

August 28, 2024

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: Partial Rebuild of Lines #256 and #2090/2335 and New 230 kV Lines #2372 (Ladysmith – New Post) and #2378 (Lee’s Hill – New Post)

Case No. PUR-2024-00159

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, 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 Spotsylvania and Caroline Counties, 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 August 28, 2024.

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

Highest regards,



Vishwa B. Link

Enclosures

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

Mr. Bernard Logan, Clerk

August 28, 2024

Page 2

Mr. Neil Joshipura (without enclosures)

Mr. Michael A. Cizenski (without enclosures)

David J. DePippo, Esq.

Charlotte P. McAfee, Esq.

Jontille D. Ray, Esq.

Etahjayne J. Harris, Esq.



**Dominion
Energy®**

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

**Before the State Corporation
Commission of Virginia**

**Partial Rebuild of Lines #256
and #2090/#2335 and New 230
kV Lines #2372 and #2372
(Ladysmith - New Post) and
#2378 (Lee's Hill - New Post)**

Application No. 340

Case No. PUR-2024-00159

Filed: August 29, 2024

Volume 2 of 2

COMMONWEALTH OF VIRGINIA
BEFORE THE
STATE CORPORATION COMMISSION

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

Partial Rebuild of Lines #256 and #2090/#2335
and New 230 kV Lines #2372 (Ladysmith – New Post) and
#2378 (Lee’s Hill – New Post)

Application No. 340

Case No. PUR-2024-00159

Filed: August 29, 2024

COMMONWEALTH OF VIRGINIA
STATE CORPORATION COMMISSION

APPLICATION OF	)	
	)	
VIRGINIA ELECTRIC AND POWER COMPANY	)	Case No. PUR-2024-00159
	)	
For approval and certification of electric transmission	)	
facilities: Partial Rebuild of Lines #256 and #2090/#2335	)	
and New 230 kV Lines #2372 (Ladysmith – New Post)	)	
and #2378 (Lee’s Hill – New Post)	)	

**APPLICATION OF VIRGINIA ELECTRIC AND POWER COMPANY
FOR APPROVAL AND CERTIFICATION OF ELECTRIC
TRANSMISSION FACILITIES: PARTIAL REBUILD OF LINES
#256 AND #2090/#2335 AND NEW 230 KV LINES
#2372 (LADYSMITH – NEW POST) AND #2378 (LEE’S HILL – NEW POST)**

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 resolve identified violations of North American Electric Reliability Corporation (“NERC”) Reliability Standards and to maintain the structural integrity and reliability of its transmission system in compliance with mandatory NERC Reliability Standards, the Company proposes in Caroline County, Virginia, and Spotsylvania County, Virginia to:

(1) Partially rebuild 230 kV Line #256 from Ladysmith Combustion Turbine (“CT”) to St. Johns Substation. Line #256 currently shares an existing double-circuit tower line with Line #2090, which was constructed in 2010-2011, from Ladysmith CT to Structure #256/107, #2090/107 (“Elmont Junction”). Line #256 will be reconducted on existing structures for approximately 5.1 miles, starting at Ladysmith CT and traveling to Elmont Junction. The existing right-of-way (“ROW”) in this 5.1-mile section is 250 feet in width. This portion of Line #256 will be reconducted with 2-768 ACSS conductor. One new Design Number (“DNO”)-11410 48-fiber shield wire will be installed above Line #256 for lightning protection shielding and telecommunication purposes. The existing towers for this portion of Line #256 will remain unimproved.¹ After reconducting the 5.1-mile section of Line #256, Line #256 and Line #2090 will split at Elmont Junction. Line #256 will proceed south and be rebuilt along an existing 200-foot-wide ROW to St. Johns Substation for approximately 7.3 miles on new double-circuit weathering steel monopole structures. Line #256 will be strung on one side of the double-circuit monopoles, and a new 230 kilovolt (“kV”) line will be installed on the other side of the double-circuit monopoles for a future circuit that will be extended to Elmont Substation. The conductor on both sides of the structures will be 2-768 ACSS conductor. Two new DNO-11410 48-fiber

¹ While a component of the proposed Project, the reconducting portions of the project are deemed ordinary course, pursuant to Va. Code § 56-265.2 A 1 and consistent with the Staff’s July 6, 2017 guidance (available at <https://sec.virginia.gov/getdoc/7f6ec0f6-7d14-4ca9-bd8a-9bd2511c5cdb/StaffGuidanceOrdvsNonOrd.pdf>), which provides that any transmission project that only requires reconducting, maintenance or station work does not require a CPCN, except as noted therein.

shield wires will also be installed for lightning protection shielding and telecommunication purposes. The new line and substation equipment will have a minimum summer rating of 1573 MVA² using 4000 Ampere (“A”) substation equipment.

- (2) Partially rebuild Line #2090 from Ladysmith CT to Lee’s Hill Substation. As previously noted, the 2090 Line shares an existing double-circuit tower line with Line #256 in this section that was constructed in 2010-2011. Line #2090 will be reconducted on the same existing structures as Line #256 for approximately 5.1 miles along a 250-foot-wide ROW, traveling from Ladysmith CT to Elmont Junction. This portion of the line will be reconducted with 2-768 ACSS conductor. One new DNO-11410 48-fiber shield wire will be installed above Line #2090 for lightning protection shielding and telecommunication purposes. The existing towers will remain unimproved.³ After reconducting the first 5.1-mile section, Line #256 and Line #2090 split at Elmont Junction. From Elmont Junction, Line #2090 will proceed north and be rebuilt along an existing 200-foot-wide ROW for approximately 5.5 miles on new double-circuit weathering steel monopoles to New Post Substation. Line #2090 will then continue for approximately 0.9 mile on existing 200-foot-wide ROW to Lee’s Hill Substation but will be renumbered Line #2335. Line #2090/Line #2335 will be strung on one side of the double-circuit monopoles, and a new 230 kV line (Line #2372/Line #2378) will be installed on the other side of the double-circuit monopoles. The conductor on both sides of the structures will be 2-768 ACSS conductor. Two new DNO-11410 48-fiber shield wires will also be installed for lightning protection shielding and telecommunication purposes. The new line and substation equipment will have a minimum summer rating of 1573 MVA using 4000 A substation equipment.
- (3) Construct a new approximately 14.1-mile overhead 230 kV line between Ladysmith and Lee’s Hill Substations, connecting at New Post Substation. The new Ladysmith – New Post line will be numbered Line #2372 and the new Lee’s Hill – New Post line will be numbered #2378. Line #2372 will be installed onto the existing structures of Line #2089. Line 2089 will be reconducted from Ladysmith Substation to Ladysmith CT.⁴ Line #2372 will have three segments. Starting at Ladysmith Substation, the first segment will travel approximately 3.2 miles along an existing 250-foot-wide ROW on existing double-circuit galvanized steel towers from structure #2089/3 to 2089/18. The second segment of Line #2372 will travel approximately 4.5 miles on existing 250-

² 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 retail customer projected load, reflecting representative pf, and the equipment ratings to handle the apparent power, which includes the real and reactive load components.

³ See *supra*, n. 2.

⁴ See *supra*, n.1.

foot-wide ROW from Ladysmith CT junction (Structure #2089/19) (“Ladysmith Junction”) to Elmont Junction. For this segment of Line #2372, the new line will be installed on new single-circuit weathering steel 230 kV monopoles. Finally, the third segment will travel approximately 5.5 miles from Elmont Junction to New Post Substation and will be constructed on the same double-circuit weathering steel monopoles as Line #2090 along an existing 200-foot-wide ROW. All three segments will be installed with 2-768 ACSS conductor. One new DNO-11410 OPGW will be installed for lightning protection shielding and telecommunications purposes above the new Line #2372 from Ladysmith Substation to the New Post Substation. The Company will install equipment as needed at Ladysmith Substation to provide a termination point for Line #2372. Because the existing right-of-way is adequate for the new proposed Line #2372, no new right-of-way is required. Line #2372 will become Line #2378 at New Post Substation and will continue north approximately 0.9 mile along existing 200-foot-wide ROW up to Lee’s Hill Substation, sharing structures with Line #2335. The same structure framing, finishing, conductor and telecom/shielding wire described for Line # 2335 will be used for Line #2378.

The components described above are collectively referred to as the “Project.”

4. The Project is necessary to ensure that Dominion Energy Virginia can maintain reliable service for the overall growth in the Richmond Load Area and to comply with mandatory NERC Reliability Standards. 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 data center market continues to rapidly expand in Virginia. In the Stafford to Elmont Substation Corridor, the Company projects significant load growth in excess of 10,000 MW by 2032. The Company has received 12 delivery point (“DP”) requests in the Project area with a total projected load of approximately 3100 MW by 2029. This demand, coupled with overall load growth in the Richmond Load Area, requires transmission line and substation upgrades to ensure the Company can continue to deliver safe and reliable service to its customers.

5. The proposed Line #256 Partial Rebuild is needed to resolve Generator Deliverability violations found by PJM in the 2023 Open Window Summer case and to support overall load growth in the Richmond Load Area. The overload was found on Line #256 between Ladysmith CT and St. John's Substation. Additionally, the Project is needed to resolve the 300 MW load drop identified at the Company's existing St. Johns and Four Rivers Substations. The proposed Line #2090 Rebuild is needed to solve load violations resulting from the loss of Line #568 (Ladysmith - Possum Point), to maintain reliable service for the overall load growth in the area, and to comply with mandatory NERC Reliability Standards. PJM identified an overload on Line #2090 from Ladysmith CT to Summit DP in the 2022 Open Window 3. The proposed Lines #2372 and #2378 are needed to increase capacity in the Stafford to Elmont Corridor resulting from significant load growth in the area, to maintain reliable service for the overall load growth in the area, and to comply with mandatory NERC Reliability Standards. This additional source is also needed to address the Company's 300 MW load drop criteria during N-1-1 scenarios.

6. The Project will be located within the existing transmission line ROW which spans approximately 3.2 miles from the Ladysmith Substation to Ladysmith CT and then continues east approximately 5.1 miles from Ladysmith CT to Elmont Junction. The Project ROW splits at Elmont Junction to travel north approximately 5.5 miles to New Post Substation and then approximately 0.9 mile from New Post Substation to Lee's Hill Substation, and to travel south approximately 7.31 miles to St. Johns Substation. No alternative routes are proposed for this Project.

7. The Line #256 Partial Rebuild will require removing all of the existing single-circuit 230 kV structures from Structure #256/107 to Structure 256/168, which are primarily wood H-Frame Structures. All The existing steel structures supporting Line #256 from Ladysmith CT

to Structure #256/106 will be reused. The Company plans to replace the removed structures with two side-by-side single-circuit 230 kV structures, which are primarily weathering steel monopole structures, in order to support the rebuilt Line #256 for approximately 7.3 miles within the existing 200-foot-wide ROW. Additionally, the Line #256 Partial Rebuild includes replacing the existing three-phase twin-bundled 795 ACSR conductors with three-phase 2-768 ACSS conductors. The existing Line #256 795 ACSR conductors have a normal/summer transfer capability of 1225 MVA. The proposed Line #256 768 ACSS conductors have a normal/emergency transfer capability of approximately 1573 MVA.

8. The Line #2090/#2335 rebuild Partial Rebuild will require removing all the existing single circuit 230 kV structures from Structure #2090/105 to Structure #2090/63, which are primarily wood H-Frame Structures. All existing steel structures supporting Line #2090 from Ladysmith CT to Structure #2090/106 will be reused. The Company plans to replace the removed structures with two side-by-side single-circuit 230 kV structures, which are primarily weathering steel monopole structures, in order to support the rebuilt Line #2090 for approximately 5.5 miles within the existing 200-foot-wide ROW. The Line #2090/#2335 Partial Rebuild will also require removing all the existing single-circuit 230 kV structures from Structure #2090/60 to Structure #2090/55, which are primarily wood H-Frame structures. This section of Line #2090 will be renumbered as Line #2335. The Company plans to replace the removed structures with two side-by-side single-circuit 230 kV structures, which are primarily weathering steel monopole structures, in order to support the rebuilt Line #2090 for approximately 0.9 mile within the existing 200-foot-wide ROW. Additionally, the Line #2090/#2335 Partial Rebuild includes replacing the existing three-phase twin-bundled 795 ACSR conductors with three-phase 2-768 ACSS conductors. The existing Line #2090 795 ACSR conductors have a normal/summer transfer capability of 1225

MVA. The proposed Line #2090/#2335 768 ACSS conductors have a normal/emergency transfer capability of approximately 1573 MVA.

9. The desired in-service target date for the proposed Project is June 2028. The Company estimates it will take approximately 36 months for detailed engineering, 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 31, 2025. Should the Commission issue a final order by May 31, 2025, to accommodate long-lead materials procurement, the Company estimates that construction should begin around January 2026, and be completed by June 2028. 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 or materials/supply issues.

10. In addition, the Company is monitoring actively regulatory changes and requirements associated with the Northern long-eared bat (“NLEB”) and how they could potentially impact construction timing associated with time of year restrictions (“TOYRs”). The U.S. Fish and Wildlife Service (“USFWS”) previously indicated that it planned to issue final NLEB guidance to replace the interim guidance by April 1, 2024; however, the interim guidance has been extended by USFWS until late summer 2024. The Company is actively tracking updates from the USFWS with respect to the final guidance. Once issued, the Company plans to review and follow the final guidance to the extent it applies to the Company’s projects. Until the final

guidance is issued, the Company will continue following the interim guidance. For projects that may require additional coordination, the Company will coordinate with the USFWS.

11. The Company is also monitoring potential regulatory changes associated with the potential up-listing of the Tricolored bat (“TCB”). On September 14, 2022, the USFWS published the proposed rule to the Federal Register to list the TCB as endangered under the Endangered Species Act. USFWS extended its Final Rule issuance target from September 2023 to September 2024. The Company is actively tracking this ruling and evaluating the effects of potential outcomes on Company projects’ permitting, construction, and in-service dates, including electric transmission projects.

12. Any adjustments to this Project schedule resulting from these or similar challenges could necessitate a minimum of a six- to twelve-month delay in the targeted in-service date. Accordingly, for purposes of judicial economy, the Company requests that the Commission issue a final order approving both a desired in-service target date (*i.e.*, June 2028) and an authorization sunset date (*i.e.*, June 2029) for energization of the Project.

13. The estimated conceptual cost of the Project utilizing the Proposed Route is approximately \$117.7 million, which includes approximately \$101.6 million for transmission-related work and approximately \$16.1 million for substation-related work (2024 dollars).⁵

14. 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.

15. Based on the Company’s experience, the advice of consultants, and a review of

⁵ The substation related costs are discussed and broken down in Section I.I. of the Appendix.

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.

16. 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.

17. In addition to the information provided in the Appendix and the DEQ Supplement, this Application is supported by the pre-filed direct testimony of Company Witnesses Jason S. Whitlow, Sergio E. De Hoyos Irizarry, Kamlesh A. Joshi, and Melissa A. Harreld filed with this Application.

18. Finally, Dominion Energy Virginia requests that, to the extent the Commission modifies the deadline for responses to interrogatories and requests for production of documents in 5 VAC 5-20-260, the Commission grant the parties seven calendar days in order to afford the Company adequate time to provide comprehensive responses to discovery.

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

David J. DePippo
Charlotte P. McAfee
Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, Virginia 23219
(804) 819-2411 (DJD)
(804) 771-3708 (CPM)
david.j.depippo@dominionenergy.com
charlotte.p.mcafee@dominionenergy.com

Vishwa B. Link
Jontille D. Ray
Etahjayne J. Harris
McGuireWoods LLP
Gateway Plaza
800 E. Canal Street
Richmond, Virginia 23219
(804) 775-4330 (VBL)
(804) 775-1173 (JDR)
(804) 775-1465 (EJH)
vlink@mcguirewooods.com
jray@mcguirewoods.com
eharris@mcguirewoods.com

Counsel for Applicant Virginia Electric and Power Company

August 29, 2024

COMMONWEALTH OF VIRGINIA
BEFORE THE
STATE CORPORATION COMMISSION

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

**Partial Rebuild of Lines #256 and #2090/#2335 and
New 230 kV Lines #2372 (Ladysmith – New Post) and
#2378 (Lee’s Hill – New Post)**

Application No. 340

Appendix

Containing Information in Response to
“Guidelines for Transmission Line Applications Filed Under title 56 of the Code of Virginia”

Case No. PUR-2024-00159

Filed: August 29, 2024

TABLE OF CONTENTS

I.	Necessity for the Proposed Project	1
II.	Description of the Proposed Project	31
III.	Impact of Line on Scenic, Environmental and Historic Features	119
IV.	Health Aspects of EMF.....	165
V.	Notice.....	192

EXECUTIVE SUMMARY

In order to resolve identified violations of North American Electric Reliability Corporation (“NERC”) Reliability Standards and to maintain the structural integrity and reliability of its transmission system in compliance with mandatory NERC Reliability Standards, Virginia Electric and Power Company (“Dominion Energy Virginia” or the “Company”) proposes in Caroline County, Virginia, and Spotsylvania County, Virginia to:

- (1) Partially rebuild 230 kV Line #256 from Ladysmith Combustion Turbine (“CT”) to St. Johns Substation. Line #256 currently shares an existing double-circuit tower line with Line #2090, which was constructed in 2010-2011, from Ladysmith CT to Structure #256/107, #2090/107 (“Elmont Junction”). Line #256 will be reconducted on existing structures for approximately 5.1 miles, starting at Ladysmith CT and traveling to Elmont Junction. The existing right-of-way (“ROW”) in this 5.1-mile section is 250 feet in width. This portion of Line #256 will be reconducted with 2-768 ACSS conductor. One new Design Number (“DNO”)-11410 48-fiber shield wire will be installed above Line #256 for lightning protection shielding and telecommunication purposes. The existing towers for this portion of Line #256 will remain unimproved.¹ After reconducting the 5.1-mile section of Line #256, Line #256 and Line #2090 will split at Elmont Junction. Line #256 will proceed south and be rebuilt along an existing 200-foot-wide ROW to St. Johns Substation for approximately 7.3 miles on new double-circuit weathering steel monopole structures. Line #256 will be strung on one side of the double-circuit monopoles, and a new 230 kilovolt (“kV”) line will be installed on the other side of the double-circuit monopoles for a future circuit that will be extended to Elmont Substation. The conductor on both sides of the structures will be 2-768 ACSS conductor. Two new DNO-11410 48-fiber shield wires will also be installed for lightning protection shielding and telecommunication purposes. The new line and substation equipment will have a minimum summer rating of 1573 MVA² using 4000 Ampere (“A”) substation equipment.
- (2) Partially rebuild Line #2090 from Ladysmith CT to Lee’s Hill Substation. As previously noted, the 2090 Line shares an existing double-circuit tower line with Line #256 in this section that was constructed in 2010-2011. Line #2090 will be reconducted on the same existing structures as Line #256 for approximately 5.1 miles along a 250-foot-wide ROW, traveling from Ladysmith CT to Elmont Junction. This portion of the line will be reconducted with 2-768 ACSS conductor. One new DNO-

¹ While a component of the proposed Project, the reconducting portions of the project are deemed ordinary course, pursuant to Va. Code § 56-265.2 A 1 and consistent with the Staff’s July 6, 2017 guidance (available at <https://scc.virginia.gov/getdoc/7f6ec0f6-7d14-4ca9-bd8a-9bd2511c5cdb/StaffGuidanceOrdvsNonOrd.pdf>), which provides that any transmission project that only requires reconducting, maintenance or station work does not require a CPCN, except as noted therein.

² 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 retail customer projected load, reflecting representative pf, and the equipment ratings to handle the apparent power, which includes the real and reactive load components.

11410 48-fiber shield wire will be installed above Line #2090 for lightning protection shielding and telecommunication purposes. The existing towers will remain unimproved.³ After reconductoring the first 5.1-mile section, Line #256 and Line #2090 split at Elmont Junction. From Elmont Junction, Line #2090 will proceed north and be rebuilt along an existing 200-foot-wide ROW for approximately 5.5 miles on new double-circuit weathering steel monopoles to New Post Substation. Line #2090 will then continue for approximately 0.9 mile on existing 200-foot-wide ROW to Lee's Hill Substation but will be renumbered Line #2335. Line #2090/Line #2335 will be strung on one side of the double-circuit monopoles, and a new 230 kV line (Line #2372/Line #2378) will be installed on the other side of the double-circuit monopoles. The conductor on both sides of the structures will be 2-768 ACSS conductor. Two new DNO-11410 48-fiber shield wires will also be installed for lightning protection shielding and telecommunication purposes. The new line and substation equipment will have a minimum summer rating of 1573 MVA using 4000 A substation equipment.

- (3) Construct a new approximately 14.1-mile overhead 230 kV line between Ladysmith and Lee's Hill Substations, connecting at New Post Substation. The new Ladysmith – New Post line will be numbered Line #2372 and the new Lee's Hill – New Post line will be numbered #2378. Line #2372 will be installed onto the existing structures of Line #2089. Line 2089 will be reconducted from Ladysmith Substation to Ladysmith CT.⁴ Line #2372 will have three segments. Starting at Ladysmith Substation, the first segment will travel approximately 3.2 miles along an existing 250-foot-wide ROW on existing double-circuit galvanized steel towers from structure #2089/3 to 2089/18. The second segment of Line #2372 will travel approximately 4.5 miles on existing 250-foot-wide ROW from Ladysmith CT junction (Structure #2089/19) ("Ladysmith Junction") to Elmont Junction. For this segment of Line #2372, the new line will be installed on new single-circuit weathering steel 230 kV monopoles. Finally, the third segment will travel approximately 5.5 miles from Elmont Junction to New Post Substation and will be constructed on the same double-circuit weathering steel monopoles as Line #2090 along an existing 200-foot-wide ROW. All three segments will be installed with 2-768 ACSS conductor. One new DNO-11410 OPGW will be installed for lightning protection shielding and telecommunications purposes above the new Line #2372 from Ladysmith Substation to the New Post Substation. The Company will install equipment as needed at Ladysmith Substation to provide a termination point for Line #2372. Because the existing right-of-way is adequate for the new proposed Line #2372, no new right-of-way is required. Line #2372 will become Line #2378 at New Post Substation and will continue north approximately 0.9 mile along existing 200-foot-wide ROW up to Lee's Hill Substation, sharing structures with Line #2335. The same structure framing, finishing, conductor and telecom/shielding wire described for Line # 2335 will be used for Line #2378.

The components described above are collectively referred to as the "Project." PJM identified NERC reliability violations expected to occur within the Project area that, if not relieved, will severely impact the transmission system's ability to provide reliable service to the Company's

³ See *supra*, n. 2.

⁴ See *supra*, n.1.

customers in the Project area. Accordingly, the Project is required to mitigate identified potential NERC reliability violations and to maintain reliable service for overall load growth.

For the Line #256 reconductoring and partial rebuild, the existing ROW to be used is 250 feet in width from Ladysmith CT to Elmont Junction and 200 feet in width from Elmont Junction to St. John's Substation. Because the existing ROW and Company-owned property is adequate for the proposed Line #256 reconductoring and partial rebuild, no new right-of-way is required. As a result, the ROW for the Line #256 reconductoring and partial rebuild has been identified as the proposed route. Given the availability of existing ROW, statutory preference for use of existing rights-of-way, and because additional costs and environmental impacts would be associated with the acquisition of and construction on new ROW, the Company did not consider any alternative routes for the Line #256 reconductoring and partial rebuild.

For the Line #2090/#2335 reconductoring and partial rebuild, the existing ROW to be used is 250 feet in width from Ladysmith CT to Elmont Junction and 200 feet in width to New Post Substation and to Lee's Hill Substation. Because the existing ROW and Company-owned property is adequate for the proposed Line #2090 reconductoring and partial rebuild, no new ROW is required, and the ROW for the Line #2090/#2335 rebuild has been identified as the proposed route. Given the availability of existing ROW, the statutory preference for use of existing rights-of-way, and because additional costs and environmental impacts would be associated with the acquisition of and construction on new ROW, the Company did not consider any alternative routes requiring new ROW for the Line #2090/#2335 reconductoring and partial rebuild.

For the new 230 kV sources, Lines #2372 and #2378, the Company identified an approximately 14.1-mile overhead route. The existing ROW to be used is 250 feet in width from Ladysmith Substation to Elmont Junction and 200 feet in width from Elmont Junction to New Post Substation and from New Post Substation to Lee's Hill Substation. Because the existing ROW is adequate for the new proposed Lines #2372 and #2378, no new ROW is required. The Company did not consider any alternative routes requiring new ROW for Lines #2372 and #2378.

The Company is proposing these proposed routes for Commission consideration and notice. Discussion of these proposed routes and the route selection process is provided in Section II of the Appendix.

The estimated conceptual cost of the Project utilizing the proposed routes is approximately \$117.7 million, which includes approximately \$101.6 million for transmission-related work and approximately \$16.1 million for substation-related work⁵ (2024 dollars).

The desired in-service target date for the Project is June 2028. The Company estimates it will take approximately 36 months for detailed engineering, 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 31, 2025. Should the Commission issue a final order by May 31, 2025, to accommodate long-lead materials procurement, the Company estimates that construction should begin around January 2026, and be completed by June 2028. This schedule is contingent upon obtaining the

⁵ See *supra*, n.1.

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, or materials/supply issues.

In addition, the Company is actively monitoring the regulatory changes and requirements associated with the Northern long-eared bat (“NLEB”) and how they could potentially impact construction timing associated with time of year restrictions (“TOYRs”). The U.S. Fish and Wildlife Service (“USFWS”) previously indicated that it planned to issue final NLEB guidance to replace the interim guidance by April 1, 2024; however, the interim guidance has been extended by USFWS until late summer 2024. The Company is actively tracking updates from the USFWS with respect to the final guidance. Once issued, the Company plans to review and follow the final guidance to the extent it applies to the Company’s projects. Until the final guidance is issued, the Company will continue following the interim guidance. For projects that may require additional coordination, the Company will coordinate with the USFWS.

The Company is also monitoring potential regulatory changes associated with the potential up-listing of the Tricolored bat (“TCB”). On September 14, 2022, the USFWS published the proposed rule to the Federal Register to list the TCB as endangered Under the Endangered Species Act (“ESA”). USFWS recently extended its Final Rule issuance target date from September 2023 to September 2024. The Company is actively tracking this ruling and evaluating the effects of potential outcomes on the Company projects’ permitting, construction, and in-service dates, including electric transmission projects.

Any adjustments to this Project schedule resulting from these or similar challenges could necessitate a minimum of a six- to twelve-month delay in the targeted in-service date. Accordingly, for purposes of judicial economy, the Company requests that the Commission issue a final order approving both a desired in-service target date (*i.e.*, June 2028) and an authorization sunset date (*i.e.*, June 2029) for energization of the Project.

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 resolve identified violations of NERC Reliability Standards resulting from the overall load growth in the Richmond Load Area and to maintain the reliability of the Company's transmission system. See Attachment I.A.1 for an overview map of the proposed Project.

Dominion Energy Virginia's transmission system is responsible for providing transmission service (i) for redelivery to the Company's retail customers; (ii) to Appalachian Power Company, Old Dominion Electric Cooperative, Northern Virginia Electric Cooperative, Central Virginia Electric Cooperative, and Virginia Municipal Electric Association for redelivery to their retail customers in Virginia; and, (iii) to North Carolina Electric Membership Corporation and North Carolina Eastern Municipal Power Agency for redelivery to their customers in North Carolina (collectively, the "DOM Zone"). The Company needs to be able to maintain the overall, long-term reliability of its transmission system to meet its customers' evolving power needs 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 is currently 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 165,563 MW for summer peak demand, of which Dominion Energy Virginia's load portion was approximately 19,256 MW. On July 28, 2023, the Company set a record high of 21,993 MW for summer peak demand. On December 24, 2022, the Company set a winter and all-time record demand of 22,189 MW. Based on the 2024 PJM Load Forecast, the DOM Zone is expected to grow with average growth rates of 5.6% summer and 5.1% winter over the next 10 years compared to the PJM average of 1.7% and 2.0% over the same period for the summer and winter, respectively.⁶

Dominion Energy Virginia is also part of the Eastern Interconnection transmission grid, meaning its transmission system is interconnected, directly or indirectly, with

⁶ A copy of the 2024 PJM Load Report is available at the following: <https://www.pjm.com/-/media/library/reports-notices/load-forecast/2024-load-report.ashx>. See, in particular, page 3 (PJM) and pages 28, 35, 39 (DOM Zone).

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.⁷

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.⁸ 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.⁹ 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-

⁷ 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>.

⁸ PJM Manual 14B (effective December 20, 2023) focuses on the RTEP process and can be found at <https://www.pjm.com/-/media/documents/manuals/m14b.ashx>.

⁹ See PJM Manual 14B, Attachment D: PJM Reliability Planning Criteria. *See supra*, n. 8.

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 Line #256 and Line#2090/#2335 Partial Rebuilds have been designated as baseline projects in the PJM Open Window process. The New 230KV Sources for New Post and Lee’s Hill Substations (Lines #2372 and #2378) have been designated as a supplemental project. While supplemental 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.

NEED FOR THE PROJECT

As discussed in more detail below, the Project is needed to meet increased load demand, maintain reliable service for the overall load growth in the Richmond Load Area, and maintain compliance with mandatory NERC Reliability Standards. 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 data center market continues to rapidly expand in Virginia. In the Stafford to Elmont Substation Corridor, the Company projects significant load growth in excess of 10,000 MW by 2032.

As shown in the chart below, in the Project area, the Company has received 12 delivery point (“DP”) requests with a total projected load of approximately 3100 MW by 2028.

Table I.A.: DP Requests and Total Projected Load for Project Area

DP Request #	Project Name	Projected Load (MW by 2028)	Requested Target Date
993260	River View (FMR LC Reidhill Substation)	108	6/1/2025
993196	Caroline County Substation	200	6/1/2025
993185	New Post Substation	462	7/1/2025
993217	Lee’s Hill Substation	600	10/1/2025
993272	Slayden Creek Substation	210	1/1/2026
993092	Matta (FMR Thornburg)	225	3/1/2027

DP Request #	Project Name	Projected Load (MW by 2028)	Requested Target Date
	Orrock Substation)		
993242	Hickory Ridge Substation	290	1/15/2026
993261	Ruther Glen Substation (FMR Ladysmith)	338	3/2/2026
993244	Carmel Church Substation	187	12/31/2026
993317	Kettler Crossroads Substation	297	1/1/2027
993273	Falling Creek Substation	92	1/1/2028
993348	Binns Road Substation	120	5/1/2026

This demand, coupled with overall load growth in the Richmond Load Area, requires transmission line and substation upgrades to ensure the Company can continue to deliver safe and reliable service to its customers.

Line #256 Partial Rebuild (Ladysmith CT to St. Johns Substation)

The proposed Line #256 Partial Rebuild is needed to resolve Generator Deliverability violations found by PJM in the 2023 Open Window 3 and to support overall load growth in the Richmond Load Area. The overload was found on Line #256 between Ladysmith CT and St. John's Substation. Additionally, the Project is needed to resolve the 300 MW load drop identified at the Company's existing St. Johns and Four Rivers Substations.

Therefore, the Company proposes to reconductor approximately 5.1 miles from Ladysmith CT to Elmont Junction and rebuild approximately 7.3 miles of Line #256 from Elmont Junction to the St. Johns Substation to current 230 kV standards. Upgrading the existing line to a new rating of 1573 MVA will help to resolve the violations found in the 2022 Open Window 3.

Line #2090/#2335 Partial Rebuild (Ladysmith CT to Lee's Hill Substation)

The proposed Line #2090 Rebuild is needed to solve load violations resulting from the loss of Line #568 (Ladysmith - Possum Point), to maintain reliable service for the overall load growth in the area, and to comply with mandatory NERC

Reliability Standards. PJM identified an overload on Line #2090 from Ladysmith CT to Summit DP in the 2022 Open Window 3.

Therefore, the Company proposes to reconductor Line #2090 for approximately 5.1 miles from Ladysmith CT to Elmont Junction, rebuild approximately 5.5 miles of Line #2090 from Elmont Junction to New Post Substation and rebuild approximately 0.9 mile of Line #2090 from New Post Substation to Lee's Hill Substation to the Company's existing 230kV standards.¹⁰ From New Post Substation to Lee's Hill Substation, Line #2090 will be renumbered Line #2335.

New 230 kV Lines #2372 (Ladysmith - New Post) and #2378 (Lee's Hill - New Post)

The proposed Lines #2372 and #2378 are needed to increase capacity in the Stafford to Elmont Corridor resulting from significant load growth in the area, to maintain reliable service for the overall load growth in the area, and to comply with mandatory NERC Reliability Standards. This additional source is also needed to address the Company's 300 MW load drop criteria during N-1-1 scenarios as addressed in Section I.D. Therefore, the Company proposes to construct a new, approximately 14.1-mile 230 kV Line between Ladysmith and Lee's Hill Substations, connecting at New Post Substation. The new Ladysmith – New Post line will be numbered Line #2372 and the new Lee's Hill – New Post line will be numbered #2378. Line #2372 will be installed onto the existing structures of Line #2089. Existing Line #2089 currently runs from Ladysmith Substation to Ladysmith CT. This line has an existing summer rating of 1174 MVA. In order to improve power transfer flow from Ladysmith Substation to the Elmont – Fredericksburg corridor, Line #2089 will be reconducted to new 230kV standards from Ladysmith Substation to Ladysmith CT using 2-768 ACSS conductor which will provide a new summer rating of 1573 MVA.

¹⁰ Line #2090 will eventually be separated into several smaller lines. This separation will not involve construction of a new line more than 0.5 miles long, or require the use of new right-of-way or the replacement of any structures. Accordingly, the Company considers this work to be an "ordinary extension[]" or improvement[] in the usual course of business" ("ordinary course project") pursuant to Va. Code § 56-265.2 A 1 and consistent with the Staff's July 6, 2017 guidance (available at <https://scc.virginia.gov/getdoc/7f6ec0f6-7d14-4ca9-bd8a-9bd2511c5cdb/StaffGuidanceOrdvsNonOrd.pdf>).

THE PROPOSED PROJECT

The proposed Project, entirely within existing ROW, is as follows:

Line #256 Partial Rebuild (Ladysmith CT to St. Johns Substation)

First, the Company proposes to partially rebuild 230 kV Line #256 from Ladysmith CT to St. Johns Substation. Line #256 currently shares an existing double circuit tower line, which was constructed in 2010-2011, with Line #2090. Line #256 will be reconducted on existing structures for approximately 5.1 miles, from Ladysmith CT to Elmont Junction. Line #256 will share existing double circuit structures with Line #2090 in this section up to Structure 256/106. The existing ROW of this 5.1-mile section is 250 feet in width. This portion of Line #256 will be reconducted with 2-768 ACSS conductor. One new DNO-11410 48-fiber shield wire will be installed above Line #256 for lightning protection shielding and telecommunication purposes. The existing towers for this portion of Line #256 will remain unimproved. After reconducting the 5.1-mile section of Line #256, Line #256 and Line #2090 will split at Elmont Junction. Line #256 will proceed south and be rebuilt along an existing 200-foot-wide ROW to St. Johns Substation for approximately 7.3 miles on new double-circuit weathering steel monopole structures. Line #256 will be strung on one side of the double-circuit monopoles, and a new 230 kV line will be installed on the other side of the double-circuit monopoles for a future circuit that will be extended to Elmont Substation. The conductor on both sides of the structures will be 2-768 ACSS conductor. Two new DNO-11410 48-fiber shield wires will also be installed for lightning protection shielding and telecommunication purposes. The new line and substation equipment will have a minimum summer rating of 1573 MVA using 4000 A substation equipment.

Line #2090/#2335 Partial Rebuild (Ladysmith CT to Lee's Hill Substation)

Next, the Company proposes to rebuild Line #2090 from Ladysmith CT to Lee's Hill Substation. Line #2090 will be reconducted on the same existing structures as Line #256 for approximately 5.1 miles along a 250-foot-wide ROW, traveling from Ladysmith CT to Elmont Junction. This portion of the line will be reconducted with 2-768 ACSS conductor. One new DNO-11410 48-fiber shield wire will be installed above Line #2090 for lightning protection shielding and telecommunication purposes. The existing towers will remain unimproved. After reconducting the first 5.1-mile section, Line #256 and Line #2090 split at Elmont Junction. From Elmont Junction, Line #2090 will proceed north and be rebuilt along a 200-foot wide ROW for approximately 5.5 miles on new double-circuit weathering steel monopoles to New Post Substation. Line #2090 will then continue for approximately 0.9 mile along a 200-foot-wide ROW to Lee's Hill Substation but will be renumbered Line #2335. Line #2090/#2335 will be strung on one side of the double-circuit monopoles, and a new 230 kV line (Line #2372/Line#2378)

will be installed on the other side of the double-circuit monopoles. The conductor on both sides of the structures will be 2-768 ACSS conductor. Two new DNO-11410 48-fiber shield wires will also be installed for lightning protection shielding and telecommunication purposes. The new line and substation equipment will have a minimum summer rating of 1573 MVA using 4000 A substation equipment.

New 230 kV Lines #2372 (Ladysmith - New Post) and #2378 (Lee's Hill - New Post)

Finally, the Company proposes to construct a new 14.1-mile overhead 230kV line between Ladysmith and Lee's Hill Substations, connecting at New Post Substation. The new Ladysmith – New Post line will be numbered Line #2372 and the new Lee's Hill – New Post line will be numbered #2378. Line #2372 will be installed on the existing structures of Line #2089. In addition to installing the proposed Line #2372, to improve power transfer flow from Ladysmith Substation to the Elmont – Fredericksburg corridor, the Company will reconductor Line #2089 to provide a normal summer rating of 1,573 MVA. Line 2089 will be reconducted from Ladysmith Substation to Ladysmith CT. The new conductor and substation equipment will have a minimum summer rating of 1573 MVA using 4000 A substation equipment.

Line #2372 will have three segments. Starting at Ladysmith Substation, the first segment will travel approximately 3.2 miles along an existing 250-foot ROW on existing double-circuit galvanized steel towers from Structure 2089/3 to Structure 2089/18. The second segment of Line #2372 will travel 4.5 miles on existing 250-foot-wide ROW from Ladysmith Junction (Structure #2089/19) to Elmont Junction. For this segment of Line #2372, the new line will be installed on new single-circuit weathering steel 230 kV monopoles. For this segment of Line #2372, the new line will be installed on new single-circuit weathering steel 230 kV monopoles. Finally, the third segment will travel 5.5 miles from Elmont Junction to New Post Substation and will be constructed on the same double-circuit weathering steel monopoles as Line #2090 along an existing 200-foot-wide ROW. All three segments will be installed with 2-768 ACSS conductor. One new DNO-11410 OPGW will be installed for lightning protection shielding and telecommunication purposes above the new Line #2372 from Ladysmith Substation to the New Post Substation. The Company will install equipment as needed at Ladysmith Substation to provide a termination point for Line #2372. Because the existing right-of-way is adequate for the new proposed Line #2372, no new right-of-way is required.

Line #2372 will become Line #2378 at New Post Substation and will continue north approximately 0.9 mile along existing 200-foot-wide ROW up to Lee's Hill Substation, sharing structures with Line # 2335 (formerly Line #2090). The same structure framing, finishing, conductor and telecom/shielding wire described for Line # 2335 will be used for Line #2378.

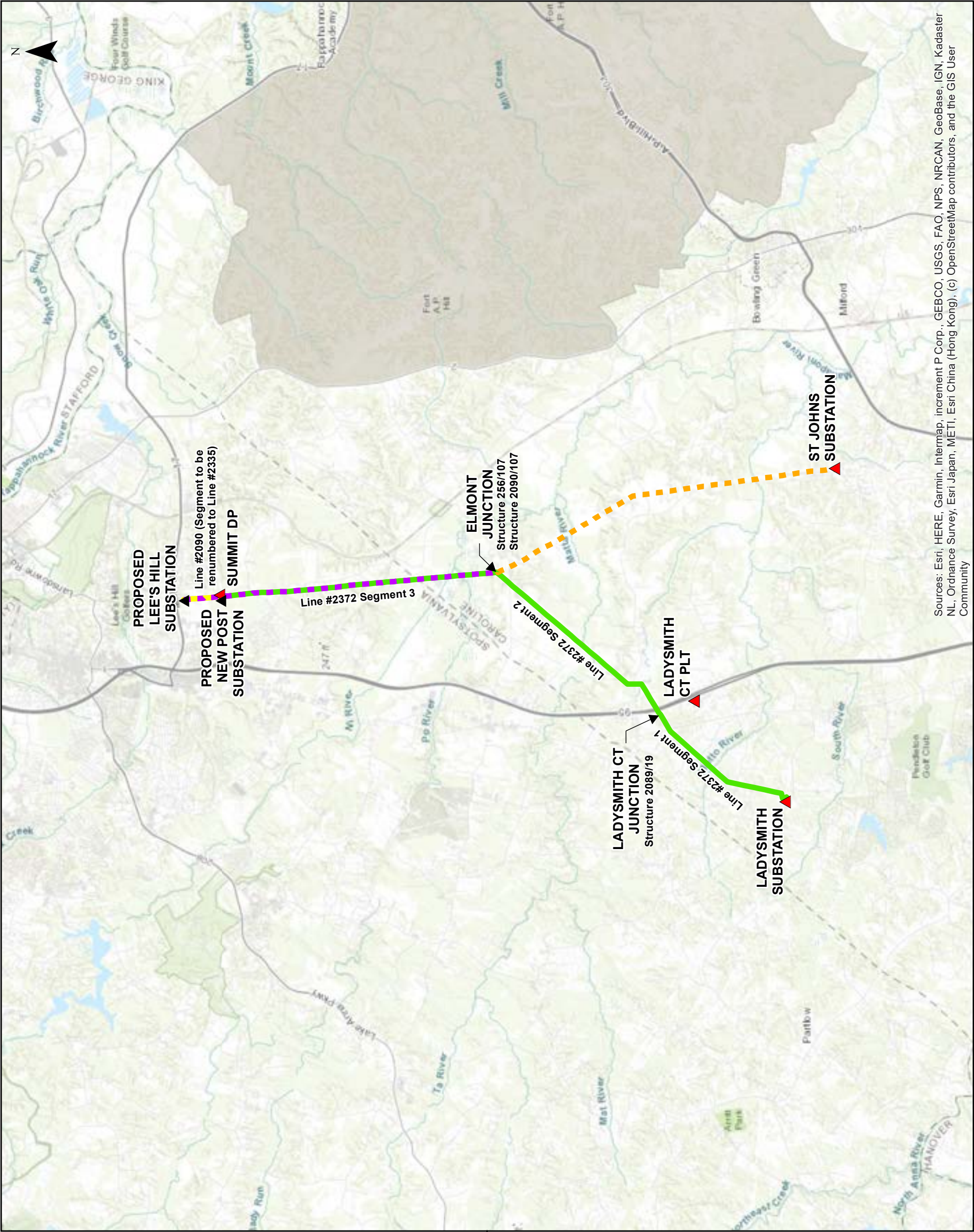
The terminal equipment at Ladysmith, Ladysmith CT, New Post, and Lee's Hill substations will be upgraded to match the new line capacity.

EXISTING & PROPOSED TRANSMISSION SYSTEM

Attachment I.A.2 provides existing one-line diagrams of the area transmission system. Attachment I.A.3 provides one-line diagrams of the area transmission system with the proposed Project, including future substations presented to PJM in the Richmond Load Area.

See Attachment II.A.2 for a map depicting the proposed Project area and constraints.

In summary, the proposed Project will resolve identified potential violations of mandatory NERC Reliability Standards and maintain the structural integrity and reliability of the transmission system for the overall load growth in the Richmond Load Area.



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

ATTACHMENT I.A.1

PROJECT OVERVIEW MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill) Caroline and Spotsylvania Counties, Virginia

Client:

Dominion Energy Virginia

C2 Env Project:

0354

Prepared By:

JRC

Date:

08/15/24

0124 Miles

Scale is 1 IN = 2 MI when printed at original size of 11x17

Proposed 230 kV Line #2372 in Existing ROW

Proposed 230 kV Line #2378 in Existing ROW

Existing 230 kV Line #2090 (and Future Line #2335) Partial Rebuild

Existing 230 kV Line #256 Partial Rebuild

Proposed Substation

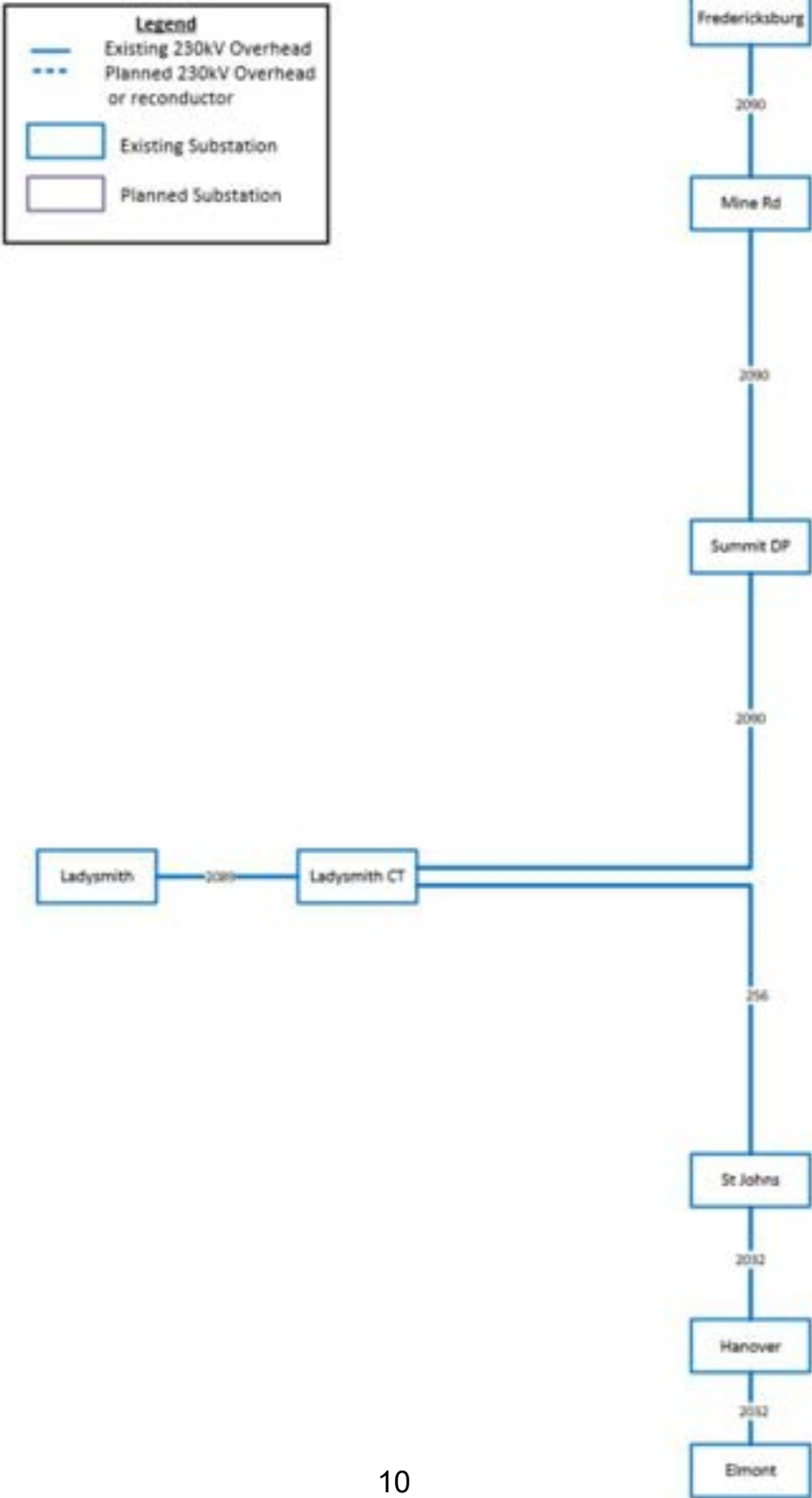
Existing Substation

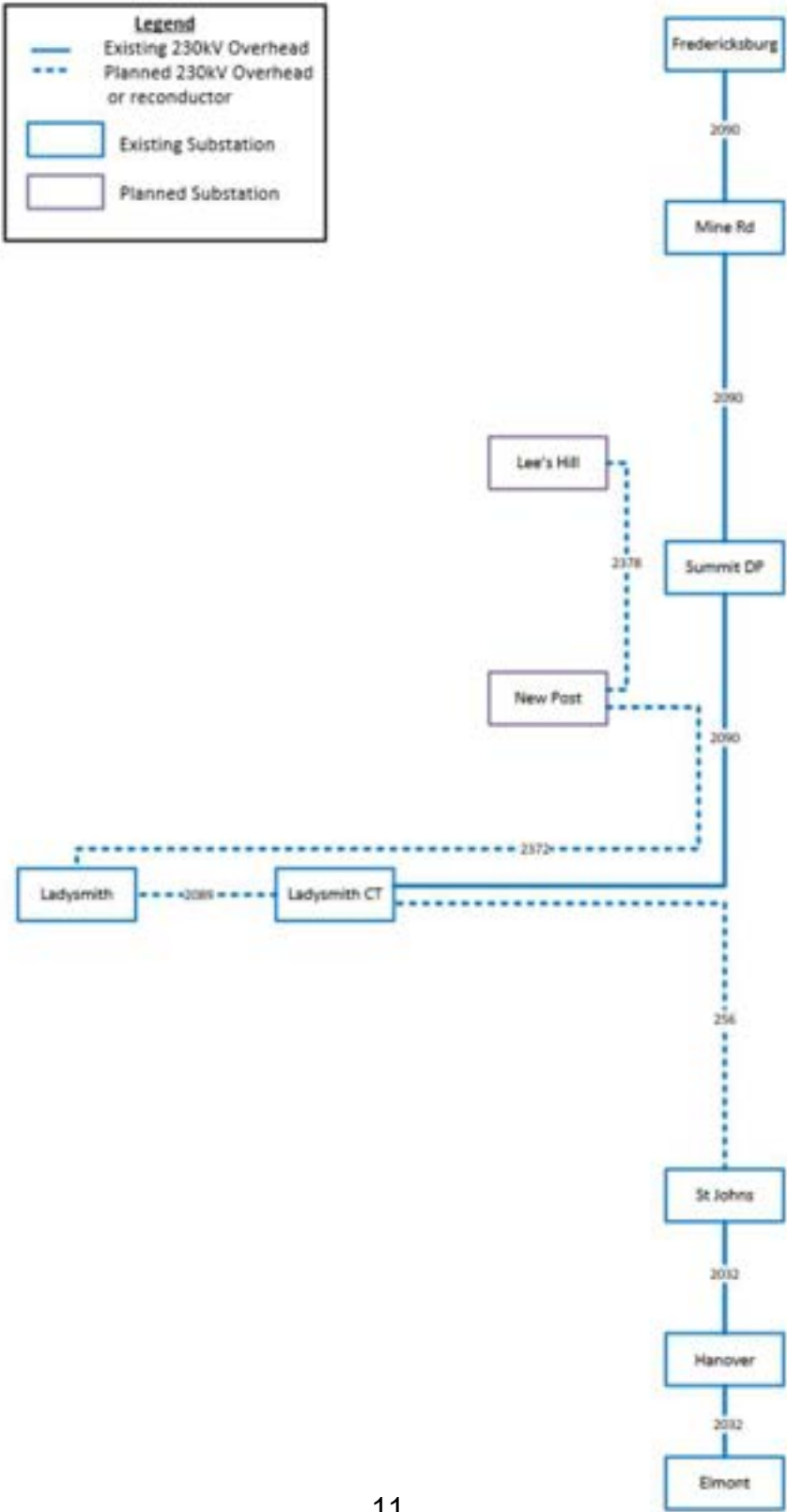
- Notes:
- 1. Basemap from ESRI World Topographic Map
 - 2. Project centerline provided by Dominion Energy Virginia
 - 3. Roads and railroads from Virginia Geographic Information Network



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN,







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**

See Section I.A of the Appendix.

(2) Known Future Projects

As described in Section I.A, the proposed Project is needed to serve future data center development, to meet increased load demand, and maintain reliable service for overall load growth in the area, consistent with NERC Reliability Standards. See Attachment I.A.1 for existing and future distribution facilities in the affected load area, including the proposed Project, which will work together to continue to serve existing and future customers in the area. While future Company projects are located generally within the same load area, each has its own unique load growth drivers, and as such, these future projects do not “require” the proposed Project to be constructed.¹¹

(3) Planning Studies

As part of any RTEP cycle, PJM along with the member TOs run baseline reliability analysis to identify if any potential violations exist based on projected network topology and loading. A portion of Manual 14B Section 1.4.1.1 describes the process from a high level:

PJM Manual 14B – 1.4.1.1 Baseline reliability analyses

The PJM Transmission System (“PJM System”) provides the means for delivering the output of interconnected generators to the load centers in the PJM energy and capacity markets. Baseline reliability analyses ensure the security and adequacy of the Transmission System to serve all existing and projected long term firm transmission use including existing and projected native load growth as well as long term firm transmission service. RTEP

¹¹ See *supra*, n.10.

baseline analyses include system voltage and thermal analysis, and stability, load deliverability, and generator deliverability testing. These tests variously entail single and multiple contingency testing for violations of established NERC reliability criteria regarding stability, thermal line loadings and voltage limits.¹²

Any thermal, voltage, or generation deliverability violations will require a baseline network upgrade. Typically, during the RTEP cycle, PJM is focused on a case that is five years out in time. PJM identified an overload on Line #256 between Ladysmith CT and St. Johns Substation under the 2022 RTEP Open Window 3 scenario. PJM also identified an overload on Line #2090 between Ladysmith CT and Summit DP in the 2027 High Load case under Generator Deliverability studies.

(4) Facilities List

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

See Attachment I.A.3 for transmission infrastructure planned for the affected area of Caroline County and Spotsylvania County, Virginia. See Attachment I.G.1 for existing and future transmission facilities.

¹² See *supra*, n. 8 as to the web address where PJM Manual 14B is located.

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: For this Application, the Richmond Area is defined generally as the area along the Interstate 95 corridor between Stafford, VA and Elmont Substation. See Attachment I.G.1 for the portion of the Company's transmission facilities in the area of the Project and Attachment I.A.1 for the approximate boundary of the Richmond Load Area.

Line #256 Partial Rebuild (Ladysmith CT to St. Johns Substation)

The rebuild will increase the line capacity from the existing 876 MVA to 1573 MVA. This conductor rating increase, along with the new 230kV Lines #2372 and #2378, will prevent the lines from becoming overloaded in Generator Deliverability reliability studies.

Line #2090/#2335 Partial Rebuild (Ladysmith CT to Lee's Hill Substation)

The rebuild will increase the line capacity from the existing 1174 MVA to 1573 MVA. This conductor rating increase, along with the new 230kV Lines #2372 and #2378, will prevent the lines from becoming overloaded in Generator Deliverability reliability studies.

New 230 kV Lines #2372 (Ladysmith - New Post) and #2378 (Lee's Hill - New Post)

Projected loads from the 12 DP requests discussed in Section I.A are shown in Table I.A. The projections from the new DP requests are estimated to drive the total direct-connected load in the Project Area to over 3100 MW by 2028 and 4,500 MW by 2032. In the corridor to the immediate north, between Lee's Hill and Stafford, the Company has received DP requests for an additional 16 new substations to serve the growing data center load. The projected new load in this area is estimated to be over 600 MW by 2028 and over 3,000 MW by 2032. See Attachment I.C.1.

Due to the volume of DP requests, the Company continues to model the impacts of this unprecedented load growth; however, given the reliability upgrades that have already been identified in the Project Area, the Company's strategy to maximize the number of lines that can fit into the existing rights-of-way by rebuilding existing

single-circuit structures with double-circuit structures, utilizing current 230 kV standards with a minimum normal summer rating of 1573 MVA, is prudent utility practice.

Loads taken from 2023-2038 MW / MVAR Load Projection Spreadsheet
Highlighted cells used in application

Forecast Load MW

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	MAX	MIN
Richmond Area Summer	2280	2368	2403	2474	2553	2687	2828	2969	3103	3255	3255	2280
Richmond Area Winter	2467	2531	2641	2680	2748	2833	2964	3116	3268	3397	3397	2467

Historic Load MW

	2019	2020	2021	2022	2023					MAX	MIN
Richmond Area Summer	1878	2006	1980	2056	2204					2204	1878
Richmond Area Winter	2087	1816	1819	2131	2400					2400	1816

I. NECESSITY FOR THE PROPOSED PROJECT

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

Response: See Sections I.A and I.C above. See also Table I.A.

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 did not identify any feasible alternatives for the proposed Project because there is no alternative within the existing right of way that can satisfy the proposed Project's three primary drivers, which are to: (i) maintain the structural integrity and reliability of the networked transmission system; (ii) resolve identified violations of the mandatory NERC Reliability Standards; and (iii) provide for future load growth in the area.

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, 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, the Company has identified a need for the Project in order to maintain the structural integrity and reliability of the networked transmission system and comply with mandatory NERC Reliability Standards given the future load growth in the area.¹³ Notwithstanding, when performing an analysis based on PJM's 50/50 load forecast, there is no adjustment in load for DR programs because PJM only dispatches DR when the system is under stress (*i.e.*, a system emergency). Accordingly, while existing DSM is considered to the extent the load forecast accounts for it, DR that has been bid previously into PJM's capacity market is not a factor in this particular Application because of the identified need for the Project. Based on these considerations, the evaluation of the Project demonstrated that despite accounting for DSM consistent with PJM's methods, the Project is necessary.

Incremental DSM also will not eliminate the need for the Project. As discussed in Section I.C, the Project is necessary to resolve identified violations of NERC Reliability Standards and to maintain the structural integrity and reliability of its transmission system. As reflected in Sections I.A and I.C, the projected load fully built out, combined with emerging load in the Stafford to Elmont Substation Corridor Area, is in excess of 3000 MW by 2028. By way of comparison, statewide the Company achieved demand savings of 276.5 MW (net) / 350 MW (gross) from its DSM Programs in 2023.

¹³ 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 PJM's load forecast considers the historical non-coincident peak ("NCP") for each load serving entity ("LSE") within PJM, it reflects the actual load reductions achieved by DSM programs to the extent an LSE has used DSM to reduce its NCPs.

I. NECESSITY FOR THE PROPOSED PROJECT

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

Response: Line #256 Partial Rebuild (Ladysmith CT to St. Johns Substation)

The Line #256 Partial Rebuild will require removing all existing single-circuit 230 kV structures from Structure #256/107 to Structure 256/168, which are primarily wood H-Frame Structures. The existing steel structures supporting Line #256 from Ladysmith CT to Structure #256/106 will be reused.

As proposed, the Company plans to replace the removed structures with two side-by-side single-circuit 230 kV structures, which are primarily weathering steel monopole structures, in order to support the rebuilt Line #256 for approximately 7.3 miles within the existing 200-foot-wide ROW.

Additionally, the Line #256 Partial Rebuild includes replacing the existing three-phase twin-bundled 795 ACSR conductors with three-phase 2-768 ACSS conductors. The existing Line #256 795 ACSR conductors have a normal/summer transfer capability of 1225 MVA. The proposed Line #256 768 ACSS conductors have a normal/emergency transfer capability of approximately 1573 MVA.

Line #2090/#2335 Partial Rebuild (Ladysmith CT to Lee's Hill Substation)

Elmont Junction to New Post Substation

The Line #2090/#2335 Partial Rebuild will require removing all the existing single circuit 230 kV structures from Structure #2090/105 to Structure #2090/63, which are primarily wood H-Frame Structures. All existing steel structures supporting Line #2090 from Ladysmith CT to Structure #2090/106 will be reused.

As proposed, the Company plans to replace the removed structures with two side-by-side single-circuit 230 kV structures, which are primarily weathering steel monopole structures, in order to support the rebuilt Line #2090 for approximately 5.5 miles within the existing 200-foot-wide ROW.

New Post Substation to Lee's Hill Substation

The Line #2090/#2335 Partial Rebuild will also require removing all the existing single-circuit 230 kV structures from Structure #2090/60 to Structure #2090/55, which are primarily wood H-Frame structures. This section of Line #2090 will be renumbered as Line #2335.

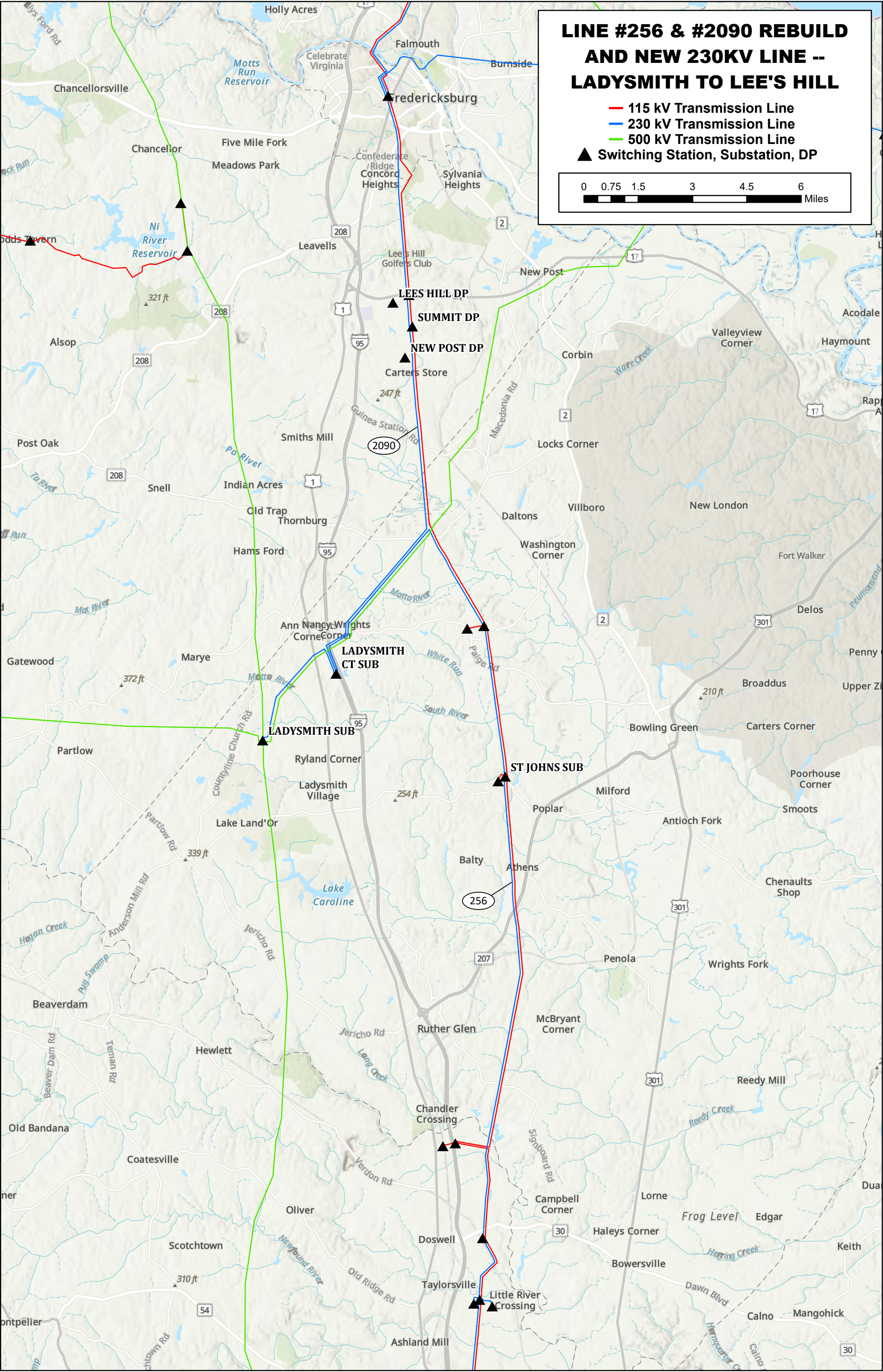
As proposed, the Company plans to replace the removed structures with two side-by-side single-circuit 230 kV structures, which are primarily weathering steel monopole structures, in order to support the rebuilt Line #2090 for approximately 0.9 mile within the existing 200-foot-wide ROW.

Additionally, the Line #2090/#2335 Partial Rebuild includes replacing the existing three-phase twin-bundled 795 ACSR conductors with three-phase 2-768 ACSS conductors. The existing Line #2090 795 ACSR conductors have a normal/summer transfer capability of 1225 MVA. The proposed Line #2090/#2335 768 ACSS conductors have a normal/emergency transfer capability of approximately 1573 MVA.

I. NECESSITY FOR THE PROPOSED PROJECT

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

Response: See Attachment I.G.1.



I. NECESSITY FOR THE PROPOSED PROJECT

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

Response: The desired in-service target date for the Line #2090/#2335 and Line #2372/Line#2378 portion of the proposed Project is June 2027. The desired in-service target date for the Line #256 portion of the proposed Project is June 2028.

The Company estimates it will take approximately 36 months for detailed engineering, 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 31, 2025. Should the Commission issue a final order by May 31, 2025, to accommodate long-lead materials procurement, the Company estimates that construction should begin around January 2026, and be completed by June 2028. 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 or materials/supply issues.

In addition, the Company is actively monitoring regulatory changes and requirements associated with the northern long-eared bat (“NLEB”) and how they could potentially impact construction timing associated with time of year restrictions (“TOYRs”). The U.S. Fish and Wildlife Service (“USFWS”) previously indicated that it planned to issue final NLEB guidance to replace the interim guidance by April 1, 2024; however, the interim guidance has been extended by USFWS until late summer 2024. The Company is actively tracking updates from the USFWS with respect to the final guidance. Once issued, the Company plans to review and follow the final guidance to the extent it applies to the Company’s projects. Until the final guidance is issued, the Company will continue following the interim guidance. For projects that may require additional coordination, the Company will coordinate with the USFWS.

