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November 17, 2022

BY ELECTRONIC FILING

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: 230 kV Altair Loop and Altair Switching Station
Case No. PUR-2022-00197

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, DEQ Supplement, and Routing Study, 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 Public Utility Regulation on November 15, 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.
Mr. 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

230 kV Altair Loop and Altair Switching Station

Application No. 319

Case No. PUR-2022-00197

Filed: November 17, 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

230 kV Altair Loop and Altair Switching Station

Application No. 319

Case No. PUR-2022-00197

Filed: November 17, 2022

COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

APPLICATION OF	)	
	)	
VIRGINIA ELECTRIC AND POWER COMPANY	)	Case No. PUR-2022-00197
	)	
For approval and certification of electric transmission facilities: 230 kV Altair Loop and Altair Switching Station	)	

APPLICATION OF VIRGINIA ELECTRIC AND POWER COMPANY FOR APPROVAL AND CERTIFICATION OF ELECTRIC TRANSMISSION FACILITIES: 230 kV ALTAIR LOOP AND ALTAIR SWITCHING STATION

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 requested transmission service to Northern Virginia Electric Cooperative ("NOVEC"), to maintain reliable service for the overall load 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:

- Construct two new approximately 1.66-mile 230 kV single circuit lines on new right-of-way by cutting 230 kV Belmont-Brambleton Line #201 between Structure #201/52 and #201/53 south of Belmont Switching Station ("Belmont Station"), resulting in (i) 230 kV Altair-Brambleton Line #201, and (ii) 230 kV Altair-Belmont Line #2263 ("Altair Loop"). From the cut-in location, the Altair Loop will extend to the Company's proposed new 230 kV Altair Switching Station adjacent to NOVEC's future Altair Delivery Point ("DP"). While the cut-in location is within existing right-of-way, the proposed Altair Loop will be constructed on new 120-foot-wide right-of-way for the majority of the 1.66-mile route (approximately 1.55 miles) supported primarily by two side-by-side single circuit weathering steel monopoles.[1] Approximately 0.06 mile of the Altair Loop will be constructed on new 200-foot-wide right-of-way, supported by single circuit weathering steel H-frame structures.[2] The remaining 0.05 mile of the route will be located either

[1] For the majority (approximately 1.55 miles) of the proposed Altair Loop, the new single circuit conductors will be supported by two single circuit weathering steel monopoles installed side-by-side within the proposed 120-foot-wide transmission corridor. The Company is proposing to install two single circuit structures instead of one double circuit structure at the request of NOVEC's customer. An additional 20 feet of right-of-way (120 feet for two single circuit structures installed side-by-side versus 100 feet for one double circuit structure) is required to install the two single circuit monopoles. The cost differential associated with utilization of two single circuit structures and the additional 20 feet of right-of-way will be collected from NOVEC through an excess facilities charge. See Appendix Section I.A.

[2] Within the existing Belmont-Brambleton Line #201 right-of-way, the Company will install two new single circuit 3-pole structures to support the proposed Altair-Brambleton Line #201 and the proposed Altair-Belmont Line #2263. From there, the proposed Altair Loop will extend approximately 0.06 mile along new 200-foot-wide right-of-way supported by two side-by-side single circuit H-frame structures. This approximately 0.06-mile segment of 200-foot-wide right-of-way is necessary to meet clearance requirements of the existing 500 kV Brambleton-Goose Creek Line #558 in the existing transmission corridor. Specifically, the structures will need to be in the horizontal configuration (H-frame structures) at the cut-in location in order to maintain clearances between the existing Line #558 and the proposed Lines #201 and #2263. Within that 0.06-mile segment, the Altair Loop will

within the Altair Switching Station or within the Company's existing Line #201 right-of-way.[3]

- Construct a new 230 kV delivery point switching station in Loudoun County, Virginia (the "Altair Switching Station" or "Altair Station"), which will provide interconnection to NOVEC's future Altair DP; and

- Perform minor related work at the Belmont Station and Brambleton Substation.

The Altair Loop, Altair Station, and related station work comprise the "Project."

4. The Project is necessary to assure that Dominion Energy Virginia can provide requested service to NOVEC's Altair DP for its data center customer in Loudoun County, Virginia, maintain reliable electric service for overall load growth in the Project area, and comply with mandatory NERC Reliability Standards for transmission facilities and the Company's mandatory planning criteria. The Northern Virginia data center market is spread

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transition from horizontal (H-frame structures) to vertical (monopoles), thereby reducing the necessary right-of-way from 200 feet to 120 feet. The 120-foot-wide right-of-way for the remainder of the route is required to maintain adequate clearances for blowout and forestry maintenance for the single circuit monopole structures. See Appendix Attachment II.A.2 for the location of the 120-foot-wide and 200-foot-wide right-of-way segments.

[3] As noted herein, the Project requires 120-foot-wide new right-of-way for approximately 1.55 miles of the route and 200-foot-wide new right-of-way for approximately 0.06 mile of the route. See Appendix Attachment II.A.2 for the location of the 120-foot-wide and 200-foot-wide right-of-way segments of the route. That said, the Company proposes to seek to acquire 160-foot-wide new right-of-way for a 1.55-mile segment of the route (with the exception of one span that will require 170-foot-wide right-of-way due to airport structure height restrictions), and 280-foot-wide new right-of-way for a 0.06-mile segment of the route. The additional right-of-way is necessary in order to accommodate installation of a third circuit within the corridor of these segments in the future. To be clear, only the proposed 120-foot-wide right-of-way (1.55 miles) and proposed 200-foot-wide right-of-way (0.06 mile) will be cleared and utilized for the proposed Project. Dominion Energy Virginia asks that the Commission not prohibit the Company from voluntarily obtaining the full right-of-way—at 160, 170, and 280 feet wide as described above—with the understanding that the Company could not condemn for more than the proposed 1.55-mile segment of 120-foot-wide right-of-way and 0.06-mile segment of 200-foot-wide right-of-way needed for the proposed Project, as shown in Appendix Attachment II.A.2. This approach is consistent with the approach approved by the Commission in the Company's recent DTC Line Loop and Substation proceeding. *See Application of Virginia Electric and Power Company for approval and certification of electric facilities: DTC 230 kV Line Loop and DTC Substation*, Case No. PUR-2021-00280, Final Order at 13 (July 7, 2022). The 160-foot-wide right-of-way (approximately 1.55 miles, with the exception of one span that will be 170 feet wide) will accommodate a future 230 kV line to serve another potential future data center campus development in the Project area. This potential future development has separate load growth drivers (another data center campus) and is distinct from the need for the proposed Project, as described in Appendix Sections I.B and II.A.9. The 280-foot-wide right-of-way within the 0.06-mile segment of the route at the cut-in of Line #201 will accommodate a future 230 kV line necessary to satisfy NERC reliability criteria (specifically, to prevent a 300 MW N-1-1 load drop scenario) in the Project area. See Appendix Attachments I.A.4 and III.E.1. To the extent that the Company's Project is approved as proposed, the Company believes that it is reasonable and prudent to construct the Altair Loop on right-of-way that will allow for the future construction of these additional circuits.

across Loudoun, Fairfax, and Prince William Counties. The combination of competitive collocation/cloud environment, fiber connectivity, strategic geographic location, low risk of business disruptions, affordable and reliable power, and the business climate in Virginia has created the largest market for data center capacity in the United States. The DP request from NOVEC projected a summer peak of 80 MW in 2024 to 225 MW in 2034, a peak kilovolt amp DP transformer capacity of 300 MW, and an in-service date of September 1, 2024.

5. The Company identified an approximately 1.66-mile proposed overhead route for the Altair Loop ("Route 1" or the "Proposed Route") and one approximately 1.52-mile overhead alternative route ("Alternative Route 2"), both of which the Company is proposing for Commission consideration and notice. Discussion of the Proposed and Alternative Routes, as well as other overhead routes that the Company studied, but ultimately rejected, is provided in Section II of the Appendix and Sections 2.4 and 2.5 of the Environmental Routing Study included with the Application.

6. Route 1 was identified as the Proposed Route for four primary reasons when compared with Alternative Route 2. First, Route 1 would not impact the developable land associated with the JK Land Holdings II, LLC (or "JKLH") Southern Future Development, and would allow adequate space for a future third circuit in the right-of-way to serve that development. Second, the construction of the Proposed Route would require approximately half the amount of clearing of forested land than Alternative Route 2 (5.64 acres compared with 11.12 acres). Forested land is at a premium in Loudoun County due to the amount of development in the area. Third, the Proposed Route would maximize collocation opportunities; approximately 69 percent of the total route length would be collocated with existing infrastructure. Conversely, Alternative Route 2 only would be collocated for approximately 51

percent of the total route length. Finally, while the Proposed Route is longer than Alternative Route 2 (by approximately 0.14 mile), the Proposed Route is less costly. Therefore, based on this analysis, Route 1 was selected as the Proposed Route for the Project as it would reasonably minimize adverse impacts on scenic assets, historic districts, and the environment of the area concerned. Importantly, the Proposed Route is the only route that would not conflict with the development of JKLH's proposed data center campus on the north side of the Dulles Greenway.

7. The proposed Altair Station initially will be constructed with four 230 kV breakers in a ring bus arrangement 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 breakers in a ring bus arrangement. The Company's proposed Altair Station will serve NOVEC's Altair DP. A more detailed description of the Project, including the Altair Loop and Altair Station, 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 1, 2024. The Company estimates it will take approximately 16 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 May 17, 2023. Should the Commission issue a final order by May 17, 2023, the Company estimates that construction of the Project should begin around June 2023, and be completed by September 1, 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 and outages, the latter of which may be particularly challenging due to the amount of new load growth,

rebuilds, and new builds scheduled to occur in this load area. 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 the ability to schedule outages, and unpredictable delays due to labor shortages and/or materials/supply issues.

9. The estimated conceptual cost of the proposed Project is approximately $48.9 million, which includes approximately $40.4 million for transmission-related work, approximately $8.5 million for substation-related work (2022 dollars).

10. 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.

11. 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.

12. 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.

13. 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, Logan J. Manzuk, Aaron C. Kuhn, Nancy R. Reid, and Andrea R. Thornton.

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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Counsel for Applicant Virginia Electric and Power Company

November 17, 2022

COMMONWEALTH OF VIRGINIA
BEFORE THE
STATE CORPORATION COMMISSION

APPLICATION OF

VIRGINIA ELECTRIC AND POWER COMPANY

FOR APPROVAL AND CERTIFICATION
OF ELECTRIC TRANSMISSION FACILITIES

230 kV Altair Loop and Altair Switching Station

Application No. 319

Appendix

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

Case No. PUR-2022-00197

Filed: November 17, 2022

TABLE OF CONTENTS

EXECUTIVE SUMMARY

In order to provide requested transmission service to Northern Virginia Electric Cooperative ("NOVEC"), to maintain reliable service for the overall load 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:

- Construct two new approximately 1.66-mile 230 kV single circuit lines on new right-of-way by cutting 230 kV Belmont-Brambleton Line #201 between Structure #201/52 and #201/53 south of Belmont Switching Station ("Belmont Station"), resulting in (i) 230 kV Altair-Brambleton Line #201, and (ii) 230 kV Altair-Belmont Line #2263 ("Altair Loop"). From the cut-in location, the Altair Loop will extend to the Company's proposed new 230 kV Altair Switching Station adjacent to NOVEC's future Altair Delivery Point ("DP"). While the cut-in location is within existing right-of-way, the proposed Altair Loop will be constructed on new 120-foot-wide right-of-way for the majority of the 1.66-mile route (approximately 1.55 miles) supported primarily by two side-by-side single circuit weathering steel monopoles.[1] Approximately 0.06 mile of the Altair Loop will be constructed on new 200-foot-wide right-of-way, supported by single circuit weathering steel H-frame structures.[2] The remaining 0.05 mile of the route will be located either within the Altair Switching Station or within the Company's existing Line #201 right-of-way.[3]

[1] For the majority (approximately 1.55 miles) of the proposed Altair Loop, the new single circuit conductors will be supported by two single circuit weathering steel monopoles installed side-by-side within the proposed 120-foot-wide transmission corridor. The Company is proposing to install two single circuit structures instead of one double circuit structure at the request of NOVEC's customer. An additional 20 feet of right-of-way (120 feet for two single circuit structures installed side-by-side versus 100 feet for one double circuit structure) is required to install the two single circuit monopoles. The cost differential associated with utilization of two single circuit structures and the additional 20 feet of right-of-way will be collected from NOVEC through an excess facilities charge. See Section I.A.

[2] Within the existing Belmont-Brambleton Line #201 right-of-way, the Company will install two new single circuit 3-pole structures to support the proposed Altair-Brambleton Line #201 and the proposed Altair-Belmont Line #2263. From there, the proposed Altair Loop will extend approximately 0.06 mile along new 200-foot-wide right-of-way supported by two side-by-side single circuit H-frame structures. This approximately 0.06-mile segment of 200-foot-wide right-of-way is necessary to meet clearance requirements of the existing 500 kV Brambleton-Goose Creek Line #558 in the existing transmission corridor. Specifically, the structures will need to be in the horizontal configuration (H-frame structures) at the cut-in location in order to maintain clearances between the existing Line #558 and the proposed Lines #201 and #2263. Within that 0.06-mile segment, the Altair Loop will transition from horizontal (H-frame structures) to vertical (monopoles), thereby reducing the necessary right-of-way from 200 feet to 120 feet. The 120-foot-wide right-of-way for the remainder of the route is required to maintain adequate clearances for blowout and forestry maintenance for the single circuit monopole structures. See Attachment II.A.2 for the location of the 120-foot-wide and 200-foot-wide right-of-way segments.

[3] As noted herein, the Project requires 120-foot-wide new right-of-way for approximately 1.55 miles of the route and 200-foot-wide new right-of-way for approximately 0.06 mile of the route. See Attachment II.A.2 for the location of the 120-foot-wide and 200-foot-wide right-of-way segments of the route. That said, the Company proposes to seek to acquire 160-foot-wide new right-of-way for a 1.55-mile segment of the route (with the exception of one span that will require 170-foot-wide right-of-way due to airport structure height restrictions), and 280-foot-wide new right-of-way for a 0.06-mile segment of the route. The additional right-of-way is necessary in order to accommodate installation of a third circuit within the corridor of these segments in the future. To be clear, only the proposed 120-foot-wide right-of-way (1.55 miles) and proposed 200-foot-wide right-of-way (0.06 mile) will be cleared and utilized for the proposed Project. Dominion Energy Virginia asks that the State Corporation Commission ("Commission") not prohibit the Company from voluntarily obtaining the full right-of-way—at 160, 170, and 280 feet wide as described

The entire proposed Altair Loop will be constructed utilizing three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA.[4]

- Construct a new 230 kV delivery point switching station in Loudoun County, Virginia (the "Altair Switching Station" or "Altair Station"), which will provide interconnection to NOVEC's future Altair DP; and

- Perform minor related work at the Belmont Station and Brambleton Substation.

Collectively, the Altair Loop, Altair Station, and related station work comprise the Project.

The Project is necessary to assure that Dominion Energy Virginia can provide requested service to NOVEC's Altair DP for its data center customer in Loudoun County, Virginia ("Altair Campus"), maintain reliable electric service for overall load growth in the Project area, and comply with mandatory NERC Reliability Standards for transmission facilities and the Company's mandatory planning criteria ("Planning Criteria"). The Northern Virginia data center market is spread across Loudoun, Fairfax, and Prince William Counties. The combination of competitive collocation/cloud environment, fiber connectivity, strategic geographic location, low risk of business disruptions, affordable and reliable power, and the business climate in Virginia has created the largest market for data center capacity in the United States. The DP request from NOVEC projected a summer peak of 80 megawatts ("MW") in 2024 to 225 MW in 2034, a peak kilovolt amp ("kVA") DP transformer capacity of 300 MW, and an in-service date of September 1, 2024.

The Company identified an approximately 1.66-mile proposed overhead route for the Altair Loop ("Route 1" or the "Proposed Route") and one approximately 1.52-mile overhead alternative route ("Alternative Route 2"), both of which the Company is proposing for Commission consideration and notice. Discussion of the Proposed and Alternative Routes, as well as other overhead routes

above—with the understanding that the Company could not condemn for more than the proposed 1.55-mile segment of 120-foot-wide right-of-way and 0.06-mile segment of 200-foot-wide right-of-way needed for the proposed Project, as shown in Attachment II.A.2. This approach is consistent with the approach approved by the Commission in the Company's recent DTC Line Loop and Substation proceeding. *See Application of Virginia Electric and Power Company for approval and certification of electric facilities: DTC 230 kV Line Loop and DTC Substation*, Case No. PUR-2021-00280, Final Order at 13 (July 7, 2022). The 160-foot-wide right-of-way (approximately 1.55 miles, with the exception of one span that will be 170 feet wide) will accommodate a future 230 kV line to serve another potential future data center campus development in the Project area. This potential future development has separate load growth drivers (another data center campus) and is distinct from the need for the proposed Project, as described in Sections I.B and II.A.9. The 280-foot-wide right-of-way within the 0.06-mile segment of the route at the cut-in of Line #201 will accommodate a future 230 kV line necessary to satisfy NERC reliability criteria (specifically, to prevent a 300 MW N-1-1 load drop scenario) in the Project area. See Attachments I.A.4 and III.E.1. To the extent that the Company's Project is approved as proposed, the Company believes that it is reasonable and prudent to construct the Altair Loop on right-of-way that will allow for the future construction of these additional circuits.

[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.

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 Altair Station initially will be constructed with four 230 kV breakers in a ring bus arrangement 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 breakers in a ring bus arrangement. The Company's proposed Altair Station will serve NOVEC's Altair DP.

The estimated conceptual cost of the proposed Project is approximately $48.9 million, which includes approximately $40.4 million for transmission-related work and approximately $8.5 million for substation-related work (2022 dollars).

The in-service target date for the proposed Project is September 1, 2024. The Company estimates it will take approximately 16 months for detailed engineering, scheduled outages, materials procurement, permitting, real estate, and construction after a final order from the Commission. Accordingly, to support this estimated construction timeline and construction plan, the Company respectfully requests a final order by May 17, 2023. Should the Commission issue a final order by May 17, 2023, the Company estimates that construction should begin around June 2023, and be completed by September 1, 2024. This schedule is contingent upon obtaining the necessary permits and outages, the latter of which may be particularly challenging due to the amount of new load growth, rebuilds, and new builds scheduled to occur in this load area. 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 the ability to schedule outages, and unpredictable delays due to labor shortages and/or materials/supply issues.

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 to provide requested transmission service to NOVEC in Loudoun County, Virginia, to maintain reliable service for the overall load growth in the Project area, and to comply with mandatory NERC Reliability Standards. See Attachment I.A.1 for a map showing the general Project area.

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, NOVEC, 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 "DOM Zone"). The Company needs to be able to maintain the overall, long-term reliability of its transmission system as its customers require more power in the future.

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 currently is responsible for ensuring the reliability 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 MW for summer peak demand, of which Dominion Energy Virginia's load portion was approximately 19,256 MW. On August 9, 2022, the Company set a record high of 21,156 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 must follow these NERC Reliability Standards, and imposes fines on utilities found to be in noncompliance up to $1.3 million a day per violation.

PJM's Regional Transmission Expansion Plan ("RTEP") is the culmination of a FERC-approved annual transmission planning process that includes extensive analysis of the electric transmission system to determine any needed improvements.[6] PJM's annual RTEP is based on the effective criteria in place at the time of the analyses, including applicable standards and criteria of NERC, PJM, and local reliability planning criteria, among others.[7] Projects identified through the RTEP process are developed by the TO in coordination with PJM, and are presented at the Transmission Expansion Advisory Committee ("TEAC") meetings prior to inclusion in the RTEP, which is then presented for approval to the PJM Board of Managers (the "PJM Board").

Outcomes of the RTEP process include three types of transmission system upgrades or projects: (i) baseline upgrades are those that resolve a system reliability criteria violation, which can include planning criteria from NERC, ReliabilityFirst, SERC Reliability Corporation, PJM, and TOs; (ii) network upgrades are new or upgraded facilities required primarily to eliminate reliability criteria violations caused by proposed generation, merchant transmission, or long-term firm transmission service requests; and (iii) supplemental projects are projects initiated by the TO in order to interconnect new customer load, address degraded equipment performance, improve operational flexibility and efficiency, and increase infrastructure resilience. The Project is classified as a supplemental project initiated by the TO to interconnect new customer load. While supplemental

[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.

[6] PJM Manual 14B (effective December 15, 2021) focuses on the RTEP process and can be found at https://www.pjm.com/-/media/documents/manuals/m14b.ashx.

[7] *See* PJM Manual 14B, Attachment D: PJM Reliability Planning Criteria. *See supra*, n. 6.

projects are included in the RTEP, the PJM Board does not actually approve such projects. See Section I.J for a discussion of the PJM process as it relates to this Project.

The Northern Virginia data center market is spread across Loudoun, Fairfax, and Prince William Counties. The combination of competitive collocation/cloud environment, fiber connectivity, strategic geographic location, low risk of business disruptions, affordable and reliable power, and the business climate in Virginia has created the largest market for data center capacity in the United States.

On December 11, 2020, NOVEC submitted to the Company a DP request to serve a NOVEC customer's large data center campus in Loudoun County. The Altair Campus is located to the southwest of the Leesburg Executive Airport between the Dulles Greenway (Route 267) and Sycolin Road (Route 643). See Attachment I.A.1 for the location of the Altair Campus. The DP request from NOVEC projected a summer peak of 80 MW in 2024 to 225 MW in 2034, a peak kVA DP transformer capacity of 300 MW, and an in-service date of September 1, 2024. The DP request, excluding attachments, is provided as Attachment I.A.2.

As part of the Project, the Company proposes to construct two new approximately 1.66-mile 230 kV single circuit lines on new right-of-way by cutting 230 kV Belmont-Brambleton Line #201 between Structure #201/52 and #201/53 south of Belmont Station, resulting in (i) 230 kV Altair-Brambleton Line #201, and (ii) 230 kV Altair-Belmont Line #2263 (*i.e.*, the Altair Loop). From the cut-in location, the Altair Loop will extend to the Company's proposed new 230 kV Altair Switching Station adjacent to NOVEC's future Altair DP. While the cut-in location is within existing right-of-way, the proposed Altair Loop will be constructed on new 120-foot-wide right-of-way for majority of the 1.66-mile route (approximately 1.55 miles) supported primarily by two side-by-side single circuit weathering steel monopoles.[8] Approximately 0.06 mile of the Altair Loop will be constructed on new 200-foot-wide right-of-way, supported by single circuit weathering steel H-frame structures.[9] The remaining 0.05 mile of the route will be located either within the Altair Switching Station or within the Company's existing Line #201 right-of-way. The entire proposed Altair Loop will be constructed utilizing three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA.

It is the Company's understanding that NOVEC's customer has asked that the Altair Loop serving NOVEC's future Altair DP primarily be constructed on two side-by-side single circuit structures as opposed to one double circuit structure in order to provide two totally independent transmission feeds to NOVEC's future Altair DP, which in turn will provide separate independent distribution feeds to the customer's Altair Campus. At any customer's request, including a wholesale customer such as NOVEC, the Company will endeavor to design a distribution or

[8] *See supra*, n. 1.

[9] *See supra*, n. 2.

transmission 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 (including additional right-of-way and structure costs) is collected through an excess facilities charge.

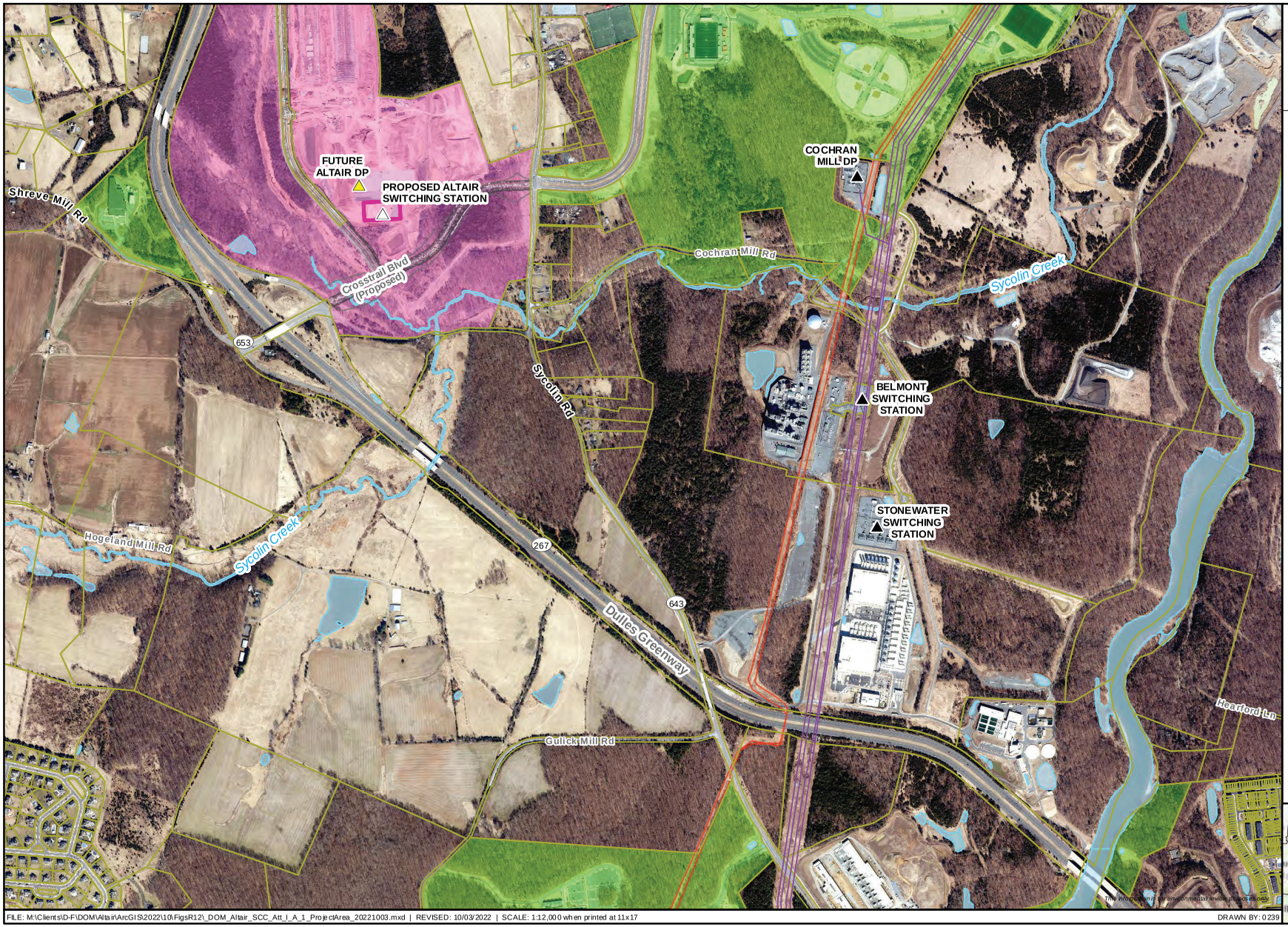
The Company identified an approximately 1.66-mile overhead Proposed Route (Route 1) and an approximately 1.52-mile overhead Alternative Route (Alternative Route 2). The Company is proposing both of these routes for Commission consideration and notice. Discussion of the Proposed Route and Alternative Route, as well as other 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 Company also proposes to construct the Altair Station as part of the Project. The proposed Altair Station initially will be constructed with four 230 kV breakers in a ring bus arrangement 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 breakers in a ring bus arrangement. The Company's proposed Altair Station will serve NOVEC's Altair DP, which the DP request indicates will include installation of four 120 MVA 230-34.5 kV transformers and twelve 34.5 kV distribution feeders to serve NOVEC's customer's data center complex load.

Attachment I.A.3 provides the existing one-line diagram of the area transmission system. Attachment I.A.4 provides a one-line diagram of the area transmission system after the proposed Project is energized. See Attachment II.A.2 for a map depicting the proposed Project along the Proposed and Alternative Routes.

***

In summary, the proposed Project will provide service requested by NOVEC in Loudoun County, Virginia, maintain reliable service for the overall load growth in the Project area, and comply with mandatory NERC Reliability Standards and the Company's Planning Criteria.



Dominion Energy®

Attachment I.A.1
Project Area Map
230 kV Altair Loop and Altair Switching Station Project
Catoctin District
Loudoun County, Virginia

- Existing Substation/ Switching Station
- Proposed Switching Station
- Future Substation
- Proposed Switching Station Boundary
- Existing Dominion Transmission Line
- Natural Gas Pipeline
- Altair Campus
- Loudoun County Owned
- Parcel Boundary
- Waterbody

0 500 1,000
Feet

1:12,000

ERM

N W E S

REQUEST/NOTIFICATION FOR
CHANGES IMPACTING DOMINION FACILITIES

SECTION I – GENERAL Date: 12 / 11/ 2020 Revision No.:

Requestor Name: Northern Virginia Electric Cooperative

Requestor Address: 5399 Wellington Branch Drive

Gainesville, VA 20155-1616

Name of Contact Person: Heather Anderson 5399 Wellington Branch Drive, Gainesville, VA 20155

Contact's Phone: [redacted] ext. Contact's Cell: - -

Contact's Fax: - - Contact's Email: [redacted]

Signature below authorizes Dominion to proceed with design, engineering, and estimation of Project cost as appropriate for Dominion to evaluate and respond to this request. This authorization is pursuant and subject to all terms and conditions of the Agreement of which this Appendix is a part.

Authorizing Signature: Robert E Bisson Auth. Date: 12 /11/ 2020

Printed Name: Robert E. Bisson Phone: [redacted]

Title: Vice-President, Elecric System Development

SECTION II – DESCRIPTION OF REQUEST

Name of Delivery Point: New Substation - Altair substation

Brief Description of Request:
(attach detail)

Construct a new 230kV delivery point from the existing Dominion 230kV transmission system to interconnect to the new NOVEC Altair substation. The new Altair substation will include 4 - 72/96/120MVA, 230kV - 34.5kV transformers, 9 - 230kV, 2,000A, 80kA interrupting circuit breakers, 12 - 35kV, 2,000A, 40kA interrupting circuit breakers, 6 - 35kV, 3,000A, 40kA interrupting circuit breakers, 1 - substation structure, 2 - 230kV buses, 6 - 35kV buses, and 1 - control house with associated protection, control and communications systems.

The Altair substation site is to be constructed at 19540 Compass Creek Parkway, Leesburg, VA, GPIN# 235297431. NOVEC has attached a preliminary oneline and site plan. Other required attachments will be provided as they become available.

Brief Reasoning for Request:
(attach detail)

Customer plans to construct a new datacenter complex at the address.

Delivery Point Location:
(attach detail if DP is new)

The proposed site is GPIN# 235297431, 19540 Compass Creek Parkway, Leesburg, VA.

Noteworthy Load Characteristics:
(large motors, large fluctuating loads, large harmonic-producing loads, etc.)

The new Altair substation will serve a data center block load with long term load factor of approximately 80% and power factor of approximately 98%.

PRESENT DELIVERY POINT DATA:

Present Delivery Point Voltage: N/A

Present Maximum kVA Capacity of Delivery Point Facilities: N/A

Present Summer Peak kW Demand: N/A Present Summer Peak kVAR Demand: N/A

Present Winter Peak kW Demand: N/A Present Winter Peak kVAR Demand: N/A

ANTICIPATED NEW DELIVERY POINT FACILITES DATA:

New Delivery Point Voltage: 230 kV

New Peak kVA Capacity of Delivery Point Facilities: 300,000

Peak kW and rkVA During First Three Years Following Implementation and Highest Peak Within Ten Years:

	Initial Year:	Second Year:	Third Year:	Highest in First Ten Years:
Enter Year →	2024	2025	2026	2034
Summer Peak kW:	80,000	95,000	107,000	225,000
Summer Peak rkVA:	16,000	19,000	21,000	45,000
Winter Peak kW:	80,000	95,000	107,000	225,000
Winter Peak rkVA:	16,000	19,000	21,000	45,000

Delivery Point Facilities Route:
(attach detail if new line extension is involved)

Additional Comments:

NOVEC is providing bridging power via the Cochran Mill Delivery Point to energize the data center customer ahead of the anticipated transmission extension and substation construction completion. When the Altair Substation is energized, the load served by the bridging power to this campus will be transferred to the new Altair Substation. NOVEC anticipates that the Cochran Mill Substation risks exceeding 100MVA in September of 2024 and requests that Dominion Energy energize the new substation by this date to mitigate Facility Interconnection Requirement criteria violations. The new Altair Substation will initially include four (4) 120MVA transformers. When the customer adds the fith building at the site, NOVEC will install two (2) additional transformers.

