Dominion Energy®

Application, Direct Testimony, Appendices, and Schedules of Virginia Electric and Power Company

Before the State Corporation Commission of Virginia

For approval and certification of the Coastal Virginia Offshore Wind Commercial Project and Rider Offshore Wind, pursuant to § 56-585.1:11, § 56-46.1, § 56-265.1 *et seq.*, and § 56-585.1 A 6 of the Code of Virginia

Volume 3 of 11
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Case No. PUR-2021-00142

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WITNESS DIRECT TESTIMONY SUMMARY

Witness: J. Kevin Curtis

Title: Vice President – Transmission, Power Delivery

Summary:

Company Witness J. Kevin Curtis testifies in support of the Virginia Facilities, providing an overview of the Coastal Virginia Offshore Wind Commercial Project ("CVOW Project" or "CVOW") and the PJM Interconnection Queue process, the components of the Virginia Facilities, the development of routes and related outreach and stakeholder engagement.

First, Mr. Curtis discusses the three interconnection queue requests submitted by Dominion Generation, which comprise the CVOW Project. As Mr. Curtis explains, customers are dependent on the development of generation resources, transmission facilities, and distribution facilities to satisfy their electrical needs. Therefore, it is important that proposed generation facilities be interconnected with the transmission system in accordance with NERC Reliability Criteria, in a manner that promotes overall system reliability. Mr. Curtis explains the process set forth in the PJM OATT to interconnect a generating unit to the transmission system in the PJM region.

Next, Mr. Curtis describes the components that comprise the Virginia Facilities, including: Offshore Export Circuits, Onshore Export Circuits, Harpers Switching Station, new Overhead Transmission Circuits, Line #271 Partial Rebuild, Line #2240 Rebuild, and Fentress Substation Expansion. As Mr. Curtis testifies, the proposed Virginia Facilities represent the minimal amount of transmission facilities required to interconnect the CVOW Commercial Project reliably with the existing transmission system, consistent with Dominion Transmission's Facility Interconnection Requirements, which are a required NERC Reliability Standard, and Dominion Transmission's reliability criteria. Mr. Curtis additionally describes CVOW's point of interconnection to the existing transmission system for PJM purposes.

Mr. Curtis then summarizes the Company's process for developing the routes for the onshore Virginia Facilities and the Company's associated, extensive outreach conducted throughout the route development and selection process. Indeed, as Mr. Curtis testifies, the Company has worked with the State Military Reservation, the City of Virginia Beach, and the United States Navy over many months to review, evaluate, plan, and agree on the location of the Onshore Export Circuits. Mr. Curtis also describes the Company's extensive engagement with the City of Virginia Beach, City of Chesapeake, the public, including Environmental Justice communities, Native American Tribes, other non-governmental organizations, homeowners' associations, church leaders, community-based organization leaders, and other stakeholders to seek input regarding the location and nature of the proposed route of the Overhead Transmission Circuits.

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

DIRECT TESTIMONY
OF
J. KEVIN CURTIS
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2021-00142

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

A. My name is J. Kevin Curtis and my business address is 10900 Nuckols Road, Glen Allen, Virginia 23060. I am the Vice President – Transmission, Power Delivery, for the Company. A statement of my background and qualifications is attached as Appendix A.

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

A. I am responsible for over 6,700 miles of electric transmission lines and more than 800 substation assets providing service to the Company's 2.6 million customers, and the approximately 500,000 customers associated with 33 different electric cooperatives and municipalities. These responsibilities include transmission and substation planning, engineering, project development, construction, operations and maintenance, compliance, and the Electric Transmission System Operations Center.

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

A. On September 25, 2019, Dominion Virginia Power's Generation Construction Group ("Dominion Generation" or the "Customer") submitted three queue requests to PJM Interconnection, L.L.C. ("PJM") (PJM Generation Queue Projects AF1-123, 124, and 125) to interconnect the Customer's Coastal Virginia Offshore Wind Commercial Project ("CVOW Commercial Project" or "CVOW") with Dominion Energy Virginia's (here

referred to as "Dominion Transmission") electric transmission system. Each queue request was for 880 MW of energy, giving the combined CVOW Commercial Project queues a collective rating of 2,640 MW (nominal) of energy.[1]

In order to reliably interconnect the proposed CVOW Commercial Project as requested by the Customer, and to maintain the structural integrity and reliability of its transmission system in compliance with mandatory North American Reliability Corporation ("NERC") Reliability Standards, Dominion Energy Virginia proposes certain facilities in the Cities of Virginia Beach and Chesapeake, Virginia (the "Virginia Facilities").

I am testifying in support of the Virginia Facilities. Specifically, I provide an overview of the CVOW Commercial Project and the PJM Interconnection Queue process, the components of the Virginia Facilities, and the development of routes and related outreach and stakeholder engagement. As part of this testimony, it is important for me to clarify that with respect to the CVOW Commercial Project, the term Dominion Transmission is used to describe the Company's transmission function as it interfaces with PJM and Dominion Generation in the interconnection process. The terms Dominion Energy Virginia or the Company generally are used when addressing CVOW Project proposals before the Commission for consideration, most notably for my testimony the Virginia Facilities, unless the context suggests differently.

Q. Please describe how your testimony is organized.

A. My testimony is organized as follows:

[1] As discussed in the Generation Appendix, which is being filed in support of this Application, the CVOW Commercial Project currently is projected to have a combined nominal capacity of 2,587 MW. See Section II.B of the Generation Appendix.

I. CVOW Commercial Project Overview

II. The Virginia Facilities

III. Route Development and Outreach

I. CVOW COMMERCIAL PROJECT OVERVIEW

Q. Please provide an overview of the CVOW Commercial Project as relevant to Dominion Transmission as the Transmission Grid Owner.

A. Dominion Generation submitted three interconnection requests with PJM on September 25, 2019, to construct the following:

- AF1-123: an 880 MW Off-Shore Wind Facility with a projected in-service date ("ISD") of December 31, 2025;
- AF1-124: an 880 MW Off-Shore Wind Facility with a projected ISD of December 31, 2026; and
- AF1-125: an 880 MW Off-Shore Wind Facility with a projected ISD of December 31, 2024.

Collectively, these three queue requests totaling 2,640 MW (nominal) comprise the CVOW Commercial Project[2] located in a federal lease area beginning approximately 27 statute miles (approximately 24 nautical miles)[3] off the coast of Virginia Beach, Virginia.

Q. The CVOW Project is in the PJM Interconnection Queue. What does that mean for the Project with respect to the transmission grid?

A. Customers are dependent on the development of generation resources, transmission facilities, and distribution facilities to satisfy their electrical needs. Therefore, it is important that proposed generation facilities be interconnected with the transmission

[2] PJM recognizes 802.5 MW of this facility as capacity.

[3] Hereinafter, all miles will be noted as approximate statute miles, unless otherwise indicated.

system in accordance with NERC Reliability Criteria, in a manner that promotes overall system reliability. The Company is a member of the PJM regional transmission organization ("RTO") and, as such, any generator (including Dominion Generation) wishing to construct a new generation facility, or modify an existing generation facility interconnected to the Company's transmission system, must file an interconnection request as part of the PJM generation queue process pursuant to the terms and conditions of PJM's FERC-approved Open Access Transmission Tariff ("OATT" or "Tariff").

Q. Please discuss the relevant provisions of the PJM OATT.

A. Part IV of the PJM OATT provides that an interconnection customer who proposes to interconnect a generating unit to the transmission system in the PJM region and make wholesale sales using the output of the unit "shall comply with the terms, conditions and procedures" in the Tariff. Part VI of the Tariff contains the PJM procedures, terms, and conditions governing administration of the New Services Queue, System Impact Studies and Facilities Studies of Interconnection Requests, as well as the agreements related to such studies and Interconnection Service. Specifically, Sections 212 and 212.6 require that an Interconnection Service Agreement ("ISA") and Interconnection Construction Service Agreement ("ICSA") be executed by the Interconnection Customer, the Company (as the Transmission Owner (also called Dominion Transmission here)), and the RTO (as the Transmission Provider) before the Customer can interconnect and energize its generation facilities.

Q. What are the requirements of the ISA and ICSA?

A. The ISA and ICSA generally provide that any actions taken by Dominion Transmission must comply with its obligations, responsibilities, and representations set forth in the ISA

and ICSA. In particular, under the ISA and ICSA, Dominion Transmission has a duty to use "Reasonable Efforts" in good faith to achieve the objectives of the agreements (*i.e.*, getting the generator interconnected with the transmission system subject to the conditions and actions PJM requires). "Reasonable Efforts" are defined in Appendix 1 of the ISA as "with respect to any action required to be made, attempted, or taken by an Interconnection Party or by a Construction Party under Tariff, Part IV or Part VI, an Interconnection Service Agreement, or a Construction Service Agreement, such efforts as are timely and consistent with Good Utility Practice and with efforts that such party would undertake for the protection of its own interests."

Generally speaking, all of this means that Dominion Transmission is obligated to act reasonably in preparing the information needed by PJM to undertake any required interconnection studies for a generation customer and, once an ISA is signed, to act reasonably in doing the work needed to interconnect the generator to the system. To be clear, it is Dominion Transmission's obligation to determine the costs and perform the work on its system to allow a generator to interconnect and to treat the generator in a non-discriminatory fashion. Moreover, it is not Dominion Transmission's role to select or change a generator's chosen point of interconnection that has proceeded through PJM's interconnection process.

Q. What is the current status of the CVOW Project in the queue?

A. On January 22, 2020, PJM issued the Feasibility Study Reports for the three queue requests that constitute the proposed CVOW Commercial Project. On September 1, 2020, PJM issued the System Impact Study Reports for the three CVOW Project queue requests. As discussed below, in light of ongoing queue backlogs and continuing reviews

by PJM, the Network Upgrades identified in these studies are considered initial and subject to change. Nevertheless, this information represents the most up to date and best information regarding Network Upgrades at this time.

Dominion Generation executed a Facility Study Agreement with PJM on October 20, 2020, with an estimated completion date of April 2022. On January 4, 2021, an Interim ISA was executed between PJM, Dominion Transmission and Dominion Generation to allow for the permitting and engineering of the transmission facilities between the Interconnection Substation (Harpers Switching Station) and the expansion required at Fentress Substation to interconnect the new transmission facilities.

Since Dominion Generation executed a Facility Study Agreement, PJM placed all ongoing study work in the generation queues on hold in an attempt to resolve the current backlog with regards to issuing Facility Study Reports and ISAs. In October 2021, PJM proposed four frameworks for solutions regarding the backlog.[4] All four options utilize an effective date of October 1, 2022 ("Effective Date"). PJM is planning to complete all projects in queue AD2 by the Effective Date. After the Effective Date, the selected transition option will go into effect. Generally, for all options, PJM is estimating completing (either to an ISA or withdrawal) 300 projects per year. Under all of the options PJM is currently considering to address the backlog, it appears PJM will likely complete its work for the CVOW Commercial Project prior to the proposed interconnection and energization dates. Additional discussion is provided in Section

[4] PJM's summary of Proposed Transition Options is available at https://www.pjm.com/-/media/committees-groups/task-forces/iprtf/2021/20211007/20211007-item-02a-solution-proposal-framework.ashx.

VII.3 of the Generation Appendix.

The Company anticipates that, once PJM completes its backlog study process and issues the Facility Study Report for the CVOW Commercial Project, the currently identified Network Upgrades likely will change from those preliminarily identified in the System Impacts Study Report, along with their associated costs, as certain Network Upgrades may change or may no longer be required and cost allocations and the associated Network Upgrade Costs are updated. These changes in project scopes and required Network Upgrades, along with projected projects costs are a normal part of the PJM Interconnection Queue Process and not unique to the current PJM queue backlog.

II. THE VIRGINIA FACILITIES

Q. Please describe the Virginia Facilities required as part of the CVOW Commercial Project.

A. The proposed Virginia Facilities are necessary to interconnect the proposed CVOW Commercial Project reliably, and to maintain the structural integrity and reliability of the transmission system in compliance with mandatory NERC Reliability Standards, in order to allow the energy output of the CVOW Commercial Project onto the existing transmission system.

Q. Please describe the Virginia Facilities.

A. At a high level, the Virginia Facilities, which are planned to be located in the Cities of Virginia Beach and Chesapeake, Virginia, include the following:

- Offshore Export Circuits: Install nine 230 kV submarine export circuits, which begin approximately 3.0 miles offshore at the Virginia jurisdictional line demarcating state-owned submerged lands and extend to an onshore Cable Landing Location on the State Military Reservation ("SMR") in the City of Virginia Beach, Virginia;

- Onshore Export Circuits: At the onshore Cable Landing Location on SMR, the Offshore Export Circuits will transition to nine underground 230 kV Onshore Export Circuits, which will extend underground approximately 4.4 miles to the proposed Harpers Switching Station located on Naval Air Station Oceana ("NAS Oceana") property in Virginia;

- Harpers Switching Station: Construct a 230 kV Gas Insulated Station ("GIS"), 12 line-position, breaker-and-a-half bus configuration switching station on a site located along Harpers Road at NAS Oceana, which will transition the nine Onshore Export Circuits to three Overhead Transmission Circuits. The proposed arrangement will include twenty-five 230 kV 4000A circuit breakers, nine 230 kV 180 MVAR fixed reactor banks, two 230 kV 150 MVAR variable reactor banks, three 250 MVAR static synchronous compensators ("STATCOMs"), and associated facilities;

- Overhead Transmission Circuits: Install three new overhead 230 kV transmission circuits, each with a rating of approximately 1,500 MVA, along the same corridor extending approximately 14.2 miles between the Harpers Switching Station and the Company's existing Fentress Substation and utilizing a combination of new, existing and expanded right-of-way in the Cities of Virginia Beach and Chesapeake, Virginia;

- Line #271 Partial Rebuild: Wreck and rebuild approximately 6.1 miles of the Company's existing approximately 7.1-mile 230 kV overhead Landstown-Pocaty Line #271, which also supports idle 115 kV Line #I-74. With a few exceptions discussed in Section I.A of the Transmission Appendix, the Company will wreck the existing double circuit lattice structures for Lines #271/I-74 and replace them with (i) new double circuit monopole structures to carry Line #271 and one Overhead Transmission Circuit, and (ii) either new single circuit or double circuit monopole structures to carry the two remaining Overhead Transmission Circuits. The Line #271 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities;

- Line #2240 Rebuild: Wreck and rebuild the entire approximately 1.9 miles of the Company's existing 230 kV overhead Fentress-Pocaty Line #2240, which also supports idle 115 kV Line #I-74, where all three Overhead Transmission Circuits will be co-located on structures within a 40-foot expanded right-of-way (from the existing 120-foot-wide right-of-way to an expanded 160-foot right-of-way). The Line #2240 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities;

- Fentress Substation Expansion: Expand the Company's existing 500-230 kV Fentress Substation in Chesapeake, Virginia. The proposed arrangement will expand the existing 500 kV yard into a GIS six-position ring bus, install three new 230 kV line terminals, uprate the existing 230 kV Line #2240 terminal to 4000A, which includes replacement of four disconnect switches, and install a new control house to accommodate communications and protective relays. The proposed arrangement, which also includes installation of circuit breakers, transformers and related equipment, expands the Fentress Substation entirely within Company-owned property. Based on conceptual design, in order to expand the Fentress Substation to the north and accommodate the routing of existing Line #2128 into the station, two structures (Structures #2128/1 and #2128/2) will be removed and replaced with four new structures (Structures #2128/1, #2128/1A, #2128/1B, and #2128/2), all entirely within existing right-of-way or on Company-owned property. Additionally, the Company proposes to remove three 500 kV structures (Structures #588/254, #588/255, and #588/256) and replace with two new 500 kV structures (Structures #588/254 and #588/255). Proposed Structure #588/255 is a backbone structure and will be located inside Fentress Substation, while proposed structure #588/254 will be in existing right of way to the west of Fentress Substation.

The proposed Virginia Facilities represent the minimal amount of transmission facilities required to interconnect the CVOW Commercial Project reliably with the existing transmission system, consistent with Dominion Transmission's Facility Interconnection Requirements, which are a required NERC Reliability Standard, and Dominion Transmission's reliability criteria. See Section I.A of the Transmission Appendix for a more detailed description of the Virginia Facilities and related requirements.

Q. Why was Fentress Substation selected to connect CVOW to the Company's transmission system?

A. Consistent with PJM's FERC-approved interconnection process set forth in the OATT, Dominion Generation chose to interconnect the proposed CVOW Commercial Project to the existing transmission system at the Fentress Substation, which contains the closest 500 kV transmission facilities to the Cable Landing Location (approximately 18.7 miles). Dominion Transmission understands that Dominion Generation chose to interconnect at

the Fentress Substation because, among other things, (a) it provides access to the systems 500 kV facilities, which it believes allows for the most efficient and effective interconnection, and (b) the limited amount of accessible and suitable interconnection points in this area of the transmission system.

Q. Does that mean that the Fentress Substation is CVOW's point of interconnection ("POI") to the existing transmission system for PJM's purposes?

A. No. PJM's Feasibility and System Impact Studies identified the proposed Harpers Switching Station as the Point of Interconnection ("POI") for the CVOW Project. Specifically, for PJM's purposes, after the CVOW Project (including the Virginia Facilities) is constructed and energized, the POI will be set at Harpers Switching Station to delineate facilities that will remain as Dominion Generation owned interconnection facilities (*i.e.*, station and wires components within the switching station and eastward up and until the offshore substations) from facilities that will become Dominion Transmission owned facilities (*i.e.*, station and wire components within the switching station and westward up to and including within the Fentress Substation). Please see Attachment II.C.1 of the Transmission Appendix, which shows the proposed Harpers Switching Station and the breakdown of its three separate components and their ownership following the setting of the POI after energization: Generator Owned Facilities, Attachment Facilities, and Direct Connect Network Facilities.

- The Generator Owned Facilities are substation and transmission facilities that will be located within the overall Harpers Switching Station footprint and will be owned and maintained by Dominion Generation. These facilities are shown in red on Attachment II.C.1 of the Transmission Appendix.

- The Attachment Facilities are the substation facilities that Dominion Transmission will install, own and maintain that directly connect the generator owned facilities into the proposed Harpers Switching Station. The generator

owner (*i.e.*, Dominion Generation) will pay an on-going O&M charge for these facilities, which is billed by PJM. The Attachment Facilities are shown on Attachment II.C.1 of the Transmission Appendix inside a black bubble.

- The Direct Connect Network Facilities are comprised of the remaining substation facilities and are required to interconnect the proposed CVOW Project with the Company's transmission system. Dominion Generation will pay for the actual cost to construct these facilities after which this portion of the Harpers Switching Station becomes a Dominion Transmission system asset.

III. ROUTE DEVELOPMENT AND OUTREACH

Q. Please generally describe the process for developing the routes for the onshore Virginia Facilities.

A. The Company's route selection for a new transmission line typically begins with identification of the project "origin" and "termination" points provided by the Company's Transmission Planning Department. As discussed above, in this case, the origin and termination points were provided by Dominion Generation, as the interconnection customer, consistent with PJM's review of the CVOW Commercial Project. This is followed by the development of a study area for the project. The study area represents a circumscribed geographic area from which potential routes that may be suitable for a transmission line can be identified.

For this project, the Company requested the services of Environmental Resources Management ("ERM") to help collect information within the study area, identity potential routes, perform a routing analysis comparing the route alternatives, and document the routing efforts in an Environmental Routing Study. ERM defined a study area for identifying potential alternatives for the onshore Project components, then mapped environmental, scenic, cultural, and historic resources, routing constraints, and routing opportunities (*i.e.*, abilities to utilize existing right-of-way) within this area. Data on the

study area were compiled through publicly available Geographic Information Systems databases, internet research, and agency, property owner, stakeholder, and public outreach and engagement.

Q. Please describe the routes identified as a result of this routing analysis.

A. As discussed in the Environmental Routing Study, and noted below regarding the Company's engagement and work with the State Military Reservation (formerly named Camp Pendleton) ("SMR"), the City of Virginia Beach, and the United States Navy ("Navy"), a single underground proposed route was identified for the Onshore Export Circuits along new right-of-way between the Cable Landing Location and Harpers Switching Station.

An overhead proposed route and three overhead alternative routes, with two route variations, were identified for the Overhead Transmission Circuits along a combination of new, existing, and expanded right-of-way between the Harpers Switching Station and Fentress Substation. Additionally, one hybrid alternative route[5] was identified for the Overhead Transmission Circuits along a combination of new, existing, and expanded right-of-way between the Chicory Switching Station near Princess Anne Road in Virginia Beach, Virginia, and Fentress Substation. It is important to note that while the Company is proposing certain routes for notice for the Virginia Facilities, and those routes are evaluated extensively in the Environmental Routing Study, that study also involved the review of numerous routing possibilities that ultimately were rejected. The

[5] For purposes of the hybrid alternative route, the underground Onshore Export Circuits would extend from the Cable Landing Location to the Chicory Switching Station (instead of the Harpers Switching Station) near Princess Anne Road in Virginia Beach, Virginia, where the circuits would then transition to overhead for the remainder of the route to Fentress Substation.

Environmental Routing Study discusses rejected possibilities as well.

Q. How were agencies and stakeholders involved in developing the single underground proposed route of the Onshore Export Circuits?

A. The Company has worked with SMR, the City of Virginia Beach, and the Navy over many months to review, evaluate, plan, and agree on the location of the Onshore Export Circuits. As discussed further in the Transmission Appendix, these three governmental entities have indicated their support for the CVOW Commercial Project, and have been instrumental in working with the Company to determine an acceptable location for the Project's landfall and inward journey. Specifically, and as the maps in the Transmission Appendix demonstrate, these three entities own and manage nearly all of the land between the Cable Landing Station at SMR and the Harpers Switching Station at NAS Oceana. Their work and cooperation allows the project to avoid impacts to military operations and on private property for a substantial portion of the overall interconnection route. See Attachments II.A.9.a, II.A.9.b, and II.A.9.c of the Transmission Appendix for letters of collaboration and cooperation from these three governmental entities.

In addition to engaging with these three landowners extensively, as discussed in Sections III.B, III.J, and III.K of the Transmission Appendix, the Company engaged extensively with the public, including Environmental Justice communities, Native American Tribes, non-governmental organizations, and other community stakeholders.

Q. How were agencies and stakeholders engaged in developing the overhead proposed route, four overhead alternative routes, and one hybrid route of the Overhead Transmission Circuits?

A. Similar to the process for the Onshore Export Circuits, to develop alternatives for the Overhead Transmission Circuits, the Company engaged extensively with the Cities of Virginia Beach and Chesapeake, as well as the Navy, U.S. Army Corps of Engineers ("Corps"), The Nature Conservancy, and other owners along the potential routes, to develop the alternatives. The Company also had extensive engagement with other interested stakeholders that have broad perspective of the communities, such as faith-based organizations, local historians, business owners, residents, and other knowledgeable members of the area. As the maps in the Transmission Appendix and Environmental Routing Study show, the City of Virginia Beach in particular holds numerous parcels, including many parks and other City-owned lands between the Harpers Switching Station and the Fentress Substation in that locality, making it a key partner in determining acceptable and preferred routing options. For example, the City of Virginia Beach controls much of the land along an existing infrastructure corridor, known as the Southeastern Parkway and Greenbelt ("SEPG") Corridor, which was the potential location of a new highway in the area running from nearby the Harpers Switching Station west southwestward into the City of Chesapeake. While that project was not continued, through discussions and evaluations, the City has indicated a willingness and preference for the location of the Virginia Facilities within the SEPG Corridor, for example, so as to avoid impacts to other areas of the City that are or may be used for commercial or residential purposes.

Similarly, the Company has worked with the City of Chesapeake to review and evaluate the location of routes. Through those discussions, the Company believes the City supports the Company's utilization of existing transmission right-of-way, and co-location

with existing transmission facilities, for the Virginia Facilities and has indicated that they will work with the Company to obtain easements that are needed on City-owned lands. Relatedly, the utilization of routes through Chesapeake co-located with existing right-of-way south of the Intracoastal Waterway can be done consistently with various development restriction easements (relevant here for structure heights) the City has with the Navy for the benefit of the nearby Fentress Airfield, which is an auxiliary airfield associated with NAS Oceana.

Of equal importance for the routing in the City of Chesapeake was the Company's extended discussions with The Nature Conservancy ("TNC"). As can be seen on the maps in the Transmission Appendix and in the Environmental Routing Study, TNC is a major landowner in the region of properties that abut the Intracoastal Waterway. Indeed, TNC's parcels, portions of which contain extremely sensitive and important environmental and ecological resources, essentially render only two available locations for a transmission route to cross the Intracoastal Waterway (one to the west where existing Line #271 crosses, and one to the east where North Landing Road crosses). Through discussions with TNC, the Company gained additional information regarding the ecological importance of much of the areas owned and preserved by TNC, and importantly, the areas TNC believed were of lesser ecological values, and, thus, TNC's view of the potential routes and where it believed it was most appropriate for the transmission lines to cross the Intracoastal Waterway. TNC favors crossing at the western location, co-located with Line #271 (which is where Harpers to Fentress Proposed Route 1 and the Harpers to Fentress Alternative Hybrid Route are proposed to cross), as opposed to creating a new corridor to the east. As such, as noted in Section

II.A.9 of the Transmission Appendix, TNC confirmed their support of this crossing and the resulting tree clearing needed for the +/- 1.60 acres to maintain the minimal expansion of existing Line #271 right-of-way across their parcels. We appreciate the collaboration and working relationship with TNC on this crossing. See Attachment II.A.9.d of the Transmission Appendix for a letter of collaboration and cooperation from TNC.

Relatedly, discussions with the Corps regarding crossing the Intracoastal Waterway, which is owned and managed by the Corps, yielded the Corps also favoring a transmission line crossing in the western location, co-located with Line #271. This is because, among other things, the Corps believes a crossing in the eastern location would be more environmentally damaging to aquatic resources, be more visually impactful to the existing historic district that encompasses the Intracoastal Waterway, and could interfere with the Corps's planned rebuilding of the bridge allowing North Landing Road to cross the waterway.

In addition to discussions with these stakeholders, as discussed in Sections III.B, III.J, and III.K of the Transmission Appendix, the Company engaged extensively with the public, including Environmental Justice communities, Native American Tribes, other non-governmental organizations, homeowners' associations, church leaders, community-based organization leaders, and other stakeholders to seek input regarding the location and nature of the proposed routes. In addition to in-person meetings and mailings, the Company held numerous virtual and in-person open houses, and utilized its new GeoVoice tool, which allows members of the public to use an interactive online mapping tool to view the proposed routes in relation to places of interest (*e.g.*, their residences),

and to leave geolocated comments and information for the Company to consider. Through various means—whether through public meetings, GeoVoice comments, individual discussions, or other such venues—stakeholder comments were valuable in making adjustments to the routing options throughout the process and the proposed Virginia Facilities are reflective of that input.

Q. Did the Company engage in any other outreach with the public regarding the CVOW Project?

A. The Company began its engagement with the public regarding the CVOW Commercial Project as a continuation of the Company's CVOW Pilot efforts. The public generally includes the fishing community (both recreational and commercial), landowners, community members, civic leaders, faith-based organizations, Environmental Justice communities and advocates, Native American Tribes, environmental groups, historic and scenic resource organizations, and any other interested person that had a connection to the area.

Regarding the proposed onshore transmission lines, community and stakeholder engagement began in earnest in January 2021, with the staff from the Cities of Virginia Beach and Chesapeake briefed in the fall of 2020. As noted above, a full description of the Company's stakeholder and public engagement efforts are included in Sections III.B, III.J, and III.K of the Transmission Appendix, however, I will summarize these efforts below. The Company undertook a comprehensive stakeholder outreach program, which included the following key elements:

- Conducted more than 1,100 outreach encounters with more than 6,500 individuals, including both in-person and virtual meetings with individuals,

Homeowner Associations, civic groups, and church congregations to accommodate community availability and solicit participation in the process in the form of questions, concerns and feedback from diverse audiences;

- Sent seven mailers, totaling more than 140,000 pieces;
- Established a website, a Project email address, a toll-free Project phone number and calendar to schedule meetings with the Company;
- Requested property owner permission to access parcels for surveying activities;
- Hosted 10 virtual and in-person public meetings, reaching more than 600 attendees;
- Held cultural and historic advocacy roundtables and environmental workshops;
- Directly engaged with Native American Tribes in groups and individually;
- Conducted Environmental Justice specific outreach, enlisted a grassroots advisory group and coordinated with trusted individuals and organizations, such as faith-based organizations, and neighborhood and homeowner associations, as well as other EJ-relevant organizations such as local NAACP chapters, diverse chambers of commerce, community organizations and civic leagues, houses-of-faith, historical centers, societies, and preservation groups, and socio-economic equity advocacy groups to ensure appropriate understanding and engagement with the communities directly and indirectly impacted by the CVOW Project. Dominion Energy Virginia consulted with a diverse group of community members knowledgeable of: (1) the surrounding areas' historical and cultural resources; (2) community sentiments, concerns, and feelings surrounding the CVOW Project; (3) best practices for effective communications to diverse audiences; and (4)

potential solutions to identified concerns;

- Engaged local historic and cultural experts to gain a better understanding of potential unregistered or undocumented historic resources that might hold importance to local communities. Through this ground truthing exercise, no such otherwise undocumented resources were identified within a reasonable proximity to the alternative routes;
- Held multiple workshops with Cities of Virginia Beach and Chesapeake and other Hampton Roads leaders, as well as participated in local events;
- Utilized an online tool, GeoVoice, which allows the public to view Project maps and identify potential Project facilities and their proximity to specific addresses and locations, and to leave geo-referenced comments; and
- Translated certain materials in Spanish and Tagalong, with a full translation of the CVOW website in Spanish, to be more inclusive with our sharing of the information pertaining to the CVOW Project.

Q. Following extensive outreach with stakeholders and route evaluation in the Environmental Routing Study, what is the Company's preferred route for the Overhead Transmission Circuits?

A. The Company's preferred route is Harpers to Fentress Proposed Route 1. Harpers to Fentress Proposed Route 1 is a route that was developed in line with recognized best practices in linear siting principles and in consultation with the key governmental entities and landowners in the area, whose support and cooperation is of key importance. As shown in the Transmission Appendix, discussions with these entities have yielded letters of support and acknowledgement of collaboration for the CVOW Project, and that

support has followed the discussions and considerations outlined above, among other things.

