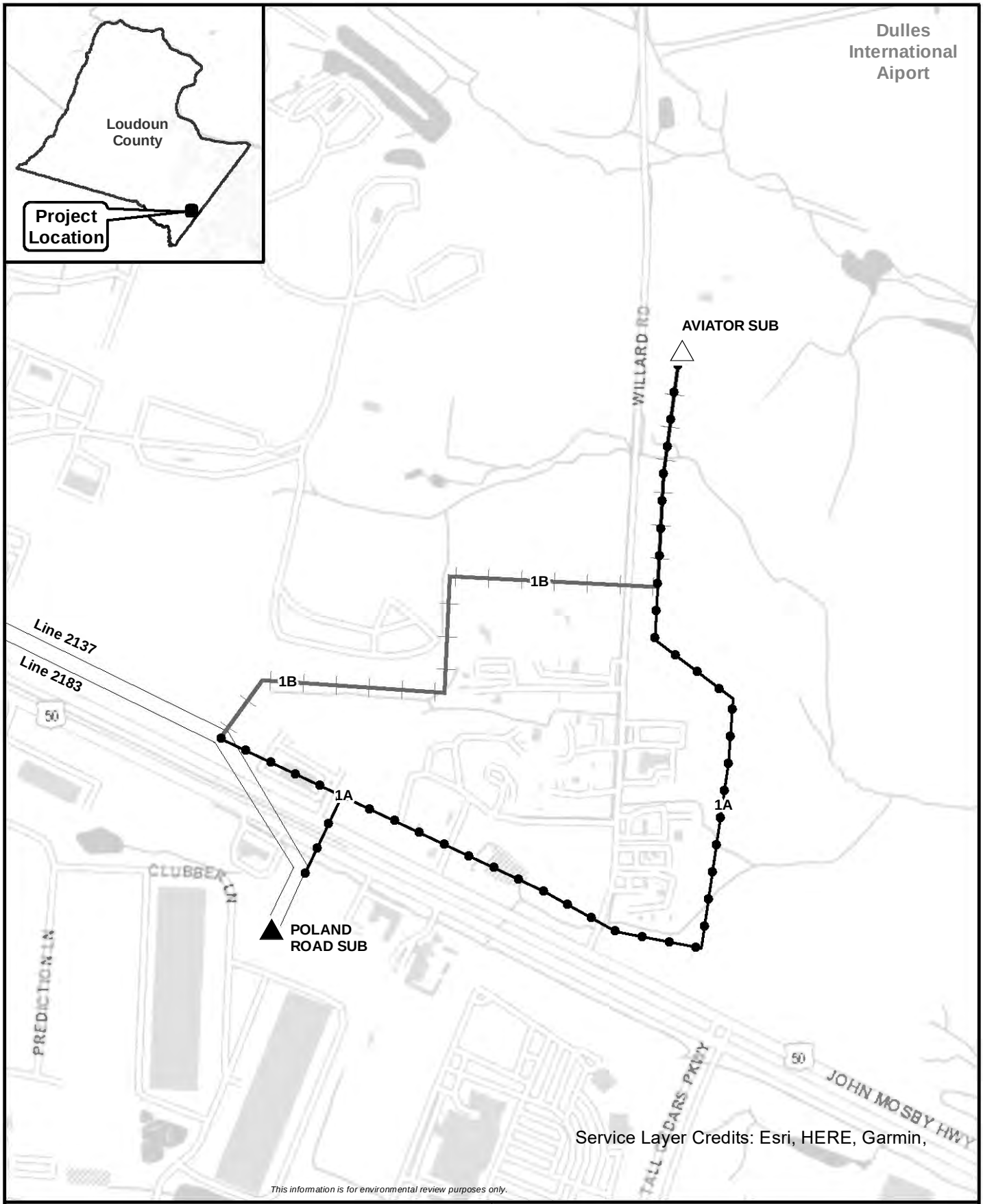
Dominion Energy appreciates your assistance with this project review and looks forward to any additional information you may have to offer.

Sincerely,

Greg Baka

Greg Baka
Local Permitting Consultant

Attachment: Project Overview Map



Proposed Route
Overhead Route 1A
(0.90 Miles - 100 ft ROW)

Alternative Route
Overhead Route 1B
(0.58 Miles - 100 ft ROW)

Existing Dominion
Transmission Lines

Proposed Aviator Substation

Existing Poland Road Substation

1:6,000

0 250 500 Feet

N

Overview Map
Aviator 230 kV Line Loop and Aviator Substation
Loudoun County, Virginia

M:\Clients\ID-F\DOM\Aviator_ArcGIS\20211123\Figures_DOM_AVR_Overview_BW_20211229.mxd

COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

APPLICATION OF	)	
	)	
VIRGINIA ELECTRIC AND POWER COMPANY	)	Case No. PUR-2022-00012
	)	
For approval and certification of electric transmission facilities: Aviator 230 kV Line Loop and Aviator Substation	)	

IDENTIFICATION, SUMMARIES, AND TESTIMONY OF DIRECT WITNESSES OF VIRGINIA ELECTRIC AND POWER COMPANY

Harrison S. Potter

Witness Direct Testimony Summary
Direct Testimony
Appendix A: Background and Qualifications

Robert C. Moorhead III

Witness Direct Testimony Summary
Direct Testimony
Appendix A: Background and Qualifications

Jared R. Williams

Witness Direct Testimony Summary
Direct Testimony
Appendix A: Background and Qualifications