SECTION III – CUSTOMER'S EQUIPMENT

Transformer Primary Voltage: 230 kV Transformer Secondary Voltage: 34.5kV

Transformer Nameplate Capacity: 120 MVA Temperature Rise: 55 C

Transformer Taps: 218500-224250-230000-235750-241500

Connection (e.g. Wye-Wye):	Delta-Wye
Transformer Impedance:	TBD
Isolation Device Type and Rating:	245kV, 2000A Gang Operated Switch
Protection Device Type and Rating:	Circuit breaker, 245kV, 2000A, 80kA

Required Attachments: [1] One-line diagram [2] Transformer test report [3] Transformer loss curve
[4] Operating procedures description [5] Protection scheme functional diagram
[6] Protection Device information (including device types, serial and model numbers, relay settings, etc.)

SECTION IV – TIMING

Request included in Customer's planning documents submitted to Dominion on:

Most Recent Submission:	/ /20	Second Most Recent Submission:	/ /20
Expected Date Customer's Construction to Commence:	08 /01/ 2022		
Expected Completion Date of Customer Work:	08 /15/ 2024		
Date Requested for Dominion Construction to Commence:	/ /20 TBD by Dominion		
Requested Completion Date of Dominion Work (De-energized):	08 /15/ 2024		
Requested Date to Energize: **(See Note)**	09 /01/ 2024		
Other Milestones:			

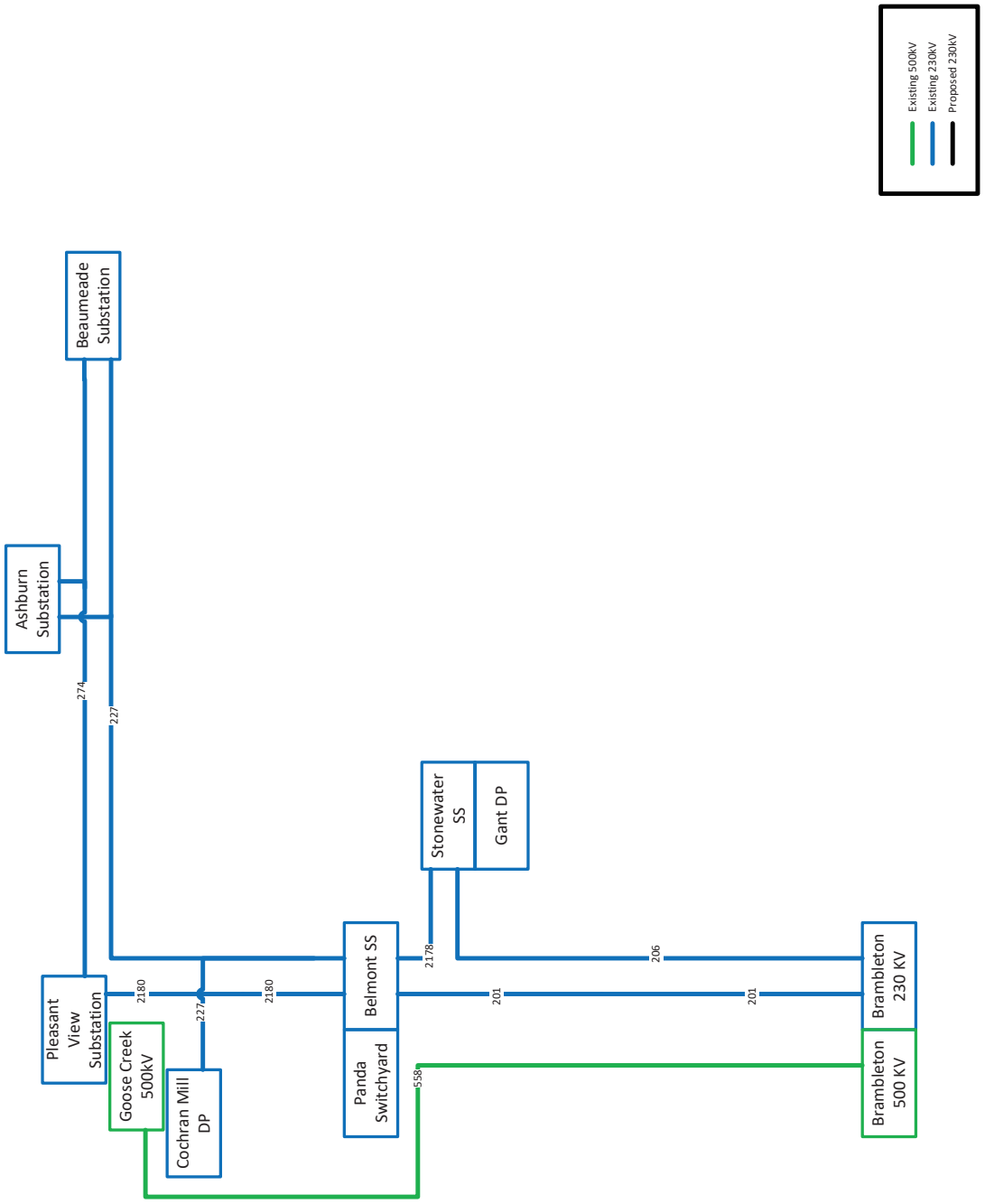
NOTE: If the "Requested Date to Energize" is marked as (E), then the firm date ultimately supplied must be on or after the estimated date, unless an earlier firm date is mutually agreed-upon prior to submission of the revised request form.

(E) = Estimated

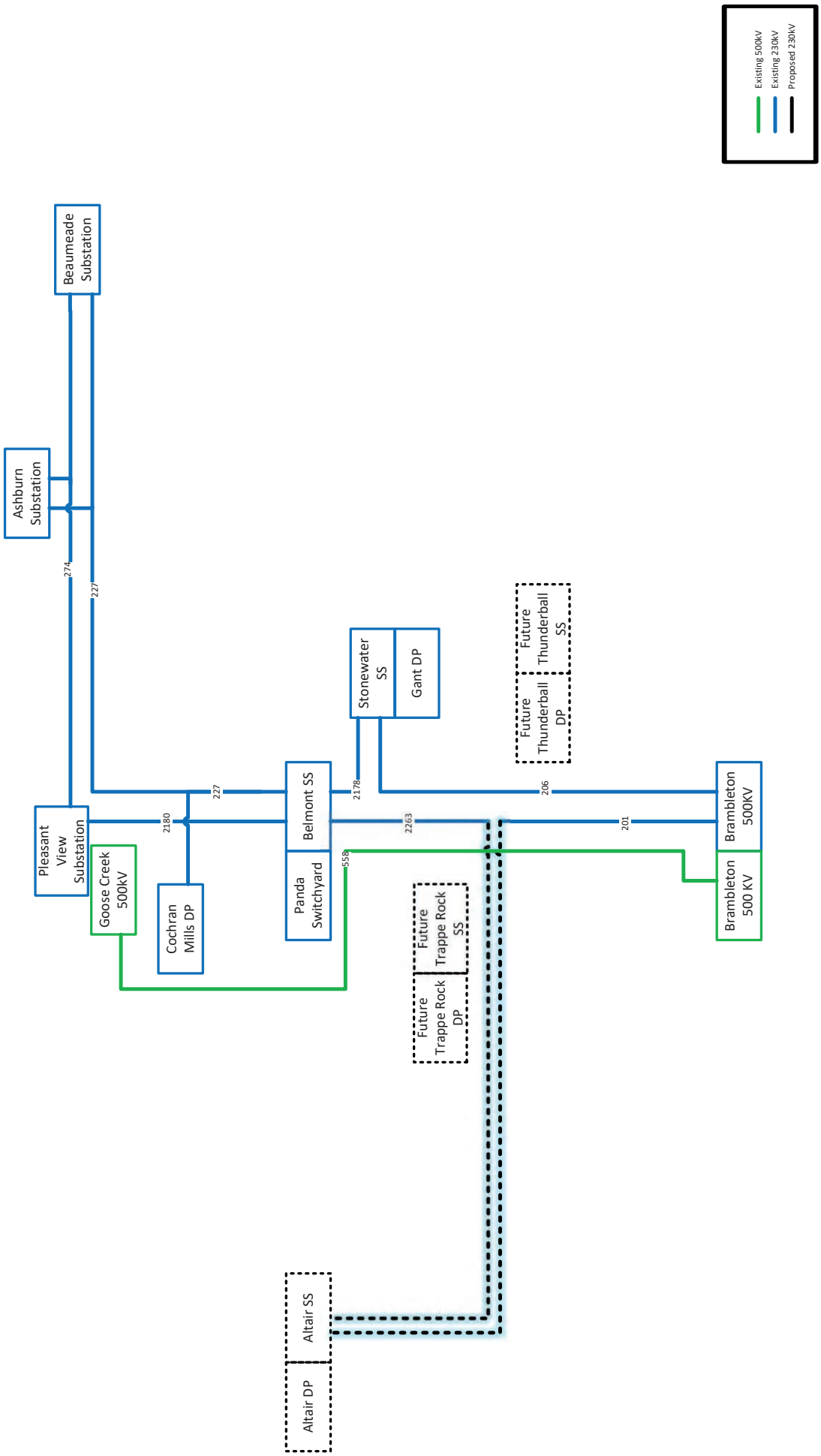
N/A = Not Available

TBD = To Be Determined

Existing System



System after Proposed 230kV Altair Loop and Altair Switching Station



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) Engineering Justification for Project**

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.

(2) Known Future Projects

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 the Altair Campus per NOVEC's DP request, as discussed in Section I.A. See Attachments I.A.1 and I.A.2. While the Company is aware of another potential future data center campus development in the immediate area, and additional 230 kV transmission facilities in the Project area required to serve that need and/or address NERC reliability criteria,[10] there are no known future projects that require the proposed Project to be constructed. See Attachments I.A.4 and III.E.1.

(3) Planning Studies

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.

Dominion Energy Virginia's Electric Transmission Planning group performs planning studies to ensure delivery of bulk power to a continuously changing

[10] *See supra*, n. 3.

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 and to comply with mandatory NERC Reliability Standards, specifically Facility Connection ("FAC") standard FAC-001,[11] the Company's Facility Interconnections Requirement ("FIR") document[12] 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 to establish facility connection and performance requirements in accordance with FAC-001, and the TOs and end-users meet and adhere to the established facility connection and performance requirements in accordance with FAC-002.

NERC Reliability Standards TPL-001 requirements R2, R5, and R6 require PJM, the Planning Coordinator, and the TO to have 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.[13] 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);

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).

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[11] *See supra*, n. 5.

[12] The Company's FIR document is available online at https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/virginia/parallel-generation/facility-connection-requirements.pdf?la=en&rev=f280781e90cf47f69ea526c944c9c347&hash=82DD2567D0B033C47536134B8C4D5C5E. The Company's Transmission Planning Criteria (effective April 1, 2022) is attached thereto.

[13] For additional information related to FERC Form 715, *see* https://www.pjm.com/library/request-access/ferc-form-715.

The Project is being constructed as a single circuit loop supported primarily by two side-by-side single circuit weathering steel monopoles [14] 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) Facilities List

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

See Attachments I.A.1, I.A.3, I.A.4, and III.E.1 for existing and future transmission facilities in the Project area. See Attachment I.G.1 for a map of the existing transmission system in the vicinity of the proposed Project.

[14] *See supra*, n. 1.

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: As presented in Attachment I.G.1, Dominion Energy Virginia's existing utility system in the vicinity of the proposed Altair Station includes the Company's Belmont Station that sources Panda Stonewall Energy Park's 230 kV switchyard, the Company's Stonewater Switching Station ("Stonewater Station") that sources NOVEC's Gant DP, NOVEC's Cochran Mill DP, and the Company's Pleasant View Substation. See also Attachment I.A.3 for a one-line diagram of the existing area transmission system.

The Company's Belmont Station is approximately 1.15 straight-line miles east of the Altair Campus. Belmont Station contains five 230 kV breakers arranged in ring bus configuration with one 230 kV feed to Panda Stonewall Energy Park's 230 kV switchyard. Four overhead 230 kV lines currently terminate at Belmont Station. Leaving the station to the south are 230 kV Belmont-Brambleton Line #201 and Belmont-Stonewater Line #2178. Leaving the station to the north are 230 kV Belmont-Pleasant View Line #2180 and Beaumeade-Belmont Line #227. There is not any available space at the Belmont Station to accommodate the additional power transformers and circuit breakers needed to supply the capacity at 34.5 kV to NOVEC's customer's planned facility at the Altair Campus, and there is no available property to expand the substation footprint.

NOVEC's Cochran Mill DP is sourced by the 230 kV Beaumeade-Belmont Line #227 and is located 1.0 mile east of the Altair Campus. The existing t-tap configuration feeding Cochran Mill DP from Beaumeade-Belmont Line #227 limits the available capacity at Cochran Mill DP to 100 MW based on the Company's FIR document.

The Company's Stonewater Station is approximately 1.25 straight-line miles east of the Altair Campus. Stonewater Station contains four 230 kV breakers configured in a ring bus configuration with two 230 kV feeds to NOVEC's Gant DP. Stonewater Station is sourced by 230 kV Belmont-Stonewater Line #2178 and 230 kV Brambleton-Stonewater Line #206 and is built to accommodate a total of 300 MW based on the Company's FIR document. NOVEC's Gant DP sources a data center customer with expected loads in excess of 100 MW. The expected load of the Altair Campus and load projection of Gant DP would exceed the 300 MW available at Stonewater Station.

The Company's Pleasant View Substation is approximately 1.85 miles northeast of Altair Campus and is sourced by 230 kV Belmont-Pleasant View Line #2180 and 230 kV Beaumeade-Pleasant View Line #274. The Altair Campus is in NOVEC's distribution service territory and, therefore, the Pleasant View Substation would not be an electrically prudent source for the Altair Campus.

See Attachment I.A.2 for the projected peak load at NOVEC's Altair DP in the first, second, and third years of operation, and the highest peak in the first 10 years.

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: Not applicable.

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 identified the following transmission electrical alternative to the proposed Project, as discussed below. No distribution alternatives were considered based on NOVEC's DP request.

Transmission Alternative: *Cut Line #2180 between Cochran Mill DP and Belmont Station*

Under this transmission scenario, the Company would cut Line #2180 north of its existing Belmont Station. From an electrical standpoint, this solution is similar to the Company's preferred option of cutting Line #201 south of the Belmont Station. However, future conceptual data center plans near Pleasant View may require cutting Line #2180 between Cochran Mill DP and Belmont Station, thereby limiting the available capacity for the Altair Campus. Additionally, based on routing considerations, as discussed further in Section II.A.9 (referred to therein as Option 2) and in the Environmental Routing Study, cutting Line #2180 was not presented as a preferred option.

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 provide requested service and comply with mandatory NERC Reliability Standards, while maintaining the overall long-term reliability of its transmission system.[15] Notwithstanding, when performing an analysis based on PJM's 50/50 load forecast, there is no adjustment in load for DR programs that are considered in PJM's fixed resource requirement ("FRR") plan 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 previously has been bid into PJM's reliability pricing model ("RPM") market is not a factor in this particular application because of the identified need for the Project. Based on these

[15] 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.

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 discussed in Section I.C, the need is based on the Company's obligation to interconnect the new NOVEC Altair DP consistent with the FIR document and mandatory NERC Reliability Standards. As reflected in Attachment I.A.2, the highest projected peak load over the next 10 years at NOVEC's Altair DP is 225 MW. By way of comparison, statewide, the Company achieved demand savings of 308.4 MW (net) / 396.8 MW (gross) from its DSM Programs in 2021.

I. NECESSITY FOR THE PROPOSED PROJECT

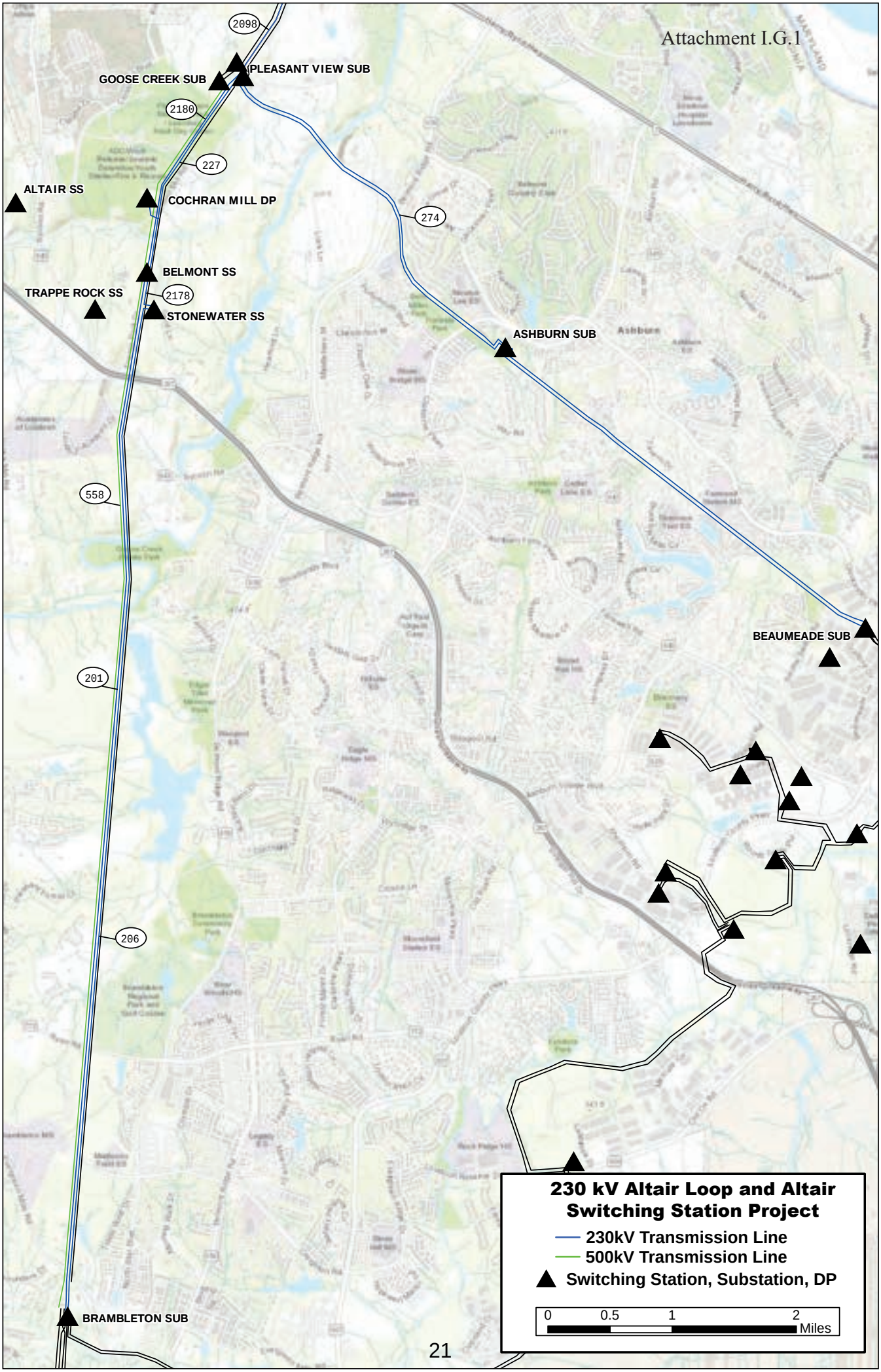
F. Describe any lines or facilities that will be removed, replaced, or taken out of service upon completion of the proposed project, including the number of circuits and normal and emergency ratings of the facilities.

Response: Not applicable.

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.


2098
PLEASANT VIEW SUB
GOOSE CREEK SUB
2180
227
ALTAIR SS
COCHRAN MILL DP
274
BELMONT SS
TRAPPE ROCK SS
2178
STONEWATER SS
ASHBURN SUB
Ashburn
558
BEAUMEADE SUB
201
206
BRAMBLETON SUB
230 kV Altair Loop and Altair Switching Station Project
230kV Transmission Line
500kV Transmission Line
Switching Station, Substation, DP
0
0.5
1
2
Miles

I. NECESSITY FOR THE PROPOSED PROJECT

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

Response: The in-service target date for the proposed Project is September 1, 2024.

The Company estimates it will take approximately 16 months for detailed engineering, scheduled outages, materials procurement, permitting, real estate, and construction after a final order from the Commission. Accordingly, to support this estimated construction timeline and construction plan, the Company respectfully requests a final order by May 17, 2023. Should the Commission issue a final order by May 17, 2023, the Company estimates that construction should begin around June 2023, and be completed by September 1, 2024. This schedule is contingent upon obtaining the necessary permits and outages, the latter of which may be particularly challenging due to the amount of new load growth, rebuilds, and new builds scheduled to occur in this load area. 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 the ability to schedule outages, and unpredictable delays due to labor shortages and/or materials/supply issues.

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 along the Proposed Route (Route 1) is approximately $48.9 million, which includes a total of approximately $40.4 million for transmission-related work, and a total of approximately $8.5 million for substation-related work (2022 dollars).

The estimated conceptual cost for transmission-related work associated with Alternative Route 2 is provided in Section II.A.9. The substation-related cost associated with Alternative Route 2 is the same as that identified along the Proposed Route (Route 1).

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-2021-0012) initiated by the TO to interconnect new customer load. The Project was submitted to PJM on February 9, 2021, and the solution slide was submitted to PJM on March 9, 2021. See Attachments I.J.1 and I.J.2, respectively. The Project has been assigned Supplemental Project No. s2598 and was accepted into the 2021 Local Plan. See Attachment I.J.3. The Company plans to present revised slides to PJM as to Project cost 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 DOM Zone.

Dominion Supplemental Projects

Transmission Expansion Advisory Committee
February 9, 2021

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-2021-0012

Process Stage: Need Meeting 02/09/2021

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:

NOVEC has submitted a DP Request for a new substation (Altair) to serve a data center complex in Loudoun County with a total projected load in excess of 100MW. Requested in-service date is 09/01/2024.

Initial In-Service Load	Projected 2026 Load
Summer: 80.0 MW	Summer: 107.0 MW

Dominion Supplemental Projects

Transmission Expansion Advisory Committee
March 9, 2021

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

Dominion Transmission Zone: Supplemental Customer Load Request

Need Number: DOM-2021-0012

Process Stage: Solutions Meeting 03/09/2021

Previously Presented: Need Meeting 02/09/2021

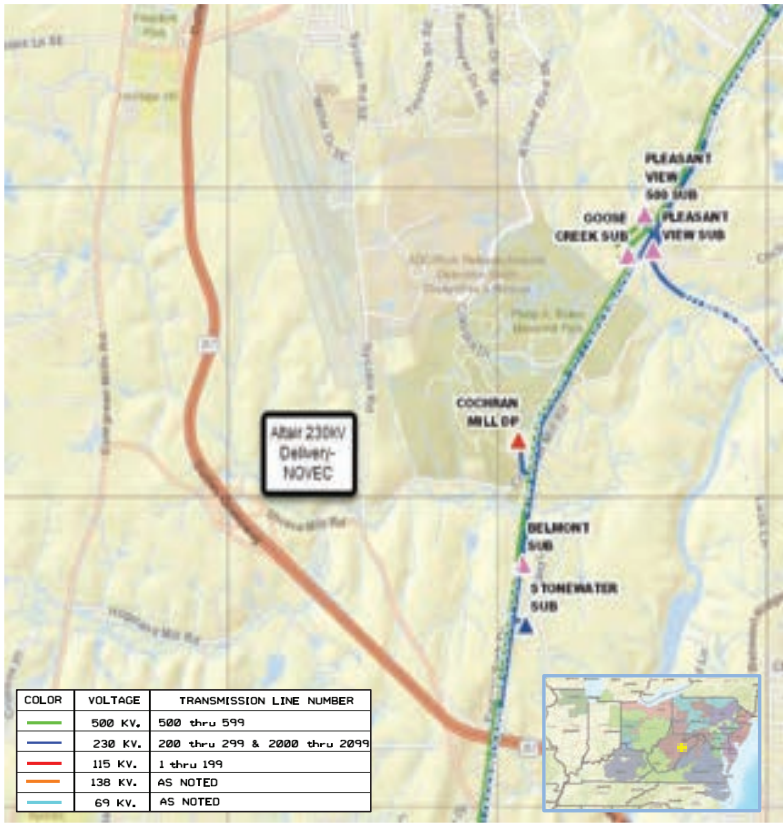
Project Driver: Customer Service

Specific Assumption References:

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

Problem Statement:

NOVEC has submitted a DP Request for a new substation (Altair) to serve a data center complex in Loudoun County with a total projected load in excess of 100MW. Requested in-service date is 09/01/2024.



Initial In-Service Load	Projected 2026 Load
Summer: 80.0 MW	Summer: 107.0 MW

Dominion Transmission Zone: Supplemental Altair 230kV Delivery - NOVEC

Need Number: DOM-2021-0012

Process Stage: Solutions Meeting 03/09/2021

Proposed Solution:
Interconnect the new substation by cutting and extending Line #201 (Belmont-Brambleton) to the proposed Altair Substation. Lines to terminate in a 230kV four-breaker ring arrangement with an ultimate arrangement of a six-breaker ring.

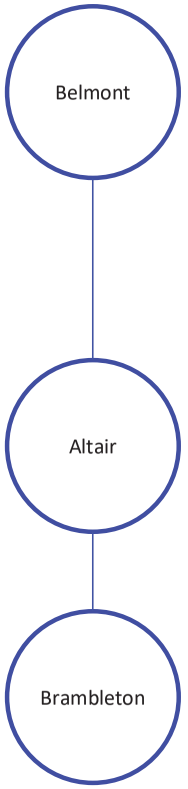
Estimated Project Cost: $15.0 M

Alternatives Considered:
No feasible alternatives

Projected In-service Date: 09/01/2024

Project Status: Engineering

Model:



Dominion Transmission Zone M-3 Process
Altair 230kV Delivery - NOVEC

Need Number: DOM-2021-0012
Process Stage:
Submission of Supplemental Project for Inclusion in the Local Plan – 11/12/2021

Previously Presented:

Need – 02/09/2021

Solution – 03/09/2021

Project Driver:

Customer Service

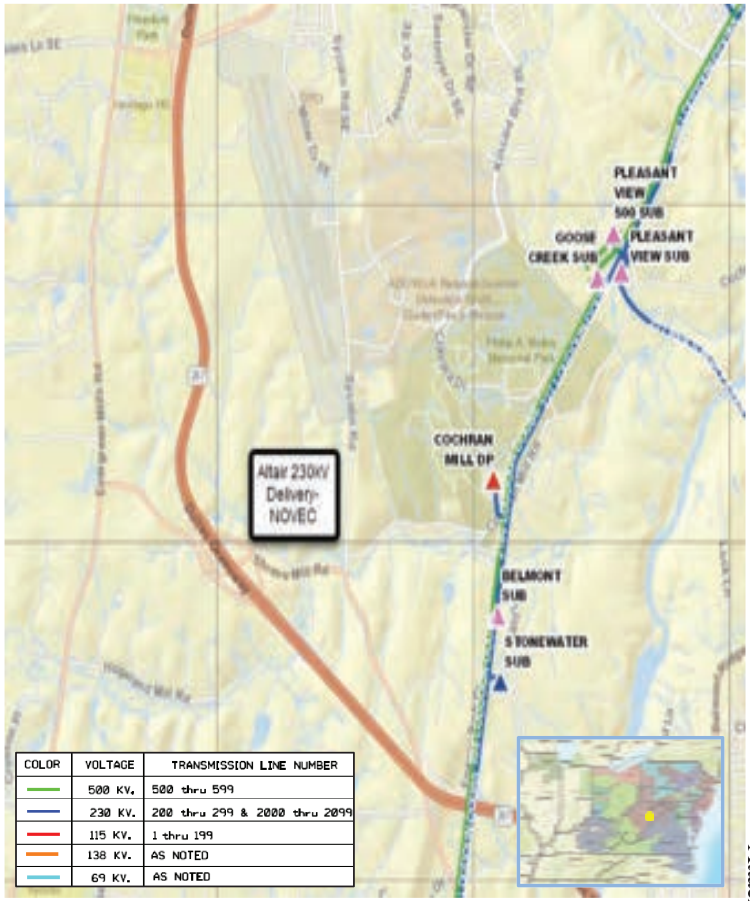
Specific Assumption Reference:
Customer load request will be evaluated per Dominion's Facility Interconnection Requirements Document and Dominion's Transmission Planning Criteria.

Problem Statement:

NOVEC has submitted a DP Request for a new substation (Altair) to serve a data center complex in Loudoun County with a total projected load in excess of 100MW. Requested in-service date is 09/01/2024.

Projected 2026 load

Summer: 107.0 MW
Winter: 107.0 MW



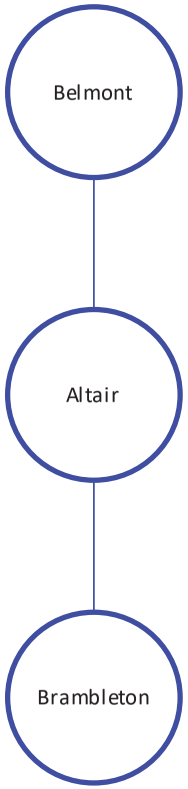
Dominion Transmission Zone M-3 Process
Altair 230kV Delivery - NOVEC

Need Number: DOM-2021-0012
Process Stage:
Submission of Supplemental Project for Inclusion in the Local Plan – 11/12/2021

Selected Solution:

Interconnect the new substation by cutting and extending Line #201 (Belmont-Brambleton) to the proposed Altair Substation. Lines to terminate in a 230kV four-breaker ring arrangement with an ultimate arrangement of a six-breaker ring.

Estimated Cost: $15.0 M
Projected In-Service: 09/01/2024
Supplemental Project ID: s2598
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 Altair Station will serve NOVEC's future Altair DP. See Section I.A and Attachment I.A.4. 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 for the 230 kV Altair Loop are as follows:

Proposed Route (Route 1): 1.66 miles

Alternative Route 2: 1.52 miles

See Section II.A.9 for an explanation of the Company's route selection process, as well as the Environmental Routing Study referenced therein.

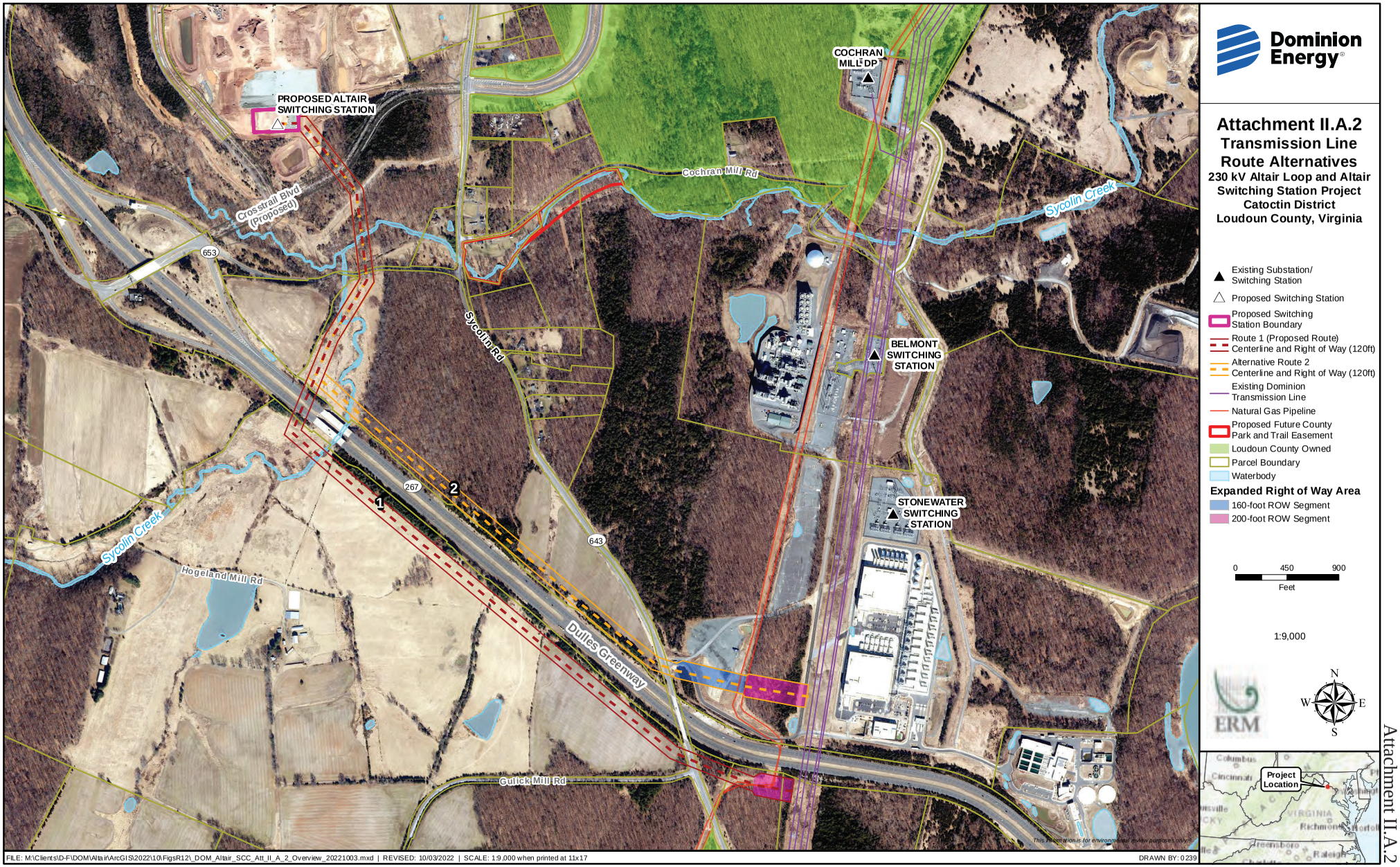
II. DESCRIPTION OF THE PROPOSED PROJECT

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. No portion of the right-of-way is proposed to be quitclaimed or relinquished.