The Company is also monitoring potential regulatory changes associated with the potential up-listing of the tricolored bat (“TCB”). On September 14, 2022, the USFWS published the proposed rule to the Federal Register to list the TCB as endangered under the Endangered Species Act (“ESA”). USFWS recently extended its Final Rule issuance target from September 2023 to September 2024. The Company is actively tracking this ruling and evaluating the effects of potential outcomes on Company projects’ permitting, construction, and in-service dates, including electric transmission projects.

Any adjustments to this Project schedule resulting from these or similar challenges could necessitate a minimum of a six- to twelve-month delay in the targeted in-service date. Accordingly, for purposes of judicial economy, the Company requests that the Commission issue a final order approving both a desired in-service target date (*i.e.*, June 2028) and an authorization sunset date (*i.e.*, June 2029) for energization of the Project.

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 total estimated conceptual cost of the Project utilizing the Proposed Route is approximately \$117.7 million, which includes approximately \$101.6 million for transmission-related work and approximately \$16.1 million for substation-related work (2024 dollars).

The substation related costs are broken out by substation in the table below.

**Substation-Related Costs by Substation
(Millions (approximate))**

Substation	Estimated Conceptual Costs
Ladysmith Sub	\$4.8M
Ladysmith CT	\$6.0M
New Post	\$2.7M
Lee's Hill	\$2.5M

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: Line #256 Partial Rebuild (Ladysmith CT to St. Johns Substation)

As discussed in Section I.A., PJM notified the Company of a potential violation on Line #256 from Ladysmith CT to St Johns Substation in the 2022 Open Window 3. The Project has been designated as a baseline project in the PJM Open Window process and has been assigned baseline number b3800.373-374.

Line #2090/#2335 Partial Rebuild (Ladysmith CT to Lee's Hill Substation)

As discussed in Section I.A., PJM notified the Company of a potential violation on Line #2090 from Ladysmith CT to Summit DP in the 2022 Open Window 3. The Project has been designated as a baseline project in the PJM Open Window process and has been assigned baseline number b3800.359

New 230 kV Lines #2372 (Ladysmith - New Post) and #2378 (Lee's Hill - New Post)

As discussed in Section I.A, to maintain reliable service for the overall load growth in the Stafford to Elmont Substation Corridor and consistent with NERC Reliability Standards, the Company plans to submit the new 230kV Line #2372 (Ladysmith - New Post) and new 230kV Line #2378 (Lee's Hill – New Post) to PJM in 2024 as part of the Supplemental Process. The New 230 kV Sources for New Post and Lee's Hill Substations have been designated as a supplemental project in the PJM RTEP process. They will be assigned Dominion Supplemental Numbers and are anticipated to be presented to PJM in the third quarter of 2024.

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

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. See Sections I.A and I.C.

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. See Sections I.A and I.C.

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: Not applicable.

II. DESCRIPTION OF THE PROPOSED PROJECT

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

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

Response: Given the availability of existing ROW and the statutory preference given to the use of existing ROW, and because additional costs and environmental impacts would be associated with the acquisition and construction of new ROW, the Company did not consider any alternate routes requiring new ROW for the Project. See Section II.A.9.

The Project will be located within the existing transmission line ROW which spans approximately 3.2 miles from the Ladysmith Substation to Ladysmith CT and then continues east approximately 4.5 miles from Ladysmith CT to Elmont Junction. The Project ROW splits at Elmont Junction to travel north approximately 5.5 miles to New Post Substation and then approximately 0.9 mile from New Post Substation to Lee's Hill Substation, and to travel south approximately 7.3 miles to St. Johns Substation. No alternative routes are proposed for this Project.

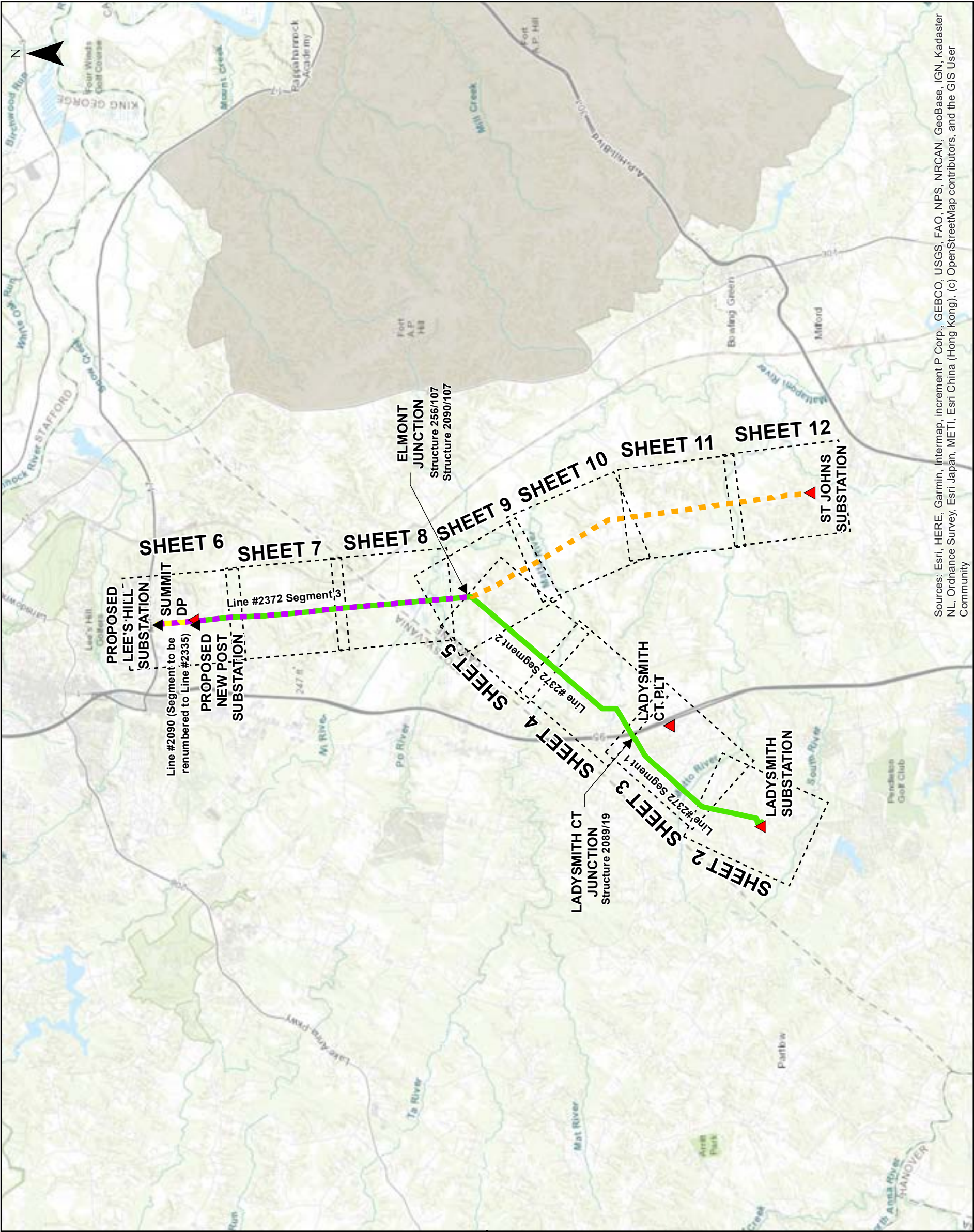
II. DESCRIPTION OF THE PROPOSED PROJECT

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 ROW 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.



ATTACHMENT II.A.2
ENVIRONMENTAL CONSTRAINTS MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)

Client: Caroline and Spotsylvania Counties, Virginia

Dominion Energy Virginia

C2 Env Project: 0354 Prepared By: JRC Date: 08/15/24

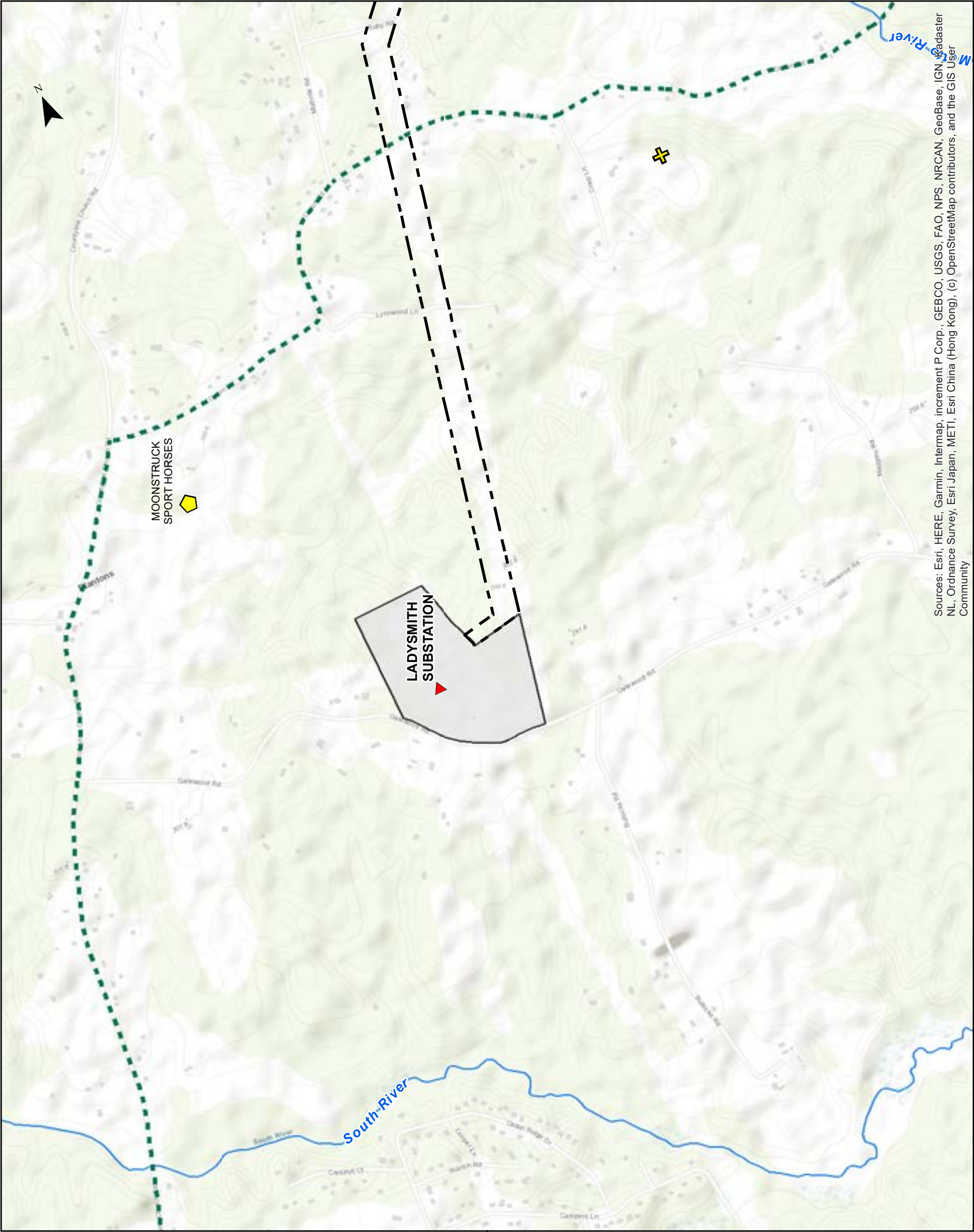
- Scale is 1 IN = 2 MI when printed at original size of 11x17
- 0 1 2 4 Miles
- Map Sheet
- Proposed 230 kV Line #2372 in Existing ROW
 - Proposed 230 kV Line #2378 in Existing ROW
 - Existing 230 kV Line #2090 (and Future Line #2335) Partial Rebuild
 - Existing 230 kV Line #256 Partial Rebuild
 - Proposed Substation
 - Existing Substation

Notes:

1. Basemap from ESRI Topographic and World Street Map
2. Project right-of-way provided by Dominion Energy Virginia
3. Conservation lands, easements, and local lands from Virginia Department of Conservation and Recreation, U.S. Geological Survey Protected Areas Database of the U.S., and Department of Historic Resources Virginia Cultural Resources Information System
4. Places digitized from Google Earth
5. Railroads from Virginia Geographic Information Network
6. Stream centerlines from U.S. Geological Survey National Hydrography Dataset



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

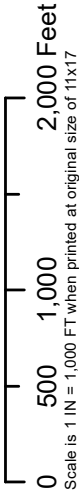
ATTACHMENT II.A.2
ENVIRONMENTAL CONSTRAINTS MAP

Partial Rebuild of Lines #256 and #2090/#2335
(Ladysmith, St. Johns, New Post, Lee's Hill)
and New 230 kV Line #2372 (Ladysmith - New Post)
and New 230 kV Line #2378 (New Post - Lee's Hill)

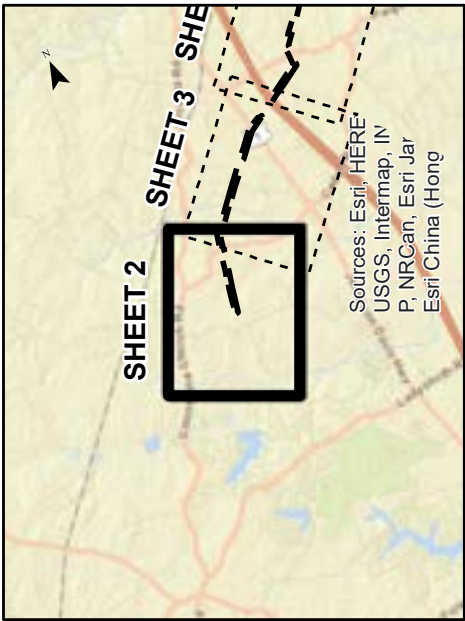
Caroline and Spotsylvania Counties, Virginia

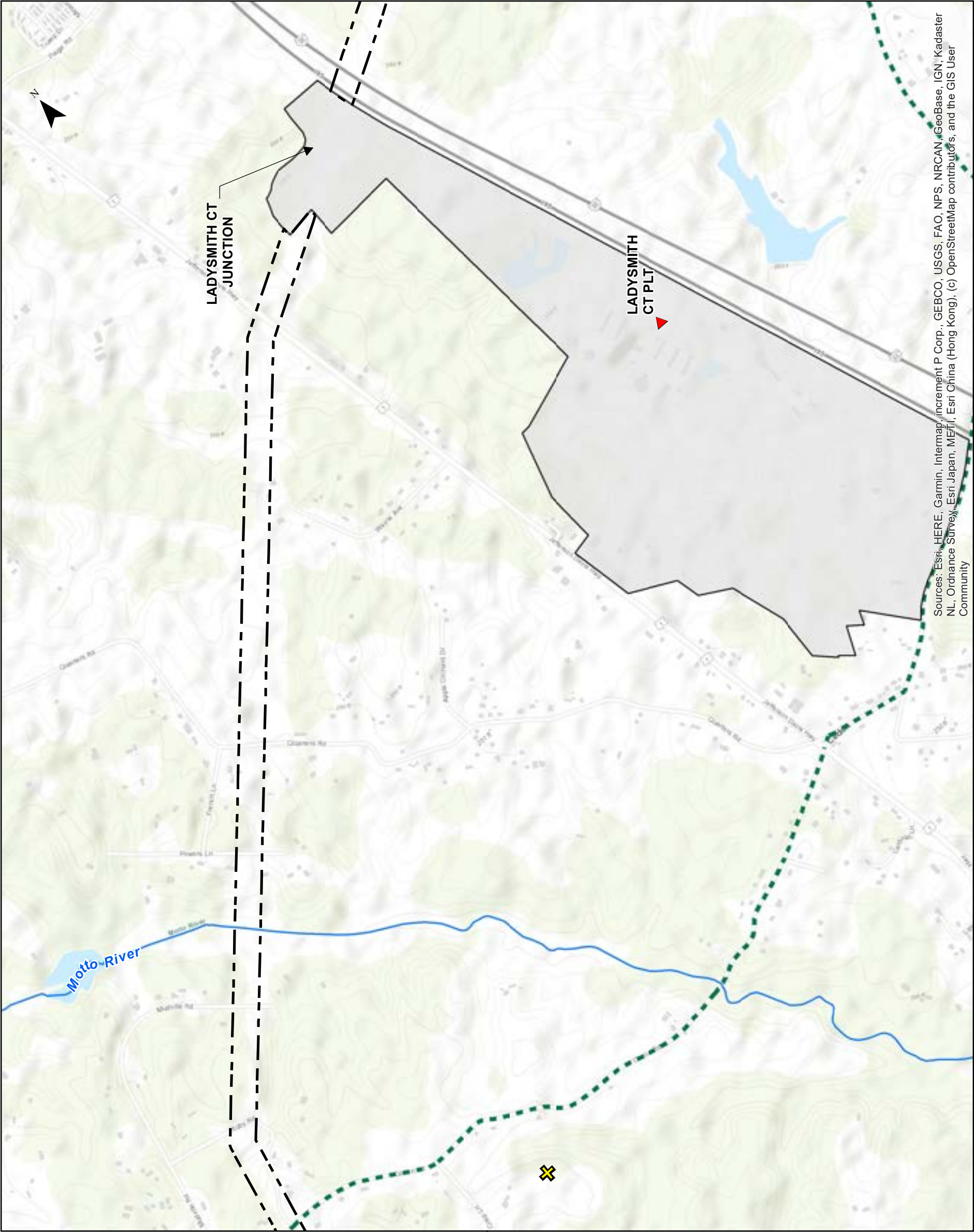
Client:
Dominion Energy Virginia

C2 Env Project:	Prepared By:	Date:
0354	JRC	08/15/24



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Dominion Owned Substation Parcel
- Spotsylvania County Easement
- Spotsylvania County Park
- Virginia Department of Historic Resources Easement
- Private Conservation Easement
- Wetlands Reserve Program (WRP)
- Eligible or Potentially Eligible VCRIS Architecture Resource
- School
- Cemetery
- Place of Worship
- Other Recreational Site
- US Bike Route 1
- USGS National Hydrography Stream Centerline
- Scenic River
- Railroad





ATTACHMENT II.A.2
ENVIRONMENTAL CONSTRAINTS MAP

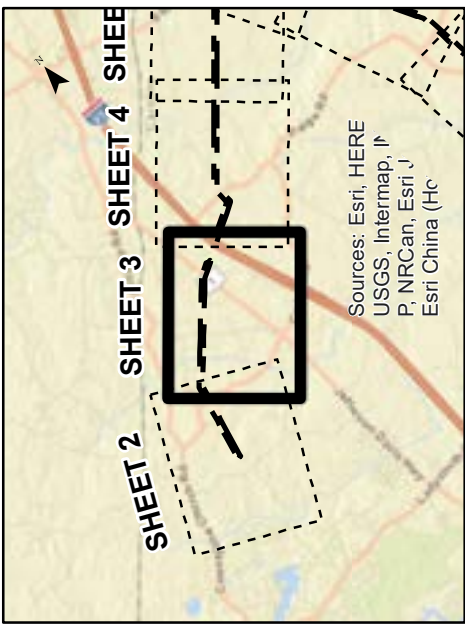
Partial Rebuild of Lines #256 and #2090/#2335
(Ladysmith, St. Johns, New Post, Lee's Hill)
and New 230 kV Line #2372 (Ladysmith - New Post)
and New 230 kV Line #2378 (New Post - Lee's Hill)

Client:
Dominion Energy Virginia

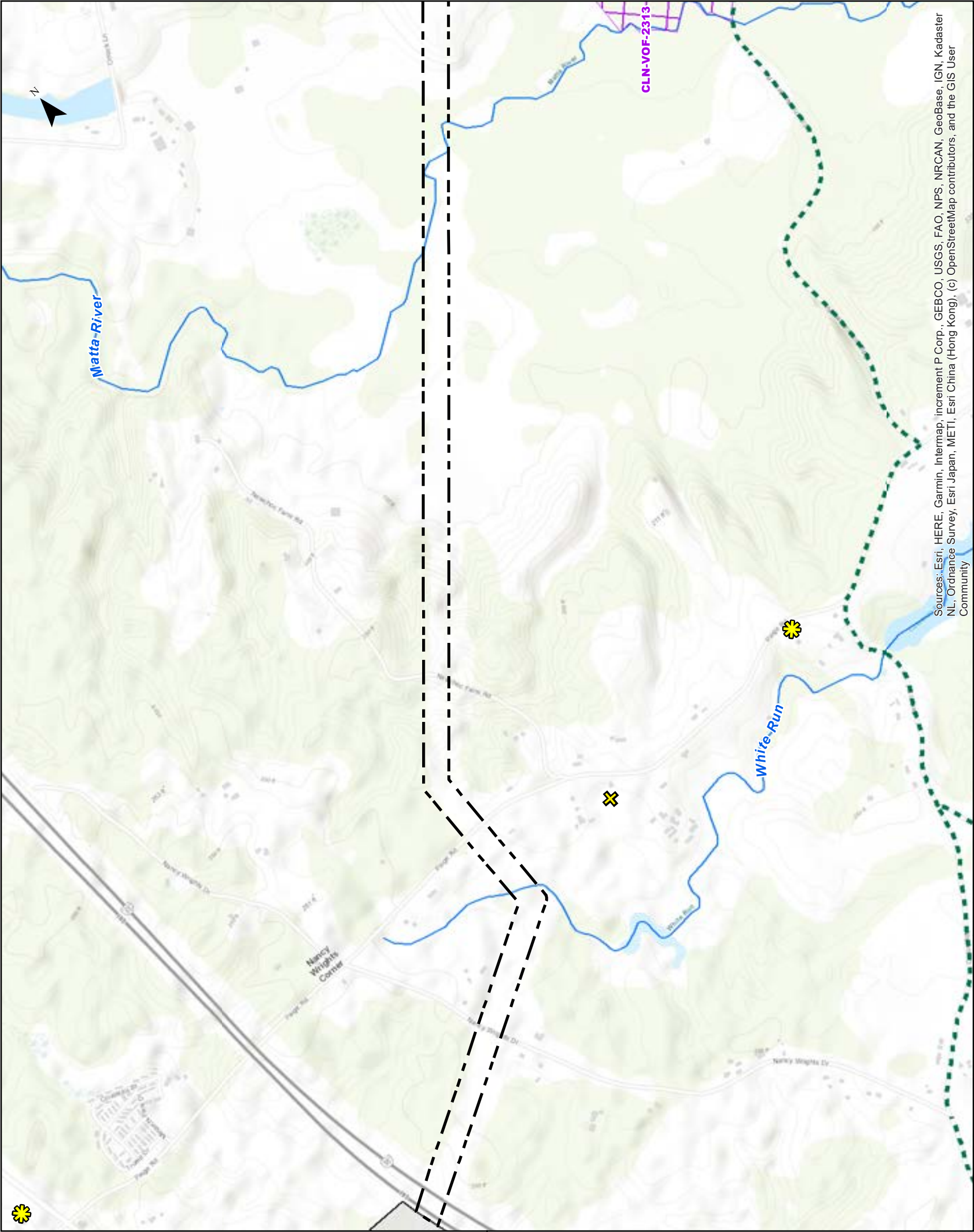
C2 Env Project: 0354
Prepared By: JRC
Date: 08/15/24



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Dominion Owned Substation Parcel
- Spotsylvania County Easement
- Spotsylvania County Park
- Virginia Department of Historic Resources
- Private Conservation Easement
- Wetlands Reserve Program (WRP)
- Eligible or Potentially Eligible VCRIS Architecture Resource
- School
- Place of Worship
- Cemetery
- Other Recreational Site
- US Bike Route 1
- USGS National Hydrography Stream Centerline
- Scenic River
- Railroad



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

ATTACHMENT II.A.2
ENVIRONMENTAL CONSTRAINTS MAP

Partial Rebuild of Lines #256 and #2090/#2335
(Ladysmith, St. Johns, New Post, Lee's Hill)
and New 230 kV Line #2372 (Ladysmith - New Post)
and New 230 kV Line #2378 (New Post - Lee's Hill)

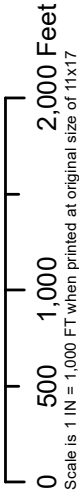
Caroline and Spotsylvania Counties, Virginia

Client:

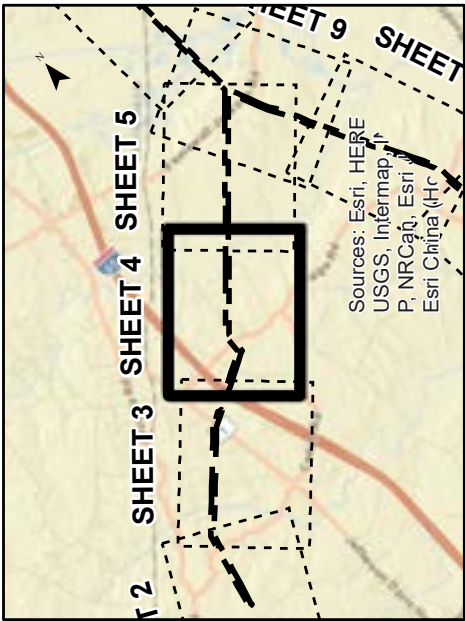
Dominion Energy Virginia

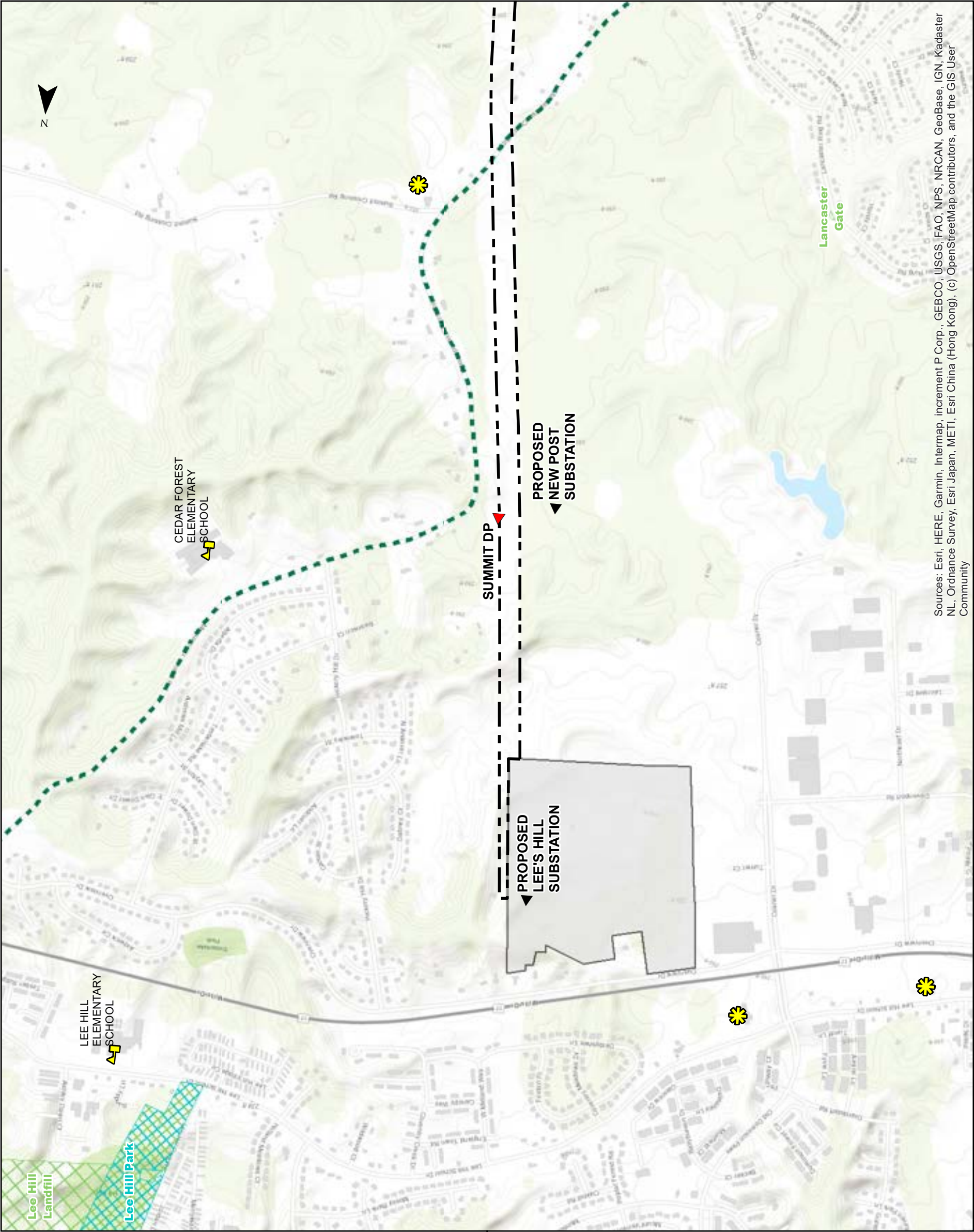
C2 Env Project: Prepared By: Date:

0354 JRC 08/15/24



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Dominion Owned Substation Parcel
- Spotsylvania County Easement
- Spotsylvania County Park
- Virginia Department of Historic Resources Easement
- Private Conservation Easement
- Wetlands Reserve Program (WRP)
- Eligible or Potentially Eligible VCRIS Architecture Resource
- School
- Cemetery
- US Bike Route 1
- USGS National Hydrography Stream Centerline
- Scenic River
- Railroad
- Place of Worship
- Other Recreational Site



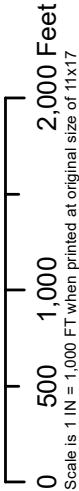


ATTACHMENT II.A.2
ENVIRONMENTAL CONSTRAINTS MAP

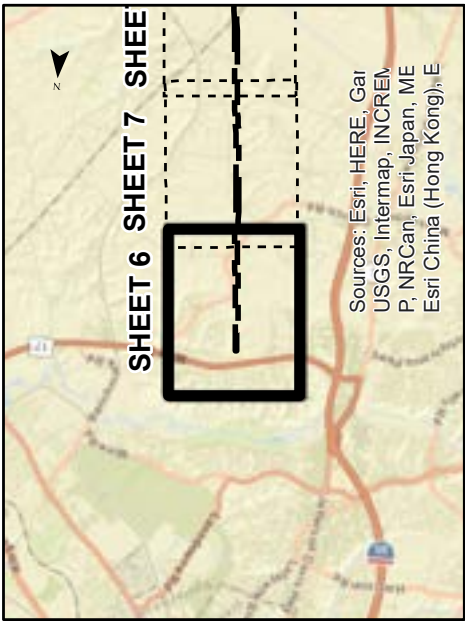
Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)

Client:
Dominion Energy Virginia

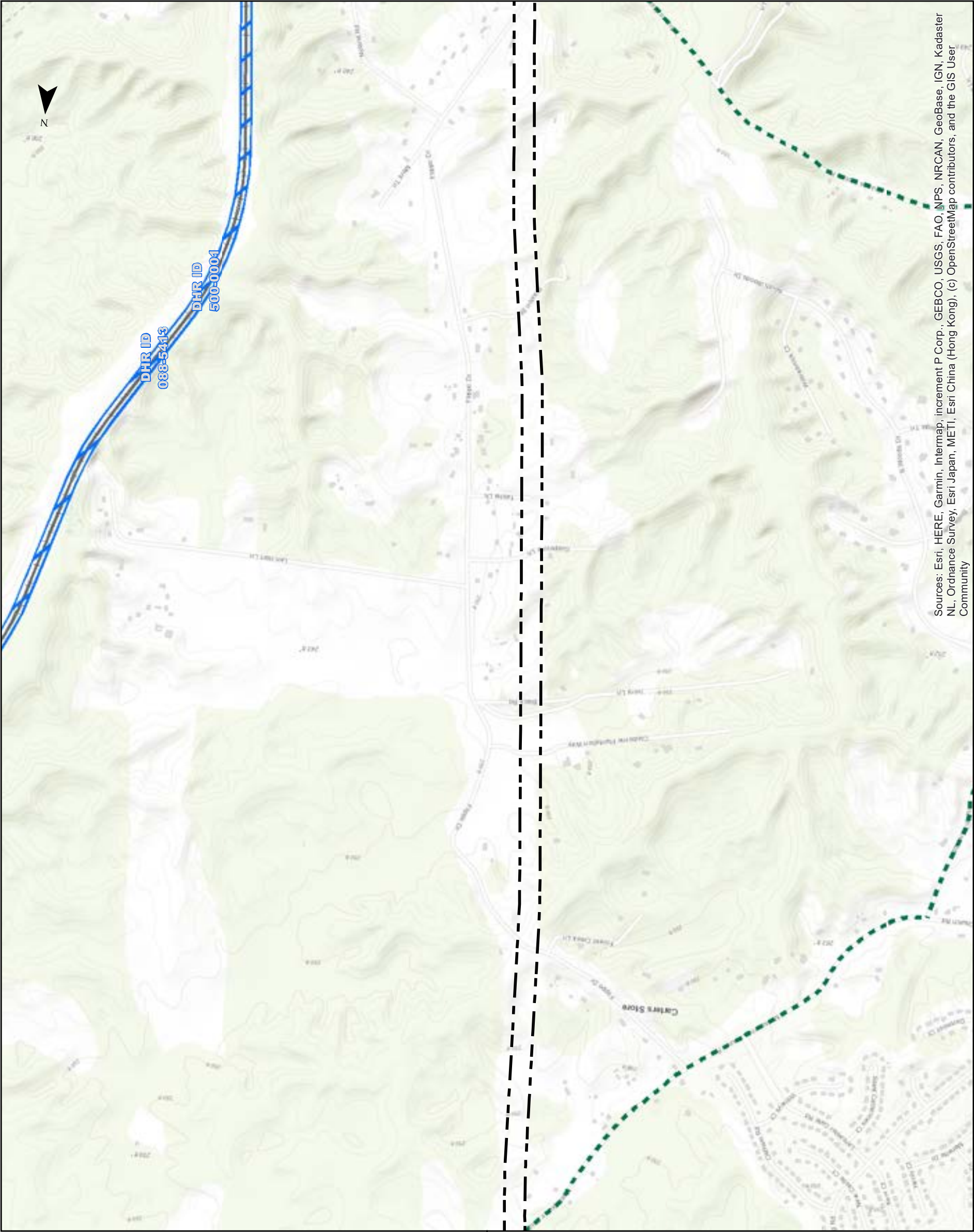
C2 Env Project: 0354
Prepared By: JRC
Date: 08/15/24



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Dominion Owned Substation Parcel
- Spotsylvania County Easement
- Spotsylvania County Park
- Virginia Department of Historic Resources Easement
- Private Conservation Easement
- Wetlands Reserve Program (WRP)
- Eligible or Potentially Eligible VCRIS Architecture Resource
- School
- Cemetery
- US Bike Route 1
- USGS National Hydrography Stream Centerline
- Scenic River
- Railroad
- Place of Worship
- Other Recreational Site



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

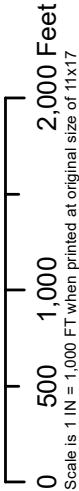


ATTACHMENT II.A.2
ENVIRONMENTAL CONSTRAINTS MAP

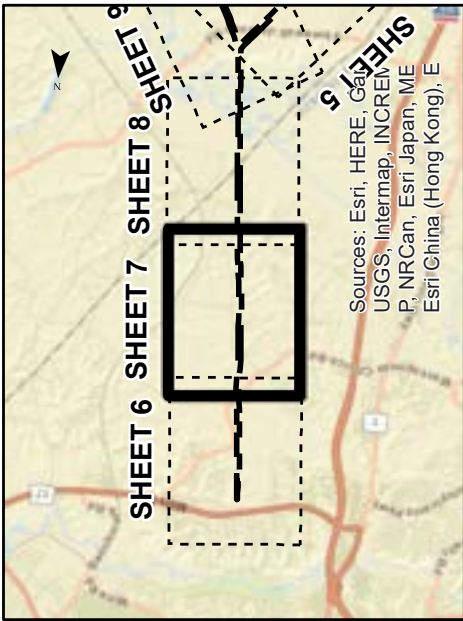
Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)

Caroline and Spotsylvania Counties, Virginia
Client:
Dominion Energy Virginia

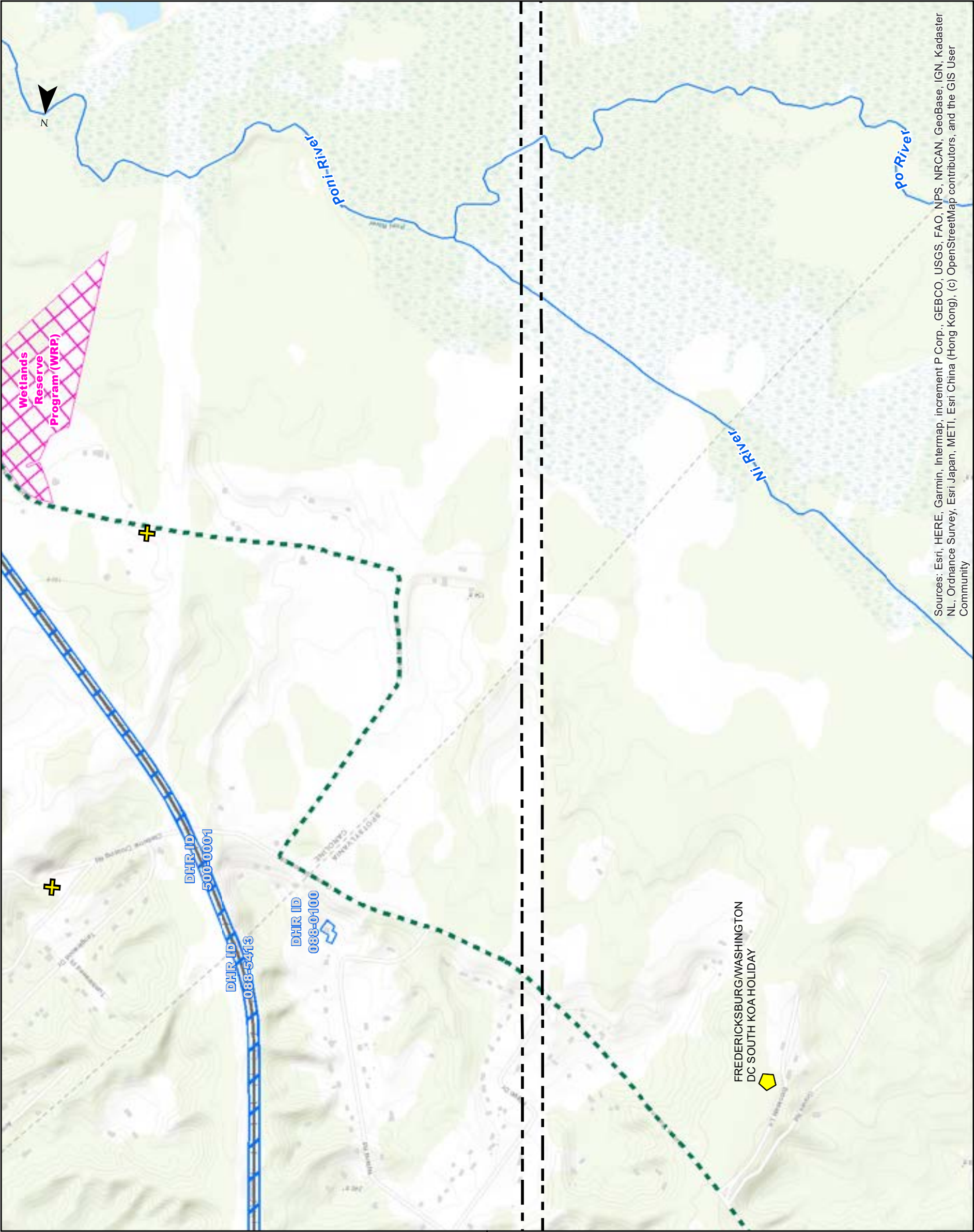
C2 Env Project:	Prepared By:	Date:
0354	JRC	08/15/24



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Dominion Owned Substation Parcel
- Spotsylvania County Easement
- Spotsylvania County Park
- Virginia Department of Historic Resources Easement
- Private Conservation Easement
- Wetlands Reserve Program (WRP)
- Eligible or Potentially Eligible VCRIS Architecture Resource
- School
- Cemetery
- US Bike Route 1
- USGS National Hydrography Stream Centerline
- Scenic River
- Railroad
- Place of Worship
- Other Recreational Site



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



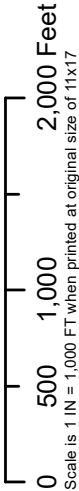
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

ATTACHMENT II.A.2
ENVIRONMENTAL CONSTRAINTS MAP

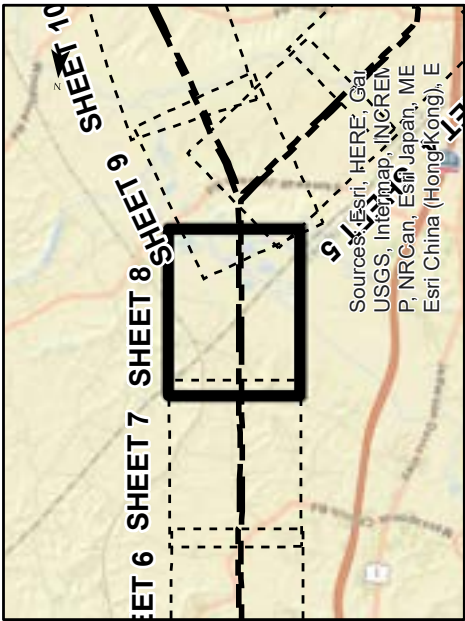
Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)

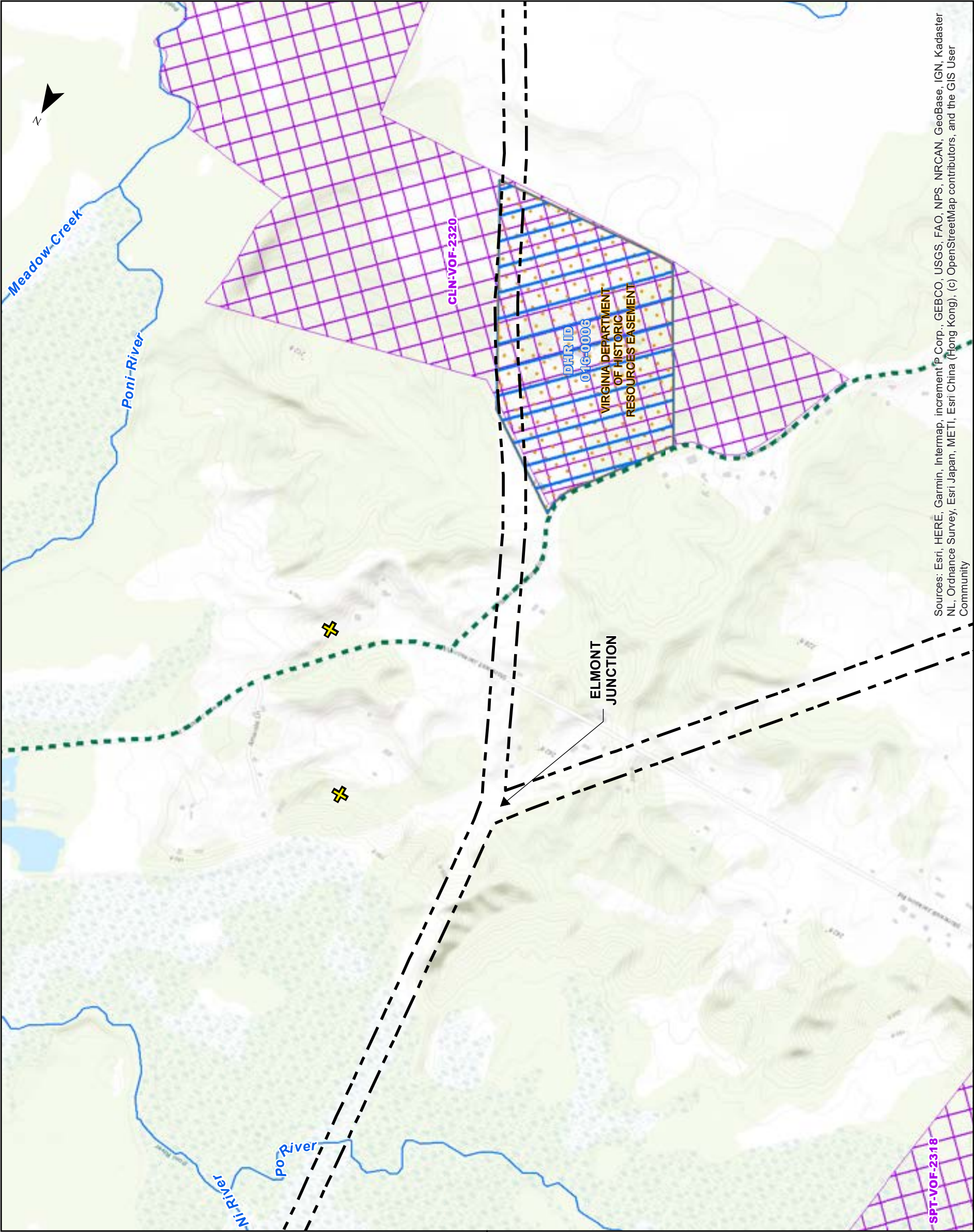
Caroline and Spotsylvania Counties, Virginia
Client:
Dominion Energy Virginia

C2 Env Project: 0354
Prepared By: JRC
Date: 08/15/24



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Dominion Owned Substation Parcel
- Spotsylvania County Easement
- Spotsylvania County Park
- Virginia Department of Historic Resources Easement
- Private Conservation Easement
- Wetlands Reserve Program (WRP)
- Eligible or Potentially Eligible VCRIS Architecture Resource
- School
- Cemetery
- US Bike Route 1
- USGS National Hydrography Stream Centerline
- Scenic River
- Railroad
- Place of Worship
- Other Recreational Site





Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

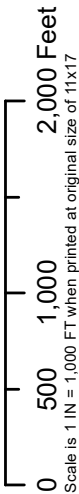
ATTACHMENT II.A.2
ENVIRONMENTAL CONSTRAINTS MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)

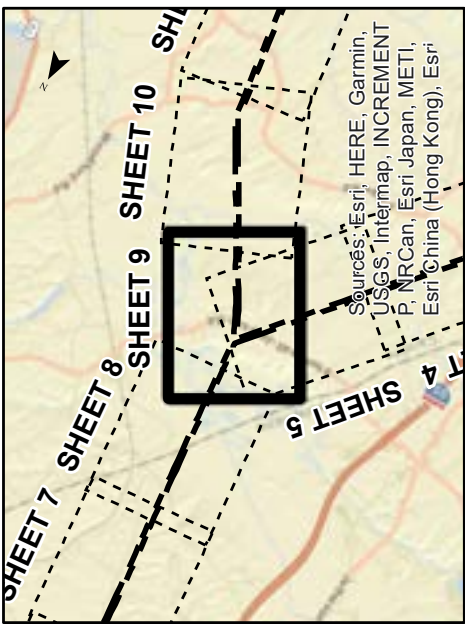
Caroline and Spotsylvania Counties, Virginia
Client:

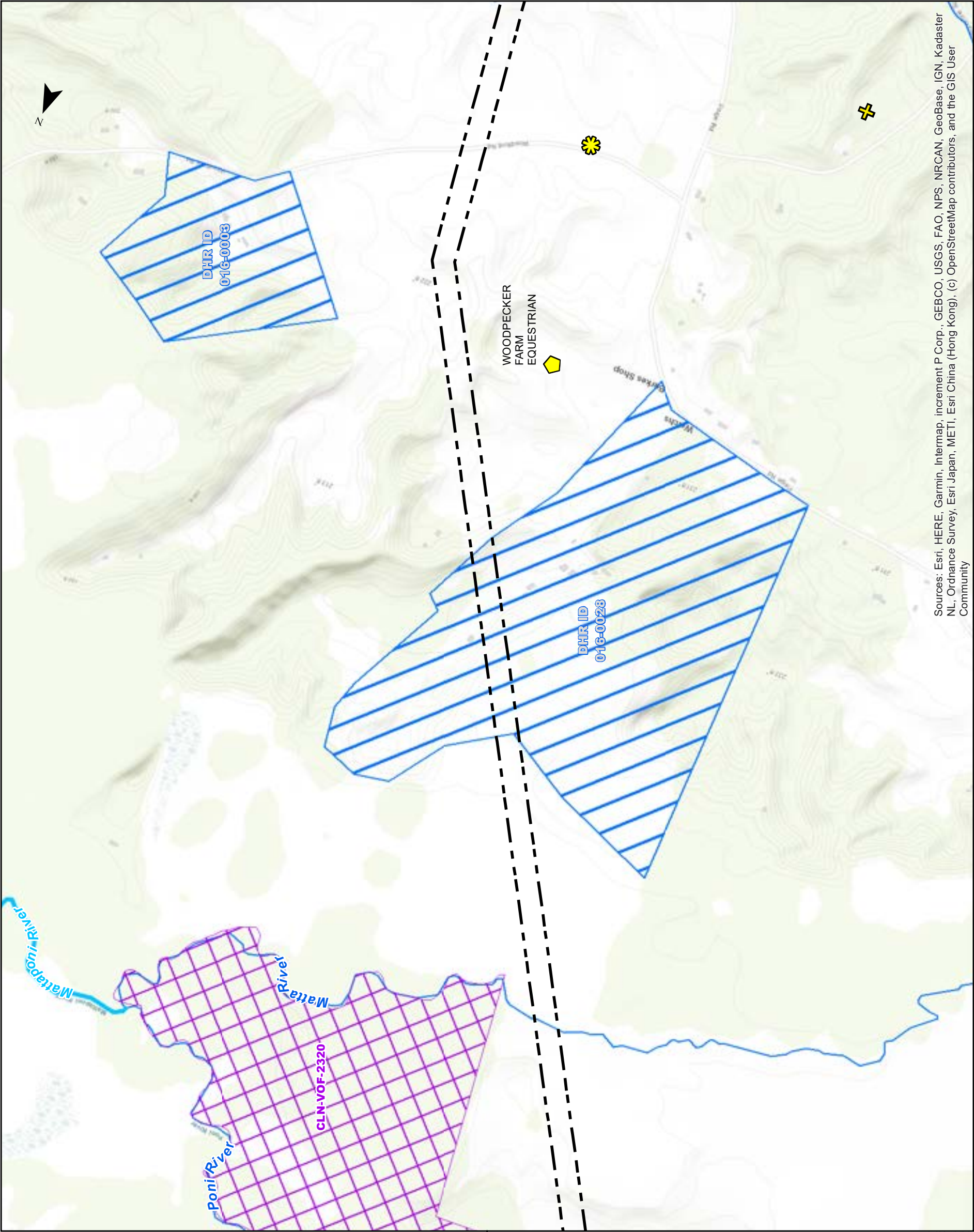
Dominion Energy Virginia

C2 Env Project: 0354
Prepared By: JRC
Date: 08/15/24



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Dominion Owned Substation Parcel
- Spotsylvania County Easement
- Spotsylvania County Park
- Virginia Department of Historic Resources Easement
- Private Conservation Easement
- Wetlands Reserve Program (WRP)
- Eligible or Potentially Eligible VCRIS Architecture Resource
- School
- Cemetery
- US Bike Route 1
- USGS National Hydrography Stream Centerline
- Scenic River
- Railroad
- Place of Worship
- Other Recreational Site





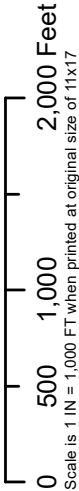
ATTACHMENT II.A.2
ENVIRONMENTAL CONSTRAINTS MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)

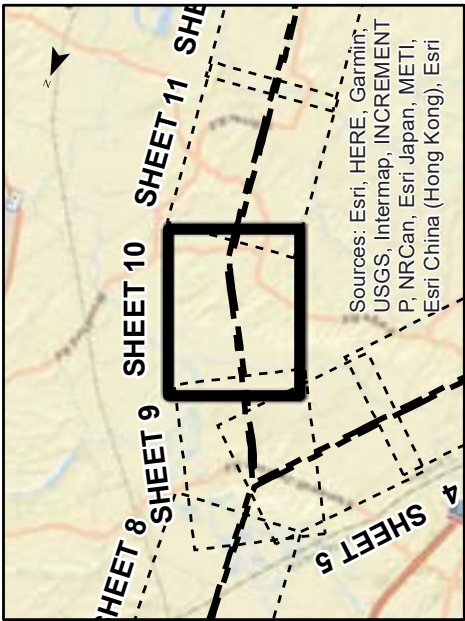
Caroline and Spotsylvania Counties, Virginia
Client:

Dominion Energy Virginia

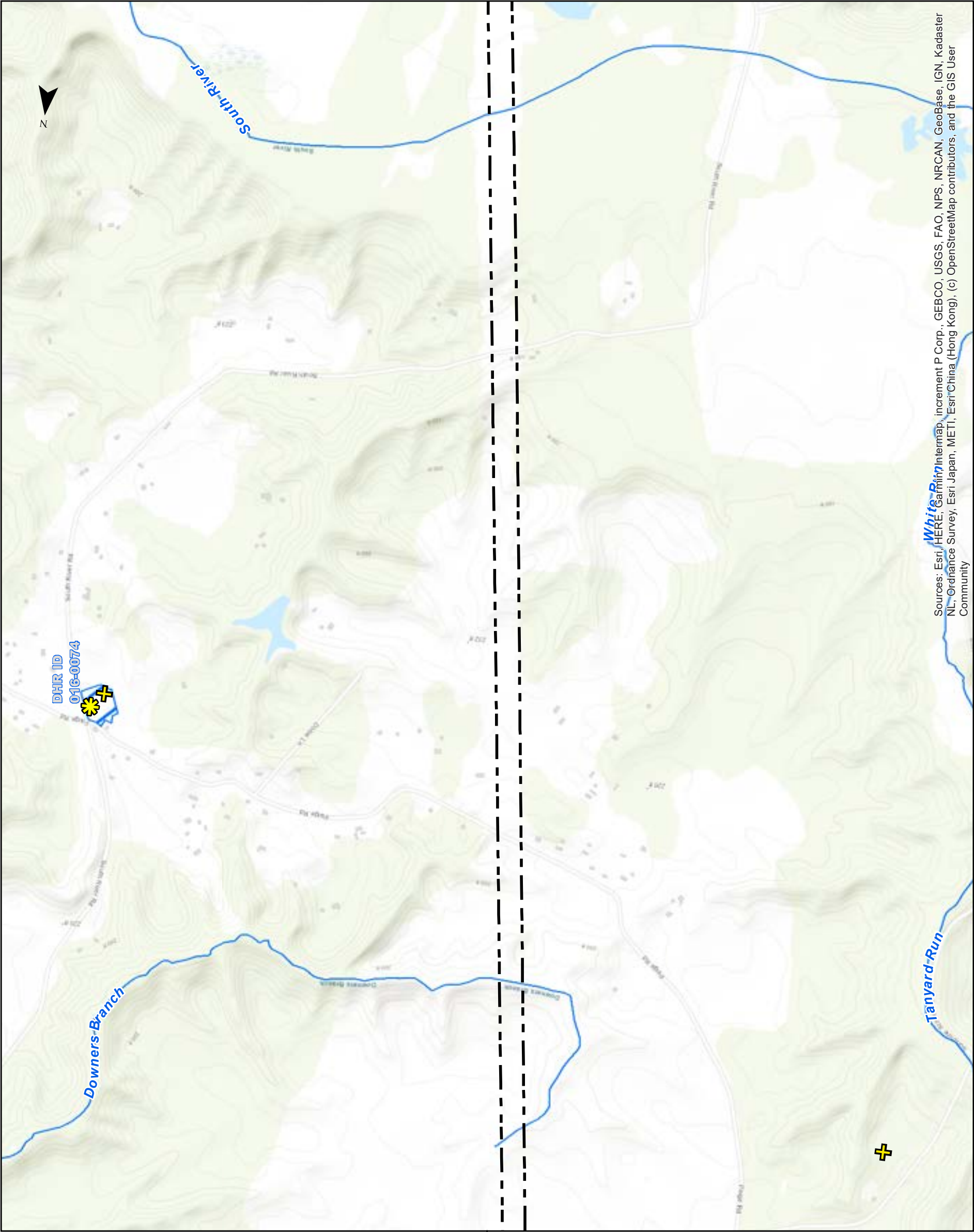
C2 Env Project:	Prepared By:	Date:
0354	JRC	08/15/24



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Dominion Owned Substation Parcel
- Spotsylvania County Easement
- Spotsylvania County Park
- Virginia Department of Historic Resources Easement
- Private Conservation Easement
- Wetlands Reserve Program (WRP)
- Eligible or Potentially Eligible VCRIS Architecture Resource
- School
- Cemetery
- US Bike Route 1
- USGS National Hydrography Stream Centerline
- Scenic River
- Railroad
- Place of Worship
- Other Recreational Site



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



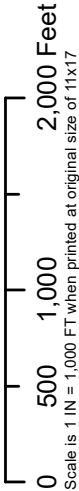
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

ATTACHMENT II.A.2
ENVIRONMENTAL CONSTRAINTS MAP

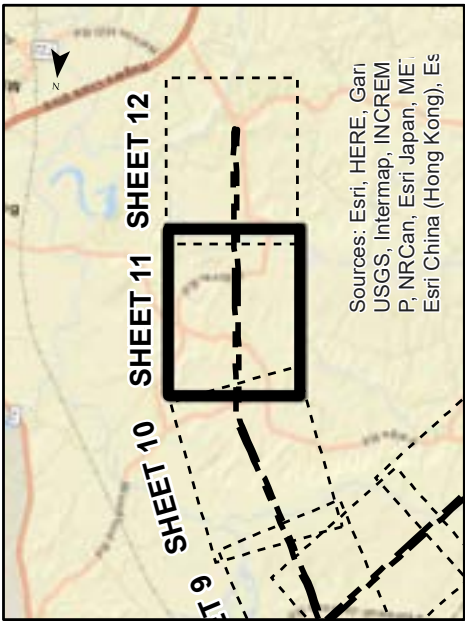
Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)

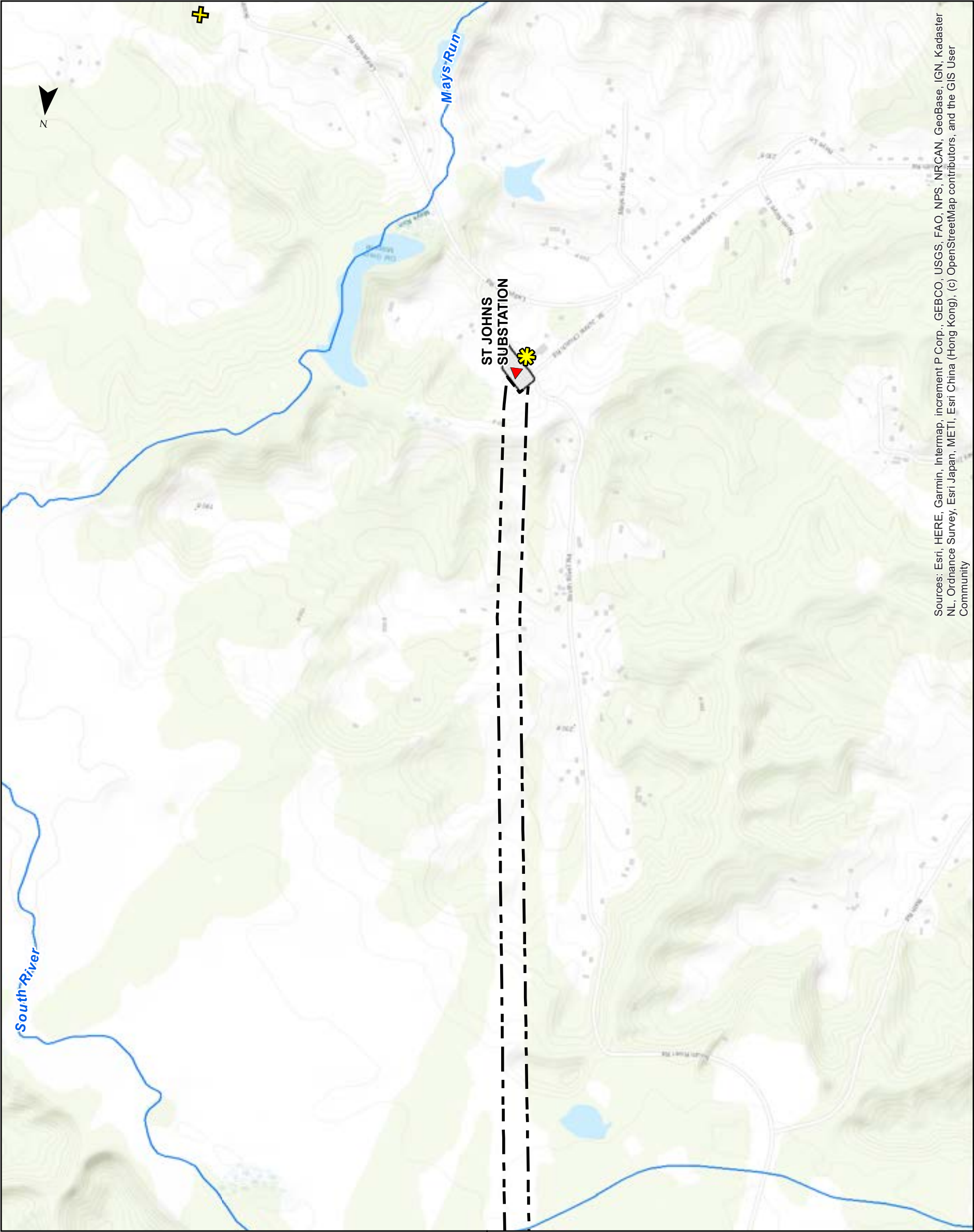
Caroline and Spotsylvania Counties, Virginia
Client:
Dominion Energy Virginia

C2 Env Project: 0354
Prepared By: JRC
Date: 08/15/24



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Dominion Owned Substation Parcel
- Spotsylvania County Easement
- Spotsylvania County Park
- Virginia Department of Historic Resources Easement
- Private Conservation Easement
- Wetlands Reserve Program (WRP)
- Eligible or Potentially Eligible VCRIS Architecture Resource
- School
- Cemetery
- US Bike Route 1
- USGS National Hydrography Stream Centerline
- Scenic River
- Railroad
- Place of Worship
- Other Recreational Site





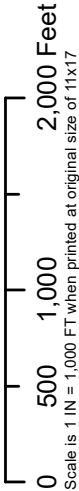
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

ATTACHMENT II.A.2
ENVIRONMENTAL CONSTRAINTS MAP

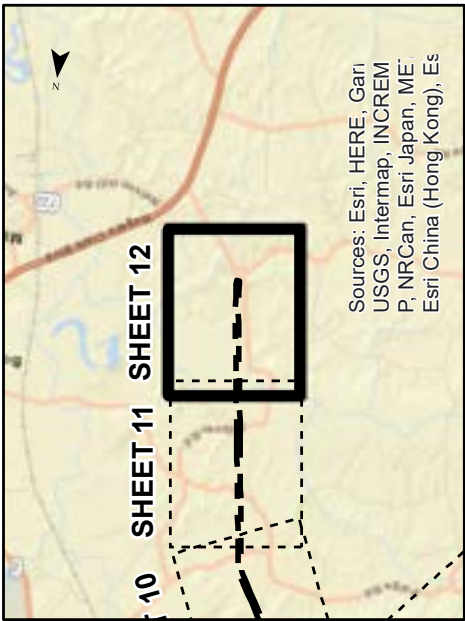
Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)

Caroline and Spotsylvania Counties, Virginia
Client:
Dominion Energy Virginia

C2 Env Project:	Prepared By:	Date:
0354	JRC	08/15/24



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Dominion Owned Substation Parcel
- Spotsylvania County Easement
- Spotsylvania County Park
- Virginia Department of Historic Resources Easement
- Private Conservation Easement
- Wetlands Reserve Program (WRP)
- Eligible or Potentially Eligible VCRIS Architecture Resource
- School
- Cemetery
- US Bike Route 1
- USGS National Hydrography Stream Centerline
- Scenic River
- Railroad
- Place of Worship
- Other Recreational Site



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: Not applicable.

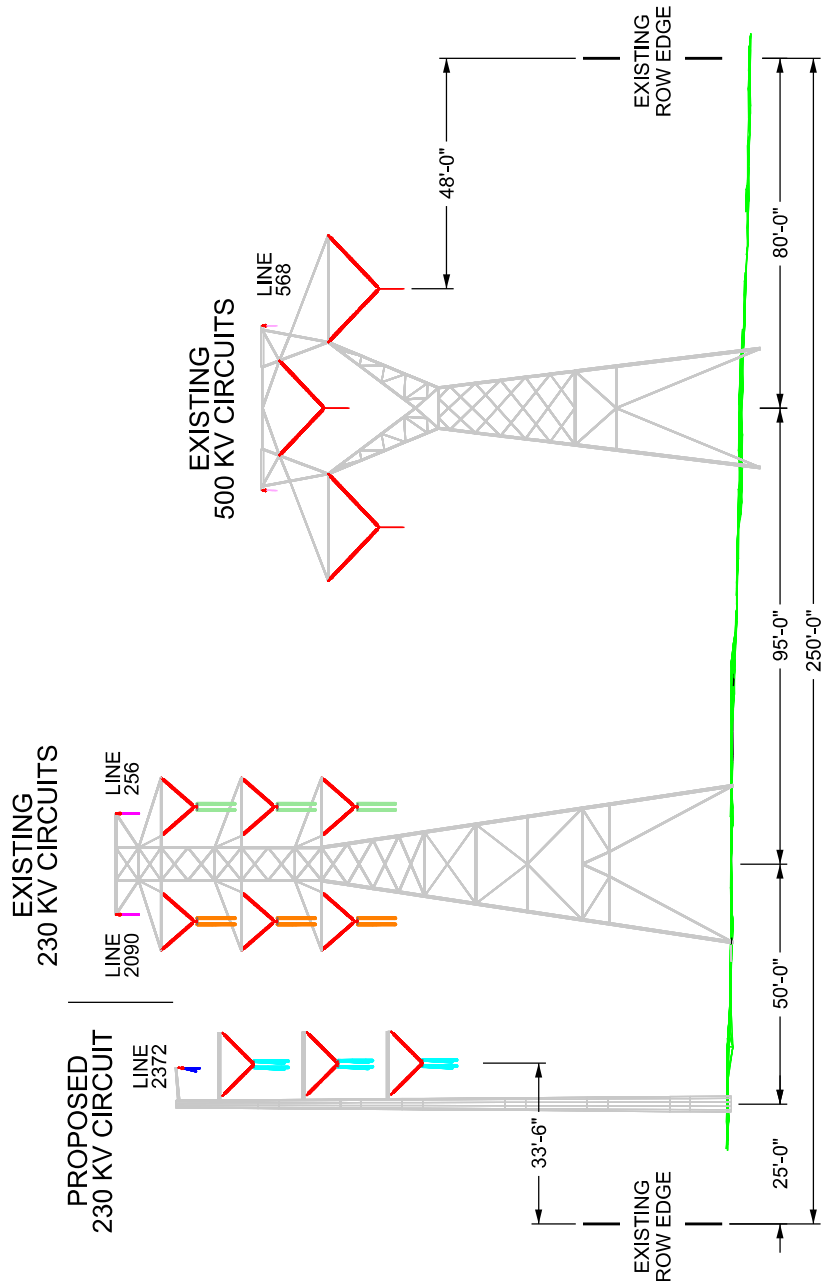
II. DESCRIPTION OF THE PROPOSED PROJECT

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-c.