Santosh Bhattarai

Witness Direct Testimony Summary
Direct Testimony
Appendix A: Background and Qualifications

Greg R. Baka

Witness Direct Testimony Summary
Direct Testimony
Appendix A: Background and Qualifications

Jon M. Berkin, PhD

Witness Direct Testimony Summary
Direct Testimony
Appendix A: Background and Qualifications

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Harrison S. Potter

Title: Consulting Engineer – Electric Transmission Planning

Summary:

Company Witness Harrison S. Potter sponsors those sections of the Appendix describing the Company's electric transmission system and the need for, and benefits of, the proposed Project, as follows:

- Section I.G: This section provides a system map for the affected area.
- Section I.J: This section provides information about the project if approved by the RTO.
- Section I.K: This section, when applicable, provides outage history and maintenance history for existing transmission lines if the proposed project is a rebuild and is due in part to reliability issues.
- Section I.M: This section, when applicable, contains information for transmission lines interconnecting a non-utility generator.
- Section II.A.3: This section provides color maps of existing or proposed rights-of-way in the vicinity of the proposed project.
- Section II.A.10: This section provides details of the construction plans for the proposed project, including requested line outage schedules.

Additionally, Company Witness Potter co-sponsors the following sections of the Appendix:

- Section I.A (co-sponsored with Company Witnesses Robert C. Moorhead, Jared R. Williams, Santosh Bhattarai, Greg R. Baka, and Jon M. Berkin): This section details the primary justifications for the proposed project.
- Section I.B (co-sponsored with Company Witness Robert C. Moorhead): This section details the engineering justifications for the proposed project.
- Section I.C (co-sponsored with Company Witness Robert C. Moorhead): This section describes the present system and details how the proposed project will effectively satisfy present and projected future load demand requirements.
- Section I.D (co-sponsored with Company Witness Robert C. Moorhead): This section describes critical contingencies and associated violations due to the inadequacy of the existing system.
- Section I.E (co-sponsored with Company Witness Robert C. Moorhead): This section explains feasible project alternatives, when applicable.
- Section I.H (co-sponsored with Company Witnesses Robert C. Moorhead and Greg R. Baka): This section provides the desired in-service date of the proposed project and the estimated construction time.
- Section I.I. (co-sponsored with Company Witnesses Jared R. Williams and Santosh Bhattarai): This section provides the estimated total cost of the proposed project.
- Section I.L (co-sponsored with Company Witness Jared R. Williams): This section, when applicable, provides details on the deterioration of structures and associated equipment.
- Section I.N (co-sponsored with Company Witness Robert C. Moorhead): This section provides the proposed and existing generating sources, distribution circuits or load centers planned to be served by all new substations, switching stations, and other ground facilities associated with the proposed project.

A statement of Mr. Potter's background and qualifications is attached to his testimony as Appendix A.

DIRECT TESTIMONY
OF
HARRISON S. POTTER
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00012

Q. Please state your name, business address and position with Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company").

A. My name is Harrison S. Potter, and I am a Consulting Engineer in Electric Transmission Planning for the Company. My business address is 10900 Nuckols Road, Glen Allen, Virginia 23060. A statement of my qualifications and background is provided as Appendix A.

Q. Please describe your areas of responsibility with the Company.

A. I am responsible for planning the Company's electric transmission system for voltages of 69 kilovolt ("kV") through 500 kV.

Q. What is the purpose of your testimony in this proceeding?

A. In order to provide service requested by a retail electric service customer (the "Customer"), to maintain reliable service for the overall growth in the area, and to comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, Dominion Energy Virginia proposes in Loudoun County, Virginia, to:

(i) Construct a new approximately 0.9-mile overhead 230 kV double circuit transmission line loop on new 100-foot-wide right-of-way by cutting existing 230 kV overhead Poland Road-Shellhorn Line #2137 (Brambleton-Poland Road Line #2183) at Structures #2137/133-134 (Structures #2183/58-57), resulting in (i) 230 kV Aviator-Shellhorn Line #2137, and (ii) 230 kV Aviator-Poland Road Line #2221 (the "Aviator

Loop"). The 0.9-mile proposed route of the Aviator Loop includes removal of one existing overhead span of double circuit 230 kV line located entirely within existing right-of-way between existing Structures #2137/133-134 (Structures #2183/58-57), and installation of a new overhead double circuit 230 kV line in new right-of-way for approximately 0.1 mile from existing Structure #2137/133 (Structure #2183/58) to a proposed new triple circuit steel pole located along Route 50 across from the existing Poland Road Substation (the "Aviator Junction"), and for approximately 0.06 mile from the Aviator Junction to existing Structure #2137/134 (Structure #2183/57) at Poland Road Substation; and

(ii) Construct a new 230-34.5 kV substation located on land purchased by the Company from the Customer along Willard Road (the "Aviator Substation") and upgrade line protection at the Company's existing Poland Road Substation and future Sojourner Switching Station.

The Aviator Loop, Aviator Substation, and related substation work are collectively referred to as the "Project."

The purpose of my testimony is to describe the Company's electric transmission system and the need for, and benefits of, the proposed Project. I am sponsoring Sections I.G, I.J, I.K, I.M, II.A.3, and II.A.10 of the Appendix. Additionally, I co-sponsor the Executive Summary and Section I.A with Company Witnesses Robert C. Moorhead, Jared R. Williams, Santosh Bhattarai, Greg R. Baka, and Jon M. Berkin; Sections I.B, I.C, I.D, I.E, and I.N with Company Witness Robert C. Moorhead; Section I.H with Company Witnesses Robert C. Moorhead and Greg R. Baka; Section I.I with Company Witnesses Jared R. Williams and Santosh Bhattarai; and Section I.L with Company Witness Jared R. Williams.