Dominion Energy Virginia 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.


PROPOSED ALTAIR SWITCHING STATION
COCHRAN MILL DP
Cochran Mill Rd
Crossrail Blvd (Proposed)
653
Sycolin Creek
Sycolin Rd
BELMONT SWITCHING STATION
STONEWATER SWITCHING STATION
267
1
2
643
Hogeland Mill Rd
Dulles Greenway
Gulick Mill Rd
This information is for environmental review purposes only.
FILE: M:\Clients\D-F\DOM\Altair\ArcGIS\2022\10\FigsR12_DOM_Altair_SCC_Att_II_A_2_Overview_20221003.mxd | REVISED: 10/03/2022 | SCALE: 1:9,000 when printed at 11x17
DRAWN BY: 0239
Dominion Energy
Attachment II.A.2
Transmission Line Route Alternatives
230 kV Altair Loop and Altair Switching Station Project
Catoctin District
Loudoun County, Virginia
Existing Substation/ Switching Station
Proposed Switching Station
Proposed Switching Station Boundary
Route 1 (Proposed Route) Centerline and Right of Way (120ft)
Alternative Route 2 Centerline and Right of Way (120ft)
Existing Dominion Transmission Line
Natural Gas Pipeline
Proposed Future County Park and Trail Easement
Loudoun County Owned
Parcel Boundary
Waterbody
Expanded Right of Way Area
160-foot ROW Segment
200-foot ROW Segment
0
450
900
Feet
1:9,000
ERM
N
W
E
S
Project Location
Columbus
Cincinnati
VIRGINIA
Richmond
Raleigh

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 Company's proposed Altair Station or NOVEC's future Altair DP.

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;

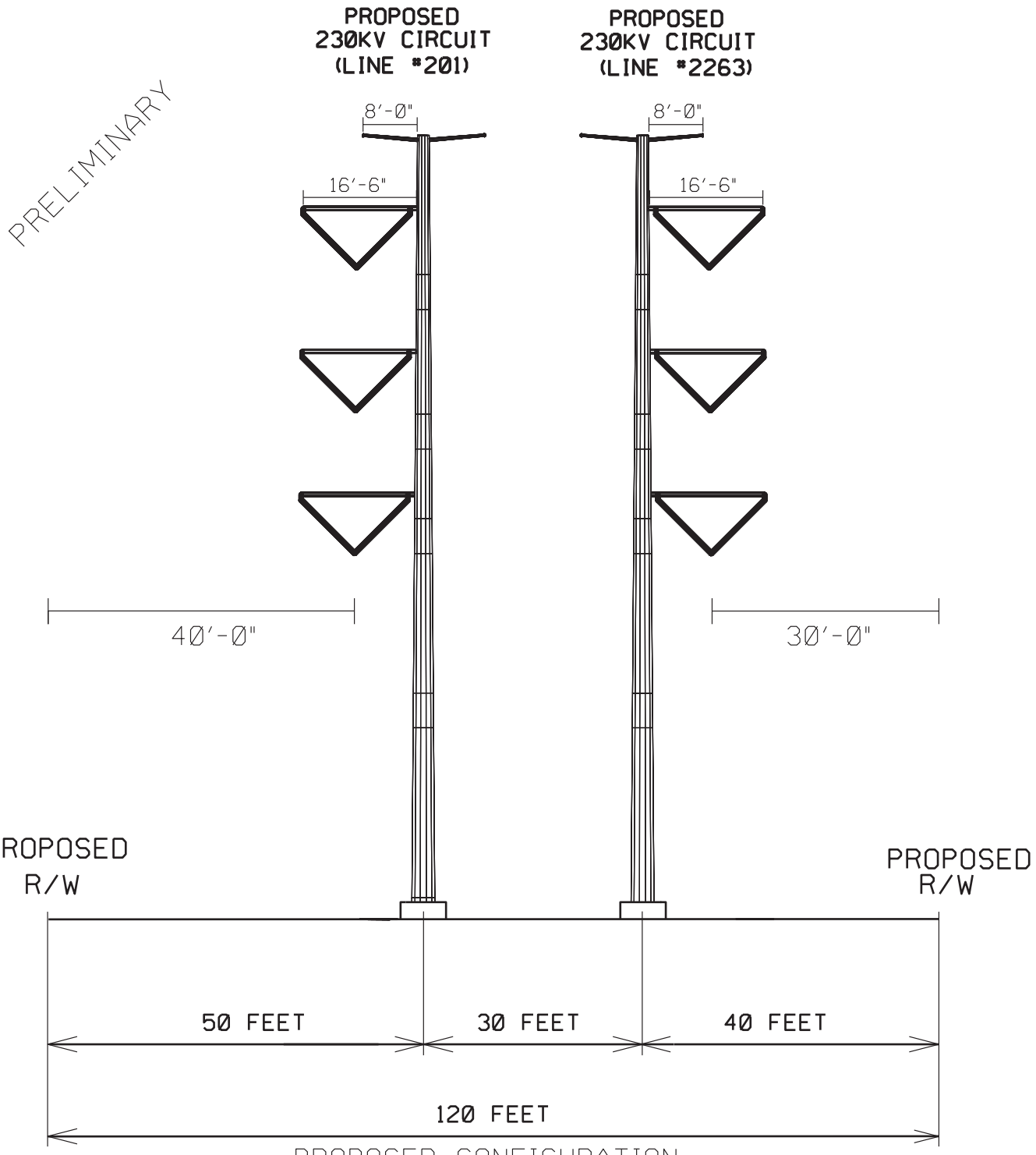
c. Existing utility facilities on the ROW; and

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 Attachments II.A.5.a through II.A.5.f. Note that the staggered arm monopoles (Attachment II.A.5.d) are used for sections of the right-of-way where structure height is limited by the Leesburg Executive Airport. To the extent the cross section drawings depict placement of structures off-center in the right-of-way, this is to better accommodate the need for a future line within additional expanded right-of-way, as noted therein.[16]

[16] *See supra* n. 2 and n. 3. Note that the single circuit 3-pole structures at the cut-in location (see Attachment II.B.3.i) and single circuit H-frame structures within the first approximately 0.06 mile of the Altair Loop (see Attachment II.B.3.ii) are subject to change as the Company continues to evaluate the most efficient way to add a third circuit to that segment of the right-of-way in order to satisfy NERC reliability criteria (specifically, to prevent a 300 MW N-1-1 load drop scenario) in the Project area. See Attachments I.A.4 and III.E.1.

TYPICAL CONFIGURATION
TWO SINGLE CIRCUIT SUSPENSION MONOPOLES

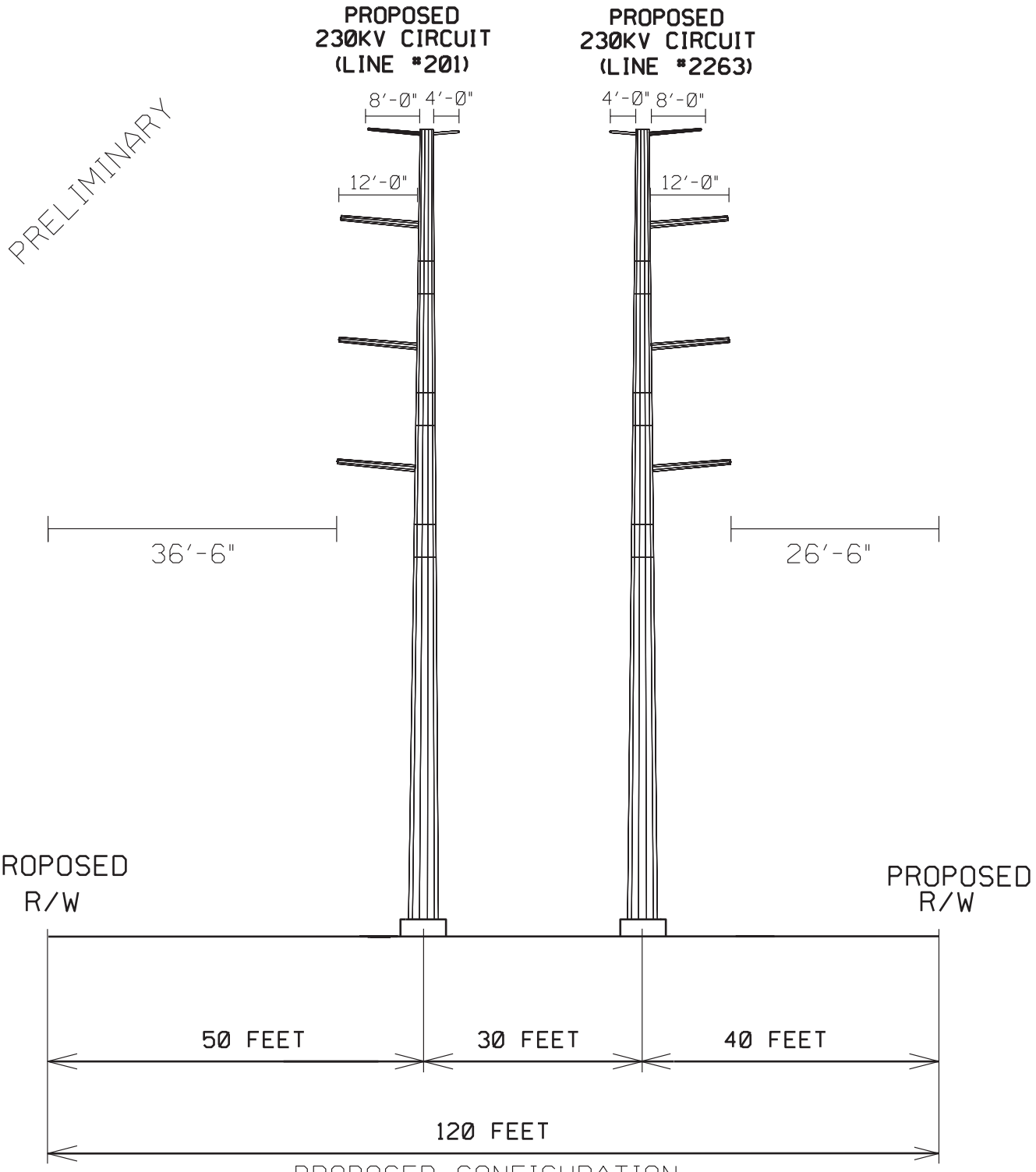


PROPOSED CONFIGURATION
TYPICAL CORRIDOR LOOKING TOWARD ALTAIR

NOTES: 1. Information contained on drawing is to be considered preliminary in nature and subject to change based on final design.
2. While only 120 feet of new right-of-way is necessary for the proposed project, the company plans to acquire a total of 160 feet of right-of-way to accomodate the installation of a future third circuit in the corridor.

$DGNSPEC$

TYPICAL CONFIGURATION
TWO SINGLE CIRCUIT DEADEND MONOPOLES



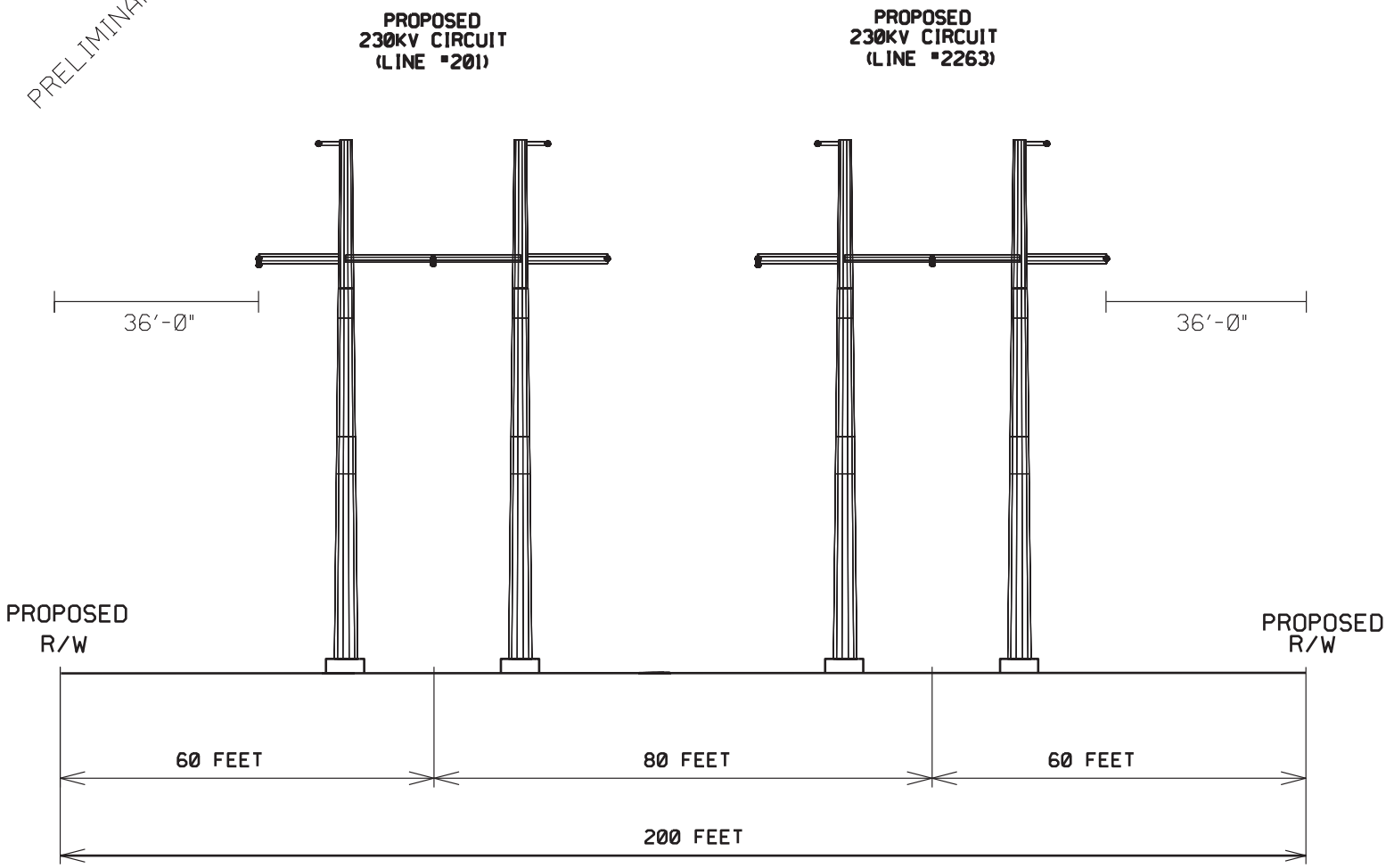
PROPOSED CONFIGURATION
TYPICAL CORRIDOR LOOKING TOWARD ALTAIR

NOTES: 1. Information contained on drawing is to be considered preliminary in nature and subject to change based on final design.
2. While only 120 feet of new right-of-way is necessary for the proposed project, the company plans to acquire a total of 160 feet of right-of-way to accomodate the installation of a future third circuit in the corridor.

$DGNSPEC$

TYPICAL CONFIGURATION
TWO SINGLE CIRCUIT H-FRAMES

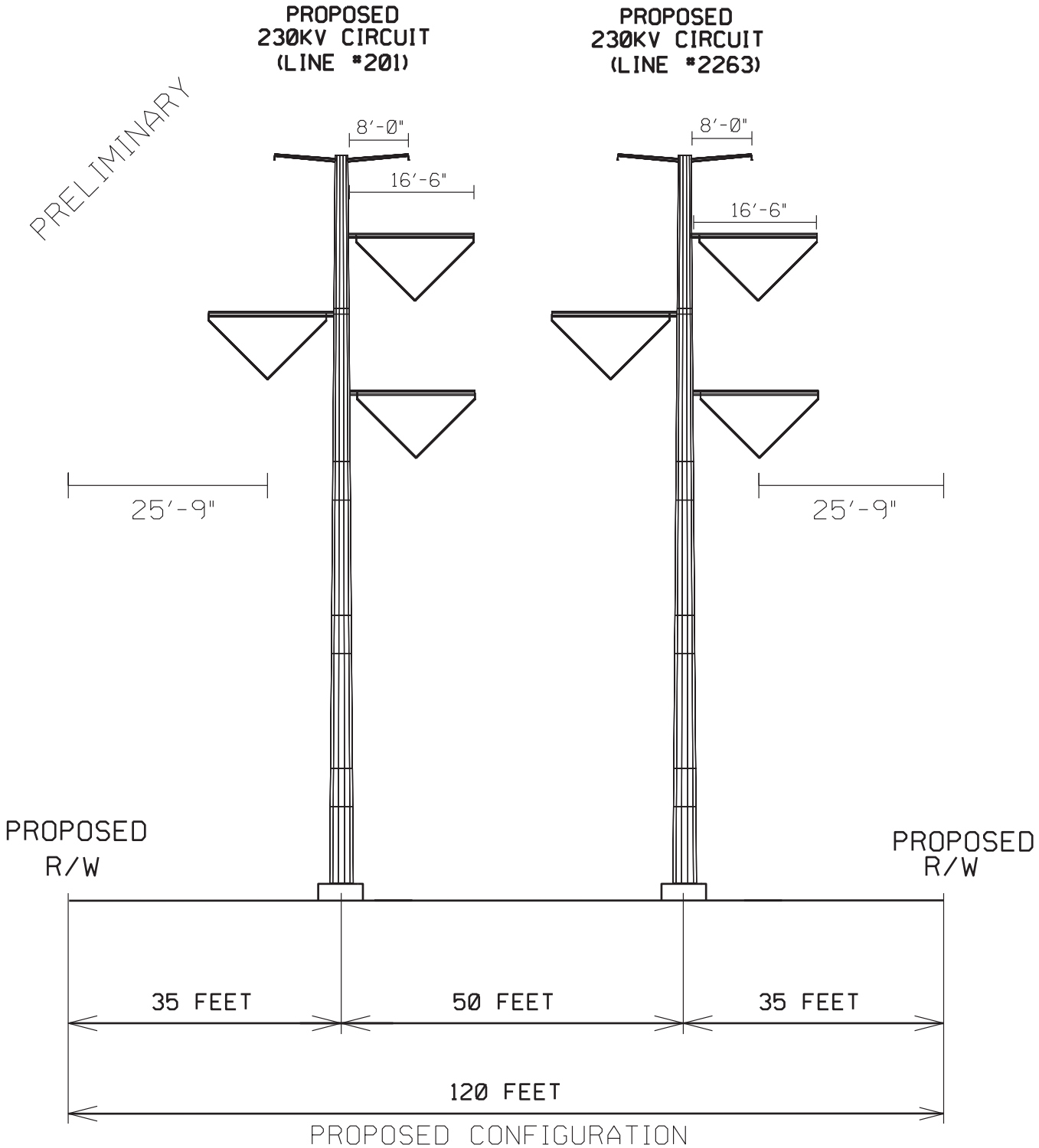
PRELIMINARY



PROPOSED CONFIGURATION
TYPICAL CORRIDOR LOOKING TOWARD ALTAIR

NOTES: 1. Information contained on drawing is to be considered preliminary in nature and subject to change based on final design.
2. While only 200 feet of new right-of-way is necessary for the proposed project, the company plans to acquire a total of 280 feet of right-of-way to accomodate the installation of a future third circuit in the corridor.

TYPICAL CONFIGURATION
TWO SINGLE CIRCUIT STAGGERED ARM MONOPOLES

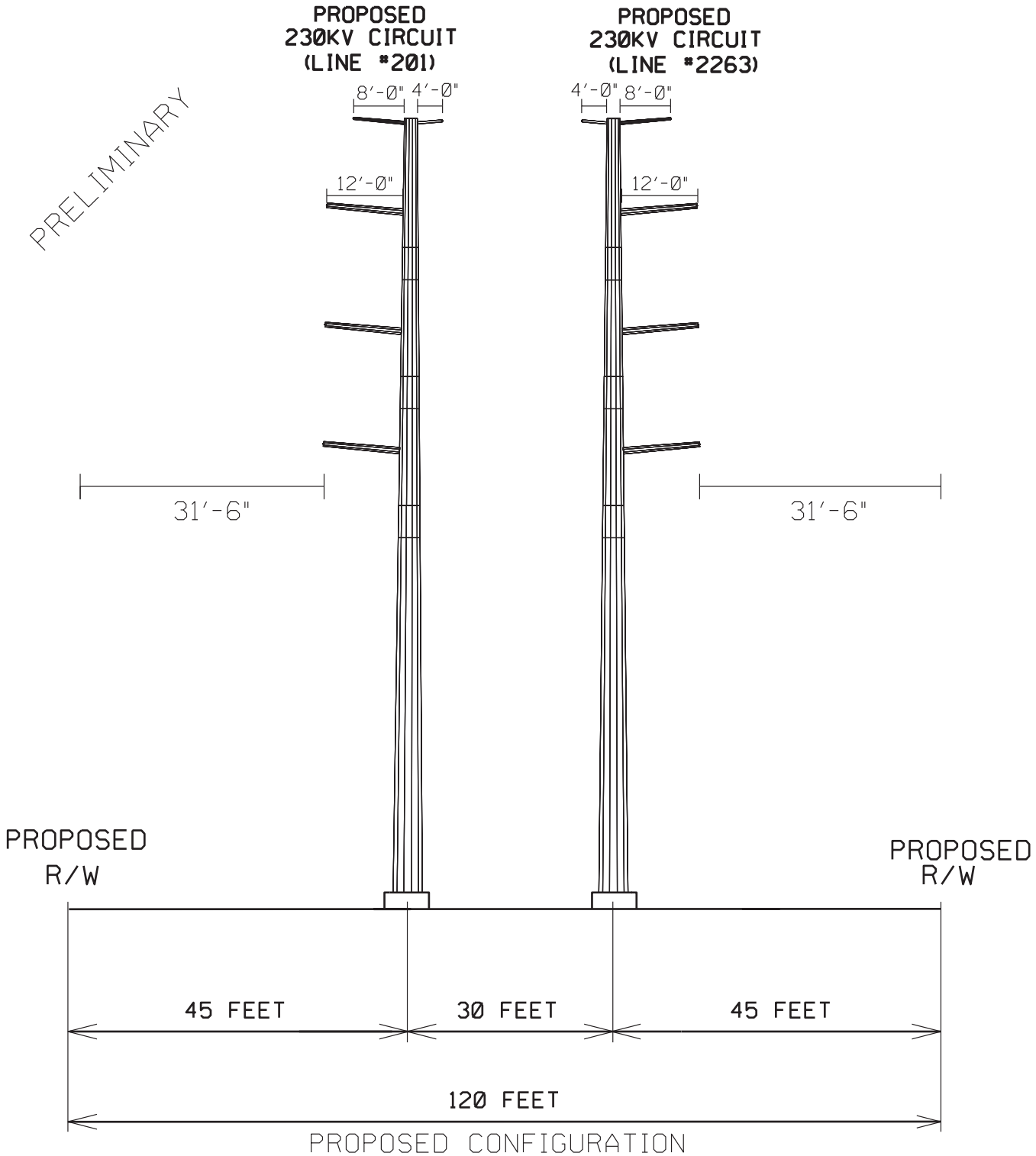


PROPOSED CONFIGURATION
TYPICAL CORRIDOR LOOKING TOWARD ALTAIR

NOTES: 1. Information contained on drawing is to be considered preliminary in nature and subject to change based on final design.
2. While only 120 feet of new right-of-way is necessary for the proposed project, the company plans to acquire a total of 170 feet of right-of-way to accomodate the installation of a future third circuit in the corridor.

$DGNSPEC$

TYPICAL CONFIGURATION
TWO SINGLE CIRCUIT DEADEND MONOPOLES



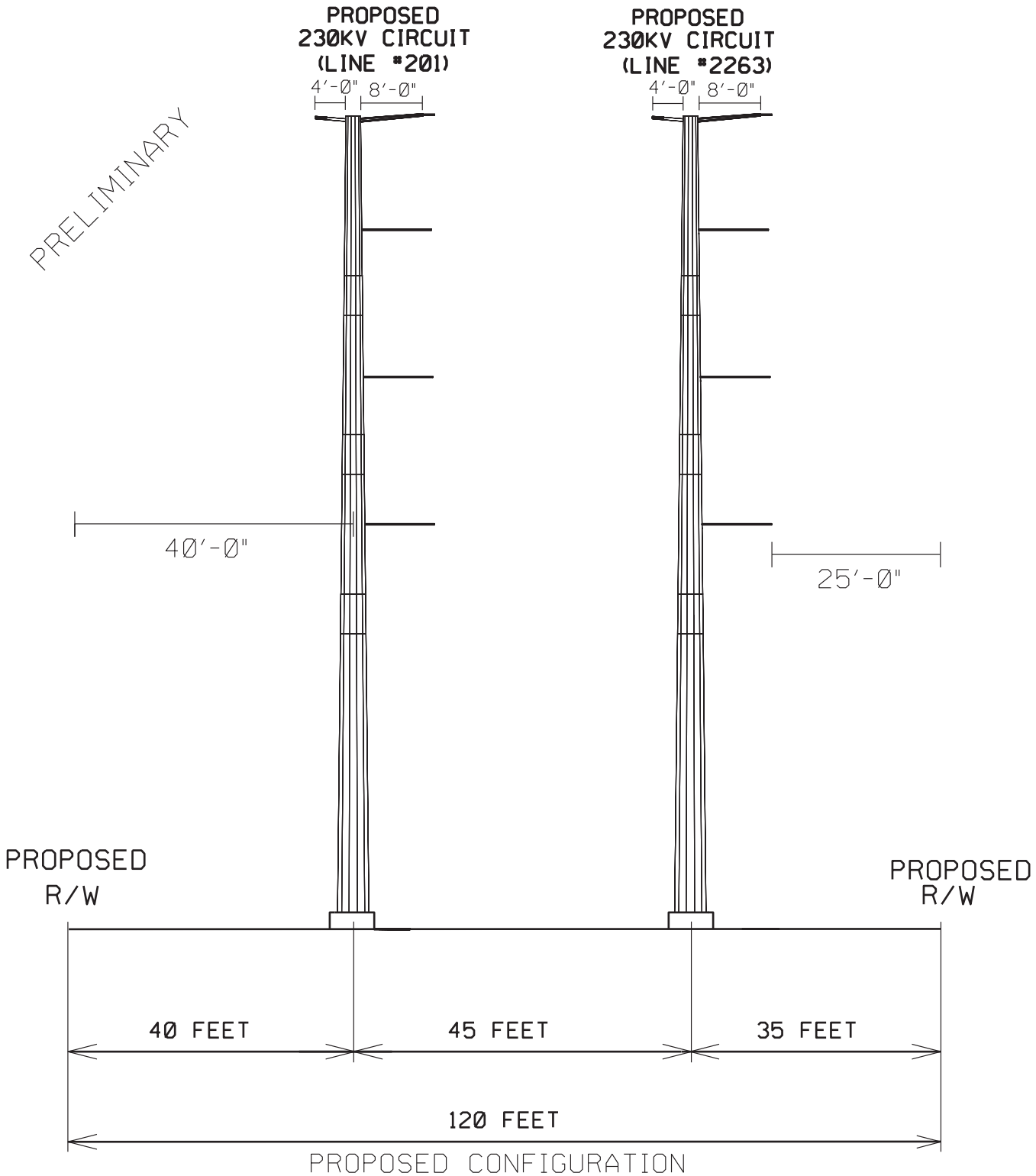
PROPOSED CONFIGURATION

TYPICAL CORRIDOR LOOKING TOWARD ALTAIR

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

$DGNSPEC$

TYPICAL CONFIGURATION
TWO SINGLE CIRCUIT NO ARM MONOPOLES



PROPOSED CONFIGURATION
TYPICAL CORRIDOR LOOKING TOWARD ALTAIR

NOTES: 1. Information contained on drawing is to be considered preliminary in nature and subject to change based on final design.
2. While only 120 feet of new right-of-way is necessary for the proposed project, the company plans to acquire a total of 160 feet of right-of-way to accomodate the installation of a future third circuit in the corridor.

$DGNSPEC$

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 Company's proposed Altair Station or NOVEC's future Altair DP. Therefore, with the exception of approximately 0.05 mile of the route located within either the Altair Switching Station or the existing Line #201 right-of-way, the remaining right-of-way will require easements for a new-build transmission line. However, portions of the routes will parallel existing, non-transmission line rights-of-way including the Dulles Greenway, Sycolin Road, Shreve Mill Road, and existing electric distribution lines. Additionally, two TC Energy natural gas pipelines (located in the same easement corridor) will be crossed by the Proposed and Alternative Routes. The Proposed Route crosses the existing TC Energy gas pipeline corridor in the area between Sycolin Road and the Dulles Greenway. The Company is in the process of coordinating with TC Energy to adjust the route such that no transmission structures impact the pipelines. If the Proposed Route is selected as the preferred route by the Commission, the Company would seek flexibility to modify the alignment of the route to shift the route up to 150 feet to the south to avoid conflicts with the existing natural gas pipeline easement. With the exception of this crossing, no overlap between existing easements and the proposed easement for the Project will occur. See Attachment II.A.6.


PROPOSED ALTAIR SWITCHING STATION
COCHRAN MILL DP
BELMONT SWITCHING STATION
STONEWATER SWITCHING STATION
Crossrail Blvd (Proposed)
Cochran Mill Rd
Sycolin Creek
Sycolin Rd
Hogeland Mill Rd
Dulles Greenway
Gulick Mill Rd
653
267
643
1
2
Dominion Energy
Attachment II.A.6
Existing Easements
230 kV Altair Loop and Altair Switching Station Project
Catoctin District
Loudoun County, Virginia
Existing Substation/ Switching Station
Proposed Switching Station
Proposed Switching Station Boundary
Route 1 (Proposed Route) Centerline and Right of Way
Alternative Route 2 Centerline and Right of Way
Existing Dominion Transmission Line
Electric Distribution Line
Natural Gas Pipeline
Conservation Easement
Loudoun County Owned
Parcel Boundary
Waterbody
0
450
900
Feet
1:9,000
ERM
N
W
E
S
Project Location
Columbus
Cincinnati
VIRGINIA
Richmond
Raleigh
This information is for environmental review purposes only.
FILE: M:\Clients\D-F\DOM\Altair\ArcGIS\2022\10\FigsR12_DOM_Altair_SCC_Att_II_A_6_Easements_20221031.mxd | REVISED: 10/31/2022 | SCALE: 1:9,000 when printed at 11x17
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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 Proposed Route primarily will be 120 feet wide (approximately 1.55 miles), with a small portion of the route requiring a 200-foot right-of-way (approximately 0.06 mile). The remaining 0.05 mile of the route will be located either within the Altair Switching Station or within the Company's existing Line #201 right-of-way. In general, the entire right-of-way will require clearing.

Trimming of tree limbs along the edge of the right-of-way also 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 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
- 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 Department. 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 two viable electrical solutions for the Project: a 230 kV overhead route that would cut the existing Belmont-Brambleton Line #201 (Option 1) or Belmont-Pleasant View Line #2180 (Option 2) and extend northwest to the proposed Altair Station. ERM then developed a study area for these solutions that encompassed the area surrounding the proposed Altair Station and potential cut-in locations with Line #201 or Line #2180.

ERM and Dominion Energy Virginia originally identified six potential overhead routes (Routes 1 through 6) between Lines #201 and #2180 and the proposed Altair Switching Station (four Option 1 alternatives and two Option 2 alternatives). In consultation with a landowner and JK Land Holdings II, LLC (a land acquisition and development company headquartered in Loudoun County, sometimes referred to herein as "JKLH"), a seventh alternative (Route 7) was proposed to the Company for consideration in its analysis of route alternatives for this Project. This seventh route would involve cutting Line #2180 and, therefore, is considered an Option 2 alternative. Of the seven overhead routes, one overhead route (Route 1) was identified as the Proposed Route and one overhead Alternative Route (Alternative

Route 2) was identified as a potentially viable alternative to the Proposed Route. Both the Proposed and Alternative Routes cut Line #201 (*i.e.*, Option 1).