Harpers to Fentress Proposed Route 1 utilizes the greatest amount of publicly owned land consistent with the localities' preferences, which mitigates against impacts on private landowners. It utilizes the western crossing location of the Intracoastal Waterway, which is consistent with the priorities and positions of the Corps and TNC, and otherwise is consistent with Chesapeake and Navy structure height considerations in the City of Chesapeake. As detailed in the Environmental Routing Study, Harpers to Fentress Proposed Route 1 is consistent with Commission guidelines favoring the use of existing right-of-way and the co-location of infrastructure. These include co-locating and using the existing rights-of-way for transmission Lines #271, #2240, and #2118/#147 and utilizing the City of Virginia Beach's existing SEPG corridor. Harpers to Fentress Proposed Route 1 is able to utilize 13.1 miles (92%) of routing opportunities whereas the other overhead routes are less, and is the shortest overhead route as well. Harpers to Fentress Proposed Route 1 compares favorably against the other noticed routes and variations, including having the least impacts to forest and tree resources, as well as to aquatic resources (*e.g.*, wetlands). This latter point is of particular importance, in light of the significance of aquatic resource impacts to the Corps's federal permitting process and the water management plans of the City of Virginia Beach.

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

A. Yes, it does.

BACKGROUND AND QUALIFICATIONS OF J. KEVIN CURTIS

J. Kevin Curtis is Vice President-Transmission, Power Delivery. He is responsible for over 6,700 miles of electric transmission lines and more than 800 substation assets providing service to the Company's 2.6 million customers. These responsibilities include transmission and substation planning, engineering, project development, construction, operations and maintenance, NERC compliance, and the Electric Transmission System Operations Center.

Mr. Curtis joined the Company in 1986 as an associate engineer. He held management positions in Electric Distribution in System Reliability and System Planning and became manager-Electric Transmission on July 1, 2006. He was promoted to director-Electric Transmission Planning & Marketing on April 1, 2007 and became director-Electric Transmission SOC & Planning on April 1, 2010. Curtis became director-Electric Transmission Planning & Strategic Initiatives on Jan. 1, 2013, and vice president-Technical Solutions, Power Delivery on Sept. 1, 2015. He assumed his current post in July 2018.

Mr. Curtis serves on the board of the Virginia Early Childhood Foundation and the Industry Advisory Board for the Electrical and Computer Engineering department at Old Dominion University. He is a registered professional engineer in Virginia and North Carolina.

Mr. Curtis received his bachelor's degree in electrical engineering from North Carolina State University and a Master of Business Administration degree from Virginia Commonwealth University.

Nedwick

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Peter Nedwick

Title: Principal Engineer – Electric Transmission Planning

Summary:

Company Witness Peter Nedwick sponsors those sections of the Transmission Appendix describing the Company's transmission system and need for, and benefits of, the proposed Virginia Facilities, as follows:

- 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: Although not applicable, 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.
- Section I.G: This section provides a system map for the affected area.
- Section I.H: This section provides the desired in-service date of the proposed project and the estimated construction time.
- Section I.J: This section provides information about the project if approved by the RTO.
- Section I.K: Although not applicable, this section 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, this section, when applicable, contains information for transmission lines interconnecting a non-utility generator.
- Section II.A.3: This section provides color maps of existing or proposed rights-of-way in the vicinity of the proposed project.
- Section II.A.10: This section provides details of the construction plans for the proposed project, including requested line outage schedules.

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

- Section I.A (co-sponsored with Company Witnesses Sherrill A. Crenshaw, Shane A. Moulton, Thomas A. Dorsey, Lane E. Carr, and Jon M. Berkin): This section details the primary justifications for the proposed project.
- Section I.B (co-sponsored with Company Witnesses Sherrill A. Crenshaw, Shane A. Moulton, and Thomas A. Dorsey): This section details the engineering justifications for the proposed project.
- Section I.I (co-sponsored with Company Witnesses Sherrill A. Crenshaw, Shane A. Moulton, and Thomas A. Dorsey): This section provides the estimated total cost of the proposed project.
- Section I.L (co-sponsored with Company Witness Sherrill A. Crenshaw): This section, when applicable, provides details on the deterioration of structures and associated equipment.
- Section I.N (co-sponsored with Company Witnesses Sherrill A. Crenshaw, Shane A. Moulton, and Thomas A. Dorsey): 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.

Mr. Nedwick also sponsors Section VII.3 of the Generation Appendix as it pertains to electric transmission planning. Lastly, Mr. Nedwick sponsors portions of Filing Schedule 46.

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

DIRECT TESTIMONY
OF
PETER NEDWICK
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2021- 00142

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

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

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

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

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

A. In order to interconnect the proposed CVOW Commercial Project reliably as requested by Dominion Virginia Power's Generation Construction Group ("Dominion Generation" or the "Customer"), and to maintain the structural integrity and reliability of the transmission system in compliance with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, Dominion Energy Virginia requests approval and certification of the following in the Cities of Virginia Beach and Chesapeake, Virginia (collectively referred to as the "Virginia Facilities"):

- Offshore Export Circuits: Install nine 230 kV submarine export circuits, which begin approximately 3.0 miles offshore at the Virginia jurisdictional line demarcating state-owned submerged lands and extend to an onshore Cable Landing Location on the State Military Reservation ("SMR") in the City of Virginia Beach, Virginia;

- Onshore Export Circuits: At the onshore Cable Landing Location on SMR, the Offshore Export Circuits will transition to nine underground 230 kV Onshore Export Circuits, which will extend approximately 4.4 miles to the proposed Harpers Switching Station located on Naval Air Station Oceana ("NAS Oceana") property in Virginia;

- Harpers Switching Station: Construct a 230 kV Gas Insulated Station ("GIS"), 12 line-position, breaker-and-a-half bus configuration switching station on a site located along Harpers Road at NAS Oceana, which will transition the nine Onshore Export Circuits to three Overhead Transmission Circuits. The proposed arrangement will include twenty-five 230 kV 4000A circuit breakers, nine 230 kV 180 MVAR fixed reactor banks, two 230 kV 150 MVAR variable reactor banks, three 250 MVAR static synchronous compensators ("STATCOMs"), and associated facilities;

- Overhead Transmission Circuits: Install three new overhead 230 kV transmission circuits, each with a rating of approximately 1,500 MVA, along the same corridor extending approximately 14.2 miles between the Harpers Switching Station and the Company's existing Fentress Substation and utilizing a combination of new, existing and expanded right-of-way in the Cities of Virginia Beach and Chesapeake, Virginia;

- Line #271 Partial Rebuild: Wreck and rebuild approximately 6.1 miles of the Company's existing approximately 7.1-mile 230 kV overhead Landstown-Pocaty Line #271, which also supports idle 115 kV Line #I-74. With a few exceptions discussed in Section I.A of the Transmission Appendix, the Company will wreck the existing double circuit lattice structures for Lines #271/I-74 and replace them with (i) new double circuit monopole structures to carry Line #271 and one Overhead Transmission Circuit, and (ii) either new single circuit or double circuit monopole structures to carry the two remaining Overhead Transmission Circuits. The Line #271 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities;

- Line #2240 Rebuild: Wreck and rebuild the entire approximately 1.9 miles of the Company's existing 230 kV overhead Fentress-Pocaty Line #2240, which also supports idle 115 kV Line #I-74, where all three Overhead Transmission

Circuits will be co-located on structures within a 40-foot expanded right-of-way (from the existing 120-foot-wide right-of-way to an expanded 160-foot right-of-way). The Line #2240 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities; and

- Fentress Substation Expansion: Expand the Company's existing 500-230 kV Fentress Substation in Chesapeake, Virginia. The proposed arrangement will expand the existing 500 kV yard into a GIS six-position ring bus, install three new 230 kV line terminals, uprate the existing 230 kV Line #2240 terminal to 4000A, which includes replacement of four disconnect switches, and install a new control house to accommodate communications and protective relays. The proposed arrangement, which also includes installation of circuit breakers, transformers and related equipment, expands the Fentress Substation entirely within Company-owned property. Based on conceptual design, in order to expand the Fentress Substation to the north and accommodate the routing of existing Line #2128 into the station, two structures (Structures #2128/1 and #2128/2) will be removed and replaced with four new structures (Structures #2128/1, #2128/1A, #2128/1B, and #2128/2), all entirely within existing right-of-way or on Company-owned property. Additionally, the Company proposes to remove three 500 kV structures (Structures #588/254, #588/255, and #588/256) and replace with two new 500 kV structures (Structures #588/254 and #588/255). Proposed Structure #588/255 is a backbone structure and will be located inside Fentress Substation, while proposed structure #588/254 will be in existing right of way to the west of Fentress Substation.

The purpose of my testimony is to describe the Company's electric transmission system and the need for, and benefits of, the proposed Virginia Facilities. Specifically, I am sponsoring Sections I.C, I.D, I.E, I.G, I.H, I.J, I.K, I.M, II.A.3, and II.A.10 of the Transmission Appendix. Additionally, I co-sponsor the Executive Summary and Section I.A with Company Witnesses Sherrill A. Crenshaw, Shane A. Moulton, Thomas A. Dorsey, Lane E. Carr and Jon M. Berkin; Sections I.B, I.I, and I.N with Company Witnesses Sherrill A. Crenshaw, Shane A. Moulton, and Thomas A. Dorsey; and Section

I.L with Company Witness Sherrill A. Crenshaw. Lastly, I sponsor portions of Filing Schedule 46.

Q. Are you sponsoring any filing schedules in this proceeding?

A. Yes. I am sponsoring portions of Filing Schedule 46. Specifically, I sponsor Filing Schedule 46.b.1.iii, Statement 1, which provides the justification for the proposed costs; Filing Schedule 46.b.1.iv, Statement 4, which address the key documents supporting the Project costs related to transmission; Filing Schedule 46.b.2.iv, Statement 1, which addresses the planning assumptions for the proposed generating unit; and Filing Schedule 46.b.2.vi, Statement 1, which addresses the projected and actual costs of the proposed generating unit.

Q. Do you sponsor any sections in the Generation Appendix of this filing?

A. Yes. I also sponsor Section VII.3 of the Generation Appendix as it pertains to electric transmission planning. Specifically, in response to the additional information and analyses required by the Commission in its July 26, 2021 Order entered in this docket, I discuss the status of the CVOW Commercial Project in the PJM Interconnection Queue and the related backlog.

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

A. Yes, it does.

BACKGROUND AND QUALIFICATIONS OF PETER NEDWICK

Peter Nedwick graduated from the Pennsylvania State University with a Bachelor's Degree in Electrical Engineering. He is also Registered Professional Engineer with the Commonwealth of Virginia (No. 0402 019479).

Mr. Nedwick's experience with the Company includes System Protection, Distribution Planning, and Transmission Planning. He joined the Company in 1984 as an Associate Engineer in the System Protection Group. In 1986, he joined the Company's Transmission Planning Group, where he was promoted to Engineer in 1987 and to Senior Engineer in 1991. While in the Transmission Planning Group, Mr. Nedwick was responsible for special operating studies and for planning the Company's electric transmission system for eastern Virginia and North Carolina.

In 1997, Mr. Nedwick was promoted to Staff Engineer and joined the Company's Distribution Planning Department, where he served as that department's technical expert. While in the Distribution Planning Department, Mr. Nedwick was promoted to Consulting Engineer in 2000. In 2002, Mr. Nedwick joined the Company's Electric Transmission Planning Group and was promoted to Principal Engineer in 2017.

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

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Sherrill A. Crenshaw

Title: Consulting Engineer – Electric Transmission Line Engineering

Summary:

Company Witness Sherrill A. Crenshaw sponsors those sections of the Transmission Appendix providing an overview of the design characteristics of the overhead transmission facilities for the proposed Virginia Facilities, and discusses electric and magnetic field ("EMF") levels pertaining to those overhead facilities, as follows:

- Section I.A (co-sponsored with Company Witnesses Peter Nedwick, Shane A. Moulton, Thomas A. Dorsey, Lane E. Carr and Jon M. Berkin): This section details the primary justifications for the proposed project.
- Section I.B (co-sponsored with Company Witnesses Peter Nedwick, Shane A. Moulton, and Thomas A. Dorsey): This section details the engineering justifications for the proposed project.
- Section I.F (co-sponsored with Company Witnesses Shane A. Moulton and Thomas A. Dorsey): 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 (co-sponsored with Company Witnesses Peter Nedwick, Shane A. Moulton, and Thomas A. Dorsey): This section provides the estimated total cost of the proposed project.
- Section I.L (co-sponsored with Company Witness Peter Nedwick): This section, when applicable, provides details on the deterioration of structures and associated equipment.
- Section I.N (co-sponsored with Company Witnesses Peter Nedwick, Shane A. Moulton, and Thomas A. Dorsey): 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.5 (co-sponsored with Company Witness Shane A. Moulton): This section provides drawings of the right-of-way cross section showing typical transmission lines structure placements.
- Sections II.B.1 to II.B.2 (co-sponsored with Company Witness Shane A. Moulton): These sections provide the line design and operational features of the proposed project, as applicable.
- Sections II.B.3 to II.B.5 (co-sponsored with Company Witnesses Lane E. Carr and Jon M. Berkin): These sections, when applicable, provide supporting structure details along the proposed and alternative routes.
- Section II.B.6 (co-sponsored with Company Witnesses Lane E. Carr, Robert E. Richardson, and Jon M. Berkin): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section IV (co-sponsored with Company Witness Shane A. Moulton): This section provides analysis on the health aspects of electric and magnetic field levels.
- Section V.A (co-sponsored with Company Witnesses Lane E. Carr and Jon M. Berkin): This section provides the proposed route description and structure heights for notice purposes.

Lastly, Mr. Crenshaw sponsors portions of Filing Schedule 46.

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

DIRECT TESTIMONY
OF
SHERRILL A. CRENSHAW
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2021-00142

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

A. My name is Sherrill A. Crenshaw, and I am a Consulting Engineer in the Electric Transmission Line Engineering Department of the Company. My business address is 10900 Nuckols Road, Glen Allen, Virginia 23060. A statement of my qualifications and background is provided as Appendix A.

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

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

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

A. In order to interconnect the proposed CVOW Commercial Project reliably as requested by Dominion Virginia Power's Generation Construction Group ("Dominion Generation" or the "Customer"), and to maintain the structural integrity and reliability of the transmission system in compliance with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, Dominion Energy Virginia requests approval and certification of the following in the Cities of Virginia Beach and Chesapeake, Virginia (collectively referred to as the "Virginia Facilities"):

- Offshore Export Circuits: Install nine 230 kV submarine export circuits, which begin approximately 3.0 miles offshore at the Virginia jurisdictional line

demarcating state-owned submerged lands and extend to an onshore Cable Landing Location on the State Military Reservation ("SMR") in the City of Virginia Beach, Virginia;

- Onshore Export Circuits: At the onshore Cable Landing Location on SMR, the Offshore Export Circuits will transition to nine underground 230 kV Onshore Export Circuits, which will extend approximately 4.4 miles to the proposed Harpers Switching Station located on Naval Air Station Oceana ("NAS Oceana") property in Virginia;

- Harpers Switching Station: Construct a 230 kV Gas Insulated Station ("GIS"), 12 line-position, breaker-and-a-half bus configuration switching station on a site located along Harpers Road at NAS Oceana, which will transition the nine Onshore Export Circuits to three Overhead Transmission Circuits. The proposed arrangement will include twenty-five 230 kV 4000A circuit breakers, nine 230 kV 180 MVAR fixed reactor banks, two 230 kV 150 MVAR variable reactor banks, three 250 MVAR static synchronous compensators ("STATCOMs"), and associated facilities;

- Overhead Transmission Circuits: Install three new overhead 230 kV transmission circuits, each with a rating of approximately 1,500 MVA, along the same corridor extending approximately 14.2 miles between the Harpers Switching Station and the Company's existing Fentress Substation and utilizing a combination of new, existing and expanded right-of-way in the Cities of Virginia Beach and Chesapeake, Virginia;

- Line #271 Partial Rebuild: Wreck and rebuild approximately 6.1 miles of the Company's existing approximately 7.1-mile 230 kV overhead Landstown-Pocaty Line #271, which also supports idle 115 kV Line #I-74. With a few exceptions discussed in Section I.A of the Transmission Appendix, the Company will wreck the existing double circuit lattice structures for Lines #271/I-74 and replace them with (i) new double circuit monopole structures to carry Line #271 and one Overhead Transmission Circuit, and (ii) either new single circuit or double circuit monopole structures to carry the two remaining Overhead Transmission Circuits. The Line #271 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities;

- Line #2240 Rebuild: Wreck and rebuild the entire approximately 1.9 miles of the Company's existing 230 kV overhead Fentress-Pocaty Line #2240, which also supports idle 115 kV Line #I-74, where all three Overhead Transmission Circuits will be co-located on structures within a 40-foot expanded right-of-way (from the existing 120-foot-wide right-of-way to an expanded 160-foot right-of-

way). The Line #2240 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities; and

- Fentress Substation Expansion: Expand the Company's existing 500-230 kV Fentress Substation in Chesapeake, Virginia. The proposed arrangement will expand the existing 500 kV yard into a GIS six-position ring bus, install three new 230 kV line terminals, uprate the existing 230 kV Line #2240 terminal to 4000A, which includes replacement of four disconnect switches, and install a new control house to accommodate communications and protective relays. The proposed arrangement, which also includes installation of circuit breakers, transformers and related equipment, expands the Fentress Substation entirely within Company-owned property. Based on conceptual design, in order to expand the Fentress Substation to the north and accommodate the routing of existing Line #2128 into the station, two structures (Structures #2128/1 and #2128/2) will be removed and replaced with four new structures (Structures #2128/1, #2128/1A, #2128/1B, and #2128/2), all entirely within existing right-of-way or on Company-owned property. Additionally, the Company proposes to remove three 500 kV structures (Structures #588/254, #588/255, and #588/256) and replace with two new 500 kV structures (Structures #588/254 and #588/255). Proposed Structure #588/255 is a backbone structure and will be located inside Fentress Substation, while proposed structure #588/254 will be in existing right of way to the west of Fentress Substation.

The purpose of my testimony is to describe the design characteristics of the overhead transmission facilities for the proposed Virginia Facilities, and also to discuss electric and magnetic field ("EMF") levels pertaining to those overhead facilities. Specifically, I am co-sponsoring the following sections of the Transmission Appendix: the Executive Summary and Section I.A with Company Witnesses Peter Nedwick, Shane A. Moulton, Thomas A. Dorsey, Lane E. Carr and Jon M. Berkin; Sections I.B, I.I, and I.N with Company Witnesses Peter Nedwick, Shane A. Moulton, and Thomas A. Dorsey; Section I.F with Company Witnesses Shane A. Moulton and Thomas A. Dorsey; Section I.L with Company Witness Peter Nedwick; Sections II.A.5, II.B.1, and II.B.2, and IV with

Company Witness Shane A. Moulton; Sections II.B.3 to II.B.5 with Company Witness Lane E. Carr and Jon M. Berkin; Section II.B.6 with Lane E. Carr, Robert E. Richardson, and Jon M. Berkin; and Section V.A with Company Witnesses Lane E. Carr and Jon M. Berkin.

Q. Are you sponsoring any filing schedules in this proceeding?

A. Yes. I am sponsoring portions of Filing Schedule 46. Specifically, I sponsor Filing Schedule 46.b.1.iii, Statement 1, which provides the justification for the proposed costs.

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

A. Yes, it does.

BACKGROUND AND QUALIFICATIONS OF SHERRILL A. CRENSHAW

Sherrill A. Crenshaw graduated from Virginia Polytechnic Institute and State University in 1985 with a Bachelor of Science in Civil Engineering. He joined the Company in 1986 and has held various engineering titles within the Electric Transmission Engineering department, where he currently works as a Consulting Engineer. Mr. Crenshaw is a licensed engineer in the Commonwealth of Virginia.

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

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Shane A. Moulton

Title: Engineer III – Electric Underground Transmission Line Engineering

Summary:

Company Witness Shane A. Moulton sponsors those sections of the Transmission Appendix providing an overview of the design characteristics of the underground transmission facilities for the proposed Virginia Facilities, and discusses electric and magnetic field ("EMF") levels pertaining to those underground facilities, as follows:

- Section I.A (co-sponsored with Company Witnesses Peter Nedwick, Sherrill A. Crenshaw, Thomas A. Dorsey, Lane E. Carr, and Jon M. Berkin): This section details the primary justifications for the proposed project.
- Section I.B (co-sponsored with Company Witnesses Peter Nedwick, Sherrill A. Crenshaw, and Thomas A. Dorsey): This section details the engineering justifications for the proposed project.
- Section I.F (co-sponsored with Company Witnesses Sherrill A. Crenshaw and Thomas A. Dorsey): 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 (co-sponsored with Company Witnesses Peter Nedwick, Sherrill A. Crenshaw, and Thomas A. Dorsey): This section provides the estimated total cost of the proposed project.
- Section I.N (co-sponsored with Company Witnesses Peter Nedwick, Sherrill A. Crenshaw, and Thomas A. Dorsey): 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.5 (co-sponsored with Company Witness Sherrill A. Crenshaw): This section provides drawings of the right-of-way cross section showing typical transmission lines structure placements.
- Sections II.B.1 to II.B.2 (co-sponsored with Company Witness Sherrill A. Crenshaw): These sections provide the line design and operational features of the proposed project, as applicable.
- Section IV (co-sponsored with Company Witness Sherrill A. Crenshaw): This section provides analysis on the health aspects of electric and magnetic field levels.

Additionally, Mr. Moulton sponsors Attachment IV.A.4 of Section IV.A of the Generation Appendix providing an overview of the competitive bid process as it relates to certain underground facilities. Lastly, Mr. Moulton sponsors portions of Filing Schedule 46.

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

DIRECT TESTIMONY
OF
SHANE A. MOULTON
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2021-00142

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

A. My name is Shane A. Moulton, and I am an Engineer III in the Electric Underground Transmission Line Engineering Department of the Company. My business address is 10900 Nuckols Road, Glen Allen, Virginia 23060. A statement of my qualifications and background is provided as Appendix A.

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

A. I am responsible for the estimating, conceptual, and detailed design of underground high voltage transmission line projects from 69 kilovolts ("kV") to 500 kV.

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

A. In order to interconnect the proposed CVOW Commercial Project reliably as requested by Dominion Virginia Power's Generation Construction Group ("Dominion Generation" or the "Customer"), and to maintain the structural integrity and reliability of the transmission system in compliance with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, Dominion Energy Virginia requests approval and certification of the following in the Cities of Virginia Beach and Chesapeake, Virginia (collectively referred to as the "Virginia Facilities"):

- Offshore Export Circuits: Install nine 230 kV submarine export circuits, which begin approximately 3.0 miles offshore at the Virginia jurisdictional line

demarcating state-owned submerged lands and extend to an onshore Cable Landing Location on the State Military Reservation ("SMR") in the City of Virginia Beach, Virginia;

- Onshore Export Circuits: At the onshore Cable Landing Location on SMR, the Offshore Export Circuits will transition to nine underground 230 kV Onshore Export Circuits, which will extend approximately 4.4 miles to the proposed Harpers Switching Station located on Naval Air Station Oceana ("NAS Oceana") property in Virginia;

- Harpers Switching Station: Construct a 230 kV Gas Insulated Station ("GIS"), 12 line-position, breaker-and-a-half bus configuration switching station on a site located along Harpers Road at NAS Oceana, which will transition the nine Onshore Export Circuits to three Overhead Transmission Circuits. The proposed arrangement will include twenty-five 230 kV 4000A circuit breakers, nine 230 kV 180 MVAR fixed reactor banks, two 230 kV 150 MVAR variable reactor banks, three 250 MVAR static synchronous compensators ("STATCOMs"), and associated facilities;

- Overhead Transmission Circuits: Install three new overhead 230 kV transmission circuits, each with a rating of approximately 1,500 MVA, along the same corridor extending approximately 14.2 miles between the Harpers Switching Station and the Company's existing Fentress Substation and utilizing a combination of new, existing and expanded right-of-way in the Cities of Virginia Beach and Chesapeake, Virginia;

- Line #271 Partial Rebuild: Wreck and rebuild approximately 6.1 miles of the Company's existing approximately 7.1-mile 230 kV overhead Landstown-Pocaty Line #271, which also supports idle 115 kV Line #I-74. With a few exceptions discussed in Section I.A of the Transmission Appendix, the Company will wreck the existing double circuit lattice structures for Lines #271/I-74 and replace them with (i) new double circuit monopole structures to carry Line #271 and one Overhead Transmission Circuit, and (ii) either new single circuit or double circuit monopole structures to carry the two remaining Overhead Transmission Circuits. The Line #271 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities;

- Line #2240 Rebuild: Wreck and rebuild the entire approximately 1.9 miles of the Company's existing 230 kV overhead Fentress-Pocaty Line #2240, which also supports idle 115 kV Line #I-74, where all three Overhead Transmission Circuits will be co-located on structures within a 40-foot expanded right-of-way (from the existing 120-foot-wide right-of-way to an expanded 160-foot right-of-

way). The Line #2240 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities; and

- Fentress Substation Expansion: Expand the Company's existing 500-230 kV Fentress Substation in Chesapeake, Virginia. The proposed arrangement will expand the existing 500 kV yard into a GIS six-position ring bus, install three new 230 kV line terminals, uprate the existing 230 kV Line #2240 terminal to 4000A, which includes replacement of four disconnect switches, and install a new control house to accommodate communications and protective relays. The proposed arrangement, which also includes installation of circuit breakers, transformers and related equipment, expands the Fentress Substation entirely within Company-owned property. Based on conceptual design, in order to expand the Fentress Substation to the north and accommodate the routing of existing Line #2128 into the station, two structures (Structures #2128/1 and #2128/2) will be removed and replaced with four new structures (Structures #2128/1, #2128/1A, #2128/1B, and #2128/2), all entirely within existing right-of-way or on Company-owned property. Additionally, the Company proposes to remove three 500 kV structures (Structures #588/254, #588/255, and #588/256) and replace with two new 500 kV structures (Structures #588/254 and #588/255). Proposed Structure #588/255 is a backbone structure and will be located inside Fentress Substation, while proposed structure #588/254 will be in existing right of way to the west of Fentress Substation.

The purpose of my testimony is to describe the design characteristics of the underground transmission facilities for the proposed Virginia Facilities, and also to discuss electric and magnetic field ("EMF") levels pertaining to those underground facilities. Specifically, I am co-sponsoring the following sections of the Transmission Appendix: the Executive Summary and Section I.A with Company Witnesses Peter Nedwick, Sherrill A. Crenshaw, Thomas A. Dorsey, Lane E. Carr and Jon M. Berkin; Sections I.B, I.I, and I.N with Company Witnesses Peter Nedwick, Sherrill A. Crenshaw, and Thomas A. Dorsey; and Sections II.A.5, II.B.1, and II.B.2, and IV with Company Witness Sherrill A. Crenshaw.

Q. Are you sponsoring any filing schedules in this proceeding?

A. Yes. I am sponsoring portions of Filing Schedule 46. Specifically, I sponsor Filing Schedule 46.b.1.iii, Statement 1, which provides the justification for the proposed costs; Filing Schedule 46.b.1.iv, Statement 5, which address the key documents supporting the Project costs related to transmission; Filing Schedule 46.b.2.i, Statement 1, which addresses the need and justification for the proposed generating unit; and Filing Schedule 46.b.2.iv, Statement 1, which addresses the planning assumptions for the proposed generating unit.

Q. Do you sponsor any sections from the Generation Appendix of this filing?

A. Yes. I sponsor Attachment IV.A.4 that is provided in Section IV.A of the Generation Appendix providing an overview of the competitive bid process as it relates to certain underground facilities. Specifically, Attachment IV.A.4 provides the report detailing the process for the Onshore Export Circuits and the Offshore Export Circuits request for proposals.

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

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS OF SHANE A. MOULTON

Shane A Moulton received a Bachelor's degree in Biomechanical Engineer from Drexel University. He has worked in the electric utility industry since 2015. Since joining the Company in 2018, Mr. Moulton's primary responsibility has been the engineering and design of large scale underground transmission capital projects.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Thomas A. Dorsey

Title: Contractor – Substation Engineering

Summary:

Company Witness Thomas A. Dorsey sponsors or co-sponsors the following sections of the Transmission Appendix describing the substation work to be performed for the proposed Virginia Facilities as follows:

- Section I.A (co-sponsored with Company Witnesses Peter Nedwick, Sherrill A. Crenshaw, Shane A. Moulton, Lane E. Carr and Jon M. Berkin): This section details the primary justifications for the proposed project.

- Section I.B (co-sponsored with Company Witnesses Peter Nedwick, Sherrill A. Crenshaw, and Shane A. Moulton): This section details the engineering justifications for the proposed project.

- Section I.F (co-sponsored with Company Witnesses Sherrill A. Crenshaw and Shane A. Moulton): 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 (co-sponsored with Company Witnesses Peter Nedwick, Sherrill A. Crenshaw, and Shane A. Moulton): This section provides the estimated total cost of the proposed project.

- Section I.N (co-sponsored with Company Witnesses Peter Nedwick, Sherrill A. Crenshaw, and Shane A. Moulton): 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.C: This section describes and furnishes a one-line diagram of the substation associated with the proposed project.

Lastly, Mr. Dorsey sponsors portions of Filing Schedule 46.

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

DIRECT TESTIMONY
OF
THOMAS A. DORSEY
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2021-00142

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

A. My name is Thomas A. Dorsey. I am employed by Burns and McDonnell; however, I am a Contractor for the Company's Substation Engineering section of the Electric Transmission group. My business address is 9400 Ward Parkway, Kansas City, Missouri 64114. A statement of my qualifications and background is provided as Appendix A.