Q. Does this conclude your pre-filed direct testimony?

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS
OF
HARRISON S. POTTER

Harrison Potter is a 2012 graduate from Virginia Commonwealth University with a Masters in Business Administration and a 2005 graduate from Virginia Polytechnic Institute and State University with a Bachelor of Science in Mechanical Engineering. Mr. Potter has been employed by the Company for approximately 17 years. His experience with the Company includes transmission planning (two years), distribution planning (11 years), distribution design (two years), and GIS services (two years). Mr. Potter was promoted to his current role in transmission planning in 2019.

Mr. Potter has previously testified before the Virginia State Corporation Commission.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Robert C. Moorhead III

Title: Engineer III – Distribution Planning

Summary:

Company Witness Robert C. Moorhead co-sponsors those sections of the Appendix describing the Company's electric distribution system and the need for, and benefits of, the proposed Project, as follows:

- Section I.A (co-sponsored with Company Witnesses Harrison S. Potter, Jared R. Williams, Santosh Bhattarai, Greg R. Baka, and Jon M. Berkin): This section details the primary justifications for the proposed project.

- Section I.B (co-sponsored with Company Witness Harrison S. Potter): This section details the engineering justifications for the proposed project.

- Section I.C (co-sponsored with Company Witness Harrison S. Potter): This section describes the present system and details how the proposed project will effectively satisfy present and projected future load demand requirements.

- Section I.D (co-sponsored with Company Witness Harrison S. Potter): This section describes critical contingencies and associated violations due to the inadequacy of the existing system.

- Section I.E (co-sponsored with Company Witness Harrison S. Potter): This section explains feasible project alternatives, when applicable.

- Section I.H (co-sponsored with Company Witnesses Harrison S. Potter and Greg R. Baka): This section provides the desired in-service date of the proposed project and the estimated construction time.

- Section I.N (co-sponsored with Company Witness Harrison S. Potter): This section provides the proposed and existing generating sources, distribution circuits or load centers planned to be served by all new substations, switching stations, and other ground facilities associated with the proposed project.

A statement of Mr. Moorhead's background and qualifications is attached to his testimony as Appendix A.

DIRECT TESTIMONY
OF
ROBERT C. MOORHEAD III
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00012

Q. Please state your name, business address and position with Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company").

A. My name is Robert C. Moorhead III, and I am an Engineer III – Distribution Planning for the Company. My business address is 600 E. Canal Street, Richmond, Virginia 23219. A statement of my qualifications and background is provided as Appendix A.

Q. Please describe your areas of responsibility with the Company.

A. I am responsible for planning the Company's electric distribution system that serves data centers, primarily in the Company's Northern Virginia offices, for voltage under 69 kV.

Q. What is the purpose of your testimony in this proceeding?

A. In order to provide service requested by a retail electric service customer (the "Customer"), to maintain reliable service for the overall growth in the area, and to comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, Dominion Energy Virginia proposes in Loudoun County, Virginia, to:

(i) Construct a new approximately 0.9-mile overhead 230 kV double circuit transmission line loop on new 100-foot-wide right-of-way by cutting existing 230 kV overhead Poland Road-Shellhorn Line #2137 (Brambleton-Poland Road Line #2183) at Structures #2137/133-134 (Structures #2183/58-57), resulting in (i) 230 kV Aviator-Shellhorn Line #2137, and (ii) 230 kV Aviator-Poland Road Line #2221 (the "Aviator Loop"). The 0.9-mile proposed route of the Aviator Loop includes removal of one existing overhead span of double circuit 230 kV line

located entirely within existing right-of-way between existing Structures #2137/133-134 (Structures #2183/58-57), and installation of a new overhead double circuit 230 kV line in new right-of-way for approximately 0.1 mile from existing Structure #2137/133 (Structure #2183/58) to a proposed new triple circuit steel pole located along Route 50 across from the existing Poland Road Substation (the "Aviator Junction"), and for approximately 0.06 mile from the Aviator Junction to existing Structure #2137/134 (Structure #2183/57) at Poland Road Substation; and

(ii) Construct a new 230-34.5 kV substation located on land purchased by the Company from the Customer along Willard Road (the "Aviator Substation") and upgrade line protection at the Company's existing Poland Road Substation and future Sojourner Switching Station.

The Aviator Loop, Aviator Substation, and related substation work are collectively referred to as the "Project."

The purpose of my testimony is to describe the Company's electric distribution system and the need for, and benefits of, the proposed Project. I co-sponsor the Executive Summary and Section I.A with Company Witnesses Harrison S. Potter, Jared R. Williams, Santosh Bhattarai, Greg R. Baka, and Jon M. Berkin. Additionally, I co-sponsor Sections I.B, I.C, I.D, I.E, and I.N of the Appendix with Company Witness Harrison S. Potter; and Section I.H with Company Witnesses Harrison S. Potter and Greg R. Baka.