The remaining three overhead Option 2 routes cutting Line #2180 (Route 4, Route 5, and Route 7) and two Option 1 routes cutting Line #201 (Route 3 and Route 6) were all rejected from further consideration and not noticed due to fatal flaws in the routes identified during initial route development (Route 6) or due to excessive impacts identified during ERM's comparative analysis (Route 3, Route 4, Route 5, and Route 7).

Route 6 was found to have a number of significant issues and, as a result, was rejected from consideration without further evaluation. Route 6 would impact planned developments and the viewshed of a planned park. In addition, this route would have significant environmental impacts; the majority of the route crosses forested land and the route also parallels Sycolin Creek for about 0.1 mile.

The developer of the Sycolin Road Distribution Facility planned development is deeding approximately 6 acres of the property to the County for a planned park. Both Loudoun County Parks and Recreation and the Planning and Zoning Departments expressed significant concerns about any of the routes that would cross or be adjacent to this planned park. Route 6 runs adjacent to this park and also would cross an approximately 1-acre area of the planned Sycolin Road Distribution Facility, which has been dedicated for tree conservation.

Route 6 also would cross land associated with the Project Celtics planned development. While the route would not impact any of the buildings at the site, the route would cross about 4.7 acres of land that were dedicated as tree conservation areas along Sycolin Road. Clearing of this land would place the developer out of conformance with its County approved development plan and proffers. In addition, the Company learned during a meeting with the developers of Project Celtics that a 200-year-old heritage tree and an archaeological site would be located within the right-of-way of Route 6. While the archaeological site could be spanned by the proposed transmission line, construction of this route alternative would require the heritage tree to be cut down. For these reasons discussed above, Route 6 was rejected from further consideration.

Routes 3, 4, 5, and 7 were all subjected to a complete analysis in the Environmental Routing Study, but were rejected due to excessive impacts identified during ERM's comparative route analysis. While shorter than Routes 1 and 2, Routes 3, 4, 5, and 7 all would have significantly greater environmental impacts and/or greater impacts on planned and potential future developments. Routes 3, 4, 5, and 7 would require more clearing of forested lands (including greater impact on high value forested land). Routes 5 and 7 would also have more significant wetland impacts (including more palustrine forested ("PFO") wetland impacts), and a larger number of waterbody crossings as compared with Routes 1 and 2. Moreover, Routes 4, 5, and 7 would cut Line #2180 and would not have met the Company's future need of adding a third transmission line to connect a potential future data center

development.[17]

Routes 4, 5, and 7 would also have significant impacts on planned developments and a planned park. As discussed above, the developer of the Sycolin Road Distribution Facility is deeding approximately 6 acres of the property to the County for a future park. Routes 4, 5, and 7 either directly cross this park or would be located immediately adjacent to the park. Both Loudoun County Parks and Recreation and the Planning and Zoning Departments expressed significant concerns about any routes that would cross or be adjacent to this future park.

The Company learned during discussions with Scannell Properties, the developer of the Sycolin Road Distribution Facility, that Scannell Properties does not have the flexibility to make adjustments to their site plan and proffers due to environmental and topographic constraints of the site. Routes 4, 5, and 7 would put the developer out of conformance with its County approved site plans. Of these three routes, Route 5 would have the most significant impact on the Sycolin Road Distribution Facility. This route crosses areas of steep slope where a planned retaining wall will be constructed, as well as areas where additional proffers/zoning requirements are in place related to the steep slopes present on the development site. In addition, Routes 4, 5, and 7 all cross land associated with the planned Project Celtics development. While these routes would not conflict with any physical buildings associated with the Sycolin Road or Project Celtics developments, they would all cross land dedicated as tree conservation areas. Clearing of this land would place the developers out of conformance with their County approved development plan and proffers. Of Routes 4, 5, and 7, Route 4 would have the greatest impact on Project Celtics tree preservation areas. Finally, Route 4 would bisect the 22-acre JK Land Holdings II, LLC Northern Future Development area.[18]

Route 3 would have the most significant impact on the developable land associated with the JK Land Holdings II, LLC Southern Future Development, crossing multiple planned buildings and equipment yards. This impact would significantly reduce the value of the land for development. In addition, portions of Route 3 are collocated with segments of the proposed Loudoun County Sanitation Authority ("Loudoun Water") gravity sewer line/water line project and the future expansion of Sycolin Road. The design of the Loudoun Water project has yet to be finalized and may conflict with a portion of Route 3. Modifying the alignment of Route 3 to avoid these potential impacts would further reduce the amount of available developable land associated with the JK Land Holdings II, LLC Southern Future

[17] *See supra*, n. 3.

[18] The Company has had discussions with JKLH regarding this parcel located east of Sycolin Road. JKLH is the contract purchaser of the parcel and has participated in a Pre-Application Conference with Loudoun County Planning & Zoning (PRAP 2022-0065) regarding the rezoning of the site. However, it is the Company's understanding that as of this filing, JKLH has not closed on the purchase of the property or submitted a site plan or rezoning application to Loudoun County.

Development.[19] Moreover, the portion of Route 3 which parallels the west side of Sycolin Road would restrict the future expansion of Sycolin Road. Therefore, it is possible that this segment of the route would need to be relocated at some point in the future to accommodate the road widening project. Given the amount of planned and potential development in the Project area, there may not be adequate space in the area for the relocation of the transmission line.

Given the significant impacts of these routes on the environment, future recreation areas, and planned and potential developments, the Company rejected Routes 3, 4, 5, and 7.

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 the Environmental Routing Study for additional information on the rejected routes.

PROPOSED AND ALTERNATIVE ROUTES

Proposed Route (Route 1)

This route would construct two side-by-side overhead single circuit 230 kV lines from the proposed cut-in location of existing 230 kV Line #201 to the proposed Altair Station. As noted in Section I.I, the estimated conceptual cost of the Proposed Route is approximately $40.4 million (2022 dollars).

The length of the corridor for the Proposed Route is approximately 1.66 miles. The route extends northwest from Line #201 for about 1.04 mile, crossing over two existing TC Energy gas pipelines in the same easement,[20] paralleling the southern side of the Dulles Greenway and crossing Sycolin Creek. The route then turns north and continues for approximately 0.62 mile, crossing the Dulles Greenway, Sycolin Creek, Shreve Mill Road, Sycolin Creek in a third location, and the future Crosstrail Boulevard Extension, and terminates at the proposed Altair Station.

Construction of the Proposed Route (Route 1) crosses a total of 1.66 miles of land affecting 25.74 acres of right-of-way (including 1.77 acres for the proposed Altair Station). All six parcels crossed by the route are privately owned. Land use along the Proposed Route right-of-way consists of 11.93 acres of agricultural land, 5.64 acres of forested land, 7.24 acres of open space, 0.69 acre of developed land, and 0.24 acre of open water.

The majority (1.08 miles) of the privately owned land crossed by the Proposed

[19] The Company has had discussions with JKLH regarding this parcel located west of Sycolin Road. JKLH is the contract purchaser of the parcel and has participated in a Pre-Application Conference with Loudoun County Planning & Zoning (PRAP 2022-0061) regarding the rezoning of the site. However, it is the Company's understanding that as of this filing, JKLH has not closed on the purchase of the property or submitted a site plan or rezoning application to Loudoun County.

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

Route (Route 1) is owned by Cammack Brothers, LLC. A portion of this land (0.21 mile) is currently under contract to be purchased by JKLH. The Company consulted with Cammack Brothers, LLC and JKLH to attempt to identify a route that would be preferable to the current and future landowners. Of the route alternatives that cross Cammack Brothers, LLC property, the Proposed Route would have the greatest impact on the working farm located on the south side of the Dulles Greenway. Additionally, Cammack Brothers, LLC has expressed concern regarding the visual impact of the transmission line on its farm. Based on a review of the preliminary site plans provided to the Company, it appears that the Proposed Route would not conflict with JKLH's planned development.

Based on ERM's desktop wetland and waterbody analysis,[21] the right-of-way of the Proposed Route (Route 1) will encompass approximately 22 percent (5.76 acres) of land with a medium or higher probability of containing wetlands and waterbodies. Of these 5.76 acres, the majority (3.33 acres) consist of palustrine emergent ("PEM") wetlands. The Proposed Route will have five waterbody crossings: three crossing of a perennial waterbody (Sycolin Creek) and two crossings of waterbodies with intermittent flow (unnamed tributaries to Sycolin Creek). No open waterbody features (*e.g.*, reservoirs, lakes, and ponds) will be crossed by this route. Additionally, the Proposed Route will require the clearing of about 5.64 acres of forested land. Finally, Route 1 will be collocated with the Dulles Greenway (including the crossing of the Dulles Greenway) for 1.15 mile.

Route 1 was identified as the Proposed Route for four primary reasons when compared with Alternative Route 2. First, Route 1 would not impact the developable land associated with the JK Land Holdings II, LLC Southern Future Development. The short segment of the route (0.2 mile) that crosses the parcel would be located within a floodplain, which would not be developable. In addition, as discussed previously, the Company anticipates the need for a future third circuit in the right-of-way to serve the JK Land Holdings II, LLC Southern Future Development. There would be adequate space on the south side of the Dulles Greenway to expand the right-of-way of Route 1 to accommodate this additional transmission line. Alternatively, it would not be possible to expand the right-of-way of Alternative Route 2 along the north side of the Dulles Greenway without significantly impacting the developable portion of this parcel. Therefore, if Alternative Route 2 was selected, this future transmission line would need to be installed on the south side of the Dulles Greenway. The presence of transmission lines on both sides of the Dulles Greenway would create a much more significant visual impact on the surrounding area.

Second, the construction of the Proposed Route would require approximately half the amount of clearing of forested land than Alternative Route 2 (5.64 acres

[21] Note that the desktop wetland and waterbody analysis (Attachment 2.D.1 to the DEQ Supplement) includes information on Routes 3, 4, 5, and 7. The Company determined these routes were not viable due to excessive impacts identified during ERM's comparative analysis and, therefore, they are not being proposed by the Company for Commission consideration and notice.

compared with 11.12 acres). Forested land is at a premium in Loudoun County due to the amount of development in the area.

Third, the Proposed Route would maximize collocation opportunities; approximately 69 percent of the total route length would be collocated with existing infrastructure. Conversely, Alternative Route 2 only would be collocated for approximately 51 percent of the total route length.

Finally, while the Proposed Route is longer than Alternative Route 2 (by approximately 0.14 mile), the Proposed Route is less costly. The estimated conceptual cost for the transmission-related work associated with the Proposed Route is approximately $40.4 million compared with a cost of approximately $43.9 million for Alternative Route 2. The difference in costs is due to the increased expense of both the real estate crossed by the route and additional structures required for Alternative Route 2.

Therefore, based on this analysis, ERM recommends Route 1 as the Company's Proposed Route for the Project as it would reasonably minimize adverse impacts on scenic assets, historic districts, and the environment of the area concerned. Importantly, the Proposed Route is the only route that would not conflict with the development of JKLH's potential future data center campus development on the north side of the Dulles Greenway. This conforms with Attachment 1 (Guidelines for the Protection of Natural, Historic, Scenic, and Recreational Values in the Design and Location of Rights-of-Way and Transmission Facilities) to the Commission's Guidelines for Transmission Line Applications Filed under Title 56 of the Code of Virginia. Specifically, this approach is consistent with Guideline #1 of Attachment 1, which states that to the extent permitted by the property interest involved, rights-of-way should be selected with the purpose of minimizing conflict between the rights-of-way and present and prospective uses of the land on which they are to be located.

Alternative Route 2

Alternative Route 2 would construct two side-by-side overhead single circuit 230 kV lines from an alternate cut-in of existing 230 kV Line #201 to the proposed Altair Station. The estimated conceptual cost of Alternative Route 2 is approximately $43.9 million (2022 dollars).

The length of the corridor for Alternative Route 2 is approximately 1.52 miles. The route extends northwest from Line #201 for about 0.25 mile, crosses over two existing TC Energy gas pipelines in the same easement,[22] crosses Sycolin Road, and then continues northwest for another 0.75 mile, continuing to parallel the northern side of the Dulles Greenway and crossing Sycolin Creek. The route then turns to the north for approximately 0.52 mile, crossing Sycolin Creek, Shreve Mill

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

Road, Sycolin Creek in a third location, and the future Crosstrail Boulevard Extension, and terminates at the proposed Altair Station.

Alternative Route 2 crosses a total of 1.52 miles of land affecting 24.67 acres of right-of-way (including 1.77 acres for the proposed switching station). All four parcels crossed by the route are privately owned. Land use along the Alternative Route 2 right-of-way consists of 11.12 acres of forested land, 9.84 acres of open space, 2.58 acres of agricultural land, 0.88 acre of developed land, and 0.25 acre of open water. Cammack Brothers, LLC currently owns property on both the north and south sides of the Dulles Greenway. Alternative Route 2 crosses 0.93 mile of land on the north side of the Dulles Greenway owned by Cammack Brothers, LLC, which is in the process of being sold to JKLH for future development. The Company consulted with Cammack Brothers, LLC and JKLH in an attempt to identify a route that would be preferable to the current and future landowners. JKLH expressed concerns about the impacts that the route would have on the JK Land Holdings II, LLC Southern Future Development. If Alternative Route 2 were selected by the Commission, the Company would continue to coordinate with JKLH and attempt to minimize the impacts of the route on the developable portion of the parcel.

Based on ERM's desktop wetland and waterbody analysis, the right-of-way of Alternative Route 2 will encompass approximately 21 percent (5.16 acres) of land with a medium or higher probability of containing wetlands and waterbodies. Of these 5.16 acres, the majority (3.54 acres) consist of PEM wetlands. Alternative Route 2 will have five waterbody crossings; three crossings of a perennial waterbody (Sycolin Creek) and two crossings of waterbodies with intermittent flow (unnamed tributaries to Sycolin Creek). No open waterbody features (*e.g.*, reservoirs, lakes, and ponds) will be crossed by this route. Alternative Route 2 will require the clearing of about 11.12 acres of forested land. Finally, Alternative Route 2 will be collocated with the Dulles Greenway for 0.78 mile.

Alternative Route 2 represents a viable, but much less preferable alternative to the Proposed Route. With regards to environmental impacts, the Proposed Route and Alternative Route 2 would have the same number of waterbody crossings and Alternative Route 2 would have slightly less wetland impacts than the Proposed Route (5.16 acres versus 5.76 acres). Alternative Route 2 would require a significantly greater amount of forested land clearing than the Proposed Route (11.12 acres versus 5.64 acres). In addition, Alternative Route 2 would have less of an overall visual impact when compared with the Proposed Route (low impact versus medium impact). However, both routes would be visible from the Cammack Brothers, LLC's farm.

Alternative Route 2 would have a significantly greater impact on planned and potential future developments than the Proposed Route. The Company attempted to design an alignment for Alternative Route 2 that would avoid impacting the developable land associated with the JK Land Holdings II, LLC Southern Future Development. The majority of the segment of the 120-foot-wide transmission line

right-of-way for Alternative Route 2 located along the northern side of the Dulles Greenway would fit within the County required building setback in this area. However, due to the irregular nature of the parcel boundary along the Dulles Greenway, portions of the route would extend outside of the 150-foot building setback and impact the developable area for the JK Land Holdings II, LLC's Southern Future Development.

In addition, the construction of an additional single circuit transmission line on the north side of the Dulles Greenway that would be required to serve JKLH's potential future data center campus development would further, and more significantly, impact the developable area for the data center campus. Consequently, if Alternative Route 2 was selected, this future transmission line would need to be installed on the south side of the Dulles Greenway. The presence of transmission lines on both sides of the Dulles Greenway would create a much more significant visual impact on the surrounding area.

Alternatively, the construction of the Proposed Route would have no impact on planned and potential developments and only a minimal impact on existing land use. While the Proposed Route would have an impact on the Cammack Brothers, LLC's working farm, the presence of the transmission lines would not preclude the Cammack Brothers, LLC's ability to utilize the land crossed by the right-of-way for agricultural purposes. Therefore, direct impacts on the farm would be minimal and limited to the footprint of the transmission line structure foundations.

Finally, while Alternative Route 2 would be somewhat shorter in length than the Proposed Route (1.52 versus 1.66 miles), Alternative Route 2 would be the more costly of the two routes by approximately $3.5 million. This cost differential is due to increased costs for both the real estate along Alternative Route 2 and the additional structures required along portions the route. For these reasons discussed above, Alternative Route 2 represents a viable, although not preferred, alternative to Route 1.

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 new transmission lines in a manner that minimizes outage time on Line #201. Assuming construction commences around June 2023, the cut-in of the lines going to the Company's proposed Altair Station should start around July 2024. The cut-in process will require a PJM outage eDart ticket on the Belmont-Brambleton Line #201. The line cut-in should only require a 30-day outage. Assuming a final order from the Commission by May 17, 2023, as requested in Section I.H of this Appendix, the Company estimates that construction of the new Project will commence around June 2023, and be completed by September 1, 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 (up until one week prior) and, therefore, it may be subject to change. Outages for this Project have been submitted to the Company's System Operating Center.

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 several existing road corridors. Collocation numbers for the Proposed and Alternative Routes 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 Dutton & Associates on behalf of the Company is included with the Environmental Routing Study as Attachment F of the Routing Study. The Company submitted the Stage I Pre-Application Analysis to the Virginia Department of Historic Resources ("VDHR") on August 31, 2022.[23]

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.

[23] Note that the Stage I Pre-Application Analysis (Attachment 2.I.1 to the DEQ Supplement) includes information on Routes 3, 4, 5, and 7. The Company determined these routes were not viable due to excessive impacts identified during ERM's comparative analysis and, therefore, they are not being proposed by the Company for Commission consideration and notice.

II. DESCRIPTION OF THE PROPOSED PROJECT

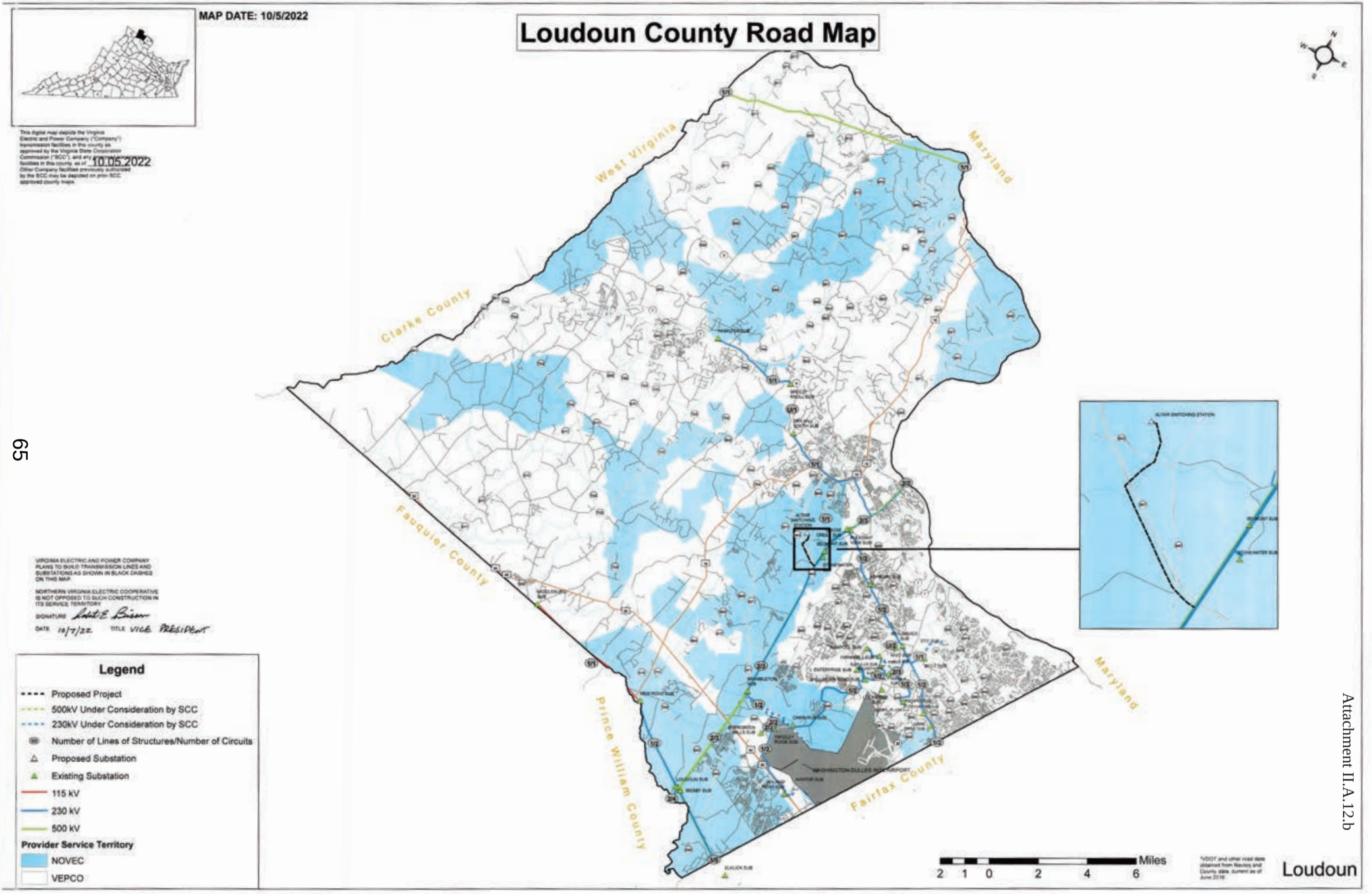
A. Right-of-way ("ROW")

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 proposed Project traverses Loudoun County for a total of approximately 1.66 miles and is located entirely within NOVEC's service territory. The Company has confirmed that NOVEC does not object to the Project.

b. An electronic copy of the Virginia Department of Transportation ("VDOT") "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.


MAP DATE: 10/5/2022
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 facilities in this county as of 10.05.2022 Other Company facilities pre-viously authorized by the SCC may be depicted on prior SCC approved county maps.
West Virginia
Maryland
Clarke County
Fauquier County
Prince William County
Fairfax County
Maryland
VIRGINIA ELECTRIC AND POWER COMPANY PLANS TO BUILD TRANSMISSION LINES AND SUBSTATIONS AS SHOWN IN BLACK DASHES ON THIS MAP.
NORTHERN VIRGINIA ELECTRIC COOPERATIVE IS NOT OPPOSED TO SUCH CONSTRUCTION IN ITS SERVICE TERRITORY
SIGNATURE
DATE 10/7/22 TITLE VICE PRESIDENT
Legend
Proposed Project
500kV Under Consideration by SCC
230kV Under Consideration by SCC
Number of Lines of Structures/Number of Circuits
Proposed Substation
Existing Substation
115 kV
230 kV
500 kV
Provider Service Territory
NOVEC
VEPCO
Miles
2 1 0 2 4 6
Loudoun

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 two proposed single circuit 230 kV lines 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 two proposed single circuit 230 kV lines will include 3-phase twin-bundled 768.2 ACSS/TW/HS conductors arranged as shown in Attachments II.B.3.i-vi. 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.

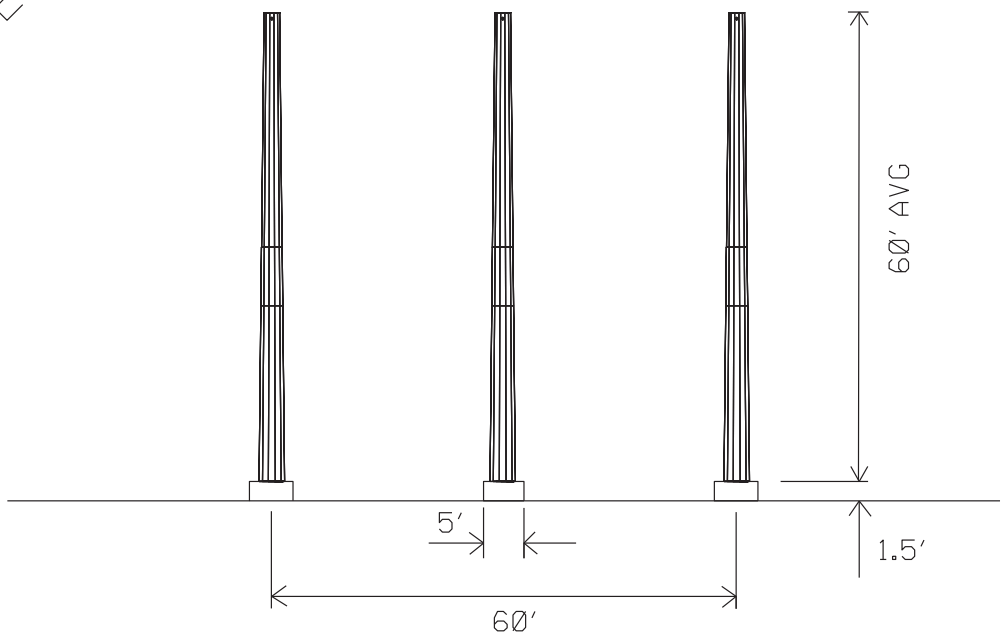
Response: See Attachments II.B.3.i through II.B.3.vi for subparts (b)-(j).[24]

See Attachment II.B.3.vii for a structure map responsive to subpart (a).

[24] *See, also, supra* n. 1-3, and n. 16.

SINGLE CIRCUIT
3-POLE STRUCTURE

PRELIMINARY



PROPOSED STRUCTURE

a. MAPPING THAT IDENTIFIES EACH PORTION OF THE PREFERRED ROUTE: SEE ATTACHMENT II.B.3.v11

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE: HORIZONTAL CONFIGURATION ALLOWS FOR SHORTER STRUCTURES TO MAINTAIN ADEQUATE CLEARANCE TO 500KV TRANSMISSION LINE AT CUT-IN POINT.

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W: 2 STRUCTURES & 0.03 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL: WEATHERING STEEL WAS SELECTED TO BLEND IN WITH WOODED AREAS.

e. FOUNDATION MATERIAL: CONCRETE.

f. AVERAGE WIDTH AT CROSSARM: N/A (NO CROSSARM)

g. AVERAGE WIDTH AT BASE: 5 FEET

h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: MAX: 60FT, MIN: 60FT, AVG: 60FT

i. AVERAGE SPAN LENGTH: 105 FEET

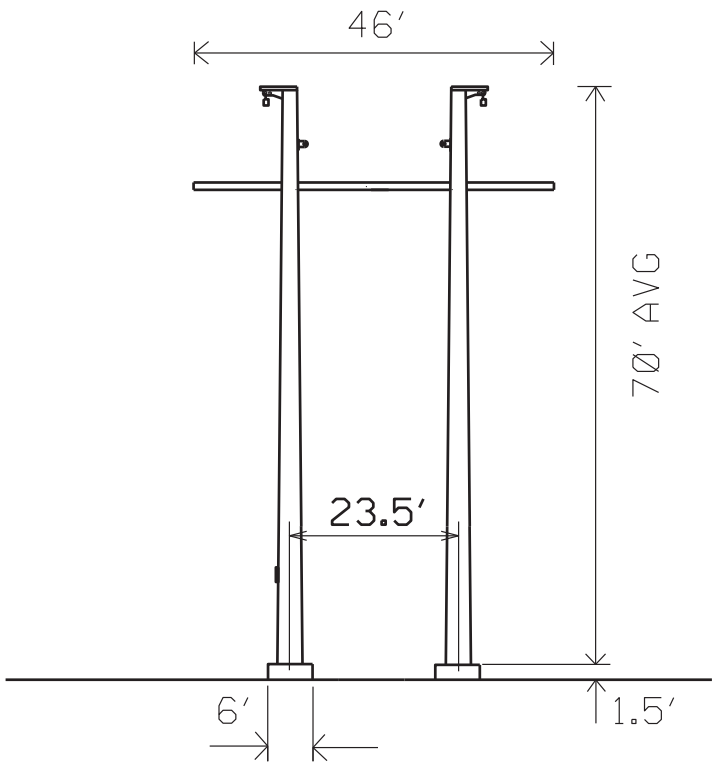
j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS: 25.5 FEET

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

$DGNSPEC$

PRELIMINARY

SINGLE CIRCUIT H-FRAME



PROPOSED STRUCTURE

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

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE:
STRUCTURE TYPE TO TRANSITION FROM HORIZONTAL TO VERTICAL CONGIRUATION AT CUT-IN POINT.

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:
2 STRUCTURES & 0.11 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:
WEATHERING STEEL WAS SELECTED TO BLEND IN WITH WOODED AREAS.

e. FOUNDATION MATERIAL: CONCRETE

f. AVERAGE WIDTH AT CROSSARM: 46 FEET

g. AVERAGE WIDTH AT BASE: 6 FEET

h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: MAX: 70FT, MIN: 70FT, AVG: 70FT

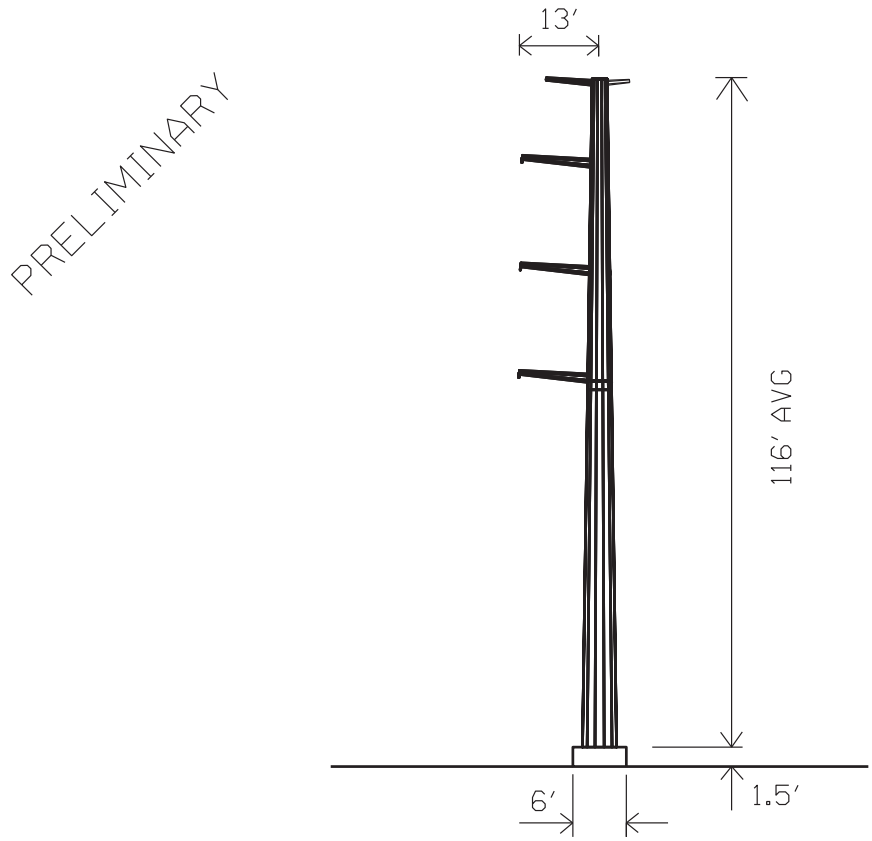
i. AVERAGE SPAN LENGTH: 309 FEET

j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS:
25.5 FEET

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

$DGNSPEC$

SINGLE CIRCUIT DEADEND MONOPOLE



PROPOSED STRUCTURE

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

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE:
MONOPOLES HAVE SMALLER FOOTPRINT COMPARED TO LATTICE TOWERS AND USE LESS ROW WIDTH COMPARED TO H-FRAMES.