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

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

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

A. In order to interconnect the proposed CVOW Commercial Project reliably as requested by Dominion Virginia Power's Generation Construction Group ("Dominion Generation" or the "Customer"), and to maintain the structural integrity and reliability of the transmission system in compliance with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, Dominion Energy Virginia requests

approval and certification of the following in the Cities of Virginia Beach and Chesapeake, Virginia (collectively referred to as the "Virginia Facilities"):

- Offshore Export Circuits: Install nine 230 kV submarine export circuits, which begin approximately 3.0 miles offshore at the Virginia jurisdictional line demarcating state-owned submerged lands and extend to an onshore Cable Landing Location on the State Military Reservation ("SMR") in the City of Virginia Beach, Virginia;

- Onshore Export Circuits: At the onshore Cable Landing Location on SMR, the Offshore Export Circuits will transition to nine underground 230 kV Onshore Export Circuits, which will extend approximately 4.4 miles to the proposed Harpers Switching Station located on Naval Air Station Oceana ("NAS Oceana") property in Virginia;

- Harpers Switching Station: Construct a 230 kV Gas Insulated Station ("GIS"), 12 line-position, breaker-and-a-half bus configuration switching station on a site located along Harpers Road at NAS Oceana, which will transition the nine Onshore Export Circuits to three Overhead Transmission Circuits. The proposed arrangement will include twenty-five 230 kV 4000A circuit breakers, nine 230 kV 180 MVAR fixed reactor banks, two 230 kV 150 MVAR variable reactor banks, three 250 MVAR static synchronous compensators ("STATCOMs"), and associated facilities;

- Overhead Transmission Circuits: Install three new overhead 230 kV transmission circuits, each with a rating of approximately 1,500 MVA, along the same corridor extending approximately 14.2 miles between the Harpers Switching Station and the Company's existing Fentress Substation and utilizing a combination of new, existing and expanded right-of-way in the Cities of Virginia Beach and Chesapeake, Virginia;

- Line #271 Partial Rebuild: Wreck and rebuild approximately 6.1 miles of the Company's existing approximately 7.1-mile 230 kV overhead Landstown-Pocaty Line #271, which also supports idle 115 kV Line #I-74. With a few exceptions discussed in Section I.A of the Transmission Appendix, the Company will wreck the existing double circuit lattice structures for Lines #271/I-74 and replace them with (i) new double circuit monopole structures to carry Line #271 and one Overhead Transmission Circuit, and (ii) either new single circuit or double circuit monopole structures to carry the two remaining Overhead Transmission Circuits. The Line #271 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities;

- Line #2240 Rebuild: Wreck and rebuild the entire approximately 1.9 miles of the Company's existing 230 kV overhead Fentress-Pocaty Line #2240, which also supports idle 115 kV Line #I-74, where all three Overhead Transmission Circuits will be co-located on structures within a 40-foot expanded right-of-way (from the existing 120-foot-wide right-of-way to an expanded 160-foot right-of-way). The Line #2240 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities; and

- Fentress Substation Expansion: Expand the Company's existing 500-230 kV Fentress Substation in Chesapeake, Virginia. The proposed arrangement will expand the existing 500 kV yard into a GIS six-position ring bus, install three new 230 kV line terminals, uprate the existing 230 kV Line #2240 terminal to 4000A, which includes replacement of four disconnect switches, and install a new control house to accommodate communications and protective relays. The proposed arrangement, which also includes installation of circuit breakers, transformers and related equipment, expands the Fentress Substation entirely within Company-owned property. Based on conceptual design, in order to expand the Fentress Substation to the north and accommodate the routing of existing Line #2128 into the station, two structures (Structures #2128/1 and #2128/2) will be removed and replaced with four new structures (Structures #2128/1, #2128/1A, #2128/1B, and #2128/2), all entirely within existing right-of-way or on Company-owned property. Additionally, the Company proposes to remove three 500 kV structures (Structures #588/254, #588/255, and #588/256) and replace with two new 500 kV structures (Structures #588/254 and #588/255). Proposed Structure #588/255 is a backbone structure and will be located inside Fentress Substation, while proposed structure #588/254 will be in existing right of way to the west of Fentress Substation.

The purpose of my testimony is to describe the work to be performed as part of the Virginia Facilities at the Harpers Switching Station, the Fentress Substation Expansion, and the Chicory Switching Station. Specifically, as it pertains to station work, I sponsor Section II.C of the Transmission Appendix. Additionally, I co-sponsor the Executive Summary and Section I.A with Company Witnesses Peter Nedwick, Sherrill A. Crenshaw, Shane A. Moulton, Lane E. Carr and Jon M. Berkin; Sections I.B, I.I, and I.N with Company Witnesses Peter Nedwick, Sherrill A. Crenshaw, and Shane A. Moulton;

and Section I.F of the Appendix with Company Witnesses Sherrill A. Crenshaw and Shane A. Moulton.

Q. Are you sponsoring any filing schedules in this proceeding?

A. Yes. I am sponsoring portions of Filing Schedule 46. Specifically, I sponsor Filing Schedule 46.b.1.iii, Statement 1, which provides the justification for the proposed costs.

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

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS OF THOMAS A. DORSEY

Thomas A. Dorsey received a Bachelor of Science degree in Electrical Engineering from the University of Kansas in 2008. He has been licensed as a Professional Engineer in the State of Kansas since 2013. Mr. Dorsey is a contractor for the Company and has been employed by Burns & McDonnell for 13 years. Mr. Dorsey's experience with Burns & McDonnell includes Electric Transmission Substation System Protection and Facility Design, Electric Transmission Substation Conceptual Design, and Project Management.

Carr

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Lane E. Carr

Title: Senior Siting and Permitting Specialist I

Summary:

Company Witness Lane E. Carr will sponsor those sections of the Transmission Appendix providing an overview of the route for the proposed Virginia Facilities and related permitting, as follows:

- Section II.A.12: This section identifies the counties and localities through which the proposed project will pass and provides General Highway Maps for these localities.

Additionally, Ms. Carr co-sponsors the following portion of the Transmission Appendix:

- Section I.A (co-sponsored with Company Witnesses Peter Nedwick, Sherrill A. Crenshaw, Shane A. Moulton, Thomas A. Dorsey, and Jon M. Berkin): This section details the primary justifications for the proposed project.
- Section II.A.1 (co-sponsored with Company Witness Jon M. Berkin): This section provides the length of the proposed corridor and viable alternatives to the proposed project.
- Section II.A.2 (co-sponsored with Company Witness Jon M. Berkin): This section provides a map showing the route of the proposed project in relation to notable points close to the proposed project.
- Section II.A.4 (co-sponsored with Company Witness Jon M. Berkin): This section explains why the existing right-of-way is not adequate to serve the need.
- Sections II.A.6 to II.A.8 (co-sponsored with Company Witnesses Rachel M. Studebaker and Jon M. Berkin): These sections provide detail regarding the right-of-way for the proposed project.
- Section II.A.9 (co-sponsored with Company Witness Jon M. Berkin): This section describes the proposed route selection procedures and details alternative routes considered.
- Section II.A.11 (co-sponsored with Company Witnesses Rachel M. Studebaker and Jon M. Berkin): This section details how the construction of the proposed project follows the provisions discussed in Attachment 1 of the Transmission Appendix Guidelines.
- Sections II.B.3 to II.B.5 (co-sponsored with Company Witnesses Sherrill A. Crenshaw and Jon M. Berkin): These sections, when applicable, provide supporting structure details along the proposed and alternative routes.
- Section II.B.6 (co-sponsored with Company Witnesses Sherrill A. Crenshaw, Robert E. Richardson, and Jon M. Berkin): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section III (co-sponsored with Company Witnesses Rachel M. Studebaker, Robert E. Richardson, Jon M. Berkin, and Grant T. Hollett): This section details the impact of the proposed project on scenic, environmental, and historic features.
- Section V.A (co-sponsored with Company Witnesses Sherrill A. Crenshaw and Jon M. Berkin): This section provides the proposed route description and structure heights for notice purposes.
- Sections V.B-D (co-sponsored with Company Witnesses Rachel M. Studebaker and Robert E. Richardson): This section provides information related to public notice of the proposed project.

Ms. Carr co-sponsors the DEQ Supplement filed with the Application with Company Witnesses Rachel M. Studebaker and Jon M. Berkin. Lastly, Ms. Carr sponsors portions of Filing Schedule 46.

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

DIRECT TESTIMONY
OF
LANE E. CARR
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2021-00142

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

A. My name is Lane E. Carr, and I am a Senior Siting and Permitting Specialist for the Company. My business address is 10900 Nuckols Road, Glen Allen, Virginia 23060. A statement of my qualifications and background is provided as Appendix A.

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

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

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

A. In order to interconnect the proposed CVOW Commercial Project reliably as requested by Dominion Virginia Power's Generation Construction Group ("Dominion Generation" or the "Customer"), and to maintain the structural integrity and reliability of the transmission system in compliance with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, Dominion Energy Virginia requests

approval and certification of the following in the Cities of Virginia Beach and Chesapeake, Virginia (collectively referred to as the "Virginia Facilities"):

- Offshore Export Circuits: Install nine 230 kV submarine export circuits, which begin approximately 3.0 miles offshore at the Virginia jurisdictional line demarcating state-owned submerged lands and extend to an onshore Cable Landing Location on the State Military Reservation ("SMR") in the City of Virginia Beach, Virginia;

- Onshore Export Circuits: At the onshore Cable Landing Location on SMR, the Offshore Export Circuits will transition to nine underground 230 kV Onshore Export Circuits, which will extend approximately 4.4 miles to the proposed Harpers Switching Station located on Naval Air Station Oceana ("NAS Oceana") property in Virginia;

- Harpers Switching Station: Construct a 230 kV Gas Insulated Station ("GIS"), 12 line-position, breaker-and-a-half bus configuration switching station on a site located along Harpers Road at NAS Oceana, which will transition the nine Onshore Export Circuits to three Overhead Transmission Circuits. The proposed arrangement will include twenty-five 230 kV 4000A circuit breakers, nine 230 kV 180 MVAR fixed reactor banks, two 230 kV 150 MVAR variable reactor banks, three 250 MVAR static synchronous compensators ("STATCOMs"), and associated facilities;

- Overhead Transmission Circuits: Install three new overhead 230 kV transmission circuits, each with a rating of approximately 1,500 MVA, along the same corridor extending approximately 14.2 miles between the Harpers Switching Station and the Company's existing Fentress Substation and utilizing a combination of new, existing and expanded right-of-way in the Cities of Virginia Beach and Chesapeake, Virginia;

- Line #271 Partial Rebuild: Wreck and rebuild approximately 6.1 miles of the Company's existing approximately 7.1-mile 230 kV overhead Landstown-Pocaty Line #271, which also supports idle 115 kV Line #I-74. With a few exceptions discussed in Section I.A of the Transmission Appendix, the Company will wreck the existing double circuit lattice structures for Lines #271/I-74 and replace them with (i) new double circuit monopole structures to carry Line #271 and one Overhead Transmission Circuit, and (ii) either new single circuit or double circuit monopole structures to carry the two remaining Overhead Transmission Circuits. The Line #271 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities;

- Line #2240 Rebuild: Wreck and rebuild the entire approximately 1.9 miles of the Company's existing 230 kV overhead Fentress-Pocaty Line #2240, which also supports idle 115 kV Line #I-74, where all three Overhead Transmission Circuits will be co-located on structures within a 40-foot expanded right-of-way (from the existing 120-foot-wide right-of-way to an expanded 160-foot right-of-way). The Line #2240 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities; and

- Fentress Substation Expansion: Expand the Company's existing 500-230 kV Fentress Substation in Chesapeake, Virginia. The proposed arrangement will expand the existing 500 kV yard into a GIS six-position ring bus, install three new 230 kV line terminals, uprate the existing 230 kV Line #2240 terminal to 4000A, which includes replacement of four disconnect switches, and install a new control house to accommodate communications and protective relays. The proposed arrangement, which also includes installation of circuit breakers, transformers and related equipment, expands the Fentress Substation entirely within Company-owned property. Based on conceptual design, in order to expand the Fentress Substation to the north and accommodate the routing of existing Line #2128 into the station, two structures (Structures #2128/1 and #2128/2) will be removed and replaced with four new structures (Structures #2128/1, #2128/1A, #2128/1B, and #2128/2), all entirely within existing right-of-way or on Company-owned property. Additionally, the Company proposes to remove three 500 kV structures (Structures #588/254, #588/255, and #588/256) and replace with two new 500 kV structures (Structures #588/254 and #588/255). Proposed Structure #588/255 is a backbone structure and will be located inside Fentress Substation, while proposed structure #588/254 will be in existing right of way to the west of Fentress Substation.

The purpose of my testimony is to provide an overview of the route and permitting for the proposed Virginia Facilities. Specifically, I sponsor Section II.A.12 of the Transmission Appendix. Additionally, I co-sponsor the Executive Summary and Section I.A with Company Witnesses Peter Nedwick, Sherrill A. Crenshaw, Shane A. Moulton, Thomas A. Dorsey, and Jon M. Berkin; Sections II.A.1, II.A.2, II.A.4, and II.A.9 with Company Witness Jon M. Berkin; Sections II.A.6 to II.A.8, and II.A.11 with Company Witnesses Rachel M. Studebaker and Jon M. Berkin; Sections II.B.3 to II.B.5 and V.A

with Company Witnesses Sherrill A. Crenshaw and Jon M. Berkin; Section II.B.6 with Company Witnesses Sherrill A. Crenshaw, Robert E. Richardson, and Jon M. Berkin; Section III with Company Witnesses Rachel M. Studebaker, Robert E. Richardson, Jon M. Berkin, and Grant T. Hollett; and Sections V.B-D with Company Witnesses Rachel M. Studebaker and Robert E. Richardson. Lastly, I co-sponsor the DEQ Supplement with Company Witnesses Rachel M. Studebaker and Jon M. Berkin.

Q. Are you sponsoring any filing schedules in this proceeding?

A. Yes. I am sponsoring portions of Filing Schedule 46. Specifically, I sponsor Filing Schedule 46.b.1.iii, Statement 1, which provides the justification for the proposed costs.

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

A. Yes. In accordance with Va. Code § 15.2-2202 E, letters dated September 28, 2021, were sent to Mr. Patrick A. Duhaney, City Manager of the City of Virginia Beach, and Mr. Christopher M. Price, City Manager of the City of Chesapeake, where the Virginia Facilities are located. The letters described the CVOW Project and offered the Cities an opportunity to comment on the Virginia Facilities. Copies of these letters are included as Attachment V.D.1 to the Transmission Appendix.

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

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS OF LANE E. CARR

Lane E. Carr graduated from California Polytechnic State University in 1992 with a Bachelor of Science in Agricultural Business. She also obtained a Master of Science from California Polytechnic State University, San Luis Obispo in 1997. Ms. Carr joined the Company's Transmission Right-of-Way group in January 2019 as a Siting and Permitting Specialist, the position she presently holds. Prior to working for the Company, Ms. Carr worked as an Environmental Inspector for the County of Henrico.

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

Studebaker

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Rachel M. Studebaker

Title: Environmental Specialist III

Summary:

Company Witness Rachel M. Studebaker will sponsor those sections of the Transmission Appendix providing an overview of environmental permitting, as follows:

- Sections II.A.6 to II.A.8 (co-sponsored with Company Witnesses Lane E. Carr and Jon M. Berkin): These sections provide detail regarding the right-of-way for the proposed project.

- Section II.A.11 (co-sponsored with Company Witnesses Lane E. Carr and Jon M. Berkin): This section details how the construction of the proposed project follows the provisions discussed in Attachment 1 of the Transmission Appendix Guidelines.

- Section III (co-sponsored with Company Witnesses Lane E. Carr, Robert E. Richardson, Jon M. Berkin, and Grant T. Hollett): This section details the impact of the proposed project on scenic, environmental, and historic features.

- Sections V.B-D (co-sponsored with Company Witnesses Lane E. Carr and Robert E. Richardson): This section provides information related to public notice of the proposed project.

Finally, Mrs. Studebaker co-sponsors the DEQ Supplement filed with the Application with Company Witnesses Lane E. Carr and Jon M. Berkin.

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

DIRECT TESTIMONY
OF
RACHEL M. STUDEBAKER
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2021-00142

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

A. My name is Rachel M. Studebaker, and I am an Environmental Specialist III for the Company. My business address is 120 Tredegar Street, Richmond, Virginia 23219. A statement of my background and qualifications is included as Appendix A.

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

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

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

A. In order to interconnect the proposed CVOW Commercial Project reliably as requested by Dominion Virginia Power's Generation Construction Group ("Dominion Generation" or the "Customer"), and to maintain the structural integrity and reliability of the transmission system in compliance with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, Dominion Energy Virginia requests

approval and certification of the following in the Cities of Virginia Beach and Chesapeake, Virginia (collectively referred to as the "Virginia Facilities"):

- Offshore Export Circuits: Install nine 230 kV submarine export circuits, which begin approximately 3.0 miles offshore at the Virginia jurisdictional line demarcating state-owned submerged lands and extend to an onshore Cable Landing Location on the State Military Reservation ("SMR") in the City of Virginia Beach, Virginia;

- Onshore Export Circuits: At the onshore Cable Landing Location on SMR, the Offshore Export Circuits will transition to nine underground 230 kV Onshore Export Circuits, which will extend approximately 4.4 miles to the proposed Harpers Switching Station located on Naval Air Station Oceana ("NAS Oceana") property in Virginia;

- Harpers Switching Station: Construct a 230 kV Gas Insulated Station ("GIS"), 12 line-position, breaker-and-a-half bus configuration switching station on a site located along Harpers Road at NAS Oceana, which will transition the nine Onshore Export Circuits to three Overhead Transmission Circuits. The proposed arrangement will include twenty-five 230 kV 4000A circuit breakers, nine 230 kV 180 MVAR fixed reactor banks, two 230 kV 150 MVAR variable reactor banks, three 250 MVAR static synchronous compensators ("STATCOMs"), and associated facilities;

- Overhead Transmission Circuits: Install three new overhead 230 kV transmission circuits, each with a rating of approximately 1,500 MVA, along the same corridor extending approximately 14.2 miles between the Harpers Switching Station and the Company's existing Fentress Substation and utilizing a combination of new, existing and expanded right-of-way in the Cities of Virginia Beach and Chesapeake, Virginia;

- Line #271 Partial Rebuild: Wreck and rebuild approximately 6.1 miles of the Company's existing approximately 7.1-mile 230 kV overhead Landstown-Pocaty Line #271, which also supports idle 115 kV Line #I-74. With a few exceptions discussed in Section I.A of the Transmission Appendix, the Company will wreck the existing double circuit lattice structures for Lines #271/I-74 and replace them with (i) new double circuit monopole structures to carry Line #271 and one Overhead Transmission Circuit, and (ii) either new single circuit or double circuit monopole structures to carry the two remaining Overhead Transmission Circuits. The Line #271 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities;

- Line #2240 Rebuild: Wreck and rebuild the entire approximately 1.9 miles of the Company's existing 230 kV overhead Fentress-Pocaty Line #2240, which also supports idle 115 kV Line #I-74, where all three Overhead Transmission Circuits will be co-located on structures within a 40-foot expanded right-of-way (from the existing 120-foot-wide right-of-way to an expanded 160-foot right-of-way). The Line #2240 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities; and

- Fentress Substation Expansion: Expand the Company's existing 500-230 kV Fentress Substation in Chesapeake, Virginia. The proposed arrangement will expand the existing 500 kV yard into a GIS six-position ring bus, install three new 230 kV line terminals, uprate the existing 230 kV Line #2240 terminal to 4000A, which includes replacement of four disconnect switches, and install a new control house to accommodate communications and protective relays. The proposed arrangement, which also includes installation of circuit breakers, transformers and related equipment, expands the Fentress Substation entirely within Company-owned property. Based on conceptual design, in order to expand the Fentress Substation to the north and accommodate the routing of existing Line #2128 into the station, two structures (Structures #2128/1 and #2128/2) will be removed and replaced with four new structures (Structures #2128/1, #2128/1A, #2128/1B, and #2128/2), all entirely within existing right-of-way or on Company-owned property. Additionally, the Company proposes to remove three 500 kV structures (Structures #588/254, #588/255, and #588/256) and replace with two new 500 kV structures (Structures #588/254 and #588/255). Proposed Structure #588/255 is a backbone structure and will be located inside Fentress Substation, while proposed structure #588/254 will be in existing right of way to the west of Fentress Substation.

The purpose of my testimony is to provide an overview of environmental permitting for the proposed Virginia Facilities. Specifically, I co-sponsor Sections II.A.6 to II.A.8 and II.A.11 of the Transmission Appendix with Company Witnesses Lane E. Carr and Jon M. Berkin; Section III with Company Witnesses Lane E. Carr, Robert E. Richardson, Jon M. Berkin, and Grant T. Hollett; and Sections V.B-D with Company Witnesses Lane E. Carr and Robert E. Richardson. Finally, I co-sponsor the DEQ Supplement with Company Witnesses Lane E. Carr and Jon M. Berkin.

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

A. Yes, it does.

BACKGROUND AND QUALIFICATIONS OF RACHEL M. STUDEBAKER

Rachel M. Studebaker earned her Bachelor of Science in Environmental Science from Virginia Polytechnic Institute and State University (Virginia Tech) in 2006 and her Executive Master of Natural Resources in Global Sustainability from Virginia Tech in 2017. In 2007, she began working as an Environmental Project Manager, coordinating due diligence and technical NEPA review for Department of Housing and Urban Development real estate transaction projects. In 2018, she began working as a Regulatory Specialist II, obtaining Clean Water Act Section 404 and 401 permits for utility, commercial, and residential projects. Mrs. Studebaker joined the Company in 2020 as an Environmental Specialist II to secure environmental permits for electric transmission and substation projects. As of October 1, 2021, Mrs. Studebaker was promoted to Environmental Specialist III. Mrs. Studebaker previously supported the Company in 2019 as a contractor for Dominion Energy Environmental Services.

Mrs. Studebaker has previously submitted pre-filed testimony to the Virginia State Corporation Commission.

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Robert E. Richardson

Title: Communications Consultant - Electric Transmission Communications

Summary:

Company Witness Robert E. Richardson will sponsor those sections of the Transmission Appendix providing an overview of outreach and engagement with the public and interested stakeholders, as follows:

Section II.B.6 (co-sponsored with Company Witnesses Sherrill A. Crenshaw, Lane E. Carr, and Jon M. Berkin): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.

- Section III (co-sponsored with Company Witnesses Lane E. Carr, Rachel M. Studebaker, Jon M. Berkin, and Grant T. Hollett): This section details the impact of the proposed project on scenic, environmental, and historic features.

- Sections V.B-D (co-sponsored with Company Witnesses Lane E. Carr and Rachel M. Studebaker): This section provides information related to public notice of the proposed project.

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

DIRECT TESTIMONY
OF
ROBERT E. RICHARDSON
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2021-00142

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

A. My name is Robert E. Richardson, and I am a Communications Consultant for the Company. My business address is 10900 Nuckols Road, Glen Allen, Virginia 23060. A statement of my qualifications and background is provided as Appendix A.

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

A. I am responsible for directly supporting transmission project managers and their respective project teams by handling direct communication with property owners (*i.e.*, residential, commercial, industrial, and governmental property owners) and other stakeholders impacted by the Company's proposed electric transmission projects. I also communicate the impacts and benefits of the Company's projects to the public by acting as a liaison between the community and the Dominion Energy Virginia Electric Transmission Team.

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

A. In order to interconnect the proposed CVOW Commercial Project reliably as requested by Dominion Virginia Power's Generation Construction Group ("Dominion Generation" or the "Customer"), and to maintain the structural integrity and reliability of the transmission system in compliance with mandatory North American Electric Reliability

Corporation ("NERC") Reliability Standards, Dominion Energy Virginia requests approval and certification of the following in the Cities of Virginia Beach and Chesapeake, Virginia (collectively referred to as the "Virginia Facilities"):

- Offshore Export Circuits: Install nine 230 kV submarine export circuits, which begin approximately 3.0 miles offshore at the Virginia jurisdictional line demarcating state-owned submerged lands and extend to an onshore Cable Landing Location on the State Military Reservation ("SMR") in the City of Virginia Beach, Virginia;

- Onshore Export Circuits: At the onshore Cable Landing Location on SMR, the Offshore Export Circuits will transition to nine underground 230 kV Onshore Export Circuits, which will extend approximately 4.4 miles to the proposed Harpers Switching Station located on Naval Air Station Oceana ("NAS Oceana") property in Virginia;

- Harpers Switching Station: Construct a 230 kV Gas Insulated Station ("GIS"), 12 line-position, breaker-and-a-half bus configuration switching station on a site located along Harpers Road at NAS Oceana, which will transition the nine Onshore Export Circuits to three Overhead Transmission Circuits. The proposed arrangement will include twenty-five 230 kV 4000A circuit breakers, nine 230 kV 180 MVAR fixed reactor banks, two 230 kV 150 MVAR variable reactor banks, three 250 MVAR static synchronous compensators ("STATCOMs"), and associated facilities;

- Overhead Transmission Circuits: Install three new overhead 230 kV transmission circuits, each with a rating of approximately 1,500 MVA, along the same corridor extending approximately 14.2 miles between the Harpers Switching Station and the Company's existing Fentress Substation and utilizing a combination of new, existing and expanded right-of-way in the Cities of Virginia Beach and Chesapeake, Virginia;

- Line #271 Partial Rebuild: Wreck and rebuild approximately 6.1 miles of the Company's existing approximately 7.1-mile 230 kV overhead Landstown-Pocaty Line #271, which also supports idle 115 kV Line #I-74. With a few exceptions discussed in Section I.A of the Transmission Appendix, the Company will wreck the existing double circuit lattice structures for Lines #271/I-74 and replace them with (i) new double circuit monopole structures to carry Line #271 and one Overhead Transmission Circuit, and (ii) either new single circuit or double circuit monopole structures to carry the two remaining Overhead Transmission Circuits. The Line #271 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing

right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities;

- Line #2240 Rebuild: Wreck and rebuild the entire approximately 1.9 miles of the Company's existing 230 kV overhead Fentress-Pocaty Line #2240, which also supports idle 115 kV Line #I-74, where all three Overhead Transmission Circuits will be co-located on structures within a 40-foot expanded right-of-way (from the existing 120-foot-wide right-of-way to an expanded 160-foot right-of-way). The Line #2240 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities; and

- Fentress Substation Expansion: Expand the Company's existing 500-230 kV Fentress Substation in Chesapeake, Virginia. The proposed arrangement will expand the existing 500 kV yard into a GIS six-position ring bus, install three new 230 kV line terminals, uprate the existing 230 kV Line #2240 terminal to 4000A, which includes replacement of four disconnect switches, and install a new control house to accommodate communications and protective relays. The proposed arrangement, which also includes installation of circuit breakers, transformers and related equipment, expands the Fentress Substation entirely within Company-owned property. Based on conceptual design, in order to expand the Fentress Substation to the north and accommodate the routing of existing Line #2128 into the station, two structures (Structures #2128/1 and #2128/2) will be removed and replaced with four new structures (Structures #2128/1, #2128/1A, #2128/1B, and #2128/2), all entirely within existing right-of-way or on Company-owned property. Additionally, the Company proposes to remove three 500 kV structures (Structures #588/254, #588/255, and #588/256) and replace with two new 500 kV structures (Structures #588/254 and #588/255). Proposed Structure #588/255 is a backbone structure and will be located inside Fentress Substation, while proposed structure #588/254 will be in existing right of way to the west of Fentress Substation.

The purpose of my testimony is to provide an overview of outreach and engagement with the public and interested stakeholders. Specifically, I co-sponsor Section II.B.6 of the Transmission Appendix with Company Witnesses Sherrill A. Crenshaw, Lane E. Carr, and Jon M. Berkin; Section III with Company Witnesses Lane E. Carr, Rachel M.

Studebaker, Jon M. Berkin, and Grant T. Hollett; and Sections V.B-D with Company Witnesses Lane E. Carr and Rachel M. Studebaker.

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

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS OF ROBERT E. RICHARDSON

Robert E. Richardson received a Bachelor of Journalism degree from the University of Nebraska-Lincoln in 1993. He has been employed by the Company for seven years. Mr. Richardson's experience with the Company includes Media Relations (2014-2019) and his current position, Electric Transmission Communications (2019-Present).

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Jon M. Berkin, PhD

Title: Partner, Environmental Resource Management

Summary:

Company Witness Jon M. Berkin sponsors the Environmental Routing Study, which includes the Company's Environmental Justice Report, provided as part of the Company's Application. Additionally, Mr. Berkin co-sponsors the following sections of the Transmission Appendix:

- Section I.A (co-sponsored with Company Witnesses Peter Nedwick, Sherrill A. Crenshaw, Shane A. Moulton, Lane E. Carr and Thomas A. Dorsey): This section details the primary justifications for the proposed project.
- Section II.A.1 (co-sponsored with Company Witness Lane E. Carr): This section provides the length of the proposed corridor and viable alternatives to the proposed project.
- Section II.A.2 (co-sponsored with Company Witness Lane E. Carr): This section provides a map showing the route of the proposed project in relation to notable points close to the proposed project.
- Section II.A.4 (co-sponsored with Company Witness Lane E. Carr): This section explains why the existing right-of-way is not adequate to serve the need.
- Sections II.A.6 to II.A.8 (co-sponsored with Company Witnesses Lane E. Carr and Rachel M. Studebaker): These sections provide detail regarding the right-of-way for the proposed project.
- Section II.A.9 (co-sponsored with Company Witness Lane E. Carr): This section describes the proposed route selection procedures and details alternative routes considered.
- Section II.A.11 (co-sponsored with Company Witnesses Lane E. Carr and Rachel M. Studebaker): This section details how the construction of the proposed project follows the provisions discussed in Attachment 1 of the Transmission Appendix Guidelines.
- Sections II.B.3 to II.B.5 (co-sponsored with Company Witnesses Sherrill A. Crenshaw and Lane E. Carr): These sections, when applicable, provide supporting structure details along the proposed and alternative routes.
- Section II.B.6 (co-sponsored with Company Witnesses Sherrill A. Crenshaw, Lane E. Carr, and Robert E. Richardson): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section III (co-sponsored with Company Witness Lane E. Carr, Rachel M. Studebaker, Robert E. Richardson, and Grant T. Hollett): This section details the impact of the proposed project on scenic, environmental, and historic features.
- Section V.A (co-sponsored with Company Witnesses Sherrill A. Crenshaw and Lane E. Carr): This section provides the proposed route description and structure heights for notice purposes.

Additionally, Dr. Berkin co-sponsors the DEQ Supplement filed with this Application with Company Witnesses Lane E. Carr and Rachel M. Studebaker. Dr. Berkin also sponsors Attachment V.C of the Generation Appendix, which contains the environmental justice report included in Section 4.4.2 of the CVOW Commercial Project Construction and Operations Plan submitted to BOEM, pertaining to environmental justice issues. Lastly, Dr. Berkin sponsors portions of Filing Schedule 46.