Q. Does this conclude your pre-filed direct testimony?

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS
OF
ROBERT C. MOORHEAD III

Robert C. Moorhead III is a 2014 graduate from the University of Virginia with a Bachelor of Science in Mechanical Engineering and a 2019 graduate from Virginia Polytechnic Institute and State University with a Master of Science in Systems Engineering. He is licensed as a Professional Engineer in the Commonwealth of Virginia. He has been employed by the Company since 2016. His experience with the Company includes distribution reliability and standards (4 years), substation engineering (1.5 years), and most recently distribution planning. Prior to working for the Company, Mr. Moorhead worked for an engineering consulting firm for 2 years.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Jared R. Williams

Title: Manager - Electric Transmission Line Engineering Department

Summary:

Company Witness Jared R. Williams sponsors those sections of the Appendix providing an overview of the design characteristics of the transmission facilities for the proposed Project, and discussing electric and magnetic field levels, as follows:

- Section I.F: This section, when applicable, describes any lines or facilities that will be removed, replaced, or taken out of service upon completion of the proposed project.
- Section II.A.5: This section provides drawings of the right-of-way cross section showing typical transmission lines structure placements.
- Sections II.B.1 to II.B.2: These sections provide the line design and operational features of the proposed project, as applicable.
- Section IV: This section provides analysis on the health aspects of electric and magnetic field levels.

Additionally, Company Witness Williams co-sponsors the following sections of the Appendix:

- Section I.A (co-sponsored with Company Witnesses Harrison S. Potter, Robert C. Moorhead, Santosh Bhattarai, Greg R. Baka, and Jon M. Berkin): This section details the primary justifications for the proposed project.
- Section I.I. (co-sponsored with Company Witnesses Harrison S. Potter and Santosh Bhattarai): This section provides the estimated total cost of the proposed project.
- Section I.L (co-sponsored with Company Witness Harrison S. Potter): This section, when applicable, provides details on the deterioration of structures and associated equipment.
- Sections II.B.3 to II.B.5 (co-sponsored with Company Witness Greg R. Baka): These sections, when applicable, provide supporting structure details along the proposed and alternative routes.
- Section II.B.6 (co-sponsored with Company Witnesses Greg R. Baka and Jon M. Berkin): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section V.A (co-sponsored with Company Witnesses Greg R. Baka and Jon M. Berkin): This section provides the proposed route description and structure heights for notice purposes.

A statement of Mr. Williams' background and qualifications is attached to his testimony as Appendix A.

DIRECT TESTIMONY
OF
JARED R. WILLIAMS
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00012

Q. Please state your name, business address and position with Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company").

A. My name is Jared R. Williams, and I am the Manager of the Electric Transmission Line Engineering Department for the Company. My business address is 10900 Nuckols Road, Glen Allen, Virginia 23060. A statement of my qualifications and background is provided as Appendix A.

Q. Please describe your areas of responsibility with the Company.

A. In this role, I am responsible for the development of new electric transmission projects and negotiations of key contracts and agreements. I oversee the design and management of these transmission line and substation projects from conception through construction to acceptance by the customer.

Q. What is the purpose of your testimony in this proceeding?

A. In order to provide service requested by a retail electric service customer (the "Customer"), to maintain reliable service for the overall growth in the area, and to comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, Dominion Energy Virginia proposes in Loudoun County, Virginia, to:

(i) Construct a new approximately 0.9-mile overhead 230 kV double circuit transmission line loop on new 100-foot-wide right-of-way by cutting existing 230

kV overhead Poland Road-Shellhorn Line #2137 (Brambleton-Poland Road Line #2183) at Structures #2137/133-134 (Structures #2183/58-57), resulting in (i) 230 kV Aviator-Shellhorn Line #2137, and (ii) 230 kV Aviator-Poland Road Line #2221 (the "Aviator Loop"). The 0.9-mile proposed route of the Aviator Loop includes removal of one existing overhead span of double circuit 230 kV line located entirely within existing right-of-way between existing Structures #2137/133-134 (Structures #2183/58-57), and installation of a new overhead double circuit 230 kV line in new right-of-way for approximately 0.1 mile from existing Structure #2137/133 (Structure #2183/58) to a proposed new triple circuit steel pole located along Route 50 across from the existing Poland Road Substation (the "Aviator Junction"), and for approximately 0.06 mile from the Aviator Junction to existing Structure #2137/134 (Structure #2183/57) at Poland Road Substation; and

(ii) Construct a new 230-34.5 kV substation located on land purchased by the Company from the Customer along Willard Road (the "Aviator Substation") and upgrade line protection at the Company's existing Poland Road Substation and future Sojourner Switching Station.

The Aviator Loop, Aviator Substation, and related substation work are collectively referred to as the "Project."

The purpose of my testimony is to describe the design characteristics of the transmission facilities for the proposed Project, and also to discuss electric and magnetic field ("EMF") levels. I am sponsoring Sections I.F, II.A.5, II.B.1, II.B.2, and IV of the Appendix. Additionally, I co-sponsor the Executive Summary and Section I.A with Company Witnesses Harrison S. Potter, Robert C. Moorhead, Santosh Bhattarai, Greg R. Baka, and Jon M. Berkin; Section I.I with Company Witnesses Harrison S. Potter and Santosh Bhattarai; Section I.L with Company Witness Harrison S. Potter; Sections II.B.3 to II.B.5 with Company Witness Baka; and Sections II.B.6 and V.A with Company Witnesses Greg R. Baka and Jon M. Berkin.

Q. Does this conclude your pre-filed direct testimony?

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS
OF
JARED R. WILLIAMS

Jared R Williams received a Bachelor of Science degree in Civil Engineering from Old Dominion University in 2005 and a Masters in Business Administration in 2011 from Virginia Commonwealth University. He has been employed by the Company since 2007. Mr. Williams experience with the Company includes Transmission Engineering structural and overhead line design (2007-2012), Transmission Construction (2012-2018), Substation Construction (2018-2019), and Transmission Engineering (2019-Present).