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:
12 STRUCTURES & 1.60 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:
WEATHERING STEEL WAS SELECTED TO BLEND IN WITH WOODED AREAS.

e. FOUNDATION MATERIAL: CONCRETE

f. AVERAGE WIDTH AT CROSSARM: 13 FEET

g. AVERAGE WIDTH AT BASE: 6 FEET

h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: MAX: 125 FT, MIN: 100 FT, AVG: 116 FT

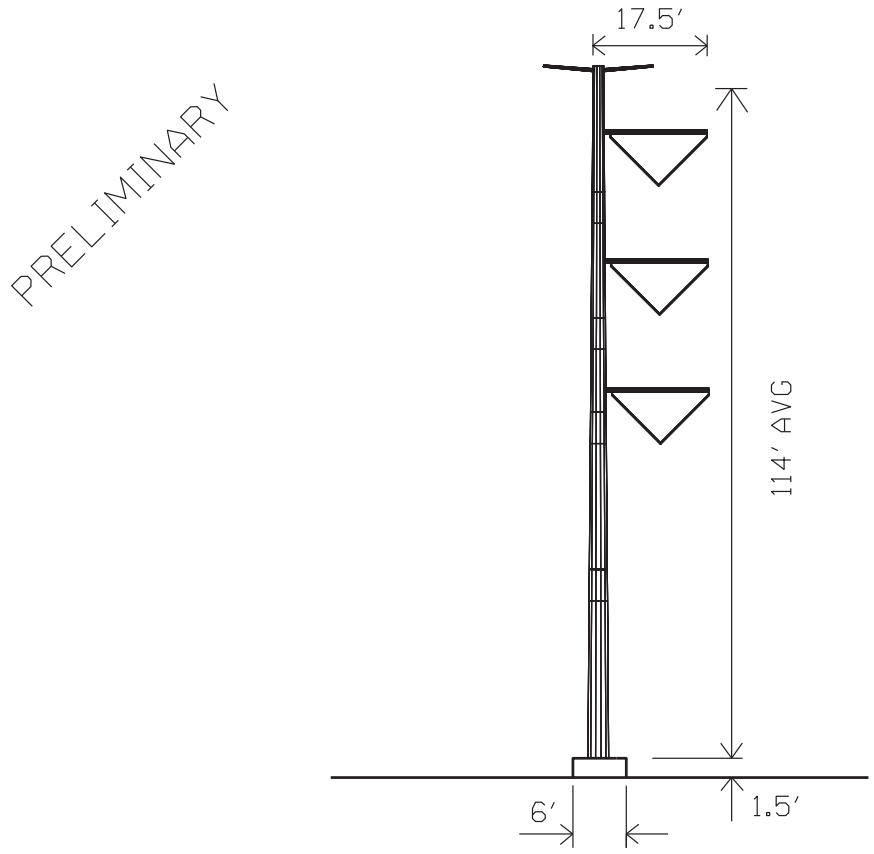
i. AVERAGE SPAN LENGTH: 705 FEET

j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS:
25.5 FEET

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

$DGNSPEC$

SINGLE CIRCUIT SUSPENSION MONOPOLE



PROPOSED STRUCTURE

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

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE:
MONOPOLES HAVE SMALLER FOOTPRINT COMPARED TO LATTICE TOWERS AND USE LESS ROW WIDTH COMPARED TO H-FRAMES.

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:
8 STRUCTURES & 0.88 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:
WEATHERING STEEL WAS SELECTED TO BLEND IN WITH WOODED AREAS.

e. FOUNDATION MATERIAL: CONCRETE

f. AVERAGE WIDTH AT CROSSARM: 17.5 FEET

g. AVERAGE WIDTH AT BASE: 6 FEET

h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: MAX: 120 FT, MIN: 110 FT, AVG: 114 FT

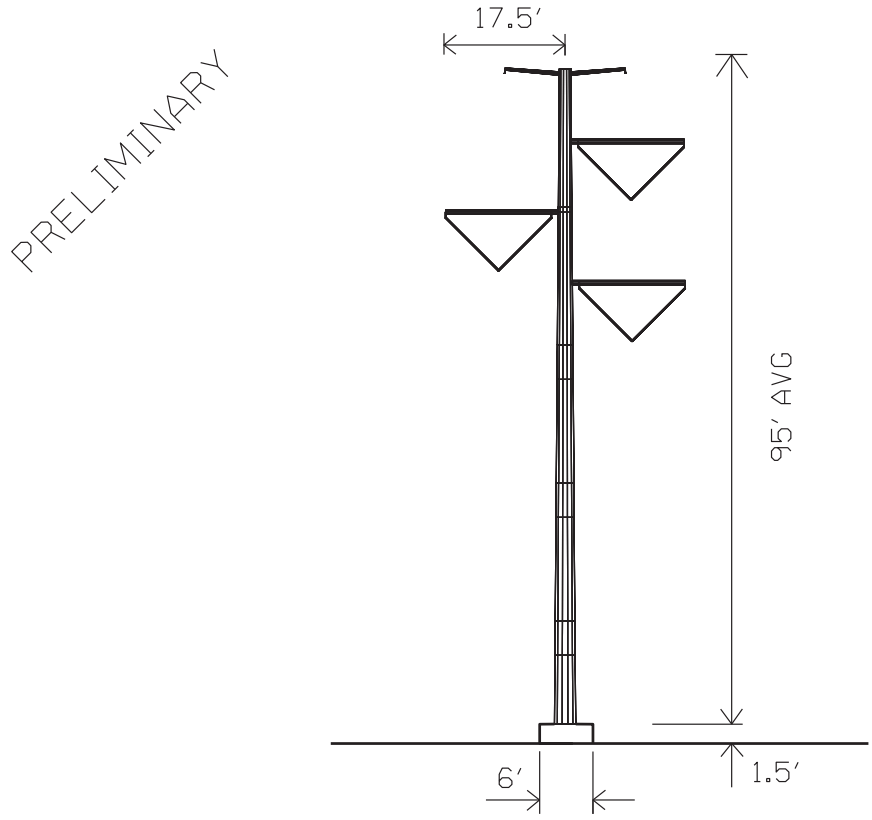
i. AVERAGE SPAN LENGTH: 580 FEET

j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS:
25.5 FEET

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

$DGNSPEC$

SINGLE CIRCUIT STAGGERED ARM MONOPOLE



PROPOSED STRUCTURE

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

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE:
STAGGERED ARM MONOPOLES ALLOW FOR SHORTER STRUCTURE HEIGHTS COMPARED TO MONOPOLES WITH ARMS ON ONE SIDE.

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:
2 STRUCTURES LOCATIONS, 0.3 MILES TOTAL

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:
WEATHERING STEEL WAS SELECTED TO BLEND IN TO WOODED AREAS.

e. FOUNDATION MATERIAL: CONCRETE

f. AVERAGE WIDTH AT CROSSARM: 17.5 FEET

g. AVERAGE WIDTH AT BASE: 6 FEET

h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: MAX: 95 FT, MIN: 95 FT, AVG: 95 FT

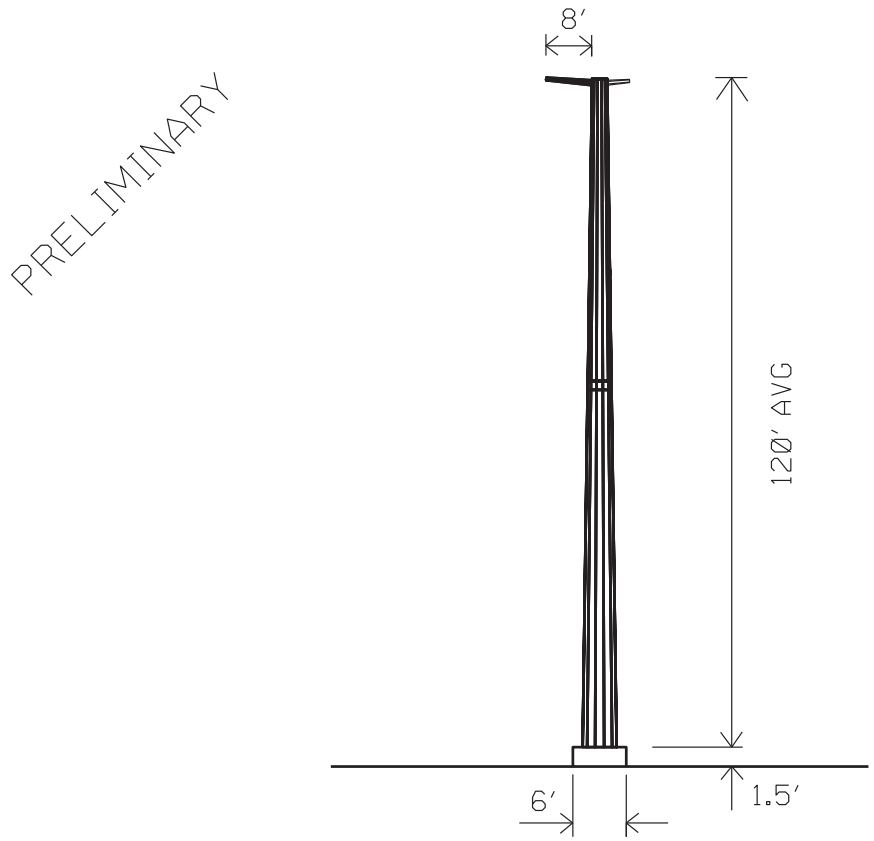
i. AVERAGE SPAN LENGTH: 695 FEET

j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS:
25.5 FEET

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

$DGNSPEC$

SINGLE CIRCUIT MONOPOLE
(NO CONDUCTOR ARMS)



PROPOSED STRUCTURE

a. MAPPING THAT IDENTIFIES EACH PORTION OF THE PREFERRED ROUTE:
SEE ATTACHMENT II.B.3.v11

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE:
MONOPOLES HAVE SMALLER FOOTPRINT COMPARED TO LATTICE TOWERS AND USE LESS ROW WIDTH COMPARED TO H-FRAMES.

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:
4 STRUCTURES & 0.42 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:
WEATHERING STEEL WAS SELECTED TO BLEND IN WITH WOODED AREAS.

e. FOUNDATION MATERIAL: CONCRETE

f. AVERAGE WIDTH AT CROSSARM: 8 FEET

g. AVERAGE WIDTH AT BASE: 6 FEET

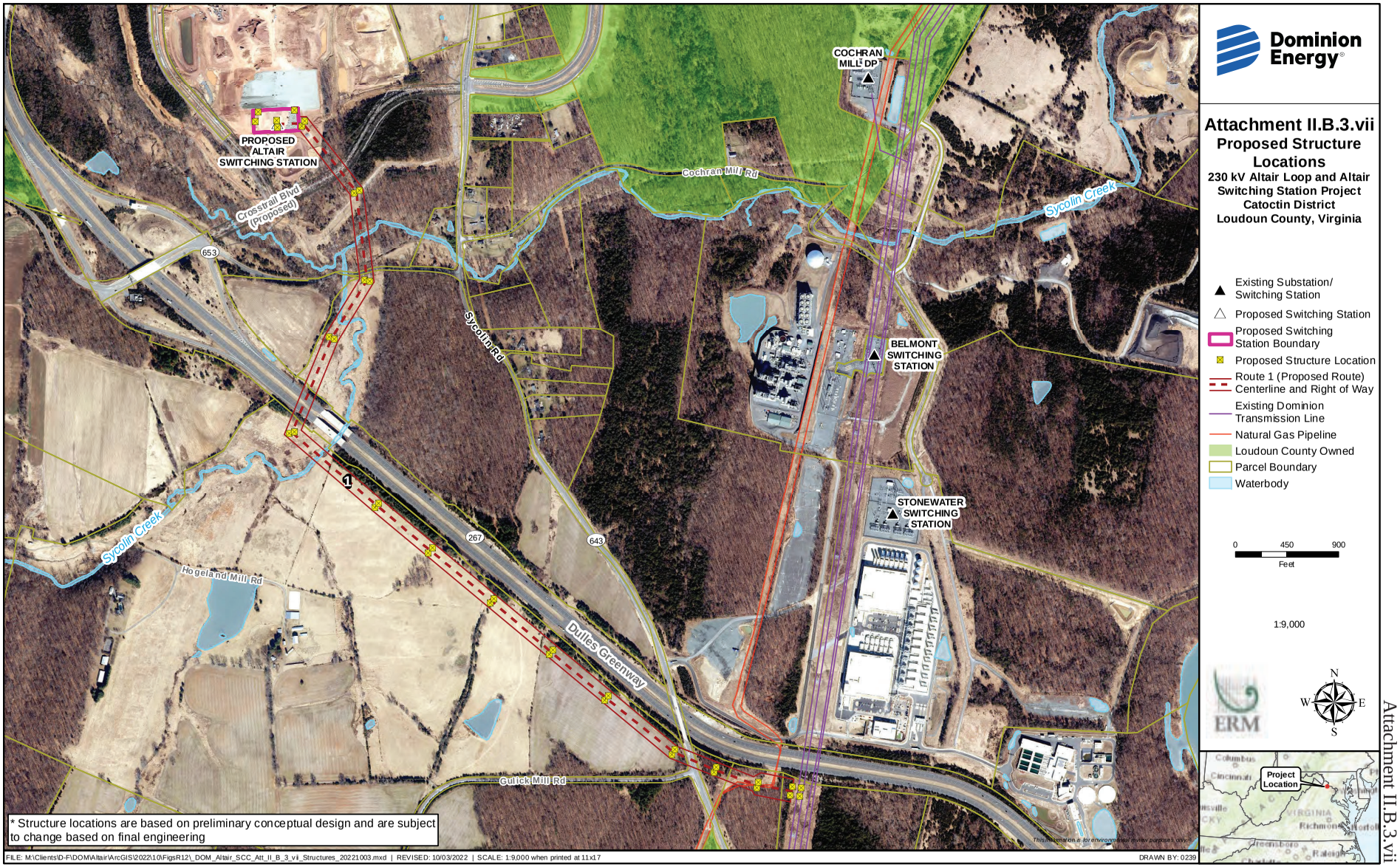
h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: MAX: 140 FT, MIN: 100 FT, AVG: 120 FT

i. AVERAGE SPAN LENGTH: 550 FEET

j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS:
25.5 FEET

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

$DGNSPEC$


PROPOSED ALTAIR SWITCHING STATION
COCHRAN MILL DP
BELMONT SWITCHING STATION
STONEWATER SWITCHING STATION
Crosstrail Blvd (Proposed)
Cochran Mill Rd
Sycolin Creek
Sycolin Rd
Hogeland Mill Rd
Dulles Greenway
Gulick Mill Rd
653
267
643
1
* Structure locations are based on preliminary conceptual design and are subject to change based on final engineering
Dominion Energy
Attachment II.B.3.vii
Proposed Structure Locations
230 kV Altair Loop and Altair Switching Station Project
Catoctin District
Loudoun County, Virginia
Existing Substation/ Switching Station
Proposed Switching Station
Proposed Switching Station Boundary
Proposed Structure Location
Route 1 (Proposed Route) Centerline and Right of Way
Existing Dominion Transmission Line
Natural Gas Pipeline
Loudoun County Owned
Parcel Boundary
Waterbody
0 450 900
Feet
1:9,000
N
W E
S
ERM
Project Location
FILE: M:\Clients\D-F\DOM\Altair\ArcGIS\2022\10\FigsR12_DOM_Altair_SCC_Att_II_B_3_vii_Structures_20221003.mxd | REVISED: 10/03/2022 | SCALE: 1:9,000 when printed at 11x17
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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, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

Route	Minimum (ft.)	Maximum (ft.)	Average (ft.)
Proposed Route (Route 1)	60	140	105
Alternative Route 2	70	125	98

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 typical existing facilities to be removed, comparable photographs or representations for proposed structures, and 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. There are no existing structures proposed for removal pursuant to the Project.

[b] See Attachment II.B.6.b.i-v for representative photographs of the proposed structures.

[c] Visual simulations showing the appearance of the proposed transmission structures at identified historic locations within 1.0 mile of the center of the right-of-way of the Proposed Route are provided. See Attachment II.B.6.c for the simulation locations, the existing views at the historic properties identified, and the simulated proposed views. These simulations were created using GIS modeling to depict whether the proposed structures will be visible from the identified historic properties. The historic properties evaluated are described below. See also the Stage I Pre-Application Analysis Report contained in Appendix G of the Environmental Routing Study.[25]

Two historic resources (053-5276 and 053-6453) that conform to the categories in VDHR's tiered study area model were identified within the review area for the Project. A description of these resources is provided in Section III.A. Table 1 below provides a summary of the impacts to these resources

Table 1: Archaeological Sites in or Adjacent to Right-of-Way of the Proposed and Alternative Routes

Location	VDHR Tier	Resource Name and VDHR #	NRHP Status	Impact
Proposed Route (Route 1)	1.0 to 1.5	None identified	Not applicable	Not applicable
	0.5 to 1.0	None identified	Not applicable	Not applicable
	0.0 to 0.5	053-5276, Sycolin General Store and Post Office	NRHP-Eligible	None
		053-6453, William Manning House	Locally Significant	None
	0.0 (within the right-of-way)	None identified	Not applicable	Not applicable

[25] *See supra*, n. 23.

Location	VDHR Tier	Resource Name and VDHR #	NRHP Status	Impact
Alternative Route 2	1.0 to 1.5	None identified	Not applicable	Not applicable
	0.5 to 1.0	None identified	Not applicable	Not applicable
	0.0 to 0.5	053-5276, Sycolin General Store and Post Office	NRHP-Eligible	None
		053-6453, William Manning House	Locally Significant	None
	0.0 (within the right-of-way)	None identified	Not applicable	Not applicable
Altair Switching Station	1.0 to 1.5	None identified	Not applicable	Not applicable
	0.5 to 1.0	None identified	Not applicable	Not applicable
	0.0 to 0.5	053-5276, Sycolin General Store and Post Office	NRHP-Eligible	None
		053-6453, William Manning House	Locally Significant	None
	0.0 (within the right-of-way	None identified	Not applicable	Not applicable

See Attachments III.B.4 and III.B.5 for visual simulations and 3-D renderings, respectively, of key locations evaluated.[26]

[26] Note that Attachments III.B.4 and III.B.5 include information on Route 3. Subsequent to the Company's preparation of the visual simulations and 3-D renderings, the Company determined this route was not viable due to excessive impacts identified during ERM's comparative analysis and, therefore, it is not being proposed by the Company for Commission consideration and notice.

Proposed Structure Type:
230 kV Single Circuit Steel Monopole (Deadend)

Attachment II.B.6.b.i

Proposed Structure Type:
230 kV Single Circuit Steel Monopole (Tangent)

Attachment II.B.6.b.ii

Proposed Structure Type:
230 kV Single Circuit Steel Monopole Staggered Arms (Tangent)

Attachment II.B.6.b.iii

Proposed Structure Type:

230 kV Single Circuit Steel 3-Pole (Deadend)

Attachment II.B.6.b.iv

Proposed Structure Type:
230 kV Single Circuit Steel H-Frame (Double Deadend)
Attachment II.B.6.b.v

Figure 5-13: Sycolin General Store and Post Office Simulation 1 – Simulation location, direction of view, and structures modeled on Routes 1 and 2. Source: GTTE, LLC

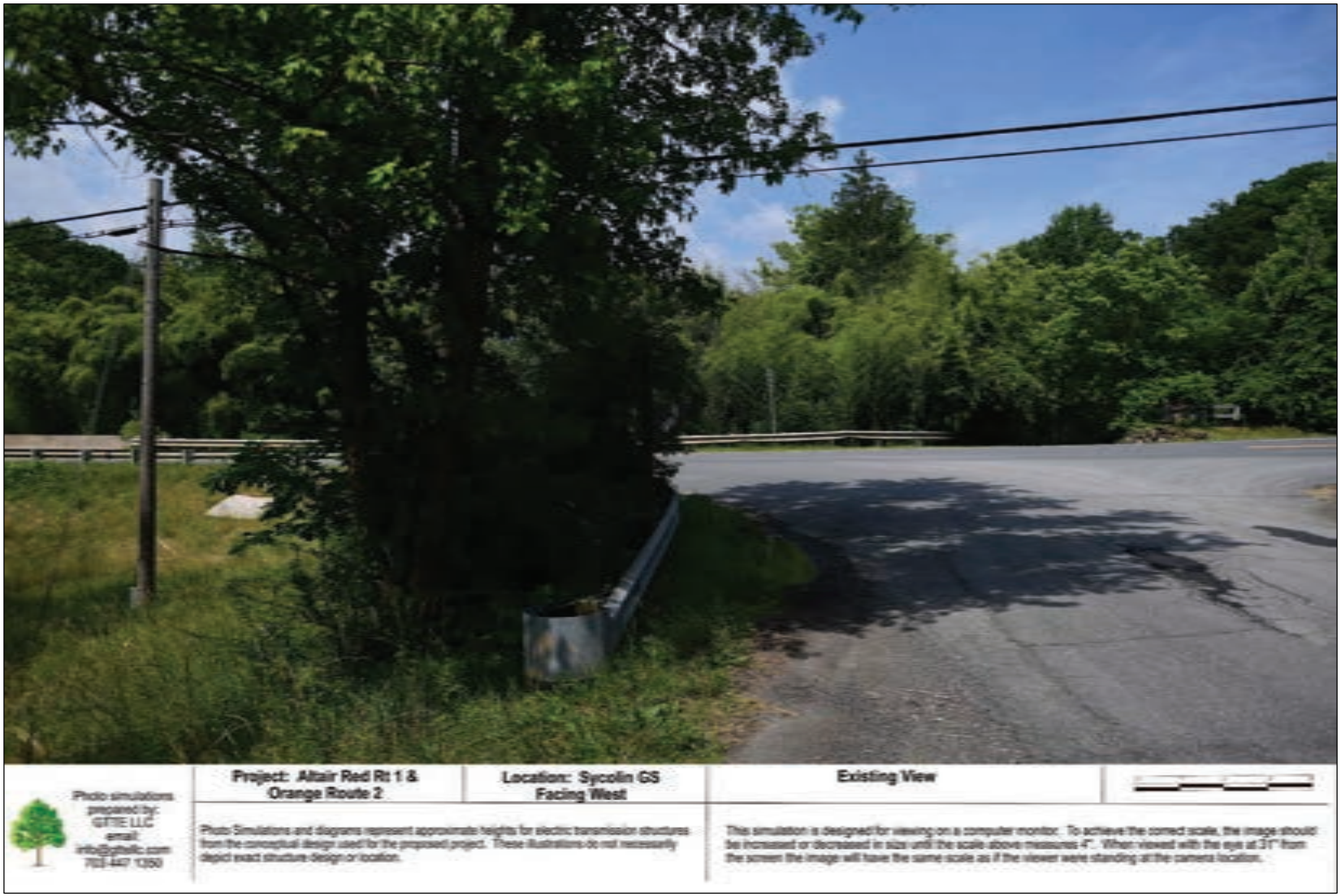


Figure 5-14: Sycolin General Store and Post Office Simulation 1 – Existing view towards Routes 1 and 2. Source: GTTE, LLC

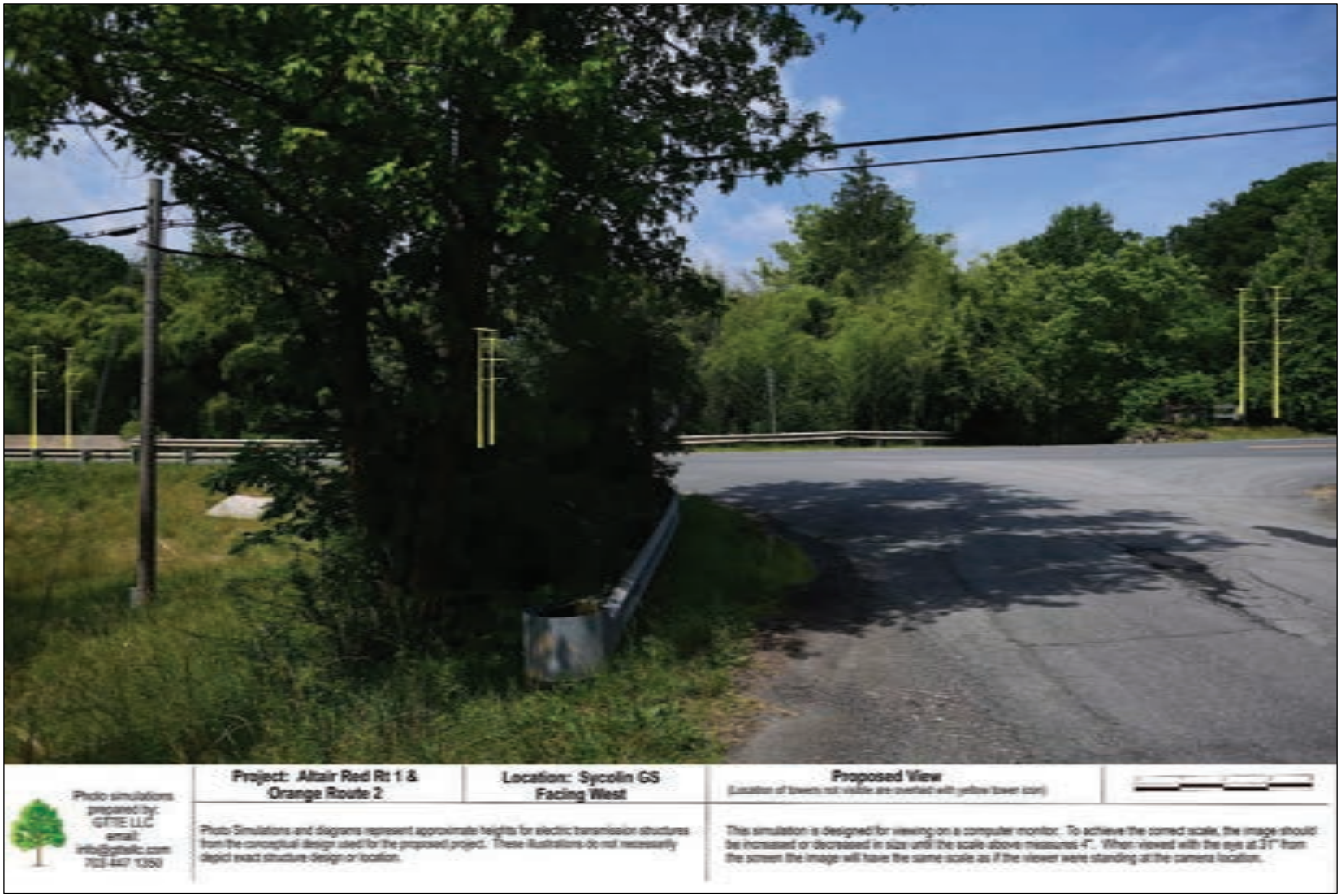


Figure 5-15: Sycolin General Store and Post Office Simulation 1 – Proposed view towards Routes 1 and 2 – (Structures not visible shown in yellow). Source: GTTE, LLC

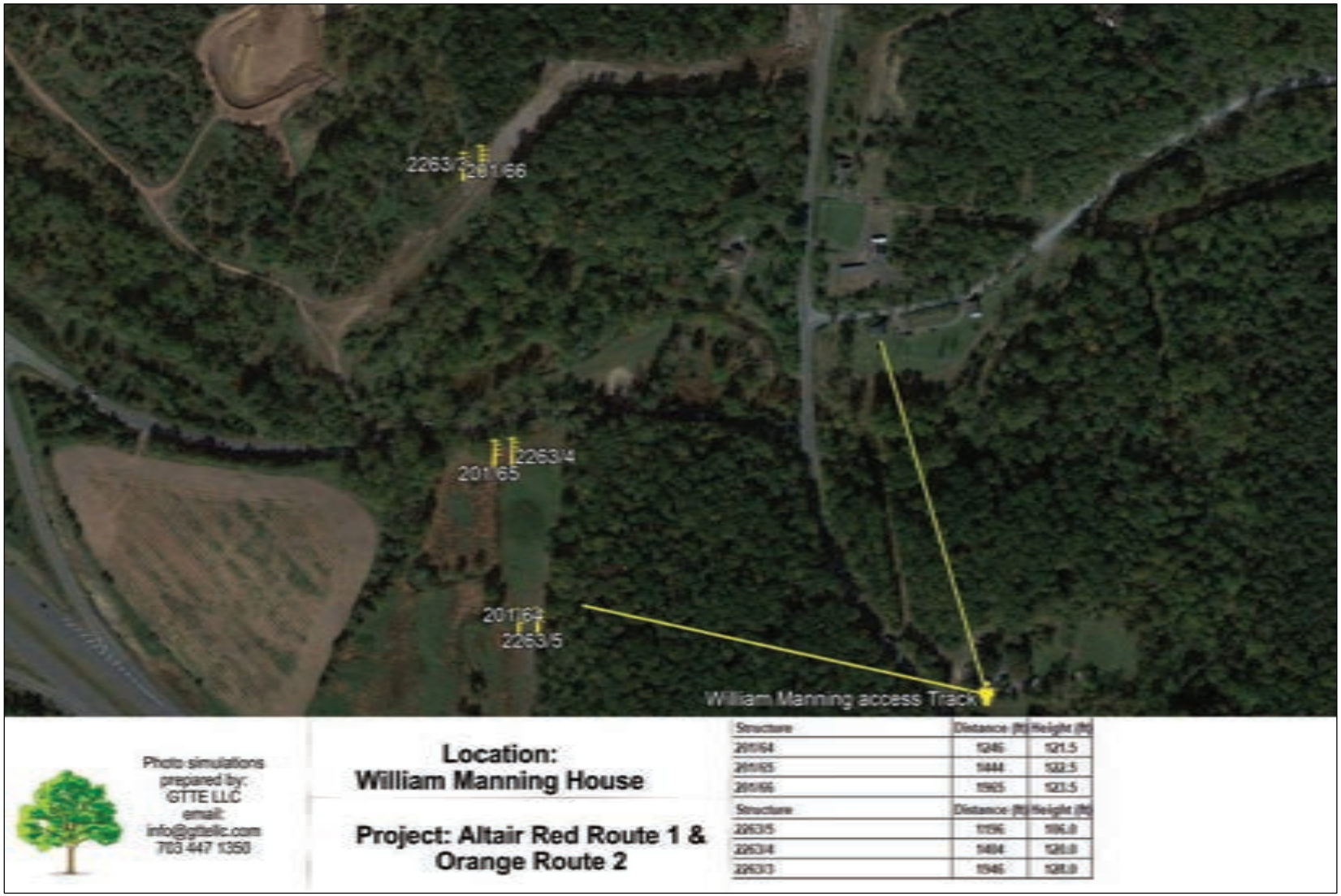


Figure 5-44: William Manning House Simulation 1 – Simulation location, direction of view, and structures modeled on Routes 1 and 2. Source: GTTE, LLC

Figure 5-45: William Manning House Simulation 1 – Existing view towards Routes 1 and 2. Source: GTTE, LLC

Figure 5-46: William Manning House Simulation 1 – Proposed view towards Routes 1 and 2 – (Structures not visible shown in yellow). Source: GTTE, LLC

II. DESCRIPTION OF THE PROPOSED PROJECT

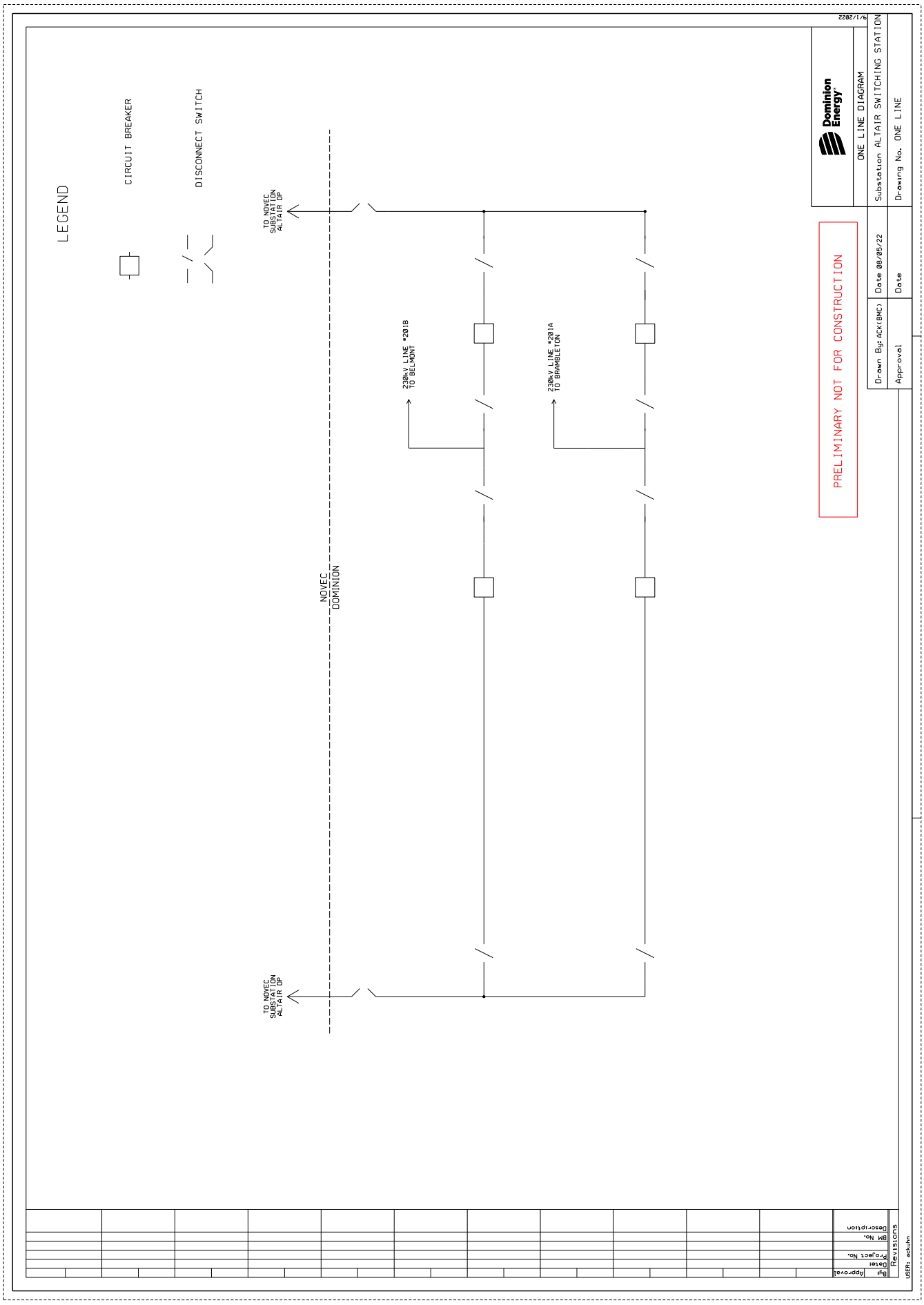
C. Describe and furnish plan drawings of all new substations, switching stations, and other ground facilities associated with the proposed project. Include size, acreage, and bus configurations. Describe substation expansion capability and plans. Provide one-line diagrams for each.