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

DIRECT TESTIMONY
OF
JON M. BERKIN, PhD
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2021-00142

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

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

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

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

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

In Virginia, we served as routing consultant to Dominion Energy Virginia for its Cannon Branch-Cloverhill 230 kV transmission line project in the City of Manassas and Prince William County, approved by the Commission in Case No. PUE-2011-00011. We similarly served as the routing consultant for the Company's Dahlgren 230 kV double circuit transmission line project in King George County, approved by the Commission in Case No. PUE-2011-00113. ERM also served as the routing consultant for the Company's Surry-Skiffes Creek-Whealton 500 and 230 kV transmission lines in Case No. PUE-2012-00029; for the Company's Remington CT-Warrenton 230 kV Double Circuit transmission line, approved by the Commission in Case No. PUE-2014-00025; for the Haymarket 230 kV Line and Substation Project in Case No. PUE-2015-00107; for the Remington-Gordonsville Electric Transmission Project, approved by the Commission in Case No. PUE-2015-00117; for the Norris Bridge project approved by the Commission in Case No. PUE-2016-00021; for the Company's Idylwood-Tysons 230 kV single circuit underground transmission line, Tysons Substation rebuild and related transmission facilities, approved by the Commission in Case No. PUR-2017-00143; and most recently the Lockridge 230 kV Line Loop and Substation Project in Case No. PUR-2019-00215.

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

Q. What were you asked to do in connection with this case?

A. In order to interconnect the proposed CVOW Commercial Project reliably as requested by Dominion Virginia Power's Generation Construction Group ("Dominion Generation" or the "Customer"), and to maintain the structural integrity and reliability of the transmission system in compliance with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, Dominion Energy Virginia requests approval and certification of the following in the Cities of Virginia Beach and Chesapeake, Virginia (collectively referred to as the "Virginia Facilities"):

- Offshore Export Circuits: Install nine 230 kV submarine export circuits, which begin approximately 3.0 miles offshore at the Virginia jurisdictional line demarcating state-owned submerged lands and extend to an onshore Cable Landing Location on the State Military Reservation ("SMR") in the City of Virginia Beach, Virginia;

- Onshore Export Circuits: At the onshore Cable Landing Location on SMR, the Offshore Export Circuits will transition to nine underground 230 kV Onshore Export Circuits, which will extend approximately 4.4 miles to the proposed Harpers Switching Station located on Naval Air Station Oceana ("NAS Oceana") property in Virginia;

- Harpers Switching Station: Construct a 230 kV Gas Insulated Station ("GIS"), 12 line-position, breaker-and-a-half bus configuration switching station on a site located along Harpers Road at NAS Oceana, which will transition the nine Onshore Export Circuits to three Overhead Transmission Circuits. The proposed arrangement will include twenty-five 230 kV 4000A circuit breakers, nine 230 kV 180 MVAR fixed reactor banks, two 230 kV 150 MVAR variable reactor banks, three 250 MVAR static synchronous compensators ("STATCOMs"), and associated facilities;

- Overhead Transmission Circuits: Install three new overhead 230 kV transmission circuits, each with a rating of approximately 1,500 MVA, along the same corridor extending approximately 14.2 miles between the Harpers

Switching Station and the Company's existing Fentress Substation and utilizing a combination of new, existing and expanded right-of-way in the Cities of Virginia Beach and Chesapeake, Virginia;

- Line #271 Partial Rebuild: Wreck and rebuild approximately 6.1 miles of the Company's existing approximately 7.1-mile 230 kV overhead Landstown-Pocaty Line #271, which also supports idle 115 kV Line #I-74. With a few exceptions discussed in Section I.A of the Transmission Appendix, the Company will wreck the existing double circuit lattice structures for Lines #271/I-74 and replace them with (i) new double circuit monopole structures to carry Line #271 and one Overhead Transmission Circuit, and (ii) either new single circuit or double circuit monopole structures to carry the two remaining Overhead Transmission Circuits. The Line #271 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities;

- Line #2240 Rebuild: Wreck and rebuild the entire approximately 1.9 miles of the Company's existing 230 kV overhead Fentress-Pocaty Line #2240, which also supports idle 115 kV Line #I-74, where all three Overhead Transmission Circuits will be co-located on structures within a 40-foot expanded right-of-way (from the existing 120-foot-wide right-of-way to an expanded 160-foot right-of-way). The Line #2240 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities; and

- Fentress Substation Expansion: Expand the Company's existing 500-230 kV Fentress Substation in Chesapeake, Virginia. The proposed arrangement will expand the existing 500 kV yard into a GIS six-position ring bus, install three new 230 kV line terminals, uprate the existing 230 kV Line #2240 terminal to 4000A, which includes replacement of four disconnect switches, and install a new control house to accommodate communications and protective relays. The proposed arrangement, which also includes installation of circuit breakers, transformers and related equipment, expands the Fentress Substation entirely within Company-owned property. Based on conceptual design, in order to expand the Fentress Substation to the north and accommodate the routing of existing Line #2128 into the station, two structures (Structures #2128/1 and #2128/2) will be removed and replaced with four new structures (Structures #2128/1, #2128/1A, #2128/1B, and #2128/2), all entirely within existing right-of-way or on Company-owned property. Additionally, the Company proposes

to remove three 500 kV structures (Structures #588/254, #588/255, and #588/256) and replace with two new 500 kV structures (Structures #588/254 and #588/255). Proposed Structure #588/255 is a backbone structure and will be located inside Fentress Substation, while proposed structure #588/254 will be in existing right of way to the west of Fentress Substation.

ERM was engaged on behalf of the Company to help collect information within the study area, identity potential routes, perform a routing analysis comparing the route alternatives, and document the routing efforts in an Environmental Routing Study. ERM defined a study area for identifying potential alternatives for the onshore Project components, then mapped environmental, scenic, cultural, and historic resources, routing constraints, and routing opportunities (*e.g.*, abilities to utilize existing right-of-way) within this area.

The purpose of my testimony is to introduce and sponsor the Environmental Routing Study, which is included as part of the Application filed by the Company in this proceeding. Additionally, I co-sponsor the Executive Summary and Section I.A of the Transmission Appendix with Company Witnesses Peter Nedwick, Sherrill A. Crenshaw, Shane A. Moulton, Thomas A. Dorsey, and Lane Carr; Sections II.A.1, II.A.2, II.A.4, and II.A.9 with Company Witness Lane E. Carr; Sections II.A.6 to II.A.8, and II.A.11 with Company Witness Lane E. Carr and Rachel M. Studebaker; Sections II.B. 3 to II.B.5 and V.A with Company Witnesses Sherrill A. Crenshaw and Lane E. Carr; Sections II.B.6 with Company Witnesses Sherrill A. Crenshaw, Lane E. Carr, and Robert Robertson; and Section III with Company Witnesses Lane E. Carr, Rachel M. Studebaker, Robert E. Richardson, and Grant T. Hollett. Lastly, I co-sponsor the DEQ Supplement with Company Witnesses Lane E. Carr and Rachel M. Studebaker.

Q. Are you sponsoring any filing schedules in this proceeding?

A. Yes. I am sponsoring portions of Filing Schedule 46. Specifically, I sponsor Filing Schedule 46.b.1.iii, Statement 1, which provides the justification for the proposed costs; and Filing Schedule 46.b.2.vi, Statement 1, which addresses the projected and actual costs of the proposed generating unit.

Q. Do you sponsor any sections from the Generation Appendix for this filing?

A. Yes. I co-sponsor Section V.C of the Generation Appendix with Company Witness Scott Lawton. Specifically, I sponsor Attachment V.C of the Generation Appendix, which contains the environmental justice report included in Section 4.4.2 of the CVOW Commercial Project Construction and Operations Plan submitted to the Bureau of Ocean Energy Management.

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

A. Yes, it does.

BACKGROUND AND QUALIFICATIONS OF JON M. BERKIN

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

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

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

Transmission Appendix

COMMONWEALTH OF VIRGINIA
BEFORE THE
STATE CORPORATION COMMISSION

APPLICATION OF

VIRGINIA ELECTRIC AND POWER COMPANY

FOR APPROVAL AND CERTIFICATION
OF ELECTRIC TRANSMISSION FACILITIES

Virginia Facilities

Application No. 308

Appendix

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

Case No. PUR-2021-00142

Filed: November 5, 2021

TABLE OF CONTENTS

EXECUTIVE SUMMARY

On September 25, 2019, Virginia Electric and Power Company's ("Dominion Energy Virginia" or the "Company") Generation Construction Group ("Dominion Generation" or the "Customer") submitted three queue requests to PJM Interconnection, L.L.C. ("PJM") (PJM Generation Queue Projects AF1-123, 124 and 125) to interconnect the Customer's Coastal Virginia Offshore Wind Commercial Project ("CVOW Commercial Project," "CVOW Project" or "CVOW") with Dominion Energy Virginia's electric transmission system. Each queue request was for 880 MW of energy, giving the combined CVOW Commercial Project queues a collective rating of 2,640 MW (nominal) of energy.[1]

In order to interconnect the proposed CVOW Commercial Project reliably as requested by the Customer, and to maintain the structural integrity and reliability of the transmission system in compliance with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, Dominion Energy Virginia proposes the following in the Cities of Virginia Beach and Chesapeake, Virginia (collectively referred to as the "Virginia Facilities"):

- Offshore Export Circuits: Install nine 230 kV submarine export circuits, which begin approximately 3.0 miles offshore at the Virginia jurisdictional line demarcating state-owned submerged lands and extend to an onshore Cable Landing Location on the State Military Reservation ("SMR") in the City of Virginia Beach, Virginia;[2]

- Onshore Export Circuits: At the onshore Cable Landing Location on SMR, the Offshore Export Circuits will transition to nine underground 230 kV Onshore Export Circuits, which will extend approximately 4.4 miles to the proposed Harpers Switching Station located on Naval Air Station Oceana ("NAS Oceana") property in Virginia;

- Harpers Switching Station: Construct a 230 kV Gas Insulated Station ("GIS"), 12 line-position, breaker-and-a-half bus configuration switching station on a site located along Harpers Road at NAS Oceana, which will transition the nine Onshore Export Circuits to three Overhead Transmission Circuits. The proposed arrangement will include twenty-five 230 kV 4000A circuit breakers, nine 230 kV 180 MVAR[3] fixed reactor banks, two 230 kV 150 MVAR variable reactor banks, three 250 MVAR static

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[1] As discussed in the Generation Appendix, which is being filed in support of this Application, the CVOW Commercial Project currently is projected to have a combined nominal capacity of 2,587 MW. See Section II.B of the Generation Appendix.

[2] For purposes of this Transmission Appendix, the Offshore Export Circuits commence 3.0 miles offshore. See Section I.A of the Generation Appendix filed with the Application for a detailed description of the Offshore Export Circuits, which are referred to therein as the Offshore Export Cables. Use of "Offshore Export Circuits" herein refers to the grouping of three Offshore Export Cables (totaling nine) coming in from an offshore substation for transfer of electricity from 3.0 miles offshore to the Cable Landing Location at SMR.

[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 the equipment ratings to handle the apparent power, which includes the real and reactive load components.

synchronous compensators ("STATCOMs"), and associated facilities;

- Overhead Transmission Circuits: Install three new overhead 230 kV transmission circuits, each with a rating of approximately 1,500 MVA, along the same corridor extending approximately 14.2 miles between the Harpers Switching Station and the Company's existing Fentress Substation and utilizing a combination of new, existing and expanded right-of-way in the Cities of Virginia Beach and Chesapeake, Virginia;

- Line #271 Partial Rebuild: Wreck and rebuild approximately 6.1 miles of the Company's existing approximately 7.1-mile 230 kV overhead Landstown-Pocaty Line #271, which also supports idle 115 kV Line #I-74. With a few exceptions discussed in Section I.A of this Appendix, the Company will wreck the existing double circuit lattice structures for Lines #271/#I-74 and replace them with (i) new double circuit monopole structures to carry Line #271 and one Overhead Transmission Circuit, and (ii) either new single circuit or double circuit monopole structures to carry the two remaining Overhead Transmission Circuits. The Line #271 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74.[4] The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities;[5]

- Line #2240 Rebuild: Wreck and rebuild the entire approximately 1.9 miles of the Company's existing 230 kV overhead Fentress-Pocaty Line #2240, which also supports idle 115 kV Line #I-74, where all three Overhead Transmission Circuits will be co-located on structures within a 40-foot expanded right-of-way (from the existing 120-foot-wide right-of-way to an expanded 160-foot right-of-way). The Line #2240 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74.[6] The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these

[4] The Company considers the removal of idle Line #I-74, as described herein for both the Line #271 Partial Rebuild and Line #2240 Rebuild, to qualify as "ordinary extensions or improvements in the usual course of business" pursuant to § 56-265.2 A 1 of the Code of Virginia ("Va. Code") and, therefore, does not require approval pursuant to Va. Code § 56-46.1 B or a certificate of public convenience and necessity ("CPCN") from the State Corporation Commission (the "Commission"). Should the Commission determine that a CPCN is required for the work associated with the removal of idle Line #I-74 as described herein, the Company requests that the Commission grant such CPCN as part of its final order in this proceeding.

[5] To the extent the Commission approves a route for the Overhead Transmission Circuits that includes the partial rebuild of Line #271, the Company would ask that the Commission's final order also include amended CPCN approval for that work, to the extent necessary.

[6] *See supra* n. 4.

structures as part of the Virginia Facilities;[7]

- Fentress Substation Expansion: Expand the Company's existing 500-230 kV Fentress Substation in Chesapeake, Virginia. The proposed arrangement will expand the existing 500 kV yard into a GIS six-position ring bus, install three new 230 kV line terminals, uprate the existing 230 kV Line #2240 terminal to 4000A, which includes replacement of four disconnect switches, and install a new control house to accommodate communications and protective relays. The proposed arrangement, which also includes installation of circuit breakers, transformers and related equipment, expands the Fentress Substation entirely within Company-owned property. Based on conceptual design, in order to expand the Fentress Substation to the north and accommodate the routing of existing Line #2128 into the station, two structures (Structures #2128/1 and #2128/2) will be removed and replaced with four new structures (Structures #2128/1, #2128/1A, #2128/1B, and #2128/2), all entirely within existing right-of-way or on Company-owned property.[8] Additionally, the Company proposes to remove three 500 kV structures (Structures #588/254, #588/255, and #588/256) and replace with two new 500 kV structures (Structures #588/254 and #588/255). Proposed Structure #588/255 is a backbone structure and will be located inside Fentress Substation, while proposed Structure #588/254 will be in existing right of way to the west of Fentress Substation.[9]

The proposed Virginia Facilities represent the minimal amount of transmission facilities required to interconnect the CVOW Commercial Project reliably with the existing transmission system consistent with Dominion Transmission's[10] Facility Interconnection Requirements,[11] which are a

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[7] To the extent the Commission approves a route for the Overhead Transmission Circuits that includes the rebuild of Line #2240, the Company would ask that the Commission's final order also include amended CPCN approval for that work, to the extent necessary.

[8] The Company considers the removal of two structures supporting existing 230 kV Line #2128 (Structures #2128/1 and #2128/2) and replacement with four new structures (Structures #2128/1, #2128/1A, #2128/1B, and #2128/2), all entirely within existing right-of-way or on Company-owned property for the purposes of expanding the Fentress Substation to the north and accommodating the routing of Line #2128 into the station as described herein, to qualify as "ordinary extensions or improvements in the usual course of business" pursuant to Va. Code § 56-265.2 A 1 and, therefore, does not require approval pursuant to Va. Code § 56-46.1 B or a CPCN from the Commission. Should the Commission determine that a CPCN is required for the work associated with this limited work as described herein, the Company requests that the Commission grant such CPCN as part of its final order in this proceeding.

[9] The Company considers the removal of three structures supporting existing 500 kV Line #588 (Structures #588/254, #588/255, and #588/256) and replacement with two new 500 kV structures (Structures #588/254 and #588/255) within Company-owned property or existing right-of-way for the purposes of expanding the Fentress Substation to the north, as described herein, to qualify as "ordinary extensions or improvements in the usual course of business" pursuant to Va. Code § 56-265.2 A 1 and, therefore, does not require approval pursuant to Va. Code § 56-46.1 B or a CPCN from the Commission. Should the Commission determine that a CPCN is required for the work associated with this limited work as described herein, the Company requests that the Commission grant such CPCN as part of its final order in this proceeding.

[10] For purposes of this Appendix, the term Dominion Transmission is used to describe the Company's transmission function as it interfaces with PJM and Dominion Generation in the interconnection process.

[11] Dominion Transmission's Facility Interconnection Requirements (or "FIR") document is available at: https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/virginia/parallel-generation/facility-connection-requirements.pdf?la=en&rev=f280781e90cf47f69ea526c944c9c347&hash=82DD2567D0B033C47536134B8C4D5C5E.

required NERC Reliability Standard,[12] and Dominion Transmission's reliability criteria. These requirements are in addition to those determined as part of the PJM generation queue process as described in PJM Manual 14A: New Services Request Process.[13]

Routing

The route of the Offshore Export Circuits, which begins for purposes of this Transmission Appendix approximately 3.0 miles offshore at the Virginia jurisdictional line demarcating state-owned submerged lands and extends to the proposed onshore Cable Landing Location, is subject to evaluation and approval by state and federal agencies, which includes, among others, the Bureau of Ocean Energy Management ("BOEM"), the Commonwealth of Virginia, the U.S. Army Corps of Engineers ("Corps"), the Virginia Marine Resources Commission ("VMRC"), and the City of Virginia Beach. Pursuant to consultation with these stakeholders, the Company has developed one proposed route for the Offshore Export Circuits.

From the Cable Landing Location to the Harpers Switching Station, the approximately 4.4-mile underground route of the Onshore Export Circuits utilizes new right-of-way that has been agreed upon by SMR, the U.S. Navy ("Navy" or "USN"), and the City of Virginia Beach, whose properties are impacted by the route. Pursuant to discussions with these stakeholders regarding use of their properties, the Company has developed one proposed underground route for the Onshore Export Circuits from the Cable Landing Location to the Harpers Switching Station. This portion of the route also is subject to review by other state and federal agencies, including BOEM, the Corps, and the City of Virginia Beach.

From the proposed Harpers Switching Station to the Company's existing Fentress Substation, the approximately 14.2-mile route of the three new 230 kV Overhead Transmission Circuits utilizes a combination of new, existing and expanded right-of-way. Following extensive study and outreach, the Company identified four routes for the segment of the new transmission lines from Harpers Switching Station to Fentress Substation, which includes three overhead routes and variations and one hybrid route (underground and overhead). The Company additionally identified an entirely underground route, which was rejected from consideration. This portion of the route also is subject to review by other state, local, and federal agencies, including BOEM, the Corps, and the Cities of Chesapeake and Virginia Beach.

Accordingly, the Company is proposing the following routes for notice: one proposed route for the Offshore Export Circuits; one proposed underground route for the Onshore Export Circuits; and one proposed and two alternative overhead routes and variations and one hybrid route (underground and overhead) for the Overhead Transmission Circuits.[14] Discussion of the proposed and alternative routes, as well as other routes that the Company studied but ultimately rejected, is

[12] 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. *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.

[13] *See* https://www.pjm.com/directory/manuals/m14a/index.html#about.html.

[14] Subject to final engineering, coordination with landowners, and working through the BOEM process, there may be slight variations to the route or engineering design. The Company does not believe any such slight variations would require updated notice.

provided in Section II of this Appendix and in the Environmental Routing Study included with the Application.

Estimated Conceptual Costs

The estimated conceptual cost of the proposed onshore Virginia Facilities[15] is approximately 1,148.5 million, which includes approximately $774.3 million in transmission-related costs, and approximately $374.2 million for substation-related work (2021 dollars).

In-Service Date

The desired in-service target date for the Virginia Facilities is July 31, 2025.[16] The Company estimates that it will take approximately 39 months for detailed engineering, materials procurement, permitting, 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 August 5, 2022.[17] Should the Commission issue a final order by August 5, 2022, the Company estimates that construction of the Virginia Facilities should begin by August 1, 2023, and be completed by July 31, 2025. This construction timeline will enable the Company to meet the targeted in-service date for the Virginia Facilities. This schedule is contingent upon obtaining the necessary permits. Dates may need to be adjusted based on permitting delays or design modifications to comply with additional agency requirements identified during the permitting application process.[18]

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[15] The costs for the Virginia Facilities include all onshore costs from the Cable Landing Location to Fentress Substation. In addition, the Virginia Facilities' costs include the direct pipe installation work associated with pulling the Offshore Export Circuits from approximately 1,800 feet offshore to the Cable Landing Location, as well as the horizontal directional drilling ("HDD") and trenching work required to pull the Onshore Export Circuits from the Cable Landing Location to the Harpers Switching Station. The costs associated with this cable pulling work, as well as the costs associated with the Onshore Export Circuits were competitively bid. Other than these specific costs, no costs associated with the Offshore Export Circuits are included in the Virginia Facilities conceptual cost estimate.

[16] Dominion Generation has indicated that it expects rolling commissioning of the CVOW Commercial Project wind turbine generators to commence in August 2025 and continue through year end 2026. See Attachment IV.B of the Generation Appendix. *See also, infra*, n. 32.

[17] As part of this Application, the Company is seeking a CPCN for the Virginia Facilities as described herein, as well as approval of a rate adjustment clause ("RAC"), designated Rider OSW, pursuant to Va. Code § 56-585.1 A 6 ("Subsection A 6") for recovery of costs associated with the CVOW Commercial Project, as described in the Generation Appendix. While there is no statutory deadline for the Commission to grant a CPCN for the Virginia Facilities, Va. Code § 56-585.1 A 7 requires a final order be entered by the Commission on a Subsection A 6 RAC no more than nine months after the application filing date. The Company respectfully requests the CPCN be issued by the deadline for the Subsection A 6 RAC in order to support the Project construction schedule.

[18] Of note, and as discussed above, the Project and onshore routes are subject to review by federal agencies. As discussed in greater detail in Section III.L of this Appendix, this process is being led by BOEM, already has begun, and currently is expected to conclude in summer of 2023. Changes to the conclusion of the BOEM-led process, or expected issuance of federal approvals thereafter, could impact the anticipated construction start date for the Virginia Facilities.

I. NECESSITY FOR THE PROPOSED PROJECT

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

Response: The proposed Virginia Facilities are necessary to interconnect the proposed CVOW Commercial Project reliably as requested by Dominion Generation, and to maintain the structural integrity and reliability of the transmission system in compliance with mandatory NERC Reliability Standards, in order to allow the energy output of the CVOW Commercial Project onto the existing transmission system. See Attachment I.A.1 for an overview map of the proposed Virginia Facilities.

Dominion Energy Virginia's transmission system is responsible for providing transmission service: (i) for redelivery to the Company's retail customers; (ii) to Appalachian Power Company, Old Dominion Electric Cooperative, Northern Virginia Electric Cooperative, Central Virginia Electric Cooperative, and Virginia Municipal Electric Association for redelivery to their retail customers in Virginia; and, (iii) to North Carolina Electric Membership Corporation and North Carolina Eastern Municipal Power Agency for redelivery to their customers in North Carolina (collectively, the "Dominion Energy Zone" or the "Dom Zone"). Any new generating facility must interconnect with the Dominion Energy Virginia's transmission system in accordance with Dominion Transmission's Facility Interconnection Requirements including the Electric Transmission Planning Criteria shown in Attachment 1 of that document. Any load or generating facility which fails to meet the requirements of the Company's Planning Criteria or PJM's Planning Criteria will necessitate a reliability improvement. The proposed Virginia Facilities are necessary to comply with Dominion Transmission's Facility Interconnection Requirements and PJM's Criteria requirements.

Dominion Energy Virginia is part of the PJM regional transmission organization ("RTO"), which provides service to a large portion of the eastern United States. PJM is currently responsible for ensuring the reliability of, and coordinating the movement of, electricity through all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia.

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

extremely reliant on a robust and reliable regional transmission system.

NERC has been designated by the Federal Energy Regulatory Commission ("FERC") as the electric reliability organization for the United States. Accordingly, NERC requires that the planning authority and transmission planner develop planning criteria to ensure compliance with NERC Reliability Standards. Mandatory NERC Reliability Standards require that a 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.[19]

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

CVOW Commercial Project

On September 25, 2019, Dominion Generation submitted three interconnection queue requests with PJM to construct the following:

- AF1-123: an 880 MW Off-Shore Wind Facility with a projected in-service date ("ISD") of December 31, 2025;
- AF1-124: an 880 MW Off-Shore Wind Facility with a projected ISD of December 31, 2026; and
- AF1-125: an 880 MW Off-Shore Wind Facility with a projected ISD of December 31, 2024.

Collectively, these three queue requests totaling 2,640 MW[20] (nominal) comprise the CVOW Commercial Project[21] located in a federal lease area beginning approximately 27 statute miles (approximately 24 nautical miles)[22] off the coast of Virginia Beach, Virginia. On January 22, 2020, PJM issued the Feasibility Study Reports for the three queue requests that constitute the proposed CVOW Commercial Project.[23] On September 1, 2020, PJM issued the System Impact Study Reports for the three CVOW Project queue requests.[24] As discussed below, in light of ongoing queue backlogs and continuing reviews by PJM, the Network Upgrades identified in these studies are considered initial and subject to change. Nevertheless, this information represents the most up to date and best information

[19] *See supra*, n. 12.
[20] *See supra*, n. 1.
[21] PJM recognizes 802.5 MW of this facility as capacity.
[22] Hereinafter, all miles will be noted as approximate statute miles, unless otherwise indicated.
[23] The Feasibility Study Reports are publicly available at https://www.pjm.com/planning/services-requests/interconnection-queues.
[24] The System Impact Study Reports are publicly available at https://www.pjm.com/planning/services-requests/interconnection-queues.

regarding Network Upgrades at this time.

Dominion Generation executed a Facility Study Agreement with PJM on October 20, 2020, with an estimated completion date of April 2022. On January 4, 2021, an Interim ISA was executed between PJM, Dominion Transmission and Dominion Generation to allow for the permitting and engineering of the transmission facilities between the Interconnection Substation (Harpers Switching Station) and the expansion required at Fentress Substation to interconnect the new transmission facilities.

Since Dominion Generation executed a Facility Study Agreement, PJM placed all ongoing study work in the generation queues on hold in an attempt to resolve the current backlog with regards to issuing Facility Study Reports and ISAs. In October 2021, PJM proposed four frameworks for solutions regarding the backlog.[25] All four options utilize an effective date of October 1, 2022 ("Effective Date"). PJM is planning to complete all projects in queue AD2 by the Effective Date. After the Effective Date, the selected transition option will go into effect. Generally, for all options, PJM is estimating completing (either to an ISA or withdrawal) 300 projects per year. Under all of the options PJM currently is considering to address the backlog, it appears PJM will likely complete its work for the CVOW Commercial Project prior to the proposed interconnection and energization dates. Additional discussion is provided in Section VII.3 of the Generation Appendix.

The Company anticipates that, once PJM completes its backlog study process and issues the Facility Study Report for the CVOW Commercial Project, the currently identified Network Upgrades likely will change from those preliminarily identified in the System Impacts Study Report, along with their associated costs, as certain Network Upgrades may change or may no longer be required and cost allocations and the associated Network Upgrade Costs are updated. These changes in project scopes and required Network Upgrades, along with projected projects costs are a normal part of the PJM Interconnection Queue Process and not unique to the current PJM queue backlog.

Virginia Facilities

In order to interconnect the proposed CVOW Commercial Project reliably as requested by the Customer, and to maintain the structural integrity and reliability of the transmission system in compliance with mandatory NERC Reliability Standards, the Company proposes the following Virginia Facilities in the Cities of Virginia Beach and Chesapeake, Virginia:

- *Offshore Export Circuits*: Install nine 230 kV submarine export circuits, which begin approximately 3.0 miles offshore at the Virginia jurisdictional line

[25] PJM's summary of Proposed Transition Options is available at https://www.pjm.com/-/media/committees-groups/task-forces/iprtf/2021/20211007/20211007-item-02a-solution-proposal-framework.ashx.

demarcating state-owned submerged lands and extend to an onshore Cable Landing Location on SMR in the City of Virginia Beach, Virginia;

- *Onshore Export Circuits*: At the onshore Cable Landing Location on SMR, the Offshore Export Circuits will transition to nine underground 230 kV export circuits, which will extend underground approximately 4.4 miles to the proposed Harpers Switching Station in the City of Virginia Beach, Virginia;

- *Harpers Switching Station*: Construct a 230 kV GIS, 12 line-position, breaker-and-a-half bus configuration switching station on a site located along Harpers Road at NAS Oceana in Virginia, which will transition the nine Onshore Export Circuits to three Overhead Transmission Circuits. The proposed arrangement will include twenty-five 230 kV 4000A circuit breakers, nine 230 kV 180 MVAR fixed reactor banks, two 230 kV 150 MVAR variable reactor banks, three 250 MVAR STATCOMs, and associated facilities. See Attachment II.C.1 for a one-line diagram of the Harpers Switching Station;

- *Overhead Transmission Circuits*: Install three new overhead 230 kV transmission circuits, each with a rating of approximately 1,500 MVA, along the same corridor extending approximately 14.2 miles between the Harpers Switching Station and the Company's existing Fentress Substation and utilizing a combination of new, existing and expanded right-of-way in the Cities of Virginia Beach and Chesapeake, Virginia;

- *Line #271 Partial Rebuild*: Wreck and rebuild approximately 6.1 miles of the Company's existing approximately 7.1-mile 230 kV overhead Landstown-Pocaty Line #271, which also supports idle 115 kV Line #I-74. The Company will wreck the existing double circuit lattice structures for Lines #271/#I-74 and replace them with new double circuit monopole structures to carry Line #271 and one Overhead Transmission Circuit. As discussed below in more detail, the Company additionally will either install new single circuit or double circuit monopole structures to carry the two remaining Overhead Transmission Circuits.