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Santosh Bhattarai

Title: Consulting Engineer – Substation Engineering

Summary:

Company Witness Santosh Bhattarai sponsors or co-sponsors the following sections of the Appendix describing the substation work to be performed for the proposed Project as follows:

- Section I.A (co-sponsored with Company Witnesses Harrison S. Potter, Robert C. Moorhead, Jared R. Williams, Greg R. Baka, and Jon M. Berkin): This section details the primary justifications for the proposed project.

- Section I.I (co-sponsored with Company Witnesses Harrison S. Potter and Jared R. Williams): This section provides the estimated total cost of the proposed project.

- Section II.C: This section describes and furnishes a one-line diagram of the substation associated with the proposed project.

A statement of Mr. Bhattarai's background and qualifications is attached to his testimony as Appendix A.

DIRECT TESTIMONY
OF
SANTOSH BHATTARAI
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00012

Q. Please state your name, business address and position with Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company").

A. My name is Santosh Bhattarai, and I am a Consulting Engineer in the Substation Engineering section of the Electric Transmission group of the Company. My business address is 2400 Grayland Avenue, Richmond, Virginia 23220. A statement of my qualifications and background is provided as Appendix A.

Q. What are your responsibilities as a Consulting Engineer?

A. I am responsible for evaluation of the substation project requirements, feasibility studies, conceptual physical design, scope development, preliminary engineering and cost estimating for high voltage transmission and distribution substations.

Q. What is the purpose of your testimony in this proceeding?

A. In order to provide service requested by a retail electric service customer (the "Customer"), to maintain reliable service for the overall growth in the area, and to comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, Dominion Energy Virginia proposes in Loudoun County, Virginia, to:

(i) Construct a new approximately 0.9-mile overhead 230 kV double circuit transmission line loop on new 100-foot-wide right-of-way by cutting existing 230 kV overhead Poland Road-Shellhorn Line #2137 (Brambleton-Poland Road Line #2183) at Structures #2137/133-134

(Structures #2183/58-57), resulting in (i) 230 kV Aviator-Shellhorn Line #2137, and (ii) 230 kV Aviator-Poland Road Line #2221 (the "Aviator Loop"). The 0.9-mile proposed route of the Aviator Loop includes removal of one existing overhead span of double circuit 230 kV line located entirely within existing right-of-way between existing Structures #2137/133-134 (Structures #2183/58-57), and installation of a new overhead double circuit 230 kV line in new right-of-way for approximately 0.1 mile from existing Structure #2137/133 (Structure #2183/58) to a proposed new triple circuit steel pole located along Route 50 across from the existing Poland Road Substation (the "Aviator Junction"), and for approximately 0.06 mile from the Aviator Junction to existing Structure #2137/134 (Structure #2183/57) at Poland Road Substation; and

(ii) Construct a new 230-34.5 kV substation located on land purchased by the Company from the Customer along Willard Road (the "Aviator Substation") and upgrade line protection at the Company's existing Poland Road Substation and future Sojourner Switching Station.

The Aviator Loop, Aviator Substation, and related substation work are collectively referred to as the "Project."

The purpose of my testimony is to describe the substation work to be performed as part of the Project. As it pertains to station work, I sponsor Section II.C of the Appendix. Additionally, I co-sponsor the Executive Summary and Section I.A with Company Witnesses Harrison S. Potter, Robert C. Moorhead, Jared R. Williams, Greg R. Baka, and Jon M. Berkin; and Section I.I of the Appendix with Company Witnesses Harrison S. Potter and Jared R. Williams.

Q. Does this conclude your pre-filed direct testimony?

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS OF SANTOSH BHATTARAI

Santosh Bhattarai received a Master of Science degree in Electrical Engineering from South Dakota State University in 2006. Before working for the Company, Mr. Bhattarai worked at Electrical Consultants, Inc. from 2006 to 2009 in Billings, Montana as a Substation Design Engineer. Then, from 2010 to 2013, he worked at Electrical Consultants, Inc. in Madison, Wisconsin as a Substation Project Engineer. Mr. Bhattarai's responsibilities included the evaluation of the substation project requirements, development of project scope documents, estimates and schedules, preparation of specifications and bid documents, material procurement, development of detailed physical drawings, bill of materials, electrical schematics and wiring diagrams. Mr. Bhattarai joined the Dominion Energy Virginia Substation Engineering department in November 2013 as an Engineer III. He was promoted to Consulting Engineer in July 2019. He has been licensed as a Professional Engineer in the Commonwealth of Virginia since 2015. In recognition of his professional standing, the Institute of Electrical and Electronics Engineers ("IEEE") board elected him to the grade of Senior Member in 2017.

Mr. Bhattarai has previously testified before the Virginia State Corporation Commission.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Greg R. Baka

Title: Electric Transmission Local Permitting Consultant

Summary:

Company Witness Greg R. Baka will sponsor those sections of the Appendix providing an overview of the design of the route for the proposed Project, and related permitting, as follows:

- Section II.A.12: This section identifies the counties and localities through which the proposed project will pass and provides General Highway Maps for these localities.
- Sections V.B-D: These sections provide information related to public notice of the proposed project.