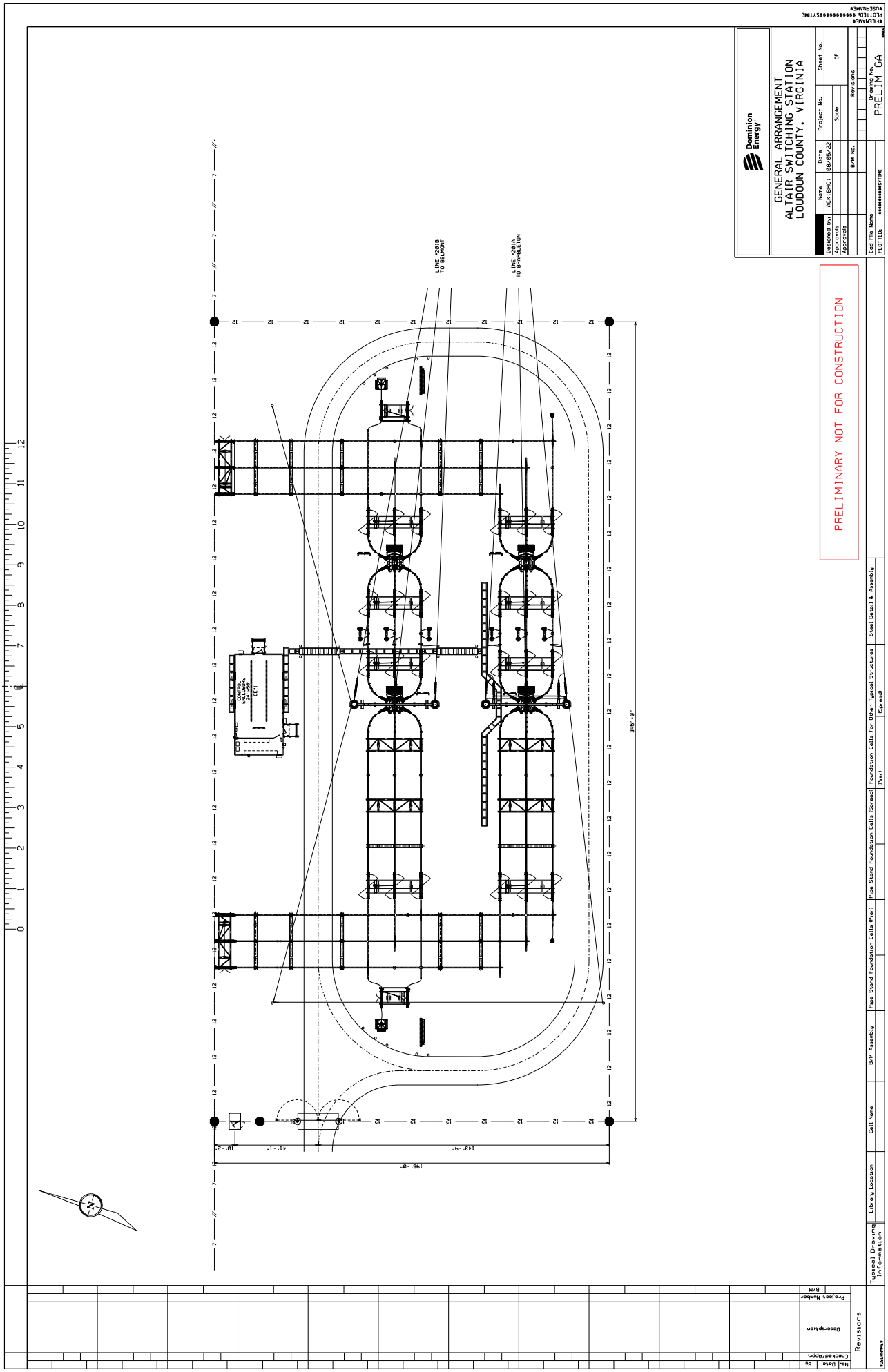
Response: The proposed Project requires the construction of the proposed 230 kV Altair Station, a new 230 kV delivery point switching station in Loudoun County, Virginia. The Company's proposed Altair Station will provide interconnection to NOVEC's future Altair DP.

The Company's proposed Altair Station will consist of a 230 kV ring bus with four breakers installed initially to terminate the cut sections of Line #201. The two remaining positions of the ring bus will provide interconnection to NOVEC's future Altair DP. The ultimate build out of the switching station will convert the ring bus into a breaker-and-a-half arrangement, providing two additional line terminal positions. The Altair Station will be constructed on an approximately 2-acre parcel.

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

Additional work will be required at Belmont Station and Brambleton Substation to remove equipment associated with the existing power line carrier communications system, bring fiber into the control enclosures, and replace Line #201 relay panels with compatible versions to those installed at Altair Station.


LEGEND
CIRCUIT BREAKER
DISCONNECT SWITCH
TO NOVEC SUBSTATION ALTAIR DP
230kV LINE #2018 TO BELMONT
230kV LINE #2014 TO BRAMBLETON
NOVEC DOMINION
TO NOVEC SUBSTATION ALTAIR DP
PRELIMINARY NOT FOR CONSTRUCTION
Dominion Energy
ONE LINE DIAGRAM
Substation ALTAIR SWITCHING STATION
Drawing No. ONE LINE
Drawn By: ACK (BMC)
Date 08/05/22
Approval
Date
Revisions
Description
BM No.
Project No.
Date
By
Approval
9/1/2022


GENERAL ARRANGEMENT
ALTAIR SWITCHING STATION
LOUDOUN COUNTY, VIRGINIA
PRELIMINARY NOT FOR CONSTRUCTION
LINE #2018
TO BELMONT
LINE #2018
TO BRAMBLETON
CONTROL ENCLOSURE 24'-0"x36'-0"
CE-1
395'-0"
143'-9"
41'-1"
10'-2"
195'-0"
N
Dominion Energy
Name
ACK (BMC)
Date
08/05/22
Designed by:
Approved:
Approved:
B/M No.
Project No.
Scale
Revisions
Sheet No.
OF
Drawing No.
PRELIM GA
Cad File Name
PLOTTED:
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
(Pier)
(Spread)
Steel Detail & Assembly
Revisions
No.
Date
By
Checked/Appr.
Description
Project Number
B/M

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 (Route 1)**

Land Use

The Proposed Route traverses approximately 1.66 miles through Loudoun County in an area that is largely characterized by agricultural land, undeveloped forested and open land for planned and potential future data center and industrial development, and VDOT rights-of-way. The area traversed by the route is surrounded by the Leesburg Executive Airport, Loudoun County owned land, agricultural land, planned industrial/commercial development, low density residential, and scattered light industrial land uses.

Dwellings

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

Farmland/Forest

A review of Natural Resources Conservation Service Data ("NRCS") soils data indicates that approximately 2.49 acres of the area of disturbance of the Proposed Route are classified as prime farmland and 15.61 acres are classified as farmland of statewide importance. According to a review of recent 2021 aerial photography, an approximately 0.9-mile segment of the route crosses land being used for agricultural purposes. About 5.64 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 crosses Sycolin Creek (a perennial waterbody) in three locations and two unnamed tributaries to Sycolin Creek. Approximately 3.33 acres of emergent wetlands, 1.91 acres of forested wetlands, and 0.52 acre of

riverine wetlands occur within the right-of-way of the Proposed Route. No wetlands are present within the area of disturbance of the Altair Station.

Historic Features

A review of the VDHR Virginia Cultural Resource Information System ("VCRIS") indicates that six previously recorded archaeological sites fall within or adjacent to the right-of-way for the Proposed Route and the Altair Switching Station (see Table 1 below). Because a formal archaeological survey has not been conducted as part of this Project, impacts to these sites have not yet been determined. The clearing of the right-of-way during the construction of the transmission lines and the installation of the transmission line structures could impact the cultural deposits associated with these sites. Many of the sites have not been evaluated for inclusion in the NRHP. A formal evaluation of these sites would be required as a part of an archaeological survey to determine their eligibility. This would be followed by an assessment of the Project's impacts on any site recommended eligible for listing in the NRHP if the site cannot be avoided. One site, 44LD0413, is recommended not eligible for inclusion in the NRHP, and no further consideration of this site is anticipated. The remaining five sites have not been evaluated for inclusion in the NRHP. Further studies would be needed to determine the Project's impact on these sites.

Table 1: Previously Recorded Archaeological Sites in or Adjacent to Right-of-Way for the Proposed Route and Altair Switching Station

Location	Site Number	Description	NRHP Status
Proposed Route (Route 1)	44LD0199	Camp, temporary, Late Woodland (1000-1606)	Not Evaluated
	44LD0413	Lithic scatter, Mill, Pre-Contact, Contact Period (1607 - 1750), Colony to Nation (1751 - 1789), Early National Period (1790 - 1829), Antebellum Period (1830 - 1860), Civil War (1861 - 1865), Reconstruction and Growth (1866 - 1916), World War I to World War II (1917 - 1945)	VDHR Evaluation Committee: Not Eligible
	44LD0465	Historic/Unknown	Not Evaluated
	44LD1411	Trash scatter, Historic/Unknown	Not Evaluated
	44LD1964	Artifact scatter, Antebellum Period (1830 - 1860), Civil War (1861 - 1865), Reconstruction and Growth (1866 - 1916), World War I to World War II (1917 - 1945)	Not Evaluated
Altair Switching Station	44LD0389	Prehistoric/Unknown (15000 B.C.-1606 A.D.)	Not Evaluated

Two historic resources that conform to the categories in VDHR's tiered study area model were identified for the Proposed Route (see Table 2 below): Sycolin General Store and Post Office (053-5276) and the William Manning House (053-6453). The

Sycolin General Store and Post Office (053-5276) was built in 1881 by Thomas D. Moffett. In 1885, the building began service as a post office for Sycolin. By that time, the community of Lower Sycolin had emerged as a thriving African American community, although it was also inhabited by some white residents, such as Thomas Moffett and his wife. The post office operated until 1905 when Leesburg's Rural Free Delivery began serving both Lower and Upper Sycolin, although the general store remained open until 1944. In 2014, VDHR determined the resource to be potentially eligible for listing in the NRHP under Criterion A for its historic role as a rural general store. The Proposed Route is anticipated to have no impact to the resource. The route would be located at a slightly lower elevation than the resource and views of the transmission lines would be screened by the intervening topography and vegetation.

The William Manning House (053-6453) is a small dwelling believed to have been built circa 1880 by William Manning, a prominent member of the Lower Sycolin African American community around the turn of the twentieth century. During the late-nineteenth century, Manning was integral to the formation of the nearby Union Church for which he served as a trustee. Manning was a carpenter by trade and is believed to have been responsible for the construction of the church, as well as most of the homes in the community, including 053-5276, built prior to his passing in 1902. The small building at this site is of log construction, which Manning is known to have employed as evidenced by land records and an order for another home nearby nearly identical in design. Although the building at 053-6453 has been altered and enlarged over time, the original log core remains intact. The resource has not been formally evaluated for NRHP eligibility by the VDHR. However, it was noted by Loudoun County as significant for its association to Manning and the African American community of Lower Sycolin during a locally reviewed development project in 2020. The resource will be demolished due to the construction of the Sycolin Road Distribution Facility. The Proposed Route is anticipated to have no impact to the resource. The route would be located at a slightly lower elevation than the resource and views of the transmission lines would be screened by the intervening topography and vegetation.

The same two previously recorded architectural resources described above fall within the VDHR study tiers for the Altair Switching Station. Construction and operation of the new facilities associated with this route would have no impact on resource 053-5276 or resource 053-6453. The proposed Altair Switching Station is located to the northwest of the Sycolin General Store and Post Office (053-5276) property, roughly 0.33 mile away at its nearest point. The proposed Altair Switching Station is located to the northwest of the William Manning House (053-6453) property, roughly 0.5 mile away at its nearest point. The landscape between these properties and the Altair Station site is densely wooded with an elevated ridge extending through it. Therefore, it is anticipated that the terrain and vegetation would completely inhibit views of the Altair Station from these properties.

Table 2: Previously Recorded Historic Resources in VDHR Tier for the Proposed Route

Location	VDHR Tier	Resource Name and VDHR #	NRHP Status	Impact
Proposed Route (Route 1)	1.0 to 1.5	None identified	Not applicable	Not applicable
	0.5 to 1.0	None identified	Not applicable	Not applicable
	0.0 to 0.5	053-5276, Sycolin General Store and Post Office	NRHP-Eligible	None
		053-6453, William Manning House	Locally Significant	None
	0.0 (within the right-of-way)	None identified	Not applicable	Not applicable

Wildlife

The U.S. Fish and Wildlife Service Information for Planning and Consultation IPaC database query identified two federally listed species, Northern long-eared bat (*Myotis septentrionalis*) and Dwarf wedgemussel (*Alasmidonta heterodon*), that may potentially occur within the Project area; however, neither have confirmed occurrences. The Virginia Department of Conservation and Recreation ("DCR") and Virginia Department of Wildlife Resources ("DWR") database queries identified 12 state-listed species (which includes the two federally listed species previously mentioned) and one additional federally listed species (Yellow lance [*Elliptio lanceolate*]) that have the potential to occur within 2 miles of the geographic center of the natural resources Project area. The nine state only listed species include: Little brown bat (*Myotis lucifugus*), Tri-colored bat (*Perimyotis subflavus*), Brook floater *(Alasmidonta varicosa*), Green floater (*Lasmigona subviridis*), Wood turtle (*Glyptemys insculpta*), Henslow's sparrow (*Ammodramus henslowii*), Loggerhead shrike (*Lanius ludovicianus*), Migrant Loggerhead shrike, (*Lanius ludovicianus migrans*), and Peregrine falcon (*Falco peregrinus*).

Of the 12 species identified, only the Green floater has been historically documented by state agencies in areas within 2 miles of the Project area.

Based on landscape and vegetation within the Project area, both the Proposed and Alternative Routes cross 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 (Route 1) and Alternative Route 2, these habitat types each could have potential to provide suitable habitat for one or more of the species listed above.

No instream work will be performed for the Project. Dominion Energy Virginia will coordinate with state and federal agencies as needed to determine if any surveys, construction-timing windows, or other mitigation would be required for the Project.

Alternative Route 2

Land Use

Alternative Route 2 traverses approximately 1.52 miles through Loudoun County in an area that is largely characterized by forested land, existing industrial development, undeveloped open space, forested areas planned for data center and industrial development, and VDOT rights-of-way. The area traversed by the route is surrounded by the Leesburg Executive Airport, Loudoun County owned land, agricultural land, planned industrial/commercial development, low density residential, and scattered light industrial land uses.

Dwellings

According to the Loudoun County GIS parcel and zoning data and aerial photo analysis, there are no dwellings located within 500 feet, 250 feet, or 100 feet or within the right-of-way of Alternative Route 2.

Farmland/Forest

A review of NRCS soils data indicates that approximately 3.14 acres of the area of disturbance of Alternative Route 2 are classified as prime farmland and 12.77 acres are classified as farmland of statewide importance. According to a review of recent 2021 aerial photography, a portion of an approximately 0.3-mile segment of the right-of-way crosses land being used for agricultural purposes. About 11.12 acres of existing forestland will be impacted by the construction of Alternative Route 2. 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), Alternative Route 2 crosses Sycolin Creek (a perennial waterbody) in three locations and two unnamed tributaries to Sycolin Creek. Approximately 3.54 acres of emergent wetlands, 1.18 acres of forested wetlands, and 0.44 acre of riverine wetlands occur within the right-of-way of Alternative Route 2. No wetlands are present within the area of disturbance of the Altair Station.

Historic Features

A review of the VDHR VCRIS indicates that five previously recorded archaeological sites fall within or adjacent to the right-of-way for Alternative Route 2 and the Altair Switching Station (see Table 3 below). Because a formal archaeological survey has not been conducted as part of this Project, the potential impacts of the Project on these archaeological sites have not yet been fully

determined. The clearing of the right-of-way during the construction of the transmission lines and the installation of the transmission line structures could impact the cultural deposits associated with the archaeological sites crossed by the route. Many of the sites have not been evaluated for inclusion in the NRHP. A formal evaluation of these sites would be required as a part of an archaeological survey to determine their eligibility for listing in the NRHP. This would be followed by an assessment of the Project's impacts on any site recommended eligible for listing in the NRHP if the site could not be avoided. One site, 44LD0413, is recommended not eligible for inclusion in the NRHP, and no further consideration of this site is anticipated. The remaining four sites have not been evaluated for inclusion in the NRHP. Further studies would be needed to determine the Project's impact on these sites.

Table 3: Previously Recorded Archaeological Sites in or Adjacent to Right-of-Way for Alternative Route 2 and Altair Switching Station

Location	Site Number	Description	NRHP Status
Alternative Route 2	44LD0199	Camp, temporary, Late Woodland (1000-1606)	Not Evaluated
	44LD0413	Lithic scatter, Mill, Pre-Contact, Contact Period (1607 - 1750), Colony to Nation (1751 - 1789), Early National Period (1790 - 1829), Antebellum Period (1830 - 1860), Civil War (1861 - 1865), Reconstruction and Growth (1866 - 1916), World War I to World War II (1917 - 1945)	VDHR Evaluation Committee: Not Eligible
	44LD0466	Prehistoric/Unknown (15000 B.C. - 1606 A.D.)	Not Evaluated
	44LD1964	Artifact scatter, Antebellum Period (1830 - 1860), Civil War (1861 - 1865), Reconstruction and Growth (1866 - 1916), World War I to World War II (1917 - 1945)	Not Evaluated
Altair Switching Station	44LD0389	Prehistoric/Unknown (15000 B.C.-1606 A.D.)	Not Evaluated

Two historic resources that conform to the categories in VDHR's tiered study area model were identified for Alternative Route 2: the Sycolin General Store and Post Office (053-5276) and the William Manning House (053-6453) (see Table 4 below). Descriptions of these resources can be found in the section above for the Proposed Route (Route 1). Alternative Route 2 is anticipated to have no impact to the Sycolin General Store and Post Office or the William Manning House. The route would be located at a slightly lower elevation than the resources and views of the transmission lines would be screened by the intervening topography and vegetation.

See discussion of the Proposed Route (Route 1) above for impacts associated with the Altair Switching Station.

Table 4: Previously Recorded Historic Resources in VDHR Tiers for Alternative Route 2

Location	VDHR Tier	Resource Name and VDHR #	NRHP Status	Impact
Alternative Route 2	1.0 to 1.5	None identified	Not applicable	Not applicable
	0.5 to 1.0	None identified	Not applicable	Not applicable
	0.0 to 0.5	053-5276, Sycolin General Store and Post Office	NRHP-Eligible	None
		053-6453, William Manning House	Locally Significant	None
	0.0 (within the right-of-way)	None identified	Not applicable	Not applicable

Wildlife

Impacts on wildlife would be the same for the Alternative Route 2 as those for the Proposed Route discussed above.

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Dominion Energy®

Attachment III.A.1
NRCS Farmland Classification
230 kV Altair Loop and Altair Switching Station Project
Catoctin District
Loudoun County, Virginia

- Existing Substation/ Switching Station
- Proposed Switching Station
- Proposed Switching Station Boundary
- Route 1 (Proposed Route) Centerline and Right of Way
- Alternative Route 2 Centerline and Right of Way
- Existing Dominion Transmission Line
- Natural Gas Pipeline
- Parcel Boundary
- Waterbody

NRCS Farmland Classification

- Farmland of statewide importance
- All areas are prime farmland
- Prime farmland if mitigated
- Not prime farmland

0 450 900
Feet

1:9,000

ERM

N W E S

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 February 2022, the Company launched an internet website dedicated to the proposed Project: www.dominionenergy.com/Altair. The website includes a description and benefits of the proposed Project, an explanation of need, route map, photo simulations, and information on the Commission review process.

On May 25, 2022, the Company sent Project announcement postcards to 20 property owners within 1,000 feet of the line. Each postcard included information about the proposed Project, an overview map, and an invitation to the virtual open house. The postcard provided a brief overview of the respective proposed Project. A copy of the postcard is included as Attachment III.B.1.[27]

Newspaper print advertisements regarding the Project and virtual open house were placed in Loudoun Now on May 26, 2022, and The Loudoun Times on May 27, 2022. A copy of the advertisement placed in the Loudoun newspapers is included as Attachment III.B.2.

In addition, digital advertisements for the virtual open house targeted residents in the Loudoun County area surrounding the Project. These paid digital and social media campaigns were also used to drive awareness of the Company's Project and the virtual community meeting to educate the public. 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/altair website to learn more about the meeting and to participate virtually.

The Project pre-event campaigns ran from May 25, 2022, through June 2, 2022. The campaigns targeted audiences around Leesburg and Loudoun County, Virginia.

Pre-event digital ads generated 2,094,001 impressions and 9,674 link clicks. There were 62,953 video views with an average 10% Video Completion Rate and the digital ads had a 0.65% Click Thru Rate.

Post-event digital ads generated 257,404 impressions and 832 link clicks. There were 23,292 video views with an average 5.6% Video Completion Rate and the digital ads had a 0.71% Click Thru Rate.

[27] Note that Attachment III.B.1 includes information on Route 3. Subsequent to sending the postcard, the Company determined this route was not viable due to excessive impacts identified during ERM's comparative analysis and, therefore, it is not being proposed by the Company for Commission consideration and notice.

One virtual community meeting was held on June 2, 2022, from 5 to 6 p.m. At the virtual open house, the Company made available details about construction, project timing, and the Commission approval process.[28] 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.[29] The Company developed additional 3-D renderings after the open house based on feedback from property owners, which are included as Attachment III.B.5.[30]

As part of preparing for the Project, the Company researched the demographics of the surrounding communities using the Environmental Protection Agency's Environmental Justice ("EJ") mapping and screening tool, EJScreen 2.0, and census data from the U.S. Census Bureau 2015-2019 American Community Survey. This information revealed five Census Block Groups ("CBGs") are within the Project area and fall within one mile of the routing options. A review of census data for several demographic characteristics identified populations within the Project study area that meet the Virginia Environmental Justice Act-defined categories and thresholds for Environmental Justice Communities ("EJ Communities") (Va. Code § 2.2-234, 2.2-235).

Communities of color have been identified in five CBGs within the Project study area. None of the CBGs within the Project study area appear to be low income or have a significant percentage of households with language barriers.

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 and others affected by the Project 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.6 for a copy of the Company's Environmental Justice Policy.

[28] At the time of the open house, the Company was still considering Route 3. Subsequently, the Company determined this route was not viable due to excessive impacts identified during ERM's comparative analysis and, therefore, it is not being proposed by the Company for Commission consideration and notice.

[29] *See supra*, n. 26.

[30] *See supra*, n. 26.

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 Substation and Power Line Project Information

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

Altair 230 kV Electric Transmission Project — Virtual Community Meeting

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 are currently preparing to build a new substation — Altair Substation — at the southern end of Leesburg Airport near the intersection of Sycolin Road. We are also planning to build a new electric transmission line connecting our existing transmission corridor to the new Altair Substation. We would like to invite you to attend a virtual community meeting to learn more about the project and its impact on your community.

AT DOMINION ENERGY, protecting the grid and making it secure against natural and man-made acts is a top priority. We work alongside government officials to prepare for potential incidents that could affect our ability to provide electricity safely and reliably to the communities we serve. Learn how we're keeping you safe at powerlines101.dominionenergy.com.

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Rapid growth in electrical demand, particularly in the commercial/high-tech sector of Loudoun County has resulted in the need for new transmission infrastructure. This project will help Dominion Energy continue to maintain a strong and reliable electric grid for all customers in the region.

While only one route is needed, we are currently studying three proposed routes for this project. The routes are estimated to be 1.5 miles long and if approved would connect transmission lines in an existing right of way parallel to Dulles Greenway or Sycolin Road to the new substation.

The project will include the installation of new monopole and H-frame structures.

Please know that we are dedicated to working safely and courteously in your community and we will continue to keep you updated on our progress.

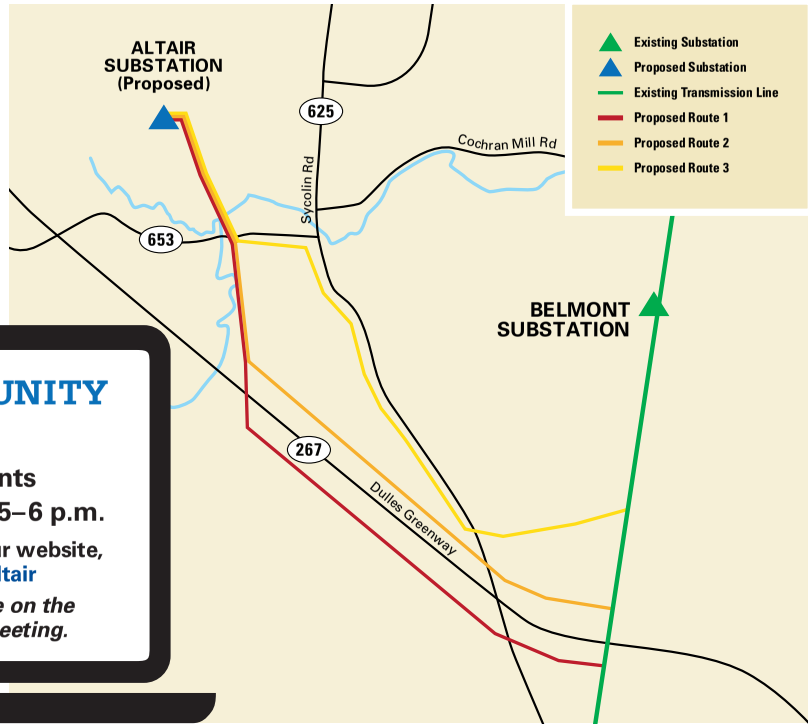
VIRTUAL COMMUNITY MEETING

Live Via Webex Events

Thursday, June 2, 2022 • 5–6 p.m.

Join the meeting by visiting our website, DominionEnergy.com/altair

A recording will be available on the project website after the meeting.



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

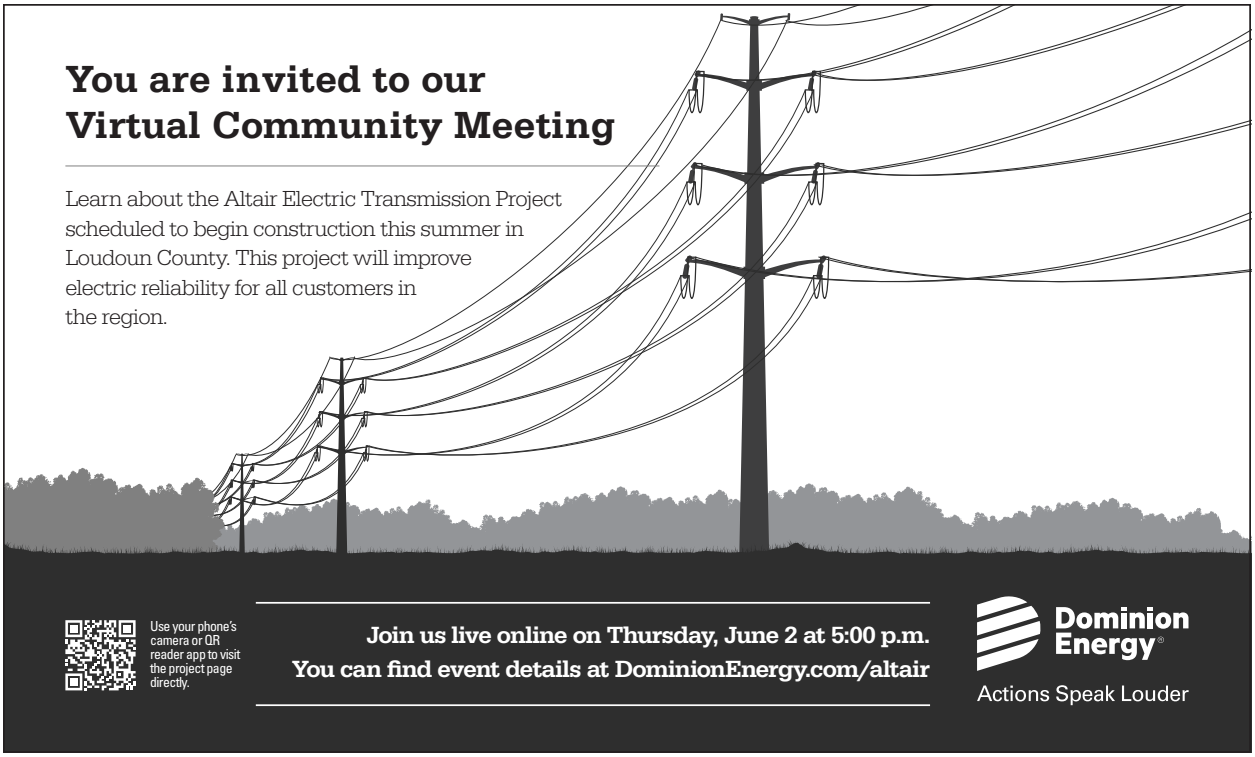
CONTACT US

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

charles ryan associates

Dominion Energy
Electric Transmission

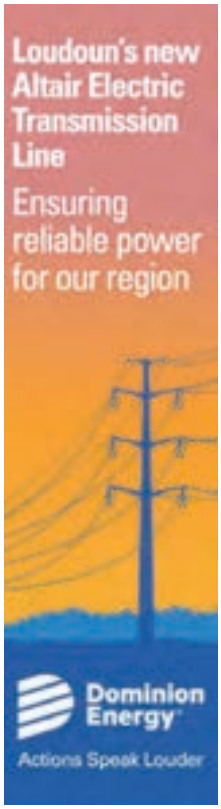
Altair Pre Event
Newspaper



charles ryan associates

Dominion Energy
Electric Transmission

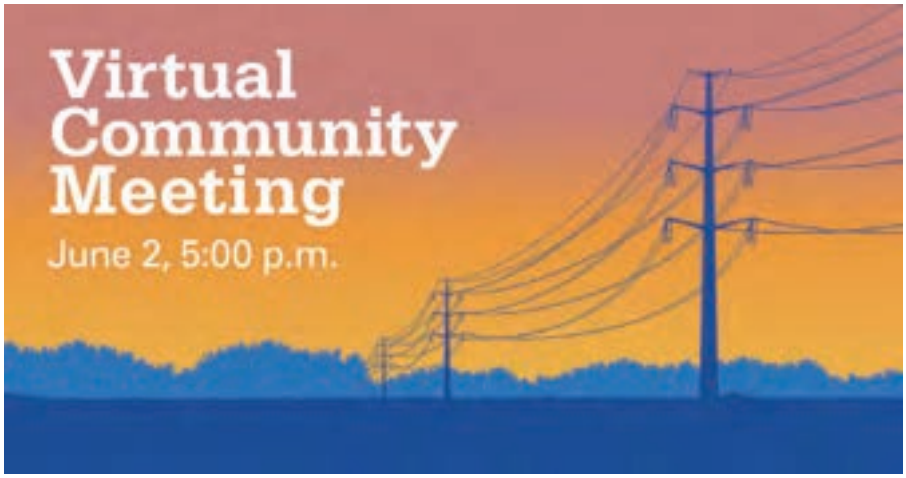
Altair Awareness Display



Dominion Energy Electric Transmission

Altair Nextdoor Imagery

Event Post Image:



Awareness Post Image:

Dominion Energy Electric Transmission

Altair Pre Event Social Videos

Pre-Event Video

Post-Event Video


ALTAIR
Substation and 230 kV
Transmission Project
Energy Park Rd
Sycolin Rd
Sycolin Rd
Route 3
Route 2
Route 1
Sycolin Rd
Proposed ALTAIR
Substation
267
Shreve Mill Rd
Dominion
Energy
N
Viewpoint Locations
This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.