  The existing Lines #271/#I-74 corridor is 120 feet wide. For a majority of the route, an additional 40 feet of new right-of-way will be needed for a total right-of-way width of 160 feet. The additional 40 feet will generally be on the west side of the existing right-of-way where two new single circuit monopole structures will be utilized in addition to the rebuilt double circuit monopole structures for Line #271. There are exceptions to this configuration:

  i. In Virginia Beach where the existing right-of-way crosses: (1) the Highland Acres and Highland Meadows subdivisions, and (2) the Dewberry Farms, Indian River Woods, and Indian River Farms subdivisions. In these two places (about 0.9 mile), the right-of-way will be limited to the existing 120-foot width due to adjacent residential development that precludes expansion of the Line #271 right-of-way. The existing double circuit lattice

structures will be wrecked and replaced with double circuit monopole structures to carry Line #271 and one Overhead Transmission Circuit, and new double circuit monopole structures will be installed to carry two Overhead Transmission Circuits.

ii. In Chesapeake where the existing right-of-way crosses: (1) Mt. Pleasant Road, a non-typical structure configuration will be used along a 0.3-mile-long segment within the existing 120-foot right-of-way to avoid impacts on a home; and (2) Bedford Solar Center, the additional 40 feet of new right-of-way will be on the east side of the existing right-of-way for an approximately 0.4-mile-long segment in the area immediately north of the existing Pocaty Substation (from the existing 120-foot-wide right-of-way to an expanded 160-foot right-of-way).

The Line #271 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. Line #271 was constructed in 1975 on COR-TEN® lattice towers (Structures #271/10A-42). These COR-TEN® towers have been identified for replacement. COR-TEN® steel is now known to be problematic when used for lattice-type structures. The Company retained a third-party company, Quanta Technology ("Quanta") to evaluate the condition of its COR-TEN® towers. After completing its evaluation, Quanta provided the Company with the 2016 Quanta Report, which confirmed the need to rebuild the COR-TEN® towers supporting Line #271, among other 230 kV COR-TEN® transmission lines on the Company's system.[26] As indicated in the Quanta Report, these 230 kV Line #271 COR-TEN® structures have been prioritized for replacement. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within the existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities;

- *Line #2240 Rebuild*: Wreck and rebuild the entire approximately 1.9 miles of the Company's existing 230 kV overhead Fentress-Pocaty Line #2240, which also supports idle 115 kV Line #I-74, where all three Overhead Transmission Circuits will be co-located on structures within a 40-foot expanded right-of-way (from the existing 120-foot-wide right-of-way to an expanded 160-foot right-of-way). The Line #2240 Partial Rebuild will rebuild COR-TEN® towers that have been identified for replacement and remove idle Line #I-74. Line #2240 was constructed in 1975 on COR-TEN® lattice towers (Structures #2240/1A-9). As noted above, COR-TEN® steel is now known to be problematic when used for lattice-type structures. The Company retained Quanta to evaluate the condition of its COR-TEN® towers. After completing its evaluation, Quanta

[26] The entire approximately 7.1-mile Line #271 is supported by COR-TEN® towers identified for replacement in the 2016 Quanta Report. For purposes of this Application, the Company is only proposing to replace the COR-TEN® structures along the approximately 6.1-mile section of Line #271 that is proposed for co-location with the Overhead Transmission Circuits.

provided the Company with the 2016 Quanta Report, which confirmed the need to rebuild the COR-TEN® towers supporting Line #2240, among other 230 kV COR-TEN® transmission lines on the Company's system. As indicated in the Quanta Report, these 230 kV Line #2240 COR-TEN® structures have been prioritized for replacement. The Company determined based on sound engineering judgment that it is prudent to wreck these COR-TEN® structures in order to accommodate the Overhead Transmission Circuits on co-located structures within an expanded existing right-of-way and during the same outage, and expedite the rebuild of these structures as part of the Virginia Facilities; and

- *Fentress Substation Expansion*: Expand the Company's existing 500-230 kV Fentress Substation in Chesapeake, Virginia. The proposed arrangement will expand the existing 500 kV yard into a GIS six-position ring bus, install three new 4000A 230 kV line terminals, uprate the existing 230 kV Line #2240 terminal to 4000A, which includes replacement of four disconnect switches, and install a new control house to accommodate communications and protective relays. The proposed arrangement, which also includes installation of circuit breakers, transformers and related equipment, expands the Fentress Substation entirely within Company-owned property. Based on conceptual design, in order to expand the Fentress Substation to the north and accommodate the routing of existing Line #2128 into the station, two structures (Structures #2128/1 and #2128/2) will be removed and replaced with four new structures (Structures #2128/1, #2128/1A, #2128/1B, and #2128/2), all entirely within existing right-of-way or on Company-owned property. Additionally, the Company proposes to remove three 500 kV structures (Structures #588/254, #588/255, and #588/256) and replace with two new 500 kV structures (Structures #588/254 and #588/255). Proposed Structure #588/255 is a backbone structure and will be located inside Fentress Substation, while proposed structure #588/254 will be in existing right of way to the west of Fentress Substation. See Attachment II.C.3.b for a one-line diagram of the Fentress Substation Expansion.

The proposed Virginia Facilities represent the minimal amount of transmission facilities required to interconnect the CVOW Commercial Project reliably with the Dominion Energy Virginia transmission system consistent with Dominion Transmission's Facility Interconnection Requirements, which are a required NERC Reliability Standard,[27] and Dominion Transmission's reliability criteria. These requirements are in addition to those determined as part of the PJM generation queue process as described in PJM Manual 14A: New Services Request Process.[28]

The PJM generation queue process will finalize the requirements of the Virginia Facilities and the remaining interconnection queue requirements needed not only to interconnect the proposed CVOW Commercial Project with the existing

[27] *See supra*, n. 12.
[28] *See supra*, n. 13.

transmission system, but also the required network upgrades if any are required to ensure the reliable delivery of CVOW's capacity and associated energy to load. See Attachment I.A.2 for an overall one-line diagram of the system between Harpers Switching Station and the expanded Fentress Substation.

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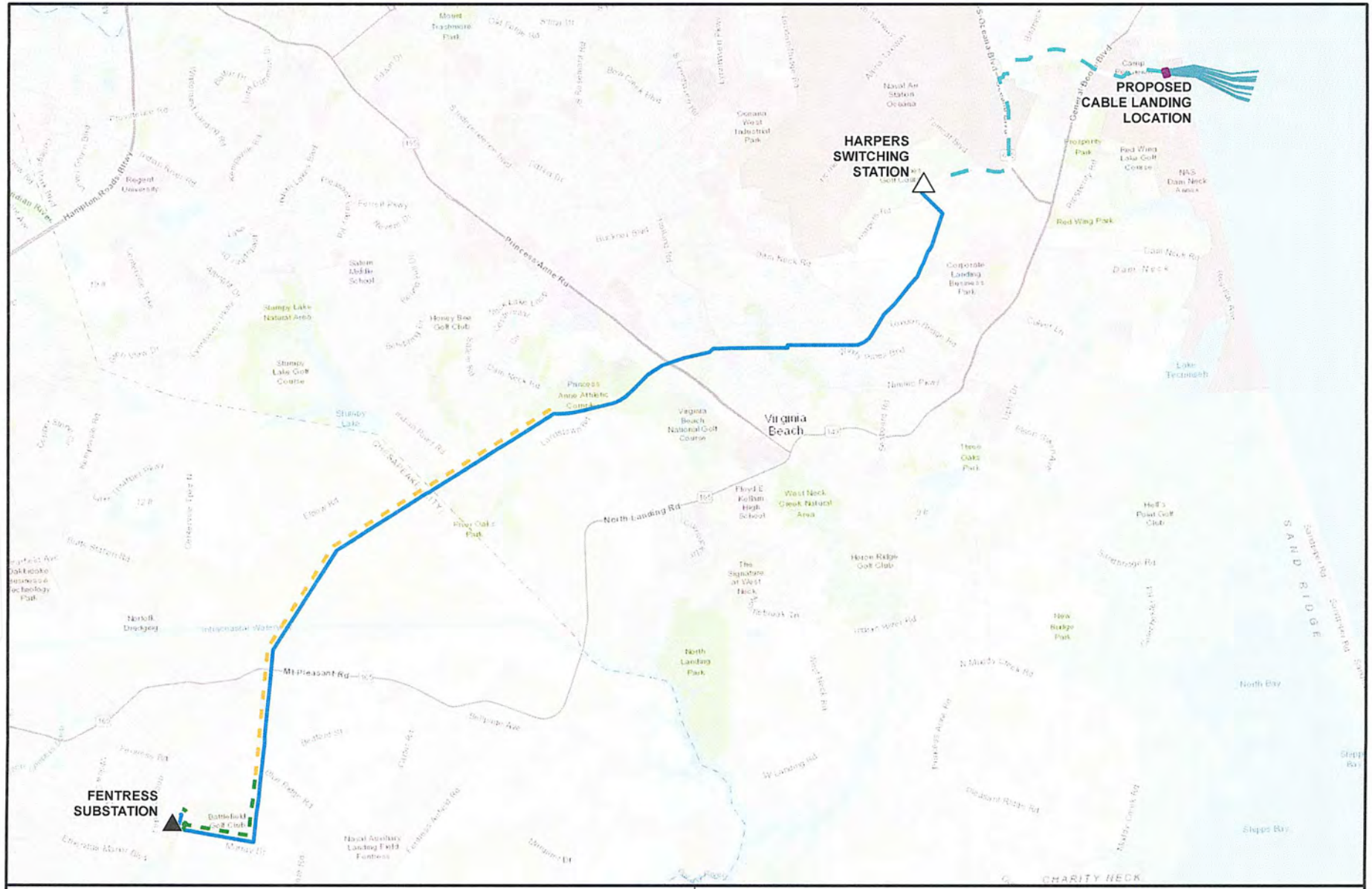
In summary, the proposed Virginia Facilities are required to interconnect the CVOW Commercial Project reliably with the Company's transmission system consistent with Dominion Transmission's mandatory interconnection requirements and reliability criteria. Accordingly, the Virginia Facilities will enable the Company to maintain the overall long-term reliability of the transmission system, while also maintaining the overall generating capabilities of the system by accommodating new generation expected from the PJM queue. Additionally, as part of the proposed Virginia Facilities, the Company will replace aging infrastructure at the end of its service life in order to comply with the Company's mandatory Planning Criteria—namely, a 6.1-mile segment of Landstown-Pocaty Line #271 and the 1.9-mile Fentress-Pocaty Line #2240. This will enable the Company to maintain the overall long-term reliability of the transmission system as well as to provide important system reliability benefits to the Company's entire network.



Attachment I.A.1
Project Overview Map
Coastal Virginia Offshore Wind Commercial Project
Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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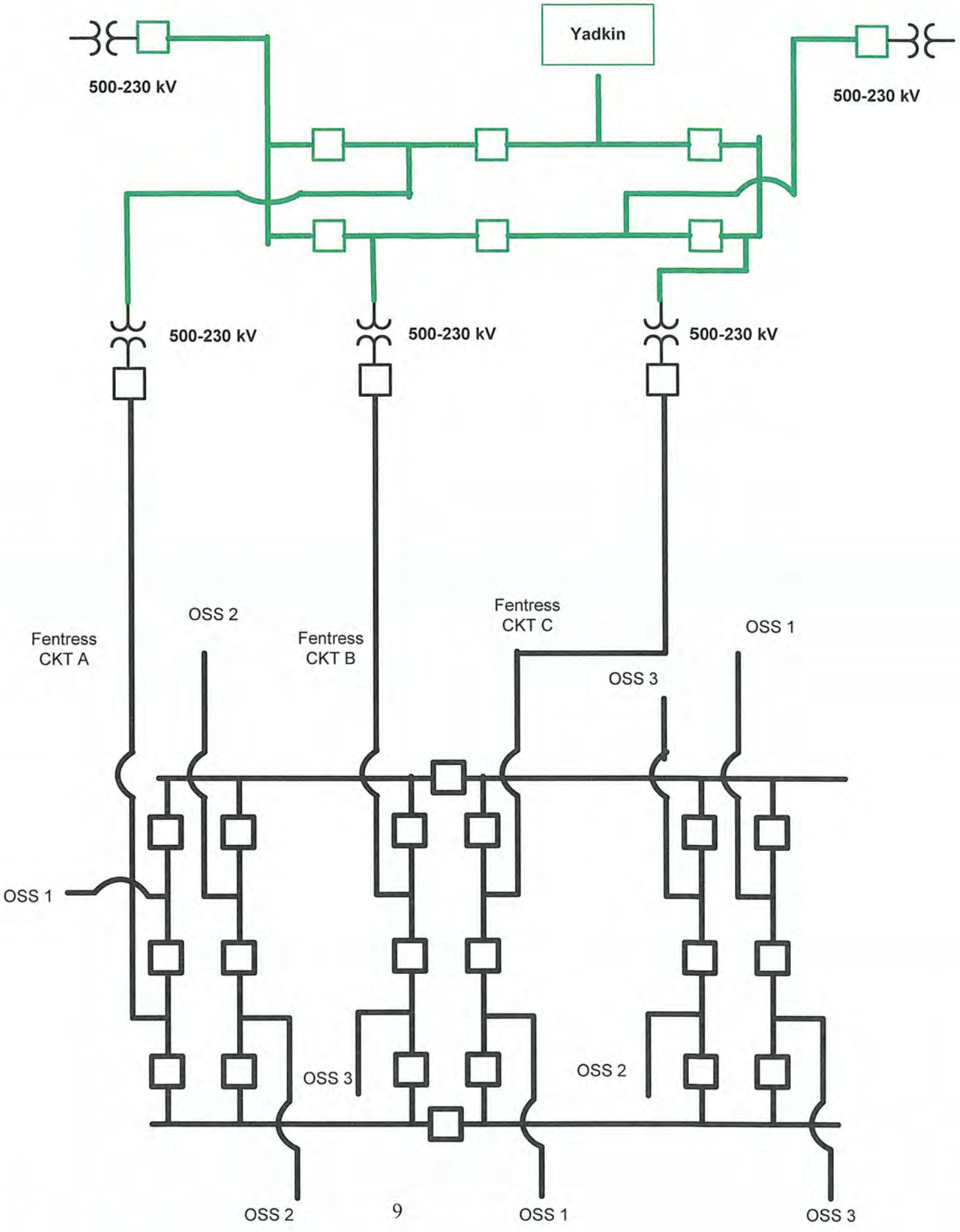
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OSS 3

I. NECESSITY FOR THE PROPOSED PROJECT

B. [1] 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.). [2] 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. [3] 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. [4] Provide a list of those facilities that are not yet in service.

Response: [1] Engineering Justifications

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.).

Attachment I.G.1 shows the Company's transmission system in this area of Virginia, which is primarily served by 230 kV and 115 kV transmission facilities. Prior to the interconnection of the proposed CVOW Commercial Project, this area of the Company's transmission system will have interconnected over 2,500 MW of potential new generating resources. Therefore, the existing 230 kV and 115 kV transmission facilities do not have the capability to integrate a large generating facility like the proposed CVOW Commercial Project.

The Company's 500 kV system is the major transportation system used to move bulk power from generating sources to load centers. At these major load centers, bulk power is transferred from the 500 kV system to the 230 kV system via 500-230 kV transformers in accordance with NERC Reliability Standards. The closest 500 kV transmission facilities are located at the Company's 500 kV Fentress Substation, which is approximately 18.7 miles from the proposed Cable Landing Location. As described in Section I.A, the Virginia Facilities are needed to interconnect the Company's proposed CVOW Commercial Project.

As shown in Attachment I.G.1, this portion of the Company's system is primarily served from one 500 kV transmission facilities and four 230 kV transmission lines:

- Fentress-Yadkin 500 kV Line #588;
- Fentress 500-230 kV Transformers #1 and #2;
- Fentress-Landstown 230 kV Line # 271;
- Fentress-Shawboro 230 kV Line #269;
- Fentress-Shawboro 230 kV Line #2087; and

- Fentress-Thrasher 230 kV Line # 2128.

Customers are dependent on the development of generation resources, transmission facilities and distribution facilities to satisfy their electrical needs. Therefore, it is important that proposed generation facilities be interconnected with the transmission system in accordance with NERC Reliability Criteria and also in a manner that promotes overall system reliability. The Company is a member of the PJM RTO and, as such, any generator wishing to construct a new generation facility or modify an existing generation facility interconnected to the Company's transmission system must file an interconnection request as part of the PJM generation queue process pursuant to the terms and conditions of PJM's FERC-approved Open Access Transmission Tariff. As described in Appendix Section I.A, Dominion Generation has filed three such interconnection requests with PJM's interconnection queue.

PJM's Feasibility and System Impact Studies preliminarily have identified the following transmission facilities and network upgrades required by the CVOW Commercial Project.

- *Onshore Export Circuits* – PJM's Feasibility and System Impact Studies and Facility Study identified the Onshore Export Circuits, which extend from the Cable Landing Location to the proposed Harpers Switching Station, as required attachment facilities for CVOW. The estimated cost for this work is approximately $478.2 million.[29]

- *Harpers Switching Station* – PJM's Feasibility and System Impact Studies identified the proposed Harpers Switching Station as the Point of Interconnection ("POI") for the CVOW Project. Specifically, for PJM's purposes, after the CVOW Project (including the Virginia Facilities) is constructed and energized, the POI will be set at Harpers Switching Station to delineate facilities that will remain as Dominion Generation owned interconnection facilities (*i.e.*, station and wires components within the switching station and eastward up and until the offshore substations) from facilities that will become Dominion Transmission owned facilities (*i.e.*, station and wire components within the switching station and westward up to and including within the Fentress Substation). See Attachment II.C.1, which shows the proposed Harpers Switching Station one-line diagram and the breakdown of its three separate components and their ownership following the setting of the POI after energization: Generator Owned Facilities, Attachment Facilities and Direct Connect Network Facilities.

    - The Generator Owned Facilities are substation and transmission facilities that will be located within the overall Harpers Switching Station footprint and will be owned and maintained by Dominion

[29] *See supra* n. 15. *See also* Section I.A of the Generation Appendix, which refers to the Offshore Export Circuits as Offshore Export Cables, as noted in n. 2, *supra*.

Generation. These facilities are shown in red on Attachment II.C.1.

- The Attachment Facilities are the substation facilities that Dominion Transmission will install, own and maintain that directly connect the generator owned facilities into the proposed Harpers Switching Station. The generator owner (*i.e.*, Dominion Generation) will pay an on-going O&M charge for these facilities, which is billed by PJM. The Attachment Facilities are shown on Attachment II.C.1 inside a black bubble.

- The Direct Connect Network Facilities are comprised of the remaining substation facilities and are required to interconnect the proposed CVOW Project with the Company's transmission system. Dominion Generation will pay for the actual cost to construct these facilities after which this portion of the Harpers Switching Station becomes a Dominion Transmission system asset.

The combined cost of all these components is approximately $219.7 million and are collectively referred to as the Harpers Switching Station.

- *Overhead Transmission Circuits* – PJM's Feasibility and System Impact Studies and Facility Study identified the Overhead Transmission Circuits, which extend from the proposed Harpers Switching Station to the Company's existing Fentress Substation, as required direct connection network upgrades for CVOW. The estimated cost for this work is approximately $296.1 million.

- *Fentress Substation Expansion* – PJM's Feasibility and System Impact Studies and Facility Study identified the proposed Fentress Substation Expansion as a required direct connection network upgrade for CVOW. The estimated cost for this work is approximately $154.5 million.

The Facility Study will finalize the required transmission facilities and network upgrades required to interconnect the CVOW Commercial Project reliably, as well as the cost allocation associated with the CVOW Commercial Project.

[2] Known Future Projects

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

The CVOW Commercial Project (comprised of 176 turbines) is a known future generation project that requires the proposed Virginia Facilities to be constructed.

[3] Planning Studies

Verify that the planning studies used to justify the need for the proposed project

considered all other generation and transmission facilities impacting the affected load area, including generation and transmission facilities that have not yet been placed into service.

See the PJM System Impact Studies.[30]

[4] Facilities List

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

See the Company's response to Section 1.B[3] above.

[30] *See supra* n. 24.

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: Attachment I.G.1 shows the portion of the Company's transmission system in the area of the proposed Virginia Facilities. The existing Fentress Substation is part of the Company's 500 kV and 230 kV system, which supports the transfer of bulk power from generating resources to major load centers.

As discussed in Section I.A, the Virginia Facilities are required to interconnect the proposed CVOW Commercial Project with the existing transmission system. Consistent with PJM's FERC-approved interconnection process, Dominion Generation chose to interconnect the proposed CVOW Commercial Project to the existing transmission system at the Fentress Substation, which contains the closest 500 kV facilities to the Cable Landing Location (approximately 18.7 miles). Dominion Transmission understands that Dominion Generation chose to interconnect at the Fentress Substation because, among other things, (a) it provides access to the system's 500 kV facilities, which it believes allows for the most efficient and effective interconnection, and (b) the limited amount of accessible and suitable interconnection points in this area of the transmission system.

The need for the proposed Virginia Facilities is not load driven; rather, it is based on the Company's obligation to interconnect the new CVOW Commercial Project consistent with Dominion Transmission's Facility Interconnection Requirements and mandatory NERC Reliability Standards, as discussed in Section I.A of this Appendix. Therefore, there is no pertinent load growth data.

The proposed Virginia Facilities will support Dominion Energy Virginia's continued reliable electric service to retail and wholesale customers and will support the future overall growth and system generation capability in the area. See Section I.A.

I. NECESSITY FOR THE PROPOSED PROJECT

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

Response: Not applicable.

I. NECESSITY FOR THE PROPOSED PROJECT

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

Response: Because this is an interconnection request from a customer, no other planning alternative was considered.

Analysis of Demand-Side Resources

Pursuant to the Commission's November 26, 2013, Order entered in Case No. PUE-2012-00029, and its November 1, 2018, Final Order entered in Case No. PUR-2018-00075 ("2018 Final Order"), the Company is required to provide analysis of demand-side resources ("DSM") incorporated into the Company's planning studies. DSM is the broad term that includes both energy efficiency ("EE") and demand response ("DR"). In this case, PJM and the Company have identified a need for the proposed Virginia Facilities based on a Customer generation interconnection request and aging infrastructure that is at the end of its service life to maintain the overall long-term reliability of the transmission system and to resolve potential violations of Dominion Energy Virginia's Planning Criteria.[31] Notwithstanding, when performing an analysis based on PJM's 50/50 load forecast, there is no adjustment in load for DR programs that are bid into the PJM reliability pricing model ("RPM") auction because PJM only dispatches DR when the system is under stress (i.e., a system emergency). Accordingly, while existing DSM is considered to the extent the load forecast accounts for it, DR that has been bid into PJM's RPM market is not a factor in this particular application because of the identified need for the Virginia Facilities. Based on these considerations, the evaluation of the Virginia Facilities demonstrated that despite accounting for DSM consistent with PJM's methods, the Virginia Facilities are necessary.

Incremental DSM also will not absolve the need for the Virginia Facilities. As discussed in Section I.C, the need for the proposed Virginia Facilities is not load driven; rather, it is based on the Company's obligation to interconnect the new CVOW Commercial Project consistent with Dominion Transmission's Facility Interconnection Requirements and mandatory NERC Reliability Standards, as discussed in Section I.A of this Appendix.

[31] 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: The following lines or facilities will be removed, replaced, or taken out of service upon completion of the Virginia Facilities.

Overhead Transmission Circuits

Line #271 Partial Rebuild

The proposed route of the Overhead Transmission Circuits includes the rebuild of an approximately 6.1 mile section of 230 kV overhead Line #271 where the proposed circuits will be co-located with that existing line. Specifically, the Company proposes to remove the following facilities along this 6.1-mile section of Line #271:

- Thirty-three double circuit COR-TEN® lattice towers supporting Line #271 and idle Line #I-74, and one single circuit weathering steel monopole supporting Line #271.
- Twin-bundled 721 ACAR (18/19) conductors and one 3#6 alumoweld shield wire on Line #271. The existing capacity of Line #271 has normal/emergency ratings of 722/722 MVA.
- Twin-bundled 721 ACAR (18/19) conductors and one 3#6 alumoweld shield wire on idle Line #I-74. The existing capacity of idle Line #I-74 has normal/emergency ratings of 722/722 MVA.

Line #2240 Rebuild

The proposed route of the Overhead Transmission Circuits also includes the rebuild of the approximately 1.9-mile 230 kV overhead Line #2240 where the proposed lines will be co-located with that existing line. Specifically, the Company proposes to remove the following facilities along the 1.9-mile Line #2240:

- Nine double circuit COR-TEN® lattice towers and one COR-TEN® monopole.
- Twin-bundled 721 ACAR (18/19) conductors and one DNO-11410 optical ground wire ("OPGW") on Line #2240. The existing capacity of Line #2240 has normal/emergency ratings of 722/722 MVA.
- Twin-bundled 721 ACAR (18/19) conductors and one 3#6 alumoweld shield wire on idle Line #I-74. The existing capacity of Line #I-74 has

normal/emergency ratings of 722/722 MVA.

Fentress Substation Expansion

To facilitate the Fentress Substation Expansion, the following facilities will be removed:

- An existing telecom tower located within the expansion area will be removed and relocated. Telecom antennas will be mounted on proposed new Structure #2128/2.

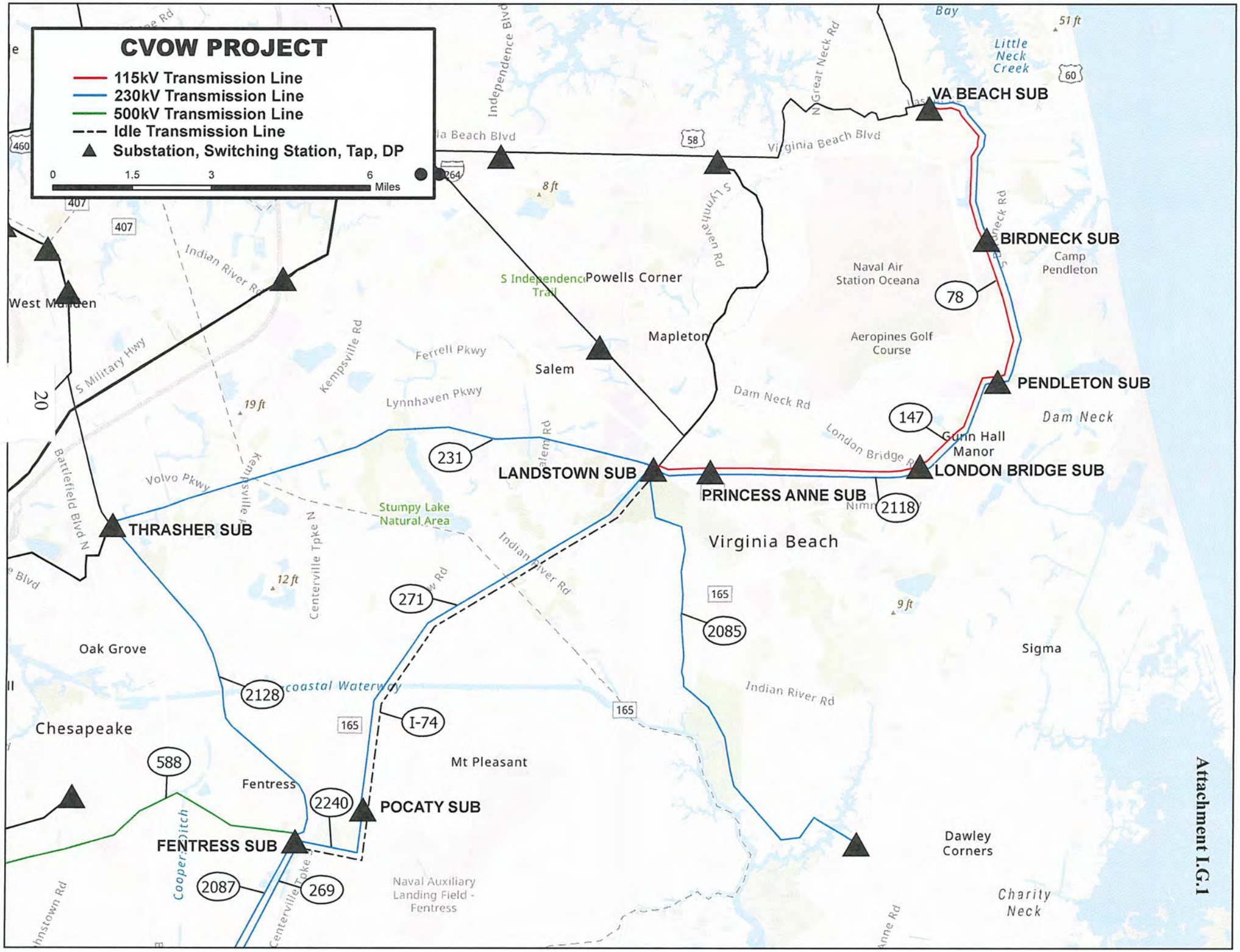
- Structure #2128/1 and #2128/2 will be removed to accommodate the Fentress Substation expansion to the north.

- Structures #588/254, #588/255, and #588/256 will be removed to accommodate the Fentress Substation expansion to the north.

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.



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: Dominion Generation expects the CVOW Commercial Project will enter service in late 2025.[32]

The desired in-service target date for the Virginia Facilities is July 31, 2025. The Company estimates that it will take approximately 39 months for detailed engineering, materials procurement, permitting, 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 August 5, 2022. Should the Commission issue a final order by August 5, 2022, the Company estimates that construction of the Virginia Facilities should begin by August 1, 2023, and be completed by July 31, 2025. This construction timeline will enable the Company to meet the targeted in-service date for the Virginia Facilities. This schedule is contingent upon obtaining the necessary permits. Dates may need to be adjusted based on permitting delays or design modifications to comply with additional agency requirements identified during the permitting application process.[33]

[32] *See supra* n. 16 and Attachment IV.B of the Generation Appendix. Once the CVOW Project is energized and interconnected to the Dominion Energy Virginia transmission system, the Offshore and Onshore Export Circuits will be generation assets. *See also* Section I.B of this Transmission Appendix.
[33] *See supra* n. 18.

I. NECESSITY FOR THE PROPOSED PROJECT

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

Response: The estimated conceptual cost of the proposed onshore Virginia Facilities[34] along Harpers to Fentress Proposed Route 1 is approximately $1,148.5 million, which includes approximately $774.3 million in transmission-related costs, and approximately $374.2 million for substation-related work (2021 dollars). A further breakdown of the estimated conceptual cost of the Virginia Facilities is provided in the table below. See Section II.A.9 for discussion of estimated transmission-related costs associated with two route variations.