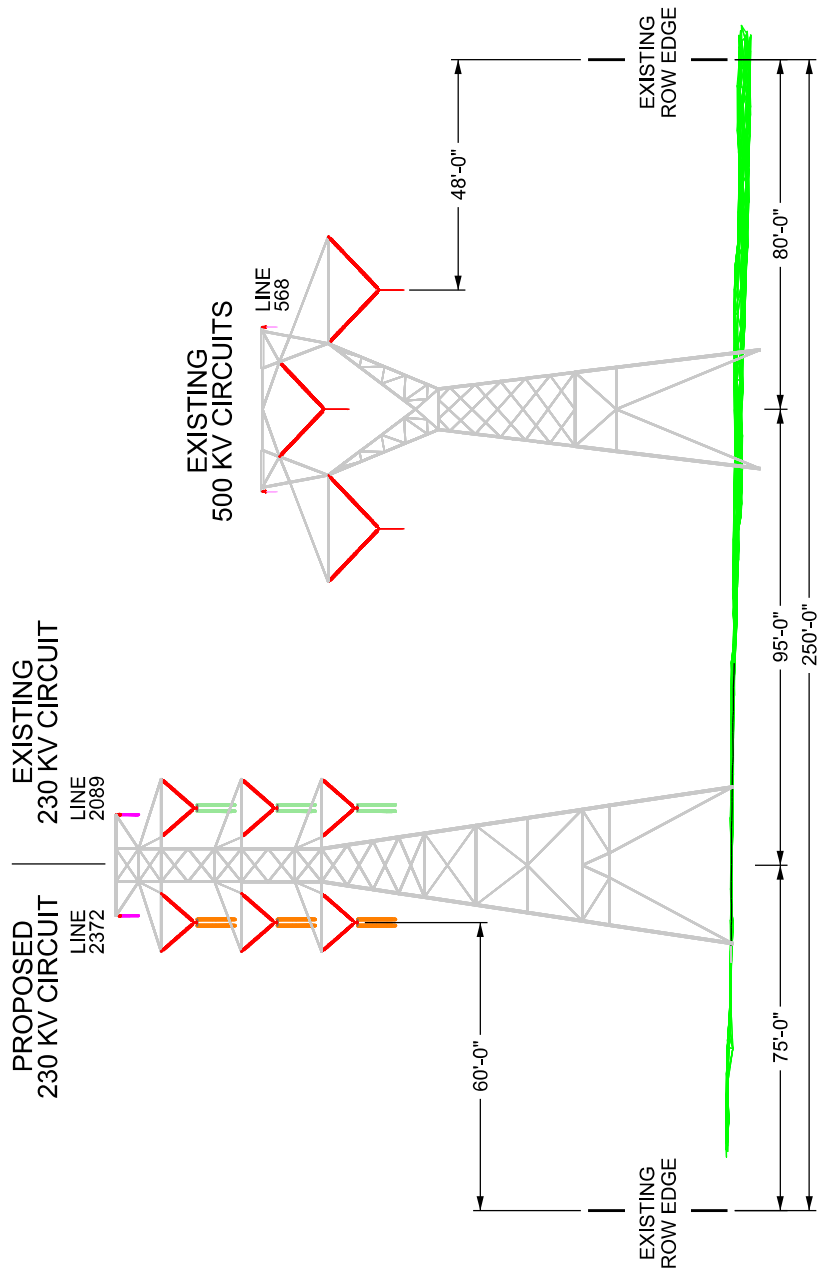
For additional information on the structures, see Section II.B.3.



PROPOSED ROW CONFIGURATION

- NOTES
- 1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
 - 2. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE
 - 3. MINIMUM FOUNDATION REVEAL SHALL BE 1.5' MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN
 - 4. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING

Electric Transmission		DESCRIPTION & VIEW	COMMENTS	ATTACHMENT
 Dominion Energy 5000 Dominion Blvd Glen Allen, VA 23060	STR. 2372/20-2372/44, 2090/131-2090/107, 568/239-568/215 TYPICAL RIGHT OF WAY LOOKING TOWARDS ELMONT/FREDERICKSBURG JCT		II.A.5.a	
				DRAWN BY: RAW

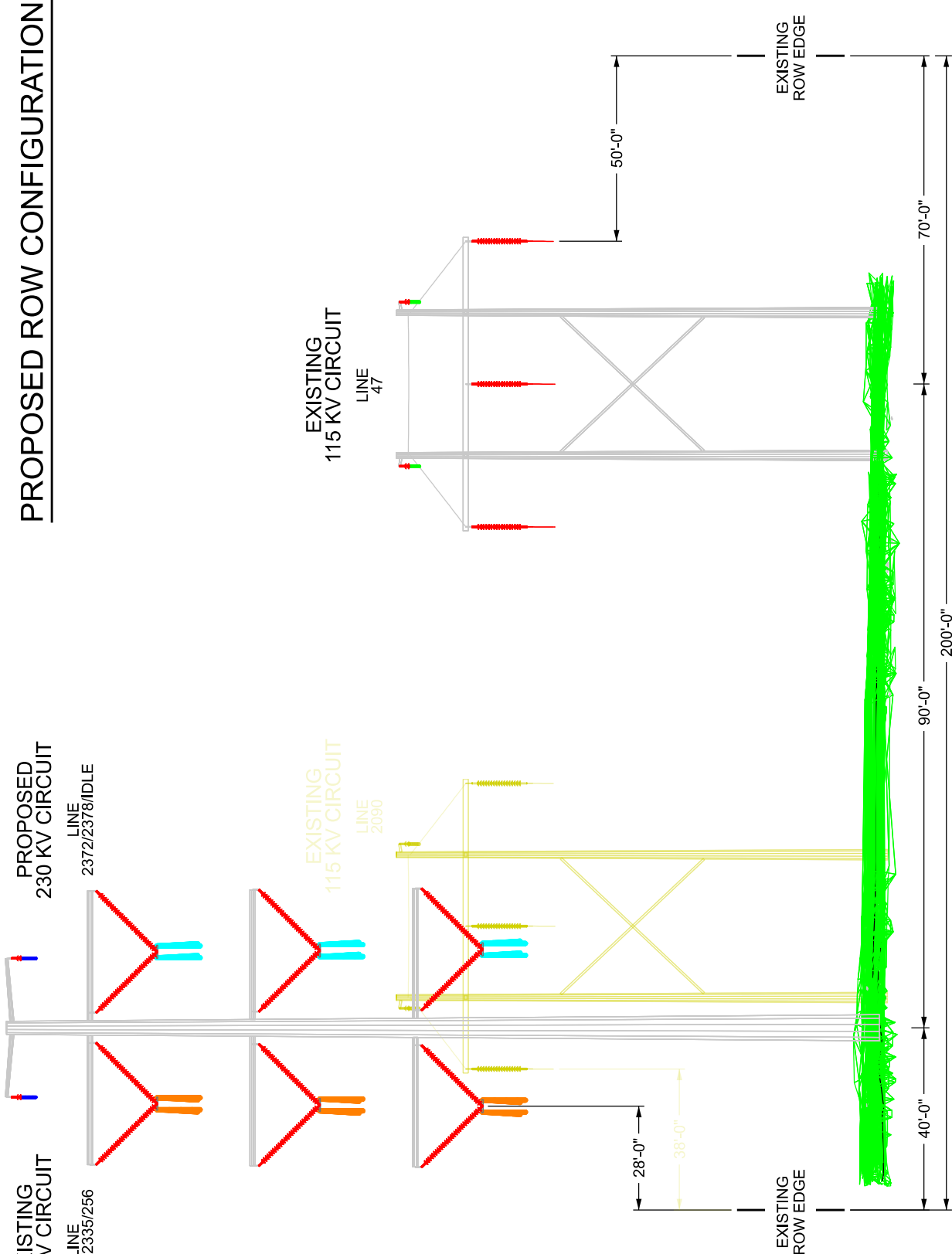


PROPOSED ROW CONFIGURATION

NOTES 1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
2. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE

Electric Transmission		DESCRIPTION & VIEW	COMMENTS	ATTACHMENT
 Dominion Energy 5000 Dominion Blvd Glen Allen, VA 23060	STR. 2089/3-2089/17 . 568/225-568/241 TYPICAL RIGHT OF WAY LOOKING TOWARDS LADYSMITH JCT			II.A.5.b
				DRAWN BY: RAW

PROPOSED ROW CONFIGURATION



- NOTES
- 1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
 - 2. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE
 - 3. MINIMUM FOUNDATION REVEAL SHALL BE 1.5' MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN
 - 4. FINAL FOUNDATION DIAMETER SHALL BE BASED UPON FINAL ENGINEERING

 Dominion Energy 5000 Dominion Blvd Glen Allen, VA 23060 <i>Electric Transmission</i>		DESCRIPTION & VIEW	COMMENTS	ATTACHMENT	
		STR. 256/166-256/107, 2090/104-2090/61, 2335/61-2335/54, 47/97-47/209 TYPICAL RIGHT OF WAY LOOKING TOWARDS NEW POST SUB/ELMONT-FRED JCT		II.A.5.c	
		DRAWN BY:		RAW	

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: The Company established the existing corridor containing Lines #2089, #256, and #2090, which includes the approximately 6.4-mile ROW between Elmont Junction and Lee's Hill Substation, and the approximately 7.3-mile ROW between Elmont Junction and St. Johns Substation, in 1991.

Two existing easements are crossed by the Project, a VDHR easement 016-0006 and Virginia Outdoors Foundation easement CLN-VOF-2320. Both were established after the Company's initial establishment of its transmission corridor. See Attachment II.A.9. The Company does not expect new easements will be required for the new Lines # 2372, #2378, and #2335 as they will be located within the existing ROW of Lines #2089, #256, and #2090.

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 Project will utilize existing ROW (approximately 250-feet wide between Ladysmith Substation, Ladysmith CT, and the Elmont Junction, approximately 200-feet wide between Elmont Junction and St. Johns Substation, and approximately 200-feet wide between Elmont Junction and Lee's Hill Substation). As such, additional clearing is not necessary, but the existing rights-of-way are currently and will continue to be maintained for operation of the existing transmission facilities.

Some trimming of tree limbs along the edge of the upland ROW may be conducted to support construction activities for the Project. For any such minimal clearing within the ROW, trees will be cut to no more than three inches above ground level. Trees located outside of the rights-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 ROW has been restored. Upon completion of the Project, the Company will restore the ROW 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.

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

II. DESCRIPTION OF THE PROPOSED PROJECT

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

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

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

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

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

- Agriculture
- Hiking Trails
- Fences
- Perpendicular Road Crossings
- Perpendicular Utility Crossings
- Residential Driveways
- 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: This Project involves both a new transmission line within existing ROW (*i.e.*, Lines #2372 and #2378), and two partial rebuilds (*i.e.*, Line #256 and Line #2090, which will be renumbered to Line #2335 between New Post Substation and Lee's Hill Substation). The route selection process is outlined below.

The Company's route selection for rebuild projects begins with a review of existing rights-of-way. This approach generally minimizes impacts on the natural and human environments. This approach is also consistent with Attachment 1 to these Guidelines, which provides a tool routinely used by the Company in routing its transmission line projects. Specifically, this approach is consistent with Guideline #1, which states that existing rights-of-way should be given priority when adding new transmission facilities, and Va. Code §§ 56-46.1 and 56-259, which promote the use of existing rights-of-way for new transmission facilities. For the proposed Project, the existing rights-of-way varying in width from 200 to 250 feet are adequate.

Because the existing rights-of-way and Company-owned property are adequate to construct the proposed Project, no new ROW is necessary. Given the availability of existing rights-of-way and/or easements and the statutory preference given to the use of existing rights-of-way, and because additional costs and environmental impacts would be associated the acquisition of and construction on entirely new rights-of-way, the Company did not consider any alternate routes requiring new rights-of-way for this Project. See Section I.I for costs of the proposed Project. See Attachment II.A.9 for conservation easements crossed by the proposed routes.

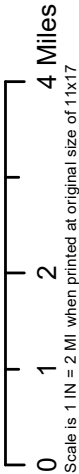
CONSERVATION EASEMENTS MAP

Partial Rebuild of Lines #256 and #2090/#2335
(Ladysmith, St. Johns, New Post, Lee's Hill)
and New 230 kV Line #2372 (Ladysmith - New Post)
and New 230 kV Line #2378 (New Post - Lee's Hill)

Caroline and Spotsylvania Counties, Virginia

Dominion Energy Virginia

C2 Env Project:	Prepared By:	Date:
0354	JRC	08/15/24



L-1; Map Sheet

Proposed 230 kV Line #2372 in Existing ROW
Proposed 230 kV Line #2378 in Existing ROW
Existing 230 kV Line #2090 (and Future Line #2335)
Partial Rebuild

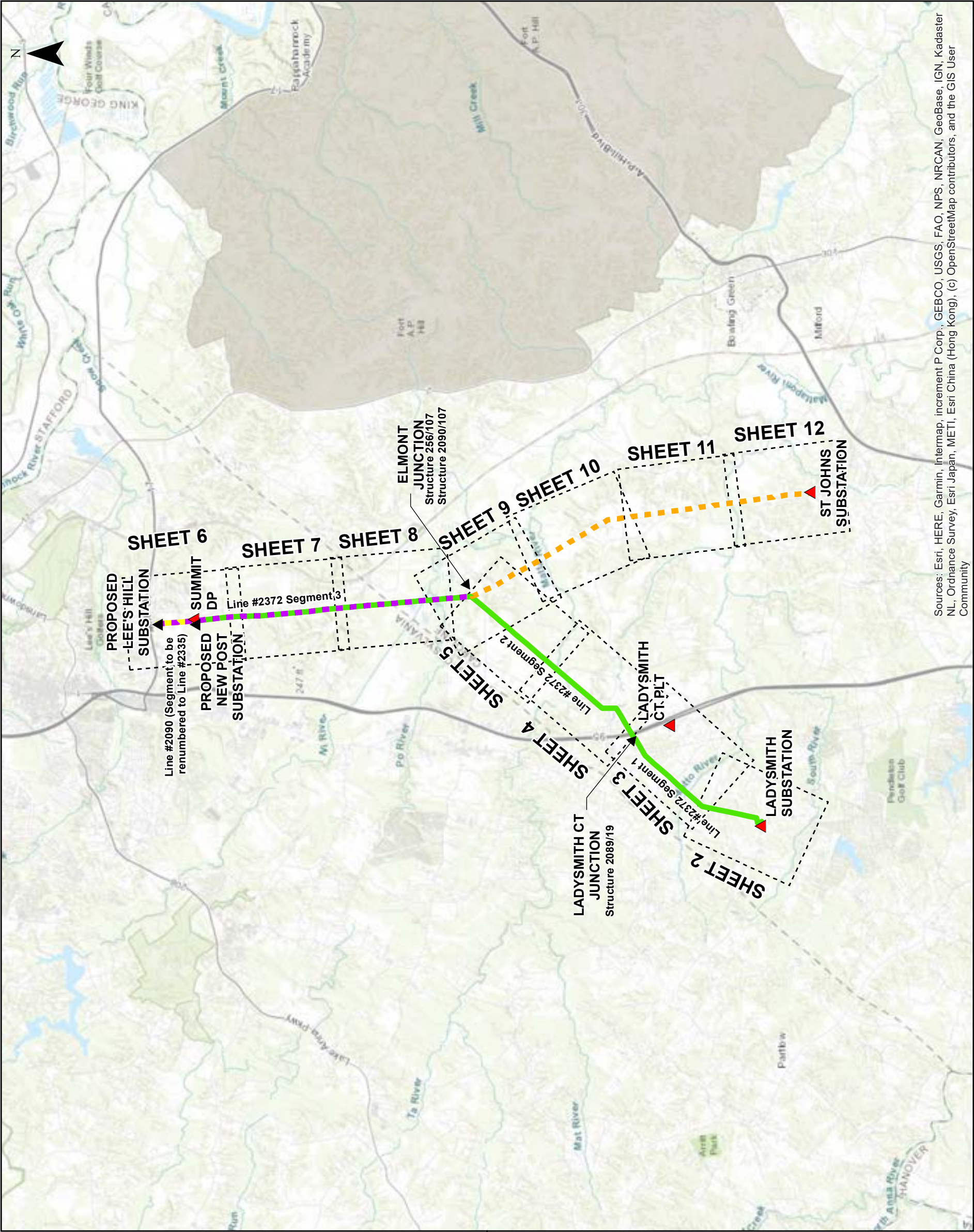
- Existing 230 kV Line #256 Partial Rebuild

▲ Proposed Substation

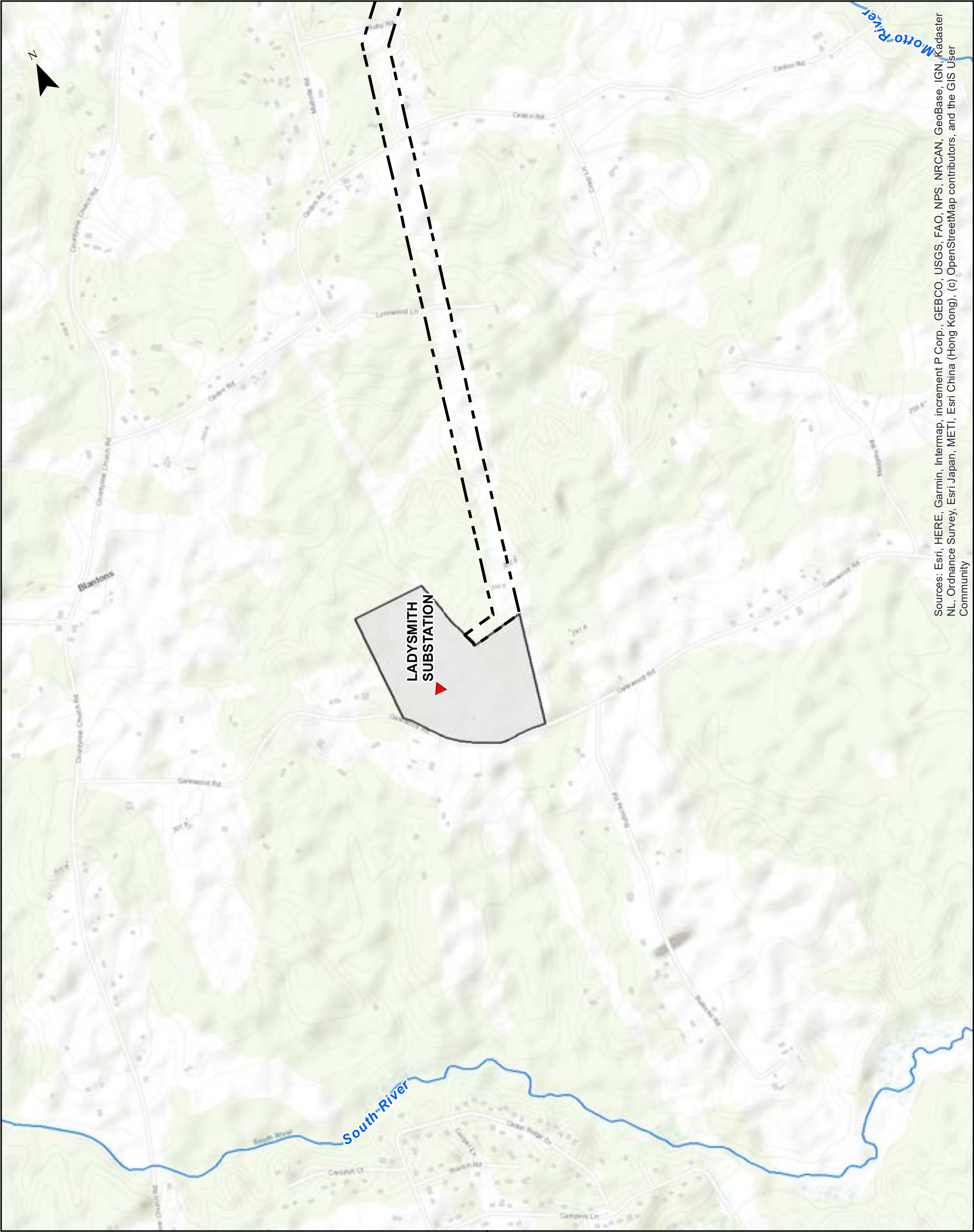
▲ Existing Substation

Notes:

1. Basemap from ESRI Topographic and World Street Map
2. Project right-of-way provided by Dominion Energy Virginia
3. Conservation lands, easements, and local lands from Virginia Department of Conservation and Recreation, U.S. Geological Survey Protected Areas Database of the U.S., and Department of Historic Resources Virginia Cultural Resources Information System
4. Railroads from Virginia Geographic Information Network
5. Stream centerlines from U.S. Geological Survey National Hydrography Dataset

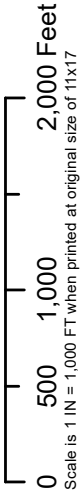


Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

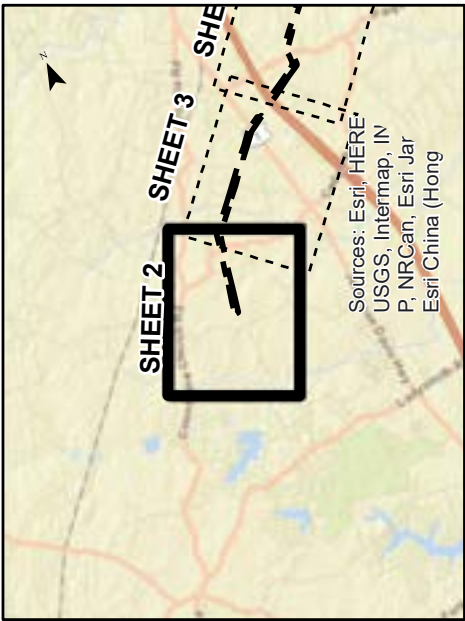


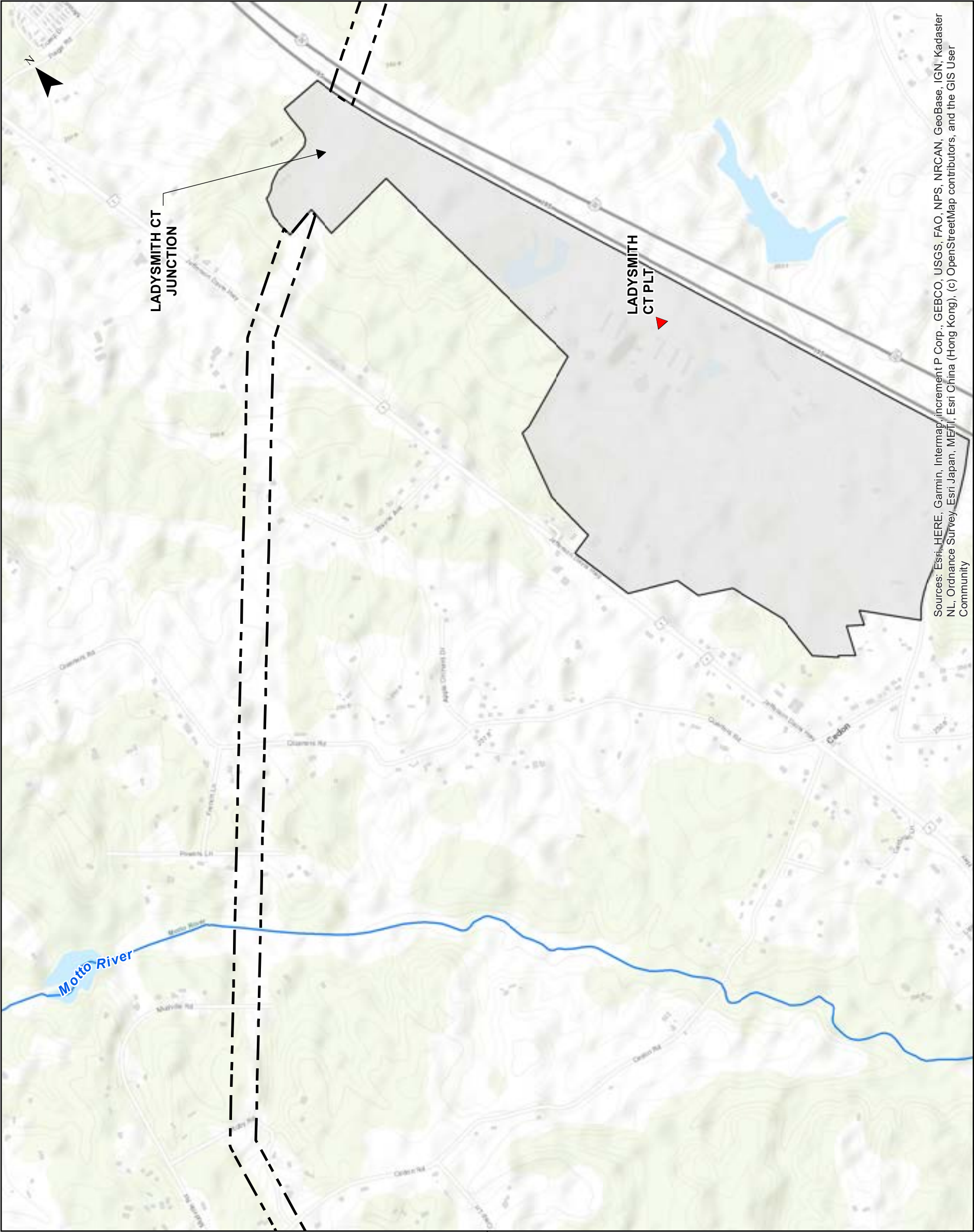
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

ATTACHMENT II.A.9
CONSERVATION EASEMENTS MAP
Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)
Caroline and Spotsylvania Counties, Virginia
Client:
Dominion Energy Virginia
C2 Env Project: 0354 Prepared By: JRC Date: 08/15/24



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Dominion Owned Substation Parcel
- Spotsylvania County Easement
- Spotsylvania County Owned Land
- Virginia Department of Historic Resources Easement
- Virginia Outdoors Foundation Easement
- Wetlands Reserve Program Easement
- USGS National Hydrography Stream Centerline
- Railroad





Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

ATTACHMENT II.A.9
CONSERVATION EASEMENTS MAP
Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)
Caroline and Spotsylvania Counties, Virginia
Client:
Dominion Energy Virginia
C2 Env Project: Prepared By: Date:
0354 JRC 08/15/24

05001,0002,000

Scale is 1 IN = 1,000 FT when printed at original size of 11x17

Existing Right-of-Way

Proposed Substation

Existing Substation

Dominion Owned Substation Parcel

Spotsylvania County Easement

Spotsylvania County Owned Land

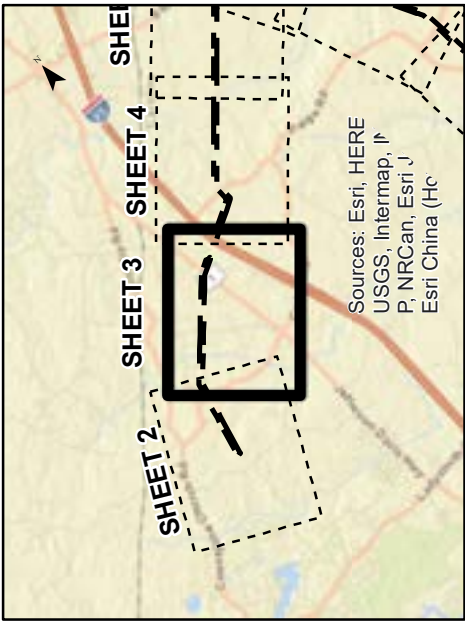
Virginia Department of Historic Resources Easement

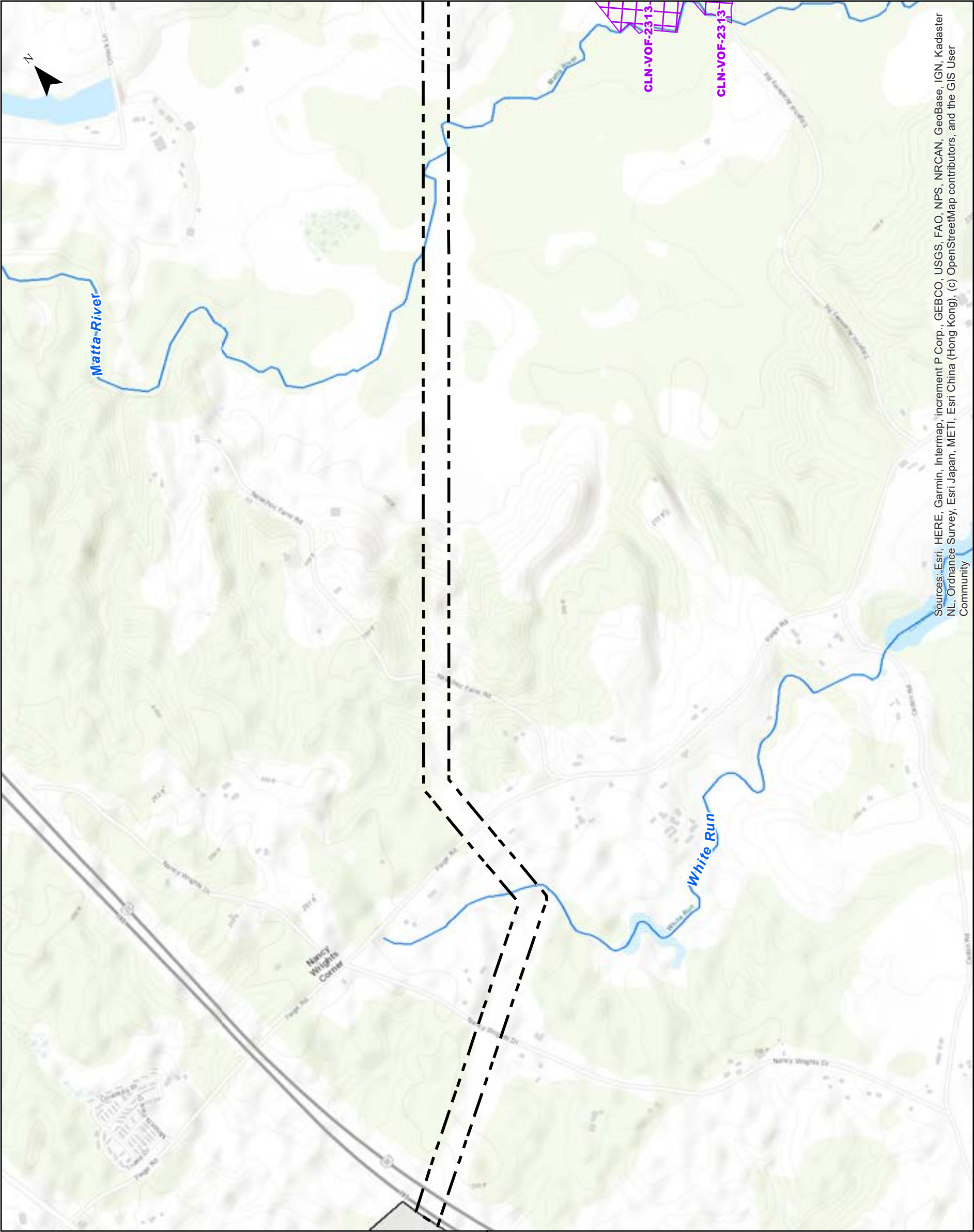
Virginia Outdoors Foundation Easement

Wetlands Reserve Program Easement

USGS National Hydrography Stream Centerline

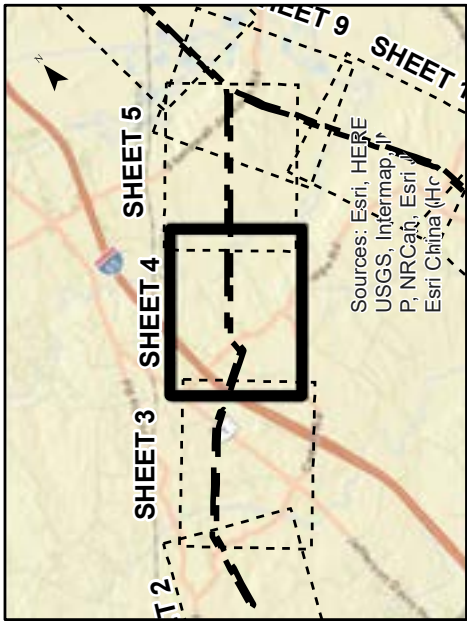
Railroad



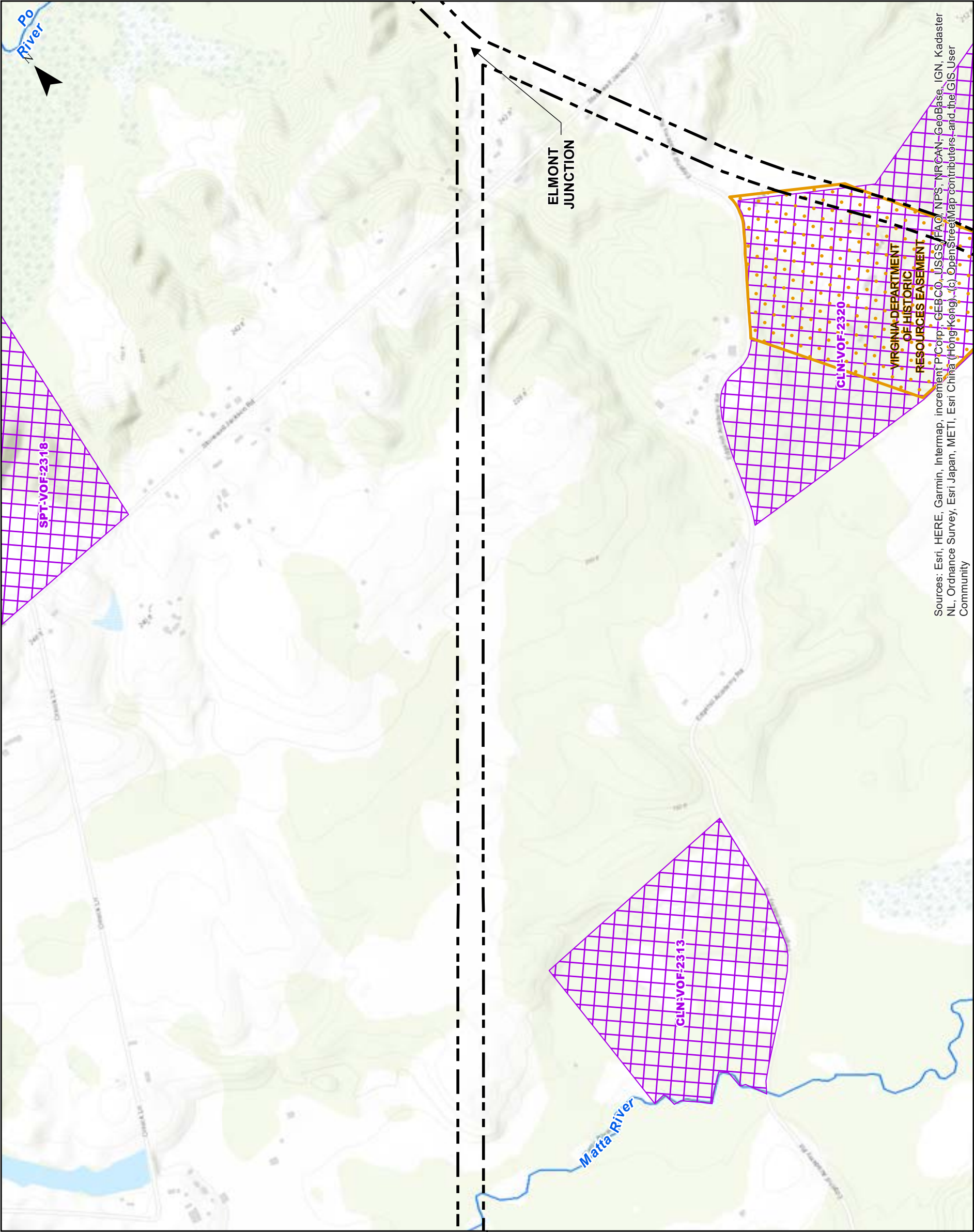


ATTACHMENT II.A.9
CONSERVATION EASEMENTS MAP
Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)
Caroline and Spotsylvania Counties, Virginia
Client:
Dominion Energy Virginia
C2 Env Project: 0354 Prepared By: JRC Date: 08/15/24
Scale is 1 IN = 1,000 FT when printed at original size of 11x17

- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Dominion Owned Substation Parcel
- Spotsylvania County Easement
- Spotsylvania County Owned Land
- Virginia Department of Historic Resources Easement
- Virginia Outdoors Foundation Easement
- Wetlands Reserve Program Easement
- USGS National Hydrography Stream Centerline
- Railroad

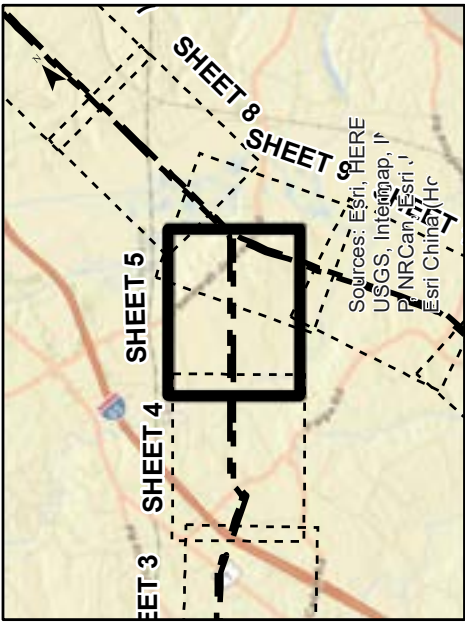


Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

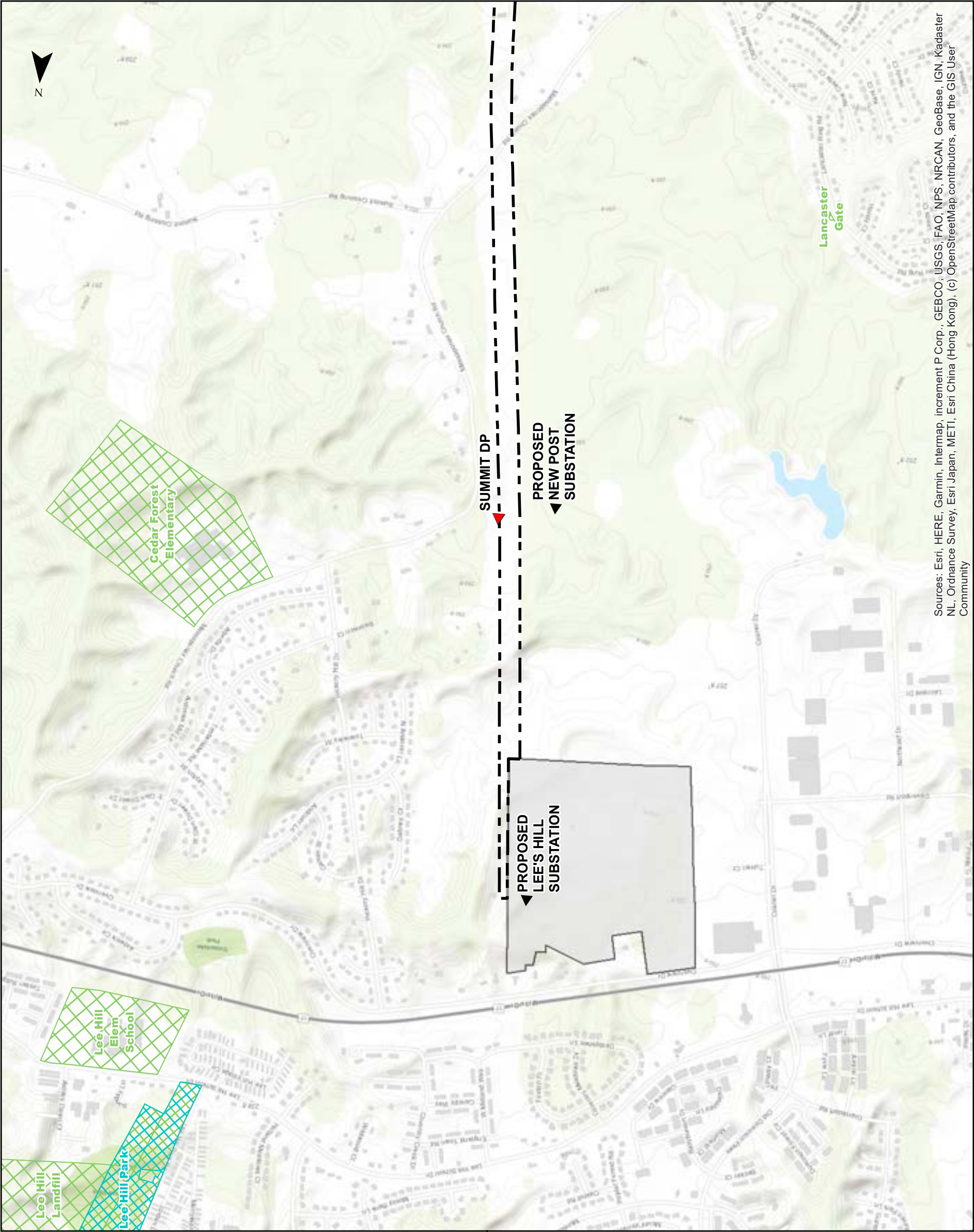


ATTACHMENT II.A.9
CONSERVATION EASEMENTS MAP
Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)
Caroline and Spotsylvania Counties, Virginia
Client:
Dominion Energy Virginia
C2 Env Project: 0354 Prepared By: JRC Date: 08/15/24
Scale is 1 IN = 1,000 FT when printed at original size of 11x17

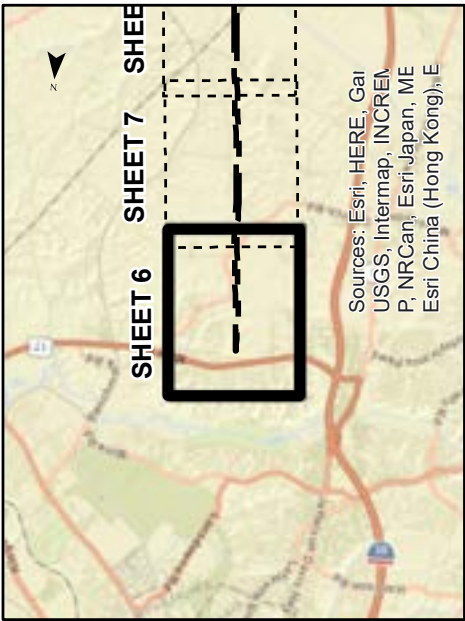
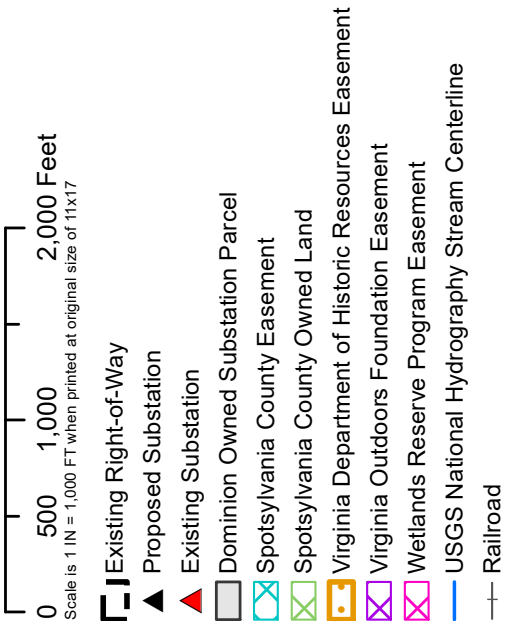
- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Dominion Owned Substation Parcel
- Spotsylvania County Easement
- Spotsylvania County Owned Land
- Virginia Department of Historic Resources Easement
- Virginia Outdoors Foundation Easement
- Wetlands Reserve Program Easement
- USGS National Hydrography Stream Centerline
- Railroad



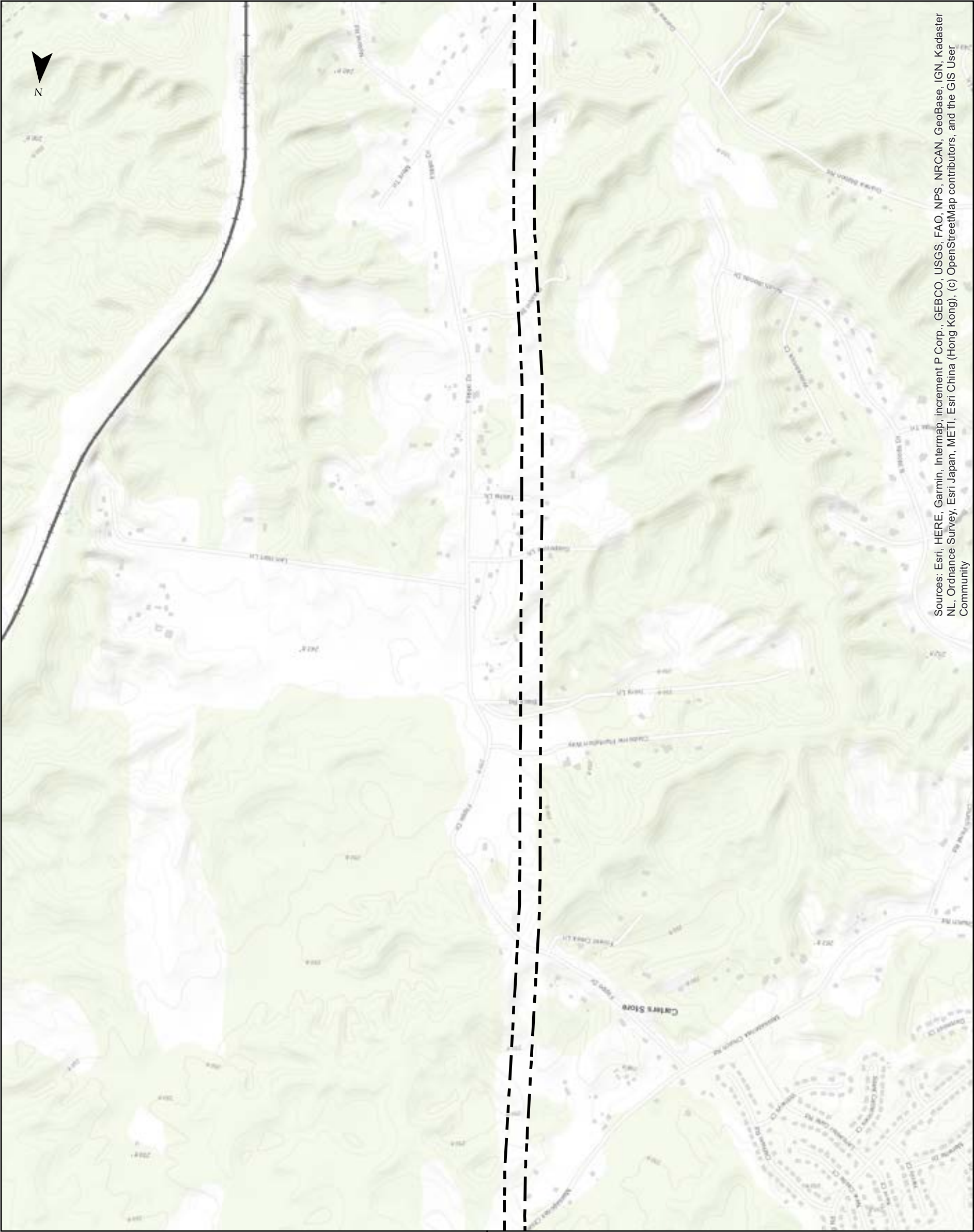
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS/FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



ATTACHMENT II.A.9
CONSERVATION EASEMENTS MAP
Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)
Caroline and Spotsylvania Counties, Virginia
Client:
Dominion Energy Virginia
C2 Env Project: 0354 Prepared By: JRC Date: 08/15/24



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community



ATTACHMENT II.A.9

CONSERVATION EASEMENTS MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)

Client: Caroline and Spotsylvania Counties, Virginia

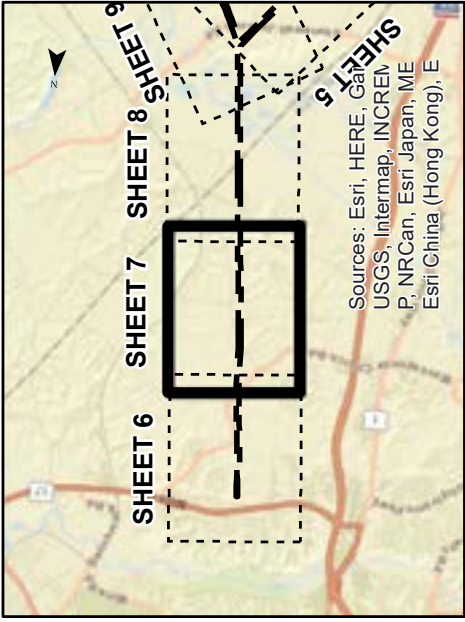
Dominion Energy Virginia

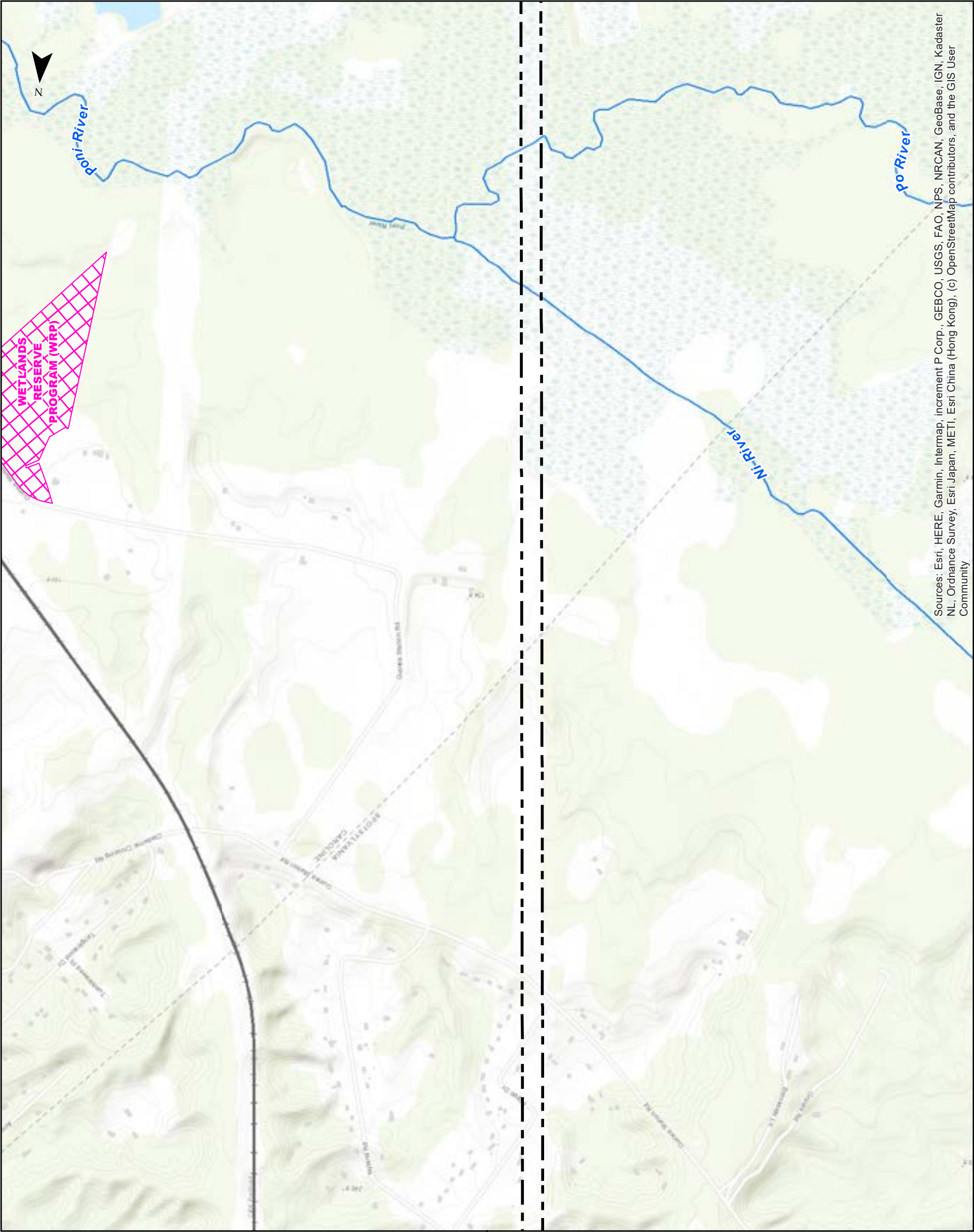
C2 Env Project: 0354 Prepared By: JRC Date: 08/15/24

Scale is 1 IN = 1,000 FT when printed at original size of 11x17

0 500 1,000 2,000 Feet

- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Dominion Owned Substation Parcel
- Spotsylvania County Easement
- Spotsylvania County Owned Land
- Virginia Department of Historic Resources Easement
- Virginia Outdoors Foundation Easement
- Wetlands Reserve Program Easement
- USGS National Hydrography Stream Centerline
- Railroad

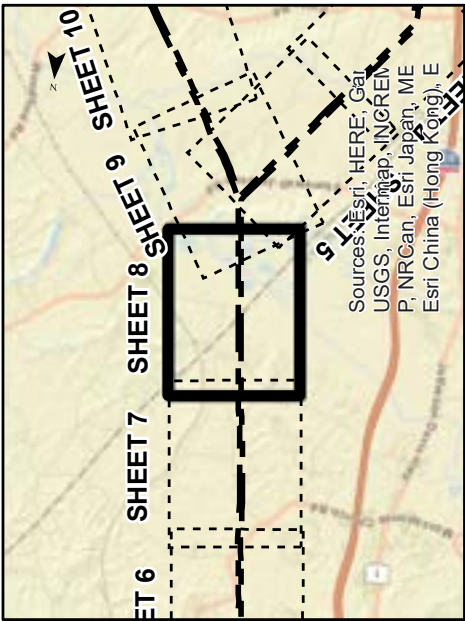




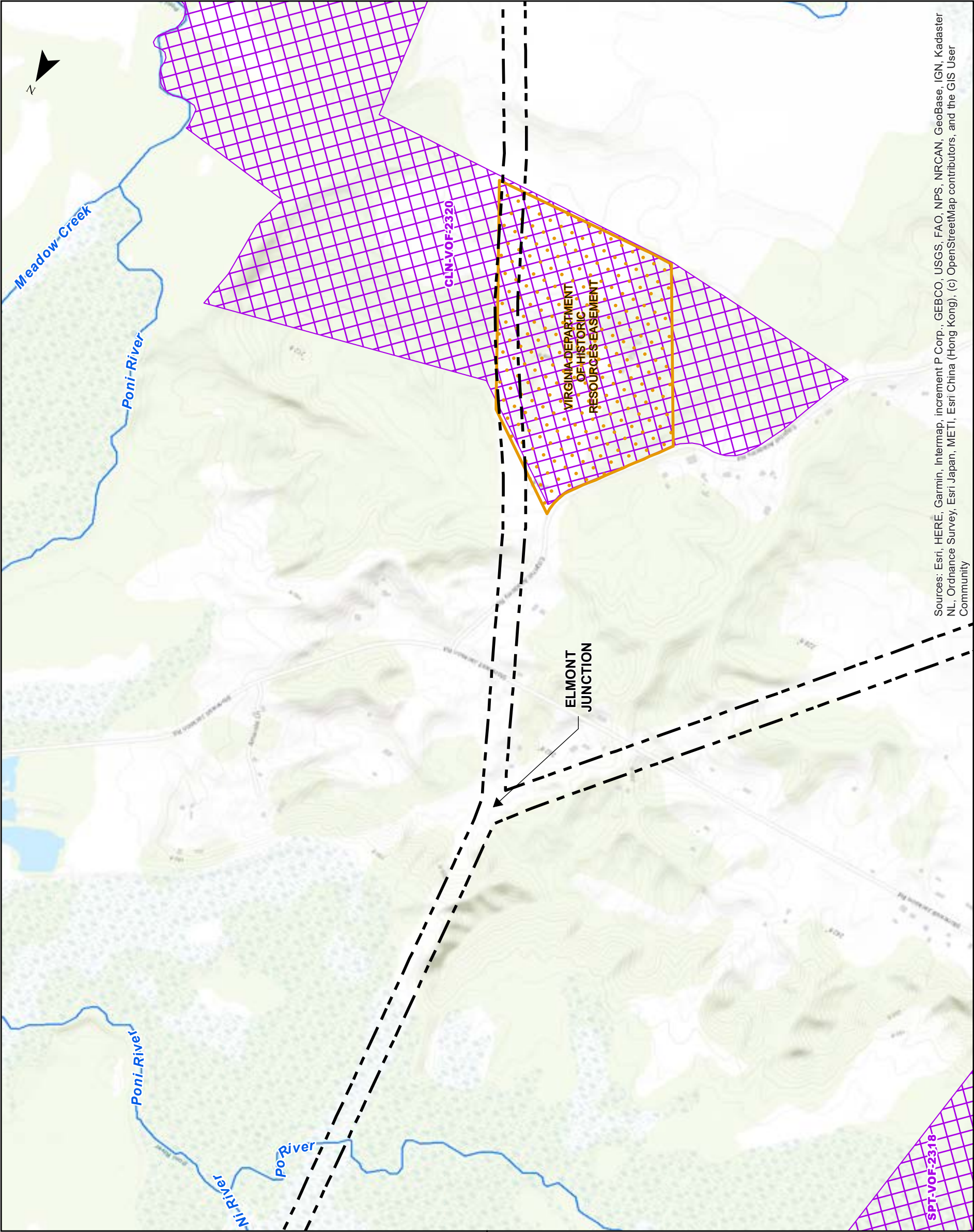
ATTACHMENT II.A.9
CONSERVATION EASEMENTS MAP
Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)
Caroline and Spotsylvania Counties, Virginia
Client:
Dominion Energy Virginia
C2 Env Project: 0354 Prepared By: JRC Date: 08/15/24

0 500 1,000 2,000 Feet
Scale is 1 IN = 1,000 FT when printed at original size of 11x17

Existing Right-of-Way
 Proposed Substation
 Existing Substation
 Dominion Owned Substation Parcel
 Spotsylvania County Easement
 Spotsylvania County Owned Land
 Virginia Department of Historic Resources Easement
 Virginia Outdoors Foundation Easement
 Wetlands Reserve Program Easement
 USGS National Hydrography Stream Centerline
 Railroad



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

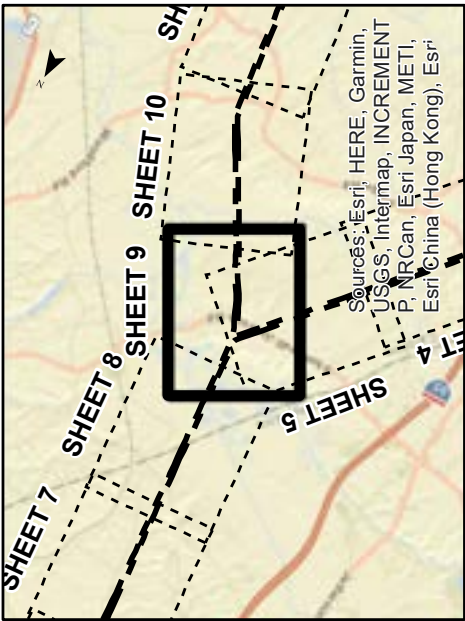


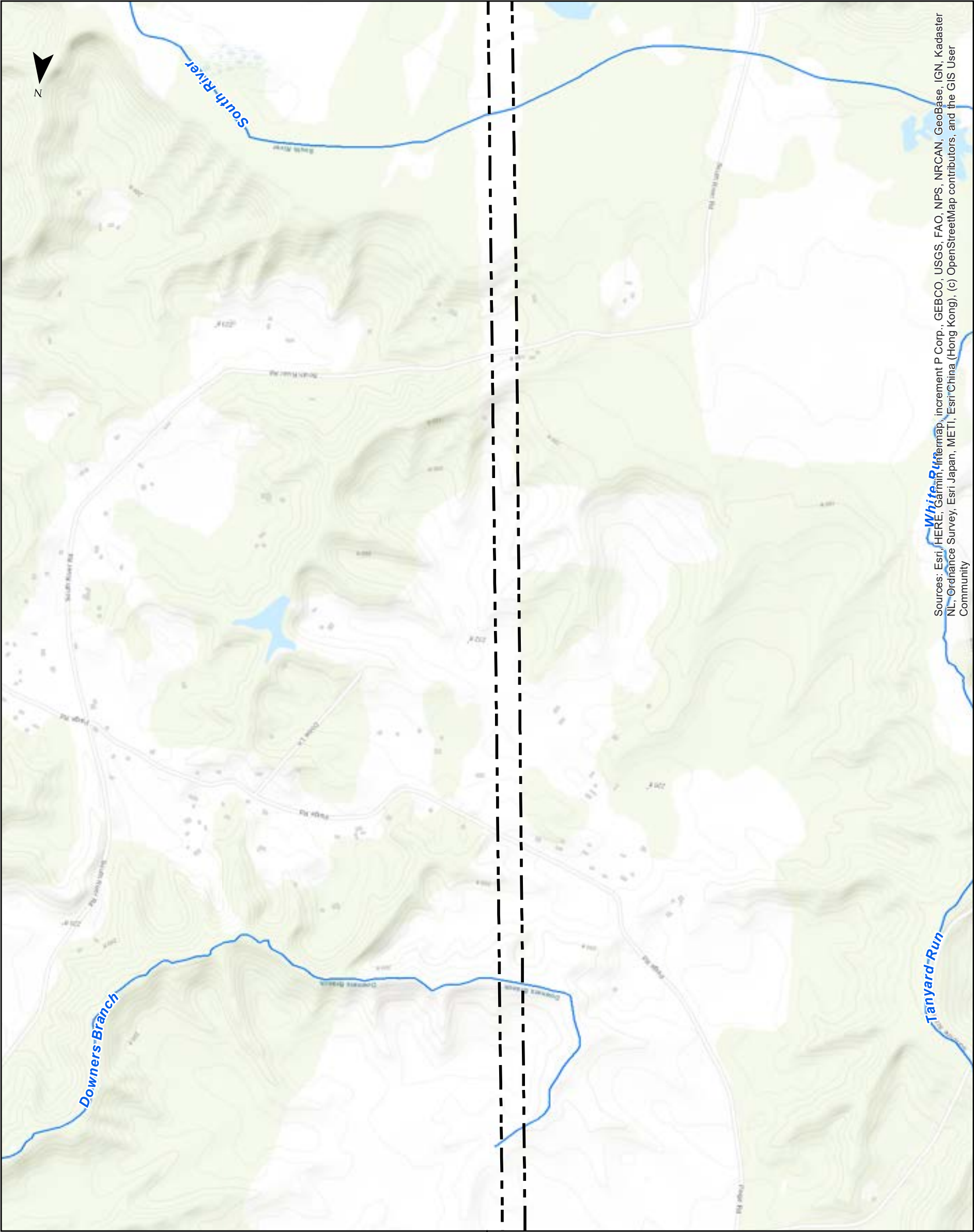
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

ATTACHMENT II.A.9
CONSERVATION EASEMENTS MAP
Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)
Caroline and Spotsylvania Counties, Virginia
Client:
Dominion Energy Virginia
C2 Env Project: 0354 Prepared By: JRC Date: 08/15/24

0 500 1,000 2,000 Feet
Scale is 1 IN = 1,000 FT when printed at original size of 11x17

- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Dominion Owned Substation Parcel
- Spotsylvania County Easement
- Spotsylvania County Owned Land
- Virginia Department of Historic Resources Easement
- Virginia Outdoors Foundation Easement
- Wetlands Reserve Program Easement
- USGS National Hydrography Stream Centerline
- Railroad





Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

ATTACHMENT II.A.9
CONSERVATION EASEMENTS MAP
Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)
Caroline and Spotsylvania Counties, Virginia
Client:
Dominion Energy Virginia
C2 Env Project: 0354 Prepared By: JRC Date: 08/15/24

05001,0002,000

Scale is 1 IN = 1,000 FT when printed at original size of 11x17

Existing Right-of-Way

Proposed Substation

Existing Substation

Dominion Owned Substation Parcel

Spotsylvania County Easement

Spotsylvania County Owned Land

Virginia Department of Historic Resources Easement

Virginia Outdoors Foundation Easement

Wetlands Reserve Program Easement

USGS National Hydrography Stream Centerline

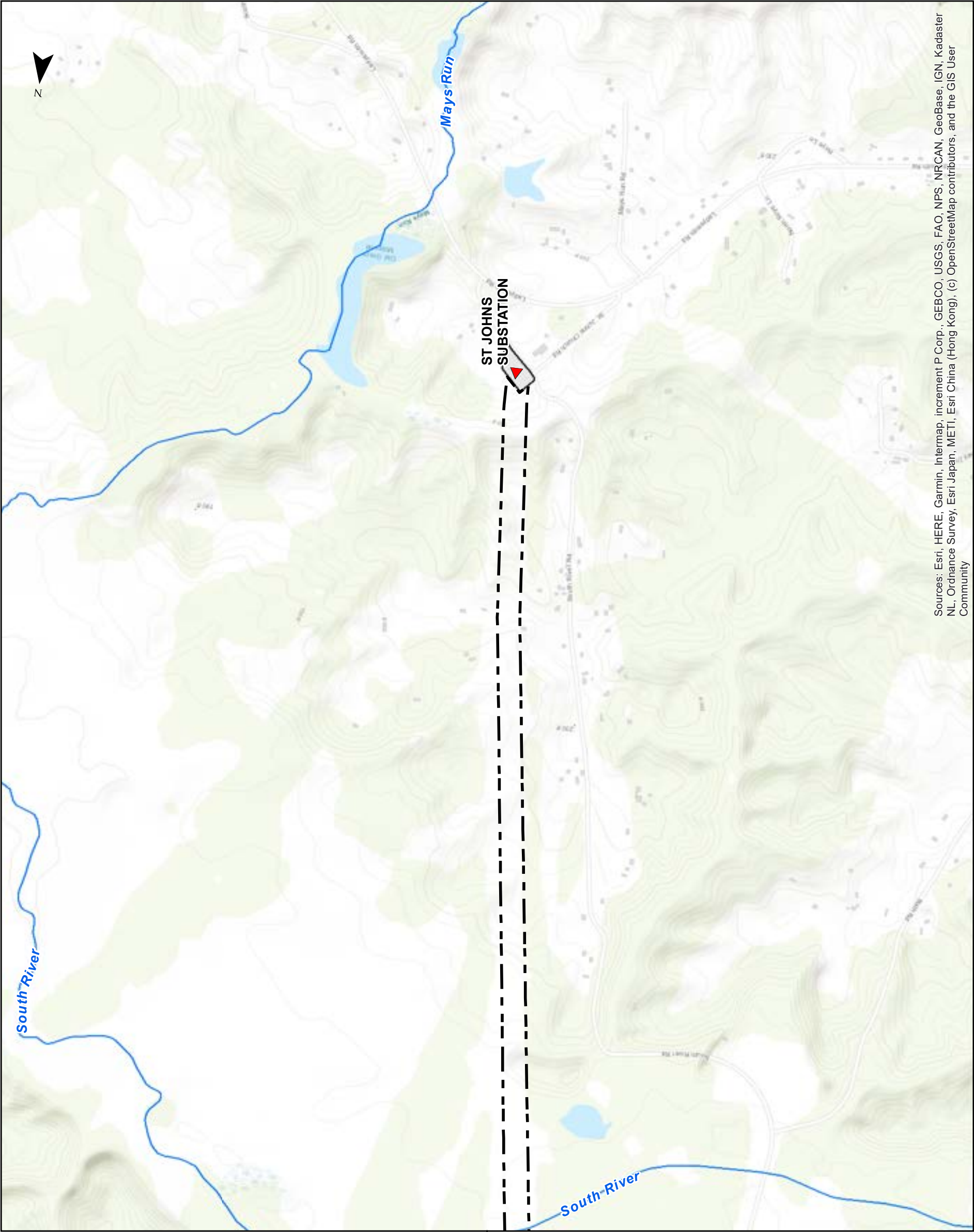
Railroad

ENVIRONMENTAL

Dominion Energy

SHEET 11 OF 12

65



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

ATTACHMENT II.A.9
CONSERVATION EASEMENTS MAP
Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)
Caroline and Spotsylvania Counties, Virginia
Client:
Dominion Energy Virginia
C2 Env Project: 0354 Prepared By: JRC Date: 08/15/24

05001,0002,000

Feet

Scale is 1 IN = 1,000 FT when printed at original size of 11x17

Existing Right-of-Way

Proposed Substation

Existing Substation

Dominion Owned Substation Parcel

Spotsylvania County Easement

Spotsylvania County Owned Land

Virginia Department of Historic Resources Easement

Virginia Outdoors Foundation Easement

Wetlands Reserve Program Easement

USGS National Hydrography Stream Centerline

Railroad

SHEET 12 OF 12

66

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 Project in a manner that minimizes outage times. Assuming a final order by May 31, 2025, the Company anticipates that all Project construction will be complete, and the Project will be energized by June 2028.