ALTAIR
Substation and 230 kV
Transmission Project
ROUTE 1
Energy Park Rd
Sycolin Rd
Sycolin Rd
Route 1
Sycolin Rd
1
2
3
4
5
Proposed ALTAIR
Substation
267
Shreve Mill Rd
N
Dominion
Energy®
Viewpoint Locations
This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.


ALTAIR
Substation and 230 kV
Transmission Project
ROUTE 2
Energy Park Rd
Sycolin Rd
Sycolin Rd
Route 2
Sycolin Rd
Proposed ALTAIR
Substation
267
Shreve Mill Rd
1
2
3
4
5
N
Dominion
Energy®
Viewpoint Locations
This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.


ALTAIR
Substation and 230 kV
Transmission Project
ROUTE 3
Energy Park Rd
Sycolin Rd
Route 3
Sycolin Rd
Sycolin Rd
1
2
3
4
5
267
Shreve Mill Rd
Proposed ALTAIR
Substation
Dominion
Energy
N
Viewpoint Locations
This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

ALTAIR
Substation and 230 kV Transmission Project

Viewpoint 1

Date: 2/10/22 Time: 12:54 pm
Direction: South

Route 3

Existing Conditions

Proposed Conditions

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

ALTAIR
Substation and 230 kV Transmission Project

Viewpoint 2

Date: 2/10/22 Time: 2:45 pm
Direction: North

Route 1

Existing Conditions

Proposed Conditions

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

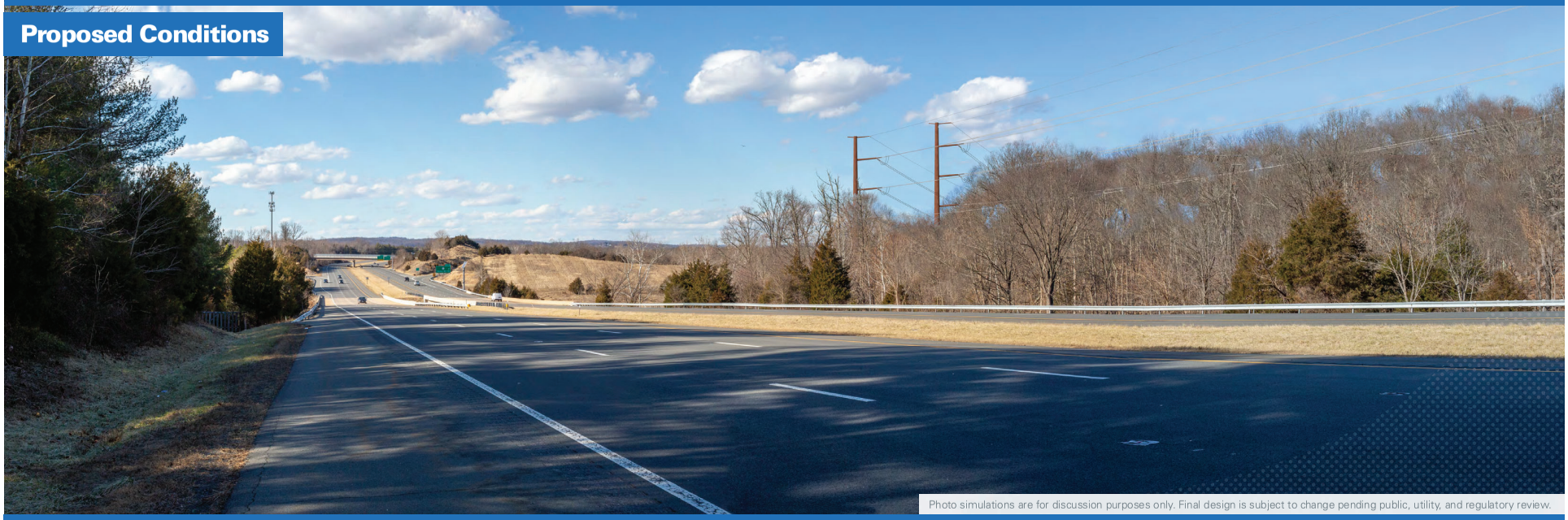
ALTAIR
Substation and 230 kV Transmission Project

Viewpoint 2

Date: 2/10/22 Time: 2:45 pm
Direction: North

Route 2

Existing Conditions



Proposed Conditions

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

ALTAIR
Substation and 230 kV Transmission Project

Viewpoint 3

Date: 2/10/22 Time: 11:05 am
Direction: Northwest

Route 1

Existing Conditions

Proposed Conditions

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

ALTAIR
Substation and 230 kV Transmission Project

Viewpoint 3

Date: 2/10/22 Time: 11:05 am
Direction: Northwest

Route 2

Existing Conditions

Proposed Conditions

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

ALTAIR
Substation and 230 kV Transmission Project

Viewpoint 3

Date: 2/10/22 Time: 11:05 am
Direction: Northwest

Route 3

Existing Conditions

Proposed Conditions

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

ALTAIR
Substation and 230 kV Transmission Project

Viewpoint 4

Date: 2/10/22 Time: 11:13 am
Direction: Northwest

Route 2

Existing Conditions

Proposed Conditions

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

ALTAIR
Substation and 230 kV Transmission Project

Viewpoint 4

Date: 2/10/22 Time: 11:13 am
Direction: Northwest

Route 3

Existing Conditions

Proposed Conditions

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

ALTAIR
Substation and 230 kV Transmission Project

Viewpoint 5

Date: 2/10/22 Time: 11:23 am
Direction: North

Route 2

Existing Conditions

Proposed Conditions

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

ALTAIR
Substation and 230 kV Transmission Project

Viewpoint 5

Date: 2/10/22 Time: 11:23 am
Direction: North

Route 3

Existing Conditions

Proposed Conditions

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.


ALTAIR
Substation and 230 kV
Transmission Project
Energy Park Rd
Sycolin Rd
Route 3
Route 2
Route 1
Sycolin Rd
Sycolin Rd
8
Proposed ALTAIR
Substation
267
Shreve Mill Rd
N
Dominion
Energy®
Viewpoint Locations
This image is intended to serve as a representation of the project area and is not intended for detailed engineering purposes.

ALTAIR
Substation and 230 kV Transmission Project

Viewpoint 8
Private Road

Date: 6/29/22 Time: 1:18 pm
Lat/Long: 39° 3'10.71"N, 77°33'29.73"W
Direction: North

Route 1

Existing Conditions

Proposed Conditions

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

ALTAIR
Substation and 230 kV Transmission Project

Viewpoint 8
Private Road

Date: 6/29/22 Time: 1:18 pm
Lat/Long: 39° 3'10.71"N, 77°33'29.73"W
Direction: North

Route 2

Existing Conditions

Proposed Conditions

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

ALTAIR
Substation and 230 kV Transmission Project

Viewpoint 8
Private Road

Date: 6/29/22 Time: 1:18 pm
Lat/Long: 39° 3'10.71"N, 77°33'29.73"W
Direction: North

Route 3

Existing Conditions

Proposed Conditions

Photo simulations are for discussion purposes only. Final design is subject to change pending public, utility, and regulatory review.

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: No buildings would have to be demolished or relocated to construct the proposed Project along the Proposed Route or Alternative Route 2.

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 (Route 1) would be collocated for a total of 1.15 miles, all of which is collocated with the Dulles Greenway. The Dulles Greenway is owned and operated by Toll Road Investors Partnership II, L.P., and consists of a paved six lane divided highway. In order to maintain a tree buffer along the highway, the Proposed Route is offset from the edge of the road right-of-way.

Alternative Route 2 would be collocated for a total of about 0.78 mile, all of which is collocation with the Dulles Greenway.

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")[31] and the Loudoun County 2019 Countywide Transportation Plan ("2019 CTP")[32] were reviewed to evaluate the potential effect the Proposed and Alternative Routes 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, and other land development near the Proposed Route.

Additionally, the Company consulted with Loudoun County Planning and Zoning Staff, Loudoun County Department of Transportation and Capital Infrastructure ("DTCI"), Leesburg Executive Airport, Toll Road Investors Partnership II, L.P., Potomac Energy, TA Realty, Scannell Properties, Cammack Brothers, LLC, and JKLH to discuss the Project and determine if there were any constraints present that would conflict with existing or proposed land uses. See Attachment III.E.1 for a map of existing, planned, and potential future developments.

The Leesburg Executive Airport (JYO) is a general aviation airport governed by the Town of Leesburg. The airport has been in operation since 1964 and has a property of approximately 293 acres. There is a single, 5,500-foot long by 100-foot-wide runway, several hangars and a terminal building associated with the airport. Runway extensions, hangars, terminal expansion, and other improvements have occurred several times, most recently in 2011 when an Instrument Landing System was installed. Leesburg Executive Airport is a reliever facility for Washington Dulles International Airport.

The 2017 Airport Master Plan and Airport Layout Plan ("Master Plan")[33] is a 20-year facilities plan that recommends the following improvements: a 500-foot

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

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

[33] *See* https://www.leesburgva.gov/departments/airport/about-leesburg-executive-airport/airport-improvements/airport-master-plan.

runway extension to the south toward Sycolin Road; additional hangars, first on the east side of the runway and in the second half of the 20-year plan period on the west side of the runway; and additional taxiways and aprons for circulation. The plan includes additional land acquisition to the north of the current boundary and additional aviation easement acquisition to the south of the extended runway.

The Company met with representatives from Leesburg Executive Airport to discuss any concerns the airport would have about the proposed Project. During these meetings, the Company was made aware of the airport's future plan to convert existing Runway 35 to a precision approach. While the Master Plan only includes plans to convert this runway to a Category C runway, the future change to a precision approach would have stricter structure height limitations on the transmission line structures associated with the proposed Project. In order to avoid the future need of either relocating structures or changing structure types, the Company has designed the proposed Project to conform with the structure height limitations of a precision approach. Therefore, the Proposed and Alternative Routes would have no impacts on Leesburg Executive Airport.

The Sycolin Road Distribution Facility is a planned development located on the east side of Sycolin Road in the Project area. A zoning map amendment and special exception were approved on November 16, 2021, for the 43-acre Sycolin Road Distribution Facility. The property was rezoned as Planned Development-Industrial Park (PD-IP) subject to a Concept Development Plan and proffers. A site plan subsequently was submitted soon after the zoning approvals using the County's fast track application process. The plan provides for a 198,300 square foot building, 360 parking spaces, 44 loading bays, and 2 driveway entrances from Sycolin Road. In addition, a dedication plat and boundary line adjustment plat are being reviewed by the County in conjunction with the site plan, which would dedicate approximately 6 acres of County parkland. Neither the Proposed Route nor Alternative Route 2 would cross the Sycolin Road Distribution Facility. Therefore, the Project would have no impacts on the development.

Project Celtics is a 145-acre development that combines two previously approved development plans: a 95-acre parcel Loudoun West, approved on July 18, 2019, for rezoning to PD-IP with a Concept Development Plan establishing bulk parcels and proffers; and a 50-acre portion of the Stonewall Creek Business Park, approved on October 12, 2016, and modified in 2017, with a Concept Development Plan establishing potential development areas and tree conservation areas. The Proposed Route would be located south of Dulles Greenway and would not cross the Project Celtics site. However, Alternative Route 2 would cross the southern portion of the Project Celtics' property boundary. The Company met with the Project Celtics developer (TA Realty) in April 2022 and again in August 2022 to discuss the Project. The Proposed Route (Route 1) is the developer's preferred route because it would not cross their property. See Attachment III.E.2 for a letter from TA Realty dated October 26, 2022, indicating its preference for Route 1.

The Potomac Stonewall Energy Center is a 778 MW, natural gas-fired power

generation plant that became operational in May 2017. The plant is located on a 101-acre site, which is crossed by two existing underground natural gas lines and two existing overhead high-voltage electrical transmission towers that pre-date the power plant. The Proposed Route would avoid both Potomac Stonewall Energy Center property and access roads. Alternative Route 2 would require two crossings of Energy Park Drive, the access road to the Potomac Stonewall Energy Center. These road crossings would be spanned and, therefore, this route would have no impacts on this facility.

JK Land Holdings II, LLC is a private land acquisition company that is actively purchasing land in Loudoun County. The Company has learned that JKLH is the contract purchaser of an approximately 85-acre portion of a parcel, which is located on the north side of the Dulles Greenway (JK Land Holdings II, LLC Southern Future Development). This development is referred to as a "future development" as the sale of this land has yet to be completed and, as of the time of this study, a site plan for the development on this property has not yet been filed with the County. JKLH informed Dominion Energy Virginia that it plans to develop the land for data center use. The Proposed Route would have no impacts on the planned development. The short segment of the route (0.2 mile) that crosses the parcel would be located within a floodplain, which would not be developable. In addition, it should be noted that if a data center campus were to be developed on this site, the load needed to serve the data center campus would require the Company to construct an additional single circuit 230 kV line to serve the facility. This additional line would require additional right-of-way.[34] There would be adequate space on the south side of the Dulles Greenway to expand the right-of-way of the Proposed Route to accommodate this additional transmission line. By contrast, Alternative Route 2 would have a significantly greater impact on planned developments than the Proposed Route. The Company attempted to design an alignment for Alternative Route 2 that would avoid impacting the developable land associated with the JK Land Holdings II, LLC Southern Future Development. The majority of the segment of the 120-foot transmission line right-of-way for Alternative Route 2 located along the northern side of the Dulles Greenway would fit within the County required building setback in this area. However, due to the irregular nature of the parcel boundary along the Dulles Greenway, portions of the route would extend outside of the 150-foot building setback and impact the developable area for JK Land Holdings II, LLC Southern Future Development. In addition, the construction of an additional single circuit transmission line on the north side of the Dulles Greenway that would be required to serve JKLH potential future data center campus development would further, and more significantly, impact the developable area for the data center campus. Consequently, if Alternative Route 2 were selected, this future transmission line would need to be installed on the south side of the Dulles Greenway. The presence of transmission lines on both sides of the Dulles Greenway would create a much more significant visual impact on the surrounding area.

[34] *See supra*, n. 3.

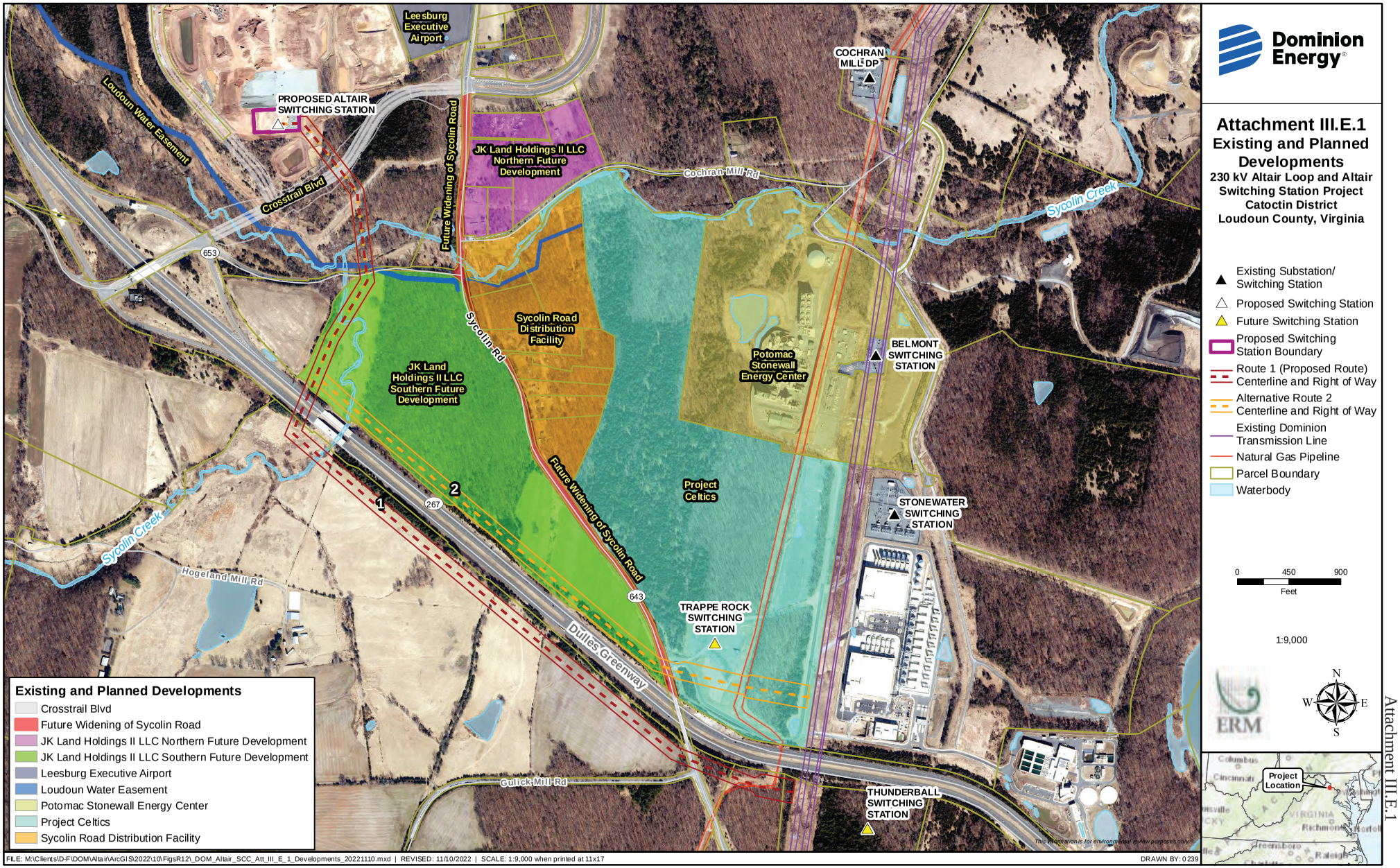
JKLH also informed the Company that they are the contract purchaser of 6 parcels encompassing approximately 22 acres in the northern portion of the study area (JK Land Holdings II, LLC Northern Future Development). As is the case with the southern parcel, this development is referred to as a "future development" as the sale of this land has yet to be completed, and as of the time of this study, a site plan for a development on this property has not yet been filed with the County. JKLH informed the Company that they plan to develop the land for data center use. Neither the Proposed Route nor Alternate Route 2 would cross these parcels, therefore no impacts would occur.

The Company met with Loudoun Water to discuss a water/sewer line project that Loudoun Water is proposing to construct within the Project study area. Loudoun Water is planning to construct new 36-inch-diameter water and sewer lines south of Shreve Mill Road. The water/sewer line project would start at the Dulles Greenway and extend southeast paralleling the northern side of a tributary to Sycolin Creek. The water/sewer lines would then cross Sycolin Creek and Shreve Mill Road, paralleling the south side of Shreve Mill Road for about 0.13 mile and crossing Sycolin Road. At this point the water line ends, and the sewer line extends northeast for an additional approximately 0.26 mile. The sewer line terminates at a pump station proposed as part of the Project Celtics development. Through the Company's correspondence with Loudoun Water, the Company is aware that Loudoun Water's new 36-inch diameter lines will require a 35-foot-wide permanent easement and a 15-foot-wide temporary construction easement (7.5 feet on either side of the permanent easement). The Proposed Route and Alternative Route 2 both cross the proposed water and sewer lines in the same location. The crossing is perpendicular and no impacts are anticipated. Construction of the water/sewer line project is anticipated to begin in the third quarter of 2023 and may overlap with construction of the Company's proposed Project. The Company will continue to coordinate with Loudoun Water on any structure set back requirements.

Review of publicly available information (including the 2019 CTP) was completed, and consultations were conducted with Loudoun County DTCI and Toll Road Investors Partnership II, L.P., to determine the impact of the Proposed Route on future road projects. There is one planned road project and one future road project in the study area: the Crosstrail Boulevard Extension and the future expansion of Sycolin Road.

The Crosstrail Boulevard Extension currently is in the road design phase with the design estimated to be completed by spring of 2023. Construction is anticipated to begin in 2024 with project completion by the end of 2026. Based on design files provided by Loudoun County DTCI, the road extension would start on the east side of Sycolin Road and head southwest crossing Shreve Mill Road and extending to the Dulles Greenway. The Proposed and Alternative Routes both cross this road extension in the same location. Based on the Company's consultation with DTCI, this crossing was adjusted to avoid impacts with a planned stormwater pond on the south side of the roadway. No impacts on the roadway would occur from construction of the Proposed or Alternative Routes.

Loudoun County DTCI informed the Company that while there is no imminent plan to expand this segment of Sycolin Road, it is very likely that the road will need to be expanded at some point into a four-lane road with a width of 90 feet. Since the project is still conceptual, no other details about the design of the road widening project are available. Finally, based on conversations with Loudoun County DTCI, there are no plans for this widening of Sycolin Road in the Countywide Transportation Plan for the next 5 years and this project may be as far out as 30 years. The Proposed and Alternative Routes both cross Sycolin Road. The Proposed Route crosses Sycolin Road south of the Dulles Greenway outside of the proposed area of expansion. Alternative Route 2 crosses Sycolin Road north of the Dulles Greenway within the proposed area of expansion. Given that the road would be spanned and proposed structures are setback from the existing roadway, no impacts to the future widening of Sycolin Road are anticipated.



Dominion Energy

Attachment III.E.1
Existing and Planned Developments
230 kV Altair Loop and Altair Switching Station Project
Catoctin District
Loudoun County, Virginia

- Existing Substation/ Switching Station
- Proposed Switching Station
- Future Switching Station
- Proposed Switching Station Boundary
- Route 1 (Proposed Route) Centerline and Right of Way
- Alternative Route 2 Centerline and Right of Way
- Existing Dominion Transmission Line
- Natural Gas Pipeline
- Parcel Boundary
- Waterbody

0 450 900
Feet

1:9,000

ERM

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S

TA REALTY

October 26, 2022

Heather McQuain
Project Manager
Dominion Energy Virginia
10900 Nuckols Road
Glen Allen, Virginia 23060

Re: TA Realty ("TA") Support for the Proposed Route for the 230 kV Altair Loop and Altair Switching Station Project ("Altair Project")

Dear Heather,

I am writing on behalf of Nova 1 Owner LLC, an entity controlled by TA, to express our strong support for Dominion Energy's proposed Route 1 or the red route of the Altair Project. This proposed 1.66-mile overhead route will not impact TA's project ("Project Celtics") in Leesburg.

TA has been pleased by Dominion Energy's efforts to develop the Project. Over the past several months Dominion Energy (the "Company") has worked very collaboratively with TA to listen, learn, and gather feedback. While TA recognizes the need for this necessary infrastructure, we are especially pleased with the Company's commitment to solicit and collect feedback and implement changes based on that input. In addition, our firm appreciates Dominion's community outreach efforts, including discussions with the County, neighboring landowners, and cultural advocacy groups.

We look forward to continued collaboration as Dominion works to make the Altair Project a reality.

Sincerely,

David H. Buxbaum
Vice President

One Federal Street | 17th Floor | Boston, Massachusetts 02110 | 617.476.2700 | tarealty.com

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) Coordination with Loudoun County has concluded that while portions of the area are being actively farmed, the County does not have any areas designated as "important farmlands." However, the County does identify prime farmland soils as an important environmental feature that contributes to the health of the County's rural economy. See Section III.A for a discussion on prime farmland.

(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. Sycolin General Store and Post Office (053-5276) is recommended potentially eligible for inclusion in the NRHP by the VDHR Staff.

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[35] 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 (Altair Loop or Altair Station) to the nearest airport runway:

- Leesburg Executive Airport, approximately 0.4 mile north of the Project; and
- Dulles International Airport, approximately 5.7 miles southeast of the Project.

The Washington Dulles International Airport is located far enough away from the Project area that there is no potential to impact the airport's federally defined airspace.

The Project would be in close proximity to the Leesburg Executive Airport and within 0.4 mile of the proposed extension of Runway 35. The Company met with Leesburg Executive Airport representatives to discuss their Master Plan. During these meetings, the airport staff informed the Company about the airport's future plan of converting existing Runway 35 to a precision approach. While the Master Plan only includes plans of converting this runway to a Category C runway, the future change to a precision approach would impose stricter structure height limitations on the proposed Project. In order to avoid the need of relocating structures or changing structure types in the future, the Company has designed the proposed Project to meet the structure height limitations of a precision approach.

The Project will have transmission line structures located below some of these surfaces, but the structures will not penetrate any of the surfaces. Portions of the

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

Project would be within the transitional, approach, and horizontal surfaces for the airport, which will restrict the maximum tower heights, as the Project routes are located in areas with higher ground elevations than the 313 above mean sea level ("AMSL") of the airport.

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.O 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 to mitigate impacts.

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

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

Response: Beginning in March 2022, the Company has engaged with the Loudoun County Staff regarding the proposed Project, including the following.

- On March 31, 2022, Company representatives met with Loudoun County Planning and Zoning Department Staff to discuss the Project and routing options.
- On March 31, 2022, Company representatives met with Loudoun County DTCI Staff to discuss the future Crosstrail Boulevard Extension road project.
- On April 6, 2022, Company representatives met with Loudoun County Parks and Recreation Staff to discuss the Project and a future park and routing options.
- On April 7, 2022, Company representatives met with Leesburg Executive Airport to discuss the Project and future airport expansion plans.
- On May 10, 2022, Company representatives met with Loudoun County DTCI to show a refined crossing of the future Crosstrail Boulevard Extension and discuss Sycolin Road.
- On May 10, 2022, Company representatives met with Leesburg Executive Airport to discuss the Project and share the results of structure height modeling to various approach surface scenarios.
- On July 7, 2022, Company representatives met with Supervisor Kershner to discuss the Project and routing options.
- On August 23, 2022, Company representatives met with Loudoun County Planning Department Staff to discuss the Project and routing options.

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

- Coordination with the U.S. Army Corps of Engineers, DEQ, and VDOT will take place as appropriate to obtain necessary approvals for the Project.
- A letter was submitted to the agencies listed in Section V.C on August 9, 2022, describing the Project and requesting comment. See Attachment 2 to the DEQ Supplement.
- A Stage I Pre-Application Analysis has been prepared and was submitted to

VDHR on August 31, 2022.[36] See Attachment 2.I.1 to the DEQ Supplement.

- On May 24, 2022, the Company solicited comments via letter from the VDHR and several federally and state recognized Native American tribes, including:

  Cheroenhaka (Nottoway) Indian Tribe
  Chickahominy Indian Tribe
  Chickahominy Indian Tribe Eastern Division
  Mattaponi Tribe
  Monacan Indian Nation
  Nansemond Indian Tribe of Virginia
  Nottoway Indian Tribe of Virginia
  Pamunkey Indian Museum and Cultural Center
  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.1.

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

[36] *See supra*, n. 23.

Dominion Energy Virginia
Electric Transmission
P.O. Box 26666, Richmond, VA 23261-6666
DominionEnergy.com

May 24, 2022

Altair 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 1.5-mile 230 kilovolt (kV) electric transmission line project in Loudoun County, Virginia.

This project is located south of Leesburg Airport near the Dulles Greenway corridor. We are planning to build a new electric transmission line to connect our proposed Altair Substation.

We are studying several overhead routes, with most of the study area along the Dulles Greenway.

Construction is scheduled to begin in 2023 with an anticipated completion date of Sept. 1, 2024.

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 July 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/altair

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.

We also invite you to attend a virtual community meeting June 2, 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: By letters dated May 24, 2022, the Company solicited comments from the non-governmental organizations and private citizen 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. Thomas Gilmore	American Battlefield Trust
Mr. Jim Campi	American Battlefield Trust
Ms. Kym Hall	Colonial National Historical Park
Mr. Jack Gary	Council of Virginia Archaeologists
Mr. Alexander Macaulay	Macaulay & Jamerson
Ms. Leighton Powell	Scenic Virginia
Ms. Sharee Williamson	National Trust for Historic Preservation
Mr. Dan Holmes	Piedmont Environmental Council
Ms. Mary Frances Wilkerson	Cheroenhaka (Nottoway) Indian Tribe
Dr. Newby-Alexander, Dean	Norfolk State University
Mr. Dave Dutton	Dutton + Associates, LLC

Dominion Energy Virginia
Electric Transmission
P.O. Box 26666, Richmond, VA 23261-6666
DominionEnergy.com

May 24, 2022

Altair 230 kV Electric Transmission Line Project

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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.

We also invite you to attend a virtual community meeting June 2, 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 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,

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.

Potential Permits

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
Aerial crossing of a stream with a drainage area 5 square miles	Subaqueous Bed Permit	Virginia Marine Resource Commission
Work within VDOT rights-of-way	Land Use Permit	Virginia Department of Transportation
Airspace obstruction evaluation	FAA 7460-1	Leesburg Executive Airport

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

A. Provide the calculated maximum electric and magnetic field levels that are expected to occur at the edge of the ROW. If the new transmission line is to be constructed on an existing electric transmission line ROW, provide the present levels as well as the maximum levels calculated at the edge of ROW 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 (2024) annual average and maximum (peak) loading conditions.

Proposed project – Projected average loading in 2024

EMF levels were calculated for the proposed Project at the ***projected average*** load condition (77.4 amps for Line #201 and 149.4 amps for Line #2263) and at an operating voltage of 241.5 kV when supported on the proposed Project structures – see Attachments II.A.5.a through II.A.5.f.

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 Looking Towards Altair		**Right Edge** Looking Towards Altair	
	Electric Field (kV/m)	Magnetic Field (mG)	Electric Field (kV/m)	Magnetic Field (mG)
Attachment II.A.5.a	0.346	3.983	1.000	7.001
Attachment II.A.5.b	0.327	4.091	1.155	8.002
Attachment II.A.5.c	1.583	2.101	1.583	5.170
Attachment II.A.5.d	1.386	2.937	1.386	4.727
Attachment II.A.5.e	0.801	4.110	0.801	6.166
Attachment II.A.5.f	0.340	3.742	0.612	5.752

Proposed project – Projected Peak loading in 2024

EMF levels were calculated for the proposed Project at the ***projected peak*** load condition (129 amps for Line #201 and 249 amps for Line #2263) and at an operating voltage of 241.5 kV when supported on the proposed Project structures – see Attachments II.A.5.a through II.A.5.f.

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**	
	Looking Towards Altair		Looking Towards Altair	
	Electric Field	Magnetic Field	Electric Field	Magnetic Field
	(kV/m)	(mG)	(kV/m)	(mG)
Attachment II.A.5.a	0.346	6.639	1.000	11.672
Attachment II.A.5.b	0.327	6.818	1.155	13.341
Attachment II.A.5.c	1.583	3.502	1.583	8.617
Attachment II.A.5.d	1.386	4.895	1.387	7.882
Attachment II.A.5.e	0.801	6.851	0.801	10.280
Attachment II.A.5.f	0.340	6.237	0.612	9.590

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."[37]

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

[37] *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[38] 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 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

[38] 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).

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 Route (Route 1) and overhead Alternative Route (Alternative Route 2) for the proposed 230 kV Altair Loop is provided in Attachment V.A. A written description of the Proposed and Alternative Routes is as follows:

Proposed Route (Route 1)

The Proposed Route (Route 1) of the Altair Loop is approximately 1.66 miles in length. Beginning from the cut-in of existing 230 kV Belmont-Brambleton Line #201 between Structure #201/52 and Structure #201/53, the route extends northwest from Line #201 for about 1.04 mile, paralleling the southern side of the Dulles Greenway and crossing Sycolin Creek. The route then turns north, and continues for approximately 0.62 mile, crossing the Dulles Greenway, Sycolin Creek, Shreve Mill Road, Sycolin Creek in a third location, and the future Crosstrail Boulevard Extension, and terminates at the proposed Altair Switching Station.