Estimated Conceptual Cost of the Virginia Facilities

Facilities *(millions, approximate)*	**Harpers to Fentress Proposed Route 1**	**Harpers to Fentress Alternative Route 2**	**Harpers to Fentress Alternative Route 5**	**Harpers to Fentress Alternative Hybrid Route**
Onshore Export Circuits[1]	$478.2	$478.2	$478.2	$878.0
Overhead Transmission Circuits[2]	$296.1	$356.1	$534.6	$178.5
Switching Station				
Harpers Switching Station	$219.7	$219.7	$219.7	N/A
Chicory Switching Station	N/A	N/A	N/A	$219.7
Fentress Substation Expansion	$154.5	$154.5	$154.5	$154.5
Virginia Facilities Total	$1,148.5	$1,208.5	$1,387.0	$1,430.7
Transmission	$774.3	$834.3	$1,012.8	$1,056.5
Substation	$374.2	$374.2	$374.2	$374.2

[1] The costs associated with Routes 1, 2 and 5 of the Onshore Export Circuits are being bid as part of a competitive bid process. The costs associated with the Hybrid Route were not included as part of the competitive bid process and were extrapolated from the costs associated with Routes 1, 2, and 5.

[2] The Overhead Transmission Circuits conceptual cost estimate includes transmission-related costs associated with the Line #271 Rebuild, the Line #2240 Rebuild, and the Fentress Substation Expansion as to the wreck and rebuild of Structures #2128/1-2 and Structures #588/254, #588/255, and #588/256.

See Section IV.A of the Generation Appendix for discussion of segments of the routes that were subject to a competitive bid process.

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[34] *See supra* n. 15. *See also* Section I.A of the Generation Appendix, which refers to the Offshore Export Circuits as Offshore Export Cables, as noted in n. 2, *supra*.

I. NECESSITY FOR THE PROPOSED PROJECT

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

Response: The proposed Virginia Facilities have not been approved by the PJM Board. The proposed Virginia Facilities are network upgrades. The new Overhead Transmission Circuits are Lines #2252, #2253, and #2254. The capital and the Attachment Facilities' ongoing operation and maintenance ("O&M") costs associated with the Virginia Facilities will be allocated 100% to Dominion Generation.

I. NECESSITY FOR THE PROPOSED PROJECT

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

Response: Not applicable.

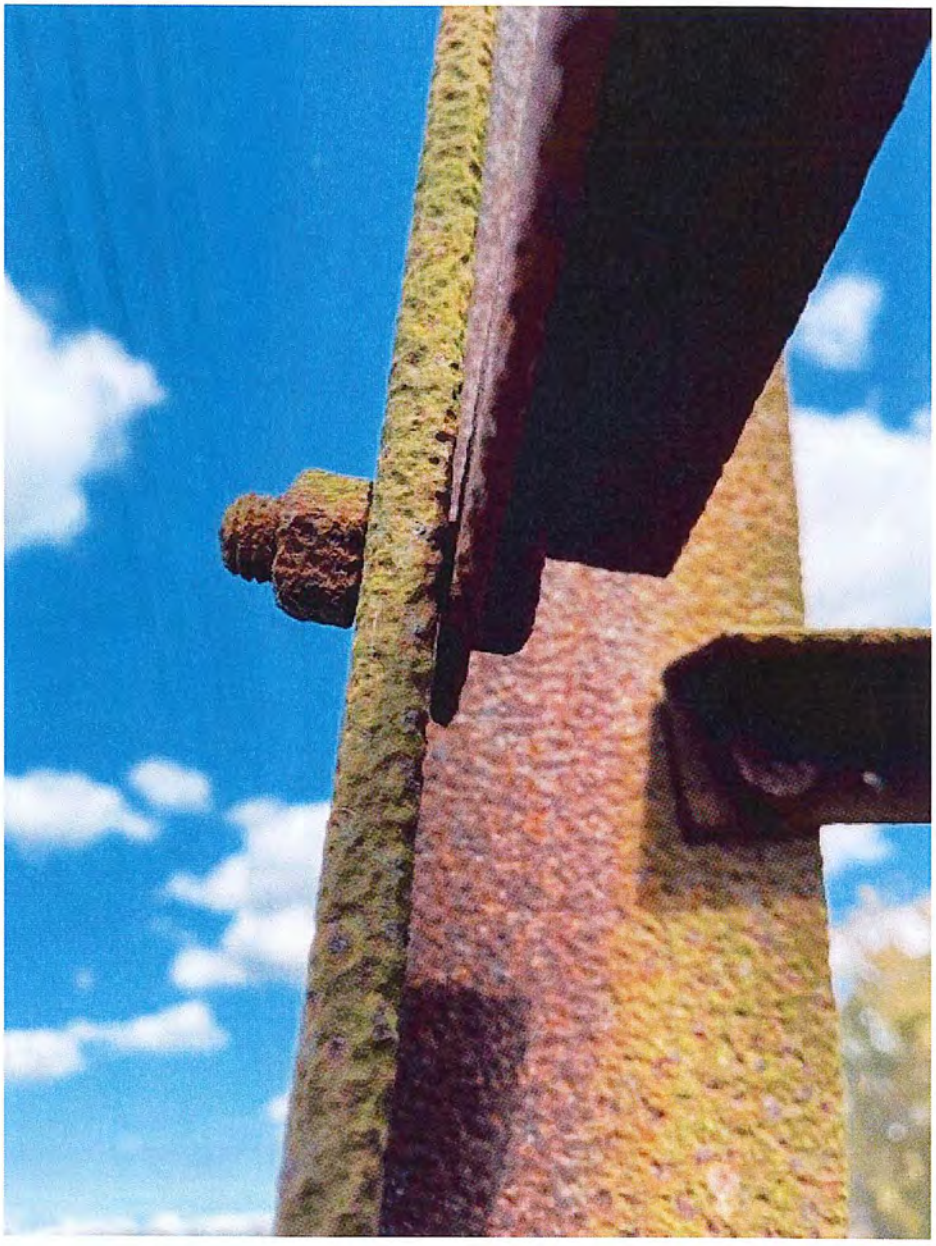
I. NECESSITY FOR THE PROPOSED PROJECT

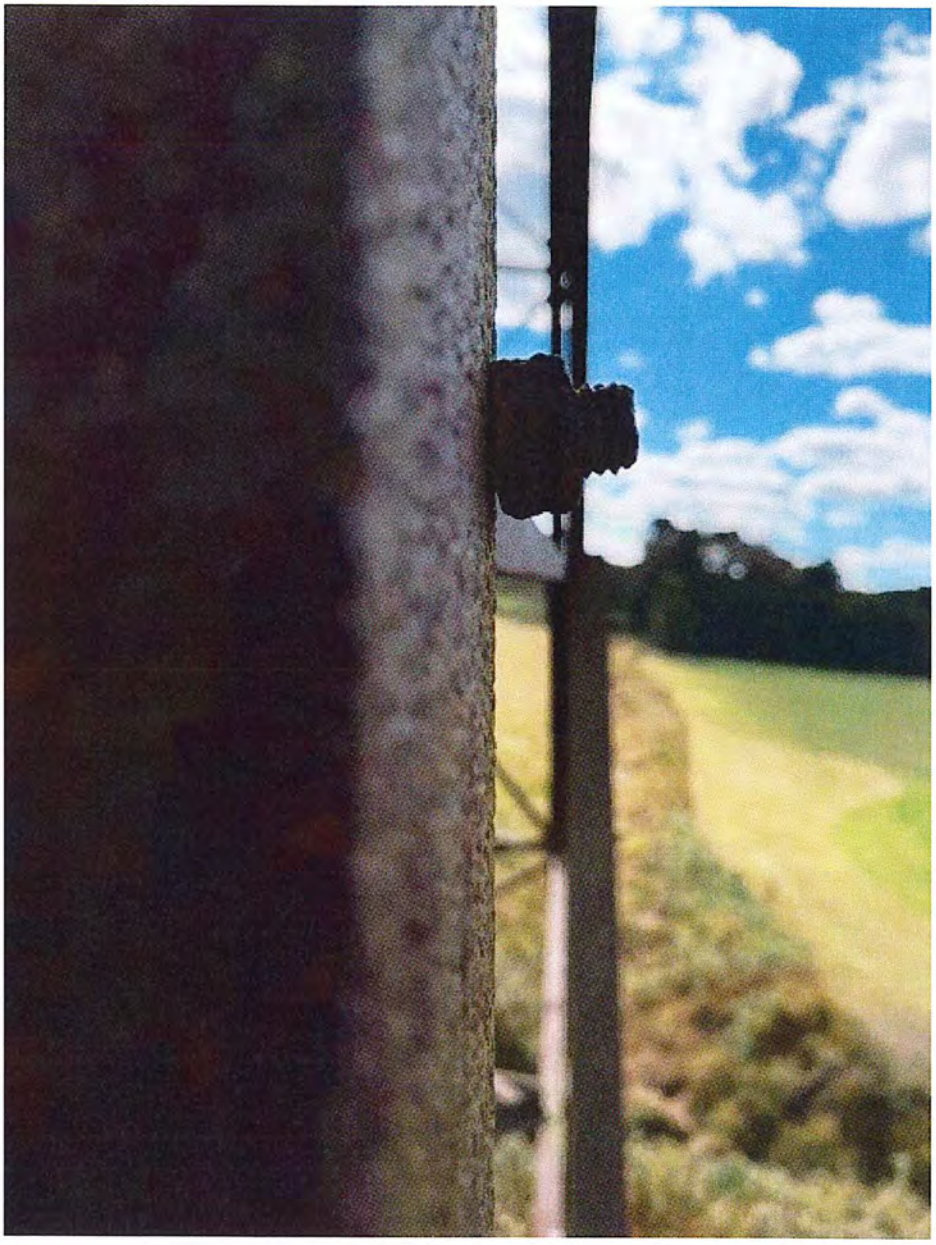
L. If the need for the proposed project is due in part to deterioration of structures and associated equipment, provide representative photographs and inspection records detailing their condition.

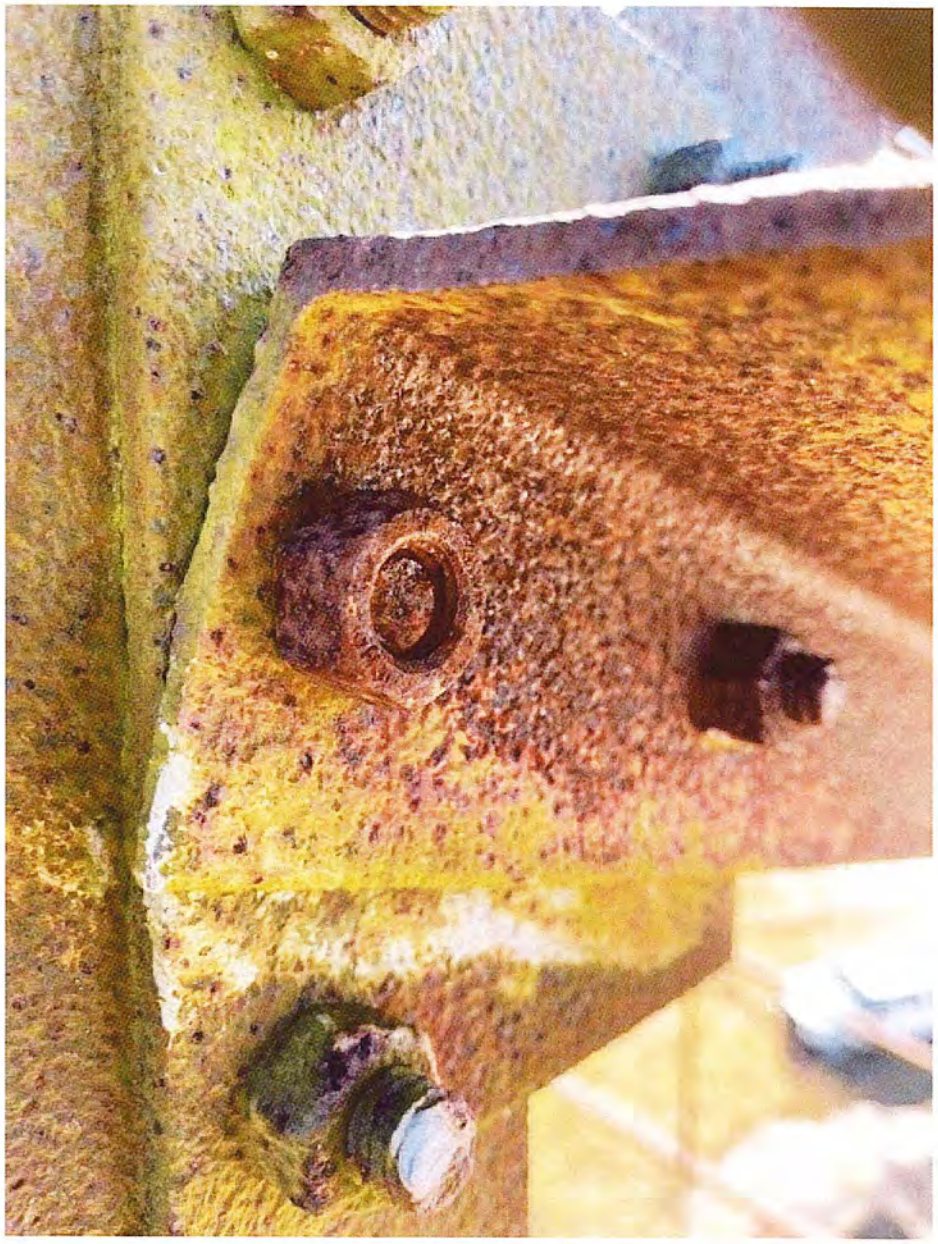
Response: See Attachment I.L.1 for representative photographs of the deterioration of the COR-TEN® structures supporting the 6.1-mile section of Line #271 and the 1.9-mile Line #2240 along the proposed route of the Overhead Transmission Circuits. As discussed in Section I.A, the 2016 Quanta Report details the conditions of these deteriorating structures, which have been prioritized for replacement.[35]

[35] Discussion of the deterioration of structures supporting Line #271 in the Quanta Report are inclusive of Line #2240, which was renumbered after construction of the Pocaty Substation.

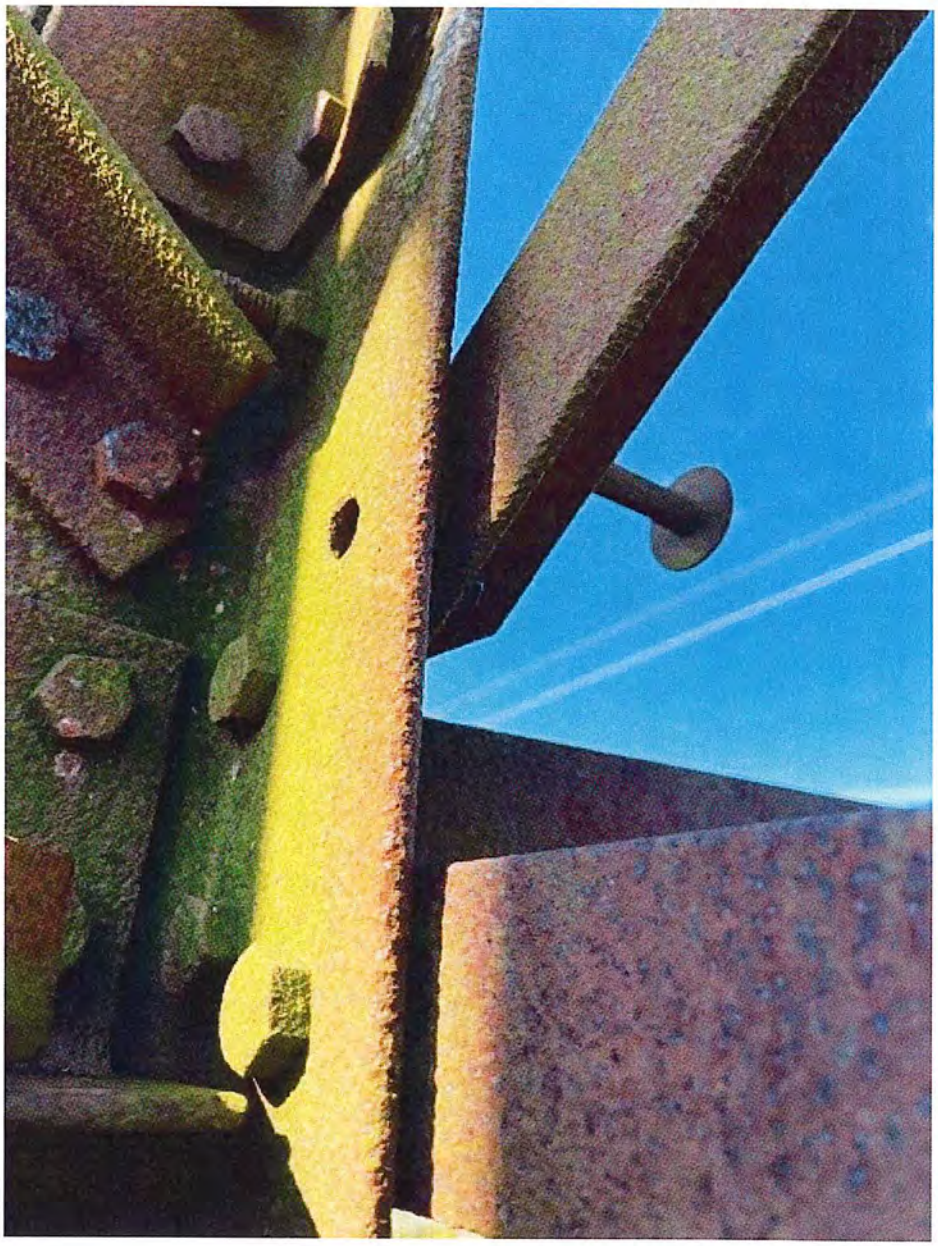
Structure #2240/7

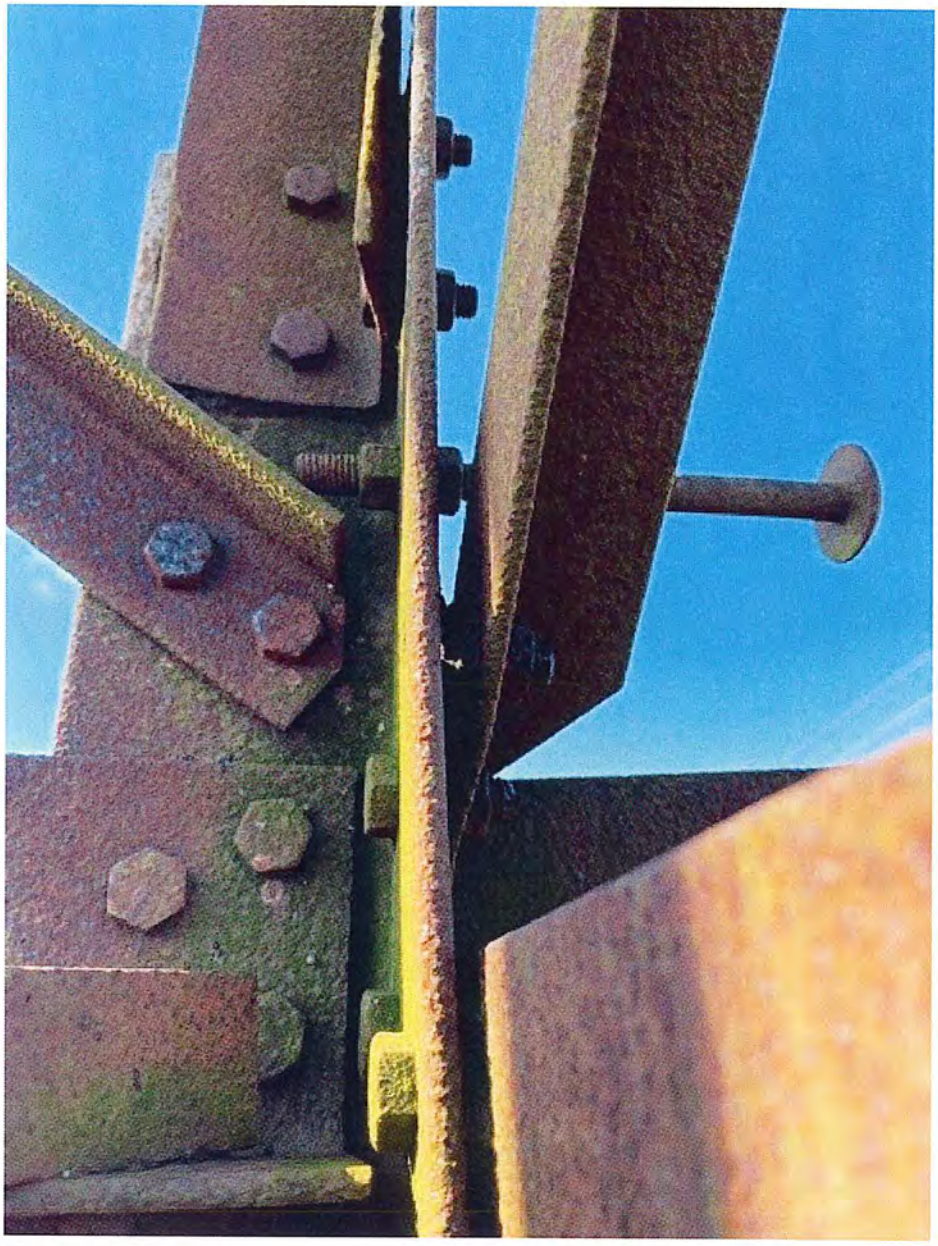







Structure #271/39



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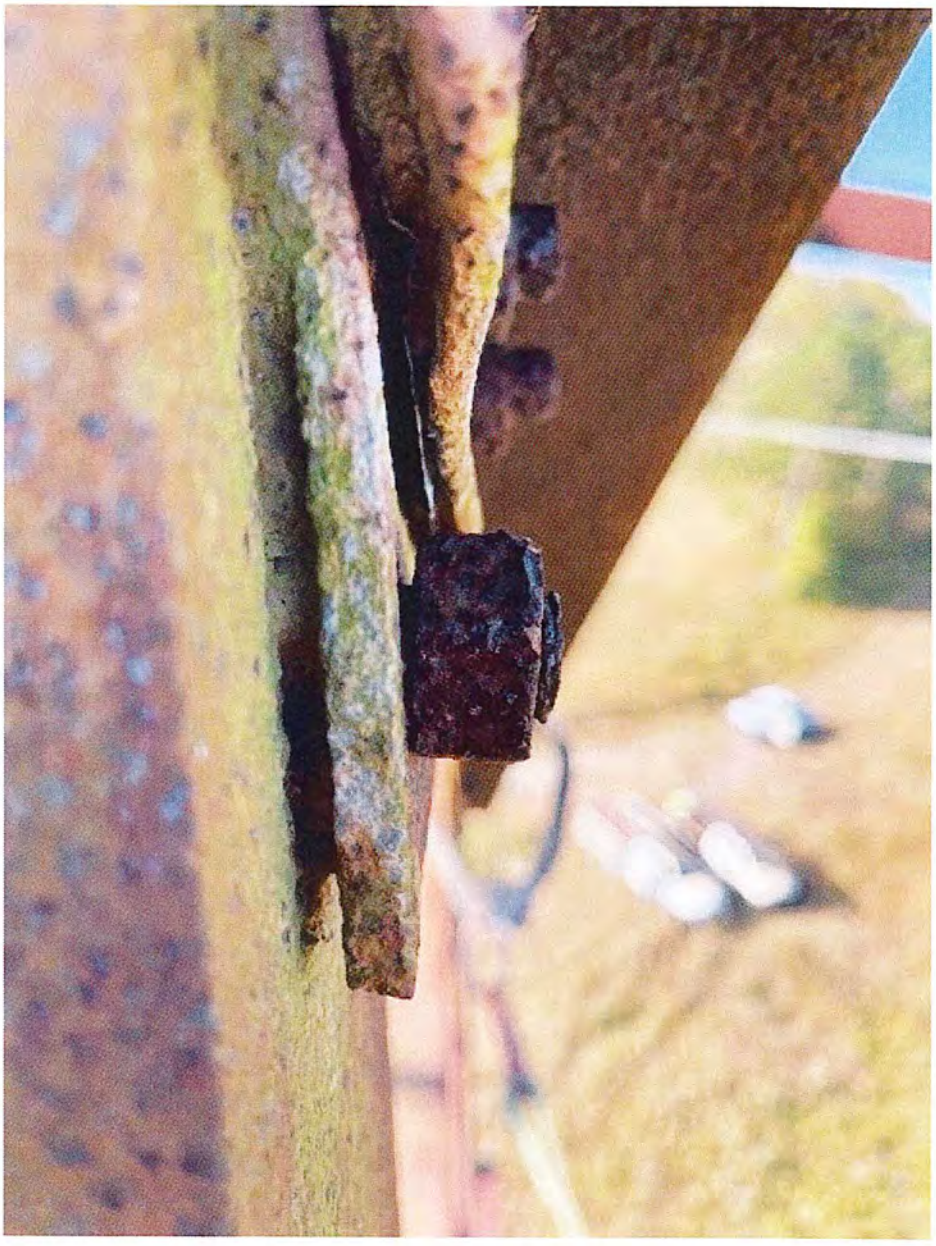


I. NECESSITY FOR THE PROPOSED PROJECT

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: See Sections I.A and I.B. See also the Generation Appendix included with this filing, which provides a description of the proposed CVOW Commercial Project that will be served by the Virginia Facilities.

II. DESCRIPTION OF THE PROPOSED PROJECT

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

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

Response: The approximate lengths of the proposed and alternative routes of the Virginia Facilities are as follows:

Offshore Export Circuits

Offshore to Cable Landing Proposed Route: 3.0 miles

Onshore Export Circuits

Cable Landing to Harpers Proposed Route: 4.4 miles

Overhead Transmission Circuits

Harpers to Fentress Proposed Route 1: 14.2 miles

Harpers to Fentress Alternative Route 2: 15.2 miles

Harpers to Fentress Alternative Route 5: 20.2 miles

Harpers to Fentress Alternative Hybrid Route: 14.2 miles

Dam Neck Route Variation: 2.8 miles

Line #2085 Route Variation: 4.4 miles

See Section II.A.9 of this Appendix for an explanation of the Company's route selection process and the table below to ascertain total route lengths along the proposed variations (as applicable).

Route Variation	Unit	Cable Landing to Harpers Proposed Route	Harpers to Fentress Proposed Route 1	Harpers to Fentress Alternative Route 2	Harpers to Fentress Alternative Route 5	Harpers to Fentress Alternative Hybrid Route
None	miles	4.4	14.2	15.2	20.2	14.2
Dam Neck	miles	N/A	14.5	15.6	20.6	N/A
Line #2085	miles	N/A	N/A	16.5	N/A	N/A
Dam Neck and Line #2085	miles	N/A	N/A	16.8	N/A	N/A

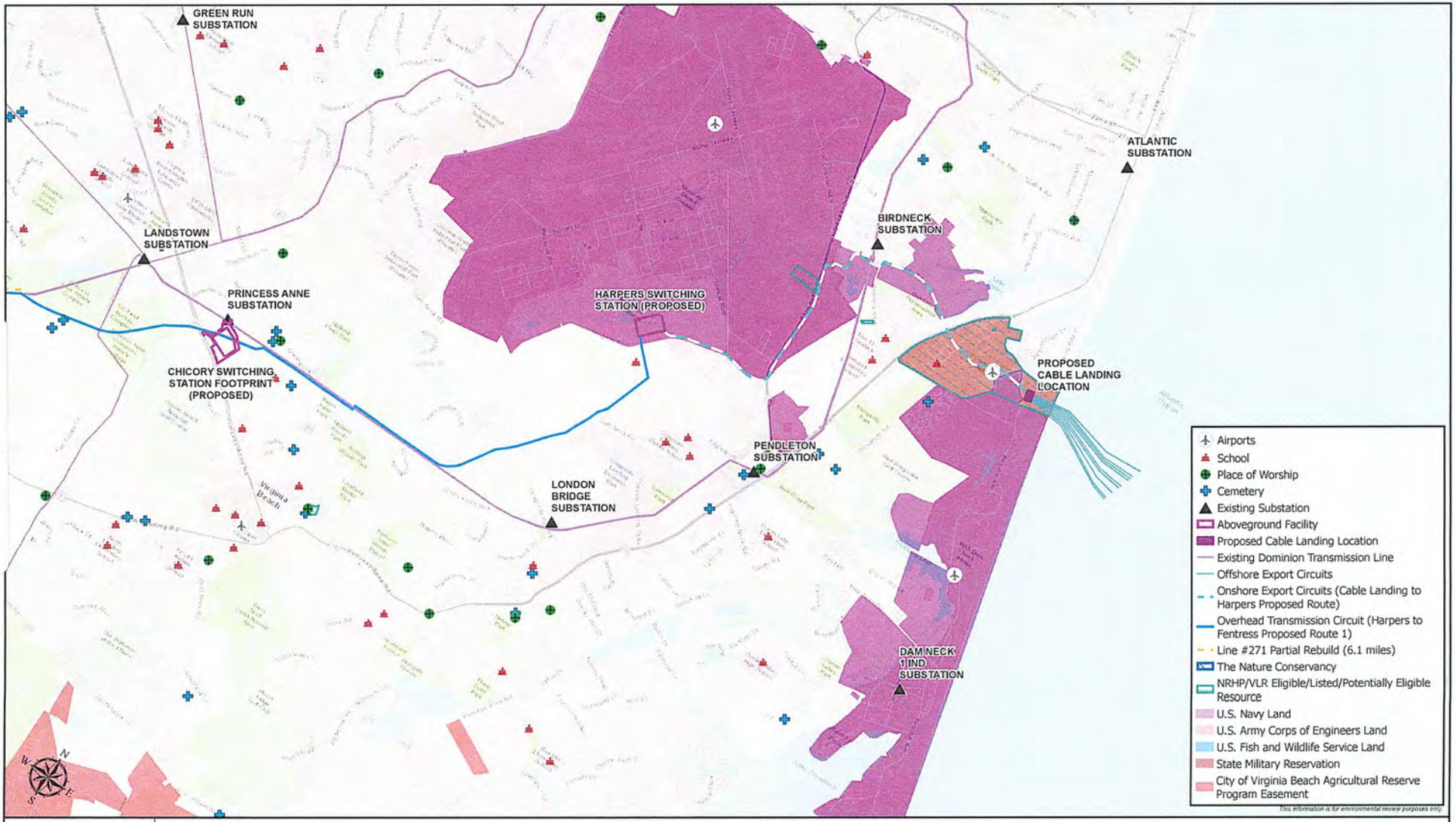
II. DESCRIPTION OF THE PROPOSED PROJECT

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

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

Response: See Attachment II.A.2. No portion of the right-of-way is proposed to be quitclaimed or relinquished.