The Company intends to complete this work during requested outage windows, as described below. However, as with all outage scheduling, these outages may change depending on whether PJM approves the outages and other relevant considerations allow for it. It is customary for PJM to hold requests for outages and approve only shortly before the outages are expected to occur and, therefore, the requested outages are subject to change. Therefore, the Company will not have clarity on whether this work will be done as requested until very close in time to the requested outages. If PJM approves different outage dates, the Company will continue to diligently pursue timely completion of this work.

Line #256 Partial Rebuild (Ladysmith CT to St. Johns Substation)

An outage on Line #256 will be required to reconductor the line. It is expected that the outage on Line #256 will have a maximum duration of eleven months. Any required outages to Line #256 would be anticipated to occur in 2026-2027.

Line #2090/ #2335 Partial Rebuild (Ladysmith CT to Lee's Hill Substation)

An outage on Line #2090 will be required to reconductor the line. It is expected that the outage on Line #2090 will have a maximum duration of ten months. Any required outages to Line #2090 would be anticipated to occur in 2026.

New 230 kV Lines #2372 (Ladysmith - New Post) and #2378 (Lee's Hill - New Post)

The line construction for Line #s 2372 and 2378 will occur under the line outages for the #2089 and #2090 lines. An outage on Line #2089 will be required to reconductor the line. It is expected that the outage on Line #2089 will have a maximum duration of three months. Substation equipment outages of a 2–4-week duration will be needed at Ladysmith Substation and Lee's Hill Substation. Any required outages are expected to occur in 2026.

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 to these Guidelines provides a tool routinely used by the Company in routing its transmission line projects.

The Company utilized Guideline #1 by minimizing conflict between the rights-of-way and present and prospective uses of the land on which the proposed Project is to be located (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. To this end, existing rights-of-way should be given priority as the locations for additions to existing transmission facilities, and the joint use of existing rights-of-way by different kinds of utility services should be considered.).

By utilizing the existing transmission corridor, the proposed Project will minimize impact to any site listed on the National Register of Historic Places (NRHP). Thus, the proposed Project is consistent with Guideline #2 (where practical, rights-of-way should avoid sites listed on the NRHP). In any event, the Company will coordinate with VDHR regarding its plans prior to engineering and construction of proposed Project to avoid or minimize impacts. A Stage I Pre-Application Analysis prepared by Dutton and Associates on behalf of the Company was submitted to the VDHR on August 28, 2024.

The Company has communicated with local, state, and federal agencies prior to filing this Application, consistent with Guideline #4 (where government land is involved the applicant should contact the agencies early in the planning process). In particular, the Company consulted with Caroline and Spotsylvania Counties regarding the proposed Project. See Sections III.B and III.J of this Appendix.

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 ROW, constructing facilities, and maintaining rights-of-way after construction. Moreover, secondary uses of ROW that are consistent with the safe maintenance and operation of facilities are permitted.

II. DESCRIPTION OF THE PROPOSED PROJECT

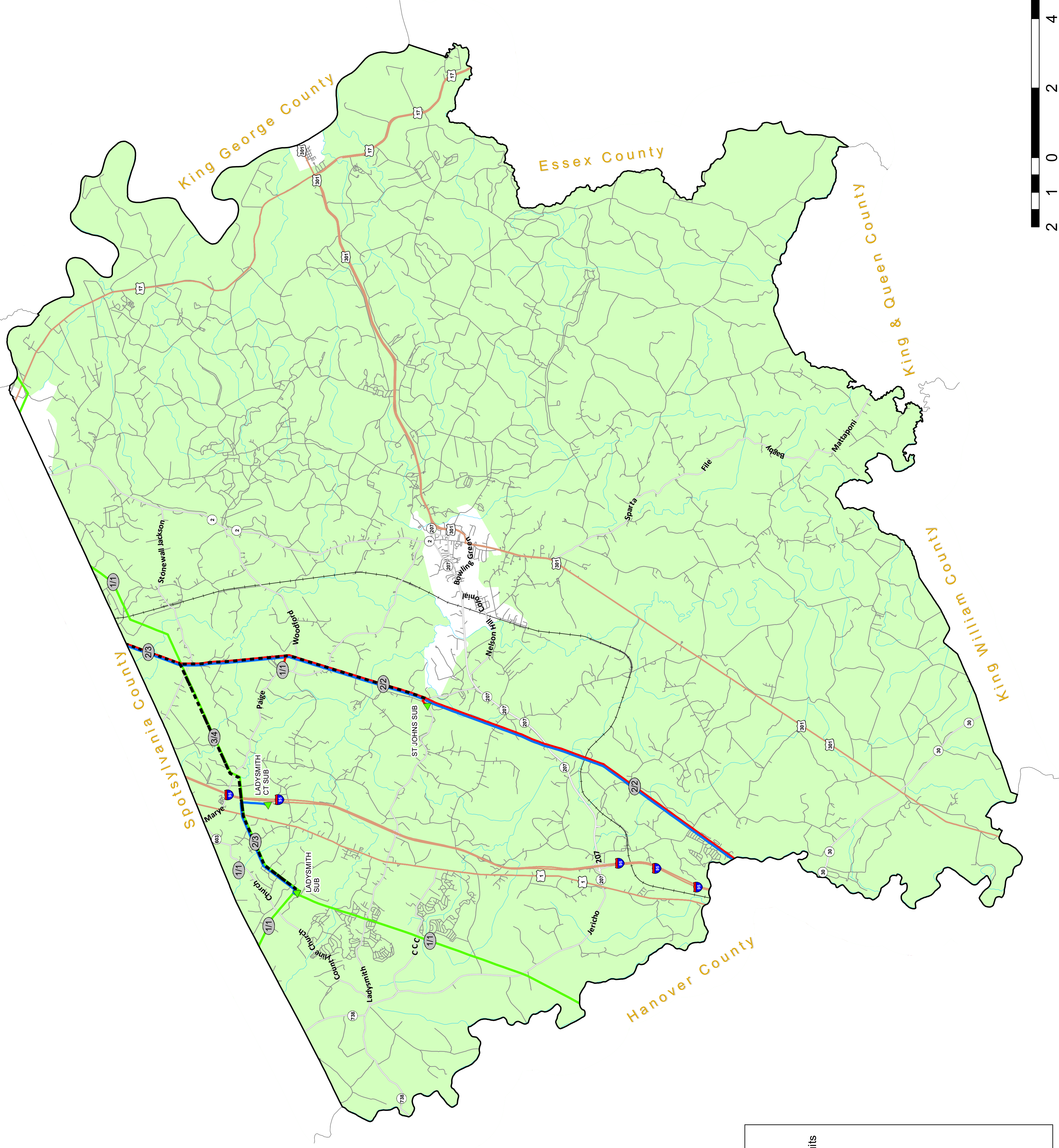
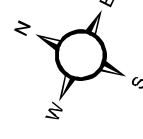
A. Right-of-way ("ROW")

- 12. a. Detail counties and localities through which the line will pass. If any portion of the line will be located outside of the Applicant's certificated service area: (1) identify each electric utility affected; (2) state whether any affected electric utility objects to such construction; and (3) identify the length of line(s) proposed to be located in the service area of an electric utility other than the Applicant; and**
- b. Provide three (3) color copies of the Virginia Department of Transportation "General Highway Map" for each county and city through which the line will pass. On the maps show the proposed line and all previously approved and certificated facilities of the Applicant. Also, where the line will be located outside of the Applicant's certificated service area, show the boundaries between the Applicant and each affected electric utility. On each map where the proposed line would be outside of the Applicant's certificated service area, the map must include a signature of an appropriate representative of the affected electric utility indicating that the affected utility is not opposed to the proposed construction within its service area.**

Response:

- a. The proposed Project crosses Spotsylvania County for a total of approximately 4.98 miles and Caroline County for a total of approximately 18.38 miles. The project is located entirely within Rappahannock Electric Cooperative ("REC") service territory.
- b. An electronic copy of the Virginia Department of Transportation ("VDOT") "General Highway Map" for Caroline County and for Spotsylvania County has been marked as required and submitted with the Application. A reduced copy of each map is provided in Attachment II.A.12.b.

Caroline County Road Map



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

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

Rappahannock Electric Cooperative
NOT OPPOSED TO SUCH CONSTRUCTION
LOCATED IN THE SPECIFIC REC SERVICE
TERRITORY. SHOWN ON THIS MAP.

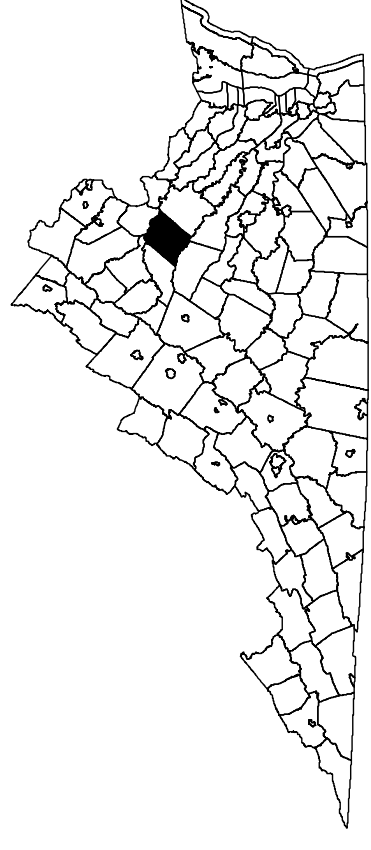
SIGNATURE  TITLE President & CEO

DATE 8/15/24

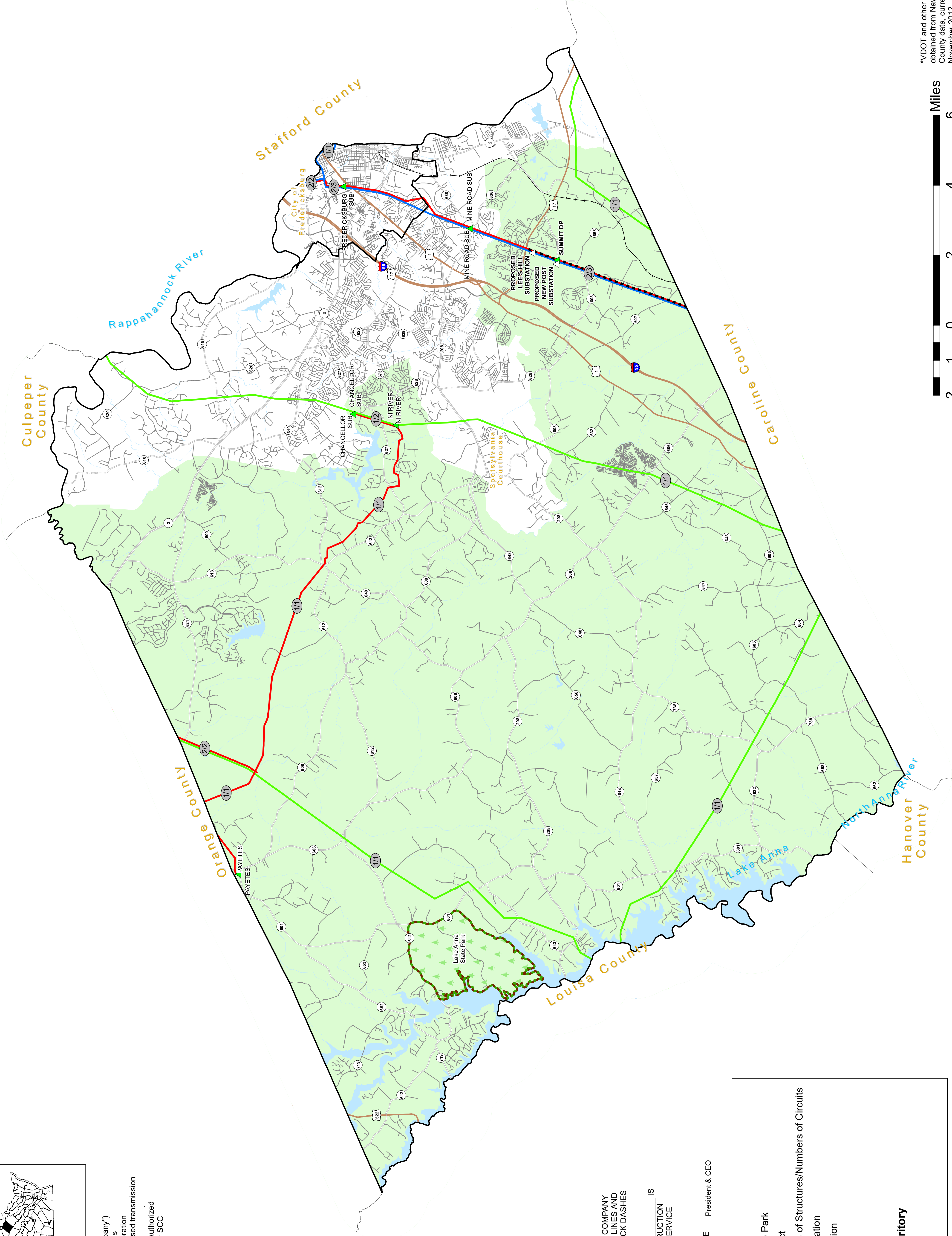
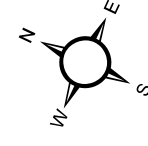
Legend

- Proposed Project
 (1/2) Number of Lines of Structures/Numbers of Circuits
 ▲ Existing Substation
 △ Proposed Substation
 69 kV
 115 kV
 138 kV
 230 kV
 500 kV
Provider Service Territory
 REC
 VEPCO

Spotsylvania County and Fredericksburg Road Map



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



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

Rappahannock Electric Cooperative

**NOT OPPOSED TO SUCH CONSTRUCTION
LOCATED IN THE SPECIFIC REC SERVICE
TERRITORY LOCATED ON THIS MAP.**

SIGNATURE 
DATE 8/19/24

TITLE
President & CEO

Legend

-  Lake Anna State Park
-  Proposed Project
-  Number of Lines of Structures/Numbers of Circuits
-  Proposed Substation
-  Existing Substation
-  115 kV
-  230 kV
-  500 kV

Provider Service Territory

-  REC
-  VEPCO

*VDOT and other road data obtained from Navteq and County data, current as of November 2012.

A horizontal scale bar with alternating black and white segments. Below the bar, the numbers 0, 1, 2, 4, and 6 are printed, indicating distances in miles. The word "Miles" is written vertically to the right of the bar.

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: Line #256 will be designed and operated at 230 kV with no anticipated voltage upgrade and have a transfer capability of 1,573 MVA. Line #2090/#2335 will be designed and operated at 230 kV with no anticipated voltage upgrade and have a transfer capability of 1,573 MVA. The proposed Lines #2372/#2378 from Ladysmith Substation to New Post Substation and from New Post Substation to Lee's Hill Substation, respectively, 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: **Line #256 Partial Rebuild (Ladysmith CT to St. Johns Substation)**

The proposed double-circuit 230 kV lines will include 3-phase 2-768.2 ACSS/TW/HS (20/7) conductors arranged as shown in Attachment II.B.3.a through Attachment II.B.3.h. 2-768.2 ACSS/TW/HS conductors are the Company's standard for new 230 kV construction.

Line #2090/#2335 Partial Rebuild (Ladysmith CT to Lee's Hill Substation)

The proposed double-circuit 230 kV lines will include 3-phase 2-768.2 ACSS/TW/HS (20/7) conductors arranged as showed in Attachment II.B.3.a through Attachment II.B.3.h. 2-768.2 ACSS/TW/HS conductors are the Company's standard for new 230 kV construction.

New 230 kV Lines #2372 (Ladysmith - New Post) and #2378 (Lee's Hill - New Post)

The proposed single-circuit 230 kV lines will include 3-phase 2-768.2 ACSS/TW/HS (20/7) conductors arranged as showed in Attachment II.B.3.a through Attachment II.B.3.h. 2-768.2 ACSS/TW/HS conductors are the Company's standard for new 230 kV construction.

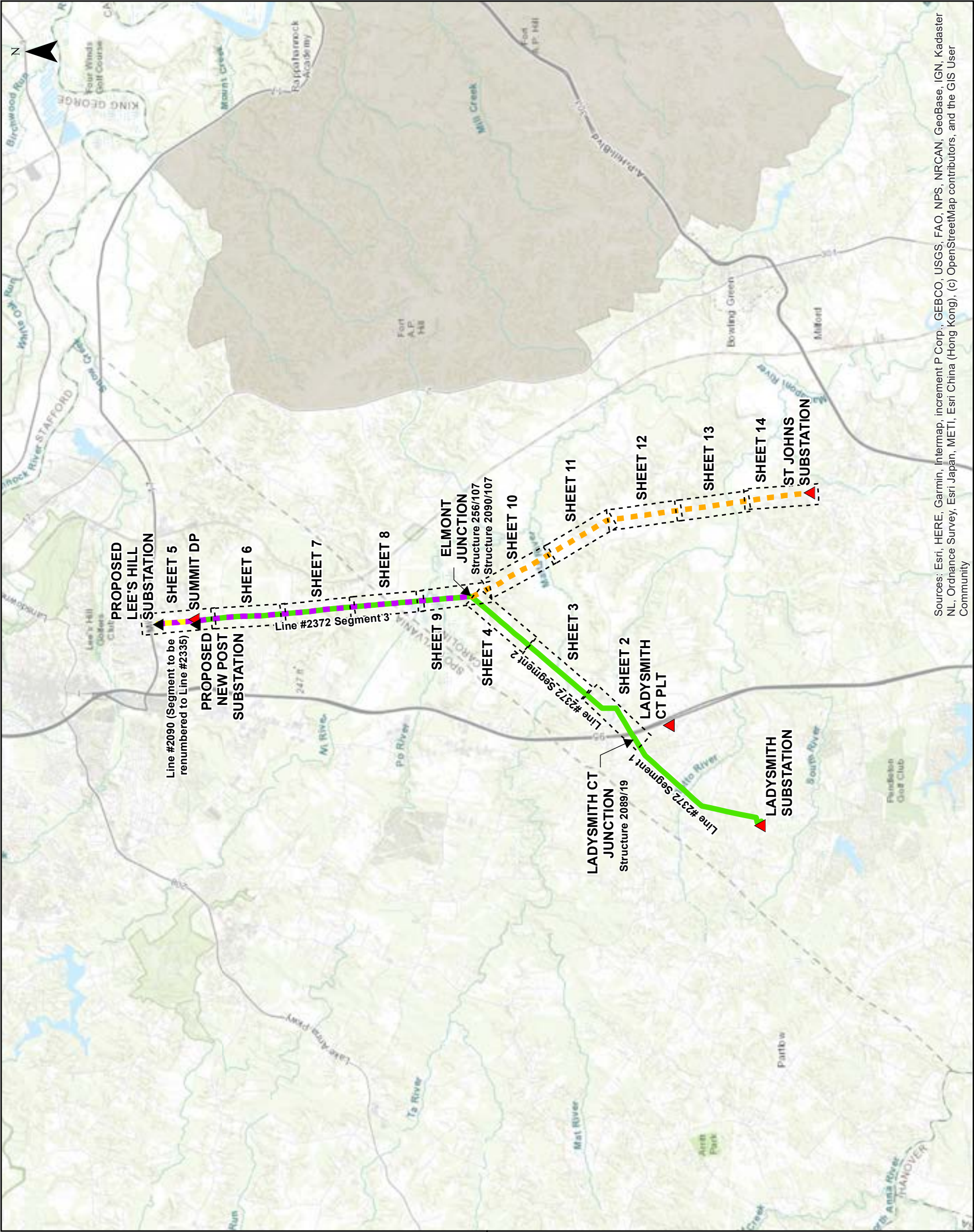
II. DESCRIPTION OF THE PROPOSED PROJECT

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: For subpart (a), see Attachment II.B.3 for approximate mapping of the proposed structures for the proposed Project, which is subject to change during final engineering.

For subparts (b) – (j), see Attachments II.B.3.a-h.



ATTACHMENT II.B.3

STRUCTURE LOCATION MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill) Caroline and Spotsylvania Counties, Virginia

Client:

Dominion Energy Virginia

C2 Env Project:

0354

Prepared By:

JRC

Date:

08/15/24

0

1

2

4

Scale is 1 IN = 2 MI when printed at original size of 11x17

Proposed 230 kV Line #2372 in Existing ROW

Proposed 230 kV Line #2378 in Existing ROW

Existing 230 kV Line #2090 (and Future Line #2335) Partial Rebuild

Existing 230 kV Line #256 Partial Rebuild

Proposed Substation

Existing Substation

Notes:

1. Basemap from ESRI World Topographic Map

2. Project centerline and structure locations provided by Dominion Energy Virginia

3. Roads and railroads from Virginia Geographic Information Network

APPROXIMATE PROJECT LOCATION

Sources: Esri, HERE, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN,

ENVIRONMENTAL

Dominion Energy

SHEET 1 OF 14

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

S:\Projects\0354 - Ladysmith\Projects SCC Support\GIS CAD\Drawings\0354_Attachment_II.B.3_StructureLocations_Index.mxd

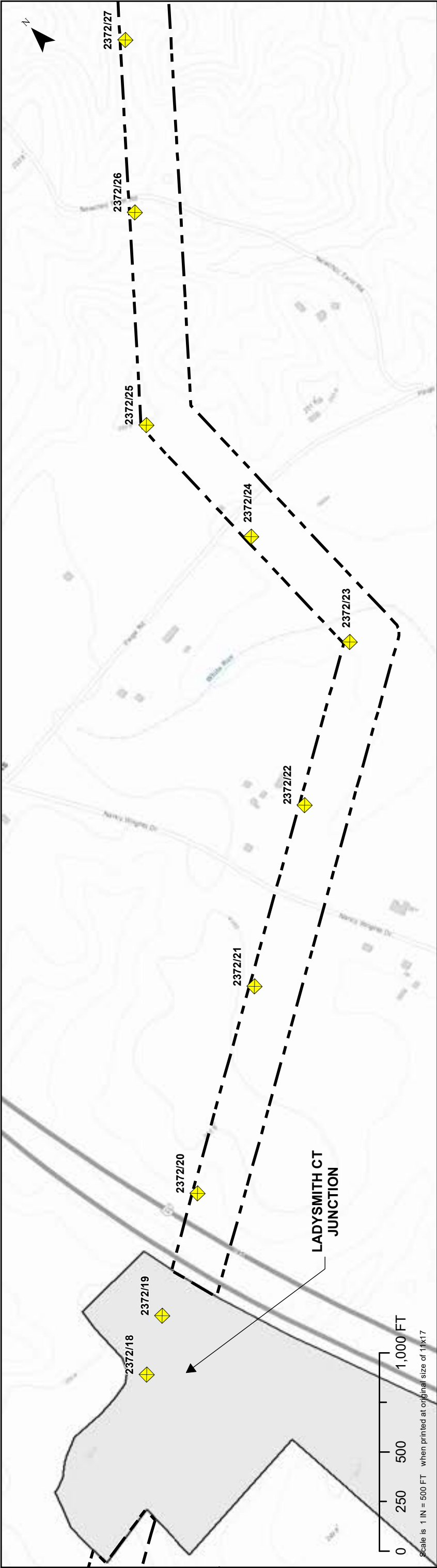
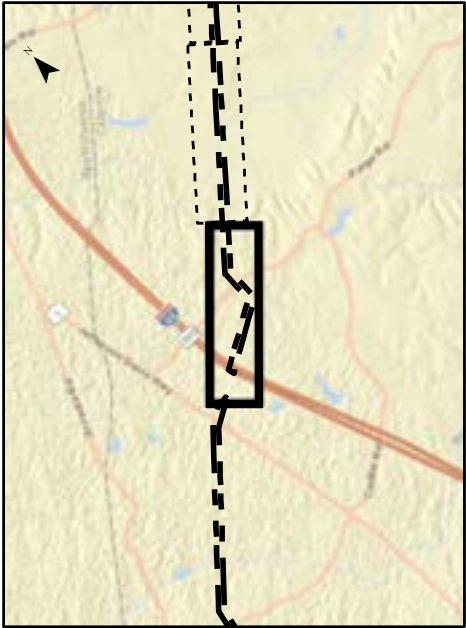


TABLE II.B.3

Proposed Line #2372 Structure Number	2372/18	2372/19	2372/20	2372/21	2372/22	2372/23	2372/24	2372/25	2372/26	2372/27
Proposed Height (FT)	110	125	140	135	120	120	120	135	120	130

Notes:

- 1. The proposed structure heights are above ground level and exclude foundation reveal.
- 2. Structure locations and heights provided by Dominion Energy Virginia.
- 3. Project and structures are subject to change based on final engineering design.
- 4. Structures depicted do not include portions of the project that are considered ordinary course as described in Section I.A.
- 5. Line #2090 will co-locate with Line #2372 between Elmont Junction and New Post Substation.
- 6. Line #2335 will co-locate with Line #2378 between New Post Substation and Lee's Hill Substation.
- 7. Basemap from ESRI Topographic and World Street Map.



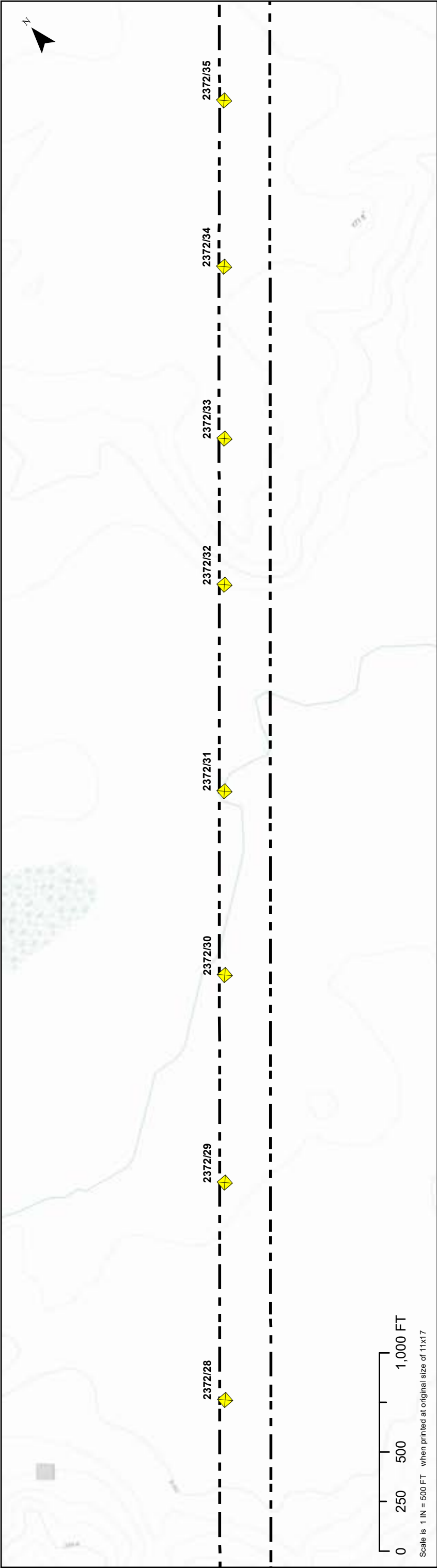
- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Proposed Structures
- Dominion Owned Substation Parcel

ATTACHMENT II.B.3
STRUCTURE LOCATION MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and Line #2378 (New Post - Lee's Hill)

Owner/ Applicant: Dominion Energy Virginia	
C2 Env Project: 0354	Prepared By: JRC
Date: 08/15/2024	





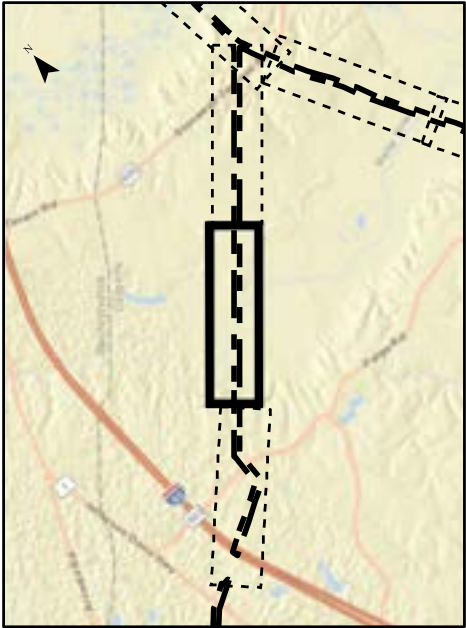
Scale is 1 IN = 500 FT when printed at original size of 11x17

TABLE II.B.3

Proposed Line #2372 Structure Number	2372/28	2372/29	2372/30	2372/31	2372/32	2372/33	2372/34	2372/35
Proposed Height (FT)	140	135	125	120	125	120	120	120

Notes:

1. The proposed structure heights are above ground level and exclude foundation reveal.
2. Structure locations and heights provided by Dominion Energy Virginia.
3. Project and structures are subject to change based on final engineering design.
4. Structures depicted do not include portions of the project that are considered ordinary course as described in Section I.A.
5. Line #2090 will co-locate with Line #2372 between Elmont Junction and New Post Substation.
6. Line #2335 will co-locate with Line #2378 between New Post Substation and Lee's Hill Substation.
7. Basemap from ESRI Topographic and World Street Map.



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Proposed Structures
- Dominion Owned Substation Parcel



ATTACHMENT II.B.3
STRUCTURE LOCATION MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and Line #2378 (New Post - Lee's Hill)

Owner/ Applicant: Dominion Energy Virginia	
C2 Env Project: 0354	Prepared By: JRC
Date: 08/15/2024	

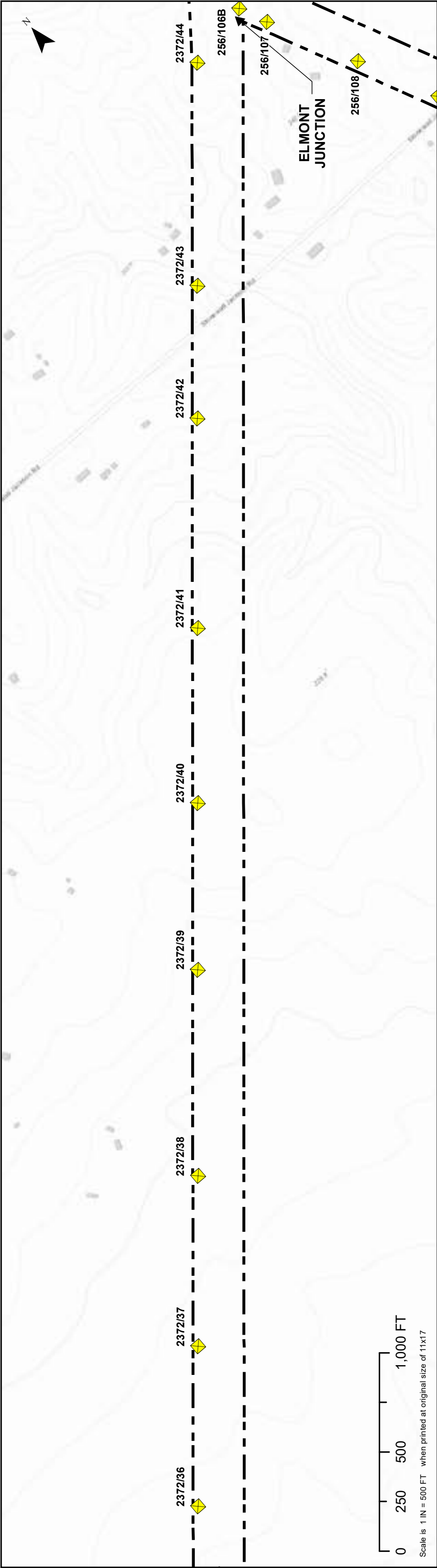
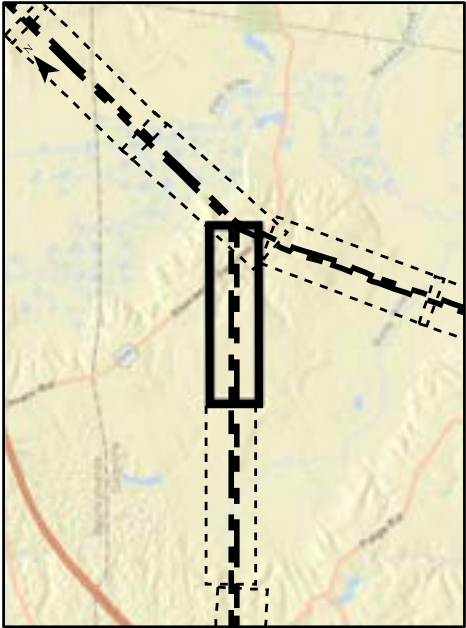


TABLE II.B.3

Proposed Line #2372 Structure Number	2372/36	2372/37	2372/38	2372/39	2372/40	2372/41	2372/42	2372/43	2372/44
Proposed Height (FT)	115	115	125	130	120	130	120	140	115
Proposed Line #256 Structure Number	256/106B	256/107	256/108						
Proposed Height (FT)	50	85	120						

Notes:

- 1. The proposed structure heights are above ground level and exclude foundation reveal.
- 2. Structure locations and heights provided by Dominion Energy Virginia.
- 3. Project and structures are subject to change based on final engineering design.
- 4. Structures depicted do not include portions of the project that are considered ordinary course as described in Section I.A.
- 5. Line #2090 will co-locate with Line #2372 between Elmont Junction and New Post Substation.
- 6. Line #2335 will co-locate with Line #2378 between New Post Substation and Lee's Hill Substation.
- 7. Basemap from ESRI Topographic and World Street Map.



S:\Projects\0354 - Ladysmith Projects SCC Support\GIS CAD\0354_Attachment_II.B.3_Structural_locations.mxd

- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Proposed Structures
- Dominion Owned Substation Parcel

ATTACHMENT II.B.3
STRUCTURE LOCATION MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and Line #2378 (New Post - Lee's Hill)

Owner/ Applicant: Dominion Energy Virginia		Caroline County and Spotsylvania County, Virginia	
C2 Env Project: 0354	Prepared By: JRC	Date: 08/15/2024	



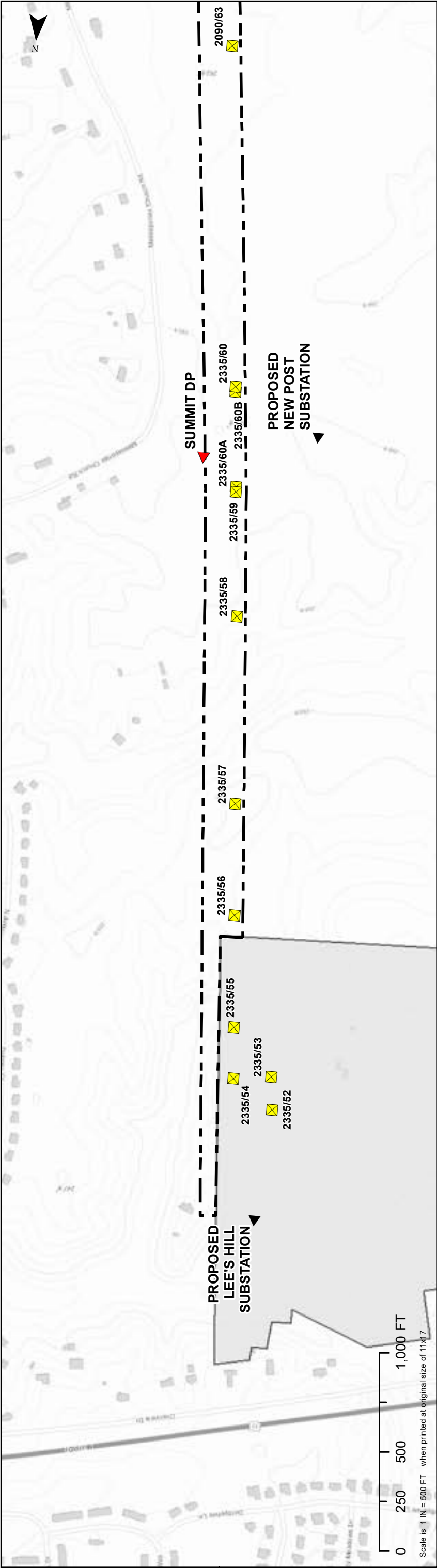
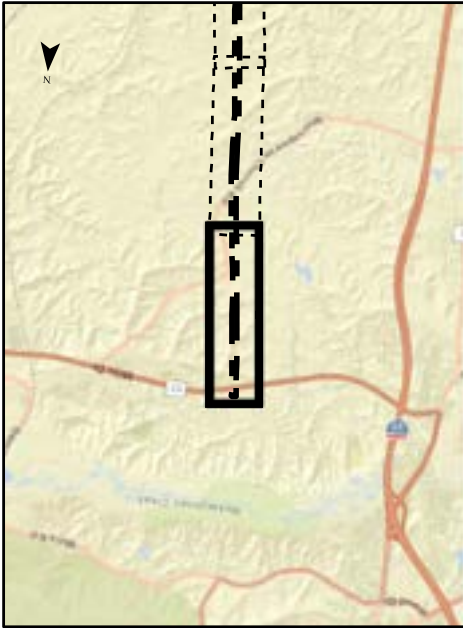


TABLE II.B.3

Proposed Line #2335 (Formerly Line #2090) Structure Number	2335/52	2335/53	2335/54	2335/55	2335/56	2335/57	2335/58	2335/59	2335/60	2335/60A	2335/60B
Proposed Height (FT)	75	100	100	110	130	125	110	95	95	27	27
Proposed Line #2090 Structure Number	2090/63										
Proposed Height (FT)	120										

Notes:

- 1. The proposed structure heights are above ground level and exclude foundation reveal.
- 2. Structure locations and heights provided by Dominion Energy Virginia.
- 3. Project and structures are subject to change based on final engineering design.
- 4. Structures depicted do not include portions of the project that are considered ordinary course as described in Section I.A.
- 5. Line #2090 will co-locate with Line #2372 between Elmont Junction and New Post Substation.
- 6. Line #2335 will co-locate with Line #2378 between New Post Substation and Lee's Hill Substation.
- 7. Basemap from ESRI Topographic and World Street Map.



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Proposed Structures
- Dominion Owned Substation Parcel

ATTACHMENT II.B.3
STRUCTURE LOCATION MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and Line #2378 (New Post - Lee's Hill)

Owner/ Applicant: Dominion Energy Virginia	
C2 Env Project: 0354	Prepared By: JRC
Date: 08/15/2024	



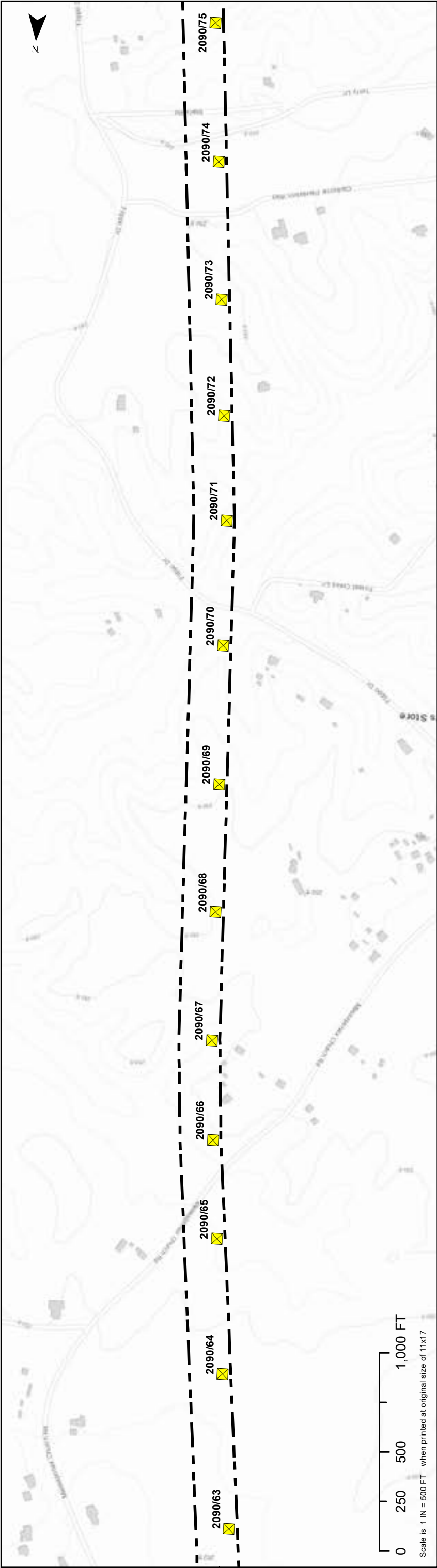
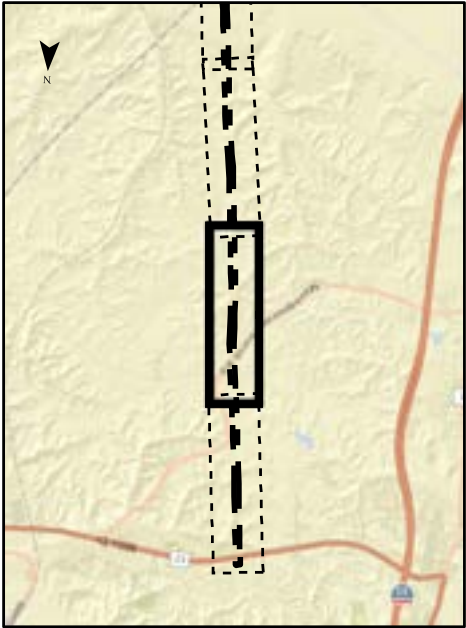


TABLE II.B.3

Proposed Line #2090 Structure Number	2090/63	2090/64	2090/65	2090/66	2090/67	2090/68	2090/69	2090/70	2090/71	2090/72	2090/73	2090/74	2090/75
Proposed Height (FT)	120	115	110	110	105	110	115	110	105	110	110	105	110

Notes:

- 1. The proposed structure heights are above ground level and exclude foundation reveal.
- 2. Structure locations and heights provided by Dominion Energy Virginia.
- 3. Project and structures are subject to change based on final engineering design.
- 4. Structures depicted do not include portions of the project that are considered ordinary course as described in Section I.A.
- 5. Line #2090 will co-locate with Line #2372 between Elmont Junction and New Post Substation.
- 6. Line #2335 will co-locate with Line #2378 between New Post Substation and Lee's Hill Substation.
- 7. Basemap from ESRI Topographic and World Street Map.



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Proposed Structures
- Dominion Owned Substation Parcel

ATTACHMENT II.B.3
STRUCTURE LOCATION MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and Line #2378 (New Post - Lee's Hill)

Caroline County and Spotsylvania County, Virginia

Owner/ Applicant:
Dominion Energy Virginia

C2 Env Project: 0354
Prepared By: JRC
Date: 08/15/2024

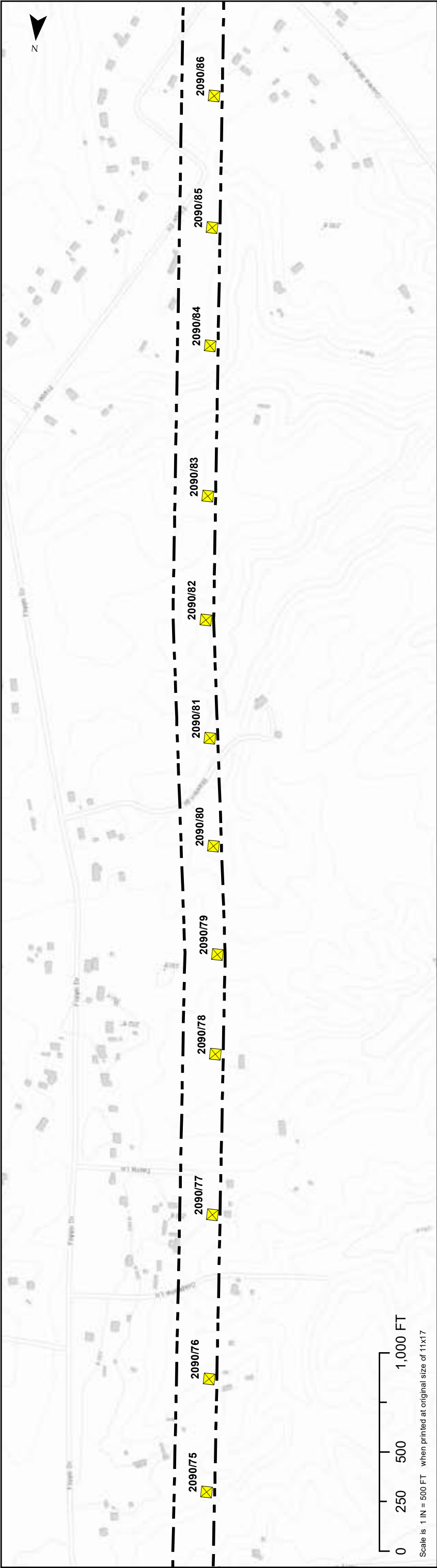
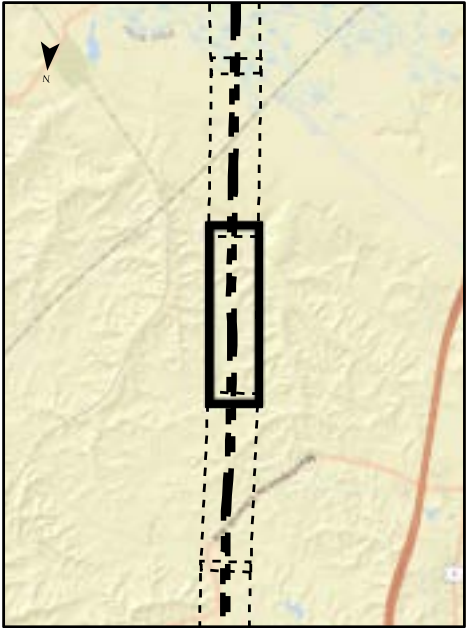


TABLE II.B.3

Proposed Line #2090 Structure Number	2090/75	2090/76	2090/77	2090/78	2090/79	2090/80	2090/81	2090/82	2090/83	2090/84	2090/85	2090/86
Proposed Height (FT)	110	115	115	115	90	115	105	115	110	115	110	110

Notes:

- 1. The proposed structure heights are above ground level and exclude foundation reveal.
- 2. Structure locations and heights provided by Dominion Energy Virginia.
- 3. Project and structures are subject to change based on final engineering design.
- 4. Structures depicted do not include portions of the project that are considered ordinary course as described in Section I.A.
- 5. Line #2090 will co-locate with Line #2372 between Elmont Junction and New Post Substation.
- 6. Line #2335 will co-locate with Line #2378 between New Post Substation and Lee's Hill Substation.
- 7. Basemap from ESRI Topographic and World Street Map.



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Proposed Structures
- Dominion Owned Substation Parcel



ATTACHMENT II.B.3
STRUCTURE LOCATION MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and Line #2378 (New Post - Lee's Hill)

Owner/ Applicant: Dominion Energy Virginia	
C2 Env Project: 0354	Prepared By: JRC
Date: 08/15/2024	

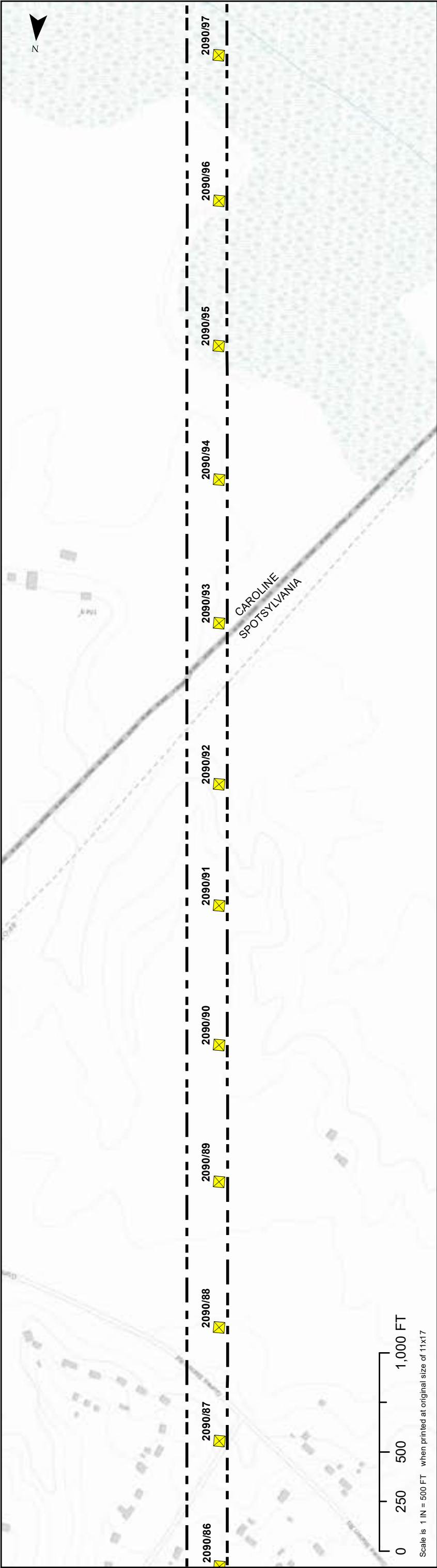
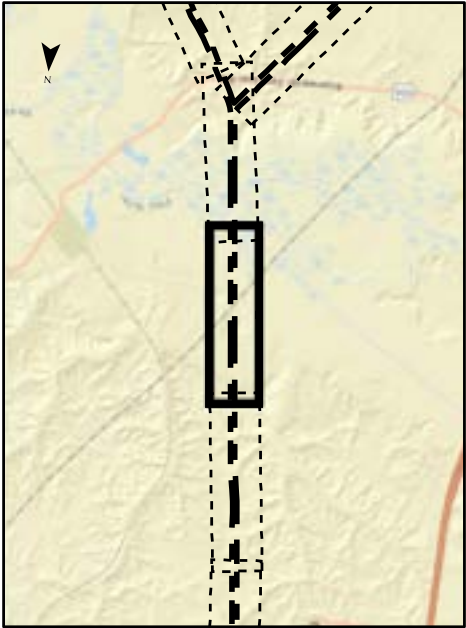


TABLE II.B.3

Proposed Line #2090 Structure Number	2090/86	2090/87	2090/88	2090/89	2090/90	2090/91	2090/92	2090/93	2090/94	2090/95	2090/96	2090/97
Proposed Height (FT)	110	105	110	115	110	115	115	115	110	120	120	110

Notes:

- 1. The proposed structure heights are above ground level and exclude foundation reveal.
- 2. Structure locations and heights provided by Dominion Energy Virginia.
- 3. Project and structures are subject to change based on final engineering design.
- 4. Structures depicted do not include portions of the project that are considered ordinary course as described in Section I.A.
- 5. Line #2090 will co-locate with Line #2372 between Elmont Junction and New Post Substation.
- 6. Line #2335 will co-locate with Line #2378 between New Post Substation and Lee's Hill Substation.
- 7. Basemap from ESRI Topographic and World Street Map.



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Proposed Structures
- Dominion Owned Substation Parcel

ATTACHMENT II.B.3
STRUCTURE LOCATION MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and Line #2378 (New Post - Lee's Hill)

Caroline County and Spotsylvania County, Virginia		
Owner/ Applicant: Dominion Energy Virginia		
C2 Env Project: 0354	Prepared By: JRC	Date: 08/15/2024

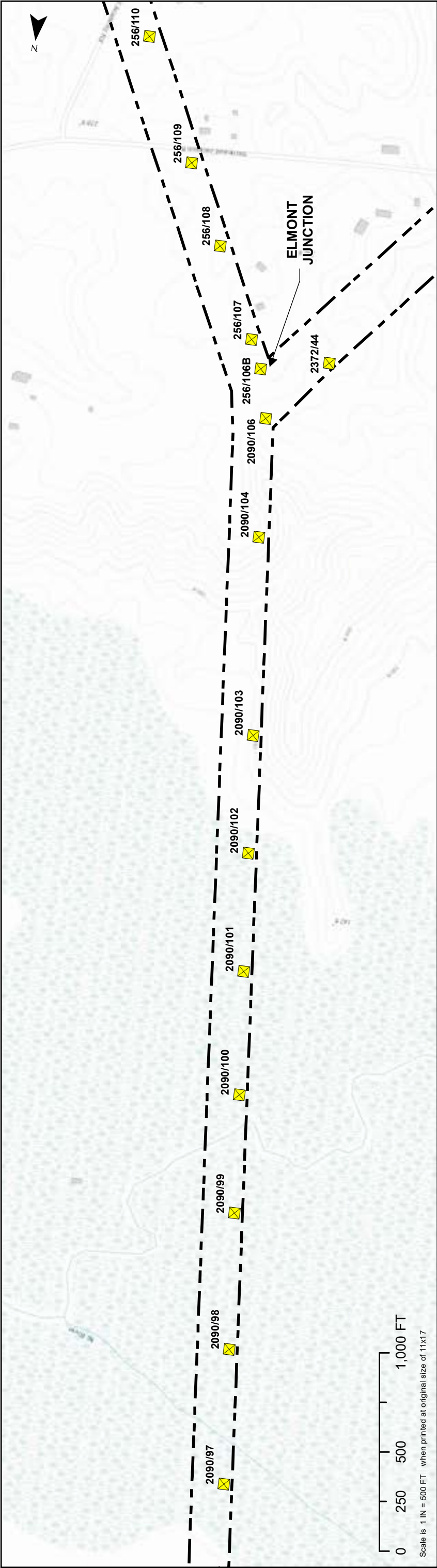
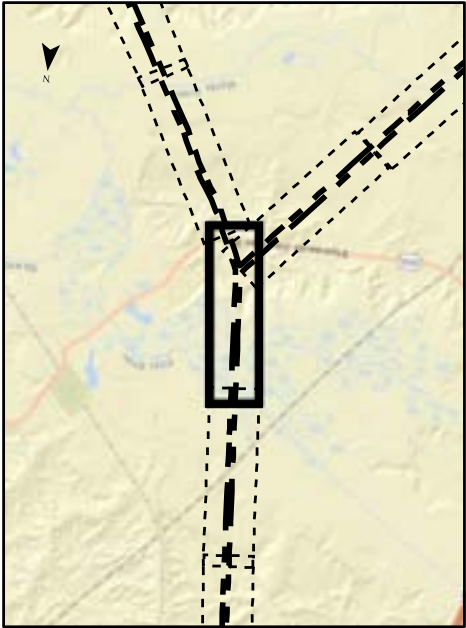


TABLE II.B.3

Proposed Line #2090 Structure Number	2090/97	2090/98	2090/99	2090/100	2090/101	2090/102	2090/103	2090/104	2090/105	2090/106
Proposed Height (FT)	110	115	110	110	110	110	105	110	NA	80
Proposed Line #256 Structure Number	256/106B	256/107	256/108	256/109	256/110					
Proposed Height (FT)	50	85	120	115	105					

Notes:

- 1. The proposed structure heights are above ground level and exclude foundation reveal.
- 2. Structure locations and heights provided by Dominion Energy Virginia.
- 3. Project and structures are subject to change based on final engineering design.
- 4. Structures depicted do not include portions of the project that are considered ordinary course as described in Section I.A.
- 5. Line #2090 will co-locate with Line #2372 between Elmont Junction and New Post Substation.
- 6. Line #2335 will co-locate with Line #2378 between New Post Substation and Lee's Hill Substation.
- 7. Basemap from ESRI Topographic and World Street Map.

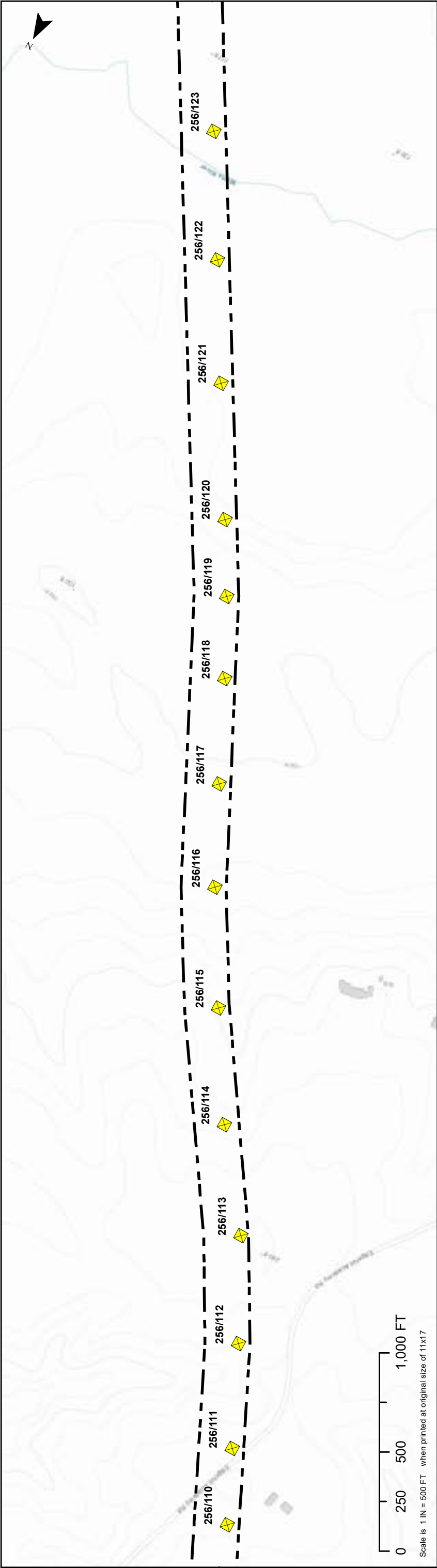


- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Proposed Structures
- Dominion Owned Substation Parcel

ATTACHMENT II.B.3
STRUCTURE LOCATION MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and Line #2378 (New Post - Lee's Hill)

Caroline County and Spotsylvania County, Virginia			
Owner/ Applicant: Dominion Energy Virginia			
C2 Env Project: 0354	Prepared By: JRC	Date: 08/15/2024	



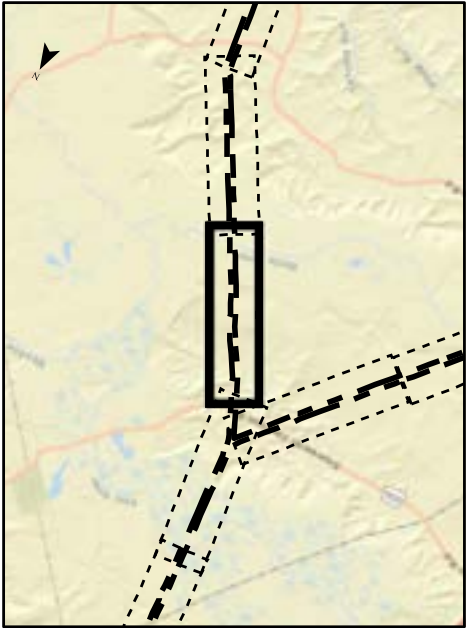
Scale is 1 IN = 500 FT when printed at original size of 11x17

TABLE II.B.3

Proposed Line #256 Structure Number	256/110	256/111	256/112	256/113	256/114	256/115	256/116	256/117	256/118	256/119	256/120	256/121	256/122	256/123
Proposed Height (FT)	105	100	110	105	110	85	110	105	105	85	110	110	110	110

Notes:

1. The proposed structure heights are above ground level and exclude foundation reveal.
2. Structure locations and heights provided by Dominion Energy Virginia.
3. Project and structures are subject to change based on final engineering design.
4. Structures depicted do not include portions of the project that are considered ordinary course as described in Section I.A.
5. Line #2090 will co-locate with Line #2372 between Elmont Junction and New Post Substation.
6. Line #2335 will co-locate with Line #2378 between New Post Substation and Lee's Hill Substation.
7. Basemap from ESRI Topographic and World Street Map.