Additionally, Mr. Baka co-sponsors the following sections of the Appendix:

- Section I.A (co-sponsored with Company Witnesses Harrison S. Potter, Robert C. Moorhead, Jared R. Williams, Santosh Bhattarai, and Jon M. Berkin): This section details the primary justifications for the proposed project.
- Section I.H (co-sponsored with Company Witnesses Harrison S. Potter and Robert C. Moorhead): This section provides the desired in-service date of the proposed project and the estimated construction time.
- Section II.A.1 (co-sponsored with Company Witness Jon M. Berkin): This section provides the length of the proposed corridor and viable alternatives to the proposed project.
- Section II.A.2 (co-sponsored with Company Witness Jon M. Berkin): This section provides a map showing the route of the proposed project in relation to notable points close to the proposed project.
- Section II.A.4 (co-sponsored with Company Witness Jon M. Berkin): This section explains why the existing right-of-way is not adequate to serve the need.
- Sections II.A.6 to II.A.8 (co-sponsored with Company Witness Jon M. Berkin): These sections provide detail regarding the right-of-way for the proposed project.
- Section II.A.9 (co-sponsored with Company Witness Jon M. Berkin): This section describes the proposed route selection procedures and details alternative routes considered.
- Section II.A.11 (co-sponsored with Company Witness Jon M. Berkin): This section details how the construction of the proposed project follows the provisions discussed in Attachment 1 of the Transmission Appendix Guidelines.
- Sections II.B.3 to II.B.5 (co-sponsored with Company Witness Jared R. Williams): These sections, when applicable, provide supporting structure details along the proposed and alternative routes.
- Section II.B.6 (co-sponsored with Company Witnesses Jared R. Williams and Jon M. Berkin): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section III (co-sponsored with Company Witness Jon M. Berkin): This section details the impact of the proposed project on scenic, environmental, and historic features.
- Section V.A (co-sponsored with Company Witnesses Jared R. Williams and Jon M. Berkin): This section provides the proposed route description and structure heights for notice purposes.

Finally, Mr. Baka co-sponsors the DEQ Supplement filed with the Application with Company Witness Jon M. Berkin. A statement of Mr. Baka's background and qualifications is attached to his testimony as Appendix A.

DIRECT TESTIMONY
OF
GREG R. BAKA
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00012

Q. Please state your name, business address and position with Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company").

A. My name is Greg R. Baka, and I am an Electric Transmission Local Permitting Consultant for the Company. My business address is 10900 Nuckols Road, Glen Allen, Virginia 23060. A statement of my qualifications and background is provided as Appendix A.

Q. Please describe your areas of responsibility with the Company.

A. I am responsible for identifying appropriate routes for transmission lines and obtaining necessary federal, state, and local approvals and environmental permits for those facilities. In this position, I work closely with government officials, permitting agencies, property owners, and other interested parties, as well as with other Company personnel, to develop facilities needed by the public so as to reasonably minimize environmental and other impacts on the public in a reliable, cost-effective manner.

Q. What is the purpose of your testimony in this proceeding?

A. In order to provide service requested by a retail electric service customer (the "Customer"), to maintain reliable service for the overall growth in the area, and to comply with mandatory North American Electric Reliability Corporation ("NERC")

Reliability Standards, Dominion Energy Virginia proposes in Loudoun County, Virginia, to:

(i) Construct a new approximately 0.9-mile overhead 230 kV double circuit transmission line loop on new 100-foot-wide right-of-way by cutting existing 230 kV overhead Poland Road-Shellhorn Line #2137 (Brambleton-Poland Road Line #2183) at Structures #2137/133-134 (Structures #2183/58-57), resulting in (i) 230 kV Aviator-Shellhorn Line #2137, and (ii) 230 kV Aviator-Poland Road Line #2221 (the "Aviator Loop"). The 0.9-mile proposed route of the Aviator Loop includes removal of one existing overhead span of double circuit 230 kV line located entirely within existing right-of-way between existing Structures #2137/133-134 (Structures #2183/58-57), and installation of a new overhead double circuit 230 kV line in new right-of-way for approximately 0.1 mile from existing Structure #2137/133 (Structure #2183/58) to a proposed new triple circuit steel pole located along Route 50 across from the existing Poland Road Substation (the "Aviator Junction"), and for approximately 0.06 mile from the Aviator Junction to existing Structure #2137/134 (Structure #2183/57) at Poland Road Substation; and

(ii) Construct a new 230-34.5 kV substation located on land purchased by the Company from the Customer along Willard Road (the "Aviator Substation") and upgrade line protection at the Company's existing Poland Road Substation and future Sojourner Switching Station.

The Aviator Loop, Aviator Substation, and related substation work are collectively referred to as the "Project."

The purpose of my testimony is to provide an overview of the route and permitting for the proposed Project. I sponsor Sections II.A.12 and V.B to V.D of the Appendix. Additionally, I co-sponsor the Executive Summary and Section I.A with Company Witnesses Harrison S. Potter, Robert C. Moorhead, Jared R. Williams, Santosh Bhattarai, and Jon M. Berkin; Section I.H with Company Witnesses Harrison S. Potter and Robert C. Moorhead; Sections II.A.1, II.A.2, II.A.4, II.A.6 to II.A.9, II.A.11, and III with Company Witness Jon M. Berkin; Sections II.B.3 to II.B.5 with Company Witness Jared R. Williams; and Sections II.B.6 and V.A with Company Witnesses Jared R.

Williams and Jon M. Berkin. Finally, I co-sponsor the DEQ Supplement with Company Witness Jon M. Berkin.