The Company will make the digital Geographic Information Systems shape file available to interested persons upon request to counsel for the Company as listed in the Application.



Attachment II.A.2
Constraints Map
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

Page 1 of 2

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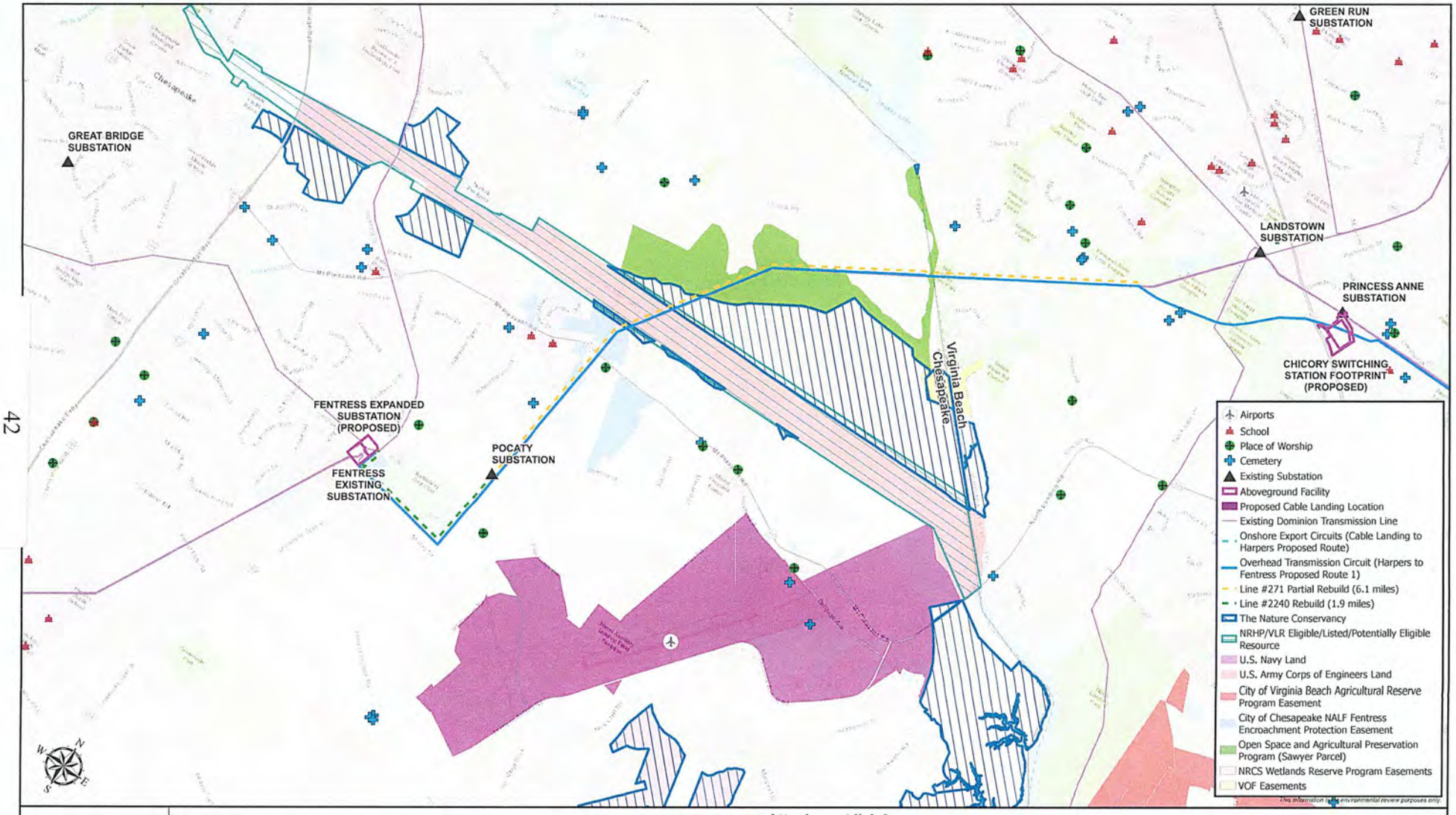

Attachment II.A.2
Constraints Map
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

Page 2 of 2

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II. DESCRIPTION OF THE PROPOSED PROJECT

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

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

Response: See Attachment I.G.1.

II. DESCRIPTION OF THE PROPOSED PROJECT

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

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

Response: Federal and state permits will be required for the location of the Offshore Export Circuits. Additionally, new right-of-way will be required for the majority of the Onshore Export Circuits and the Overhead Transmission Circuits, as there is limited to no existing Company-owned right-of-way that connects the CVOW Commercial Project to the Company's 500 kV transmission system. The rights-of-way will vary from 65 feet to 225 feet wide, which is inclusive of existing and new rights-of-way.

The route for the approximately 4.4-mile underground 230 kV Onshore Export Circuits between the onshore Cable Landing Location on SMR and Harpers Switching Station located on NAS Oceana was developed in close coordination with SMR and NAS Oceana in order to avoid conflicts with the operation and future development of these military installations. The route for the Onshore Export Circuits will require new right-of-way, since there was no existing right-of-way in the area associated either with existing transmission lines or other infrastructure to utilize for these facilities. However, the well-developed road infrastructure between the Cable Landing Location and the Harpers Switching Station offered 2.7 miles of co-location opportunities for the 230 kV Onshore Export Circuits.

There was no continuous, existing Company-owned right-of-way between Harpers Switching Station and Fentress Substation in which to construct the Overhead Transmission Circuits. However, the alignment of the Overhead Transmission Circuits will make use of portions of existing Company-owned right-of-way associated with Line #2118, Line #271, and Line #2240.

The existing right-of-way for Line #2118 is 120 feet wide. An additional 105 feet of new right-of-way on either the north or south side of the existing corridor will be required to accommodate three single circuit, monopole structures proposed for the Overhead Transmission Circuits for a total right-of-way width of 140 feet. The construction corridor for the Overhead Transmission Circuits will measure 140 feet wide, including 35 feet of overlap with the existing Line #2118 right-of-way.

The existing right-of-way for Line #271 is 120 feet wide. For a majority of the route, an additional 40 feet of new right-of-way will be needed for a total right-of-way width of 160 feet. The additional 40 feet will generally be on the west side of the existing right-of-way where two new single circuit monopole structures will be utilized in addition to the rebuilt double circuit monopole structures for Line #271. The two exceptions to this configuration are discussed in detail in Section I.A.

The existing right-of-way for Line #2240 is 120 feet wide. An additional 40 feet

of new right-of-way will be required for a total width of 160 feet. The additional 40 feet will be on the east side of the existing right-of-way between the Pocaty Substation and Whittamore Road. From Whittamore Road south to the Fentress Substation, the additional 40 feet of new right-of-way will be on the west side of the existing right-of-way. The Company will use the entire width of the existing right-of-way plus the additional 40 feet of new right-of-way for construction.

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: **Overhead Transmission Circuits**

See Attachments II.A.5.a-c for cross sections of typical structure placements of the Overhead Transmission Circuits along the proposed route. This includes:

- Attachment II.A.5.a: Typical configuration for new right-of-way for the Overhead Transmission Circuits.
- Attachment II.A.5.b: Typical configuration (existing and proposed) for route segments adjacent to Line #271. This configuration is identical for route segments adjacent to Line #2240.
- Attachment II.A.5.c: Typical configuration (existing and proposed) for route segments adjacent to Line #2118.

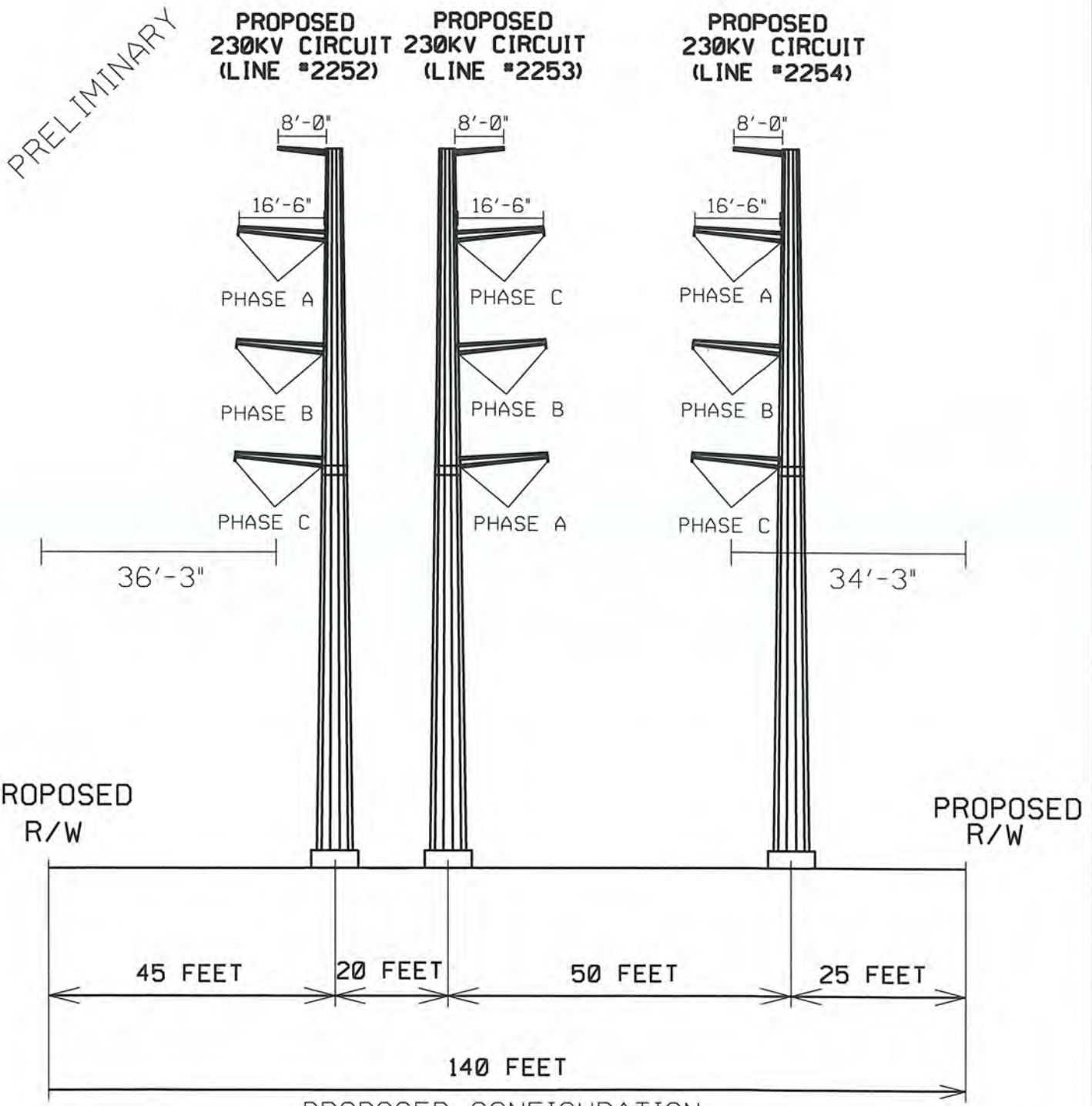
Onshore Export Circuits

See Attachment II.A.5.d for a cross section of typical structure placement of the underground Onshore Export Circuits from the Cable Landing Location to Harpers Switching Station.

Offshore Export Circuits

See Attachment II.A.5.e for cross-sections of typical configurations of the copper and aluminum conductor subsea cable from offshore to the Cable Landing Location.

TYPICAL CONFIGURATION FOR NEW RIGHT-OF-WAY



PROPOSED CONFIGURATION

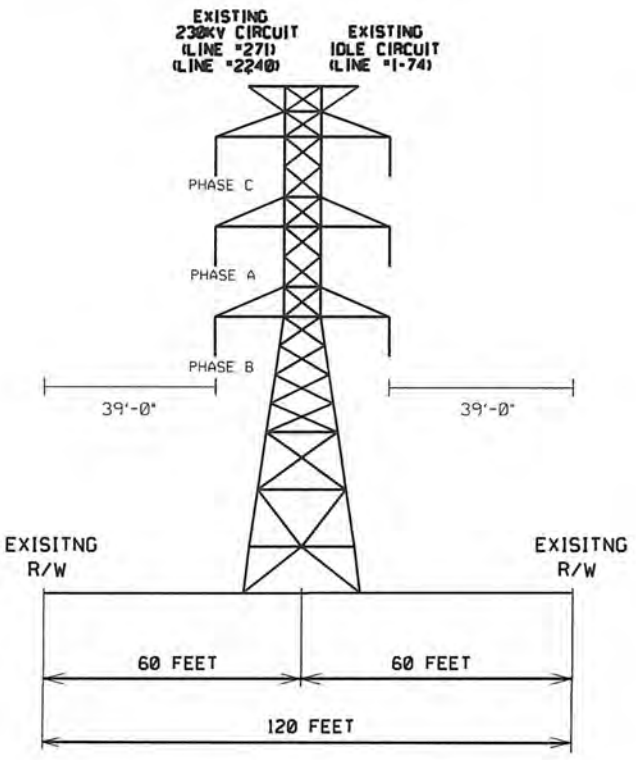
TYPICAL CORRIDOR LOOKING TOWARD HARPERS

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

$DGNSPEC$

TYPICAL CONFIGURATION

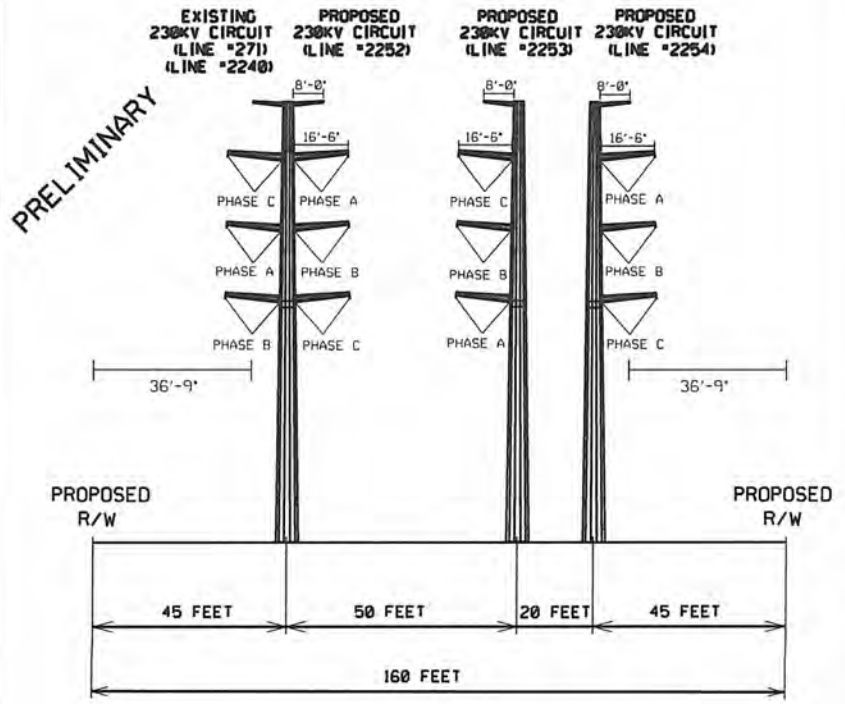
REBUILD SEGMENTS (LINE #271 & LINE #2240)



EXISTING CONFIGURATION
TYPICAL CORRIDOR LOOKING TOWARD HARPERS

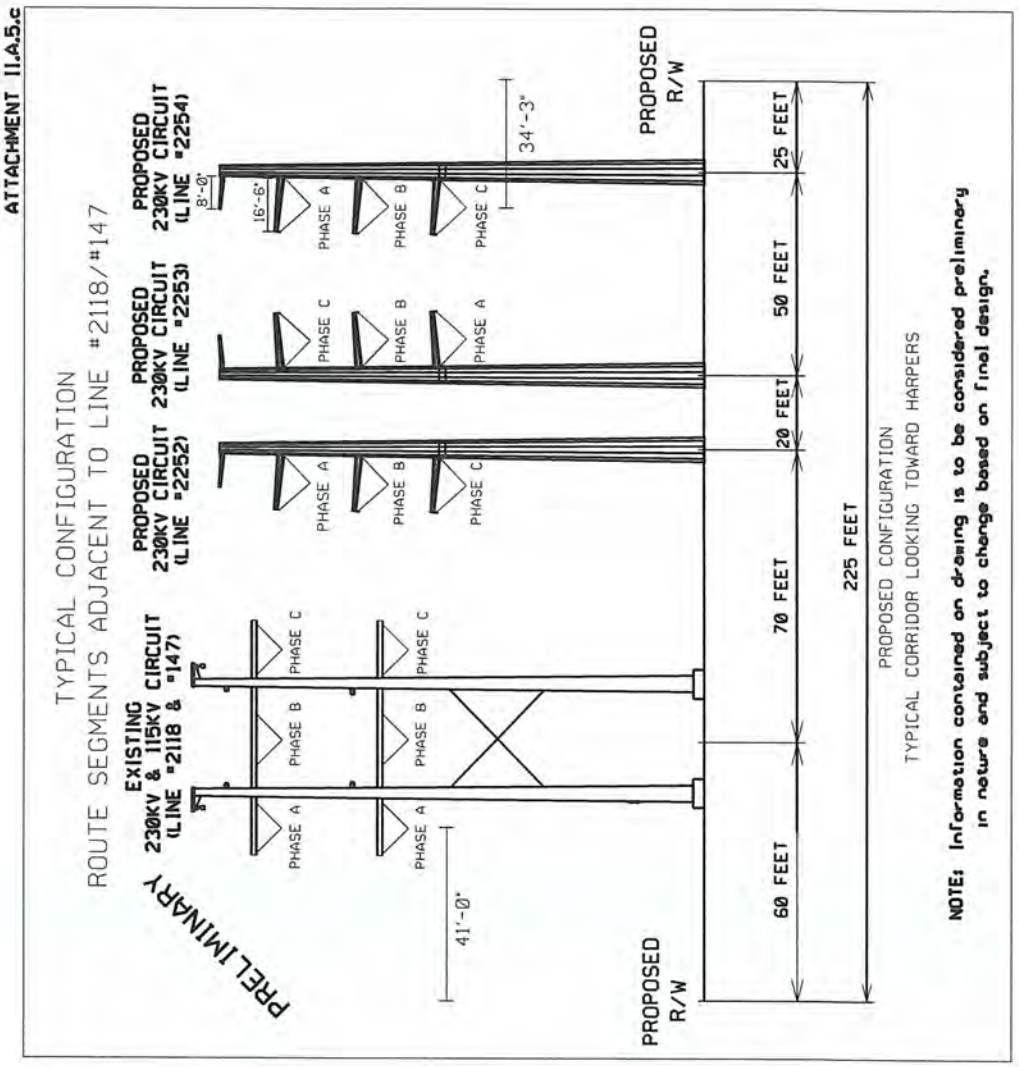
TYPICAL CONFIGURATION

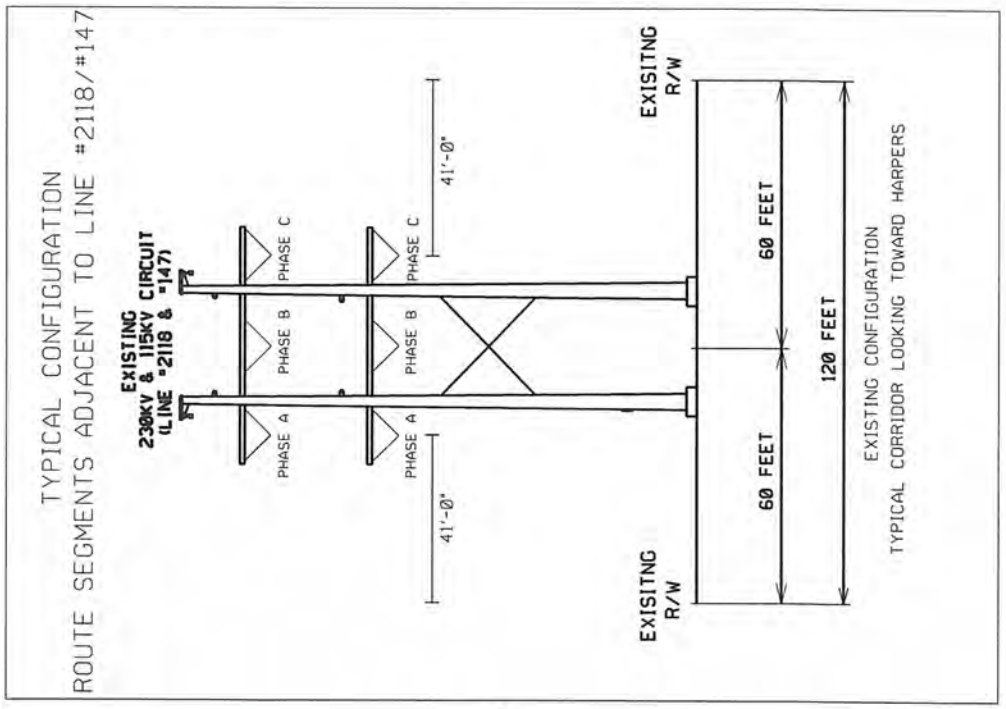
REBUILD SEGMENTS (LINE #271 & LINE #2240)

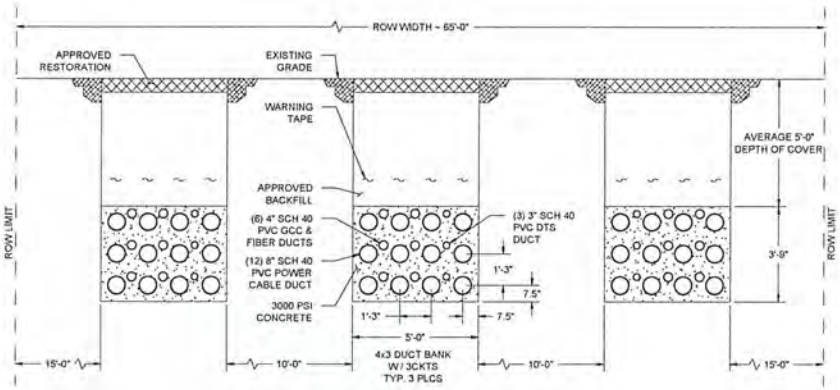


PROPOSED CONFIGURATION
TYPICAL CORRIDOR LOOKING TOWARD HARPERS

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

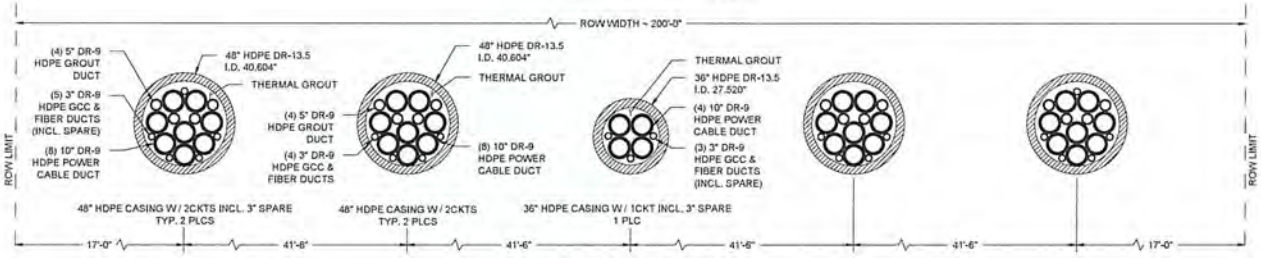

ATTACHMENT II.A.5.c
TYPICAL CONFIGURATION
ROUTE SEGMENTS ADJACENT TO LINE #2118/#147
PRELIMINARY
EXISTING 230KV & 115KV CIRCUIT (LINE #2118 & #147)
PROPOSED 230KV CIRCUIT (LINE #2252)
PROPOSED 230KV CIRCUIT (LINE #2253)
PROPOSED 230KV CIRCUIT (LINE #2254)
PHASE A
PHASE B
PHASE C
41'-0"
16'-6"
8'-0"
34'-3"
PROPOSED R/W
60 FEET
70 FEET
20 FEET
50 FEET
25 FEET
225 FEET
PROPOSED CONFIGURATION
TYPICAL CORRIDOR LOOKING TOWARD HARPERS
NOTE: Information contained on drawing is to be considered preliminary in nature and subject to change based on final design.


TYPICAL CONFIGURATION
ROUTE SEGMENTS ADJACENT TO LINE #2118/#147
EXISTING 230KV & 115KV CIRCUIT (LINE #2118 & #147)
PHASE A
PHASE B
PHASE C
41'-0"
EXISITNG R/W
60 FEET
120 FEET
EXISTING CONFIGURATION
TYPICAL CORRIDOR LOOKING TOWARD HARPERS



230-kV OPEN CUT CONCRETE-ENCASED INSTALLATION CROSS-SECTION

SECTION A
NOT TO SCALE



230-kV TRENCHLESS INSTALLATION CROSS-SECTION

SECTION B
NOT TO SCALE

PRELIMINARY – FOR INFORMATION ONLY

BURNS McDONNELL

Dominion Energy

COASTAL VIRGINIA OFFSHORE WIND
UNDERGROUND TRANSMISSION
CROSS SECTIONS

	Name	Date	Project No.	Sheet No.
Designed by	JWM	6/23/21		35 OF 38
Approved			Scale	
Approved			AS SHOWN	
		B/M No.	Revisions	
			A B	
Cad File Name: PLAN VIEW JR.DWG			Drawing No.	
PLOTTED:			UG-EX-035	

Revisions

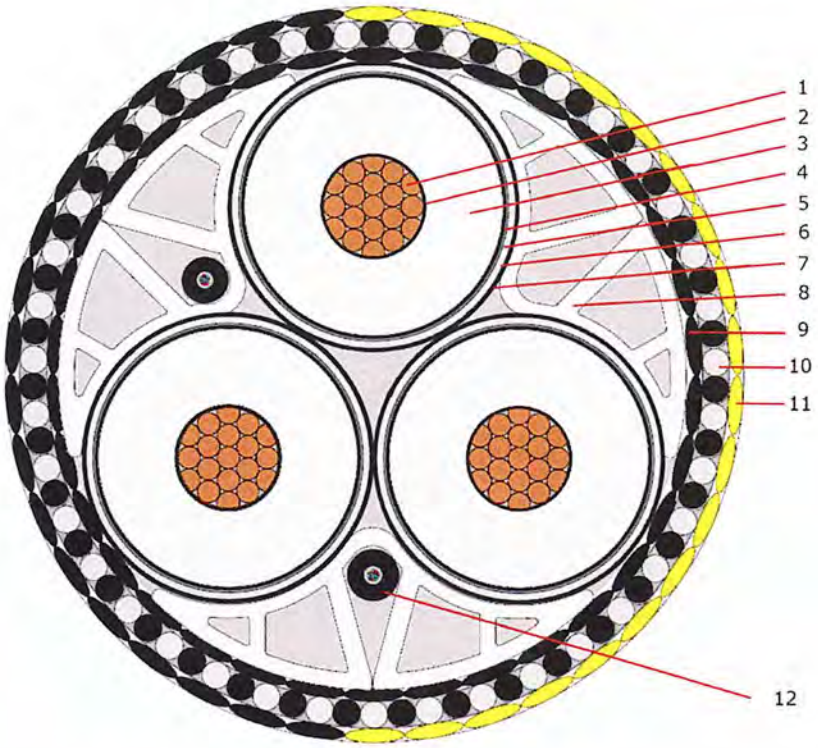
A	07/21	JWM	B	
DSC/NAH				
ISSUED FOR INFORMATION				
B/M				
123456				

References

Library	Cell Name	B/M Assembly

8.2 Optimised Case 3 x 1200 mm² copper with mixed stainless steel / PE armour (50/50)

8.2.1 Cable cross sectional drawing

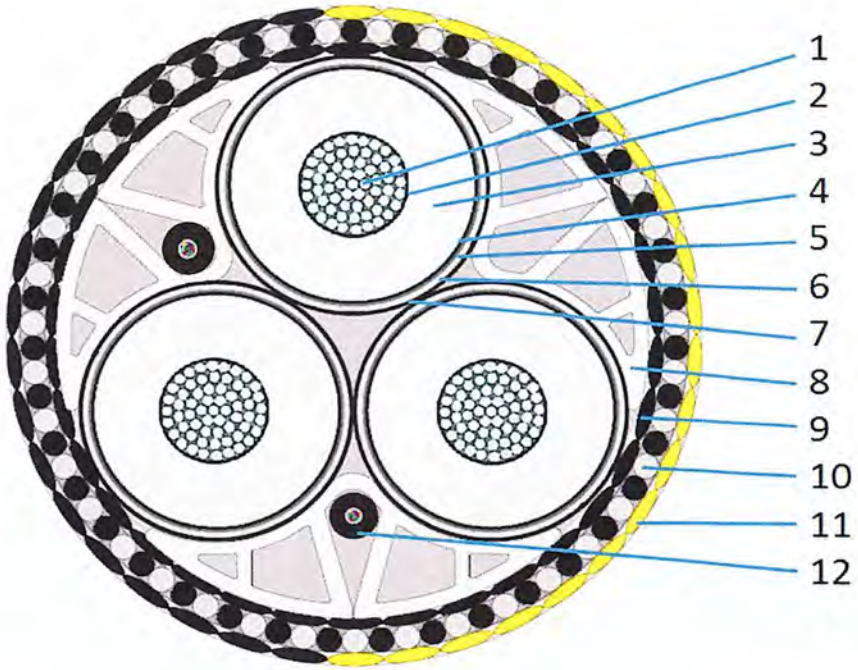


Not to scale – indicative only

No.	Description	Details
1	Conductor	Copper, round, stranded
2	Conductor screen	Extruded semi conductive layer
3	Insulation	XLPE (cross linked polyethylene)
4	Insulation screen	Extruded semi conductive layer
5	Water Blocking	Semi conductive water swellable tape
6	Metal sheath	Lead alloy sheath
7	Inner sheath	Extruded semi conductive polyethylene on each phase
8	Fillers	Plastic fillers
9	Teredo protection (available as optional) and armour bedding	copper tapes (approx. 20 % overlap), polypropylene yarns
10	Armouring	one layer mixed: stainless steel wires and PE rods

8.3 Optimised Case 3 x 1200 mm² aluminium with mixed stainless steel / PE armour (50/50)

8.3.1 Cable cross sectional drawing



Not to scale – indicative only

No.	Description	Details
1	Conductor	Aluminium, round, stranded
2	Conductor screen	Extruded semi conductive layer
3	Insulation	XLPE (cross linked polyethylene)
4	Insulation screen	Extruded semi conductive layer
5	Water Blocking	Semi conductive water swellable tape
6	Metal sheath	Lead alloy sheath
7	Inner sheath	Extruded semi conductive polyethylene on each phase
8	Fillers	Plastic fillers
9	Teredo protection and armour bedding (available as optional)	copper tapes (approx. 20 % overlap), polypropylene yarns (option)
10	Armouring	one layer mixed: stainless steel wires and PE rods
11	Serving	Polypropylene yarns
12	OF cable	2 x optical fibre cable with 44 single mode fibres and 4 multi-mode fibres

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 right-of-way for the Overhead Transmission Circuits along the proposed and alternative routes will require easements for a new-build transmission line. Portions of the routes will overlap existing Dominion Energy Virginia overhead electric transmission line rights-of-way. The table below identifies the width of new right-of-way that will be required in these locations. Maps depicting these areas of co-location are included as Attachment II.A.6.