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Proposed Structures
- Dominion Owned Substation Parcel

ATTACHMENT II.B.3
STRUCTURE LOCATION MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and Line #2378 (New Post - Lee's Hill)

Owner/ Applicant: Dominion Energy Virginia	
C2 Env Project: 0354	Prepared By: JRC
Date: 08/15/2024	



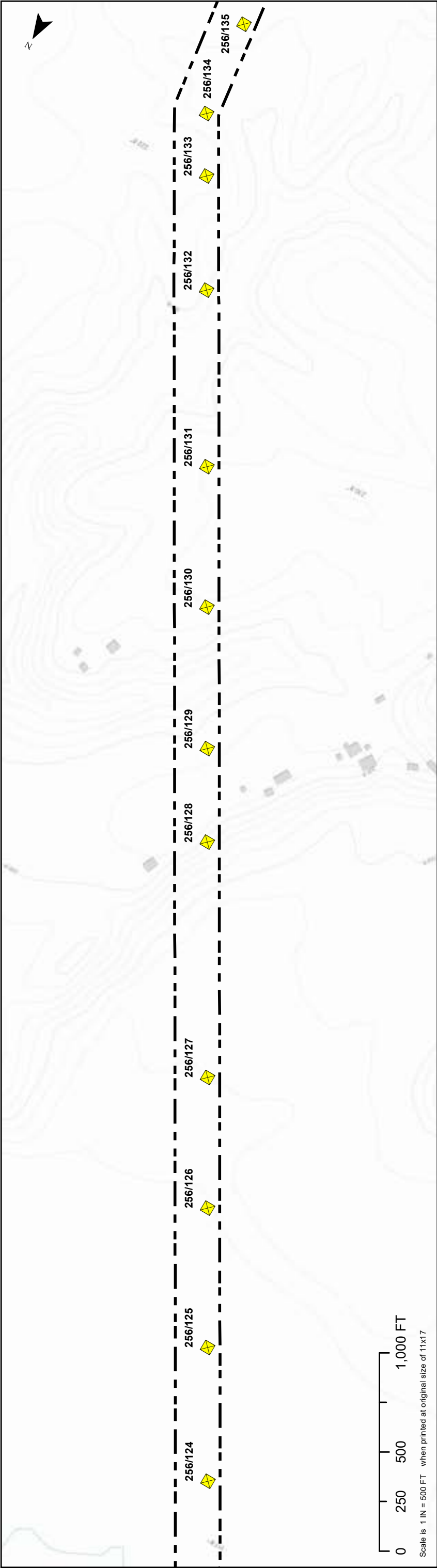
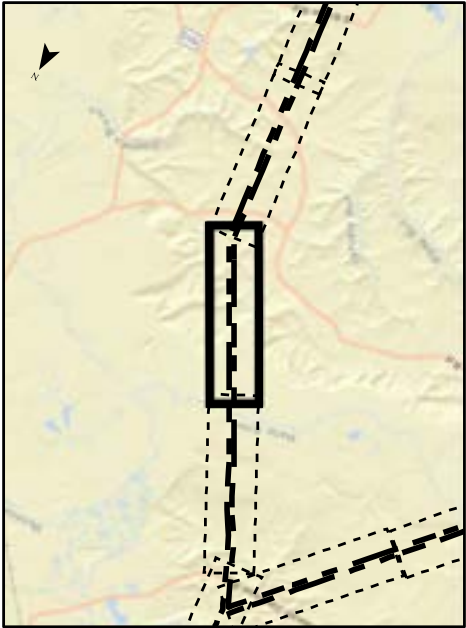


TABLE II.B.3

Proposed Line #256 Structure Number	256/124	256/125	256/126	256/127	256/128	256/129	256/130	256/131	256/132	256/133	256/134	256/135
Proposed Height (FT)	110	110	125	135	115	105	115	115	130	110	105	110

Notes:

- 1. The proposed structure heights are above ground level and exclude foundation reveal.
- 2. Structure locations and heights provided by Dominion Energy Virginia.
- 3. Project and structures are subject to change based on final engineering design.
- 4. Structures depicted do not include portions of the project that are considered ordinary course as described in Section I.A.
- 5. Line #2090 will co-locate with Line #2372 between Elmont Junction and New Post Substation.
- 6. Line #2335 will co-locate with Line #2378 between New Post Substation and Lee's Hill Substation.
- 7. Basemap from ESRI Topographic and World Street Map.



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Proposed Structures
- Dominion Owned Substation Parcel

ATTACHMENT II.B.3
STRUCTURE LOCATION MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and Line #2378 (New Post - Lee's Hill)

Owner/ Applicant: Dominion Energy Virginia	
C2 Env Project: 0354	Prepared By: JRC
Date: 08/15/2024	



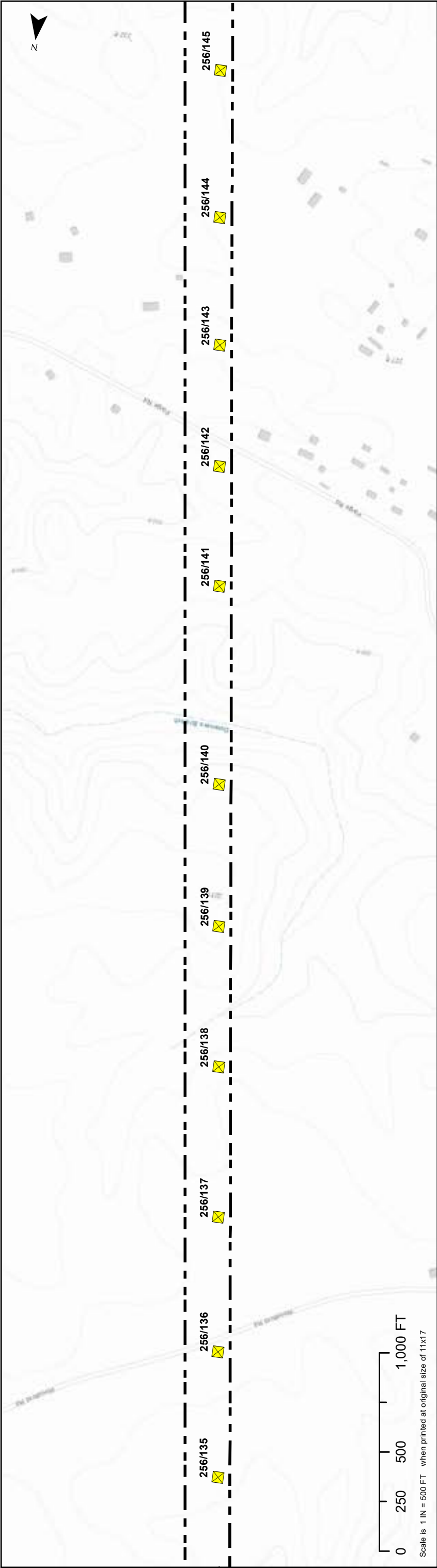
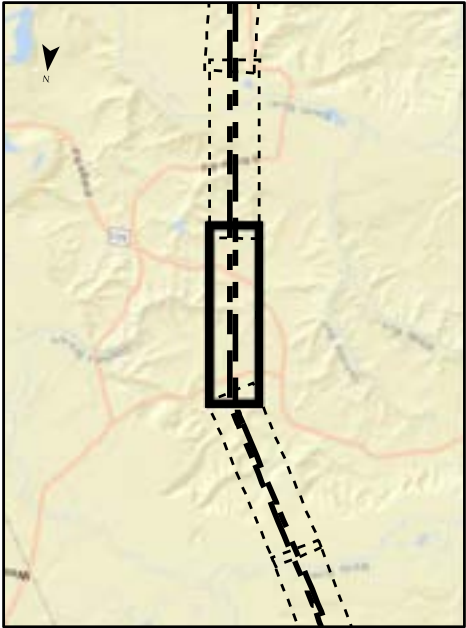


TABLE II.B.3

Proposed Line #256 Structure Number	256/135	256/136	256/137	256/138	256/139	256/140	256/141	256/142	256/143	256/144	256/145
Proposed Height (FT)	110	110	115	116	110	130	125	105	115	115	120

Notes:

- 1. The proposed structure heights are above ground level and exclude foundation reveal.
- 2. Structure locations and heights provided by Dominion Energy Virginia.
- 3. Project and structures are subject to change based on final engineering design.
- 4. Structures depicted do not include portions of the project that are considered ordinary course as described in Section I.A.
- 5. Line #2090 will co-locate with Line #2372 between Elmont Junction and New Post Substation.
- 6. Line #2335 will co-locate with Line #2378 between New Post Substation and Lee's Hill Substation.
- 7. Basemap from ESRI Topographic and World Street Map.



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Proposed Structures
- Dominion Owned Substation Parcel

ATTACHMENT II.B.3
STRUCTURE LOCATION MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and Line #2378 (New Post - Lee's Hill)

Caroline County and Spotsylvania County, Virginia

Owner/ Applicant:
Dominion Energy Virginia

C2 Env Project: 0354
Prepared By: JRC
Date: 08/15/2024

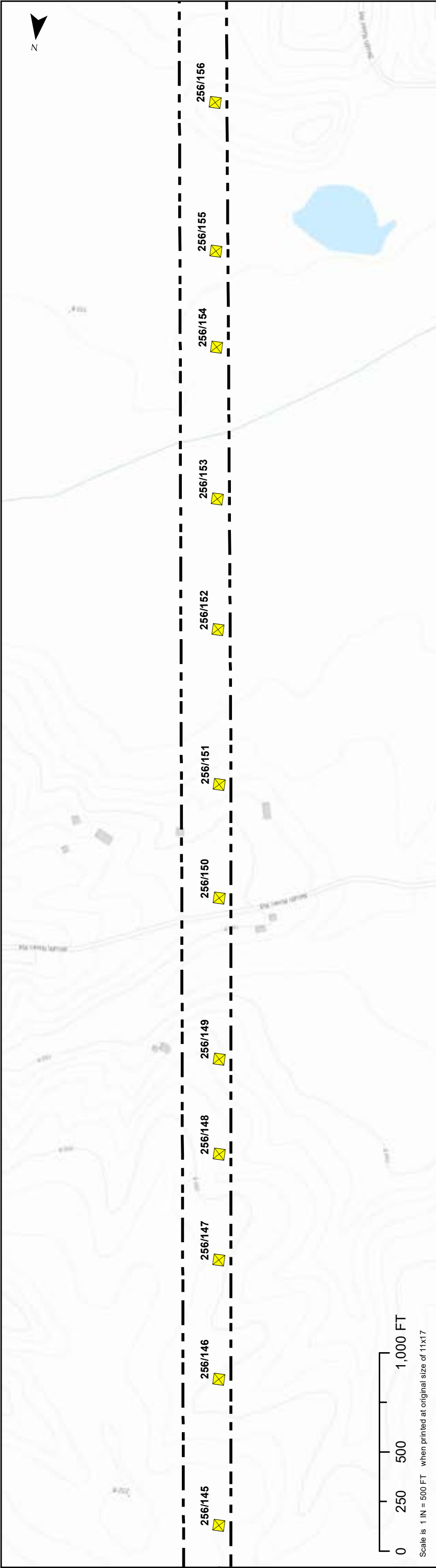
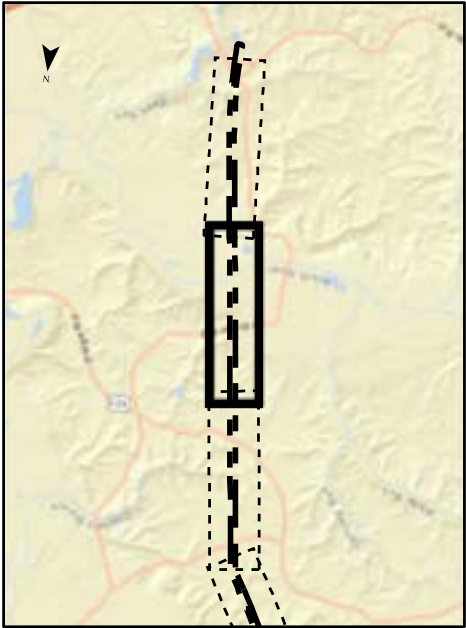


TABLE II.B.3

Proposed Line #256 Structure Number	256/145	256/146	256/147	256/148	256/149	256/150	256/151	256/152	256/153	256/154	256/155	256/156
Proposed Height (FT)	120	115	105	110	110	110	110	110	115	120	115	95

Notes:

1. The proposed structure heights are above ground level and exclude foundation reveal.
2. Structure locations and heights provided by Dominion Energy Virginia.
3. Project and structures are subject to change based on final engineering design.
4. Structures depicted do not include portions of the project that are considered ordinary course as described in Section I.A.
5. Line #2090 will co-locate with Line #2372 between Elmont Junction and New Post Substation.
6. Line #2335 will co-locate with Line #2378 between New Post Substation and Lee's Hill Substation.
7. Basemap from ESRI Topographic and World Street Map.



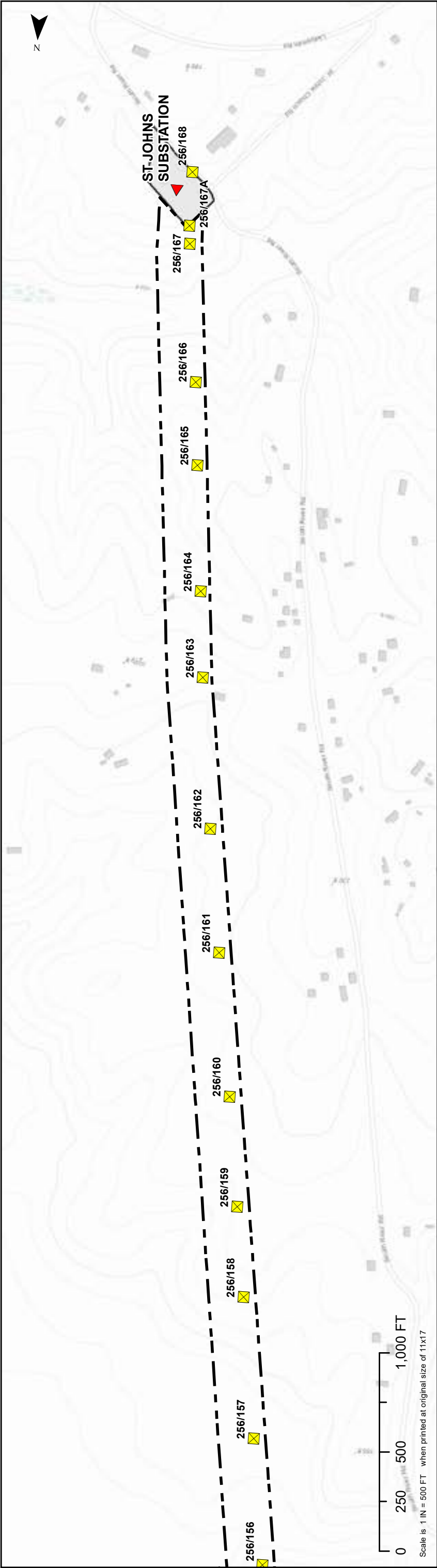
- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Proposed Structures
- Dominion Owned Substation Parcel

ATTACHMENT II.B.3
STRUCTURE LOCATION MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and Line #2378 (New Post - Lee's Hill)

Caroline County and Spotsylvania County, Virginia			
Owner/ Applicant: Dominion Energy Virginia			
C2 Env Project: 0354	Prepared By: JRC	Date: 08/15/2024	





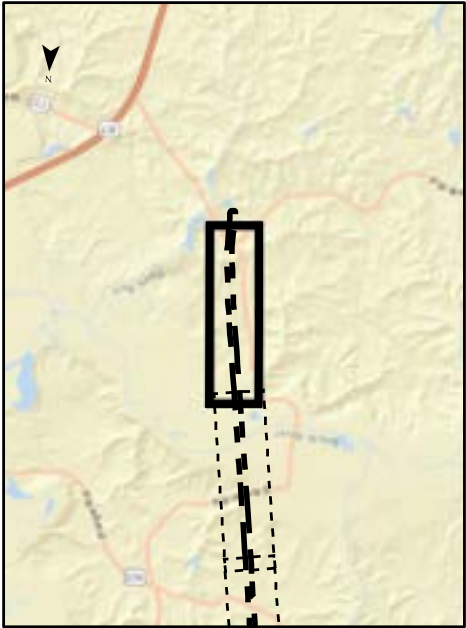
Scale is 1 IN = 500 FT when printed at original size of 11x17

TABLE II.B.3

Proposed Line #256 Structure Number	256/156	256/157	256/158	256/159	256/160	256/161	256/162	256/163	256/164	256/165	256/166	256/167	256/167A	256/168
Proposed Height (FT)	95	120	100	110	115	105	115	110	100	105	110	105	28	105

Notes:

1. The proposed structure heights are above ground level and exclude foundation reveal.
2. Structure locations and heights provided by Dominion Energy Virginia.
3. Project and structures are subject to change based on final engineering design.
4. Structures depicted do not include portions of the project that are considered ordinary course as described in Section I.A.
5. Line #2090 will co-locate with Line #2372 between Elmont Junction and New Post Substation.
6. Line #2335 will co-locate with Line #2378 between New Post Substation and Lee's Hill Substation.
7. Basemap from ESRI Topographic and World Street Map.



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Proposed Structures
- Dominion Owned Substation Parcel

ATTACHMENT II.B.3
STRUCTURE LOCATION MAP

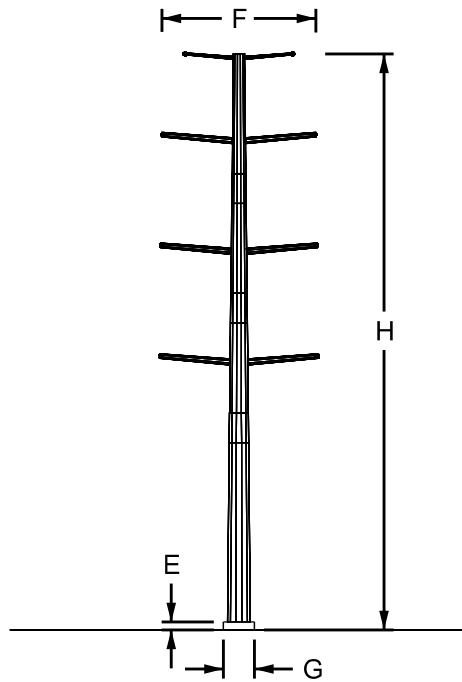
Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and Line #2378 (New Post - Lee's Hill)

Owner/ Applicant: Dominion Energy Virginia	
C2 Env Project: 0354	Prepared By: JRC
Date: 08/15/2024	



S:\Projects\0354 - Ladysmith Projects SCC Support\GIS CAD\Drawings\0354_Attachment_II.B3_Structure_locations.mxd

LINES: 256, 2090, 2335, 2372 AND 2378



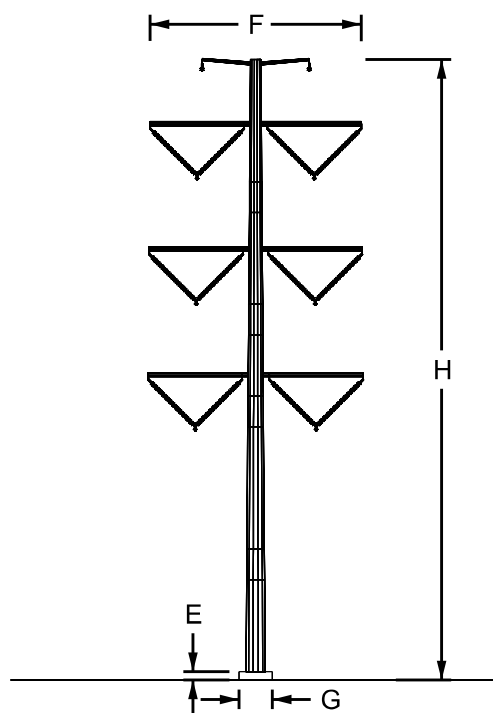
TYPICAL DC ENGINEERED MONOPOLE DOUBLE DEADEND STRUCTURE

A. STRUCTURE MAPPING	N/A
B. RATIONALE FOR STRUCTURE TYPE:	MINIMIZES RIGHT OF WAY ACQUISITION
C. LENGTH OF R/W (STRUCTURE QUANTITY):	13.3 MILES (14) - SEE NOTE 2
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONALE FOR STRUCTURE MATERIAL:	WEATHERING STEEL WAS SELECTED TO MATCH CURRENT STANDARDS
E. FOUNDATION MATERIAL:	CONCRETE
AVERAGE FOUNDATION REVEAL:	SEE NOTE 3
F. AVERAGE WIDTH AT CROSSARM:	26'
G. AVERAGE WIDTH AT CROSSARMS:	SEE NOTE 4
H. MINIMUM STRUCTURE HEIGHT:	85'
MAXIMUM STRUCTURE HEIGHT:	120'
AVERAGE STRUCTURE HEIGHT:	102'
I. AVERAGE SPAN LENGTH:	494' - SEE NOTE 6
J. MINIMUM CONDUCTOR-TO-GROUND AT MAXIMUM OPERATING TEMPERATURE:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES: 1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
 2. ROW LENGTH & STRUCTURE QUANTITY ARE EXCLUSIVE OF COMPANY-OWNED SUBSTATION PROPERTIES
 3. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN
 4. FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL ENGINEERING
 5. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE AND INCLUDE FOUNDATION REVEAL
 6. THE SPAN LENGTHS ASSOCIATED WITH THIS STRUCTURE TYPE ARE THE AHEAD SPANS

DESCRIPTION & VIEW		ATTACHMENT
Electric Transmission  Dominion Energy Dominion Energy 5000 Dominion Blvd Glen Allen, VA 23060	LINES: 256, 2090, 2335, 2372 AND 2378 TYPICAL DC ENGINEERED MONOPOLE DOUBLE DEADEND STRUCTURE	II.B.3.a
		DRAWN BY: RAW

LINES: 256, 2090, 2335, 2372 AND 2378



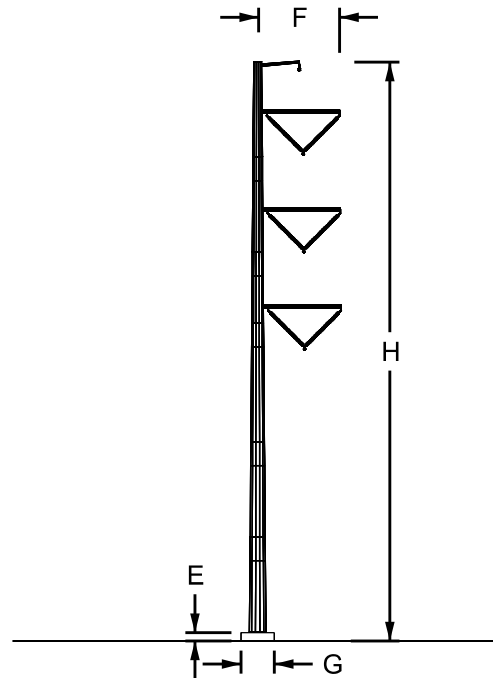
TYPICAL DC ENGINEERED MONOPOLE SUSPENSION STRUCTURE (V-STRING)

A. STRUCTURE MAPPING	N/A
B. RATIONALE FOR STRUCTURE TYPE:	MINIMIZES RIGHT OF WAY ACQUISITION; V-STRING INCREASES CLEARANCES AND OPTIMIZES EXISTING ROW USAGE
C. LENGTH OF R/W (STRUCTURE QTY):	13.3 MILES (91) - SEE NOTE 2
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONALE FOR STRUCTURE MATERIAL:	WEATHERING STEEL WAS SELECTED TO MATCH CURRENT STANDARDS
E. FOUNDATION MATERIAL:	CONCRETE
AVERAGE FOUNDATION REVEAL:	SEE NOTE 3
F. AVERAGE WIDTH AT CROSSARM:	34.5'
G. AVERAGE WIDTH AT BASE:	SEE NOTE 4
H. MINIMUM STRUCTURE HEIGHT (SEE NOTE 4):	95'
MAXIMUM STRUCTURE HEIGHT (SEE NOTE 4):	135'
AVERAGE STRUCTURE HEIGHT (SEE NOTE 4):	112'
I. AVERAGE SPAN LENGTH (RANGE):	649' - SEE NOTE 6
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES: 1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
 2. ROW LENGTH & STRUCTURE QUANTITY ARE EXCLUSIVE OF COMPANY-OWNED SUBSTATION PROPERTIES
 3. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN
 4. FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL ENGINEERING
 5. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE AND INCLUDE FOUNDATION REVEAL
 6. THE SPAN LENGTHS ASSOCIATED WITH THIS STRUCTURE TYPE ARE THE AHEAD SPANS

Electric Transmission		DESCRIPTION & VIEW	ATTACHMENT
 Dominion Energy Dominion Energy 5000 Dominion Blvd Glen Allen, VA 23060		LINES: 256, 2090, 2335, 2372 AND 2378	II.B.3.b
		TYPICAL DC ENGINEERED MONOPOLE DOUBLE DEADEND STRUCTURE	DRAWN BY: RAW

LINES: 2372



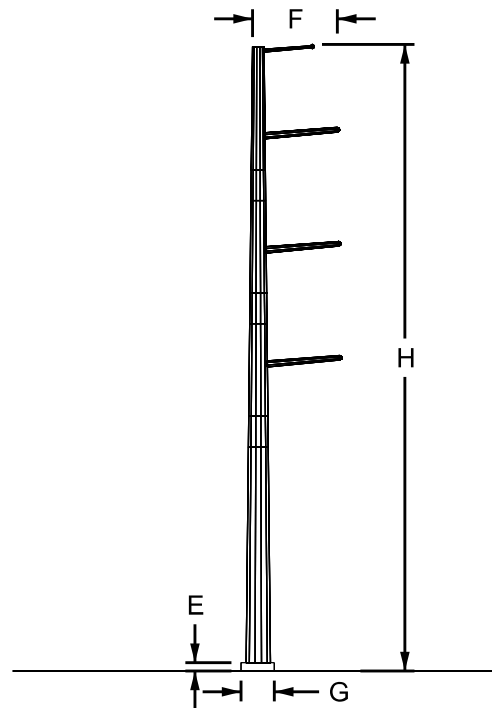
TYPICAL SC ENGINEERED MONOPOLE SUSPENSION STRUCTURE (V-STRING)

A. STRUCTURE MAPPING	N/A
B. RATIONALE FOR STRUCTURE TYPE:	MINIMIZES RIGHT OF WAY ACQUISITION
C. LENGTH OF R/W (STRUCTURE QTY):	4.6 MILES (20) - SEE NOTE 2
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONALE FOR STRUCTURE MATERIAL:	WEATHERING STEEL WAS SELECTED TO MATCH CURRENT STANDARDS
E. FOUNDATION MATERIAL:	CONCRETE
AVERAGE FOUNDATION REVEAL:	SEE NOTE 3
F. AVERAGE WIDTH AT CROSSARM:	18'
G. AVERAGE WIDTH AT BASE:	SEE NOTE 4
H. MINIMUM STRUCTURE HEIGHT (SEE NOTE 4):	125'
MAXIMUM STRUCTURE HEIGHT (SEE NOTE 4):	140'
AVERAGE STRUCTURE HEIGHT (SEE NOTE 4):	115'
I. AVERAGE SPAN LENGTH (RANGE):	906' - SEE NOTE 6
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES: 1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
 2. ROW LENGTH & STRUCTURE QUANTITY ARE EXCLUSIVE OF COMPANY-OWNED SUBSTATION PROPERTIES
 3. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN
 4. FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL ENGINEERING
 5. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE AND INCLUDE FOUNDATION REVEAL
 6. THE SPAN LENGTHS ASSOCIATED WITH THIS STRUCTURE TYPE ARE THE AHEAD SPANS

Electric Transmission		DESCRIPTION & VIEW	ATTACHMENT
 Dominion Energy 5000 Dominion Blvd Glen Allen, VA 23060		LINE: 2372	II.B.3.c
		TYPICAL SC ENGINEERED MONOPOLE SUSPENSION STRUCTURE (V-STRING)	DRAWN BY: RAW

LINES: 2372



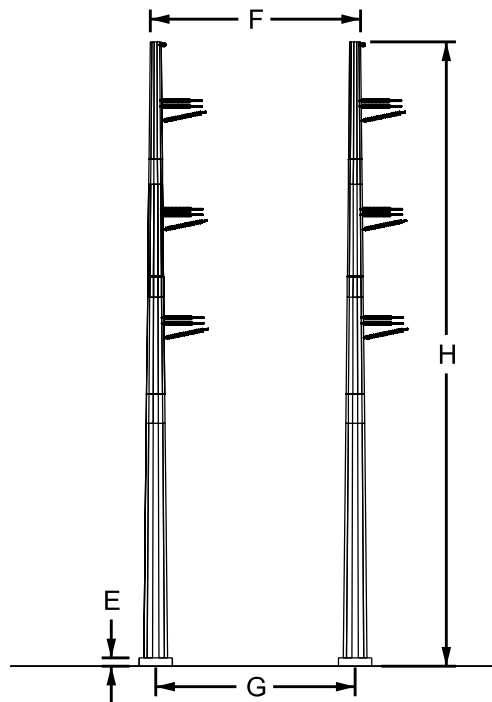
TYPICAL SC ENGINEERED MONOPOLE DOUBLE DEADEND

A. STRUCTURE MAPPING	N/A
B. RATIONALE FOR STRUCTURE TYPE:	MINIMIZES RIGHT OF WAY ACQUISITION
C. LENGTH OF R/W (STRUCTURE QTY):	4.6 MILES (3) - SEE NOTE 2
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONALE FOR STRUCTURE MATERIAL:	WEATHERING STEEL WAS SELECTED TO MATCH CURRENT STANDARDS
E. FOUNDATION MATERIAL:	CONCRETE
AVERAGE FOUNDATION REVEAL:	SEE NOTE 3
F. AVERAGE WIDTH AT CROSSARM:	14'
G. AVERAGE WIDTH AT BASE:	SEE NOTE 4
H. MINIMUM STRUCTURE HEIGHT (SEE NOTE 4):	110'
MAXIMUM STRUCTURE HEIGHT (SEE NOTE 4):	140'
AVERAGE STRUCTURE HEIGHT (SEE NOTE 4):	122'
I. AVERAGE SPAN LENGTH (RANGE):	729' - SEE NOTE 6
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES: 1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
 2. ROW LENGTH & STRUCTURE QUANTITY ARE EXCLUSIVE OF COMPANY-OWNED SUBSTATION PROPERTIES
 3. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN
 4. FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL ENGINEERING
 5. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE AND INCLUDE FOUNDATION REVEAL
 6. THE SPAN LENGTHS ASSOCIATED WITH THIS STRUCTURE TYPE ARE THE AHEAD SPANS

<i>Electric Transmission</i>		DESCRIPTION & VIEW	ATTACHMENT
 Dominion Energy Dominion Energy 5000 Dominion Blvd Glen Allen, VA 23060		LINE: 2372	II.B.3.d
		TYPICAL SC ENGINEERED MONOPOLE DOUBLE DEADEND STRUCTURE	DRAWN BY: RAW

LINES: 256, 2090, 2335, 2372 AND 2378



TYPICAL DC ENGINEERED 2-POLE DOUBLE DEADEND STRUCTURE

A. STRUCTURE MAPPING	N/A
B. RATIONALE FOR STRUCTURE TYPE:	MINIMIZES RIGHT OF WAY ACQUISITION; 2-POLES USED FOR HEAVY ANGLES TO OPTIMIZE POLE/FOUNDATION SIZE AND COST
C. LENGTH OF R/W (STRUCTURE QTY):	13.3 MILES (2) - SEE NOTE 2
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONALE FOR STRUCTURE MATERIAL:	WEATHERING STEEL WAS SELECTED TO MATCH CURRENT STANDARDS
E. FOUNDATION MATERIAL:	CONCRETE
AVERAGE FOUNDATION REVEAL:	SEE NOTE 3
F. AVERAGE WIDTH AT CROSSARM:	36'
G. AVERAGE WIDTH AT BASE:	SEE NOTE 4
H. MINIMUM STRUCTURE HEIGHT (SEE NOTE 4):	100'
MAXIMUM STRUCTURE HEIGHT (SEE NOTE 4):	100'
AVERAGE STRUCTURE HEIGHT (SEE NOTE 4):	100'
I. AVERAGE SPAN LENGTH (RANGE):	178' - SEE NOTE 6
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

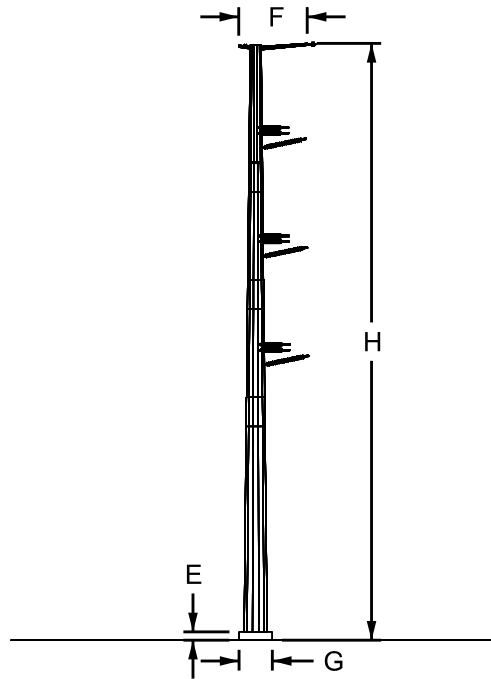
NOTES: 1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
 2. ROW LENGTH & STRUCTURE QUANTITY ARE EXCLUSIVE OF COMPANY-OWNED SUBSTATION PROPERTIES
 3. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN
 4. FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL ENGINEERING
 5. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE AND INCLUDE FOUNDATION REVEAL
 6. THE SPAN LENGTHS ASSOCIATED WITH THIS STRUCTURE TYPE ARE THE AHEAD SPANS

DESCRIPTION & VIEW		ATTACHMENT
Electric Transmission		
LINES: 256, 2090, 2335, 2372, AND 2378		II.B.3.e
TYPICAL DC ENGINEERED 2-POLE DOUBLE DEADEND STRUCTURE		DRAWN BY: RAW



Dominion Energy
 5000 Dominion Blvd
 Glen Allen, VA 23060

LINE: 2372



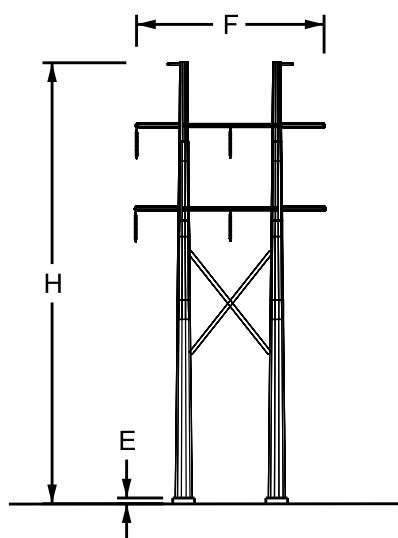
TYPICAL SC ENGINEERED MONOPOLE DOUBLE DEADEND STRUCTURE

A. STRUCTURE MAPPING	N/A
B. RATIONALE FOR STRUCTURE TYPE:	MINIMIZES RIGHT OF WAY ACQUISITION; POLE WITH NO ARMS USED FOR HEAVY ANGLES
C. LENGTH OF R/W (STRUCTURE QTY):	4.6 MILES (5) - SEE NOTE 2
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONALE FOR STRUCTURE MATERIAL:	WEATHERING STEEL WAS SELECTED TO MATCH CURRENT STANDARDS
E. FOUNDATION MATERIAL:	CONCRETE
AVERAGE FOUNDATION REVEAL:	SEE NOTE 3
F. AVERAGE WIDTH AT CROSSARM:	11.5'
G. AVERAGE WIDTH AT BASE:	SEE NOTE 4
H. MINIMUM STRUCTURE HEIGHT (SEE NOTE 4):	80'
MAXIMUM STRUCTURE HEIGHT (SEE NOTE 4):	135'
AVERAGE STRUCTURE HEIGHT (SEE NOTE 4):	116'
I. AVERAGE SPAN LENGTH (RANGE):	796' - SEE NOTE 6
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES: 1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
 2. ROW LENGTH & STRUCTURE QUANTITY ARE EXCLUSIVE OF COMPANY-OWNED SUBSTATION PROPERTIES
 3. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN
 4. FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL ENGINEERING
 5. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE AND INCLUDE FOUNDATION REVEAL
 6. THE SPAN LENGTHS ASSOCIATED WITH THIS STRUCTURE TYPE ARE THE AHEAD SPANS

Electric Transmission		DESCRIPTION & VIEW	ATTACHMENT
 Dominion Energy 5000 Dominion Blvd Glen Allen, VA 23060		LINE: 2372	II.B.3.f
		TYPICAL SC ENGINEERED MONOPOLE DOUBLE DEADEND STRUCTURE	DRAWN BY: RAW

LINES: 256, 2090 AND 2335



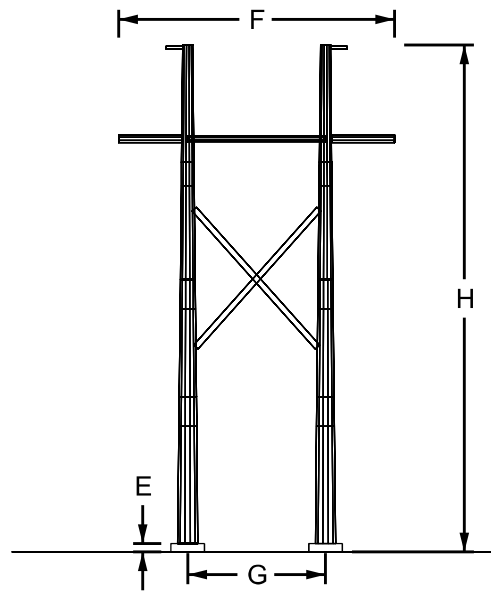
TYPICAL DC ENGINEERED H-FRAME DOUBLE DEADEND STRUCTURE

A. STRUCTURE MAPPING	N/A
B. RATIONALE FOR STRUCTURE TYPE:	USED TO MAINTAIN PRUDENT STRUCTURE HEIGHTS WHERE ROLLING PHASES
C. LENGTH OF R/W (STRUCTURE QTY):	13.3 MILES (5) - SEE NOTE 2
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONALE FOR STRUCTURE MATERIAL:	WEATHERING STEEL WAS SELECTED TO MATCH CURRENT STANDARDS
E. FOUNDATION MATERIAL:	CONCRETE
AVERAGE FOUNDATION REVEAL:	SEE NOTE 3
F. AVERAGE WIDTH AT CROSSARM (RANGE):	47'
G. AVERAGE WIDTH AT BASE (RANGE):	23.5' - SEE NOTE 4
H. MINIMUM STRUCTURE HEIGHT (SEE NOTE 4):	95'
MAXIMUM STRUCTURE HEIGHT (SEE NOTE 4):	110'
AVERAGE STRUCTURE HEIGHT (SEE NOTE 4):	102'
I. AVERAGE SPAN LENGTH (RANGE):	644' - SEE NOTE 6
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES: 1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
 2. ROW LENGTH & STRUCTURE QUANTITY ARE EXCLUSIVE OF COMPANY-OWNED SUBSTATION PROPERTIES
 3. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN
 4. FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL ENGINEERING
 5. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE AND INCLUDE FOUNDATION REVEAL
 6. THE SPAN LENGTHS ASSOCIATED WITH THIS STRUCTURE TYPE ARE THE AHEAD SPANS

Electric Transmission		DESCRIPTION & VIEW	ATTACHMENT
 Dominion Energy Dominion Energy 5000 Dominion Blvd Glen Allen, VA 23060		LINES: 256, 2090 AND 2335 TYPICAL DC ENGINEERED H-FRAME DOUBLE DEADEND STRUCTURE	II.B.3.g
			DRAWN BY: RAW

LINES: 256



TYPICAL SC ENGINEERED H-FRAME DOUBLE DEADEND STRUCTURE

A. STRUCTURE MAPPING	N/A
B. RATIONALE FOR STRUCTURE TYPE:	USED TO MAINTAIN PRUDENT STRUCTURE HEIGHTS WHERE CROSSING UNDER TRANSMISSION FACILITIES
C. LENGTH OF R/W (STRUCTURE QTY):	13.3 MILES (1) - SEE NOTE 2
D. STRUCTURE MATERIAL:	WEATHERING STEEL
RATIONALE FOR STRUCTURE MATERIAL:	WEATHERING STEEL WAS SELECTED TO MATCH CURRENT STANDARDS
E. FOUNDATION MATERIAL:	CONCRETE
AVERAGE FOUNDATION REVEAL:	SEE NOTE 3
F. AVERAGE WIDTH AT CROSSARM (RANGE):	47'
G. AVERAGE WIDTH AT BASE (RANGE):	23.5' - SEE NOTE 4
H. MINIMUM STRUCTURE HEIGHT (SEE NOTE 4):	50'
MAXIMUM STRUCTURE HEIGHT (SEE NOTE 4):	50'
AVERAGE STRUCTURE HEIGHT (SEE NOTE 4):	50'
I. AVERAGE SPAN LENGTH (RANGE):	170' - SEE NOTE 6
J. MINIMUM CONDUCTOR-TO-GROUND:	25.5' (AT MAXIMUM OPERATING TEMPERATURE)

NOTES: 1. INFORMATION ON DRAWING IS PRELIMINARY AND SUBJECT TO CHANGE DURING FINAL ENGINEERING
 2. ROW LENGTH & STRUCTURE QUANTITY ARE EXCLUSIVE OF COMPANY-OWNED SUBSTATION PROPERTIES
 3. MINIMUM FOUNDATION REVEAL SHALL BE 1.5', MAX REVEAL SUBJECT TO FINAL LOCATION AND TERRAIN
 4. FOUNDATION DIAMETER SHALL BE BASED ON GEOTECHNICAL FINDINGS DURING FINAL ENGINEERING
 5. STRUCTURE HEIGHTS ARE MEASURED FROM STRUCTURE CENTERLINE AND INCLUDE FOUNDATION REVEAL
 6. THE SPAN LENGTHS ASSOCIATED WITH THIS STRUCTURE TYPE ARE THE AHEAD SPANS

Electric Transmission		DESCRIPTION & VIEW	ATTACHMENT
 Dominion Energy Dominion Energy 5000 Dominion Blvd Glen Allen, VA 23060		LINE: 256	II.B.3.h
		TYPICAL SC ENGINEERED H-FRAME DOUBLE DEADEND STRUCTURE	DRAWN BY: RAW

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: Not applicable.

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: See the table below for the existing and proposed heights of permanent structures related to the Project. The proposed approximate structure heights are from the conceptual design created to estimate the cost of the proposed Project and are subject to change based on final engineering design. The approximate structure heights are above ground level (“AGL”) (i.e., they are inclusive of foundation reveal).

Structure Number	Existing Structure Height AGL (ft.)	Proposed Structure Height AGL (ft.)	Attachment II.B.3 Structure Type
2090/100	70	110	II.B.3.b
2090/101	70	110	II.B.3.b
2090/102	70	110	II.B.3.b
2090/103	74.5	105	II.B.3.a
2090/104	65.5	110	II.B.3.g
2090/63	75	120	II.B.3.b
2090/64	73	115	II.B.3.b
2090/65	75	110	II.B.3.b
2090/66	70	110	II.B.3.b
2090/67	70	105	II.B.3.a
2090/68	70	110	II.B.3.b
2090/69	75	115	II.B.3.b
2090/70	75	110	II.B.3.b
2090/71	68	105	II.B.3.a
2090/72	65	110	II.B.3.b
2090/73	62	110	II.B.3.b
2090/74	70	105	II.B.3.b
2090/75	74	110	II.B.3.b
2090/76	75	115	II.B.3.b
2090/77	75	115	II.B.3.b
2090/78	62	115	II.B.3.b
2090/79	58	90	II.B.3.a
2090/80	75	115	II.B.3.b
2090/81	60	105	II.B.3.b

Structure Number	Existing Structure Height AGL (ft.)	Proposed Structure Height AGL (ft.)	Attachment II.B.3 Structure Type
2090/82	70	115	II.B.3.a
2090/83	70	110	II.B.3.b
2090/84	74	115	II.B.3.b
2090/85	70	110	II.B.3.b
2090/86	70	110	II.B.3.b
2090/87	70	105	II.B.3.b
2090/88	70	110	II.B.3.b
2090/89	70	115	II.B.3.b
2090/90	73	110	II.B.3.b
2090/91	78	115	II.B.3.b
2090/92	70	115	II.B.3.b
2090/93	77	115	II.B.3.b
2090/94	70	110	II.B.3.b
2090/95	75	120	II.B.3.b
2090/96	70	120	II.B.3.b
2090/97	70	110	II.B.3.b
2090/98	70	115	II.B.3.b
2090/99	70	110	II.B.3.b
2090/61	75	90	II.B.3.e
2335/61	70	80	II.B.3.e
2335/60	79	90	II.B.3.g
2335/59	79	95	II.B.3.g
2335/58	79	110	II.B.3.b
2335/57	70	125	II.B.3.b
2335/56	70	130	II.B.3.b
2335/55	75	110	II.B.3.b
2335/54	75	100	II.B.3.e
256/107	70	85	II.B.3.a
256/108	70	120	II.B.3.b
256/109	82	115	II.B.3.b
256/110	78	105	II.B.3.b
256/111	77	100	II.B.3.b
256/112	70	110	II.B.3.a
256/113	67	110	II.B.3.a
256/114	80	110	II.B.3.a
256/115	67	110	II.B.3.b
256/116	55	110	II.B.3.a
256/117	65	105	II.B.3.b
256/118	70	105	II.B.3.b
256/119	55	85	II.B.3.a
256/120	70	110	II.B.3.b
256/121	70	110	II.B.3.b
256/122	70	110	II.B.3.b

Structure Number	Existing Structure Height AGL (ft.)	Proposed Structure Height AGL (ft.)	Attachment II.B.3 Structure Type
256/123	72	110	II.B.3.b
256/124	80	110	II.B.3.b
256/125	77	110	II.B.3.b
256/126	80	125	II.B.3.b
256/127	80	135	II.B.3.b
256/128	60	115	II.B.3.b
256/129	72	105	II.B.3.b
256/130	77	115	II.B.3.b
256/131	73	115	II.B.3.b
256/132	80	130	II.B.3.b
256/133	78	110	II.B.3.b
256/134	65	105	II.B.3.a
256/135	70	110	II.B.3.b
256/136	70	110	II.B.3.b
256/137	70	115	II.B.3.b
256/138	78	116.1	II.B.3.b
256/139	74	110	II.B.3.b
256/140	85	130	II.B.3.b
256/141	82	125	II.B.3.b
256/142	82	105	II.B.3.b
256/143	88	115	II.B.3.b
256/144	77	115	II.B.3.b
256/145	73	120	II.B.3.b
256/146	77	115	II.B.3.b
256/147	70	105	II.B.3.b
256/148	65	110	II.B.3.b
256/149	70	110	II.B.3.b
256/150	74	110	II.B.3.b
256/151	74	110	II.B.3.b
256/152	70	110	II.B.3.b
256/153	72	115	II.B.3.b
256/154	66.5	120	II.B.3.b
256/155	73	115	II.B.3.b
256/156	62	95	II.B.3.b
256/157	82	120	II.B.3.b
256/158	73	100	II.B.3.b
256/159	70	110	II.B.3.b
256/160	72	115	II.B.3.b
256/161	78	105	II.B.3.b
256/162	82	115	II.B.3.b
256/163	65	100	II.B.3.a
256/164	70	110	II.B.3.b
256/165	70	105	II.B.3.b

Structure Number	Existing Structure Height AGL (ft.)	Proposed Structure Height AGL (ft.)	Attachment II.B.3 Structure Type
256/166	77	110	II.B.3.b
256/167	75	115	II.B.3.g
256/168	70	105	II.B.3.g

	Minimum**	Maximum**	Average**
Line #256	28	135	108
Lines # 2090/ #2335	80	120	110
Lines #2372 and #2378	110	140	125

** Existing structures that are being removed and not replaced are excluded from minimum, maximum, and average calculations.

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] See Attachment II.B.6.b.i for a representative photograph of typical existing structures on Line #256 and Line #2090 that are being removed as part of the rebuild.

[b] See Attachments II.B.6.b.ii-iii for representative photographs of the proposed structures. Note that the Company has proposed dulled weathering steel as the structure material for Project structures. See Attachments II.B.3.a-c.

[c] Visual simulations showing the appearance of the proposed transmission structures at identified historic locations within 1.0 mile of the proposed centerline of the Proposed Route are provided. See Attachment II.B.6.c for a map of the simulation locations, the existing views at the historic locations, and simulated proposed views.¹⁴ These simulations were created using Geographic Information Systems modeling to depict whether the proposed structures will be visible from the identified historic location. The historic locations evaluated are described below.

Historic Property	Viewpoint	Comments ¹⁵
Braynefield (VDHR ID# 016-003)	9	Minimal Impact
Walnut Hill (VDHR ID# 016-5230)	18	No Impact
Bethel Baptist Churd and Cemetery (VDHR ID# 016-0074)	19	No Impact
Richmond, Fredericksburg and Potomac Railroad (VDHR ID# 500-0001)	17	No Impact
CSX Railroad Corridor ((VDHR ID# 088-5413)	18	No Impact

¹⁴ Note that the maps and some of the simulations provided in Attachment II.B.6.c include the Line #256 and #2090 Partial Rebuild Project, as noted therein.

¹⁵ Comments represent Dutton's recommendations to VDHR. Concurrence from VDHR is pending.

Historic Property	Viewpoint	Comments¹⁵
Nyland (VDHR ID# 088-0100)	16	No Impact
Edge Hill (VDHR ID# 016-006))	12 and 13	Minimal Impact
Woodpecker Farm (VDHR ID# 016-0028)	10 and 11	Minimal Impact
Fredericksburg and Spotsylvania Battlefields National Military Park (VDHR ID# 111-0147)	15	No Impact







LADYSMITH – ST. JOHN’S – LEE’S HILL
230 kV Electric Transmission Project



Map Legend

Corridor 1A

Corridor 1B

Corridor 3

▲

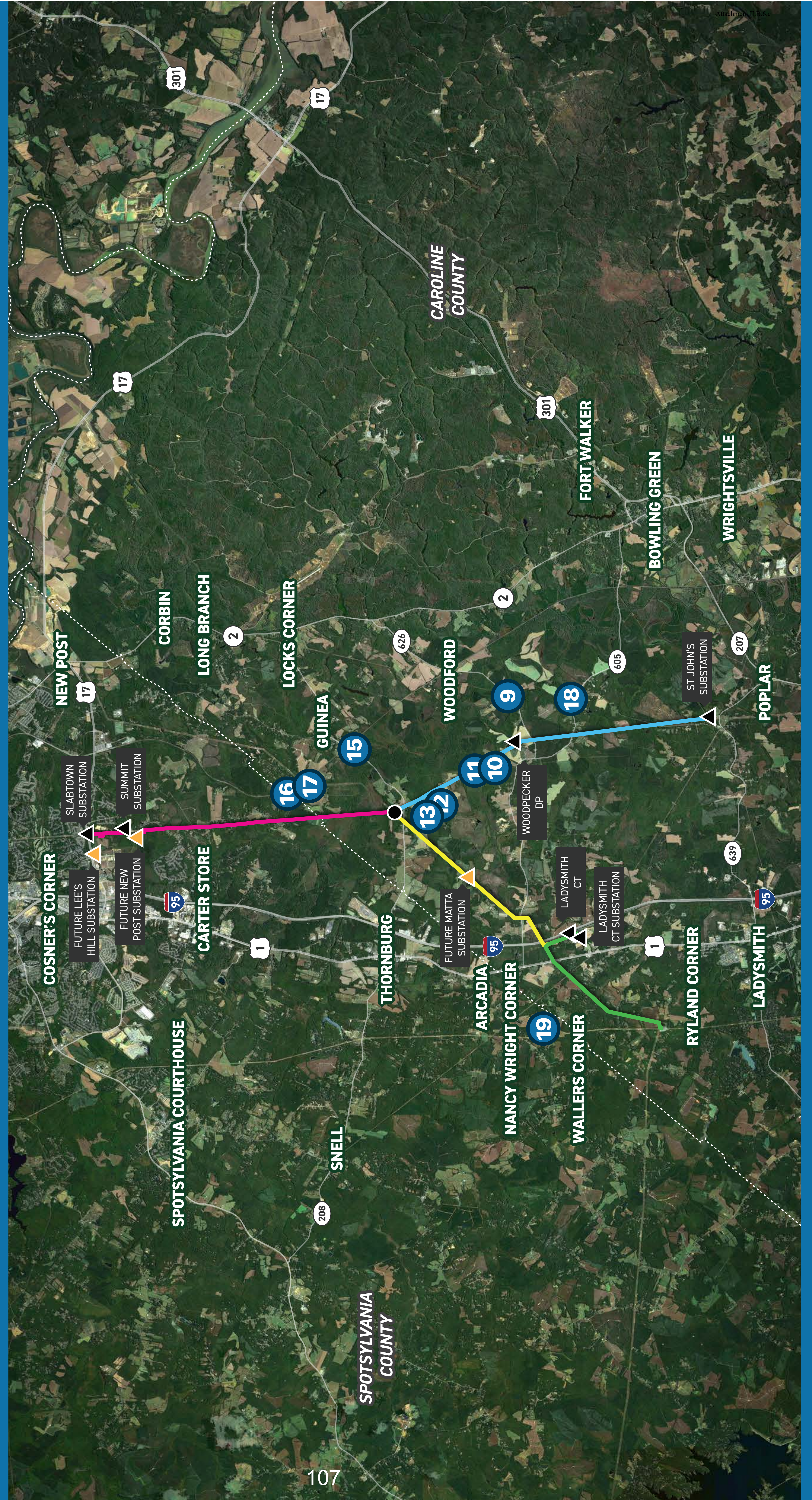
▲

▲

Existing Substation

Future Substation

Junction Point

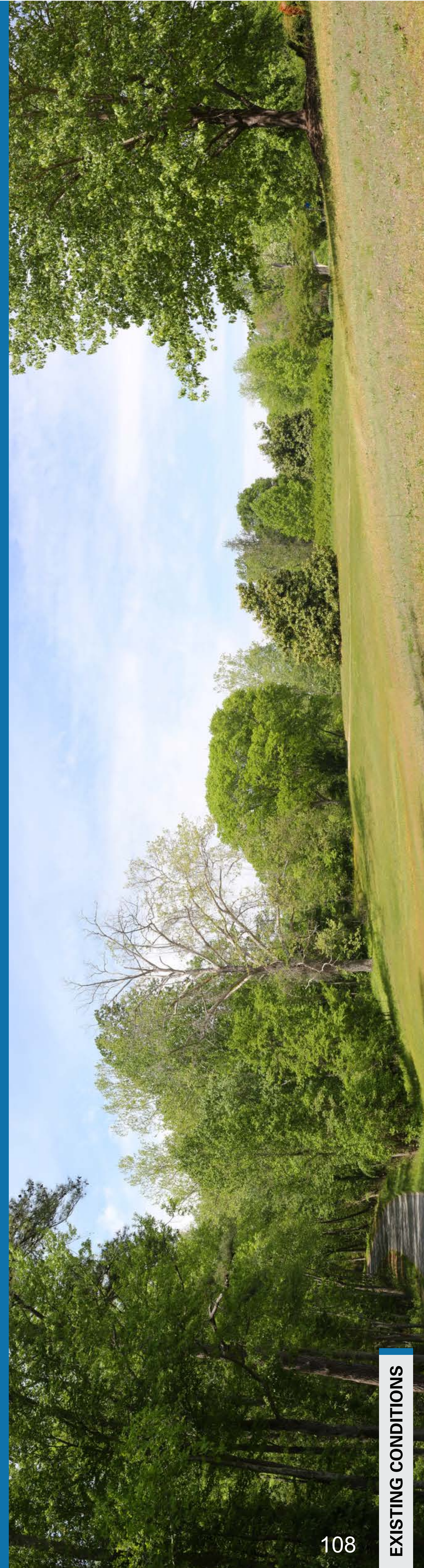
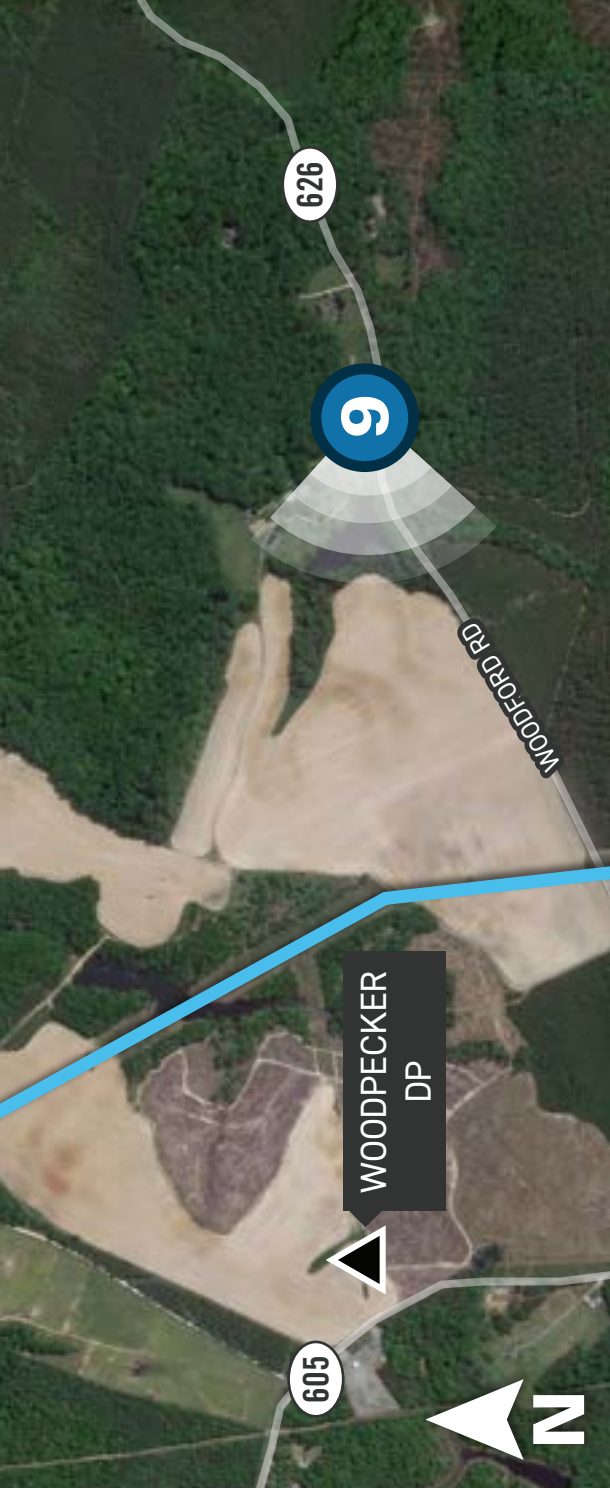


LADYSMITH – ST. JOHN'S – LEE'S HILL

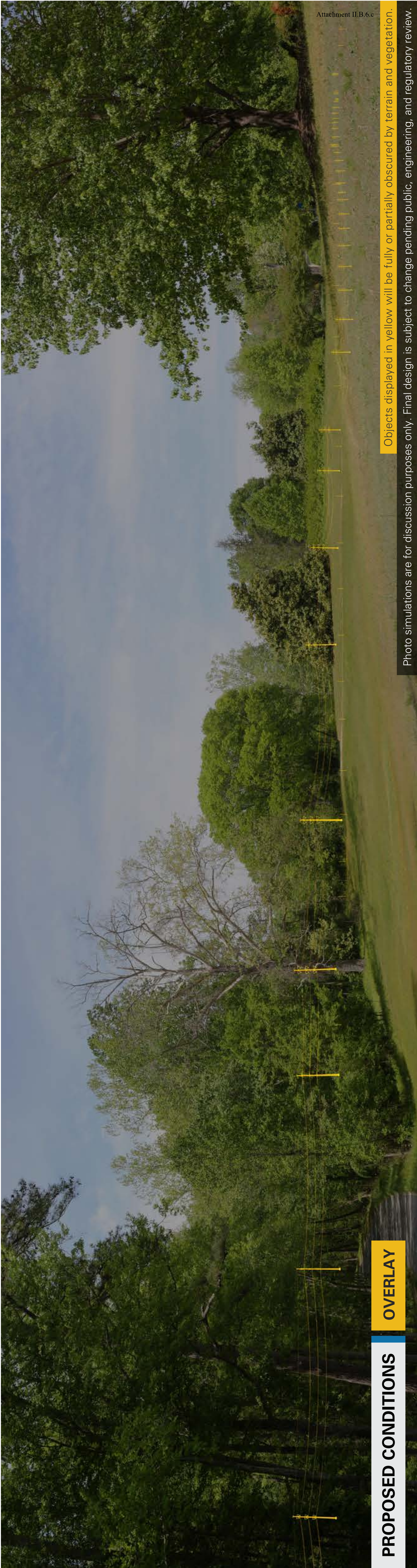
230 kV Electric Transmission Project

Viewpoint 9

Date: 04/30/2024 Time: 11:16 am
Viewing Direction: West
9 Viewpoint Location — Corridor 2
DHR ID: 016-0003 ▲ Existing Substation
Property Name: Braynefield



EXISTING CONDITIONS



PROPOSED CONDITIONS

OVERLAY

Objects displayed in yellow will be fully or partially obscured by terrain and vegetation.

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

LADYSMITH – ST. JOHN'S – LEE'S HILL

230 kV Electric Transmission Project

Viewpoint 10

Date: 04/29/2024 Time: 4:27 pm
Viewing Direction: Northeast
Viewpoint Location Corridor 2
DHR ID: 016-0028 Existing Substation
Property Name: Woodpecker Farm Equestrian



109

EXISTING CONDITIONS



PROPOSED CONDITIONS

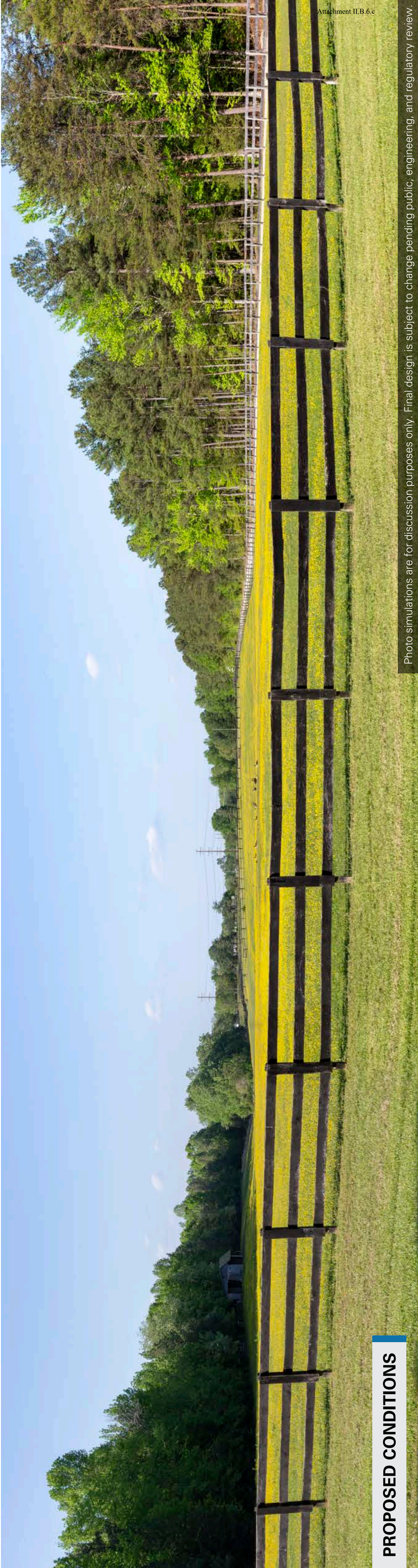


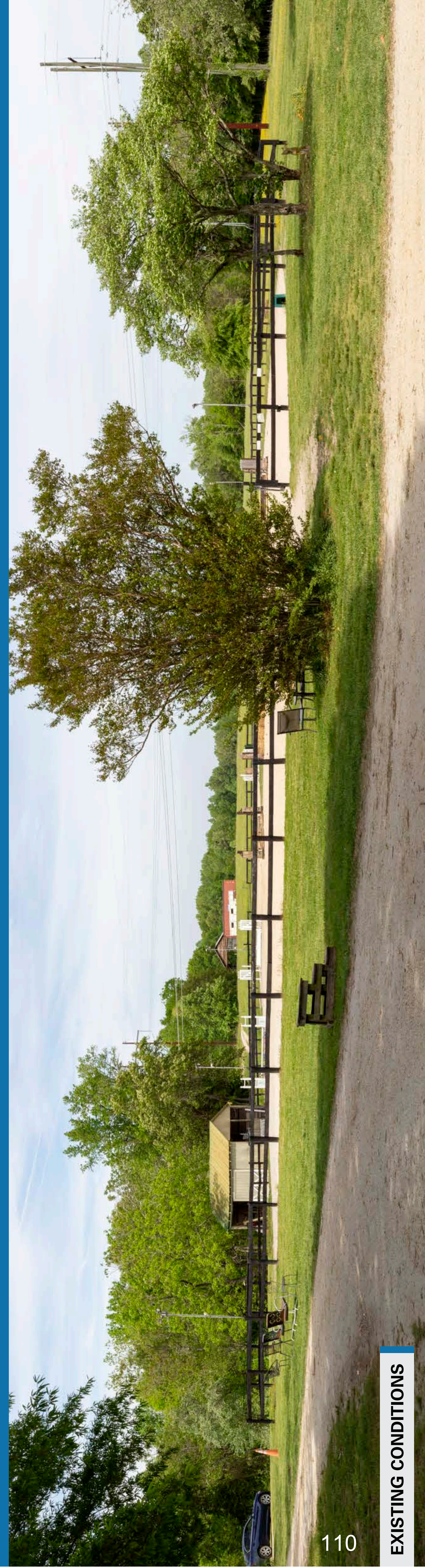
Photo simulations are for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review.