Q. Has the Company complied with Va. Code § 15.2-2202 E?

A. Yes. In accordance with Va. Code §15.2-2202 E, a letter dated December 21, 2021, was delivered to Mr. Tim Hemstreet, Administrator of Loudoun County, where the Project is located. The letter stated the Company's intention to file this Application and invited the County to consult with the Company about the Project. This letter is included as Attachment V.D.1.

Q. Does this conclude your pre-filed direct testimony?

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS
OF
GREG R. BAKA

Mr. Greg R. Baka graduated from the University of Richmond in 1989 with a Bachelor of Arts degree in Urban Studies and Political Science. From 1990 to 1992, he worked as a Zoning Analyst for the City of Gaithersburg, Maryland. From 1992 to 1995, he worked as the Zoning Administrator for King William County, Virginia. From 1995 to 1998, he served Hanover County, Virginia as a Planner and was promoted to Senior Comprehensive Planner. He returned to King William County from 1998 to 2000 and served as their Director of Planning and Community Development. He then worked at Resource International, Ltd. as a Municipal Planner between 2001 and 2003. From 2004 to 2011, Mr. Baka owned and operated Viewshed Consulting, LLC, serving clients as a Land Planning Consultant. From 2011 to 2013, he worked as the Director of Economic Development for Cumberland County, Virginia. He joined the Company's Transmission Right-of-Way group in 2013 as Senior Siting & Permitting Specialist, was promoted to Supervisor of Siting, Permitting, and Real Estate in 2015, and became a Local Permitting Consultant, his current position, in 2019. Mr. Baka has served on several land planning and development-related local boards and commissions.

Mr. Baka has previously submitted pre-filed testimony to the Virginia State Corporation Commission.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Jon M. Berkin, PhD

Title: Partner, Environmental Resource Management

Summary:

Company Witness Jon M. Berkin sponsors the Environmental Routing Study provided as part of the Company's Application.

Additionally, Dr. Berkin co-sponsors the following sections of the Appendix:

- Section I.A (co-sponsored with Company Witnesses Harrison S. Potter, Robert C. Moorhead, Jared R. Williams, Santosh Bhattarai, and Greg R. Baka): This section details the primary justifications for the proposed project.
- Section II.A.1 (co-sponsored with Company Witness Greg R. Baka): This section provides the length of the proposed corridor and viable alternatives to the proposed project.
- Section II.A.2 (co-sponsored with Company Witness Greg R. Baka): This section provides a map showing the route of the proposed project in relation to notable points close to the proposed project.
- Section II.A.4 (co-sponsored with Company Witness Greg R. Baka): This section explains why the existing right-of-way is not adequate to serve the need.
- Sections II.A.6 to II.A.8 (co-sponsored with Company Witness Greg R. Baka): These sections provide detail regarding the right-of-way for the proposed project.
- Section II.A.9 (co-sponsored with Company Witness Greg R. Baka): This section describes the proposed route selection procedures and details alternative routes considered.
- Section II.A.11 (co-sponsored with Company Witness Greg R. Baka): This section details how the construction of the proposed project follows the provisions discussed in Attachment 1 of the Transmission Appendix Guidelines.
- Section II.B.6 (co-sponsored with Company Witnesses Jared R. Williams and Jon M. Berkin): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section III (co-sponsored with Company Witness Greg R. Baka): This section details the impact of the proposed project on scenic, environmental, and historic features.
- Section V.A (co-sponsored with Company Witnesses Jared R. Williams and Greg R. Baka): This section provides the proposed route description and structure heights for notice purposes.

Finally, Dr. Berkin co-sponsors the DEQ Supplement filed with this Application with Company Witness Greg R. Baka.

A statement of Dr. Berkin's background and qualifications is attached to his testimony as Appendix A.

DIRECT TESTIMONY
OF
JON M. BERKIN, PhD
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00012

Q. Please state your name, position and place of employment and business address.

A. My name is Jon M. Berkin. I am employed as a Partner with Environmental Resource Management ("ERM"). My business address is 222 South 9th Street, Suite 2900, Minneapolis, Minnesota 55402. A statement of my qualifications and background is provided as Appendix A.

Q. What professional experience does ERM have with the routing of linear energy transportation facilities?

A. ERM has extensive experience in the routing, feasibility assessments, and permitting of energy infrastructure projects. It has assisted its clients in the identification, evaluation and development of linear energy facilities for the past 30 years. During this time it has developed a consistent approach for linear facility routing and route selection based on the identification, mapping and comparative evaluation of routing constraints and opportunities within defined study areas. ERM uses data-intensive Geographic Information System spatial and dimensional analysis and the most current and refined data layers and aerial photography resources available for the identification, evaluation and selection of transmission line routes. In addition to Virginia Electric and Power Company ("Dominion Energy Virginia" or the "Company"), its clients include some of the largest energy companies in the United States, Canada and the world, including ExxonMobil, TC Energy, Shell, NextEra Energy, Phillips 66, Kinder Morgan, British

Petroleum, Enbridge Energy and others. ERM also routinely assists the staff of the Federal Energy Regulatory Commission, United States Army Corps of Engineers, and the U.S. Forest Service in the identification and/or evaluation of linear energy routes to support federal National Environmental Policy Act evaluations. ERM works on both small and large energy projects and has assisted in or conducted the routing and route evaluation of some of the largest electric transmission line and pipeline facilities in North America.