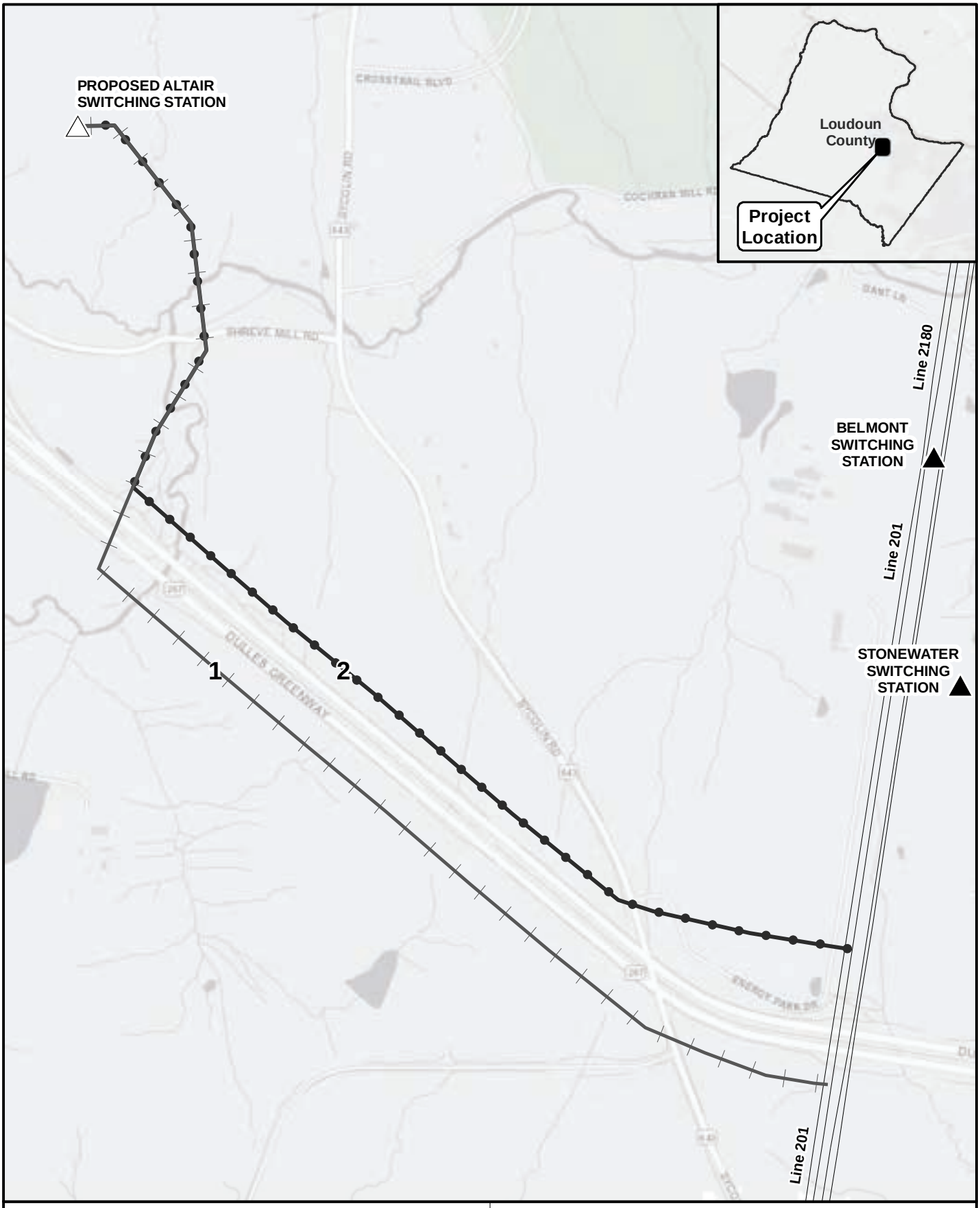
The Proposed Route will be constructed on new right-of-way supported by primarily single circuit weathering steel monopoles. For the entire route, the minimum structure height is approximately 60 feet, the maximum structure height is approximately 140 feet, and the average proposed structure height is 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.

Alternative Route 2

Alternative Route 2 of the Altair Loop is approximately 1.52 miles in length. Beginning from the cut-in of existing 230 kV Belmont-Brambleton Line #201 between Structure #201/52 and Structure #201/53, the route extends northwest from Line #201 for about 0.25 mile, crosses Sycolin Road, and then continues northwest for another 0.75 mile, continuing to parallel the northern side of the Dulles Greenway and crossing Sycolin Creek. The route then turns to the north for approximately 0.52 mile, crossing Sycolin Creek, Shreve Mill Road, Sycolin Creek in a third location, and the future Crosstrail Boulevard Extension, and terminates at the proposed Altair Switching Station.

Alternative Route 2 would be constructed on new right-of-way supported by primarily single circuit weathering steel monopoles. For the entire route, the minimum structure height is approximately 70 feet, the maximum structure height is approximately 125 feet, and the average proposed structure height is approximately 98 feet. These heights are based on preliminary conceptual design,

do not include foundation reveal, and are subject to change based on final engineering design.



Attachment V.A
Notice Map
230 kV Altair Loop and Altair Switching Station Project
Loudoun County, Virginia

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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: The Application will be made available electronically for public inspection at: www.dominionenergy.com/Altair.

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
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102 Governor Street
Richmond, Virginia 23219

Mr. Karl Didier, PhD
Virginia Department of Forestry
Forestland Conservation Division
900 Natural Resources Drive, Suite 800
Charlottesville, Virginia 22903

Mr. Mark Eversole
Virginia Marine Resources Commission
Habitat Management Division
Building 96, 380 Fenwick Road
Ft. Monroe, Virginia 23651

Mr. Troy Andersen
US Fish and Wildlife Service
Virginia Field Office, Ecological Services
6669 Short Lane
Gloucester, Virginia 23061

Regulator of the Day
US Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510

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

Sunil Rabindranath
Project Manager, Engineering Division
Metropolitan Washington Airports Authority
P.O. Box 17045, MA-224
Washington, DC 20041

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

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

John D. Lynch
Northern Virginia District Engineer
Virginia Department of Transportation, Northern Virginia District Office
4975 Alliance Drive
Fairfax, Virginia 22030

Kamal Suliman
Regional Operations Director
Virginia Department of Transportation, Northern Virginia District Office
4975 Alliance Drive
Fairfax, Virginia 22030

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

Robert Bisson
VP, Electric System Development
NOVEC
5399 Wellington Branch Dr
Gainesville, VA 20155

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 August 9, 2022, 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.[39]

[39] Note that Attachment V.D.1 includes information on Route 3. Subsequent to sending the letter, the Company determined this route was not viable due to excessive impacts identified during ERM's comparative analysis and, therefore, it is not being proposed by the Company for Commission consideration and notice.

Dominion Energy Virginia
Electric Transmission
10900 Nuckols Road, Suite 400, Glen Allen, VA 23060

August 9, 2022

BY EMAIL

Tim Hemstreet, Loudoun County Administrator
P.O. Box 7000 Leesburg, VA 20177

RE: Dominion Energy Virginia's Proposed 230 kV Altair Loop and Altair Switching Station, Loudoun County, Virginia

Mr. Hemstreet,

Dominion Energy Virginia (the "Company") is proposing to build a new 230 kV double circuit transmission line loop ("Altair Loop") and 230 kV delivery point switching station ("Altair Station") in Loudoun County, Virginia, to provide requested transmission service to Northern Virginia Electric Cooperative ("Project") and to maintain reliable service for the overall growth in the Project area. The Project requires the construction of the Altair Loop by cutting the existing 230 kV Belmont-Brambleton Line #201 at a junction located south of the Company's existing Belmont Substation and extending along new right-of-way before terminating at the proposed Altair Station. The Company has identified three possible routes for the Altair Loop between the cut-in junction and the Altair Station.

Specifically, the Company identified one approximately 1.52-mile overhead proposed route (Proposed Route 2), one approximately 1.66-mile overhead alternative route (Alternative Route 1), and one approximately 1.45-mile overhead alternative route (Alternative Route 3), all of which the Company is proposing for notice.

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

If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact Nancy Reid at 434.532.7579 or nancy.r.reid@dominionenergy.com.

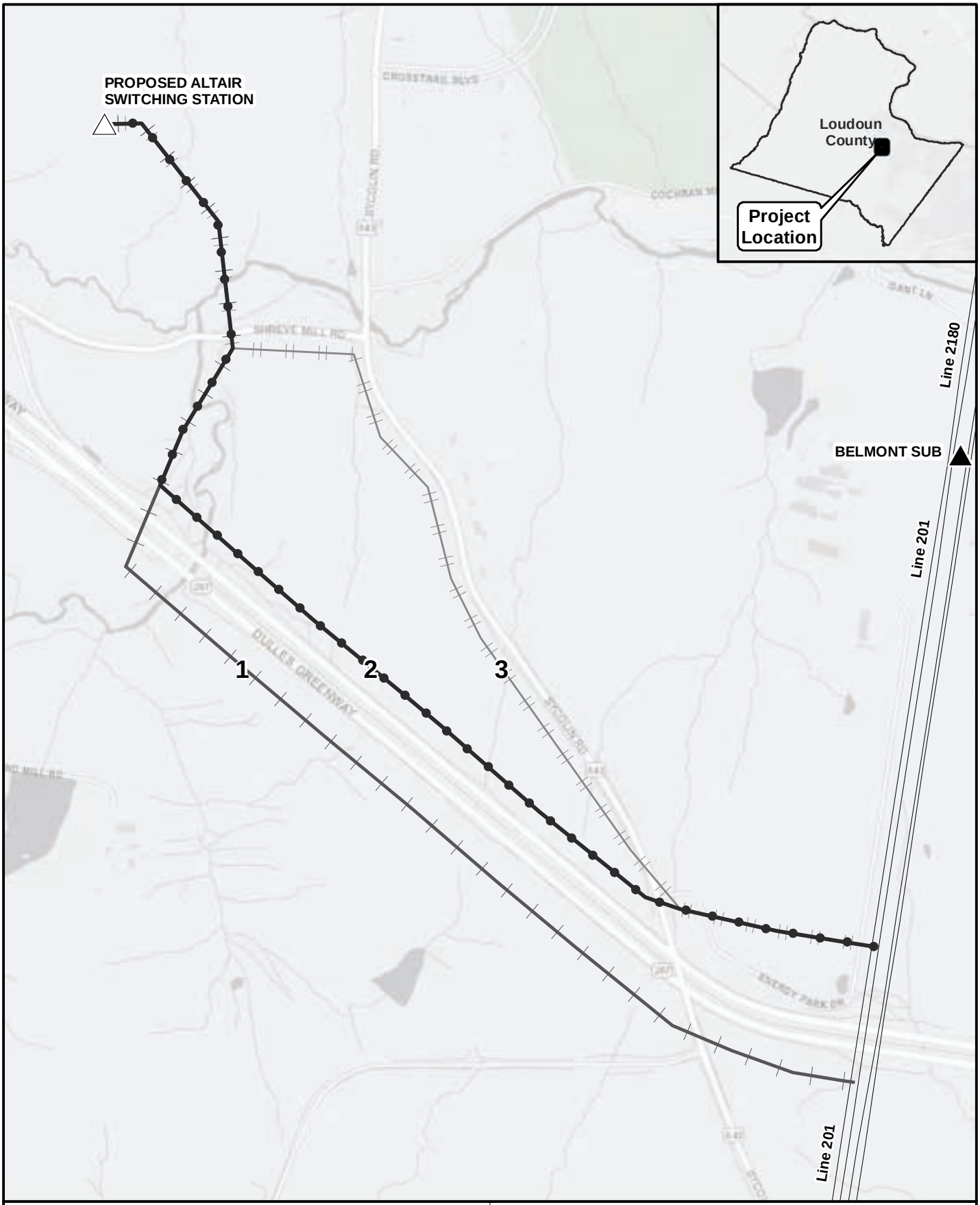
We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Sincerely,

Nancy

Nancy Reid
Sr. Siting & Permitting Specialist
434.532.7579
nancy.r.reid@dominionenergy.com

Attachment: Project Notice Map



Attachment V.A
Notice Map
230 kV Altair Loop and Altair Switching Station Project
Loudoun County, Virginia

M:\Clients\D-F\DOM\Altair\ArcGIS\2022\08\SCC_DOM_Altair_SCC_Att_V_A_Notice_BW_20220805.mxd

COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

APPLICATION OF	)	
	)	
VIRGINIA ELECTRIC AND POWER COMPANY	)	Case No. PUR-2022-00197
	)	
For approval and certification of electric transmission facilities: 230 kV Altair Loop and Altair Switching Station	)	

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

Logan J. Manzuk

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

Aaron C. Kuhn

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

Nancy R. Reid

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

Andrea R. Thornton

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.B: This section details the engineering justifications for the proposed project.
- Section I.C: 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: This section describes critical contingencies and associated violations due to the inadequacy of the existing system.
- Section I.E: This section explains feasible project alternatives, when applicable.
- Section I.G: This section provides a system map for the affected area.
- Section I.H: This section provides the desired in-service date of the proposed project and the estimated construction time.
- 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 I.N: 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.
- 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 Logan J. Manzuk, Aaron C. Kuhn, Nancy R. Reid, and Andrea R. Thornton): This section details the primary justifications for the proposed project.
- Section I.I (co-sponsored with Company Witnesses Logan J. Manzuk and Aaron C. Kuhn): This section provides the estimated total cost of the proposed project.
- Section I.L (co-sponsored with Company Witness Logan J. Manzuk): This section, when applicable, provides details on the deterioration of structures and associated equipment.

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-2022-00197

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

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 requested transmission service to Northern Virginia Electric Cooperative ("NOVEC"), to maintain reliable service for the overall load 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:

- Construct two new approximately 1.66-mile 230 kV single circuit lines on new right-of-way by cutting 230 kV Belmont-Brambleton Line #201 between Structure #201/52 and #201/53 south of Belmont Switching Station ("Belmont Station"), resulting in (i) 230 kV Altair-Brambleton Line #201, and (ii) 230 kV Altair-Belmont Line #2263 ("Altair Loop"). From the cut-in location, the Altair Loop will extend to the Company's proposed new 230 kV Altair Switching Station adjacent to NOVEC's

future Altair Delivery Point ("DP"). While the cut-in location is within existing right-of-way, the proposed Altair Loop will be constructed on new 120-foot-wide right-of-way for the majority of the 1.66-mile route (approximately 1.55 miles) supported primarily by two side-by-side single circuit weathering steel monopoles. Approximately 0.06 mile of the Altair Loop will be constructed on new 200-foot-wide right-of-way, supported by single circuit weathering steel H-frame structures. The remaining 0.05 mile of the route will be located either within the Altair Switching Station or within the Company's existing Line #201 right-of-way. The entire proposed Altair Loop will be constructed utilizing three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA.

- Construct a new 230 kV delivery point switching station in Loudoun County, Virginia (the "Altair Switching Station" or "Altair Station"), which will provide interconnection to NOVEC's future Altair DP; and

- Perform minor related work at the Belmont Station and Brambleton Substation.

The Altair Loop, Altair Substation, and related station work comprise the "Project."

The purpose of my testimony is to describe the Company's transmission system and the need for, and benefits of, the proposed Project. I am sponsoring Sections I.B, I.C, I.D, I.E, I.G, I.H, I.J, I.K, I.M, I.N, II.A.3, and II.A.10 of the Appendix. Additionally, I co-sponsor the Executive Summary and Section I.A with Company Witnesses Logan J. Manzuk, Aaron C. Kuhn, Nancy R. Reid, and Andrea R. Thornton; Section I.I with Company Witnesses Logan J. Manzuk and Aaron C. Kuhn; and Section I.L with Company Witness Logan J. Manzuk.

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 Master's 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 submitted pre-filed testimony to the State Corporation Commission of Virginia.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Logan J. Manzuk

Title: Engineer II—Electric Transmission Line Engineering

Summary:

Company Witness Logan J. Manzuk sponsors those portions of the Appendix providing an overview of the design characteristics of the overhead transmission facilities for the proposed Project, and discussing electric and magnetic field levels as pertaining to those overhead facilities.

Specifically, Company Witness Manzuk sponsors the following portions of the Appendix:

- 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 Manzuk co-sponsors the following sections of the Appendix:

- Section I.A (co-sponsored with Company Witnesses Harrison S. Potter, Aaron C. Kuhn, Nancy R. Reid, and Andrea R. Thornton): This section details the primary justifications for the proposed project.
- Section I.I (co-sponsored with Company Witnesses Harrison S. Potter and Aaron C. Kuhn): 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 Nancy R. Reid): These sections, when applicable, provide supporting structure details along the proposed and alternative routes.
- Section II.B.6 (co-sponsored with Company Witnesses Nancy R. Reid and Andrea R. Thornton): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section V.A (co-sponsored with Company Witnesses Nancy R. Reid and Andrea R. Thornton): This section provides the proposed route description and structure heights for notice purposes.

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

DIRECT TESTIMONY
OF
LOGAN J. MANZUK
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00197

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

A. My name is Logan J. Manzuk, and I am an Engineer II in the Electric Transmission Line Engineering Department of 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 the estimating, conceptual, and final design of high voltage transmission line projects from 69 kilovolt ("kV") to 500 kV.

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

A. In order to provide requested transmission service to Northern Virginia Electric Cooperative ("NOVEC"), to maintain reliable service for the overall load 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:

- Construct two new approximately 1.66-mile 230 kV single circuit lines on new right-of-way by cutting 230 kV Belmont-Brambleton Line #201 between Structure #201/52 and #201/53 south of Belmont Switching Station ("Belmont Station"), resulting in (i) 230 kV Altair-Brambleton Line #201, and (ii) 230 kV Altair-Belmont Line #2263 ("Altair Loop"). From the cut-in location, the Altair Loop will extend to the Company's proposed new 230 kV Altair Switching Station adjacent to NOVEC's

future Altair Delivery Point ("DP"). While the cut-in location is within existing right-of-way, the proposed Altair Loop will be constructed on new 120-foot-wide right-of-way for the majority of the 1.66-mile route (approximately 1.55 miles) supported primarily by two side-by-side single circuit weathering steel monopoles. Approximately 0.06 mile of the Altair Loop will be constructed on new 200-foot-wide right-of-way, supported by single circuit weathering steel H-frame structures. The remaining 0.05 mile of the route will be located either within the Altair Switching Station or within the Company's existing Line #201 right-of-way. The entire proposed Altair Loop will be constructed utilizing three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA.

- Construct a new 230 kV delivery point switching station in Loudoun County, Virginia (the "Altair Switching Station" or "Altair Station"), which will provide interconnection to NOVEC's future Altair DP; and

- Perform minor related work at the Belmont Station and Brambleton Substation.

The Altair Loop, Altair Substation, and related station work comprise 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 magnetic field levels. Specifically, I am sponsoring the following sections of the Appendix: Section I.F, II.A.5, II.B.1, II.B.2, and IV. Additionally, I am co-sponsoring the Executive Summary and Section I.A with Company Witnesses Harrison S. Potter, Aaron C. Kuhn, Nancy R. Reid, and Andrea R. Thornton; Section I.I with Company Witnesses Harrison S. Potter and Aaron C. Kuhn; Section I.L with Company Witness Harrison S. Potter; Sections II.B.3 to II.B.5 with Company Witness Nancy R. Reid; and Section II.B.6 and V.A with Company Witnesses Nancy R. Reid and Andrea R. Thornton.

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

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS
OF
LOGAN J. MANZUK

Logan J. Manzuk graduated from Pennsylvania State University in 2012 with a Bachelor of Science in Civil Engineering. He joined the Company in 2020 as an Engineer II in the Electric Transmission Engineering department. Mr. Manzuk is a licensed engineer in the Commonwealth of Pennsylvania.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Aaron C. Kuhn

Title: Contractor – Substation Engineering

Summary:

Company Witness Aaron C. Kuhn sponsors or co-sponsors the following portions of the Appendix describing the work to be performed at the stations for the proposed Project, as follows:

- Section I.A (co-sponsored with Company Witnesses Harrison S. Potter, Logan J. Manzuk, Nancy R. Reid, and Andrea R. Thornton): This section details the primary justifications for the proposed project.

- Section I.I (co-sponsored with Company Witness Harrison S. Potter and Logan J. Manzuk): 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 station(s) associated with the proposed project.

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

DIRECT TESTIMONY
OF
AARON C. KUHN
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00197

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

A. My name is Aaron C. Kuhn. I am employed by Burns and McDonnell; however, I am a Contractor for Virginia Electric and Power Company's ("Dominion Energy Virginia" or the "Company") Substation Engineering section of the Electric Transmission group. My business address is 9400 Ward Parkway, Kansas City, Missouri 64114. A statement of my qualifications and background is provided as Appendix A.

Q. What are your responsibilities as a Contractor for the Company's Substation Engineering section of the Electric Transmission group?

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 requested transmission service to Northern Virginia Electric Cooperative ("NOVEC"), to maintain reliable service for the overall load 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:

- Construct two new approximately 1.66-mile 230 kV single circuit lines on new right-of-way by cutting 230 kV Belmont-Brambleton Line #201 between Structure #201/52 and #201/53 south of Belmont Switching Station ("Belmont Station"), resulting in (i) 230 kV Altair-Brambleton Line #201, and (ii) 230 kV Altair-Belmont Line #2263 ("Altair Loop"). From the cut-in location, the Altair Loop will extend to the Company's proposed new 230 kV Altair Switching Station adjacent to NOVEC's future Altair Delivery Point ("DP"). While the cut-in location is within existing right-of-way, the proposed Altair Loop will be constructed on new 120-foot-wide right-of-way for the majority of the 1.66-mile route (approximately 1.55 miles) supported primarily by two side-by-side single circuit weathering steel monopoles. Approximately 0.06 mile of the Altair Loop will be constructed on new 200-foot-wide right-of-way, supported by single circuit weathering steel H-frame structures. The remaining 0.05 mile of the route will be located either within the Altair Switching Station or within the Company's existing Line #201 right-of-way. The entire proposed Altair Loop will be constructed utilizing three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA.

- Construct a new 230 kV delivery point switching station in Loudoun County, Virginia (the "Altair Switching Station" or "Altair Station"), which will provide interconnection to NOVEC's future Altair DP; and

- Perform minor related work at the Belmont Station and Brambleton Substation.

The Altair Loop, Altair Substation, and related station work comprise the "Project."

The purpose of my testimony is to describe the work to be performed as part of the Project at the Altair Switching Station, the Belmont Station and the Brambleton Substation. I sponsor Section II.C of the Appendix and co-sponsor the Executive Summary and Section I.A with Company Witnesses Harrison S. Potter, Logan J. Manzuk, Nancy R. Reid, and Andrea R. Thornton; and Section I.I of the Appendix with Company Witnesses Harrison S. Potter and Logan J. Manzuk, specifically, as it pertains to substation work.

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

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS
OF
AARON C. KUHN

Aaron C. Kuhn received a Bachelor of Science degree in Electrical Engineering from the University of Missouri – Columbia in 2014. Mr. Kuhn is a contractor for the Company and has been employed by Burns & McDonnell since 2015. His previous job duties included developing detailed physical construction drawings, bill of materials, grounding studies, electrical schematics and wiring diagrams for the Company. He has been licensed as a Professional Engineer in the State of Missouri since 2019.

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

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Nancy R. Reid
Title: Siting and Permitting Specialist
Summary:

Company Witness Nancy R. Reid sponsors those portions 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-V.D: These sections provide information related to public notice of the proposed project.

Additionally, Ms. Reid co-sponsors the following portions of the Appendix:

- Section I.A (co-sponsored with Company Witnesses Harrison S. Potter, Logan J. Manzuk, Aaron C. Kuhn, and Andrea R. Thornton): This section details the primary justifications for the proposed project.
- Section II.A.1 (co-sponsor with Company Witness Andrea R. Thornton): This section provides the length of the proposed corridor and viable alternatives to the proposed project.
- Section II.A.2 (co-sponsor with Company Witness Andrea R. Thornton): 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-sponsor with Company Witness Andrea R. Thornton): This section explains why the existing right-of-way is not adequate to serve the need, to the extent applicable.
- Sections II.A.6 to II.A.8 (co-sponsor with Company Witness Andrea R. Thornton): These sections provide detail regarding the right-of-way for the proposed project.
- Section II.A.9 (co-sponsor with Company Witness Andrea R. Thornton): This section describes the proposed route selection procedures and details alternative routes considered.
- Section II.A.11 (co-sponsor with Company Witness Andrea R. Thornton): 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.3 to II.B.5 (co-sponsored with Company Witness Logan J. Manzuk): This section provides the mapping and structure heights for the existing overhead structures.
- Section II.B.6 (co-sponsor with Company Witnesses Logan J. Manzuk and Andrea R. Thornton): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section III (co-sponsor with Company Witness Andrea R. Thornton): This section details the impact of the proposed project on scenic, environmental, and historic features.
- Section V.A (co-sponsored with Company Witnesses Logan J. Manzuk and Andrea R. Thornton): This section provides information related to public notice of the proposed project.

Finally, Ms. Reid co-sponsors the DEQ Supplement filed with the Application with Company Witness Andrea R. Thornton. A statement of Ms. Reid's background and qualifications is attached to her testimony as Appendix A

DIRECT TESTIMONY
OF
NANCY R. REID
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00197

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

A. My name is Nancy R. Reid, and I am a Siting and Permitting Specialist 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 requested transmission service to Northern Virginia Electric Cooperative ("NOVEC"), to maintain reliable service for the overall load 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:

- Construct two new approximately 1.66-mile 230 kV single circuit lines on new right-of-way by cutting 230 kV Belmont-Brambleton Line #201 between Structure #201/52 and #201/53 south of Belmont Switching Station ("Belmont Station"), resulting in (i) 230 kV Altair-Brambleton Line #201, and (ii) 230 kV Altair-Belmont Line #2263 ("Altair Loop"). From the cut-in location, the Altair Loop will extend to the Company's proposed new 230 kV Altair Switching Station adjacent to NOVEC's future Altair Delivery Point ("DP"). While the cut-in location is within existing right-of-way, the proposed Altair Loop will be constructed on new 120-foot-wide right-of-way for the majority of the 1.66-mile route (approximately 1.55 miles) supported primarily by two side-by-side single circuit weathering steel monopoles. Approximately 0.06 mile of the Altair Loop will be constructed on new 200-foot-wide right-of-way, supported by single circuit weathering steel H-frame structures. The remaining 0.05 mile of the route will be located either within the Altair Switching Station or within the Company's existing Line #201 right-of-way. The entire proposed Altair Loop will be constructed utilizing three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA.

- Construct a new 230 kV delivery point switching station in Loudoun County, Virginia (the "Altair Switching Station" or "Altair Station"), which will provide interconnection to NOVEC's future Altair DP; and

- Perform minor related work at the Belmont Station and Brambleton Substation.

The Altair Loop, Altair Substation, and related station work comprise the "Project."

The purpose of my testimony is to provide an overview of the route and permitting for the proposed Project. As it pertains to routing and permitting, 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, Logan J. Manzuk, Aaron C. Kuhn, and Andrea R. Thornton; Sections II.A.1, II.A.2, II.A.4, II.A.6, II.A.7, II.A.8, II.A.9, II.A.11, and III with Company Witness Andrea R. Thornton; Section II.B.3 to II.B.5 with Company Witness Logan J. Manzuk; and Sections II.B.6 and V.A with Company Witnesses Logan J. Manzuk and Andrea R. Thornton. Lastly, I co-sponsor the DEQ Supplement with Company Witness Andrea R. Thornton.

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 August 9, 2022, was sent 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. A copy of the letter is included as Appendix Attachment V.D.1.

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

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS
OF
NANCY R. REID

Nancy R. Reid earned her Bachelor's degree from Christopher Newport University in environmental biology with a minor in chemistry and her Master's degree in Safety and Environmental Management from Columbia Southern University. Her past work experience includes working for the City of Franklin and Southampton County as the Environmental Specialist where she developed the areas stormwater management and permitting programs. Ms. Reid joined Dominion Energy in 2017 as an Environmental Compliance Coordinator where she assisted in developing the environmental program for the most efficient combined-cycle gas plant in the country and is now a Sitting and Permitting Specialist for Electric Transmission.

Ms. Reid has previously submitted pre-filed testimony to the State Corporation Commission of Virginia.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Andrea R. Thornton

Title: Principal Consultant, Environmental Resource Management

Summary:

Company Witness Andrea R. Thornton sponsors the Environmental Routing Study provided as part of the Company's Application.

Additionally, Ms. Thornton co-sponsors the following sections of the Appendix:

- Section I.A (co-sponsored with Company Witnesses Harrison S. Potter, Logan J. Manzuk, Aaron C. Kuhn, and Nancy R. Reid): This section details the primary justifications for the proposed project.
- Section II.A.1 (co-sponsored with Company Witness Nancy R. Reid): 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 Nancy R. Reid): 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 Nancy R. Reid): 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 Nancy R. Reid): These sections provide detail regarding the right-of-way for the proposed project.
- Section II.A.9 (co-sponsored with Company Witness Nancy R. Reid): This section describes the proposed route selection procedures and details alternative routes considered.
- Section II.A.11 (co-sponsored with Company Witness Nancy R. Reid): 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 Logan J. Manzuk and Nancy R. Reid): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section III (co-sponsored with Company Witness Nancy R. Reid): This section details the impact of the proposed project on scenic, environmental, and historic features.
- Section V.A (co-sponsored with Company Witnesses Logan J. Manzuk and Nancy R. Reid): This section provides the proposed route description and structure heights for notice purposes.

Finally, Ms. Thornton co-sponsors the DEQ Supplement filed with this Application with Company Witness Nancy R. Reid.

A statement of Ms. Thornton's background and qualifications is attached to her testimony as Appendix A.

DIRECT TESTIMONY
OF
ANDREA R. THORNTON
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00197

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

A. My name is Andrea R. Thornton. I am employed as a Principal Consultant with Environmental Resource Management ("ERM"). My business address is 5784 Widewaters Parkway, Dewitt, New York 13214. 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"), ERM's 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 many projects over the last 15 years, including:

- Cannon Branch-Cloverhill 230 kV transmission line project in the City of Manassas and Prince William County (Case No. PUE-2011-00011);
- Dahlgren 230 kV double circuit transmission line project in King George County (Case No. PUE-2011-00113);
- Surry-Skiffes Creek-Whealton 500 kV and 230 kV transmission lines (Case No. PUE-2012-00029);
- Remington CT-Warrenton 230 kV double circuit transmission line (Case No. PUE-2014-00025);
- Haymarket 230 kV Line and Substation Project (Case No. PUE-2015-00107);
- Remington-Gordonsville Electric Transmission Project (Case No. PUE-2015-00117);
- Norris Bridge (Case No. PUE-2016-00021);
- Idylwood-Tysons 230 kV single circuit underground transmission line, Tysons Substation rebuild, and related transmission facilities (Case No. PUR-2017-00143);
- Lockridge 230 kV Line Loop and Substation (Case No. PUR-2019-00215);
- DTC 230 kV Line Loop and DTC Substation (Case No. PUR-2021-00280); and
- Nimbus Substation and 230 kV Farmwell-Nimbus Transmission Line (Case No. PUR-2022-00027).

Most recently, ERM served as the routing consultant for the Company's Coastal Virginia Offshore Wind Commercial Project (Case No. PUR-2021-00142); Aviator 230 kV Line

Loop and Substation (Case No. PUR-2022-00012); and 500-230 kV Unity Switching Station, 230 kV Tunstall-Unity Lines #2259 and #2262, 230-36.5 kV Tunstall, Evans Creek, Raines Substations, and 230 kV Substation Interconnect Lines (Case No. PUR-2022-00167).

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 requested transmission service to Northern Virginia Electric Cooperative ("NOVEC"), to maintain reliable service for the overall load 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:

- Construct two new approximately 1.66-mile 230 kV single circuit lines on new right-of-way by cutting 230 kV Belmont-Brambleton Line #201 between Structure #201/52 and #201/53 south of Belmont Switching Station ("Belmont Station"), resulting in (i) 230 kV Altair-Brambleton Line #201, and (ii) 230 kV Altair-Belmont Line #2263 ("Altair Loop"). From the cut-in location, the Altair Loop will extend to the Company's proposed new 230 kV Altair Switching Station adjacent to NOVEC's future Altair Delivery Point ("DP"). While the cut-in location is within existing right-of-way, the proposed Altair Loop will be constructed on new 120-foot-wide right-of-way for the majority of the 1.66-mile route (approximately 1.55 miles) supported primarily by two side-by-side single circuit weathering steel monopoles. Approximately 0.06 mile of the Altair Loop will be constructed on new 200-foot-wide right-of-way, supported by single circuit weathering steel H-frame structures. The remaining 0.05 mile of the route will be located either within the Altair Switching Station or within the Company's existing Line #201 right-of-way. The entire proposed Altair Loop will be constructed utilizing three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA.

- Construct a new 230 kV delivery point switching station in Loudoun County, Virginia (the "Altair Switching Station" or "Altair Station"), which will provide interconnection to NOVEC's future Altair DP; and
- Perform minor related work at the Belmont Station and Brambleton Substation.

The Altair Loop, Altair Substation, and related station work comprise 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, Logan J. Manzuk, Aaron C. Kuhn, and Nancy R. Reid; 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 Nancy R. Reid; and Sections II.B.6 and V.A with Company Witnesses Logan J. Manzuk and Nancy R. Reid. Lastly, I co-sponsor the DEQ Supplement with Company Witness Nancy R. Reid.

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

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS OF ANDREA R. THORNTON

Andrea R. Thornton earned a Bachelor of Arts degree from Northeastern University. She has approximately 14 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 natural gas pipelines throughout the United States. During this time, she has been employed 14 years with ERM, a privately-owned consulting company specializing in the siting, licensing, and environmental construction compliance of large, multi-state energy transportation facilities.

Ms. Thornton'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 she has managed or directed the identification and evaluation of over 100 miles of 230 kV and 500 kV transmission line route alternatives in the Commonwealth for Virginia Electric and Power Company.