LADYSMITH – ST. JOHN'S – LEE'S HILL

230 kV Electric Transmission Project

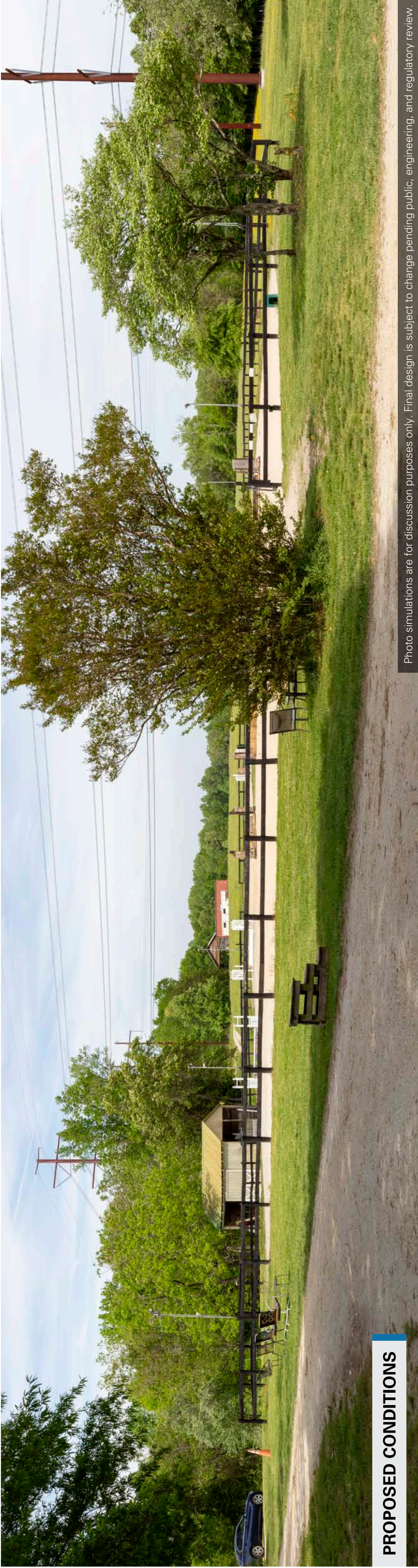
Viewpoint 11

Date: 04/30/2024 Time: 1:47 pm
Viewing Direction: Northeast
11 Viewpoint Location Corridor 2
DHR ID: 016-0028
Property Name: Woodpecker Farm Equestrian



110

EXISTING CONDITIONS



PROPOSED CONDITIONS

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

LADYSMITH – ST. JOHN'S – LEE'S HILL

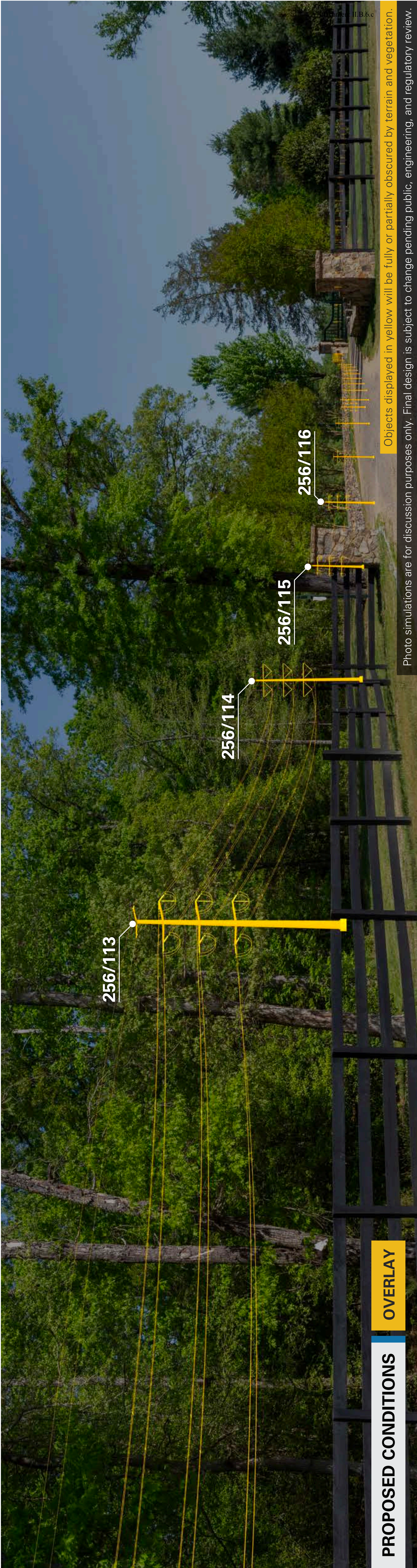
230 kV Electric Transmission Project

Viewpoint 12

Date: 04/29/2024 Time: 3:00 pm
Viewing Direction: Southeast
Viewpoint Location — Corridor 2
DHR ID: 016-0006
Property Name: Edge Hill



EXISTING CONDITIONS



PROPOSED CONDITIONS

OVERLAY

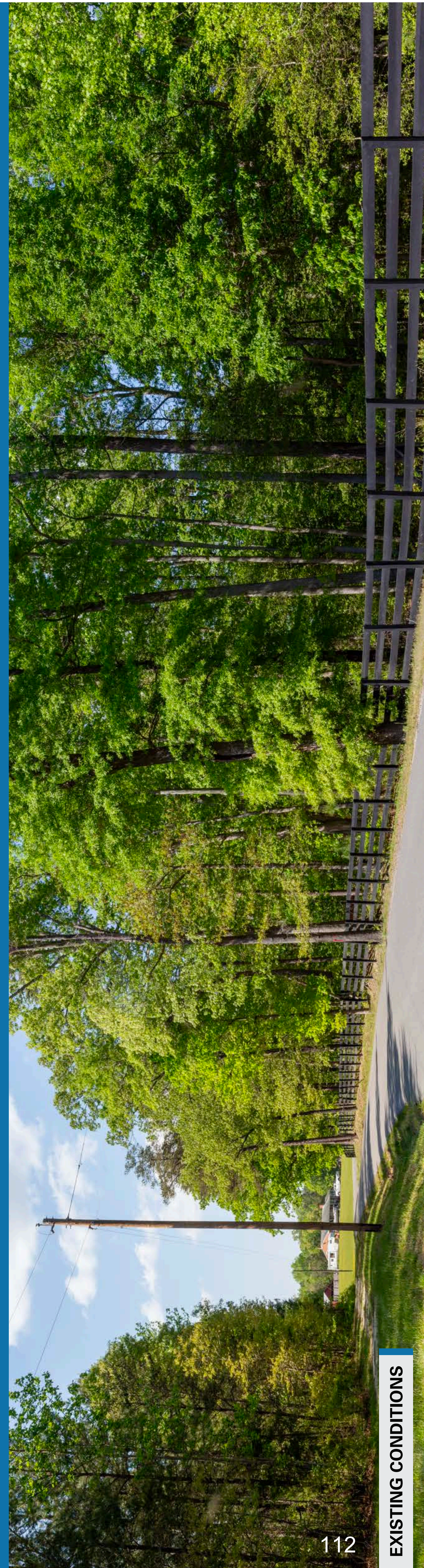
Objects displayed in yellow will be fully or partially obscured by terrain and vegetation. Photo simulations are for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review.

LADYSMITH – ST. JOHN'S – LEE'S HILL

230 kV Electric Transmission Project

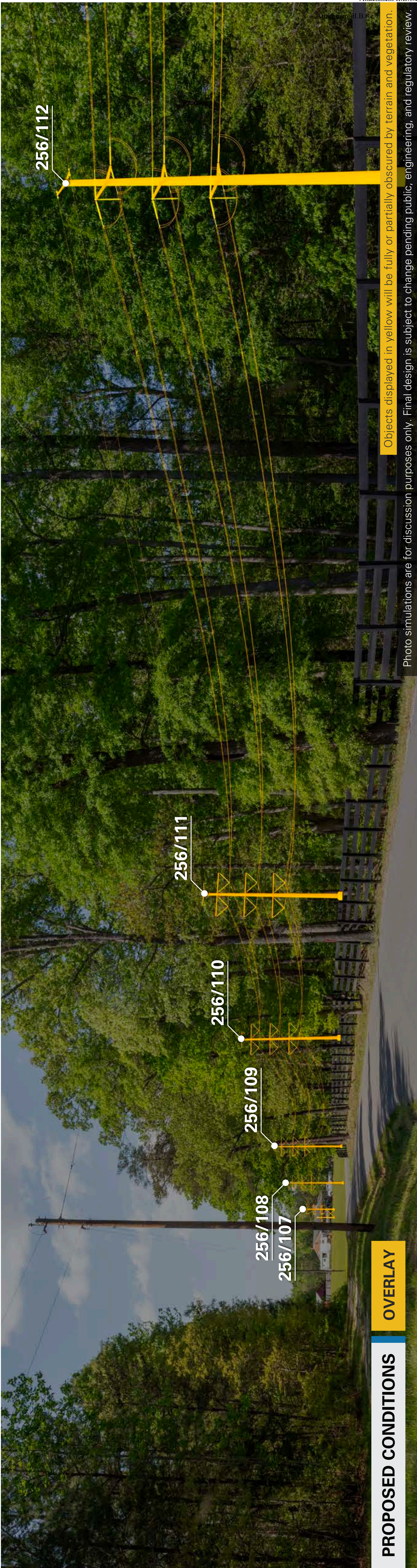
Viewpoint 13

Date: 04/29/2024 Time: 3:00 pm
Viewing Direction: North
13 Viewpoint Location Corridor 2
DHR ID: 016-0006
Property Name: Edge Hill



112

EXISTING CONDITIONS



PROPOSED CONDITIONS

OVERLAY

Objects displayed in yellow will be fully or partially obscured by terrain and vegetation.

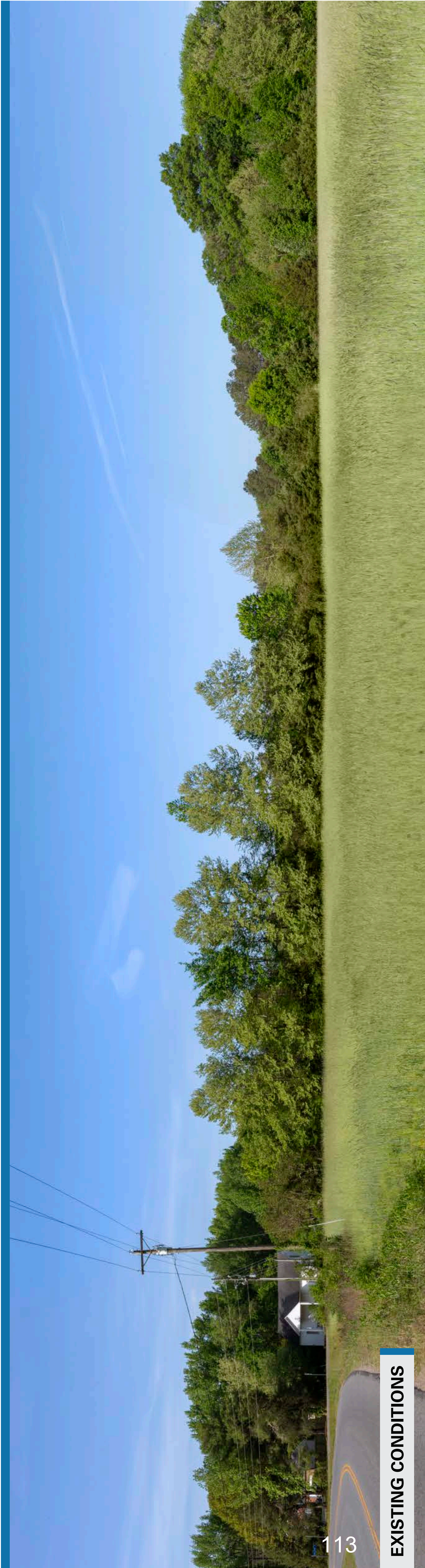
Photo simulations are for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review.

LADYSMITH – ST. JOHN'S – LEE'S HILL

230 kV Electric Transmission Project

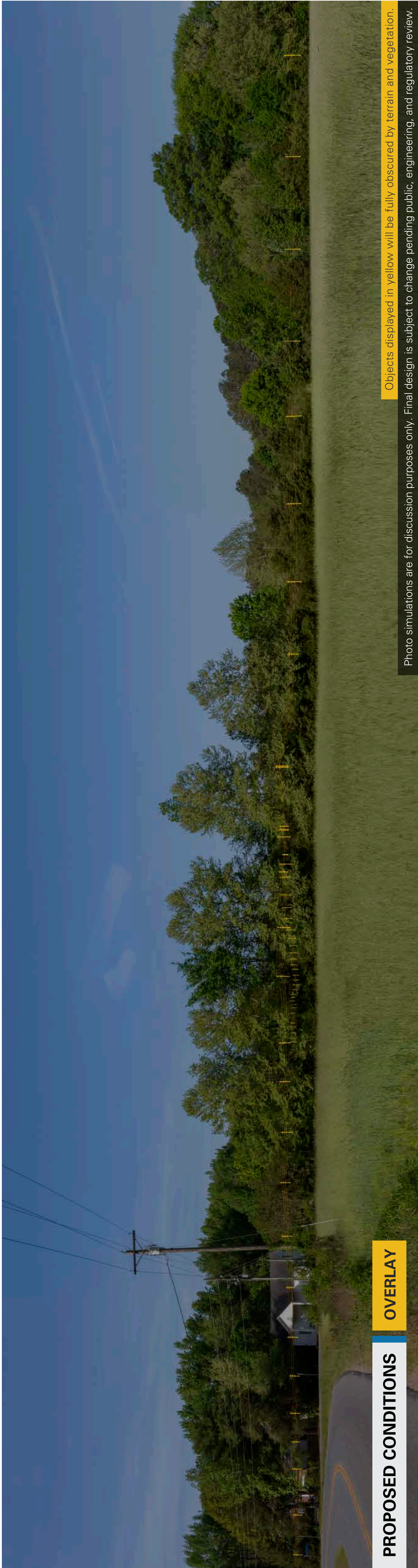
Viewpoint 15

Date: 04/30/2024 Time: 7:35 am
Viewing Direction: West
Viewpoint Location Corridor 3
DHR ID: 111-0147
Property Name: "Stonewall" Jackson Death Site



113

EXISTING CONDITIONS



PROPOSED CONDITIONS

OVERLAY

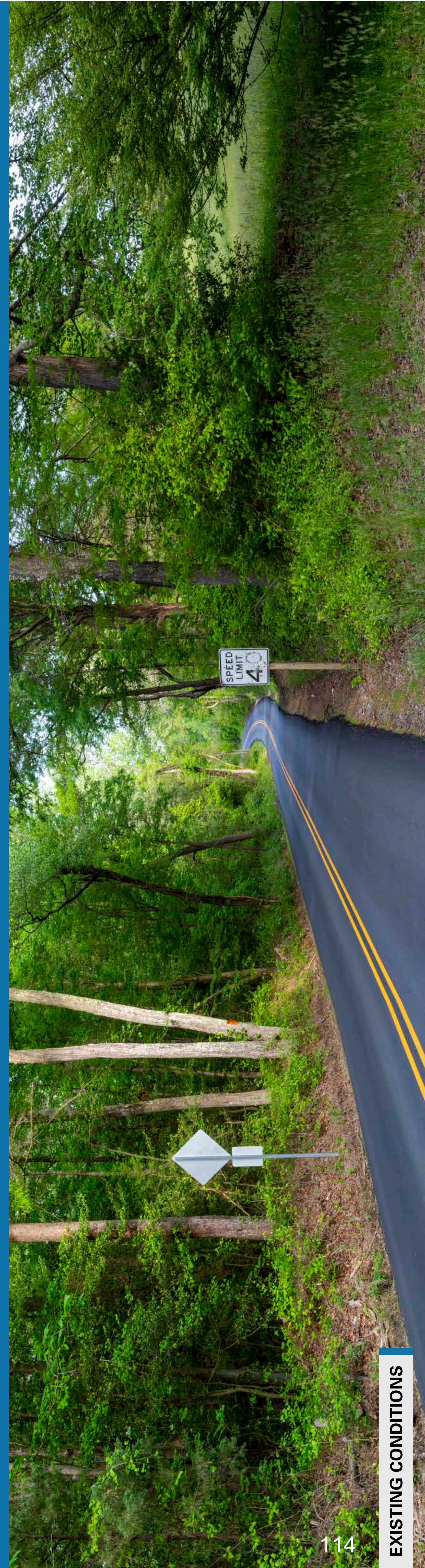
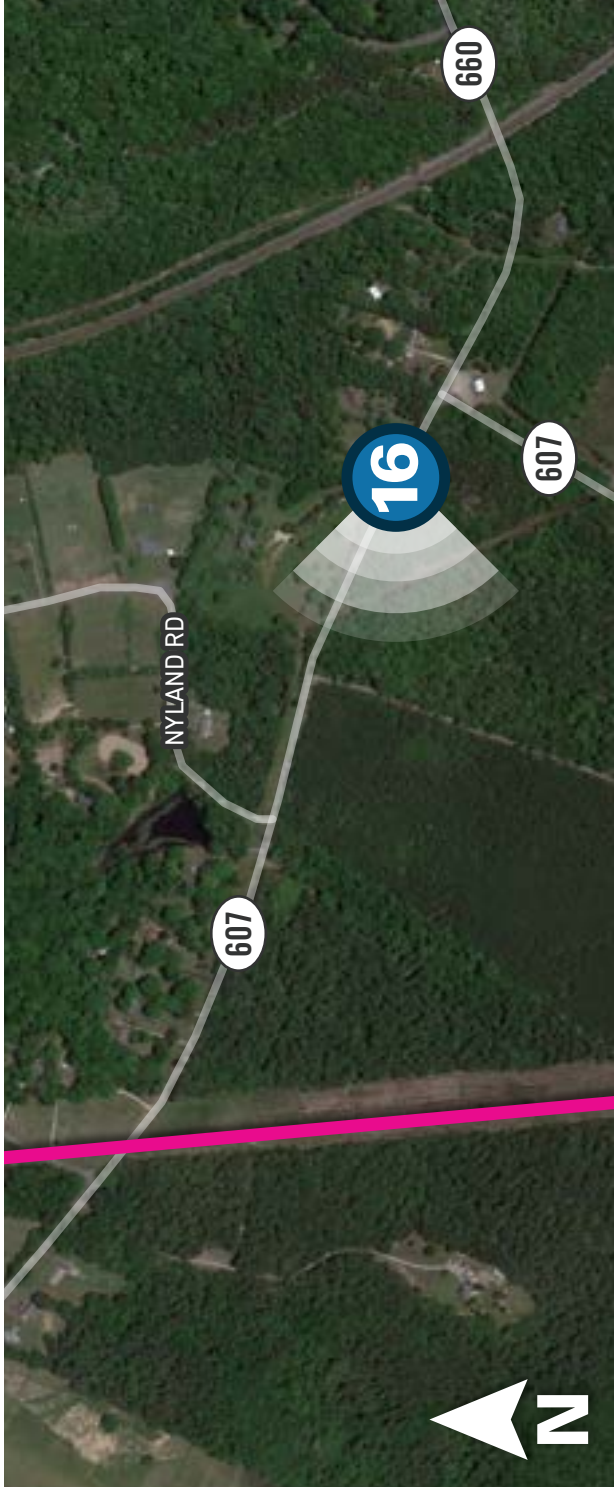
Objects displayed in yellow will be fully obscured by terrain and vegetation.
Photo simulations are for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review.

LADYSMITH – ST. JOHN'S – LEE'S HILL

230 kV Electric Transmission Project

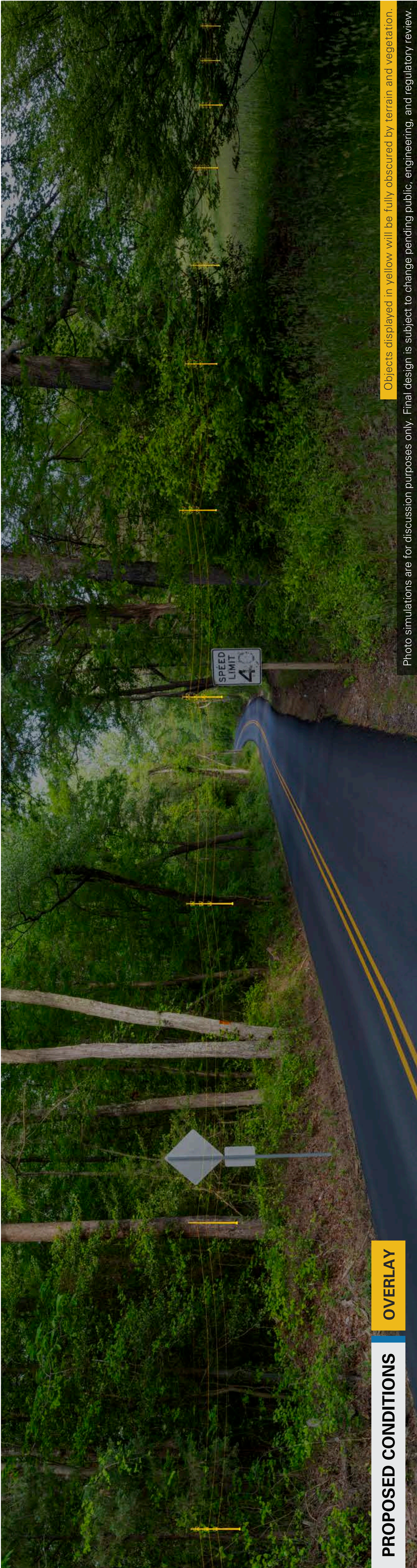
Viewpoint 16

Date: 04/29/2024 Time: 2:43 pm
Viewing Direction: West
16 Viewpoint Location Corridor 3
DHR ID: 088-0100
Property Name: Nyland



114

EXISTING CONDITIONS



PROPOSED CONDITIONS

OVERLAY

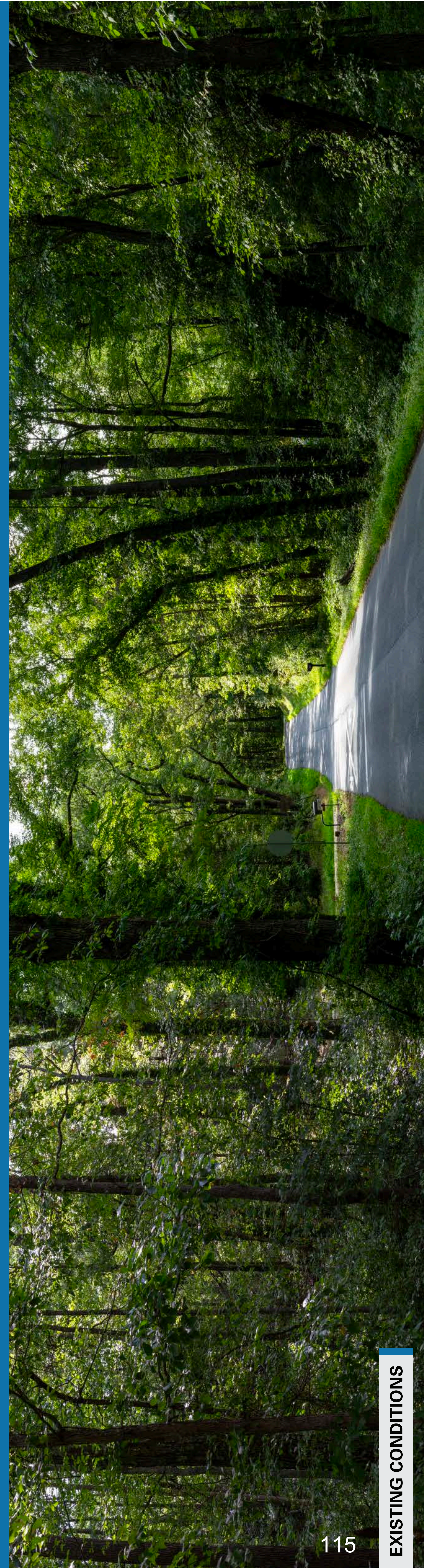
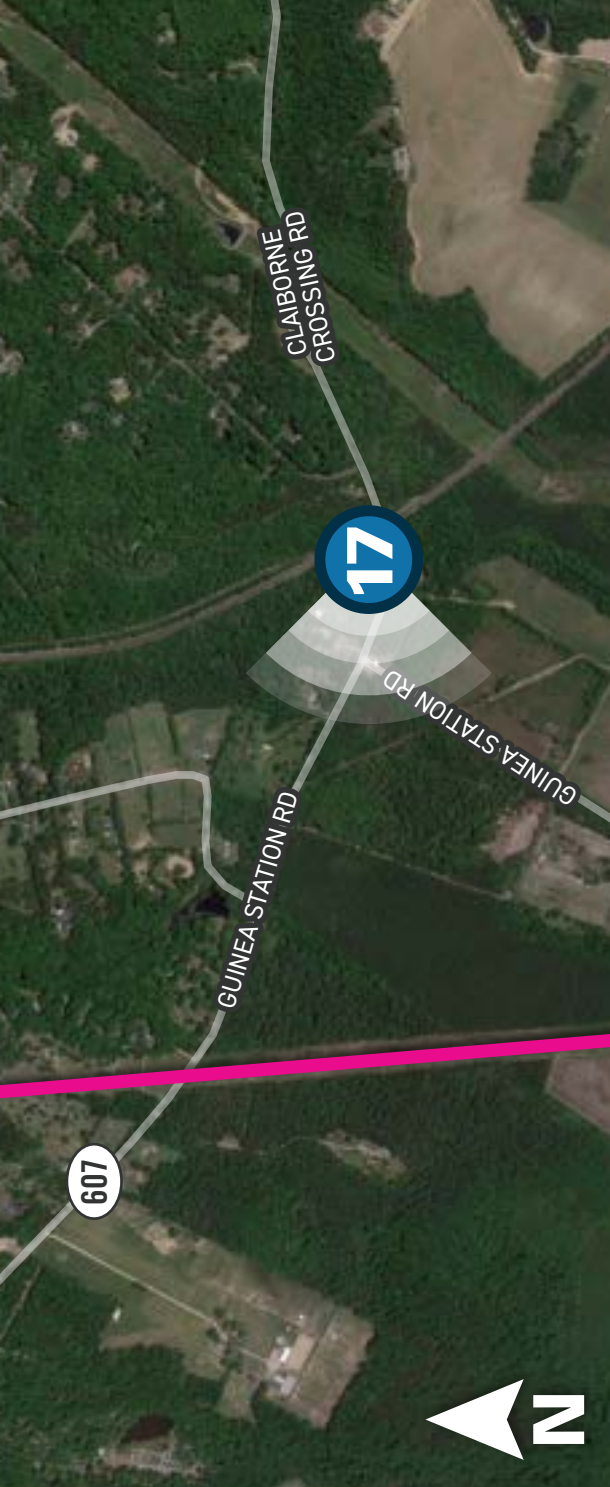
Photo simulations are for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review. Objects displayed in yellow will be fully obscured by terrain and vegetation.

LADYSMITH – ST. JOHN'S – LEE'S HILL

230 kV Electric Transmission Project

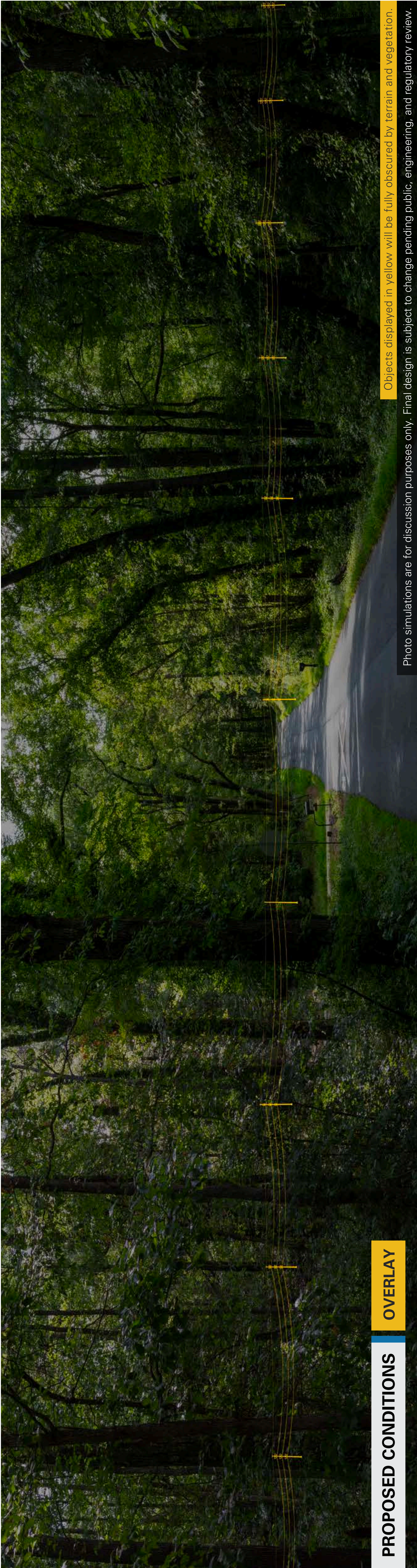
Viewpoint 17

Date: 08/06/2024 Time: 3:19 pm
Viewing Direction: West
Viewpoint Location Corridor 3
DHR ID: 088-5413/500-001
Property Name: Railroad



115

EXISTING CONDITIONS



PROPOSED CONDITIONS

OVERLAY

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

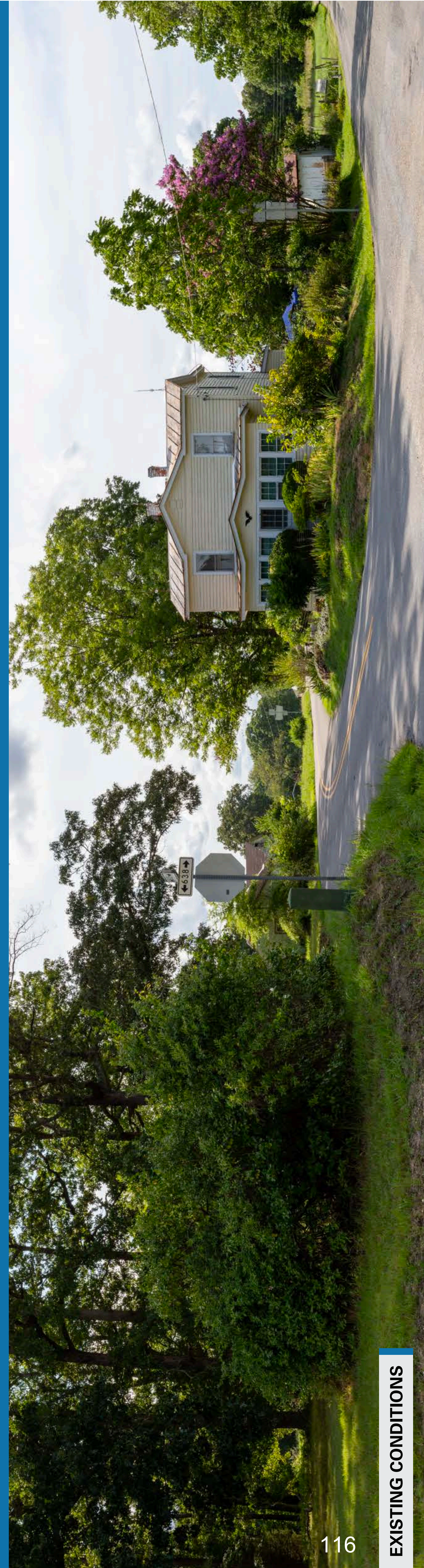
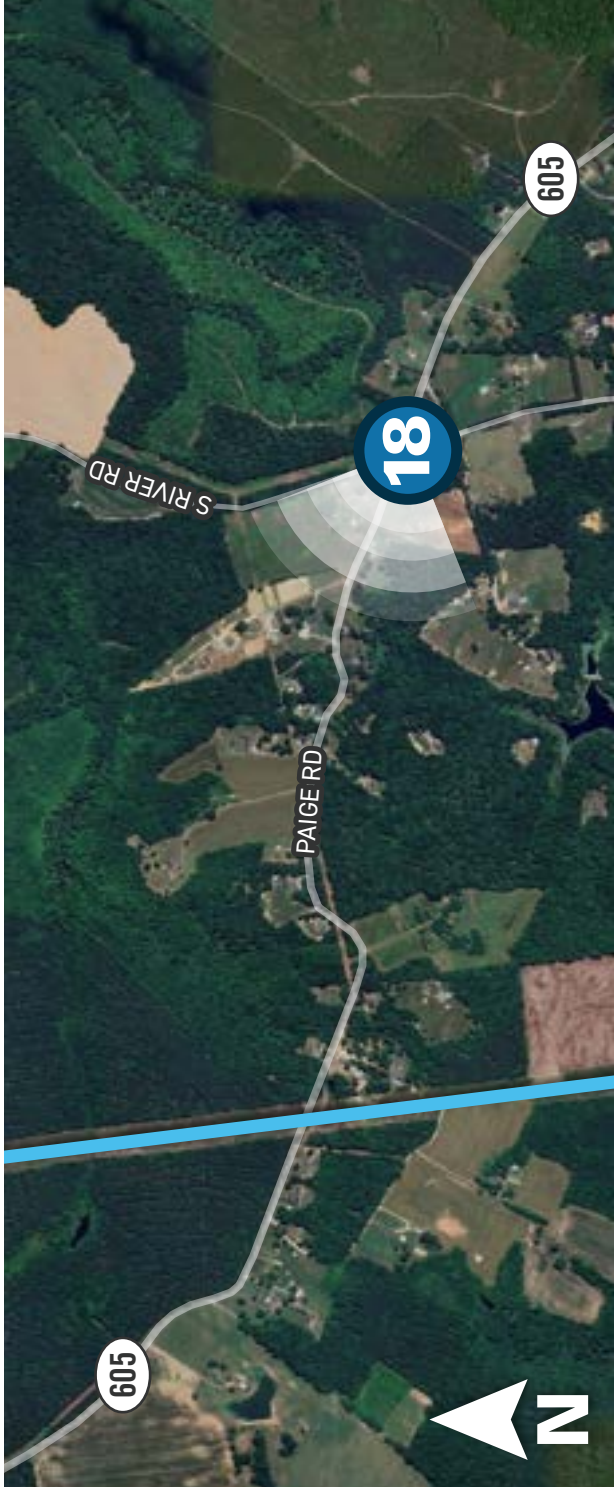
Objects displayed in yellow will be fully obscured by terrain and vegetation.

LADYSMITH – ST. JOHN'S – LEE'S HILL

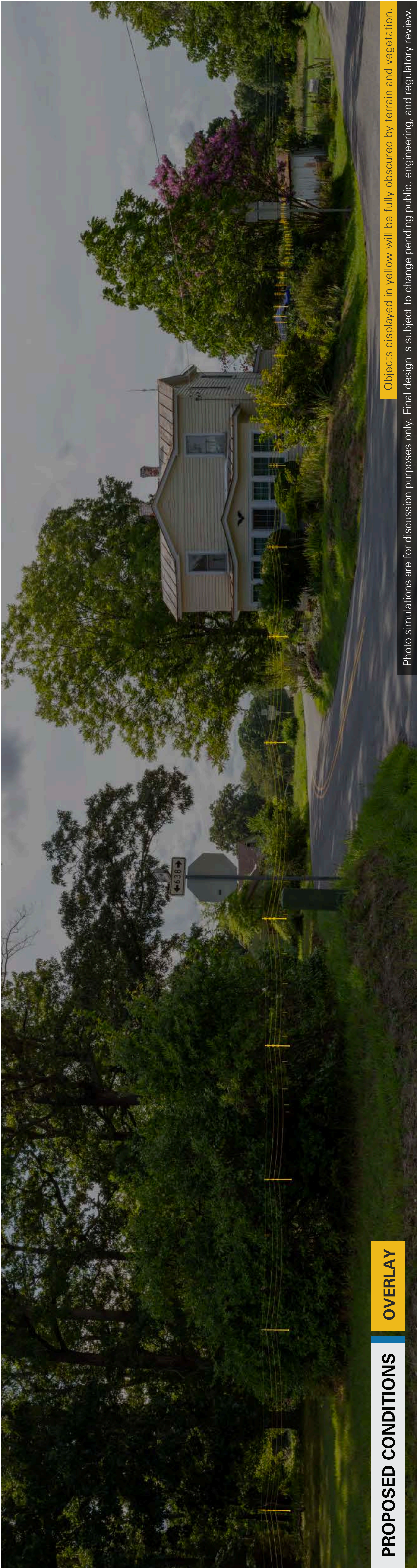
230 kV Electric Transmission Project

Viewpoint 18

Date: 08/06/2024 Time: 3:38 pm
Viewing Direction: West
18 Viewpoint Location Corridor 2
DHR ID: 016-0074
Property Name: Bethel Baptist Church



116



PROPOSED CONDITIONS

OVERLAY

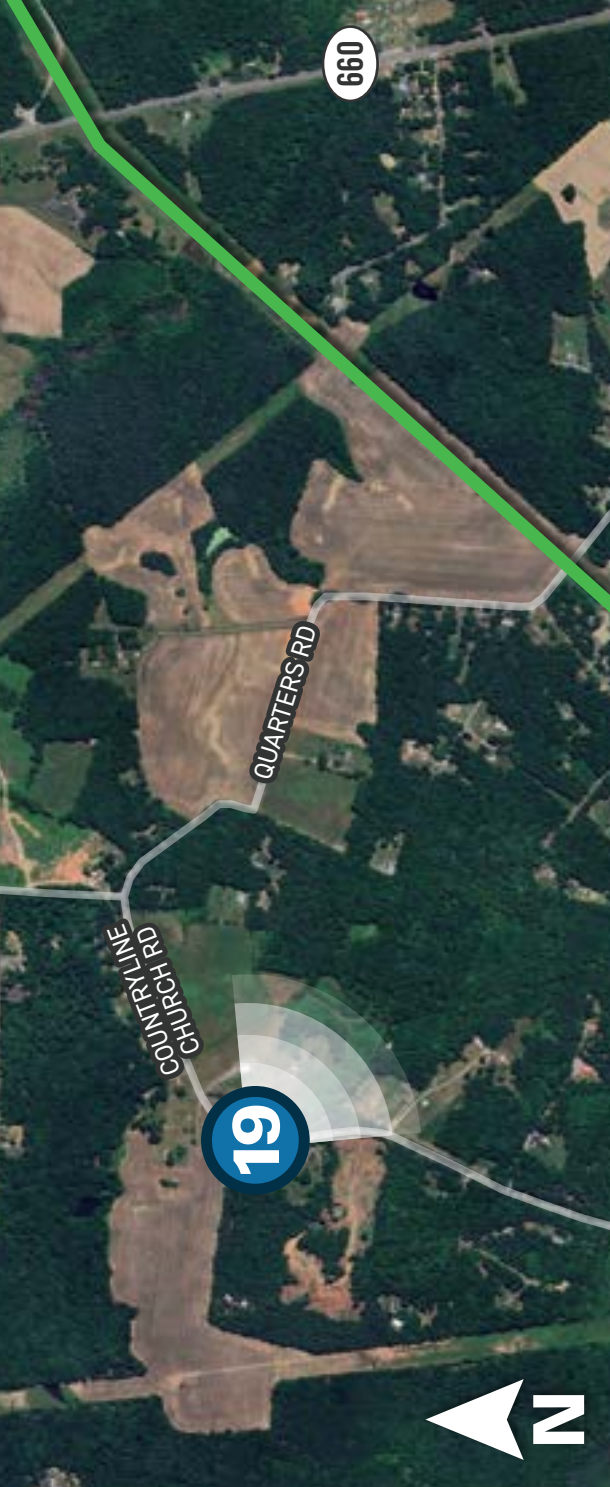
Objects displayed in yellow will be fully obscured by terrain and vegetation. Photo simulations are for discussion purposes only. Final design is subject to change pending public, engineering, and regulatory review.

LADYSMITH – ST. JOHN'S – LEE'S HILL

230 kV Electric Transmission Project

Viewpoint 19

Date: 08/06/2024 Time: 4:08 pm
Viewing Direction: Southeast
19 Viewpoint Location Corridor 1A
DHR ID: 016-5230
Property Name: Walnut Hill



117

EXISTING CONDITIONS



PROPOSED CONDITIONS

OVERLAY

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

Objects displayed in yellow will be fully obscured by terrain and vegetation.

This segment of line will be reconductor only.

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: Not applicable.

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

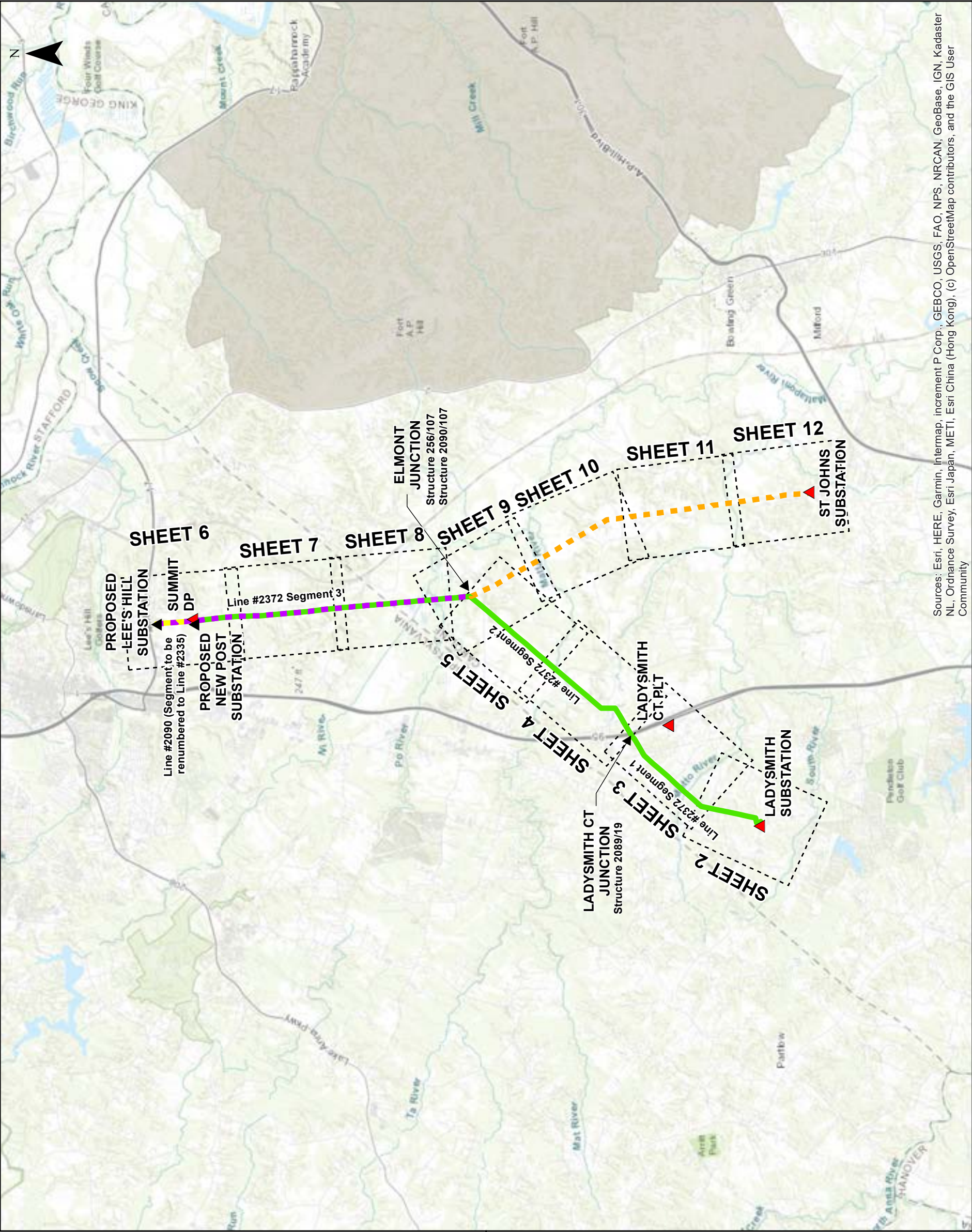
- A. Describe the character of the area that will be traversed by this line, including land use, wetlands, etc. Provide the number of dwellings within 500 feet, 250 feet and 100 feet of the centerline, and within the ROW for each route considered. Provide the estimated amount of farmland and forestland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

Response: The Project will be located within the existing transmission line ROW which spans approximately 3.2 miles from the Ladysmith Substation to Ladysmith CT and then continues east approximately 4.5 miles from Ladysmith CT to Elmont Junction. The Project ROW splits at Elmont Junction to travel north approximately 5.5 miles to New Post Substation and then approximately 0.9 miles from New Post Substation to Lee's Hill Substation, and to travel south approximately 7.3 miles to St. Johns Substation. The Project will be located entirely within the existing maintained ROW and will cross agricultural lands and undeveloped lands as well as some low-density residential communities. The Project crosses a total of approximately 275 acres of prime farmland and approximately 125 acres of farmland of statewide importance. Agricultural uses are present within the existing ROW and these activities have been occurring within the ROW while the existing transmission lines have been in operation. The proposed Project may result in temporary impacts to farmland during construction but would otherwise not be expected to impact farmlands and would not alter the agricultural use. As the Project is within existing transmission line ROW, no impacts to forestland within the ROW are expected.

According to Caroline and Spotsylvania County parcel data, zoning data, and aerial photo analysis, there are 519 dwellings located within 500 feet, 226 dwellings located within 250 feet, and 102 dwellings located within 100 feet of the centerline of the existing transmission line corridors.

See Attachment III.A.1 and Section 2.L of the DEQ Supplement for the estimated amount of farmland within the ROW that the Proposed Route would impact. The project is located entirely within existing maintained rights-of-way; therefore, no forestland is present, and no additional forestland clearing is anticipated.

For additional description of the character of the area that will be traversed by the Proposed Route and the related impacts, see the DEQ Supplement, specifically as to land use (Sections 2.G and 2.L), wetlands (Section 2.D), forests (Section 2.L), agricultural lands (Section 2.L), historic resources (Section 2.I), and wildlife (Sections 2.G and 2.K).



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

ATTACHMENT III.A.1
PRIME FARMLAND MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)

Client:		Dominion Energy Virginia	
C2 Env Project:		JRC	
0354		Date: 08/15/24	
Prepared By:		JRC	

- Scale is 1 IN = 2 MI when printed at original size of 11x17
- Map Sheet
- Proposed 230 kV Line #2372 in Existing ROW
 - Proposed 230 kV Line #2378 in Existing ROW
 - Existing 230 kV Line #2090 (and Future Line #2335) Partial Rebuild
 - Existing 230 kV Line #256 Partial Rebuild
 - Proposed Substation
 - Existing Substation

- Notes:
1. Basemap from ESRI Topographic Map, World Street Map, and World Imagery
 2. Project right-of-way provided by Dominion Energy Virginia
 3. Roads from Virginia Geographic Information Network
 4. Stream centerlines from U.S. Geological Survey National Hydrography Dataset



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri



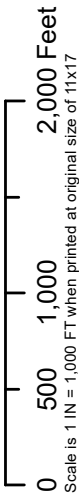
PRIME FARMLAND MAP

Partial Rebuild of Lines #256 and #2090/#2335
(Ladysmith, St. Johns, New Post, Lee's Hill)
and New 230 kV Line #2372 (Ladysmith - New Post)
and New 230 kV Line #2378 (New Post - Lee's Hill)

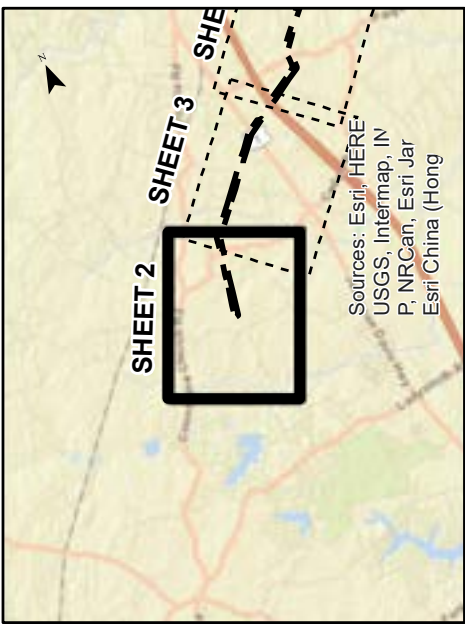
Caroline and Spotsylvania Counties, Virginia

Dominion Energy Virginia

C2 Env Project: 0354 Prepared By: JRC Date: 08/15/24



-  Existing Right-of-Way
 Proposed Substation
 Existing Substation
 Dominion Owned Substation Parcel
 Prime Farmland
 Farmland of Statewide Importance
 USGS National Hydrography Stream Centerline
 Railroad





Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

ATTACHMENT III.A.1

PRIME FARMLAND MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)

Client:
Caroline and Spotsylvania Counties, Virginia

Dominion Energy Virginia

C2 Env Project: 0354

Prepared By: JRC

Date: 08/15/24

050010002000

Feet

Scale is 1 IN = 1,000 FT when printed at original size of 11x17

Existing Right-of-Way

Proposed Substation

Existing Substation

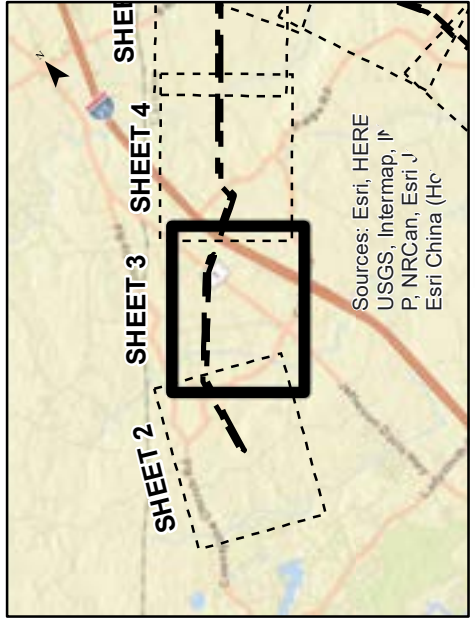
Dominion Owned Substation Parcel

Prime Farmland

Farmland of Statewide Importance

USGS National Hydrography Stream Centerline

Railroad

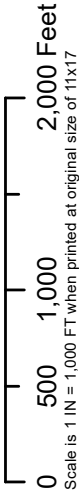


ENVIRONMENTAL

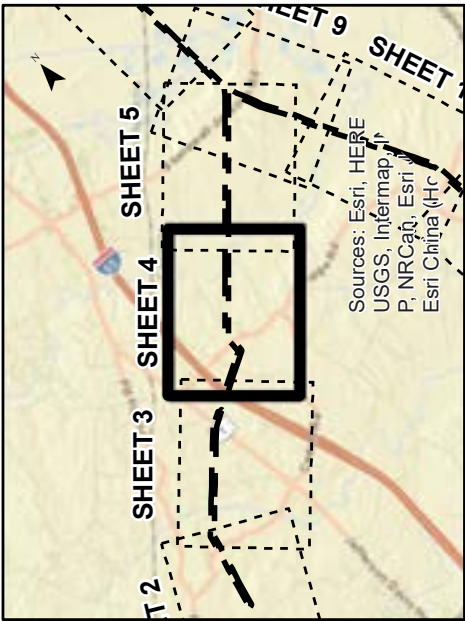
Dominion Energy



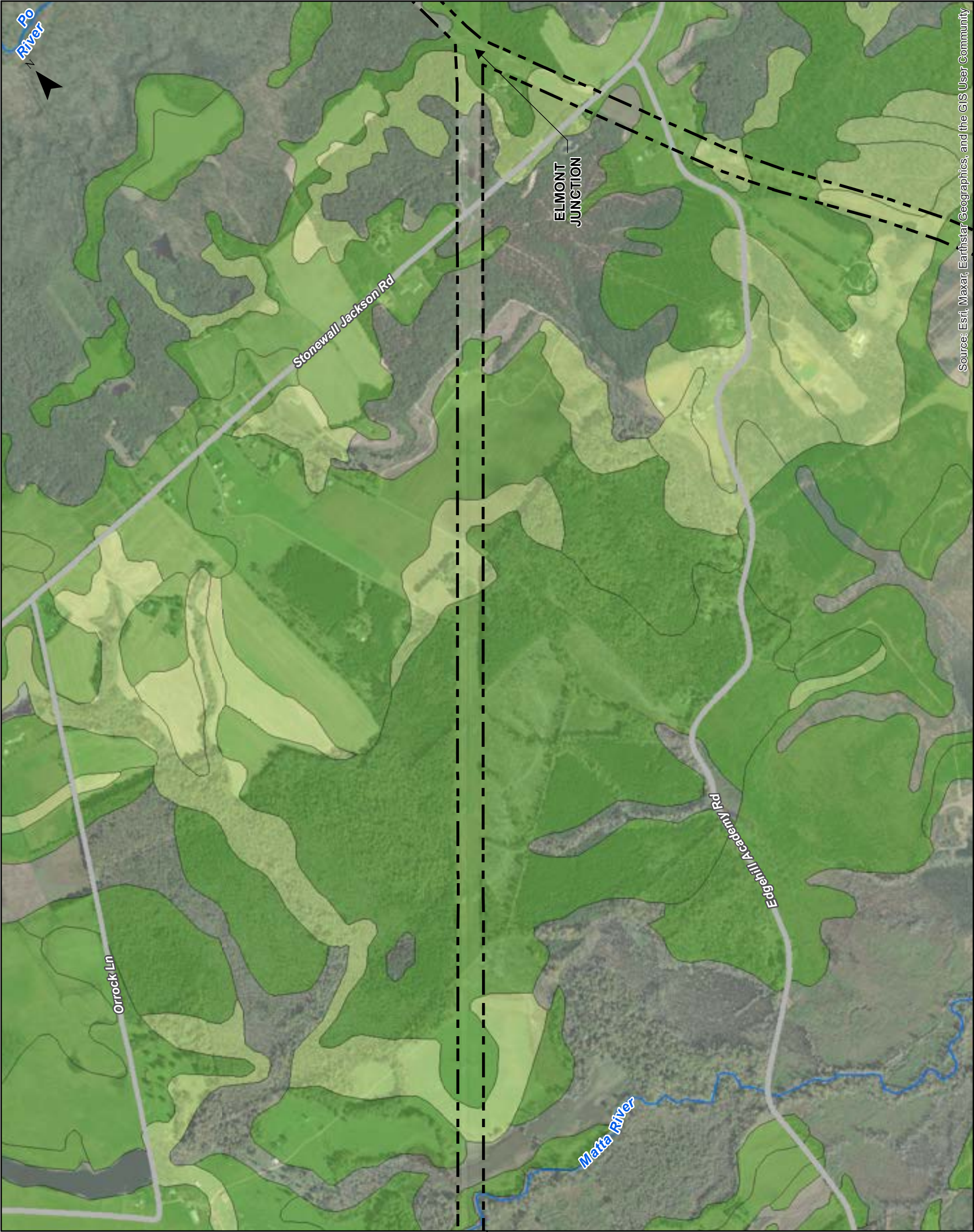
ATTACHMENT III.A.1
PRIME FARMLAND MAP
Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)
Caroline and Spotsylvania Counties, Virginia
Client:
Dominion Energy Virginia
C2 Env Project: 0354
Prepared By: JRC
Date: 08/15/24



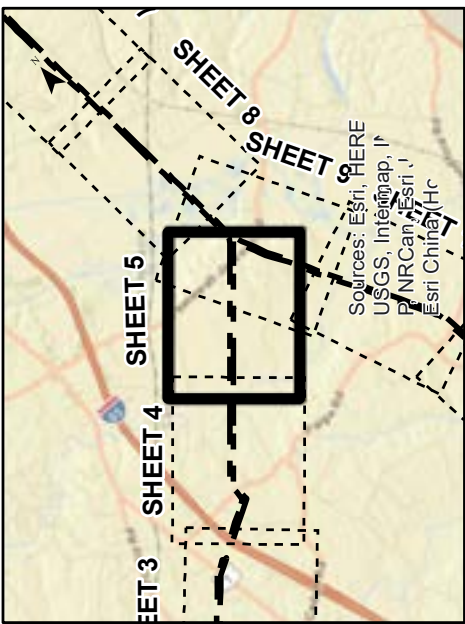
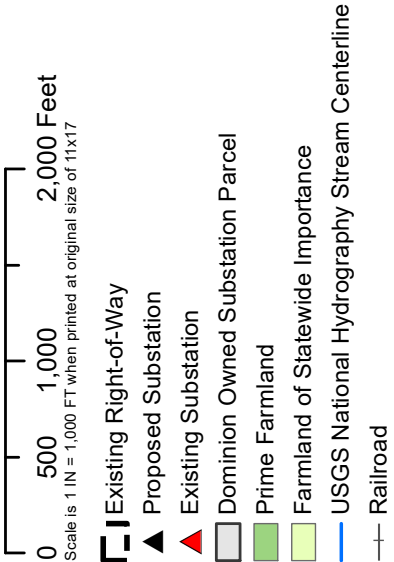
- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Dominion Owned Substation Parcel
- Prime Farmland
- Farmland of Statewide Importance
- USGS National Hydrography Stream Centerline
- Railroad



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



ATTACHMENT III.A.1
PRIME FARMLAND MAP
Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)
Caroline and Spotsylvania Counties, Virginia
Client:
Dominion Energy Virginia
C2 Env Project: 0354
Prepared By: JRC
Date: 08/15/24



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Sources: Esri, Maxar, Earthstar Geographics, and the GIS User Community

ATTACHMENT III.A.1

PRIME FARMLAND MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)

Client:
Caroline and Spotsylvania Counties, Virginia

Dominion Energy Virginia

C2 Env Project: 0354

Prepared By: JRC

Date: 08/15/24

0 500 1,000 2,000 Feet
Scale is 1 IN = 1,000 FT when printed at original size of 11x17

Existing Right-of-Way

Proposed Substation

Existing Substation

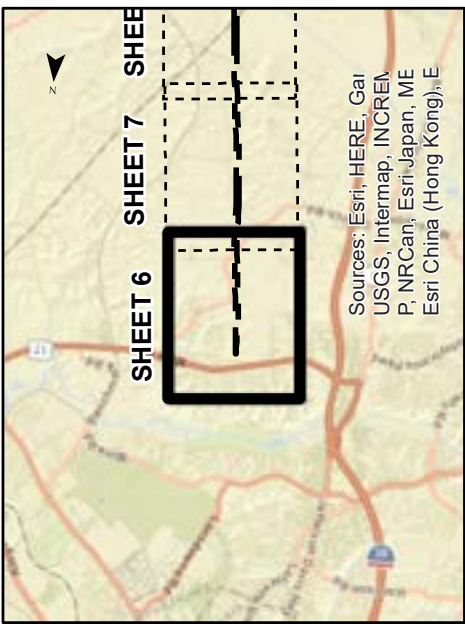
Dominion Owned Substation Parcel

Prime Farmland

Farmland of Statewide Importance

USGS National Hydrography Stream Centerline

Railroad



ENVIRONMENTAL

Dominion Energy



ATTACHMENT III.A.1

PRIME FARMLAND MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)

Client:
Caroline and Spotsylvania Counties, Virginia

Dominion Energy Virginia

C2 Env Project: 0354
Prepared By: JRC
Date: 08/15/24

050010002000

Feet

Scale is 1 IN = 1,000 FT when printed at original size of 11x17

Existing Right-of-Way

Proposed Substation

Existing Substation

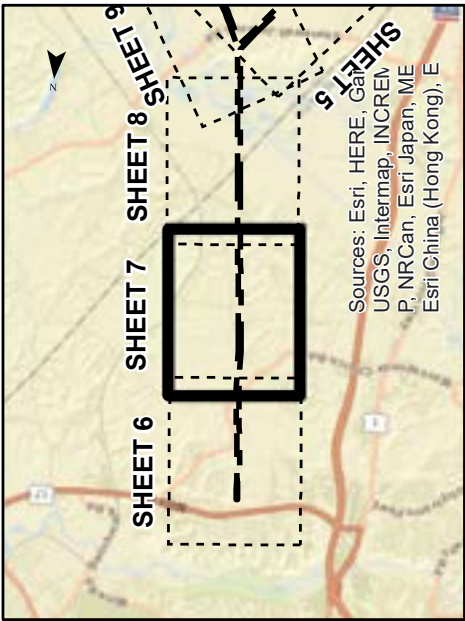
Dominion Owned Substation Parcel

Prime Farmland

Farmland of Statewide Importance

USGS National Hydrography Stream Centerline

Railroad



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, ME, Esri China (Hong Kong), E



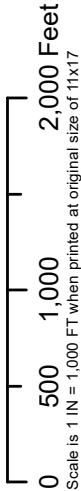
PRIME FARMLAND MAP

Partial Rebuild of Lines #256 and #2090/#2335
(Ladysmith, St. Johns, New Post, Lee's Hill)
and New 230 kV Line #2372 (Ladysmith - New Post)
and New 230 kV Line #2378 (New Post - Lee's Hill)

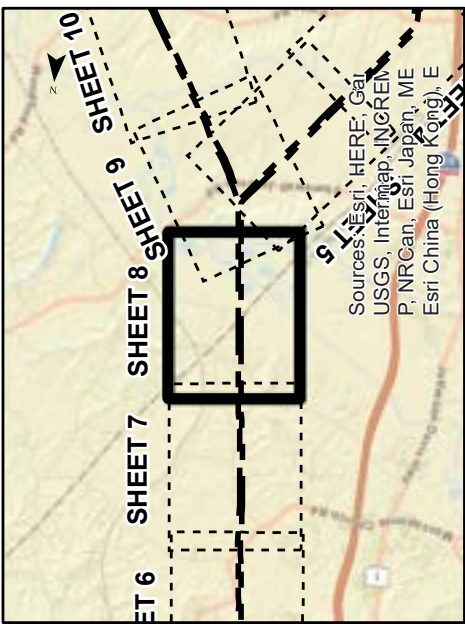
Caroline and Spotsylvania Counties, Virginia

Dominion Energy Virginia

C2 Env Project:	Prepared By:	Date:
0354	JRC	08/15/24

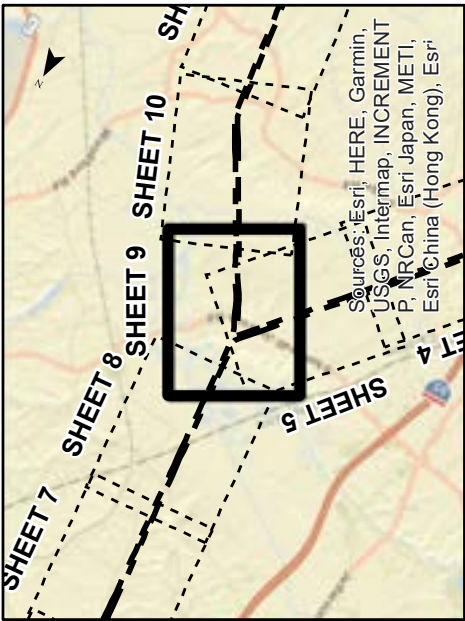


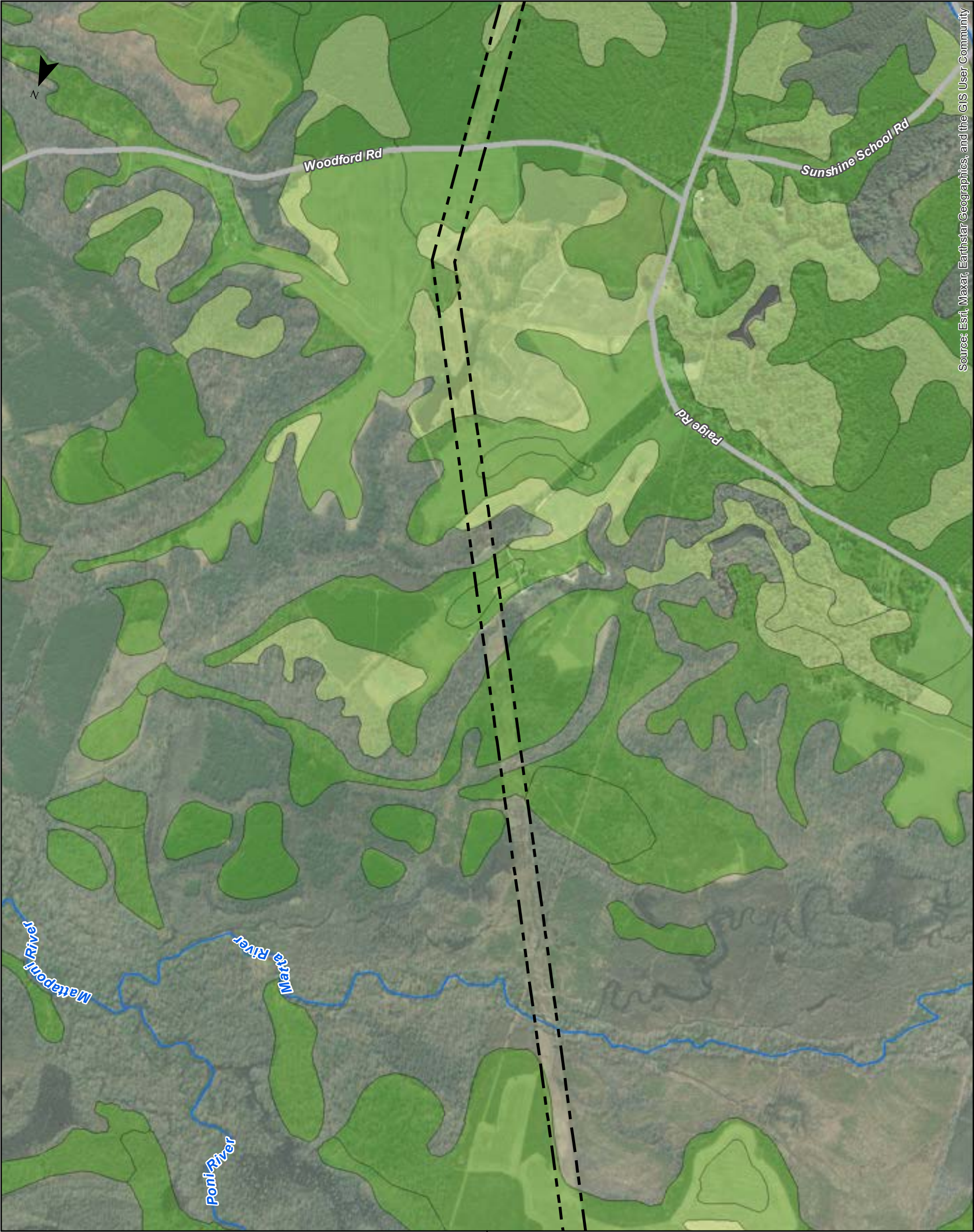
-  Existing Right-of-Way
 Proposed Substation
 Existing Substation
 Dominion Owned Substation Parcel
 Prime Farmland
 Farmland of Statewide Importance
 USGS National Hydrography Stream Centerline
 Railroad





ATTACHMENT III.A.1
PRIME FARMLAND MAP
Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)
Caroline and Spotsylvania Counties, Virginia
Client:
Dominion Energy Virginia
C2 Env Project: 0354
Prepared By: JRC
Date: 08/15/24





Sources: Esri, Maxar, Earthstar Geographics, and the GIS User Community

ATTACHMENT III.A.1

PRIME FARMLAND MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)

Caroline and Spotsylvania Counties, Virginia

Client: Dominion Energy Virginia

C2 Env Project: 0354

Prepared By: JRC

Date: 08/15/24

050010002000

Feet

Scale is 1 IN = 1,000 FT when printed at original size of 11x17

Existing Right-of-Way

Proposed Substation

Existing Substation

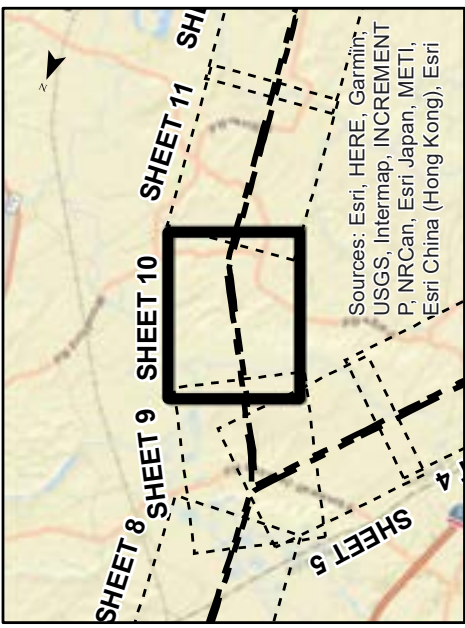
Dominion Owned Substation Parcel

Prime Farmland

Farmland of Statewide Importance

USGS National Hydrography Stream Centerline

Railroad



Sources: Esri, HERE, Garmin; USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri





ATTACHMENT III.A.1

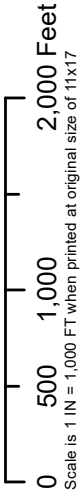
PRIME FARMLAND MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)

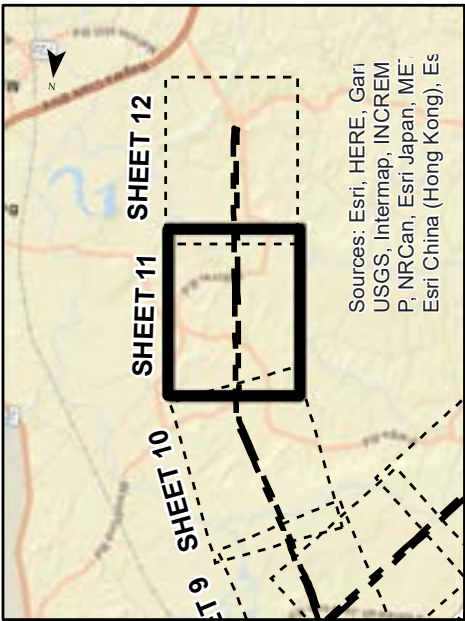
Client:
Caroline and Spotsylvania Counties, Virginia

Dominion Energy Virginia

C2 Env Project: 0354 Prepared By: JRC Date: 08/15/24



- Existing Right-of-Way
- Proposed Substation
- Existing Substation
- Dominion Owned Substation Parcel
- Prime Farmland
- Farmland of Statewide Importance
- USGS National Hydrography Stream Centerline
- Railroad





Sources: Esri, Maxar, Earthstar Geographics, and the GIS User Community

S:\projects\0354 - Ladysmith Projects\SCC Support\GIS\0354\Attachment_1\1_Prima Farmland.mxd

ATTACHMENT III.A.1

PRIME FARMLAND MAP

Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)

Client: Caroline and Spotsylvania Counties, Virginia

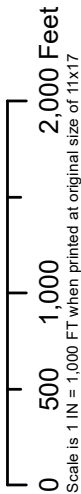
Client:

Dominion Energy Virginia

C2 Env Project: 0354

Prepared By: JRC

Date: 08/15/24



Existing Right-of-Way

Proposed Substation

Existing Substation

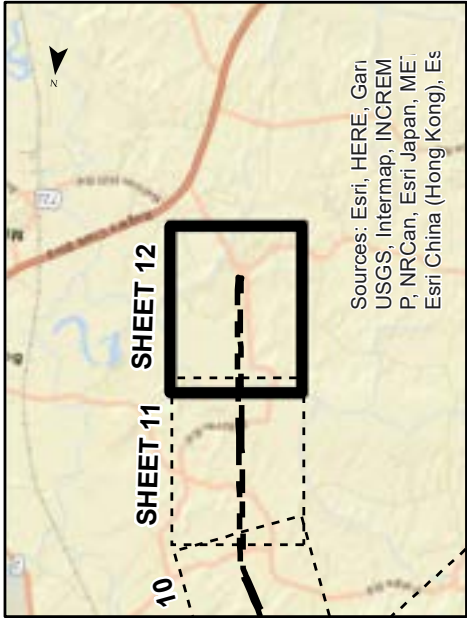
Dominion Owned Substation Parcel

Prime Farmland

Farmland of Statewide Importance

USGS National Hydrography Stream Centerline

Railroad



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: Stakeholder Engagement

On June 4, 2024, the Company announced the proposed Project to the public with a letter and launched an internet website dedicated to the proposed Project: www.dominionenergy.com/ladysmithleeshill. The website includes a description and benefits of the proposed Project, an explanation of need, an interactive map where property owners can search project areas to see changes in their area, copies of letters mailed to the community, and information on the Commission review process. The Company made the website available in English and Spanish.