In Virginia, we served as routing consultant to Dominion Energy Virginia for its Cannon Branch-Cloverhill 230 kV transmission line project in the City of Manassas and Prince William County, approved by the Commission in Case No. PUE-2011-00011. We similarly served as the routing consultant for the Company's Dahlgren 230 kV double circuit transmission line project in King George County, approved by the Commission in Case No. PUE-2011-00113. ERM also served as the routing consultant for the Company's Surry-Skiffes Creek-Whealton 500 and 230 kV transmission lines in Case No. PUE-2012-00029; for the Company's Remington CT-Warrenton 230 kV Double Circuit transmission line, approved by the Commission in Case No. PUE-2014-00025; for the Haymarket 230 kV Line and Substation Project in Case No. PUE-2015-00107; for the Remington-Gordonsville Electric Transmission Project, approved by the Commission in Case No. PUE-2015-00117; for the Norris Bridge project approved by the Commission in Case No. PUE-2016-00021; for the Company's Idylwood-Tysons 230 kV single circuit underground transmission line, Tysons Substation rebuild and related transmission facilities, approved by the Commission in Case No. PUR-2017-00143, and most recently the Lockridge 230 kV Line Loop and Substation project approved by the Commission in

Case No. PUR-2019-00215. In addition, ERM currently serves as the routing consultant for the Company's Coastal Virginia Offshore Wind Commercial Project, in Case No. PUR-2021-00142, and the Company's DTC 230 kV Line Loop and DTC Substation, in Case No. PUR-2021-00280, both of which are currently pending before the Commission.

ERM's role as routing consultant for each of these transmission line projects included preparation of an Environmental Routing Study for the project and submission of testimony sponsoring it.

Q. What is the purpose of your testimony in this proceeding?

A. In order to provide service requested by a retail electric service customer (the "Customer"), to maintain reliable service for the overall growth in the area, and to comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, Dominion Energy Virginia proposes in Loudoun County, Virginia, to:

(i) Construct a new approximately 0.9-mile overhead 230 kV double circuit transmission line loop on new 100-foot-wide right-of-way by cutting existing 230 kV overhead Poland Road-Shellhorn Line #2137 (Brambleton-Poland Road Line #2183) at Structures #2137/133-134 (Structures #2183/58-57), resulting in (i) 230 kV Aviator-Shellhorn Line #2137, and (ii) 230 kV Aviator-Poland Road Line #2221 (the "Aviator Loop"). The 0.9-mile proposed route of the Aviator Loop includes removal of one existing overhead span of double circuit 230 kV line located entirely within existing right-of-way between existing Structures #2137/133-134 (Structures #2183/58-57), and installation of a new overhead double circuit 230 kV line in new right-of-way for approximately 0.1 mile from existing Structure #2137/133 (Structure #2183/58) to a proposed new triple circuit steel pole located along Route 50 across from the existing Poland Road Substation (the "Aviator Junction"), and for approximately 0.06 mile from the Aviator Junction to existing Structure #2137/134 (Structure #2183/57) at Poland Road Substation; and

(ii) Construct a new 230-34.5 kV substation located on land purchased by the Company from the Customer along Willard Road (the "Aviator Substation") and upgrade line protection at the Company's existing Poland Road Substation and future Sojourner Switching Station.

The Aviator Loop, Aviator Substation, and related substation work are collectively referred to as the "Project."

ERM was engaged on behalf of the Company to assist it in the identification and evaluation of route alternatives to resolve the identified electrical need that would meet the applicable criteria of Virginia law and the Company's operating needs.

The purpose of my testimony is to introduce and sponsor the Environmental Routing Study, which is included as part of the Application filed by the Company in this proceeding. Additionally, I co-sponsor the Executive Summary and Section I.A with Company Witnesses Harrison S. Potter, Robert C. Moorhead, Jared R. Williams, Santosh Bhattarai, and Greg R. Baka; Sections II.A.1, II.A.2, II.A.4, II.A.6 to II.A.9, II.A.11, and III with Company Witness Greg M. Baka; and Sections II.B.6 and V.A with Company Witnesses Jared R. Williams and Greg R. Baka. Lastly, I co-sponsor the DEQ Supplement with Company Witness Greg R. Baka.

Q. Does this conclude your pre-filed direct testimony?

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS OF JON M. BERKIN

Jon M. Berkin earned a Bachelor of Arts degree from Boston University and a Master of Arts and a Doctoral degree from Bryn Mawr College. He has approximately 29 years of experience working in the energy-related consulting field specializing in the siting and regulatory permitting of major linear energy facilities, including both interstate and intrastate electric transmission lines and gas and oil pipelines throughout the United States. During this time he was employed for 5 years with R. Christopher Goodwin and Associates, Inc. and 24 years with ERM, a privately-owned consulting company specializing in the siting, licensing and environmental construction compliance of large, multi-state energy transportation facilities.

Dr. Berkin's professional experience related to electric transmission line projects includes the direct management of field studies, impact assessments and agency consultations associated with the routing and licensing of multiple transmission line projects in the mid-Atlantic region, including the management and/or supervision of the routing and permitting. Work on these projects included studies to identify and delineate routing constraints and options; identification and evaluation of route alternatives; and the direction of field studies to inventory wetlands, stream crossings, cultural resources and sensitive habitats and land uses. Within the last several years he has managed or directed the identification and evaluation of over 150 miles of 230 and 500 kV transmission line route alternatives in the Commonwealth for Virginia Electric and Power Company.

Dr. Berkin has previously testified before the Virginia State Corporation Commission.