The June 2024 project announcement letter was sent to approximately 700 property owners and residents within 1,000 feet of the centerline of the right of way. Each letter included information about the need for the Project and a fact sheet. Additionally, the communication indicated an in-person community meeting would be held on July 9, 2024. Lastly, the letter explained how to contact the Project team to provide any feedback or questions. A copy of the June 2024 letter, study area map, and fact sheet are available on the Project website (www.dominionenergy.com/ladysmithleeshill).

The Company mailed a postcard to the same property owners on June 25, 2024, to provide additional details about the July 9, 2024 community meeting. A copy of the June 2024 postcard is available on the Project website (www.dominionenergy.com/ladysmithleeshill).

On July 2, 2024, the Company mailed a postcard clarifying the date of the meeting. The original postcard stated the meeting would be held Thursday, July 9. The postcard sent on July 2, 2024, corrected the date to confirm the meeting would be held Tuesday, July 9, 2024. A copy of the July 2, 2024 postcard is available on the Project website (www.dominionenergy.com/ladysmithleeshill).

Newspaper print advertisements regarding the Project and open house were placed in The Free Lance Star (20,195 circulation on Tuesday) and Mechanicsville Ashland Local (29,758 circulation on Wednesday).

The Company used paid digital and social media campaigns to drive awareness and educate the public regarding the Company's Project, the interactive mapping tool, and the community meeting. A copy of the digital advertisements, print advertisements, and digital advertisement campaign results is included as Attachment III.B.1.

The July 9, 2024 community meeting was held from 5:00 p.m. to 7:00 p.m. at the 118 Bar and Grill at the Dominion Raceway Building, and there were 13 community members in attendance. The Company answered questions from the community in an open house-style meeting where community members could speak with Project team members individually. Open house materials have been posted on the website for the proposed Project.

Environmental Justice

The Company researched the demographics of the surrounding communities using data from the U.S. Census Bureau's American Community Survey 5-Year Estimates (2018-2022). This review revealed that 13 Census Block Groups ("CBGs") are located within one mile of the Proposed Route. A review of census data for several demographic characteristics identified populations within the Project study area that meet the Virginia Environmental Justice Act ("VEJA") thresholds for Environmental Justice Communities ("EJ Communities") (Va. Code §§ 2.2-234, 2.2-235).

Of the 13 CBGs within the Project study area, eight CBGs are crossed by a route alternative. Seven of the CBGs crossed appear to contain populations of color and seven meet low-income thresholds.

As set forth above in this Section III.B, the Company has engaged extensively all communities within the Project study area, including people in the EJ Community CBGs discussed herein. This engagement has included accommodations for Spanish speakers at the community meetings, and translations of Project information into other languages. The Company believes that 1) its work has allowed for the fair treatment and meaningful involvement of all interested people, regardless of race, color, national origin, income, faith, or disability, and 2) the Project's Proposed Route minimizes potential impacts to EJ Communities and other populations, and will not result in a disproportionate and significant adverse impact on EJ Communities.

In addition to its evaluation of impacts, the Company has and will continue to engage the EJ Communities in a manner that allows them to meaningfully participate in the Project development and approval process so that the Company can take their views and input into consideration. See Attachment III.B.2 for a copy of the Company's Environmental Justice Policy.

DE Transmission Ladysmith

Report Date: June 16, 2024 – July 19, 2024

DET | Ladysmith | 6/16/24 – 7/19/24 | Overall Report

The Ladysmith campaign ran on Facebook, Google and Nextdoor through 7/19/24. These campaigns targeted customers over the age of 25 who resided in and around the project areas.

1,509,621 impressions

of ads were delivered to target audiences.

15,636 clicks

have taken audiences to the landing pages.

166,230 video views with an average 44.14% VCR.

1.04% CTR

Most CTRs near or above benchmarks.

90,087 ad engagements

such as reactions, likes, comments, shares and saves have been made on the ads.



Notable Creative

The DET Ladysmith Post-Event 300x600 Display ad had the highest CTR at 4.25%, which is 750% higher than the 0.50% Display benchmark.

Notable Insights

- Facebook ads had a CTR of 2.18% and 38,174 completed video views for a 45.27% VCR.
- Nextdoor ads performed well with a CTR of 0.52%, which is 247% above benchmark.
- Google Display ads performed well with a CTR of 1.25%, which is 150% above benchmark.
- Google Video ads had 35,204 completed video views for a 42.98% VCR, which is 187% above the 15% Google VCR benchmark.

Facebook CTR Benchmark: 0.90% | Twitter CTR Benchmark: 1.11% | Google Search CTR Benchmark: 3.17% | Google Display CTR Benchmark: 0.50% | Google Video Benchmark: 15% | Nextdoor CTR Benchmark: 0.15%

DET | Ladysmith | 6/16/24 – 6/25/24 | Announcement Report

The Ladysmith campaign ran on Facebook, Google and Nextdoor through 7/19/24. These campaigns targeted customers over the age of 25 who resided in and around the project areas.

434,195 impressions

of ads were delivered to target audiences.

4,487 clicks

have taken audiences to the landing pages.

45,049 video views with an average 46.16% VCR.

1.03% CTR

Most CTRs near or above benchmarks.

26,190 ad engagements

such as reactions, likes, comments, shares and saves have been made on the ads.

Notable Creative

The DET Ladysmith 300x600 Display Announcement ad had the highest CTR at 3.91%, which is 682% higher than the 0.50% Display benchmark.

Notable Insights

- Facebook ads had a CTR of 1.93% and 12,285 completed video views for a 50.14% VCR.
- Nextdoor ads performed well with a CTR of 0.52%, which is 247% above benchmark.
- Google Display ads performed well with a CTR of 1.28%, which is 156% above benchmark.
- Google Video ads had 8,511 completed video views for a 41.42% VCR, which is 176% above the 15% Google VCR benchmark.



Facebook CTR Benchmark: 0.90% | Twitter CTR Benchmark: 1.11% | Google Search CTR Benchmark: 3.17% | Google Display CTR Benchmark: 0.50% | Google Video Benchmark: 15% | Nextdoor CTR Benchmark: 0.15%

DET | Ladysmith | 6/26/24 – 7/09/24 | Pre-Event Report

The Ladysmith campaign ran on Facebook, Google and Nextdoor through 7/19/24. These campaigns targeted customers over the age of 25 who resided in and around the project areas.

665,181 impressions

of ads were delivered to target audiences.

6,484 clicks

have taken audiences to the landing pages.

74,496 video views with an average 46.32% VCR.

0.97% CTR

Most CTRs near or above benchmarks.

34,492 ad engagements

such as reactions, likes, comments, shares and saves have been made on the ads.

Notable Creative

The DET Ladysmith 300x600 Display Pre-Event ad had the highest CTR at 4.23%, which is 746% higher than the 0.50% Display benchmark.



Notable Insights

- Facebook ads had a CTR of 2.58% and 15,582 completed video views for a 48.44% VCR.
- Nextdoor ads performed well with a CTR of 0.57%, which is 280% above benchmark.
- Google Display ads performed well with a CTR of 1.28%, which is 156% above benchmark.
- Google Video ads had 18,922 completed video views for a 44.70% VCR, which is 198% above the 15% Google VCR benchmark.

Facebook CTR Benchmark: 0.90% | Twitter CTR Benchmark: 1.11% | Google Search CTR Benchmark: 3.17% | Google Display CTR Benchmark: 0.50% | Google Video Benchmark: 15% | Nextdoor CTR Benchmark: 0.15%

DET | Ladysmith | 7/10/24 – 7/19/24 | Post-Event Report

The Ladysmith campaign ran on Facebook, Google and Nextdoor through 7/19/24. These campaigns targeted customers over the age of 25 who resided in and around the project areas.

410,245 impressions

of ads were delivered to target audiences.

4,665 clicks

have taken audiences to the landing pages.

46,685 video views with an average 38.72% VCR.

1.14% CTR

Most CTRs near or above benchmarks.

29,405 ad engagements

such as reactions, likes, comments, shares and saves have been made on the ads.



Notable Creative

The DET Ladysmith Post-Event 300x600 Display ad had the highest CTR at 4.25%, which is 750% higher than the 0.50% Display benchmark.

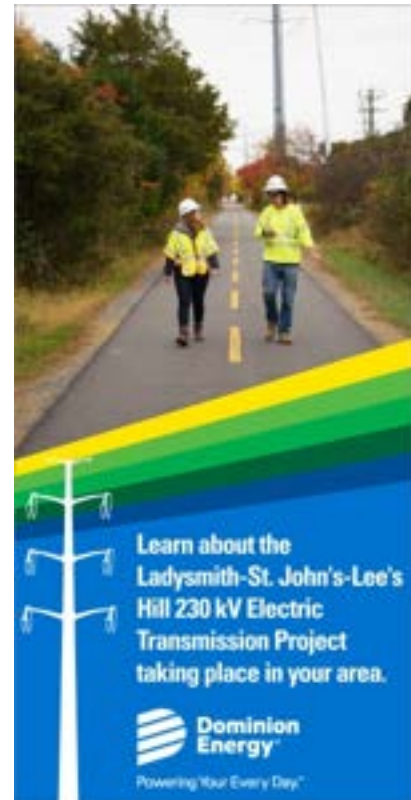
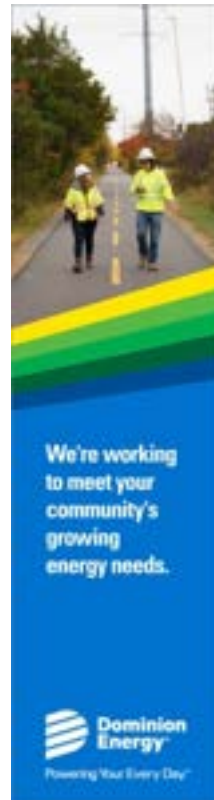
Notable Insights

- Facebook ads had a CTR of 2.07% and 10,307 completed video views for a 37.27% VCR.
- Nextdoor ads performed well with a CTR of 0.46%, which is 207% above benchmark.
- Google Display ads performed well with a CTR of 1.19%, which is 138% above benchmark.
- Google Video ads had 7,770 completed video views for a 40.83% VCR, which is 172% above the 15% Google VCR benchmark.

Facebook CTR Benchmark: 0.90% | Twitter CTR Benchmark: 1.11% | Google Search CTR Benchmark: 3.17% | Google Display CTR Benchmark: 0.50% | Google Video Benchmark: 15% | Nextdoor CTR Benchmark: 0.15%

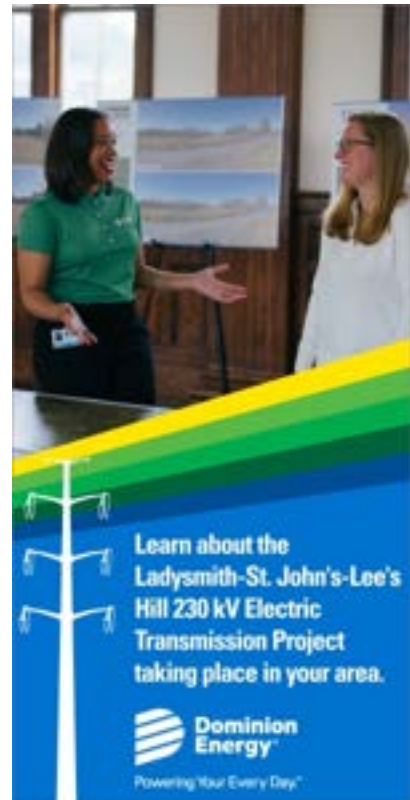
**Dominion Energy
Electric Transmission**

Ladysmith-St. John's-Lee's
Hill Electric Transmission
Line Project
Announcement Display



Dominion Energy Electric Transmission

Ladysmith-St. John's-Lee's
Hill Electric Transmission
Line Project
Pre-Event Display



**Dominion Energy
Electric Transmission**

Ladysmith-St. John's-Lee's
Hill Electric Transmission
Line Project
Nextdoor Imagery

Announcemet Image:



Pre-Event Image:



**Dominion Energy
Electric Transmission**

Ladysmith-St. John's-Lee's
Hill Electric Transmission
Line Project

Social Videos

[Announcement Video \(Click to Play\)](#)



[Pre-event Video \(Click to Play\)](#)



Dominion Energy Electric Transmission

Ladysmith-St. John's-Lee's
Hill Electric Transmission
Line Project
Print Ads

What matters to you matters to us

We're working to meet Virginia's energy needs. We'd like your input on an upcoming electric transmission project in Caroline and Spotsylvania Counties.

Join us:

Tuesday, July 9th, 2024, 5-7 p.m.
118 Bar and Grill at Dominion Raceway
6501 Dominion Raceway Ave, 2nd Floor
Thornburg, VA 22580

Learn more at
DominionEnergy.com/LadysmithLeesHill



Use your phone's camera
or QR reader app to visit
the project page directly.




**Dominion
Energy**
Powering Your Every Day.™



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: The proposed routes for the Project are located entirely within existing maintained rights-of-way. In reviewing aerial photography, the Company identified four potential outbuildings that may need to be demolished or relocated to construct the Project. The Company will confirm the location of the outbuildings prior to construction and coordinate with landowners as needed.

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 Project is located in the existing transmission line ROW corridor that contains several parallel lines. Between Ladysmith Substation and Ladysmith CT, the proposed Line #2372 will be co-located with existing Line #2089 and will parallel existing Line #568. Between Ladysmith CT and Elmont Junction, Line #2372 will parallel existing Lines #2090 and #568. Between Elmont Junction and Lee's Hill Substation, Line #2372 (which becomes Line #2378 at New Post Substation) and Line #2090 (which will become Line #2335 at New Post Substation) parallel existing Line #47. Between Elmont Junction and St. Johns Substation, Line #256 parallels existing Line #47. All proposed work will occur within the existing maintained transmission line corridors, which have been in use for approximately 33 years for the St. Johns to Lee's Hill corridor and approximately 14 years for the Elmont Junction to Ladysmith corridor.

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 Spotsylvania County Current Comprehensive Plan¹⁶ (the “Spotsylvania County Plan”) was adopted in 2021 and revised in 2022 and 2023. The Caroline County Comprehensive Plan¹⁷ (the “Caroline County Plan”) was adopted in 2010 and amended most recently in 2023. The Spotsylvania County Plan and the Caroline County Plan each focus on the responsible growth management, community preservation and development, and the preservation and access of natural amenities for the future.

The proposed Project uses existing transmission line ROW for the entire length of Line #256, Line #2090 (to be renumbered Line #2335 between New Post Substation and Lee’s Hill Substation), and Lines #2372 and #2378. The existing ROW is regularly maintained up to 250 feet for operation of the transmission lines. The ROW currently crosses largely agricultural and undeveloped land. As currently outlined in the Spotsylvania County Plan and the Caroline County Plan, no additional development zones are planned within the existing transmission line ROW. The Company engaged with Caroline and Spotsylvania Counties for feedback on the proposed Project and to understand any concerns or comments on the Project. See Section V.D. The proposed Project is not expected to interfere with future planning in either Caroline or Spotsylvania County.

¹⁶ <https://www.spotsylvania.va.us/717/Comprehensive-Plan>

¹⁷ <https://co.caroline.va.us/267/Comprehensive-Plan>

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) Caroline County and Spotsylvania County designate important farmland based on soil type. The Company coordinated with Caroline County and Spotsylvania Staff who concluded that the Project will not impact important farmlands. See Section 2.L. of the DEQ Supplement.
- (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) One property listed in the NRHP, Edge Hill (VDHR # 016-0016) is directly crossed by the Project.
 - (2) Two properties considered eligible by the VDHR are directly crossed by the Project; Edge Hill (VDHR# 016-0016) which in addition to being listed in the NRHP is also listed in the Virginia Landmarks Register, and also Woodpecker Farm (VDHR# 016-0028).
 - (3) None.
 - (4) There are four previously recorded archaeological sites within or crossed by the Project ROW. These are sites, 44CE0225, 44CE0227, 44CE0829, and 44CE1046. Site 44CE0829 is potentially eligible for listing, whereas the remaining three sites have not been formally evaluated by the VDHR.
 - (5) None.
 - (6) None.
 - (7) None.
 - (8) None.
 - (9) The Project crosses a Virginia Outdoors Foundation Conservation easement (VOF-02320) which was established after the Company's ROW.
 - (10) None.
 - (11) None.

- (12) One recreational trail (US Bicycle Route 1) is crossed by the Project. This bicycle trail was established in 1982 and the portion of the trail in Virginia travels 274 miles through 14 counties. The trail is crossed four times by the existing transmission line rights-of-way. The trail crosses the Proposed Project along Massaponax Church Road and then again further south along Guinea Station Road between Elmont Junction and Lee's Hill Substation where Line #2090 and Line #2372 will be installed on new, shared monopole structures. The trail then crosses along Edgehill Academy Road between Elmont Junction and the St. Johns Substation where Line #256 will be rebuilt on new monopole structures. Finally, the trail crosses the Proposed Project along Cedon Road between Ladysmith Substation and Elmont Junction where Line #2372 will be installed onto the existing structures of Line 2089. No new ROW will be required and visual impacts are anticipated to be minimal as riders are likely accustomed to the existing transmission line crossing this roadway. Additional information on recreation areas near the Project can be found in the DEQ Supplement Section 2.L.

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 reviewed the Federal Aviation Administration’s (“FAA”) website, aerial photography, and the AirNav website to identify public use airports, airports operated by a federal agency or the U.S. Department of Defense, airports, or heliports with at least one FAA-approved instrument approach procedure, and public use or military airports under construction within 10.0 miles of the Project. The table below provides a summary of the airports and heliports identified.

Airport Name	Approximate Distance and Direction from Proposed Project (nautical miles (approx.))	Use
Mary Walker LZ Airport (KAPH)	5.6 miles east of St Johns Substation	Private
Shannon Airport (EZF)	2.8 miles north of proposed Lee’s Hill Substation	Public
Dogwood Airpark (VA42)	9.3 miles north of proposed Lee’s Hill Substation	Private
Woodford Airpark (20VA)	1.0 mile southeast of existing Line #256/2090	Private
Robbie Campbell Memorial Airfield (4VG8)	3.3 miles west of existing Line #256/2090	Private
Spotsylvania Regional Medical Center Hospital Heliport (03VA)	1.2 miles west of existing Line #2090	Private
Mary Washington Hospital Heliport (6VA7)	5.9 miles north of proposed Lee’s Hill Substation	Private

The Shannon Airport is the only public airport that was identified. Based on the review of the FAA defined Civil Airport Imaginary Surfaces and the Spotsylvania County Airport Overlay District, it was determined that the Project is located outside of all approach and transitional surfaces for this airport. A portion of the

Project does fall within the “FAA Tower Zone” of the Spotsylvania County Airport Overlay District. 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, Dominion Energy Virginia will submit an FAA Form 7460-1 Notice pursuant to 14 CFR Part 77 for any tower locations that meet the review criteria.

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 proposed Project.¹⁸ The Project crosses one Virginia Byway, Guinea Station Rd/Route 607 in Spotsylvania County. This roadway is crossed by the existing ROW and occurs along a portion of the Proposed Route between Elmont Junction and the Lee's Hill Substation where Line #2090 will be rebuilt on new double-circuit weathering steel monopole structures which will also hold the new Line #2372. No new ROW will be required and visual impacts are anticipated to be minimal as drivers are likely accustomed to the existing transmission line crossing this roadway.

To avoid the need for any additional ROW, all road crossings will occur at a similar angle and alignment as the existing transmission lines' crossings.

¹⁸ VDOT 2021 Virginia's Scenic Roads Map. Accessed: January 2024. Retrieved from: https://www.vdot.virginia.gov/media/vdotvirginiagov/travel-and-traffic/maps/16054_ScenicMap_front.pdf.

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

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

Response: The Company solicited feedback from Caroline County and Spotsylvania County regarding the proposed Project. Below is a list of coordination that has occurred with municipal, state, and federal agencies:

- Coordination with the U.S. Army Corps of Engineers, DEQ, Virginia Marine Resources Commission, and VDOT will take place as appropriate to obtain necessary approvals for the Project.
- A letter dated July 18, 2024, was submitted to Caroline County to describe the Project and request comments. See Section V.D.
- A letter dated July 18, 2024, was submitted to Spotsylvania County to describe the Project and request comments. See Section V.D.
- A Stage I Pre-Application Analysis has been prepared and was submitted to VDHR on August 28, 2024. See Attachment 2.I.1 to the DEQ Supplement.
- On June 11, 2024, the Company solicited comments via letter from several federally recognized Native American tribes, including:

Name	Tribe
Chief Walt “Red Hawk” Brown	Cheroenhaka (Nottoway) Indian Tribe
Mary Frances Wilkerson	Cheroenhaka (Nottoway) Indian Tribe
Chief Stephen Adkins	Chickahominy Indian Tribe
Assistant Chief Reginald Stewart	Chickahominy Indian Tribe
Chief Gerald A. Stewart	Chickahominy Indian Tribe Eastern Division
Jessica Phillips	Chickahominy Indian Tribe Eastern Division
Dana Adkins	Chickahominy Tribe
Chief Mark Custalow	Mattaponi Tribe
Chief Diane Shields	Monacan Indian Nation
Chief Keith Anderson	Nansemond Indian Nation
Chief Lynette Allston	Nottoway Indian Tribe of Virginia
Ms. Beth Roach	Nottoway Indian Tribe of Virginia
Chief Robert Gray	Pamunkey Indian Tribe
Kendall Stevens	Pamunkey Indian Tribal Resource Office
Chief Charles (Bootsie) Bullock	Patawomeck Indian Tribe of Virginia
Chief G. Anne Richardson	Rappahannock Tribe
Assistant Chief	Rappahannock Tribe

Name	Tribe
Chief W. Frank Adams	Upper Mattaponi Indian Tribe
Leigh Mitchell	Upper Mattaponi Indian Tribe
Dr. Wenonah G. Haire	Catawba Indian Nation
Caitlin Rogers	Catawba Indian Nation
Katelyn Lucas	Delaware Nation, Oklahoma
Deborah Dotson	Delaware Nation, Oklahoma

A copy of the letter template and map is included as Attachment III.J.1.

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

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



June 11, 2024

Proposed Ladysmith-St. John's-Lee's Hill 230 kV Electric Transmission Project

Dear [REDACTED]

Dominion Energy is dedicated to maintaining safe, reliable, and affordable electric service in the communities we serve. You are receiving this project announcement letter as part of our efforts to proactively communicate early with Tribal Nations who may have an interest in this area. With your unique perspective, you can help us better plan projects in their earliest stages. Please note, this letter is not a notification of formal government-to-government consultation from any state or federal agency. Dominion Energy has been and continues to be committed to creating and maintaining strong, open, supportive, and mutually beneficial relationships with Tribal Nations.

We are reaching out to you now as we have an upcoming project in Caroline and Spotsylvania Counties, Virginia, and you may have an interest in this area. The Ladysmith-St. John's-Lee's Hill 230 kV Electric Transmission project proposes solutions to meet the growing power needs of the area and to maintain reliable electric service, while minimizing impacts to the surrounding area.

The project addresses three main right of way corridors, totaling approximately 21 miles of electric transmission upgrades between our Ladysmith and St. John's Substations in Caroline County, and our future Lee's Hill Substation in Spotsylvania County. The scope of work primarily consists of rebuilding existing infrastructure with new steel structures that will allow for higher capacity conductor. One portion of the project will involve building new structures in existing right of way. No new permanent right of way is anticipated for this project.

Enclosed is a project fact sheet for your reference. This project requires review by the Virginia State Corporation Commission (SCC). We are currently in the planning phase of the project. Providing your input now allows us to consider any concerns you may have as we work to meet the project's needs. Please feel free to notify other relevant organizations that may have an interest in the project area. For reference, other recipients of this letter include county and state historic, cultural, and scenic organizations, as well as Tribal Nations.

Please provide your comments by July 15, 2024, so we have adequate time to review and consider your comments in our project design. More information about the meeting and the project in general is available on our project website, DominionEnergy.com/ladysmithleeshill.

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 email at ann.gordon.mickel@dominionenergy.com or by calling 804-363-9783. You may also contact Ken Custalow, our Tribal Liaison Manager. He can be reached by email at ken.custalow@dominionenergy.com.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Ann Gordon Mickel'.

Ann Gordon Mickel
Electric Transmission Communications

Enclosure: Project Fact Sheet
cc Ken Custalow

Ladysmith-St. John's-Lee's Hill 230 kV Electric Transmission Project

CAROLINE AND SPOTSYLVANIA COUNTIES, VIRGINIA



OVERVIEW

At Dominion Energy, we are committed to providing the reliable, affordable, and increasingly clean energy that powers our customers every day. Caroline, Spotsylvania, and surrounding counties are experiencing growing energy demands. To address this development, we plan to upgrade electric transmission infrastructure using existing rights of way.

The Ladysmith-St. John's-Lee's Hill 230 kV Electric Transmission Project proposes to rebuild 230 kV electric transmission lines in three right of way corridors and add an additional 230 kV circuit to allow us to meet the growing energy needs, continue providing reliable electric service, and maintain compliance with federal reliability standards.

PROJECT SCHEDULE

SUBJECT TO CHANGE

DATE	ACTIVITY
Summer 2024	- Project announcement - Community engagement
Late Summer 2024	File application with the Virginia State Corporation Commission (SCC)
Summer 2025	Anticipated SCC ruling
2025	- Permitting - Finalize engineering - Pre-construction outreach
Early 2026	Construction to begin
Summer 2028	Construction complete, restoration begins

QUICK FACTS

- Location: Caroline and Spotsylvania Counties
- Three right of way corridors will be upgraded as part of this project.
 - CORRIDOR 1:
Ladysmith Substation – Junction
 - CORRIDOR 2:
St. John's Substation – Junction
 - CORRIDOR 3:
Junction – Future Lee's Hill Substation
- Total project length: Approximately 21 miles
- No new permanent right of way is required
- Interruption to your electric service is not anticipated as a result of this project

See map on the back of the page for more details about each corridor



SCAN HERE TO
LEARN MORE

CONTINUED ON BACK

Ladysmith-St. John's-Lee's Hill 230 kV Electric Transmission Project CONTINUED

CORRIDOR 1: Ladysmith Substation – Junction (8 miles)

• Corridor 1A: Ladysmith Substation-Ladysmith CT (3 miles)

This section will not replace or install any new structures. Instead, we will replace the existing conductor, or wires carrying electricity, with new higher capacity conductor. This process is known as reconductoring. The voltage will remain 230 kV.

• Corridor 1B: Ladysmith CT - Junction (5 miles)

The existing 230 kV lattice structures will be reconducted. New single-circuit 230 monopole structures will be installed using existing right of way.



Existing Corridor 1B – lattice tower (left) will be reconducted. New monopoles will be installed to the left of these structures. Visit the Backyard Application on the project website to view visuals of the proposed monopole structures.

CORRIDOR 2: St. John's Substation – Junction (7 miles)

The existing 230 kV line, which mostly consists of wooden H-Frame structures will be rebuilt with new double-circuit monopole structures.



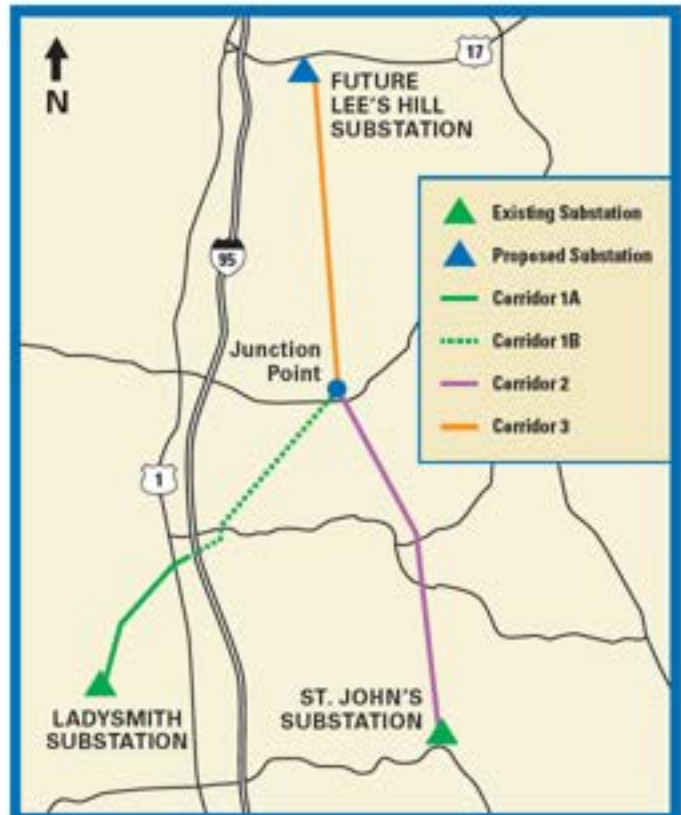
Existing Corridor 2: H-Frame structures (left) will be replaced with new monopole structures. No replacement of structures on the right.

CORRIDOR 3: Junction – Future Lee's Hill Substation (6 miles)

The existing 230 kV line, which mostly consists of wooden H-Frame structures will be replaced with new double-circuit monopole structures.



Existing Corridor 3: H-Frame structures (left) will be replaced with new monopole structures. No replacement of structures on the right.



View project details in the areas that matter most to you with our Backyard Application – an interactive map found on our project website.

Use the Backyard Application to:

- Zoom in on areas that matter to you, or search by typing in an address
- View existing and proposed structure types and heights
- View simulations of proposed structures



FOR MORE INFORMATION

Visit our website at
DominionEnergy.com/ladysmithleeshill.

You may also contact us by sending an email to powerline@dominionenergy.com or calling 888-291-0190.

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

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

Response: On June 12, 2024, the Company solicited comments via letter from the community leaders, environmental groups, and business groups identified below. A copy of the letter template and map is included as Attachment III.K.1.

Name	Organization
Ms. Elizabeth S. Kostelny	Preservation Virginia
Ms. Eleanor Breen, PhD, RPA	Council of Virginia Archaeologists
Ms. Leighton Powell	Scenic Virginia
Ms. Elaine Chang	National Trust for Historic Preservation
Mr. John McCarthy	Piedmont Environmental Council
Ms. Julie Bolthouse	Piedmont Environmental Council
Mr. Thomas Gilmore	American Battlefield Trust
Mr. Jim Campi	American Battlefield Trust
Mr. Max Hokit	American Battlefield Trust
Mr. Steven Williams	Colonial National Historical Park
Dr. Cassandra Newby-Alexander	Norfolk State University
Mr. Roger Kirchen, Archaeologist	Virginia Department of Historic Resources
Ms. Adrienne Birge-Wilson	Virginia Department of Historic Resources
Mr. Dave Dutton	Dutton and Associates, LLC

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



June 11, 2024

Proposed Ladysmith-St. John's-Lee's Hill 230 kV Electric Transmission Project

Dear [REDACTED]

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 new electric transmission line and substation in Caroline and Spotsylvania Counties, Virginia.

The Ladysmith-St. John's-Lee's Hill 230 kV Electric Transmission project proposes solutions to meet the growing power needs of the area and to maintain reliable electric service, while minimizing impacts to the surrounding area.

The project addresses three main right of way corridors, totaling approximately 21 miles of electric transmission upgrades between our Ladysmith and St. John's Substations in Caroline County, and our future Lee's Hill Substation in Spotsylvania County. The scope of work primarily consists of rebuilding existing infrastructure with new steel structures that will allow for higher capacity conductor. One portion of the project will involve building new structures in existing right of way. No new permanent right of way is anticipated for this project.

Enclosed is a project fact sheet for your reference. This project requires review by the Virginia State Corporation Commission (SCC). We are currently in the planning phase of the project. Providing your input now allows us to consider any concerns you may have as we work to meet the project's needs. Please feel free to notify other relevant organizations that may have an interest in the project area. For reference, other recipients of this letter include county and state historic, cultural, and scenic organizations, as well as Tribal Nations.

On July 9, 2024, we will host a community meeting where you can meet the project team and have your questions answered. Please provide your comments by July 15, 2024, so we have adequate time to review and consider your comments in our project design. More information about the meeting and the project in general is available on our project website, DominionEnergy.com/ladysmithleeshill.

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 email at ann.gordon.mickel@dominionenergy.com or by calling 804-363-9783.

Sincerely,

A handwritten signature in blue ink that reads "Ann Gordon Mickel".

Ann Gordon Mickel
Electric Transmission Communications

Ladysmith-St. John's-Lee's Hill 230 kV Electric Transmission Project

CAROLINE AND SPOTSYLVANIA COUNTIES, VIRGINIA



OVERVIEW

At Dominion Energy, we are committed to providing the reliable, affordable, and increasingly clean energy that powers our customers every day. Caroline, Spotsylvania, and surrounding counties are experiencing growing energy demands. To address this development, we plan to upgrade electric transmission infrastructure using existing rights of way.

The Ladysmith-St. John's-Lee's Hill 230 kV Electric Transmission Project proposes to rebuild 230 kV electric transmission lines in three right of way corridors and add an additional 230 kV circuit to allow us to meet the growing energy needs, continue providing reliable electric service, and maintain compliance with federal reliability standards.

PROJECT SCHEDULE

SUBJECT TO CHANGE

DATE	ACTIVITY
Summer 2024	- Project announcement - Community engagement
Late Summer 2024	File application with the Virginia State Corporation Commission (SCC)
Summer 2025	Anticipated SCC ruling
2025	- Permitting - Finalize engineering - Pre-construction outreach
Early 2026	Construction to begin
Summer 2028	Construction complete, restoration begins

QUICK FACTS

- Location: Caroline and Spotsylvania Counties
- Three right of way corridors will be upgraded as part of this project.
 - CORRIDOR 1: Ladysmith Substation – Junction
 - CORRIDOR 2: St. John's Substation – Junction
 - CORRIDOR 3: Junction – Future Lee's Hill Substation
- Total project length: Approximately 21 miles
- No new permanent right of way is required
- Interruption to your electric service is not anticipated as a result of this project

See map on the back of the page for more details about each corridor



SCAN HERE TO
LEARN MORE

CONTINUED ON BACK

Ladysmith-St. John's-Lee's Hill 230 kV Electric Transmission Project CONTINUED

CORRIDOR 1: Ladysmith Substation – Junction (8 miles)

• Corridor 1A: Ladysmith Substation-Ladysmith CT (3 miles)

This section will not replace or install any new structures. Instead, we will replace the existing conductor, or wires carrying electricity, with new higher capacity conductor. This process is known as reconductoring. The voltage will remain 230 kV.

• Corridor 1B: Ladysmith CT - Junction (5 miles)

The existing 230 kV lattice structures will be reconducted. New single-circuit 230 monopole structures will be installed using existing right of way.



Existing Corridor 1B – lattice tower (left) will be reconducted. New monopoles will be installed to the left of these structures. Visit the Backyard Application on the project website to view visuals of the proposed monopole structures.

CORRIDOR 2: St. John's Substation – Junction (7 miles)

The existing 230 kV line, which mostly consists of wooden H-Frame structures will be rebuilt with new double-circuit monopole structures.



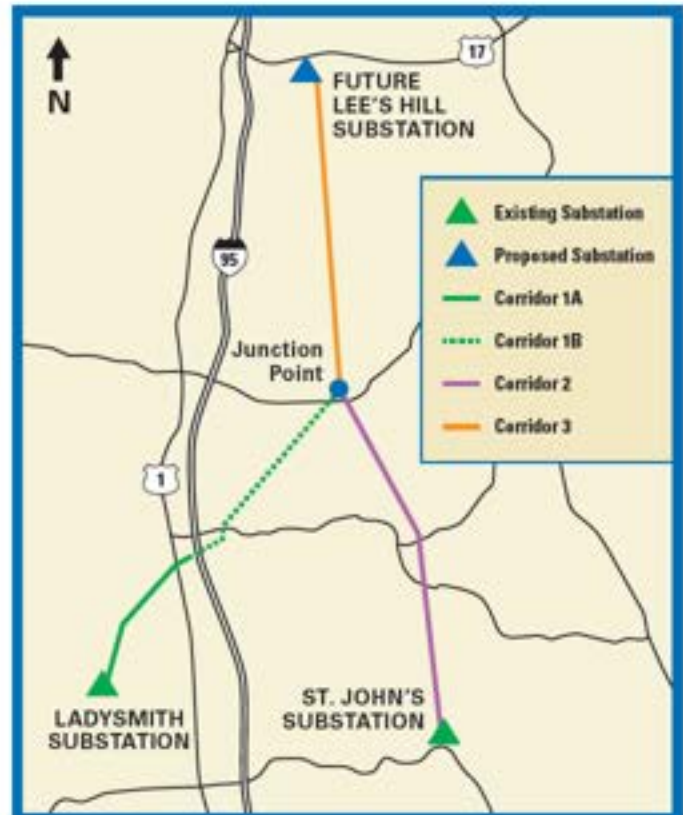
Existing Corridor 2: H-Frame structures (left) will be replaced with new monopole structures. No replacement of structures on the right.

CORRIDOR 3: Junction – Future Lee's Hill Substation (6 miles)

The existing 230 kV line, which mostly consists of wooden H-Frame structures will be replaced with new double-circuit monopole structures.



Existing Corridor 3: H-Frame structures (left) will be replaced with new monopole structures. No replacement of structures on the right.



View project details in the areas that matter most to you with our Backyard Application – an interactive map found on our project website.

Use the Backyard Application to:

- Zoom in on areas that matter to you, or search by typing in an address
- View existing and proposed structure types and heights
- View simulations of proposed structures



FOR MORE INFORMATION

Visit our website at
DominionEnergy.com/ladysmithleeshill.

You may also contact us by sending an email to powerline@dominionenergy.com or calling 888-291-0190.

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 18 or 57	U.S. Army Corps of Engineers
Impacts to state surface waters	Virginia Water Protection Permit	Virginia Department of Environmental Quality
Discharge of stormwater from construction	Construction General Permit	Virginia Department of Environmental Quality
Aerial crossing over state-owned bottomlands	Subaqueous Encroachment Permit (VGP5)	Virginia Marine Resources Commission
Work within VDOT rights-of-way	Land Use Permit	Virginia Department of Transportation
Airspace obstruction evaluation	FAA 7460-1	Federal Aviation Administration

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 associated with high voltage power lines is best estimated by field levels 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 (2029) annual average and maximum (peak) loading conditions.

Proposed Project – Projected Average Loading in 2029

EMF levels were calculated for the proposed Project at the *projected average* load condition as shown in the table below and at a maximum operating voltage of 242 kV when supported on the proposed Project structures. See Attachments II.A.5.a through II.A.5.c.

Line No.	Projected Average Loading (Amps)
2089	380
2372	1542
2090	1913
256	1827
2378	1507
2335	1405
568	2134
47	784

These field levels were calculated at mid-span where the conductors are closest to the ground at a projected average load operating temperature. Values were calculated under the assumption that the current travels in the same direction for all lines.

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

Proposed Project – Projected Average Loading (2029)				
Attachment	Left Edge		Right Edge	
	<u>Electric Field</u> (kV/m)	<u>Magnetic Field</u> (mG)	<u>Electric Field</u> (kV/m)	<u>Magnetic Field</u> (mG)
II.A.5.a	0.769	191.354	2.262	85.573
II.A.5.b	0.133	39.578	2.523	99.055
II.A.5.c	0.057	26.707	0.269	25.444

Proposed Project – Projected Peak Loading in 2029

EMF levels were calculated for the proposed Project at the *projected peak* load condition as shown in the table below and at a maximum operating voltage of 242 kV when supported on the proposed Project structures. See Attachments II.A.5.a through II.A.5.c.

Line No.	Projected Peak Loading (Amps)
2089	585
2372	2372
2090	2943
256	2811
2378	2318
2335	2162
568	3283
47	1206

These field levels were calculated at mid-span where the conductors are closest to the ground at a projected peak load operating temperature. Values were calculated under the assumption that the current travels in the same direction for all lines.

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

Proposed Project – Projected Peak Loading (2029)				
Attachment	Left Edge		Right Edge	
	<u>Electric Field</u> (kV/m)	<u>Magnetic Field</u> (mG)	<u>Electric Field</u> (kV/m)	<u>Magnetic Field</u> (mG)
II.A.5.a	0.704	288.258	2.319	133.992
II.A.5.b	0.135	61.177	2.507	151.645
II.A.5.c	0.055	40.619	0.272	39.526

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 few decades are the foundation of the Company’s opinion that no adverse health effects are anticipated to result from the operation of the proposed Project. Each of these panels has evaluated the scientific research related to health and extremely low frequency (“ELF”) EMF, also referred to as power-frequency (50/60 Hertz (“Hz”)) 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 on biological responses of high, short-term EMF exposure not typically found in people’s day-to-day lives, while others evaluate the effects of common, low 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 100 epidemiologic studies of people in their natural environment and many more laboratory studies of animals (*in vivo*) and isolated cells and tissues (*in vitro*). Standard scientific procedures, such as weight-of-evidence methods, were used by the expert panels assembled by scientific agencies to identify, review, and summarize the results of this large and diverse research.

The reviews of ELF EMF-related biological and health research have been conducted by numerous scientific and health agencies, including, for example, the European Health Risk Assessment Network on Electromagnetic Fields Exposure (“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 Health, Environmental and Emerging Risks (“SCHEER”) (formerly 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, 2022; ICES, 2019; SCHEER, 2023). 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 and 2023 reports by SCENIHR and SCHEER, respectively, and annual reviews published by SSM (i.e., for the years 2015 through 2022). 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.

WHO has recommended that countries adopt recognized international standards published by ICNIRP and ICES. Typical levels of EMF from Dominion Energy Virginia's high voltage 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.

Scientific Committee on Health, Environmental and Emerging Risks (SCHEER). Preliminary Opinion on Potential Health Effects of Exposure to Electromagnetic Fields (EMF): Update with regard to frequencies between 1Hz and 100 kHz. Brussels, Belgium: European Commission, 2023.

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.

Swedish Radiation Safety Authority (SSM). Research 2022:16. Recent Research on EMF and Health Risk – Sixteenth report from SSM's Scientific Council on Electromagnetic Fields, 2021. Stockholm, Sweden: Swedish Radiation Safety Authority (SSM), 2022.

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.”¹⁹

The continuing scientific research on ELF 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:

- WHO, which published one of the most comprehensive and detailed reviews of the relevant scientific peer-reviewed literature in 2007;
- SCHEER (formerly SCENIHR), a committee of the European Commission, which published its assessments in 2009, 2015 and 2023;
- The SSM, which has published annual reviews of the relevant peer-reviewed scientific literature since 2003, with its most recent review published in 2022; 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

¹⁹ 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). In their 2023 Preliminary Opinion providing an update on the potential health effects of exposure to electromagnetic fields in the 1 Hz to 100 kilohertz (“kHz”) range, SCHEER concluded that “overall, there is weak evidence concerning the association of ELF-MF [magnetic field] exposure with childhood leukaemia” (SCHEER 2023, p. 2).

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 March 2024, provide additional evidence and contribute to clarification of previous findings. Overall, new research studies have not provided evidence to alter the previous conclusions of scientific and health organizations, including WHO and SCENIHR.

Epidemiologic studies of EMF and childhood leukemia published during the above referenced period 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 tumors, 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 and after) and reported no overall associations between exposure categories and childhood leukemia for the later periods (1980 and after), 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 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 Quebec. 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 exposure to high calculated magnetic fields (≥ 0.4 microtesla [$[\mu\text{T}]$] (i.e., ≥ 4 milligauss [$[\text{mG}]$]). 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.
- Amoon et al. (2022) conducted a pooled analysis of four studies of residential exposure to magnetic fields and childhood leukemia published following a 2010 pooled analysis by Kheifets et al. (2010). The study by Amoon et al. (2022) compared the exposures of 24,994 children with leukemia to the exposures of 30,769 controls without leukemia in California, Denmark, Italy, and the United Kingdom. Exposure was assessed by measured or calculated magnetic fields at their residences. The exposure of these two groups to magnetic fields were found not to significantly differ. A decrease in the combined effect estimates in epidemiologic studies was observed over time, and the authors concluded that their findings, based on the most recent studies, were “not in line” with previous pooled analyses that reported an increased risk of childhood leukemia.
- Brabant et al. (2022) performed a literature review and meta-analysis of studies of childhood leukemia and magnetic-field exposure. The overall analysis included 21 epidemiologic studies published from 1979 to 2020. The authors reported a statistically significant association, which they noted was “mainly explained by the studies conducted before 2000.” The authors reported a statistically significant association between childhood leukemia and measured or calculated magnetic-field exposures $> 0.4 \mu\text{T}$ (4 mG); no statistically significant overall associations were reported between childhood leukemia and lower magnetic-field exposure ($< 0.4 \mu\text{T}$ [4 mG]), residential distance from power lines, or wire coding configuration. An association between childhood

leukemia and electric blanket use was also reported. The overall results were likely influenced by the inclusion of a large number of earlier studies; 10 of the 21 studies in the main analysis were published prior to 2000. Studies published prior to 2000 included fewer studies deemed to be of higher study quality, as determined by the authors, compared to studies published after 2000.

- Nguyen et al. (2022) investigated whether potential pesticide exposure from living in close proximity to commercial plant nurseries confounds the association between magnetic-field exposure and childhood leukemia development reported within the California study population previously analyzed in Crespi et al. (2016) and Kheifets et al. (2017). The authors in Nguyen et al. (2022) noted that while the association between childhood leukemia and magnetic-field exposure was “slightly attenuated” after adjusting for nursery proximity or when restricting to subjects living > 300 meters from nurseries, their results “do not support plant nurseries as an explanation for observed childhood leukemia risks.” The authors further noted that close residential proximity to nurseries may be an independent risk factor for childhood leukemia.
- Guo et al. (2023) reported conducting a systematic review and meta-analysis of studies published from 2015 to 2022 that evaluated associations between magnetic-field exposure and childhood leukemia development. Three meta-analyses were conducted to evaluate the relationship using different exposure metrics. In the first meta-analysis, magnetic-field levels ranging from 0.4 μT (4 mG) to 0.2 μT (2 mG) were associated with a statistically significant reduced risk of childhood leukemia development (i.e., a protective association). In the second meta-analysis, exposure was based on wiring configuration codes, and the reported pooled relative risk estimates demonstrated a statistically significant increased association with childhood leukemia. In the third meta-analysis, exposure was categorized into groupings of magnetic-field strength; no statistically significant associations with childhood leukemia were reported for any of the groupings, including for magnetic-field levels $\geq 0.4 \mu\text{T}$ (4 mG). There are significant limitations of this study that prevent meaningful interpretations of the results. Most of the analyses of magnetic fields did not state whether measurements and calculations were included, and the authors provided no description of the methods used for their analyses, no data tables to support their findings, and no references to the number and type of studies included. In fact, much of the article’s introduction discusses ionized radiation. The authors also do not report relevant metrics for evaluating meta-analyses such as study heterogeneity.
- Malagoli et al. (2023) examined associations between exposure to magnetic fields from high voltage power lines ($\geq 132 \text{ kV}$) and childhood leukemia development in a case-control study of children in Italy. The study included 182 cases diagnosed with childhood leukemia between 1998 and 2019 and 726 controls matched based on age, sex, and Italian province. The authors assessed magnetic-field exposure by calculating the distance from each participant’s

residence to the nearest high voltage power line and classifying that distance into one of three exposed categories (participants living < 100 meters, 100 to < 200 meters, or 200 to < 400 meters from the power lines) or as unexposed (participants living $\geq$ 400 meters from the power lines). The authors reported a non-statistically significant association between childhood leukemia and a residence distance of <100 meters; no statistically significant associations were reported for any distance, including when stratifying by age (< 5 or $\geq$ 5 years) or when restricting to acute lymphoblastic leukemia (ALL).

- Nguyen et al. (2023) extended their previous investigation (Nguyen et al., 2022) into whether pesticide exposure was an independent risk factor or confounder for childhood leukemia in the presence of magnetic-field exposure from high voltage power lines by examining the potential impact of specific pesticide exposure factors (*e.g.*, intended use, chemical class, active ingredient). The authors found no statistically significant associations between distance to high voltage power lines or magnetic-field exposure and childhood leukemia, including when adjusting for pesticide exposures. Several of the examined pesticides were determined by the authors to be potential independent risk factors for childhood leukemia.
- Zagar et al. (2023) examined the relationship between magnetic fields and childhood cancers, including childhood leukemia, in Slovenia. Cancer cases, including 194 cases of leukemia, were identified from the Slovenian Cancer Registry; cases were then classified into one of five calculated magnetic-field exposure levels (ranging from < 0.1 μ T [< 1 mG] to ≥ 0.4 μ T [≥ 4 mG]) based on residential distance to high voltage (*e.g.*, 110-kV, 220-kV, and 400-kV) power lines. The authors reported that less than 1% of Slovenian children and adolescents lived in an area near high voltage power lines. No differences in the development of childhood cancers, including leukemia, brain tumors, or all cancers combined, were reported across the five exposure categories.
- Crespi et al. (2024) assessed the association between residential proximity to electricity transformers in multi-story residential buildings and childhood leukemia development in the International Transformer Exposure study. Participants were required to live in an apartment building that contained a built-in transformer; exposure was estimated using the participants' apartment location relative to the transformer and categorized as high exposure (located above or adjacent to the transformer), intermediate exposure (located on the same floor as apartments in the high exposure category), or unexposed (all other apartments). In the pooled analyses of five countries' data, a total of 74 cases and 20,443 controls were included; 18 of the 74 cases were identified in the intermediate or high exposure categories. No significant associations were reported between proximity to residential transformers and childhood leukemia. Sensitivity analyses performed using the data from one of the five countries (Finland) where a cohort study design was used, also reported no significant associations. The authors concluded that the evidence for an elevated risk of childhood leukemia from proximity to residential transformers was "weak."

- Duarte-Rodríguez et al. (2024) conducted a population-based case-control study to examine the geographical distribution of childhood ALL cases in Mexico City, Mexico. Cases and controls were geolocated using the most recent residential address, and a spatial scan statistic was used to detect spatial clusters of cancer cases. The authors identified eight spatial clusters of cases, representing nearly 40% of all cases included in the study (n=1,054 cases). The authors noted that six of the eight spatial clusters were located in proximity to high voltage power lines and high voltage electric installations (distances not specified), and that the remaining two clusters were located near former petrochemical industrial facility sites. Since the study did not directly assess magnetic-field exposure and made no conclusions about magnetic-field exposure and cancer development, this study adds little value to the existing literature regarding a potential association between exposure to ELF EMF and childhood leukemia development.
- Malavolti et al. (2024) examined the association between magnetic-field exposure from transformer stations and childhood leukemia in the same Italian study population as Malagoli et al. (2023). Magnetic-field exposure was estimated based on residential distance to the nearest transformer station, and participants were then categorized as exposed or unexposed using two different distance cut-points: residing within a radius of 15 or 25 meters from the transformer station (exposed); residing ≥ 15 meters or ≥ 25 meters from the transformer station (unexposed). No significant associations were reported for all leukemias, or ALL specifically, when either distance cut-point was used, and in fact no association at all (an odds ratio = 1.0) was observed when the more stringent cut-point of 15 meters was used. In sub-analyses that stratified by participant age (< 5 years vs. ≥ 5 years), no significant associations were reported for either age category.

Epidemiologic studies of EMF and neurodegenerative diseases published during the above referenced period 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 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 Parkinsonism²⁰ 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

²⁰ 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).

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.
- Rösli and Jalilian (2018) performed a meta-analysis using data from five epidemiologic studies examining residential exposure to magnetic fields and ALS. A statistically non-significant negative association was reported between ALS and the highest exposed group, where exposure was defined based on distance from power lines or calculated magnetic-field level.
- Gervasi et al. (2019) assessed the relationship between residential distance to overhead power lines in Italy and risk of Alzheimer's dementia and Parkinson's disease. The authors included 9,835 cases of Alzheimer's dementia and 6,810 cases of Parkinson's disease; controls were matched by sex, year of birth, and municipality of residence. A weak, statistically non-significant association was observed between residences within 50 meters of overhead power lines and both Alzheimer's dementia and Parkinson's disease, compared to distances of over 600 meters.
- Peters et al. (2019) examined the relationship between ALS and occupational exposure to both magnetic fields and electric shock in a pooled study of data from three European countries. The study included 1,323 ALS cases and 2,704 controls matched for sex, age, and geographic location; exposure was assessed based on occupational title and defined as low (background), medium, or high. Statistically significant associations were observed between ALS and ever having been exposed above background levels to either magnetic fields or electric shocks; however, no clear exposure-response trends were observed with exposure duration or cumulative exposure. The authors also noted significant heterogeneity in risk by study location.
- Filippini et al. (2020) investigated the associations between ALS and several environmental and occupational exposures, including electromagnetic fields, within a case-control study in Italy. The study included 95 cases and 135 controls matched on age, gender, and residential province; exposure to electromagnetic fields was assessed using the participants' responses to questions related to occupational use of electric and electronic equipment, occupational EMF exposure, and residential distance to overhead power lines. The authors reported a statistically significant association between ALS and residential proximity to overhead power lines and a statistically non-significant association between ALS and occupational exposure to EMF; occupational use of electric and electronic equipment was associated with a statistically non-significant decrease in ALS development.

- Huang et al. (2020) conducted a meta-analysis of 43 epidemiologic studies examining potential occupational risk factors for dementia or mild cognitive impairment. The authors included five cohort studies and seven case-control studies related to magnetic-field exposure. For both study types, the authors reported positive associations between dementia and work-related magnetic-field exposures. The paper, however, provided no information on the occupations held by the study participants, their magnetic-field exposure levels, or how magnetic-field levels were assessed; therefore, the results are difficult to interpret. The authors also reported a high level of heterogeneity among studies. Thus, this analysis adds little, if any, to the overall weight of evidence on a potential association between dementia and magnetic fields.
- Jalilian et al. (2020) conducted a meta-analysis of ALS and occupational exposure to both magnetic fields and electric shocks within 27 studies from Europe, the United States, and New Zealand. A weak, statistically significant association was reported between magnetic-field exposure and ALS; however, the authors noted evidence of study heterogeneity and publication bias. No association was observed between ALS and electric shocks.
- Chen et al. (2021) conducted a case-control study to examine the association between occupational exposure to electric shocks, magnetic fields, and motor neuron disease (“MND”) in New Zealand. The study included 319 cases with a MND diagnosis (including ALS) and 604 controls, matched on age and gender; exposure was assessed using the participants’ occupational history questionnaire responses and previously developed job-exposure matrices for electric shocks and magnetic fields. The authors reported no associations between MND and exposure to magnetic fields; positive associations were reported between MND and working at a job with the potential for electric shock exposure.
- Grebeneva et al. (2021) evaluated disease rates among electric power company workers in the Republic of Kazakhstan. The authors included three groups of “exposed” workers who “were in contact with equipment generating [industrial frequency EMF]” (a total of 161 workers), as well as 114 controls “who were not associated with exposure to electromagnetic fields.” Disease rates were assessed “based on analyzing the sick leaves of employees” from 2010 to 2014 and expressed as “incidence rate per 100 employees.” The authors reported a higher “incidence rate” of “diseases of the nervous system” in two of the exposed categories compared to the non-exposed group. No meaningful conclusions from the study could be drawn, however, because no specific diagnoses within “diseases of the nervous system” were identified in the paper and no clear description was provided on how the authors defined and calculated “incidence rate” for the evaluated conditions. In addition, no measured or calculated magnetic-field levels were presented by the authors.
- Filippini et al. (2021) conducted a meta-analysis to assess the dose-response relationship between residential exposure to magnetic fields and ALS. The

authors identified six ALS epidemiologic studies, published between 2009 and 2020, that assessed exposure to residential magnetic fields by either distance from overhead power lines or magnetic-field modeling. They reported a decrease in risk of ALS in the highest exposure categories for both distance-based and modeling-based exposure estimates. The authors also reported that their dose-response analyses “showed little association between distance from power lines and ALS”; the data were too sparse to conduct a dose-response analysis for modeled magnetic-field estimates. The authors noted that their study was limited by small sample size, “imprecise” exposure categories, the potential for residual confounding, and by “some publication bias.”

- Jalilian et al. (2021) conducted a meta-analysis of occupational exposure to ELF magnetic fields and electric shocks and development of ALS. The authors included 27 studies from Europe, the United States, and New Zealand that were published between 1983 and 2019. A weak, statistically significant association was reported between magnetic-field exposure and ALS, and no association was observed between electric shocks and ALS. Indications of publication bias and “moderate to high” heterogeneity were identified for the studies of magnetic-field exposure and ALS, and the authors noted that “the results should be interpreted with caution.”
- Goutman et al. (2022) examined occupational exposures, including “electromagnetic radiation” exposure, and associations with ALS in a case-control study of Michigan workers across various industries. The study included 381 cases diagnosed with ALS, all patients at the University of Michigan’s Pranger ALS clinic, and 272 controls recruited from an online database for the University of Michigan. Participants were enrolled from 2010 to 2020 and completed a written survey of their work history and occupational exposures to nine exposure categories, including electromagnetic fields, particulate matter (PM), and pesticides. Exposure to electromagnetic fields was ascertained with a binary question asking whether they were “[e]xposed to power lines, transformation [*sic*] stations or other EM [electromagnetic radiation]?” The analysis was adjusted for age, sex, and military service. No association was observed between electromagnetic field exposure and ALS, while exposure to PM, pesticides, and metals, among others, were determined by the authors to be “associated with an increased ALS risk in this cohort.”
- Sorahan and Nichols (2022) investigated magnetic-field exposure and mortality from MND in a large cohort of employees of the former Central Electricity Generating Board of England and Wales. The study included nearly 38,000 employees first hired between 1942 and 1982 and still employed in 1987. Estimates of exposure magnitude, frequency, and duration were calculated using data from the power stations and the employees’ job histories, and were described in detail in a previous publication (Renew et al., 2003). Mortality from MND in the total cohort was observed to be similar to national rates. No statistically significant dose-response trends were observed with lifetime, recent, or distant magnetic-field exposure; statistically significant associations

were observed for some categories of recent exposure, but not for the highest exposure category.

- Duan et al. (2023) conducted a meta-summary of ALS and exposure to magnetic fields, which was 1 of 22 non-genetic risk factors evaluated across 67 studies for its association with ALS. Six of the 67 studies examined magnetic-field exposure and associations with ALS; of the six studies identified, the authors included four case-control studies and one cohort study in their meta-analysis. Pooling results from these studies resulted in significant increased odds of ALS among individuals with higher (but undefined) exposure to magnetic fields. However, this pooled odds ratio for magnetic-field exposure (1.22) was below the minimum odds ratio threshold of 1.3 set by the authors as the criterion for defining an exposure as an ALS risk factor. In addition, the authors identified “substantial” heterogeneity between studies evaluating magnetic-field exposure and ALS.
- In a subsequent publication of the same study as Goutman et al. (2022), Goutman et al. (2023) assessed the potential for the same nine exposure categories, including “electromagnetic radiation” exposure, to be risk factors for ALS progression, including survival and onset segment (bulbar, cervical, lumbar). Electromagnetic field exposure was not significantly associated with ALS survival or with bulbar onset compared to lumbar, but was significantly associated with cervical onset compared to lumbar. It is worth noting that an association with cervical onset compared to lumbar was observed in the majority (7/9) of the exposure categories. The authors make no concluding statements on electromagnetic field exposure and ALS and instead emphasize that occupational pesticide exposure and working in military operations were significantly associated with worse ALS survival.
- Saucier et al. (2023) carried out three systematic reviews of studies that evaluated relationships between urbanization, air pollution, and water pollution, and ALS development. The authors identified five studies that assessed whether electromagnetic fields (of varying frequencies) and high voltage infrastructure were significant urbanization risk factors for ALS, but make no conclusion about magnetic-field exposure and ALS development based on these studies, therefore adding little value to the existing literature.
- Vasta et al. (2023) examined the relationship between residential distance to power lines and ALS development in a cohort study of 1,098 participants in Italy. The authors reported no differences in the age of ALS onset or ALS progression rate between low-exposed and high-exposed participants based on residential distance to power lines at the time of the participants’ diagnosis. Similarly, no differences were observed when exposure was based on residential distance to repeater antennas.
- Vitturi et al. (2023) conducted a systematic review and meta-analysis of case-control studies examining potential occupational risk factors related to multiple

sclerosis, including solvents, mercury, pesticides, and low-frequency magnetic fields. The authors included 24 studies in their review, but only one of the included studies investigated exposure to magnetic fields (Pedersen et al., 2017, discussed above), thereby adding little new information to the existing body of research.

References

Amoon AT, Oksuzyan S, Crespi CM, Arah OA, Cockburn M, Vergara X, Kheifets L. Residential mobility and childhood leukemia. *Environ Res* 164:459-466, 2018a.

Amoon AT, Crespi CM, Ahlbom A, Bhatnagar M, Bray I, Bunch KJ, Clavel J, Feychting M, Hemon D, Johansen C, Kreis C, Malagoli C, Marquant F, Pedersen C, Raaschou-Nielsen O, Rööslé M, Spycher BD, Sudan M, Swanson J, Tittarelli A, Tuck DM, Tynes T, Vergara X, Vinceti M, Wunsch-Filho V, Kheifets L. Proximity to overhead power lines and childhood leukaemia: an international pooled analysis. *Br J Cancer* 119:364-373, 2018b.

Amoon AT, Arah OA, Kheifets L. The sensitivity of reported effects of EMF on childhood leukemia to uncontrolled confounding by residential mobility: a hybrid simulation study and an empirical analysis using CAPS data. *Cancer Causes Control* 30:901-908, 2019.

Amoon AT, Crespi CM, Nguyen A, Zhao X, Vergara X, Arah OA, and Kheifets L. The role of dwelling type when estimating the effect of magnetic fields on childhood leukemia in the California Power Line Study (CAPS). *Cancer Causes Control* 31:559-567, 2020.

Amoon AT, Swanson J, Magnani C, Johansen C, Kheifets L. Pooled analysis of recent studies of magnetic fields and childhood leukemia. *Environ Res* 204(Pt A):111993, 2022.

Auger N, Bilodeau-Bertrand M, Marcoux S, Kosatsky T. Residential exposure to electromagnetic fields during pregnancy and risk of child cancer: A longitudinal cohort study. *Environ Res* 176:108524, 2019.

Brabant C, Geerinck A, Beaudart C, Tirelli E, Geuzaine C, Bruyère O. Exposure to magnetic fields and childhood leukemia: a systematic review and meta-analysis of case-control and cohort studies. *Rev Environ Health* 38(2):229-253, 2022.

Bunch KJ, Keegan TJ, Swanson J, Vincent TJ, Murphy MF. Residential distance at birth from overhead high voltage powerlines: childhood cancer risk in Britain 1962-2008. *Br J Cancer* 110:1402-1408, 2014.

Bunch KJ, Swanson J, Vincent TJ, Murphy MF. Magnetic fields and childhood cancer: an epidemiological investigation of the effects of high voltage underground cables. *J Radiol Prot* 35:695-705, 2015.

Bunch KJ, Swanson J, Vincent TJ, Murphy MF. Epidemiological study of power lines and childhood cancer in the UK: further analyses. *J Radiol Prot* 36:437-455, 2016.

Checkoway H, Ilango S, Li W, Ray RM, Tanner CM, Hu SC, Wang X, Nielsen S, Gao DL, Thomas DB. Occupational exposures and parkinsonism among Shanghai women textile workers. *Am J Ind Med* 61:886-892, 2018.

Chen GX, Mannetje A, Douwes J, Berg LH, Pearce N, Kromhout H, Glass B, Brewer N, McLean DJ. Occupational exposure to electric shocks and extremely low-frequency magnetic fields and motor neurone disease. *Am J Epidemiol* 190(3):393-402, 2021.

Crespi CM, Vergara XP, Hooper C, Oksuzyan S, Wu S, Cockburn M, Kheifets L. Childhood leukaemia and distance from power lines in California: a population-based case-control study. *Br J Cancer* 115:122-128, 2016.

Crespi CM, Swanson J, Vergara XP, Kheifets L. Childhood leukemia risk in the California Power Line Study: Magnetic fields versus distance from power lines. *Environ Res* 171:530-535, 2019.

Crespi CM, Sudan M, Juutilainen J, Roivainen P, Hareuveny R, Huss A, Kandel S, Karim-Kos HE, Thuróczy G, Jakab Z, Spycher BD, Flueckiger B, Vermeulen R, Vergara X, Kheifets L. International study of childhood leukemia in residences near electrical transformer rooms. *Environ Res* 249:118459, 2024.

Duan QQ, Jiang Z, Su WM, Gu XJ, Wang H, Cheng YF, Cao B, Gao X, Wang Y, Chen YP. Risk factors of amyotrophic lateral sclerosis: a global meta-summary. *Front Neurosci* 17:1177431, 2023.

Duarte-Rodríguez DA, Flores-Lujano J, McNally RJQ, et al. Evidence of spatial clustering of childhood acute lymphoblastic leukemia cases in Greater Mexico City: report from the Mexican Inter-Institutional Group for the identification of the causes of childhood leukemia. *Front Oncol* 14:1304633, 2024.

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.

Filippini T, Tesaro M, Fiore M, Malagoli C, Consonni M, Violi F, Iacuzio L, Arcolin E, Oliveri Conti G, Cristaldi A, Zuccarello P, Zucchi E, Mazzini L, Pisano F, Gagliardi I, Patti F, Mandrioli J, Ferrante M, Vinceti M. Environmental and occupational risk factors of amyotrophic lateral sclerosis: A population-based case-control study. *Int J Environ Res Public Health* 17(8):2882, 2020.

Filippini T, Hatch EE, Vinceti M. Residential exposure to electromagnetic fields and risk of amyotrophic lateral sclerosis: a dose-response meta-analysis. *Sci Rep* 11(1):11939, 2021.

Fischer H, Kheifets L, Huss A, Peters TL, Vermeulen R, Ye W, Fang F, Wiebert P, Vergara XP, Feychting M. Occupational Exposure to Electric Shocks and Magnetic Fields and Amyotrophic Lateral Sclerosis in Sweden. *Epidemiology* 26:824-830, 2015.

Gervasi F, Murtas R, Decarli A, Giampiero Russo A. Residential distance from high voltage overhead power lines and risk of Alzheimer's dementia and Parkinson's disease: a population-based case-control study in a metropolitan area of Northern Italy. *Int J Epidemiol* 48(6):1949-1957, 2019.

Grebeneva OV, Rybalkina DH, Ibrayeva LK, Shadetova AZ, Drobchenko EA, Aleshina NY. Evaluating occupational morbidity among energy enterprise employees in industrial region of Kazakhstan. *Russian Open Medical Journal* 10(3):e0319, 2021.

Goutman SA, Boss J, Godwin C, Mukherjee B, Feldman EL, Batterman SA. Associations of self-reported occupational exposures and settings to ALS: a case-control study. *Int Arch Occup Environ Health* 95(7):1567-1586, 2022.

Goutman SA, Boss J, Godwin C, Mukherjee B, Feldman EL, Batterman SA. Occupational history associates with ALS survival and onset segment. *Amyotroph Lateral Scler Frontotemporal Degener* 24(3-4):219-229, 2023.

Gunnarsson LG and Bodin L. Amyotrophic lateral sclerosis and occupational exposures: A systematic literature review and meta-analyses. *Int J Environ Res Public Health* 15(11):2371, 2018.

Gunnarsson LG and Bodin L. Occupational exposures and neurodegenerative diseases: A systematic literature review and meta-analyses. *Int J Environ Res Public Health* 16(3):337, 2019.

Guo H, Kang L, Qin W, Li Y. Electromagnetic Radiation Exposure and Childhood Leukemia: Meta-Analysis and Systematic Review. *Altern Ther Health Med* 29(8):75-81, 2023.

Huang LY, Hu HY, Wang ZT, Ma YH, Dong Q, Tan L, Yu JT. Association of occupational factors and dementia or cognitive impairment: A systematic review and meta-analysis. *J Alzheimers Dis* 78(1):217-227, 2020.

Huss A, Peters S, Vermeulen R. Occupational exposure to extremely low-frequency magnetic fields and the risk of ALS: A systematic review and meta-analysis. *Bioelectromagnetics* 39:156-163, 2018.

Jalilian H, Teshnizi SH, Rööslä M, Neghab M. Occupational exposure to extremely

low frequency magnetic fields and risk of Alzheimer disease: A systematic review and meta-analysis. *Neurotoxicology* 69:242-252, 2018.

Jalilian H, Najafi K, Khosravi Y, and Rösli M. Amyotrophic lateral sclerosis, occupational exposure to extremely low frequency magnetic fields and electric shocks: A systematic review and meta-analysis. *Rev Environ Health* 36(1):129-142, 2021.

Kheifets L, Crespi CM, Hooper C, Cockburn M, Amoon AT, Vergara XP. Residential magnetic fields exposure and childhood leukemia: a population-based case-control study in California. *Cancer Causes Control* 28:1117-1123, 2017.

Koeman T, Schouten LJ, van den Brandt PA, Slottje P, Huss A, Peters S, Kromhout H, Vermeulen R. Occupational exposures and risk of dementia-related mortality in the prospective Netherlands Cohort Study. *Am J Ind Med* 58:625-635, 2015.

Koeman T, Slottje P, Schouten LJ, Peters S, Huss A, Veldink JH, Kromhout H, van den Brandt PA, Vermeulen R. Occupational exposure and amyotrophic lateral sclerosis in a prospective cohort. *Occup Environ Med* 74: 578-585, 2017.

Kyriakopoulou A, Meimeti E, Moisoglou I, Psarrou A, Provatopoulou X, Dounias G. Parental Occupational Exposures and Risk of Childhood Acute Leukemia. *Mater Sociomed* 30: 209-214, 2018.

Malagoli C, Malavolti M, Wise LA, Balboni E, Fabbi S, Teggi S, Palazzi G, Cellini M, Poli M, Zanichelli P, Notari B, Cherubini A, Vinceti M, Filippini T. Residential exposure to magnetic fields from high voltage power lines and risk of childhood leukemia. *Environ Res* 232:116320, 2023.

Malavolti M, Malagoli C, Wise LA, Poli M, Notari B, Taddei I, Fabbi S, Teggi S, Balboni E, Pancaldi A, Palazzi G, Vinceti M, Filippini T. Residential exposure to magnetic fields from transformer stations and risk of childhood leukemia. *Environ Res* 245:118043, 2024.

Nguyen A, Crespi CM, Vergara X, Kheifets L. Commercial outdoor plant nurseries as a confounder for electromagnetic fields and childhood leukemia risk. *Environ Res* 212(Pt C):113446, 2022.

Nguyen A, Crespi CM, Vergara X, Kheifets L. Pesticides as a potential independent childhood leukemia risk factor and as a potential confounder for electromagnetic fields exposure. *Environ Res* 238(Pt 1):116899, 2023.

Núñez-Enríquez JC, Correa-Correa V, Flores-Lujano J, Pérez-Saldivar ML, Jiménez-Hernández E, Martín-Trejo JA, Espinoza-Hernández LE, Medina-Sanson A, Cárdenas-Cardos R, Flores-Villegas LV, Peñaloza-González JG, Torres-Nava JR, Espinosa-Elizondo RM, Amador-Sánchez R, Rivera-Luna R, Dosta-Herrera JJ, Mondragón-García JA, González-Ulibarri JE, Martínez-Silva SI, Espinoza-Anrubio G, Duarte-Rodríguez DA, García-Cortés LR, Gil-Hernández AE, Mejía-

Aranguré JM. Extremely low-frequency magnetic fields and the risk of childhood B-lineage acute lymphoblastic leukemia in a city with high incidence of leukemia and elevated exposure to ELF magnetic fields. *Bioelectromagnetics* 41(8):581-597, 2020.

Pedersen C, Johansen C, Schüz J, Olsen JH, Raaschou-Nielsen O. Residential exposure to extremely low-frequency magnetic fields and risk of childhood leukaemia, CNS tumour and lymphoma in Denmark. *Br J Cancer* 113:1370-1374, 2015.

Pedersen C, Poulsen AH, Rod NH, Frei P, Hansen J, Grell K, Raaschou-Nielsen O, Schüz J, Johansen C. Occupational exposure to extremely low-frequency magnetic fields and risk for central nervous system disease: an update of a Danish cohort study among utility workers. *Int Arch Occup Environ Health* 90:619-628, 2017.

Peters S, Visser AE, D'Ovidio F, Beghi E, Chio A, Logroscino G, Hardiman O, Kromhout H, Huss A, Veldink J, Vermeulen R, van den Berg LH. Associations of Electric Shock and Extremely Low-Frequency Magnetic Field Exposure With the Risk of Amyotrophic Lateral Sclerosis. *Am J Epidemiol* 188:796-805, 2019.

Renew DC, Cook RF, Ball MC. A method for assessing occupational exposure to power-frequency magnetic fields for electricity generation and transmission workers. *J Radiol Prot* 23(3):279-303, 2003.

Röösli M and Jalilian H. A meta-analysis on residential exposure to magnetic fields and the risk of amyotrophic lateral sclerosis. *Rev Environ Health* 33:295-299, 2018.

Salvan A, Ranucci A, Lagorio S, Magnani C. Childhood leukemia and 50 Hz magnetic fields: findings from the Italian SETIL case-control study. *Int J Environ Res Public Health* 12:2184-2204, 2015.

Saucier D, Registe PPW, Bélanger M, O'Connell C. Urbanization, air pollution, and water pollution: Identification of potential environmental risk factors associated with amyotrophic lateral sclerosis using systematic reviews. *Front Neurol* 14:1108383, 2023.

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.

Scientific Committee on Health, Environmental and Emerging Risks (SCHEER). Preliminary Opinion on Potential Health Effects of Exposure to Electromagnetic Fields (EMF): Update with regard to frequencies between 1Hz and 100 kHz.

Brussels, Belgium: European Commission, 2023.

Seelen M, Vermeulen RC, van Dillen LS, van der Kooi AJ, Huss A, de Visser M, van den Berg LH, Veldink JH. Residential exposure to extremely low frequency electromagnetic fields and the risk of ALS. *Neurology* 83:1767-1769, 2014.

Seomun G, Lee J, Park J. Exposure to extremely low-frequency magnetic fields and childhood cancer: A systematic review and meta-analysis. *PLoS One* 16:e0251628, 2021.

Sorahan T and Mohammed N. Neurodegenerative disease and magnetic field exposure in UK electricity supply workers. *Occup Med (Lond)* 64:454-460, 2014.

Sorahan T and Nichols L. Motor neuron disease risk and magnetic field exposures. *Occup Med (Lond)* 72(3):184-190, 2022.

Swanson J and Bunch KJ. Reanalysis of risks of childhood leukaemia with distance from overhead power lines in the UK. *J Radiol Prot* 38:N30-N35, 2018.

Swanson J, Kheifets L, and Vergara X. Changes over time in the reported risk for childhood leukaemia and magnetic fields. *J Radiol Prot* 39:470-488, 2019.

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.

Talibov M, Olsson A, Bailey H, Erdmann F, Metayer C, Magnani C, Petridou E, Auvinen A, Spector L, Clavel J, Roman E, Dockerty J, Nikkila A, Lohi O, Kang A, Psaltopoulou T, Miligi L, Vila J, Cardis E, Schüz J. Parental occupational exposure to low-frequency magnetic fields and risk of leukaemia in the offspring: findings from the Childhood Leukaemia International Consortium (CLIC). *Occup Environ Med* 76:746-753, 2019.

Vasta R, Callegaro S, Grassano M, Canosa A, Cabras S, Di Pede F, Matteoni E, De Mattei F, Casale F, Salamone P, Mazzini L, De Marchi F, Moglia C, Calvo A, Chiò A, Manera U. Exposure to electromagnetic fields does not modify neither the age of onset nor the disease progression in ALS patients. *Amyotroph Lateral Scler Frontotemporal Degener* 24(3-4):343-346, 2023.

Vergara X, Mezei G, Kheifets L. Case-control study of occupational exposure to electric shocks and magnetic fields and mortality from amyotrophic lateral sclerosis in the US, 1991-1999. *J Expo Sci Environ Epidemiol* 25:65-71, 2015.

Vinceti M, Malagoli C, Fabbi S, Kheifets L, Violi F, Poli M, Caldara S, Sesti D, Violanti S, Zanichelli P, Notari B, Fava R, Arena A, Calzolari R, Filippini T, Iacuzio L, Arcolin E, Mandrioli J, Fini N, Odone A, Signorelli C, Patti F, Zappia M, Pietrini V, Oleari P, Teggi S, Ghermandi G, Dimartino A, Ledda C, Mauceri C,

Sciacca S, Fiore M, Ferrante M. Magnetic fields exposure from high voltage power lines and risk of amyotrophic lateral sclerosis in two Italian populations. *Amyotroph Lateral Scler Frontotemporal Degener* 18:583-589, 2017.

Vitturi BK, Montecucco A, Rahmani A, Dini G, Durando P. Occupational risk factors for multiple sclerosis: a systematic review with meta-analysis. *Front Public Health* 11:1285103, 2023.

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

Zagar T, Valic B, Kotnik T, Korat S, Tomsic S, Zadnik V, Gajsek P. Estimating exposure to extremely low frequency magnetic fields near high voltage power lines and assessment of possible increased cancer risk among Slovenian children and adolescents. *Radiol Oncol* 57(1):59-69, 2023.

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 for the proposed Project is provided in Attachment V.A. A written description of the Proposed Route is as follows:

Proposed Route

Line #256 Partial Rebuild (Ladysmith CT to St. Johns Substation)

The Line #256 Proposed Route is approximately 12.4 miles long, including 5.1 miles of reconductoring only and 7.3 miles of reconductoring and partial rebuild. The Line #256 reconductoring begins at Ladysmith CT and heads northeast along the existing 250-foot-wide transmission line ROW, crossing Interstate 95, Route 605 Paige Rd, Route 606 Stonewall Jackson Rd, and ending at the Elmont Junction. The Line #256 reconductoring and rebuild begins at Elmont Junction and then travels southeast crossing Route 606 Stonewall Jackson Rd, Route 626 Woodford Rd, Route 605 Paige Rd, Route 638 S River Rd, and Route 639 Ladysmith Rd. within the existing 200-foot-wide transmission line ROW. The rebuild ends at St. Johns Substation located just south of Route 639 Ladysmith Rd.

For the Proposed Route of the Line #256, approximately 63 existing wood structures will be replaced by 64 weathering or galvanized steel structures. For the Proposed Route, the minimum structure height is 28 feet, the maximum structure height is 135 feet, and the average structure height is 108 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

Line #2090/#2335 Partial Rebuild (Ladysmith CT to Lee's Hill Substation)

The Line #2090 Proposed Route is approximately 11.5 miles long, including 5.1 miles of reconductoring only and 6.4 miles of rebuild onto new monopole structures which will also hold the new Lines #2372 and #2378. The Line #2090 reconductoring portion begins at Ladysmith CT and heads northeast along the existing 250-foot-wide transmission line ROW, crossing Interstate 95, Route 605 Paige Rd, Route 606 Stonewall Jackson Rd, and ending at the Elmont Junction. The Line #2090/#2335 rebuild portion begins at Elmont Junction then travels north within the existing 200-foot-wide ROW crossing Route 607 Guinea Station Rd, Route 634 Flippo Dr, and Route 608 Massaponax Church Rd. The rebuild ends at the proposed Lee's Hill Substation near Route 17 Mills Dr.

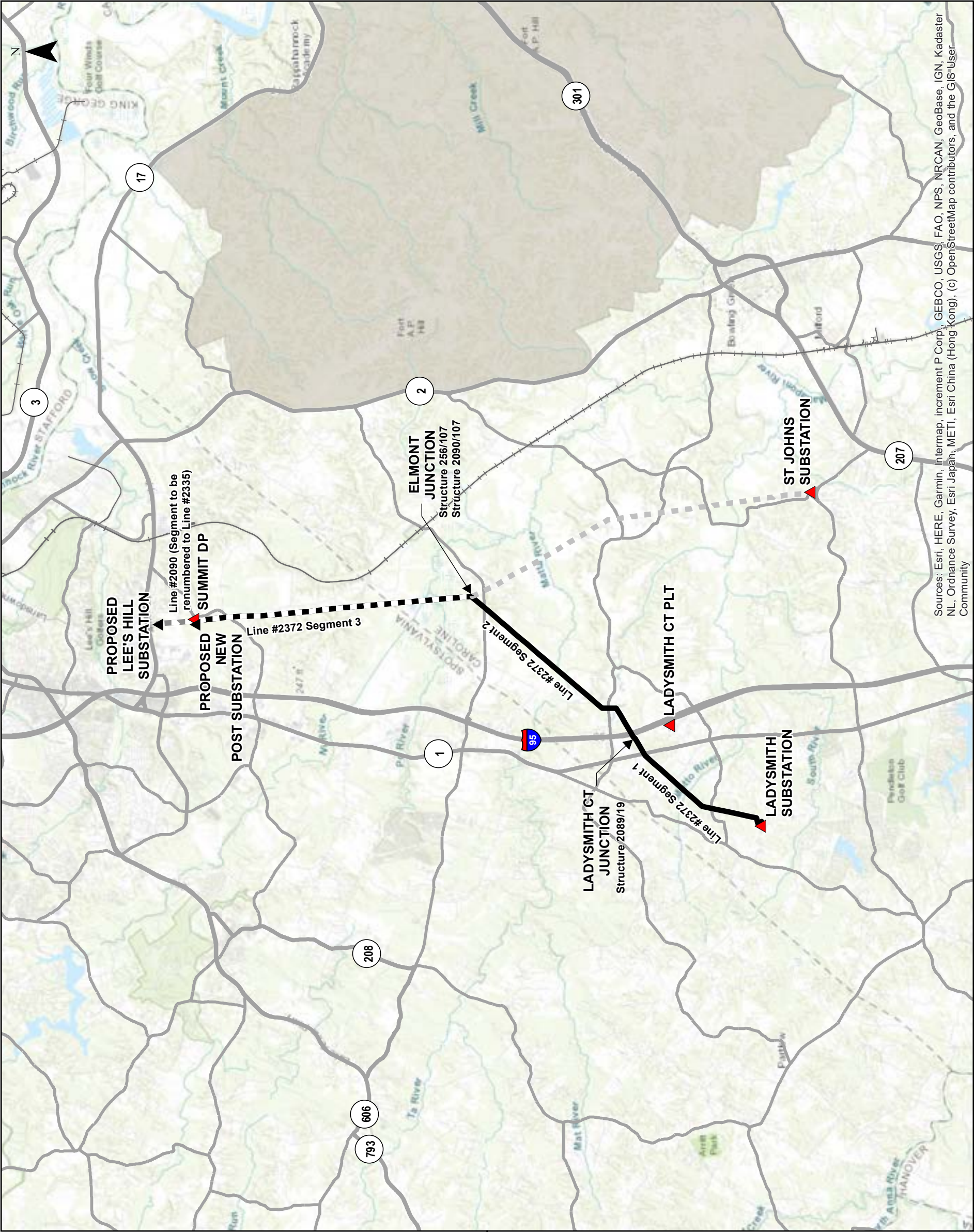
For the Proposed Route of the Line #2090 which will be renamed Line #2335 between New Post Substation and Lee's Hill Substation, approximately 52 existing wood structures will be replaced by 54 weathering steel structures. For the

Proposed Route, the minimum structure height is 80 feet, the maximum structure height is 120 feet, and the average structure height is 110 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

New 230kV Lines #2372 (Ladysmith – New Post) and Line #2378 (Lee’s Hill - New Post)

The new Lines #2372/#2378 Proposed Route is approximately 14.1 miles in length and will be constructed in three segments. The first segment will travel approximately 3.2 miles east from Ladysmith Substation on existing towers and within the existing 250-foot-wide transmission line ROW. The first segment will travel northeast to Ladysmith CT junction crossing Route 661 Cedon Road, Route 632 Quarters Rd, and US Route 1 Jefferson Davis Hwy. The second segment will travel approximately 4.5 miles on new monopole structures from the Ladysmith CT heading northeast along existing 250-foot-wide transmission line ROW. The second segment will cross Interstate 95, Route 605 Paige Rd, Route 606 Stonewall Jackson Rd, and end at Elmont Junction. The third segment will travel approximately 5.5 miles north from Elmont Junction on new monopoles and within the existing 200-foot-wide transmission line ROW. The third segment will cross Route 607 Guinea Station Rd and Route 608 Massaponax Church Rd, Route 634 Flippo Dr, Route 608 Massaponax Church Rd and end at the proposed Lee’s Hill Substation near Route 17 Mills Dr. Line #2372 will become Line # 2378 at New Post Substation and will continue north approximately 0.9 mile along existing ROW to Lee’s Hill Substation sharing structures with Line # 2335.

For the Proposed Route of the Lines #2372 and #2378, approximately 27 new weathering steel structures are proposed. For the Proposed Route, the minimum structure height is 110 feet, the maximum structure height is 140 feet, and the average structure height is 125 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS-User Community

ATTACHMENT V.A.
LOCATION MAP

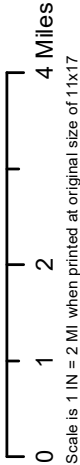
Partial Rebuild of Lines #256 and #2090/#2335 (Ladysmith, St. Johns, New Post, Lee's Hill) and New 230 kV Line #2372 (Ladysmith - New Post) and New 230 kV Line #2378 (New Post - Lee's Hill)

Caroline and Spotsylvania Counties, Virginia

Client:

Dominion Energy Virginia

C2 Env Project:	Prepared By:	Date:
0354	JRC	08/15/24



- Proposed 230 kV Line #2372 in Existing ROW
- Proposed 230 kV Line #2378 in Existing ROW
- Existing 230 kV Line #2090 (and Future Line #2335) Partial Rebuild
- Existing 230 kV Line #256 Partial Rebuild
- Proposed Substation
- Existing Substation

- Notes:
1. Basemap from ESRI World Topographic Map
 2. Project centerline provided by Dominion Energy Virginia
 3. Roads and railroads from Virginia Geographic Information Network



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: Shortly after filing, the Application will be made available electronically for public inspection at: <https://www.dominionenergy.com/ladysmithleeshill>

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
Virginia Department of Environmental Quality
Office of Environmental Impact Review
1111 East Main Street, Suite 1400
Richmond, Virginia 23219

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

Ms. Rene Hypes
Virginia Department of Conservation and Recreation
Division of Natural Heritage
600 East Main Street, Suite 1400
Richmond, Virginia 23219

Environmental Reviewer
Virginia Department of Conservation and Recreation
600 East Main Street, 17th Floor
Richmond, Virginia 23219

Ms. Hannah Schul
Virginia Department of Wildlife Resources
Wildlife Information and Environmental Services
7870 Villa Park, Suite 400
Henrico, Virginia 23228

Mr. Keith Tignor
Virginia Department of Agriculture and Consumer Services
Office of Plant Industry Services
102 Governor Street
Richmond, Virginia 23219

Mr. Clint Folks
Virginia Department of Forestry
Forestland Conservation Division
900 Natural Resources Drive, Suite 800
Charlottesville, Virginia 2290

Scoping at VMRC
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

Ms. Regena Bronson
U.S. Army Corps of Engineers
Fredericksburg Field Office
1420 Central Park Boulevard
Fredericksburg, Virginia 22401

Mr. Phil Skorupa
Virginia Department of Mine, Minerals, and Energy
1100 Bank Street
Washington Building, 8th Floor
Richmond, Virginia 23219

Arlene Fields Warren
Virginia Department of Health
Office of Drinking Water
109 Governor Street
Richmond, Virginia 23219

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

Ms. Martha Little
Virginia Outdoors Foundation
P.O. Box 85073, PMB 38979
Richmond, Virginia 23285

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

Mr. Kyle Bates
District Engineer
Virginia Department of Transportation, Fredericksburg District
86 Beacon Road Fredericksburg, VA 22405

Mr. Kevin Gregg
Chief of Maintenance and Operations for Central Office
Virginia Department of Transportation
1401 E. Broad Street
Richmond, Virginia 23219

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 July 18, 2024, was delivered to Mr. Charles M. Culley, Jr., Administrator of Caroline County, and Mr. Ed Petrovitch, County Administrator of Spotsylvania County, where the Project is located. The letter stated the Company's intention to file this Application and invited the County to consult with the Company about the Project. This letter is included as Attachment V.D.1.

Dominion Energy Services, Inc.
5000 Dominion Boulevard, 3rd Floor
Glen Allen, VA 23060
DominionEnergy.com



Mr. Charles Cully, Jr.
Caroline County, County Administrator
P.O. Box 447
Bowling Green, VA 22427

July 18, 2024

RE: Dominion Energy Virginia's Partial Rebuild of Lines #256 and #2090 (Ladysmith, St. Johns and New Post) and New 230 kV Ladysmith – Lee's Hill (Line #2372) and Lee's Hill – New Post (Line #2378)

Notice Pursuant to Va. Code § 15.2-2202 E

Dear Mr. Cully,

Dominion Energy Virginia (the "Company") is proposing to partially rebuild the existing 230 kV Line #256 from Elmont Junction to St. Johns Substation, partially rebuild the existing 230 kV Line #2090 between Elmont Junction and the proposed Lee's Hill Substation, and construct a new approximately 14-mile overhead 230 kV line between Ladysmith Substation to the proposed New Post Substation (Line #2372) and from New Post Substation to Lee's Hill Substation (Line #2378) (collectively, the "Project"). The new 230 kV line will be constructed entirely within the Company's existing transmission right-of-way corridor. The Project is located in both Caroline and Spotsylvania Counties and the Project is necessary to maintain the overall long-term reliability of its transmission system.

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

Enclosed is a Project Overview Map depicting the alignment of the proposed Project, as well as the general Project location. Please note that the Project Overview Map and route descriptions depicted therein are preliminary in nature and subject to final engineering. All final materials, including maps, will be available in the Company's CPCN filing to the Commission.

Finally, attached is a GIS shapefile of the proposed Project to assist in the project review. If you have any questions, please do not hesitate to contact me directly at 804-316-0367 or melissa.a.harreld@dominionenergy.com. We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Regards,



Melissa Harreld
Siting and Permitting Specialist, Electric Transmission

Attachment: Project Overview Map
 GIS Shapefile

Dominion Energy Services, Inc.
5000 Dominion Boulevard, 3rd Floor
Glen Allen, VA 23060
DominionEnergy.com



Mr. Ed Petrovich
Spotsylvania County, County Administrator
P.O. Box 99
Spotsylvania, VA 22553

July 18, 2024

RE: Dominion Energy Virginia's Partial Rebuild of Lines #256 and #2090 (Ladysmith, St. Johns and New Post) and New 230 kV Ladysmith – Lee's Hill (Line #2372) and Lee's Hill – New Post (Line #2378)

Notice Pursuant to Va. Code § 15.2-2202 E

Dear Mr. Petrovich,

Dominion Energy Virginia (the "Company") is proposing to partially rebuild the existing 230 kV Line #256 from Elmont Junction to St. Johns Substation, partially rebuild the existing 230 kV Line #2090 between Elmont Junction and the proposed Lee's Hill Substation, and construct a new approximately 14-mile overhead 230 kV line between Ladysmith Substation to the proposed New Post Substation (Line #2372) and from New Post Substation to Lee's Hill Substation (Line #2378) (collectively, the "Project"). The new 230 kV line will be constructed entirely within the Company's existing transmission right-of-way corridor. The Project is located in both Caroline and Spotsylvania Counties and the Project is necessary to maintain the overall long-term reliability of its transmission system.

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

Enclosed is a Project Overview Map depicting the alignment of the proposed Project, as well as the general Project location. Please note that the Project Overview Map and route descriptions depicted therein are preliminary in nature and subject to final engineering. All final materials, including maps, will be available in the Company's CPCN filing to the Commission.

Finally, attached is a GIS shapefile of the proposed Project to assist in the project review. If you have any questions, please do not hesitate to contact me directly at 804-316-0367 or melissa.a.harreld@dominionenergy.com. We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Regards,

A handwritten signature in blue ink, appearing to read "Mel Harreid". The signature is fluid and cursive, with the first name "Mel" and last name "Harreid" clearly distinguishable.

Melissa Harreid
Siting and Permitting Specialist, Electric Transmission

Attachment: Project Overview Map
GIS Shapefile

COMMONWEALTH OF VIRGINIA
STATE CORPORATION COMMISSION

APPLICATION OF	)	
	)	
VIRGINIA ELECTRIC AND POWER COMPANY	)	Case No. PUR-2024-00159
	)	
For approval and certification of electric transmission	)	
facilities: Partial Rebuild of Lines #256 and #2090/#2335	)	
and New 230 kV Lines #2372 and #2378	)	

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

Jason S. Whitlow

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

Sergio E. De Hoyos Irizarry

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

Kamlesh A. Joshi

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

Melissa A. Harreld

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

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Jason S. Whitlow

Title: Engineer – Electric Transmission Planning

Summary:

Company Witness Jason S. Whitlow sponsors those portions 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 of 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: Although not applicable to the proposed project, 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: Although not applicable to the proposed project, 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 Whitlow co-sponsors the following portions of the Appendix:

- Section I.A (co-sponsored with Company Witnesses Sergio E. De Hoyos Irizarry and Kamlesh A. Joshi): This section details the primary justifications for the proposed project.
- Section I.L (co-sponsored with Company Witness Sergio E. De Hoyos Irizarry): Although not applicable to the proposed project, this section, when applicable, provides details on the deterioration of structures and associated equipment.
- Section II.A.1 (co-sponsored with Company Witnesses Melissa A. Harreld): This section provides the length of the proposed corridor and viable alternatives.

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

**DIRECT TESTIMONY
OF
JASON S. WHITLOW
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2024-00159**

1 **Q. Please state your name, position with Virginia Electric and Power Company**
2 **(“Dominion Energy Virginia” or the “Company”), and business address.**

3 A. My name is Jason S. Whitlow, and I am an Engineer in the Electric Transmission
4 Planning Department for the Company. My business address is 5000 Dominion
5 Boulevard, Glen Allen, Virginia 23060. A statement of my qualifications and
6 background is provided as Appendix A.

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

8 A. I am responsible for planning the Company’s electric transmission system for voltages of
9 69 kilovolt (“kV”) through 500 kV.

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

11 A. In order to resolve identified violations of North American Electric Reliability
12 Corporation (“NERC”) Reliability Standards and to maintain the structural integrity and
13 reliability of its transmission system in compliance with mandatory NERC Reliability
14 Standards, the Company proposes in Caroline County, Virginia, and Spotsylvania
15 County, Virginia to:

- 16 • Partially rebuild 230 kV Line #256 from Ladysmith Combustion Turbine (“CT”) to St. Johns Substation. Line #256 currently shares an existing double-circuit tower line with Line #2090, which was constructed in 2010-2011, from Ladysmith CT to Structure #256/107, #2090/107 (“Elmont Junction”). Line #256 will be reconducted on existing structures for approximately 5.1 miles, starting at
17 Ladysmith CT and traveling to Elmont Junction. The existing right-of-way
18
19
20
21

(“ROW”) in this 5.1-mile section is 250 feet in width. This portion of Line #256 will be reconducted with 2-768 ACSS conductor. One new Design Number (“DNO”)-11410 48-fiber shield wire will be installed above Line #256 for lightning protection shielding and telecommunication purposes. The existing towers for this portion of Line #256 will remain unimproved. After reconducting the 5.1-mile section of Line #256, Line #256 and Line #2090 will split at Elmont Junction. Line #256 will proceed south and be rebuilt along an existing 200-foot-wide ROW to St. Johns Substation for approximately 7.3 miles on new double-circuit weathering steel monopole structures. Line #256 will be strung on one side of the double-circuit monopoles, and a new 230 kilovolt (“kV”) line will be installed on the other side of the double-circuit monopoles for a future circuit that will be extended to Elmont Substation. The conductor on both sides of the structures will be 2-768 ACSS conductor. Two new DNO-11410 48-fiber shield wires will also be installed for lightning protection shielding and telecommunication purposes. The new line and substation equipment will have a minimum summer rating of 1573 MVA¹ using 4000 Ampere (“A”) substation equipment.

- Partially rebuild Line #2090 from Ladysmith CT to Lee’s Hill Substation. As previously noted, the 2090 Line shares an existing double-circuit tower line with Line #256 in this section that was constructed in 2010-2011. Line #2090 will be reconducted on the same existing structures as Line #256 for approximately 5.1 miles along a 250-foot-wide ROW, traveling from Ladysmith CT to Elmont Junction. This portion of the line will be reconducted with 2-768 ACSS conductor. One new DNO-11410 48-fiber shield wire will be installed above Line #2090 for lightning protection shielding and telecommunication purposes. The existing towers will remain unimproved. After reconducting the first 5.1-mile section, Line #256 and Line #2090 split at Elmont Junction. From Elmont Junction, Line #2090 will proceed north and be rebuilt along an existing 200-foot-wide ROW for approximately 5.5 miles on new double-circuit weathering steel monopoles to New Post Substation. Line #2090 will then continue for approximately 0.9 mile on existing 200-foot-wide ROW to Lee’s Hill Substation but will be renumbered Line #2335. Line #2090/Line #2335 will be strung on one side of the double-circuit monopoles, and a new 230 kV line (Line #2372/ Line #2378) will be installed on the other side of the double-circuit monopoles. The conductor on both sides of the structures will be 2-768 ACSS conductor. Two new DNO-11410 48-fiber shield wires will also be installed for lightning protection shielding and telecommunication purposes. The new line and substation equipment will have a minimum summer rating of 1573 MVA using 4000 A substation equipment.

¹ 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 retail customer projected load, reflecting representative pf, and the equipment ratings to handle the apparent power, which includes the real and reactive load components.

- Construct a new approximately 14.1-mile overhead 230 kV line between Ladysmith and Lee’s Hill Substations, connecting at New Post Substation. The new Ladysmith – New Post line will be numbered Line #2372 and the new Lee’s Hill – New Post line will be numbered #2378. Line #2372 will be installed onto the existing structures of Line #2089. Line 2089 will be reconducted from Ladysmith Substation to Ladysmith CT.² Line #2372 will have three segments. Starting at Ladysmith Substation, the first segment will travel approximately 3.2 miles along an existing 250-foot-wide ROW on existing double-circuit galvanized steel towers from structure #2089/3 to 2089/18. The second segment of Line #2372 will travel approximately 4.5-miles on existing 250-foot-wide ROW from Ladysmith CT junction (Structure#2089/19) (“Ladysmith Junction”) to Elmont Junction. For this segment of Line #2372, the new line will be installed on new single-circuit weathering steel 230 kV monopoles. Finally, the third segment will travel approximately 5.5 miles from Elmont Junction to New Post Substation and will be constructed on the same double-circuit weathering steel monopoles as Line #2090 along an existing 200-foot-wide ROW. All three segments will be installed with 2-768 ACSS conductor. One new DNO-11410 OPGW will be installed for lightning protection shielding and telecommunications purposes above the new Line #2372 from Ladysmith Substation to the New Post Substation. The Company will install equipment as needed at Ladysmith Substation to provide a termination point for Line #2372. Because the existing right-of-way is adequate for the new proposed Line #2372, no new right-of-way is required. Line #2372 will become Line #2378 at New Post Substation and will continue north approximately 0.9 mile along existing 200-foot-wide ROW up to Lee’s Hill Substation, sharing structures with Line #2335. The same structure framing, finishing, conductor and telecom/shielding wire described for Line # 2335 will be used for Line #2378.

Collectively, the components described above are referred to as the “Project.”

The purpose of my testimony is to describe the Company’s electric transmission system and the need for, and benefits of, the proposed Project. I sponsor 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 with Company Witnesses Sergio E. De Hoyos Irizarry, Kamlesh A. Joshi, and Melissa A. Harreld; Section I.A with Company Witnesses Sergio E. De Hoyos Irizarry and Kamlesh A. Joshi; Section I.L with Company Witness Sergio E.

² See *supra*, n.1.

1 De Hoyos Irizarry; and Section II.A.1 with Company Witness Melissa A. Harreld.

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

3 A. Yes, it does.

**BACKGROUND AND QUALIFICATIONS
OF
JASON S. WHITLOW**

Jason Whitlow received a B.S. in Mechanical Engineering from Virginia Tech in 2007. Mr. Whitlow has been employed by the Company since 2013, where he has worked in both natural gas and electric transmission planning. Prior to joining the Company, he worked as a Project Manager for The Whiting-Turner Contracting Company.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Sergio E. De Hoyos Irizarry

Title: Engineer– Electric Transmission Line Engineering

Summary:

Company Witness Sergio E. De Hoyos Irizarry sponsors those portions of the Appendix providing an overview of the design characteristics of the transmission facilities for the proposed Project, and discussing electric and magnetic field levels, as follows:

- Section I.F: This section, when applicable, describes any lines or facilities that will be removed, replaced, or taken out of service upon completion of the proposed project.
- Section I.I: This section provides the estimated total cost 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.
- Section II.B.1 to II.B.2: These sections provide the line design and operational features of the proposed project, as applicable.
- Sections II.B.3 to II.B.5: These sections, when applicable, provide supporting structure details along the proposed and alternative routes.
- Section IV: This section provides analysis on the health aspects of electric and magnetic field levels.

Additionally, Company Witness De Hoyos Irizarry co-sponsors the following portions of the Appendix:

- Section I.A (co-sponsored with Company Witnesses Jason S. Whitlow and Kamlesh A. Joshi): This section details the primary justifications for the proposed project.
- Section I.L (co-sponsored with Company Witness Jason S. Whitlow): This section, when applicable, provides details on the deterioration of structures and associated equipment.
- Section II.A.4 (co-sponsored with Company Witness Melissa A. Harreld): Although not applicable to the proposed project, this section explains why the existing right-of-way is not adequate to serve the need.
- Section II.A.6 (co-sponsored with Company Witness Melissa A. Harreld): This section provides details regarding the right-of-way for the proposed project.
- Section II.B.6 (co-sponsored with Company Witnesses Melissa A. Harreld): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section V.A (co-sponsored with Company Witnesses Melissa A. Harreld): This section provides the proposed route description and structure heights for notice purposes.

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

**DIRECT TESTIMONY
OF
SERGIO E. DE HOYOS IRIZARRY
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2024-00159**

1 **Q. Please state your name, position with Virginia Electric and Power Company**
2 **(“Dominion Energy Virginia” or the “Company”), and business address.**

3 A. My name is Sergio E. De Hoyos Irizarry, and I am an Electric Transmission Engineer in
4 the Electric Transmission Line Engineering Department of the Company. My business
5 address is 5000 Dominion Boulevard, Glen Allen, Virginia 23060. A statement of my
6 qualifications and background is provided as Appendix A.

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

8 A. I am responsible for the estimating, conceptual, and final design of high voltage
9 transmission line projects from 69 kilovolt (“kV”) to 500 kV.

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

11 A. In order to resolve identified violations of North American Electric Reliability
12 Corporation (“NERC”) Reliability Standards and to maintain the structural integrity and
13 reliability of its transmission system in compliance with mandatory NERC Reliability
14 Standards, the Company proposes in Caroline County, Virginia, and Spotsylvania
15 County, Virginia to:

- 16 • Partially rebuild 230 kV Line #256 from Ladysmith Combustion Turbine (“CT”) to St. Johns Substation. Line #256 currently shares an existing double-circuit tower line with Line #2090, which was constructed in 2010-2011, from Ladysmith CT to Structure #256/107, #2090/107 (“Elmont Junction”). Line #256 will be reconducted on existing structures for approximately 5.1 miles, starting at
17 Ladysmith CT and traveling to Elmont Junction. The existing right-of-way
18
19
20
21

1 (“ROW”) in this 5.1-mile section is 250 feet in width. This portion of Line #256
2 will be reconducted with 2-768 ACSS conductor. One new Design Number
3 (“DNO”)-11410 48-fiber shield wire will be installed above Line #256 for lightning
4 protection shielding and telecommunication purposes. The existing towers for this
5 portion of Line #256 will remain unimproved. After reconducting the 5.1-mile
6 section of Line #256, Line #256 and Line #2090 will split at Elmont Junction. Line
7 #256 will proceed south and be rebuilt along an existing 200-foot-wide ROW to St.
8 Johns Substation for approximately 7.3 miles on new double-circuit weathering
9 steel monopole structures. Line #256 will be strung on one side of the double-
10 circuit monopoles, and a new 230 kilovolt (“kV”) line will be installed on the other
11 side of the double-circuit monopoles for a future circuit that will be extended to
12 Elmont Substation. The conductor on both sides of the structures will be 2-768
13 ACSS conductor. Two new DNO-11410 48-fiber shield wires will also be installed
14 for lightning protection shielding and telecommunication purposes. The new line
15 and substation equipment will have a minimum summer rating of 1573 MVA³ using
16 4000 Ampere (“A”) substation equipment.
17

- 18 • Partially rebuild Line #2090 from Ladysmith CT to Lee’s Hill Substation. As
19 previously noted, the 2090 Line shares an existing double-circuit tower line with
20 Line #256 in this section that was constructed in 2010-2011. Line #2090 will be
21 reconducted on the same existing structures as Line #256 for approximately 5.1
22 miles along a 250-foot-wide ROW, traveling from Ladysmith CT to Elmont
23 Junction. This portion of the line will be reconducted with 2-768 ACSS
24 conductor. One new DNO-11410 48-fiber shield wire will be installed above Line
25 #2090 for lightning protection shielding and telecommunication purposes. The
26 existing towers will remain unimproved. After reconducting the first 5.1-mile
27 section, Line #256 and Line #2090 split at Elmont Junction. From Elmont Junction,
28 Line #2090 will proceed north and be rebuilt along an existing 200-foot-wide ROW
29 for approximately 5.5 miles on new double-circuit weathering steel monopoles to
30 New Post Substation. Line #2090 will then continue for approximately 0.9 mile on
31 existing 200-foot-wide ROW to Lee’s Hill Substation but will be renumbered Line
32 #2335. Line #2090/Line #2335 will be strung on one side of the double-circuit
33 monopoles, and a new 230 kV line (Line #2372/ Line #2378) will be installed on
34 the other side of the double-circuit monopoles. The conductor on both sides of the
35 structures will be 2-768 ACSS conductor. Two new DNO-11410 48-fiber shield
36 wires will also be installed for lightning protection shielding and
37 telecommunication purposes. The new line and substation equipment will have a
38 minimum summer rating of 1573 MVA using 4000 A substation equipment.
39

³ 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 retail customer projected load, reflecting representative pf, and the equipment ratings to handle the apparent power, which includes the real and reactive load components.

- Construct a new approximately 14.1-mile overhead 230 kV line between Ladysmith and Lee’s Hill Substations, connecting at New Post Substation. The new Ladysmith – New Post line will be numbered Line #2372 and the new Lee’s Hill – New Post line will be numbered #2378. Line #2372 will be installed onto the existing structures of Line #2089. Line 2089 will be reconducted from Ladysmith Substation to Ladysmith CT.⁴ Line #2372 will have three segments. Starting at Ladysmith Substation, the first segment will travel approximately 3.2 miles along an existing 250-foot-wide ROW on existing double-circuit galvanized steel towers from structure #2089/3 to 2089/18. The second segment of Line #2372 will travel approximately 4.5-miles on existing 250-foot-wide ROW from Ladysmith CT junction (Structure#2089/19) (“Ladysmith Junction”) to Elmont Junction. For this segment of Line #2372, the new line will be installed on new single-circuit weathering steel 230 kV monopoles. Finally, the third segment will travel approximately 5.5 miles from Elmont Junction to New Post Substation and will be constructed on the same double-circuit weathering steel monopoles as Line #2090 along an existing 200-foot-wide ROW. All three segments will be installed with 2-768 ACSS conductor. One new DNO-11410 OPGW will be installed for lightning protection shielding and telecommunications purposes above the new Line #2372 from Ladysmith Substation to the New Post Substation. The Company will install equipment as needed at Ladysmith Substation to provide a termination point for Line #2372. Because the existing right-of-way is adequate for the new proposed Line #2372, no new right-of-way is required. Line #2372 will become Line #2378 at New Post Substation and will continue north approximately 0.9 mile along existing 200-foot-wide ROW up to Lee’s Hill Substation, sharing structures with Line #2335. The same structure framing, finishing, conductor and telecom/shielding wire described for Line # 2335 will be used for Line #2378.

Collectively, the components described above are referred to as the “Project.”

The purpose of my testimony is to describe the design characteristics of the transmission facilities for the proposed Project, and also to discuss electric and magnetic field (“EMF”) levels. I sponsor Sections I.F, I.I, II.A.5, II.B.1, II.B.2, II.B.3, II.B.4, II.B.5, and IV of the Appendix. Additionally, I co-sponsor the Executive Summary with Company Witnesses Jason S. Whitlow, Kamlesh A. Joshi, and Melissa A. Harreld; Sections I.A with Company Witnesses Jason S. Whitlow and Kamlesh A. Joshi; Section

⁴ See *supra*, n.1.

1 I.L with Company Witness Jason S. Whitlow; and Sections II.A.4, II.A.6, II.B.6, and V.A
2 with Company Witness Melissa A. Harreld.

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

4 A. Yes, it does.

**BACKGROUND AND QUALIFICATIONS
OF
SERGIO E. DE HOYOS IRIZARRY**

Sergio E. De Hoyos Irizarry received a Bachelor of Science degree in Civil Engineering from the University of Puerto Rico in 2010 and a Master of Science degree in Civil Engineering from City University of New York in 2013. He was employed by Exelon from 2014-2023 and has worked with Dominion since 2023. Mr. De Hoyos Irizarry's experience includes Overhead Transmission Standards Development & Overhead Transmission Engineering (2014-2018, 2023-Present), Underground Transmission Engineering (2018-2021), and Substation Engineering (2021-2023).

Mr. De Hoyos Irizarry has held a Professional Engineering license in the State of Virginia since 2019.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Kamlesh A. Joshi

Title: Senior Electrical Engineer - Transmission and Distribution Services Department

Summary:

Company Witness Kamlesh A. Joshi sponsors or co-sponsors the following sections of the Appendix describing the substation work to be performed for the proposed Project as follows:

- Section I.A (co-sponsored with Company Witnesses Jason S. Whitlow and Sergio E. De Hoyos Irizarry): This section details the primary justifications for the proposed Project.
- Section I.I (co-sponsored with Company Witness Jason S. Whitlow): This section provides the estimated total cost of the proposed Project.
- Section II.C: Although not applicable to the proposed project, this section describes and furnishes a one-line diagram of the substation associated with the proposed project.

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

**DIRECT TESTIMONY
OF
KAMLESH A. JOSHI
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2024-00159**

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

2 A. My name is Kamlesh A. Joshi. I am employed as a Senior Electrical Engineer in the
3 Transmission and Distribution Services Department at Burns & McDonnell. My business
4 address is 2301 Maitland Center Parkway, Maitland, Florida 32751. A statement of my
5 qualifications and background is provided as Appendix A.

6 **Q. What are your responsibilities as a Senior Electrical Engineer at Burns &
7 McDonnell?**

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

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

12 A. In order to resolve identified violations of North American Electric Reliability
13 Corporation (“NERC”) Reliability Standards and to maintain the structural integrity and
14 reliability of its transmission system in compliance with mandatory NERC Reliability
15 Standards, the Company proposes in Caroline County, Virginia, and Spotsylvania
16 County, Virginia to:

- 17 • Partially rebuild 230 kV Line #256 from Ladysmith Combustion Turbine (“CT”) to St. Johns Substation. Line #256 currently shares an existing double-circuit tower line with Line #2090, which was constructed in 2010-2011, from Ladysmith CT to Structure #256/107, #2090/107 (“Elmont Junction”). Line #256 will be

1 reconducted on existing structures for approximately 5.1 miles, starting at
2 Ladysmith CT and traveling to Elmont Junction. The existing right-of-way
3 (“ROW”) in this 5.1-mile section is 250 feet in width. This portion of Line #256
4 will be reconducted with 2-768 ACSS conductor. One new Design Number
5 (“DNO”)-11410 48-fiber shield wire will be installed above Line #256 for lightning
6 protection shielding and telecommunication purposes. The existing towers for this
7 portion of Line #256 will remain unimproved. After reconductoring the 5.1-mile
8 section of Line #256, Line #256 and Line #2090 will split at Elmont Junction. Line
9 #256 will proceed south and be rebuilt along an existing 200-foot-wide ROW to St.
10 Johns Substation for approximately 7.3 miles on new double-circuit weathering
11 steel monopole structures. Line #256 will be strung on one side of the double-
12 circuit monopoles, and a new 230 kilovolt (“kV”) line will be installed on the other
13 side of the double-circuit monopoles for a future circuit that will be extended to
14 Elmont Substation. The conductor on both sides of the structures will be 2-768
15 ACSS conductor. Two new DNO-11410 48-fiber shield wires will also be installed
16 for lightning protection shielding and telecommunication purposes. The new line
17 and substation equipment will have a minimum summer rating of 1573 MVA⁵ using
18 4000 Ampere (“A”) substation equipment.
19

- 20 • Partially rebuild Line #2090 from Ladysmith CT to Lee’s Hill Substation. As
21 previously noted, the 2090 Line shares an existing double-circuit tower line with
22 Line #256 in this section that was constructed in 2010-2011. Line #2090 will be
23 reconducted on the same existing structures as Line #256 for approximately 5.1
24 miles along a 250-foot-wide ROW, traveling from Ladysmith CT to Elmont
25 Junction. This portion of the line will be reconducted with 2-768 ACSS
26 conductor. One new DNO-11410 48-fiber shield wire will be installed above Line
27 #2090 for lightning protection shielding and telecommunication purposes. The
28 existing towers will remain unimproved. After reconductoring the first 5.1-mile
29 section, Line #256 and Line #2090 split at Elmont Junction. From Elmont Junction,
30 Line #2090 will proceed north and be rebuilt along an existing 200-foot-wide ROW
31 for approximately 5.5 miles on new double-circuit weathering steel monopoles to
32 New Post Substation. Line #2090 will then continue for approximately 0.9 mile on
33 existing 200-foot-wide ROW to Lee’s Hill Substation but will be renumbered Line
34 #2335. Line #2090/Line #2335 will be strung on one side of the double-circuit
35 monopoles, and a new 230 kV line (Line #2372/ Line #2378) will be installed on
36 the other side of the double-circuit monopoles. The conductor on both sides of the
37 structures will be 2-768 ACSS conductor. Two new DNO-11410 48-fiber shield
38 wires will also be installed for lightning protection shielding and

⁵ 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 retail customer projected load, reflecting representative pf, and the equipment ratings to handle the apparent power, which includes the real and reactive load components.

telecommunication purposes. The new line and substation equipment will have a minimum summer rating of 1573 MVA using 4000 A substation equipment.

- Construct a new approximately 14.1-mile overhead 230 kV line between Ladysmith and Lee's Hill Substations, connecting at New Post Substation. The new Ladysmith – New Post line will be numbered Line #2372 and the new Lee's Hill – New Post line will be numbered #2378. Line #2372 will be installed onto the existing structures of Line #2089. Line 2089 will be reconducted from Ladysmith Substation to Ladysmith CT.⁶ Line #2372 will have three segments. Starting at Ladysmith Substation, the first segment will travel approximately 3.2 miles along an existing 250-foot-wide ROW on existing double-circuit galvanized steel towers from structure #2089/3 to 2089/18. The second segment of Line #2372 will travel approximately 4.5-miles on existing 250-foot-wide ROW from Ladysmith CT junction (Structure#2089/19) ("Ladysmith Junction") to Elmont Junction. For this segment of Line #2372, the new line will be installed on new single-circuit weathering steel 230 kV monopoles. Finally, the third segment will travel approximately 5.5 miles from Elmont Junction to New Post Substation and will be constructed on the same double-circuit weathering steel monopoles as Line #2090 along an existing 200-foot-wide ROW. All three segments will be installed with 2-768 ACSS conductor. One new DNO-11410 OPGW will be installed for lightning protection shielding and telecommunications purposes above the new Line #2372 from Ladysmith Substation to the New Post Substation. The Company will install equipment as needed at Ladysmith Substation to provide a termination point for Line #2372. Because the existing right-of-way is adequate for the new proposed Line #2372, no new right-of-way is required. Line #2372 will become Line #2378 at New Post Substation and will continue north approximately 0.9 mile along existing 200-foot-wide ROW up to Lee's Hill Substation, sharing structures with Line #2335. The same structure framing, finishing, conductor and telecom/shielding wire described for Line # 2335 will be used for Line #2378.

Collectively, the components described above are referred to as the "Project."

The purpose of my testimony, which I am submitting on behalf of Dominion Energy Virginia, is to describe the work to be performed as part of the Project. As it pertains to station work, I sponsor Section II.C of the Appendix. Additionally, I co-sponsor the Executive Summary with Company Witnesses Jason S. Whitlow, Sergio E. De Hoyos Irizarry, and Melissa A. Harreld; Section I.A with Company Witnesses Jason A. Whitlow

⁶ See *supra*, n.1.

1 and Sergio E. De Hoyos Irizarry; and Section I.I of the Appendix with Company Witness
2 Jason S. Whitlow.

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

4 A. Yes, it does.

**BACKGROUND AND QUALIFICATIONS
OF
KAMLESH A. JOSHI**

Kamlesh A. Joshi received a Master of Science in Project Management from Harrisburg University of Science & Technology, as well as a Master of Science in Electrical Engineering from Missouri University of Science and Technology in December 2013.

Mr. Joshi worked as a Substation Design Engineer from January 2014 to July 2019 at Black & Veatch Corporation, Overland Park, Kansas. Mr. Joshi worked with the Black & Veatch Orlando, Florida, office Substation Design Team from August 2019 to January 2021. Mr. Joshi joined the Burns & McDonnell Engineering Substation Department as a Staff Electrical Engineer in February 2021. He was promoted to Senior Electrical Engineer in January 2022 at Burns & McDonnell.

Mr. Joshi's responsibilities include the evaluation of the substation project requirements; development of project scope documents, estimates and schedules; preparation of specifications and bid documents; material procurement; development of detailed physical drawings, bill of materials, electrical one-lines, schematics and wiring diagrams. He has been licensed as a Professional Engineer in Texas since 2018 and in Florida since 2021.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Melissa A. Harreld
Title: Siting and Permitting Specialist – Siting and Permitting Group
Summary:

Company Witness Melissa A. Harreld will sponsor 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.2: 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.7 to Section II.A.8: These sections provide details regarding the right-of-way for the proposed project, including information related to restoration, maintenance practices, and permitted uses.
- Section II.A.9: This section describes the proposed route selection procedures and details alternative routes considered.
- Section II.A.11: This section details how the construction of the proposed project follows the provisions discussed in Attachment 1 of the Transmission Appendix Guidelines.
- 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.
- Section III: This section details the impact of the proposed project on scenic, environmental, and historic features.
- Sections V.B: This section provides information related to public notice of the proposed project.
- Section V.C: This section lists the federal, state, and local agencies and officials that were provided notice of the proposed project.
- Section V.D: This section provides information related to public notice of the proposed project.

Additionally, Ms. Harreld co-sponsors the following section of the Appendix:

- Section II.A.1 (co-sponsored with Company Witnesses Jason S. Whitlow): This section provides the length of the proposed corridor and viable alternatives to the proposed project.
- Section II.A.4 (co-sponsored with Company Witness Sergio E. De Hoyos Irizarry): This section explains why the existing right-of-way is not adequate to serve the need.
- Section II.A.6 (co-sponsored with Company Witness Sergio E. De Hoyos Irizarry): This section provides details regarding the right-of-way for the proposed project.
- Section II.B.6 (co-sponsored with Company Witnesses Sergio E. De Hoyos Irizarry): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section V.A (co-sponsored with Company Witnesses Sergio E. De Hoyos Irizarry): This section provides the proposed route description and structure heights for notice purposes.

Finally, Ms. Harreld sponsors the DEQ Supplement filed with the Application.

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

**DIRECT TESTIMONY
OF
MELISSA A. HARRELD
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2024-00159**

1 **Q. Please state your name, position with Virginia Electric and Power Company**
2 **(“Dominion Energy Virginia” or the “Company”), and business address.**

3 A. My name is Melissa A. Harreld, and I am a Siting and Permitting Specialist in the Siting
4 and Permitting Group for the Company. My business address is 5000 Dominion Blvd.,
5 Glen Allen, Virginia 23060. A statement of my qualifications and background is
6 provided as Appendix A.

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

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

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

15 A. In order to resolve identified violations of North American Electric Reliability
16 Corporation (“NERC”) Reliability Standards and to maintain the structural integrity and
17 reliability of its transmission system in compliance with mandatory NERC Reliability

Standards, the Company proposes in Caroline County, Virginia, and Spotsylvania County, Virginia to:

- Partially rebuild 230 kV Line #256 from Ladysmith Combustion Turbine (“CT”) to St. Johns Substation. Line #256 currently shares an existing double-circuit tower line with Line #2090, which was constructed in 2010-2011, from Ladysmith CT to Structure #256/107, #2090/107 (“Elmont Junction”). Line #256 will be reconducted on existing structures for approximately 5.1 miles, starting at Ladysmith CT and traveling to Elmont Junction. The existing right-of-way (“ROW”) in this 5.1-mile section is 250 feet in width. This portion of Line #256 will be reconducted with 2-768 ACSS conductor. One new Design Number (“DNO”)-11410 48-fiber shield wire will be installed above Line #256 for lightning protection shielding and telecommunication purposes. The existing towers for this portion of Line #256 will remain unimproved. After reconducting the 5.1-mile section of Line #256, Line #256 and Line #2090 will split at Elmont Junction. Line #256 will proceed south and be rebuilt along an existing 200-foot-wide ROW to St. Johns Substation for approximately 7.3 miles on new double-circuit weathering steel monopole structures. Line #256 will be strung on one side of the double-circuit monopoles, and a new 230 kilovolt (“kV”) line will be installed on the other side of the double-circuit monopoles for a future circuit that will be extended to Elmont Substation. The conductor on both sides of the structures will be 2-768 ACSS conductor. Two new DNO-11410 48-fiber shield wires will also be installed for lightning protection shielding and telecommunication purposes. The new line and substation equipment will have a minimum summer rating of 1573 MVA⁷ using 4000 Ampere (“A”) substation equipment.
- Partially rebuild Line #2090 from Ladysmith CT to Lee’s Hill Substation. As previously noted, the 2090 Line shares an existing double-circuit tower line with Line #256 in this section that was constructed in 2010-2011. Line #2090 will be reconducted on the same existing structures as Line #256 for approximately 5.1 miles along a 250-foot-wide ROW, traveling from Ladysmith CT to Elmont Junction. This portion of the line will be reconducted with 2-768 ACSS conductor. One new DNO-11410 48-fiber shield wire will be installed above Line #2090 for lightning protection shielding and telecommunication purposes. The existing towers will remain unimproved. After reconducting the first 5.1-mile section, Line #256 and Line #2090 split at Elmont Junction. From Elmont Junction, Line #2090 will proceed north and be rebuilt along an existing 200-foot-wide ROW for approximately 5.5 miles on new double-circuit weathering steel monopoles to

⁷ 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 retail customer projected load, reflecting representative pf, and the equipment ratings to handle the apparent power, which includes the real and reactive load components.

1 New Post Substation. Line #2090 will then continue for approximately 0.9 mile on
2 existing 200-foot-wide ROW to Lee's Hill Substation but will be renumbered Line
3 #2335. Line #2090/Line #2335 will be strung on one side of the double-circuit
4 monopoles, and a new 230 kV line (Line #2372/ Line #2378) will be installed on
5 the other side of the double-circuit monopoles. The conductor on both sides of the
6 structures will be 2-768 ACSS conductor. Two new DNO-11410 48-fiber shield
7 wires will also be installed for lightning protection shielding and
8 telecommunication purposes. The new line and substation equipment will have a
9 minimum summer rating of 1573 MVA using 4000 A substation equipment.

- 10
- 11 • Construct a new approximately 14.1-mile overhead 230 kV line between
12 Ladysmith and Lee's Hill Substations, connecting at New Post Substation. The
13 new Ladysmith – New Post line will be numbered Line #2372 and the new Lee's
14 Hill – New Post line will be numbered #2378. Line #2372 will be installed onto
15 the existing structures of Line #2089. Line 2089 will be reconducted from
16 Ladysmith Substation to Ladysmith CT.⁸ Line #2372 will have three segments.
17 Starting at Ladysmith Substation, the first segment will travel approximately 3.2
18 miles along an existing 250-foot-wide ROW on existing double-circuit galvanized
19 steel towers from structure #2089/3 to 2089/18. The second segment of Line #2372
20 will travel approximately 4.5-miles on existing 250-foot-wide ROW from
21 Ladysmith CT junction (Structure#2089/19) ("Ladysmith Junction") to Elmont
22 Junction. For this segment of Line #2372, the new line will be installed on new
23 single-circuit weathering steel 230 kV monopoles. Finally, the third segment will
24 travel approximately 5.5 miles from Elmont Junction to New Post Substation and
25 will be constructed on the same double-circuit weathering steel monopoles as Line
26 #2090 along an existing 200-foot-wide ROW. All three segments will be installed
27 with 2-768 ACSS conductor. One new DNO-11410 OPGW will be installed for
28 lightning protection shielding and telecommunications purposes above the new
29 Line #2372 from Ladysmith Substation to the New Post Substation. The Company
30 will install equipment as needed at Ladysmith Substation to provide a termination
31 point for Line #2372. Because the existing right-of-way is adequate for the new
32 proposed Line #2372, no new right-of-way is required. Line #2372 will become
33 Line #2378 at New Post Substation and will continue north approximately 0.9 mile
34 along existing 200-foot-wide ROW up to Lee's Hill Substation, sharing structures
35 with Line #2335. The same structure framing, finishing, conductor and
36 telecom/shielding wire described for Line # 2335 will be used for Line #2378.

37
38 Collectively, the components described above are referred to as the "Project."

39 The purpose of my testimony is to provide an overview of the route and permitting for
40 the proposed Project. I sponsor Sections II.A.2, II.A.7, II.A.8 to II.A.9, II.A.11, II.A.12,

⁸ See *supra*, n.1.

1 III, V.B, V.C, and V.D of the Appendix. Additionally, I co-sponsor the Executive
2 Summary with Company Witnesses Jason S. Whitlow, Sergio E. De Hoyos Irizarry, and
3 Kamlesh A. Joshi; Section II.A.1 with Company Witness Jason S. Whitlow; and Sections
4 II.A.4, II.A.6, II.B.6, and V.A. with Company Witness Sergio E. De Hoyos_Irizarry.
5 Finally, I sponsor the DEQ Supplement.

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

7 A. Yes. In accordance with Va. Code § 15.2-2202 E, a letter dated July 18, 2024, was sent
8 to Mr. Charles M. Culley, Jr. Chris Shorter, Administrator of Caroline County, and Mr.
9 Ed Petrovitch, County Administrator of Spotsylvania County, where the Project is
10 located. The letter stated the Company's intention to file this Application and invited the
11 County to consult with the Company about the Project. A copy of this letter is included
12 as Attachment V.D.1 to the Appendix.

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

14 A. Yes, it does.

**BACKGROUND AND QUALIFICATIONS
OF
MELISSA A. HARRELD**

Melissa A. Harreld received a Bachelor of Science degree in Business Administration with a concentration in Real Estate and Urban Land Development from Virginia Commonwealth University in 2005. She has been employed by the Company since 2023 and prior to that was employed by a consultant from 2021-2023. Ms. Harreld's experience with the Company includes Distribution Land Use Lead (2021-2023) and Siting and Permitting Specialist (2023-Present).