Route	Existing Transmission Line	Existing Easement (feet)	New Easement (feet)
Harpers to Fentress Proposed Route 1, Harpers to Fentress Alternative Routes 2 and 5	Lines #2118/#147	120	105
Harpers to Fentress Alternative Hybrid Route	Lines #2118/#147	120	Varies between 50 and 215
Harpers to Fentress Proposed Route 1, Harpers to Fentress Alternative Hybrid Route	Line #271/#I-74	120	40
Harpers to Fentress Proposed Route 1, Harpers to Fentress Alternative Hybrid Route	Line #2240/#I-74	120	40
Harpers to Fentress Alternative Route 5 and Line #2085 Route Variation	Line #2085	120	90

Portions of the Harpers to Fentress Proposed Route 1, Harpers to Fentress Alternative Hybrid Route, Harpers to Fentress Alternative Routes 2 and 5, and the Line #2085 Route Variation overlap with the Line #2118/#147 right-of-way, an existing Dominion Energy Virginia overhead transmission line, for a distance of approximately 1.8 miles between London Bridge Road and Princess Anne Road. The new right-of-way generally will extend approximately 105 feet beyond the limits of the existing easement with one exception. Along the Harpers to Fentress Alternative Hybrid Route, near Buyrn Farm Park, the new right-of-way will extend approximately 215 feet beyond the limits of the existing easement for about 0.4 mile.

Just north of Salem Road where the Harpers to Fentress Proposed Route 1 and the

Harpers to Fentress Alternative Hybrid Route intersect the Company's existing Line #271 overhead route, the three proposed circuits will be installed within the existing Line #271 corridor as part of a wreck-and-rebuild. The existing double circuit lattice structures for Line #271 will be replaced with new double circuit monopole structures to carry Line #271 and one Overhead Transmission Circuit. The Company additionally will either install new single circuit or double circuit monopole structures to carry the two remaining Overhead Transmission Circuits, as discussed in Section I.A of this Appendix. New right-of-way is needed beyond the existing easement for the majority of this 6.1 mile segment to the Pocaty Substation. In general, an additional 40 feet of new right-of-way will be needed beyond the existing easement except in three areas where residential development precludes the expansion of the existing right-of-way, including approximately:

- 0.5 mile in the area between Salem Road and Highland Drive
- 0.5 mile in the area between North Landing River and the Virginia Beach/Chesapeake boundary
- 0.3-mile-long segment where the routes cross Mt. Pleasant Road in Chesapeake

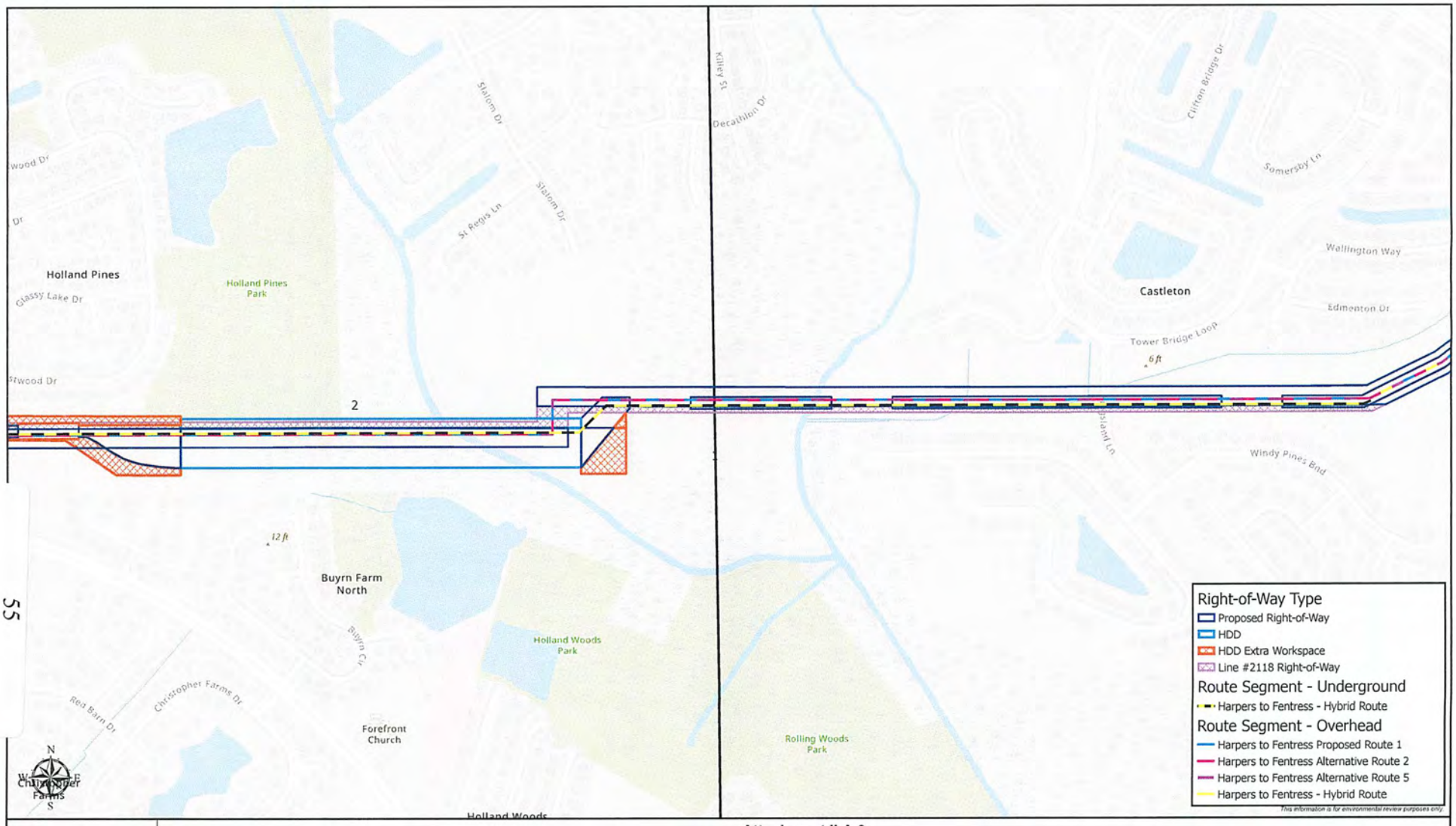
Because Line #I-74 is idle, it will be removed.

The Harpers to Fentress Proposed Route 1, Harpers to Fentress Alternative Hybrid Route, and Harpers to Fentress Alternative Route 2 that are adjacent to Line #2240, will require an additional 40 feet of new right-of-way south of the Pocaty Substation for about 1.9 miles to the existing Fentress Substation.

Harpers to Fentress Alternative Route 5 will follow the Company's existing Line #2240 right-of-way for about 0.1 mile to Fentress Substation. An additional 40 feet of new right-of-way will be needed beyond the existing easement along this segment of Alternative Route 5.

Harpers to Fentress Alternative Route 2 follows the same alignment as the Harpers to Fentress Proposed Route 1 for 1.6 miles from a point south of the Intracoastal Waterway at the intersection with the Company's existing Line #271 right-of-way to the Pocaty Substation. An additional 40 feet of new right-of-way will be needed beyond the existing easement.

The Line #2085 Route Variation and the Harpers to Fentress Alternative Route 5 will overlap on the west side of the Company's existing Line #2085 right-of-way from near Landstown Road at the Princess Anne Athletic Complex to the south for approximately 4.4 miles. An additional 90 feet of new right-of-way on the west side of the existing easement will be required.


Holland Pines
Holland Pines Park
Glassy Lake Dr
Slalom Dr
St Regis Ln
Decathlon Dr
Clifton Bridge Dr
Somersby Ln
Wellington Way
Castleton
Edmonton Dr
Tower Bridge Loop
6 ft
2
12 ft
Buyrn Farm North
Buyrn Cir
Holland Woods Park
Christopher Farms Dr
Red Barn Dr
Forefront Church
Rolling Woods Park
Windy Pines Blvd
Right-of-Way Type
Proposed Right-of-Way
HDD
HDD Extra Workspace
Line #2118 Right-of-Way
Route Segment - Underground
Harpers to Fentress - Hybrid Route
Route Segment - Overhead
Harpers to Fentress Proposed Route 1
Harpers to Fentress Alternative Route 2
Harpers to Fentress Alternative Route 5
Harpers to Fentress - Hybrid Route
This information is for environmental review purposes only.
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Miles
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Dominion Energy
Attachment II.A.6
ROW Subject to Existing Easements
Coastal Virginia Offshore Wind Commercial Project
Dominion Virginia Power
Virginia Beach and Chesapeake, VA
Page 1 of 10
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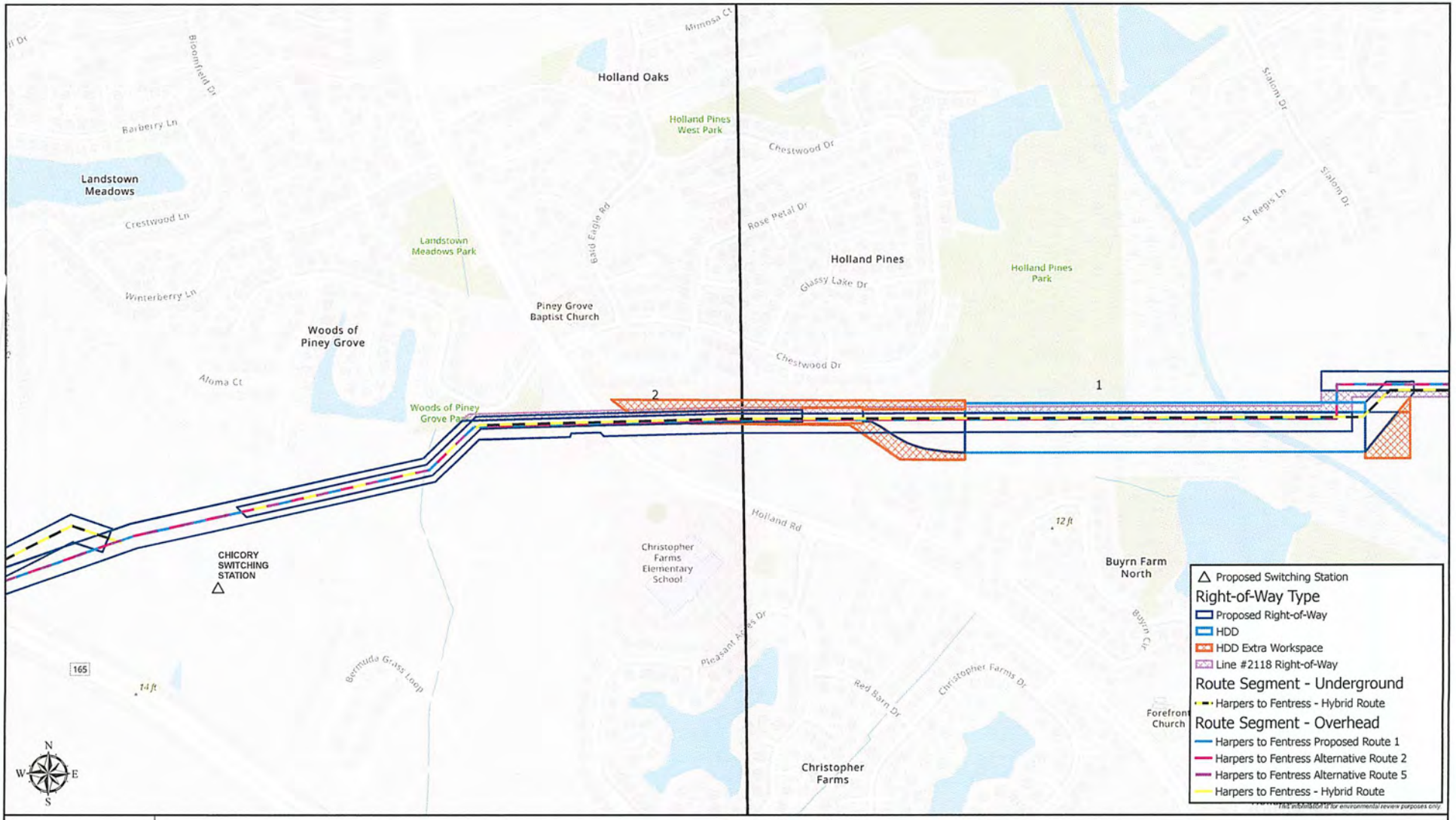

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Dominion Energy

Attachment II.A.6
ROW Subject to Existing Easements
Coastal Virginia Offshore Wind Commercial Project
Dominion Virginia Power
Virginia Beach and Chesapeake, VA

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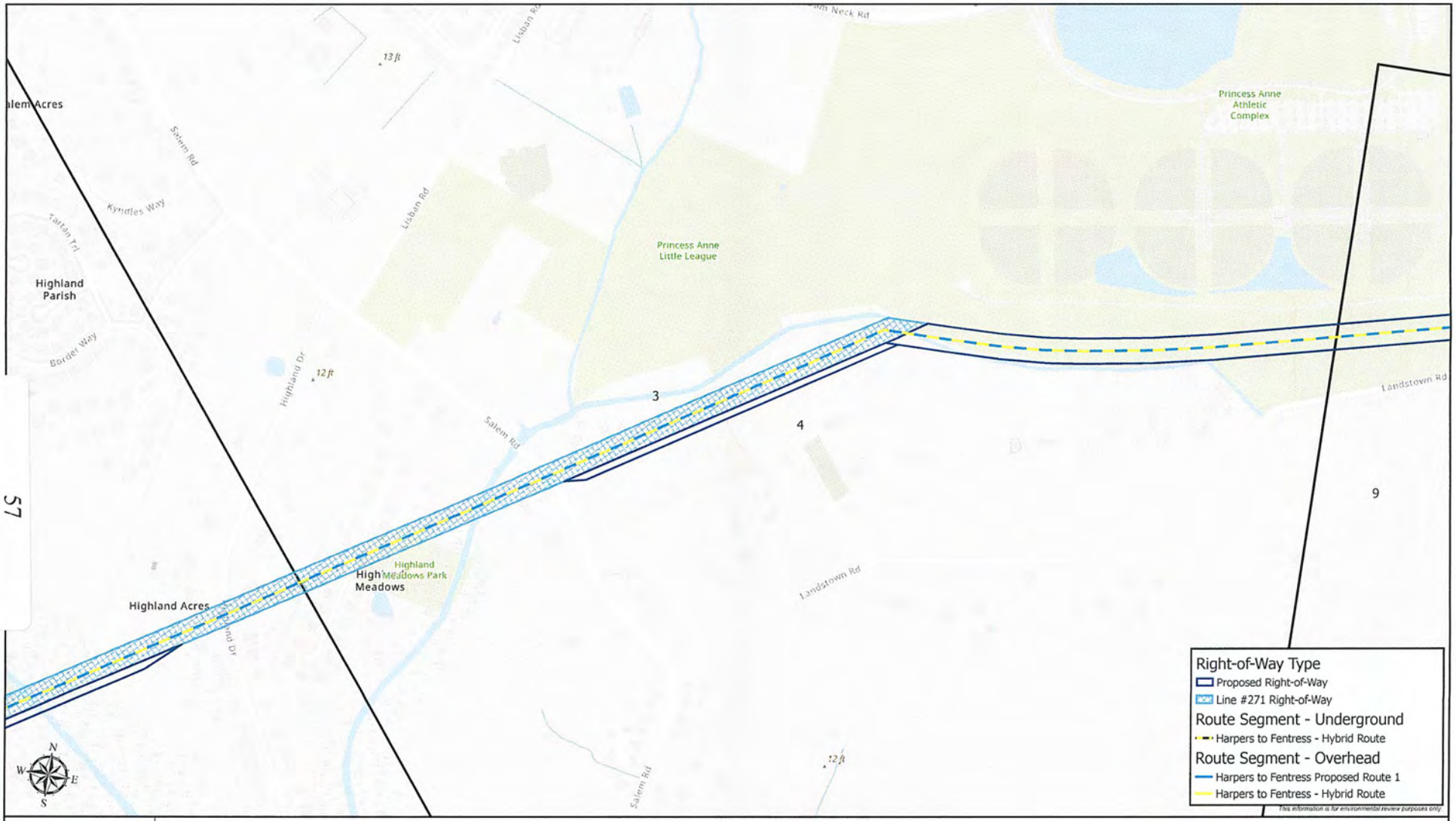

Attachment II.A.6
ROW Subject to Existing Easements
Coastal Virginia Offshore Wind Commercial Project
Dominion Virginia Power
Virginia Beach and Chesapeake, VA

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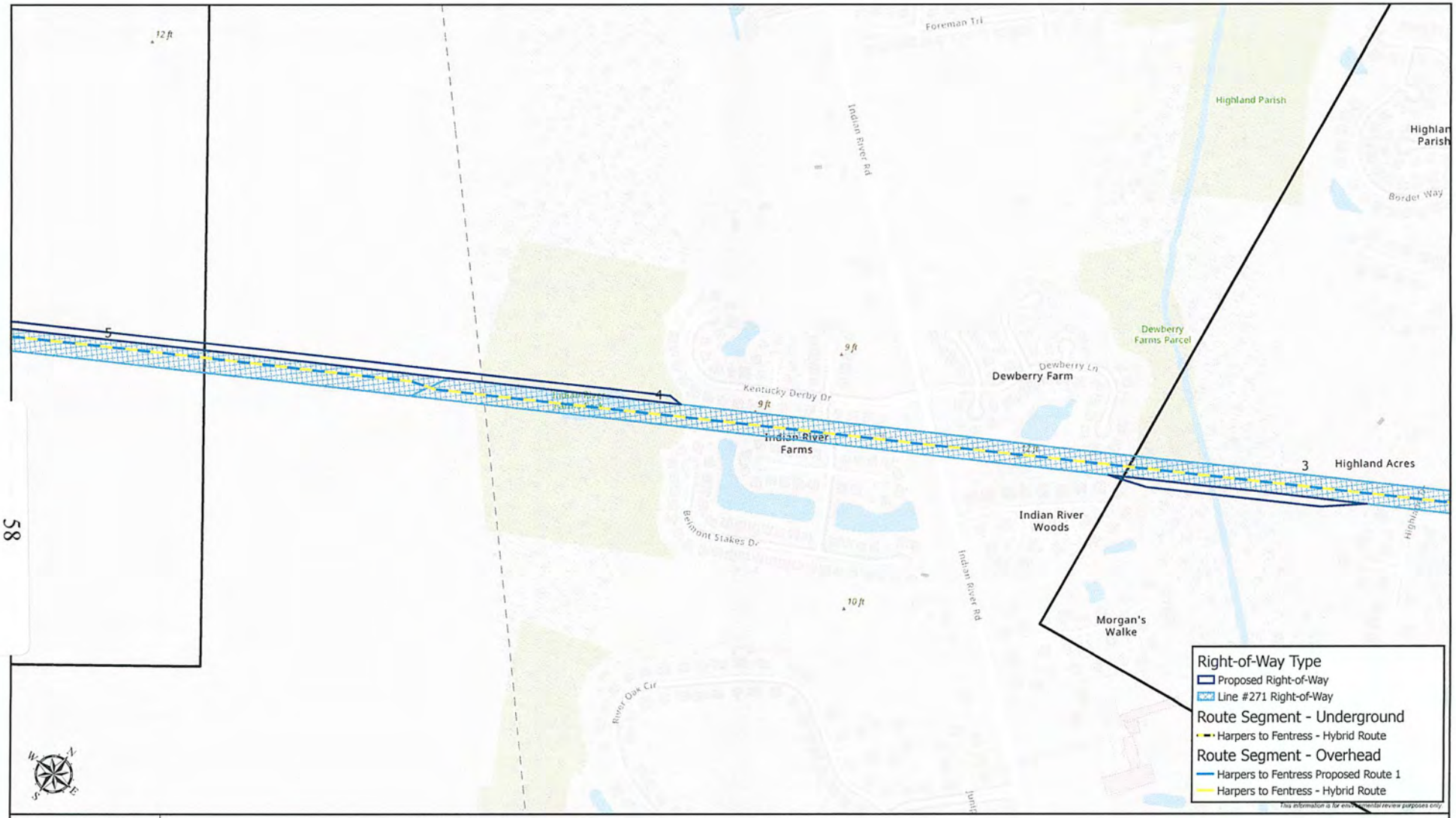

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Dominion Energy

Attachment II.A.6
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Coastal Virginia Offshore Wind Commercial Project
Dominion Virginia Power
Virginia Beach and Chesapeake, VA

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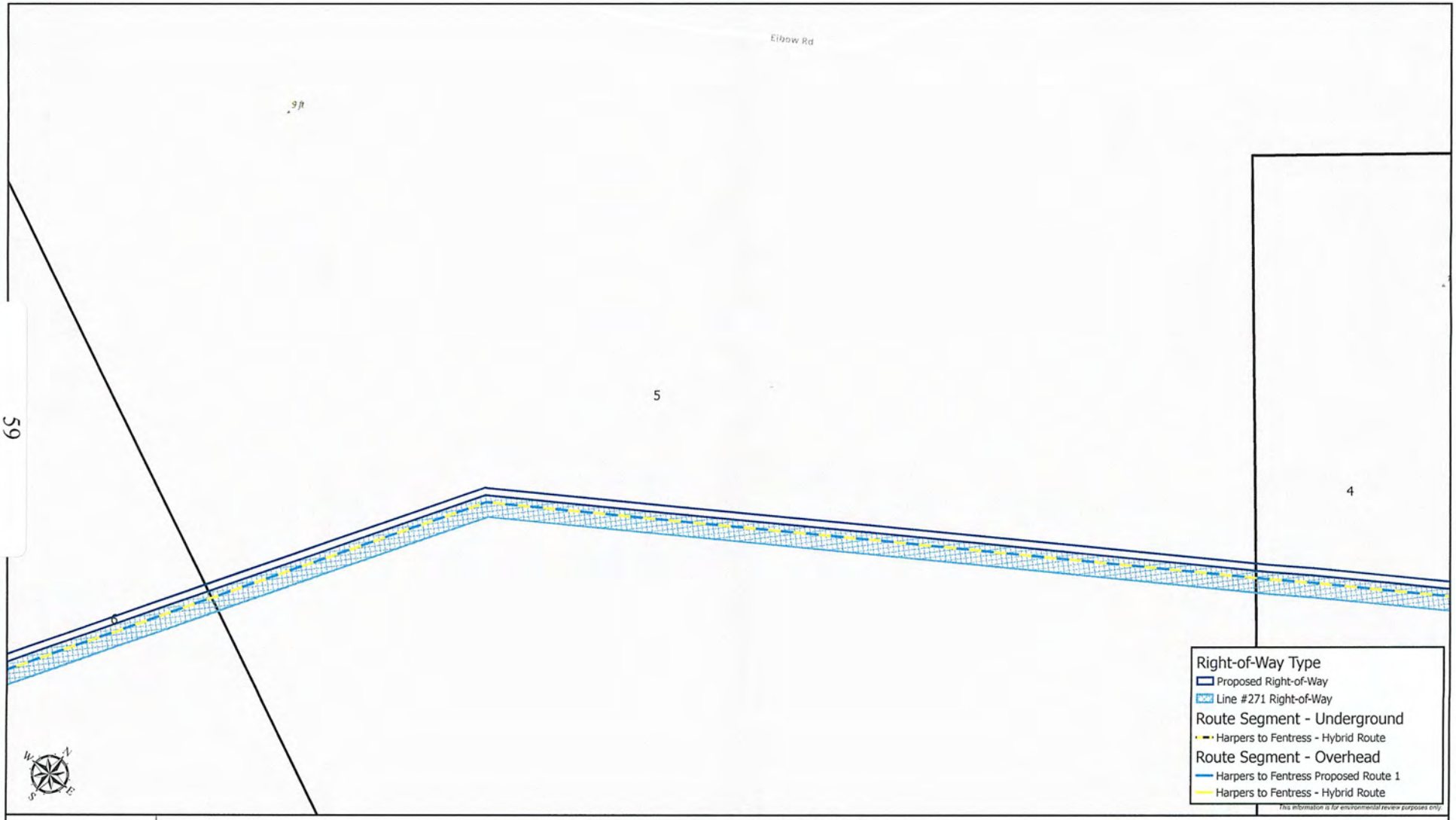

Attachment II.A.6
ROW Subject to Existing Easements
Coastal Virginia Offshore Wind Commercial Project
Dominion Virginia Power
Virginia Beach and Chesapeake, VA

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Vespasian Cir
Ravenna Crse
Ravenna East
165
9 ft
11 ft
2 ft
Mount Pleasant
Ridge Ln
6
5
7
True Way
Evangelistic
Mission
Intracoastal Waterway
9 ft
165
Right-of-Way Type
Proposed Right-of-Way
Line #271 Right-of-Way
Route Segment - Underground
Harpers to Fentress - Hybrid Route
Route Segment - Overhead
Harpers to Fentress Proposed Route 1
Harpers to Fentress Alternative Route 2
Harpers to Fentress - Hybrid Route
This information is for environmental review purposes only
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Dominion Energy
Attachment II.A.6
ROW Subject to Existing Easements
Coastal Virginia Offshore Wind Commercial Project
Dominion Virginia Power
Virginia Beach and Chesapeake, VA
Page 6 of 10
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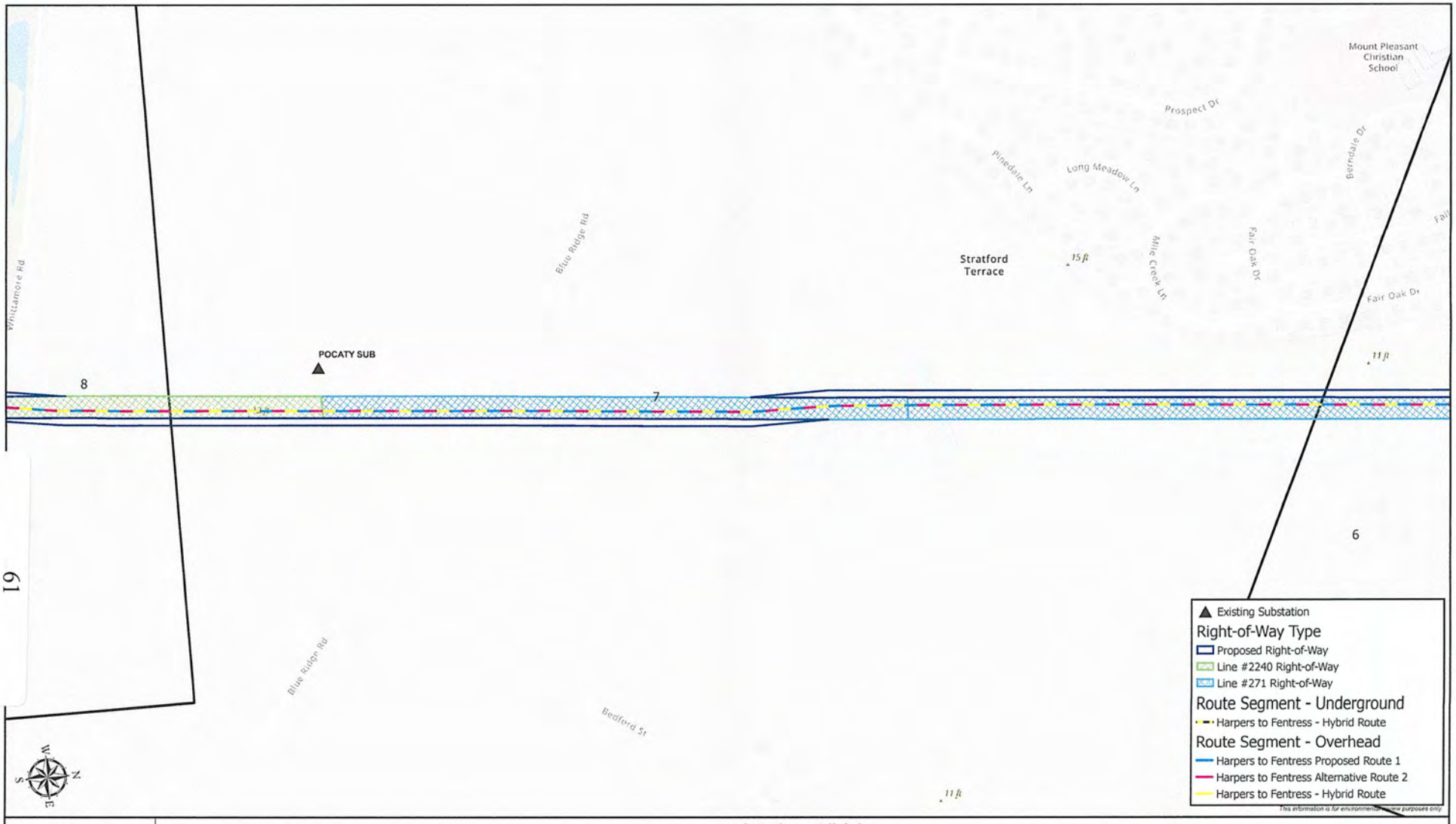

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Dominion Energy

Attachment II.A.6
ROW Subject to Existing Easements
Coastal Virginia Offshore Wind Commercial Project
Dominion Virginia Power
Virginia Beach and Chesapeake, VA

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Attachment II.A.6
ROW Subject to Existing Easements
Coastal Virginia Offshore Wind Commercial Project
Dominion Virginia Power
Virginia Beach and Chesapeake, VA

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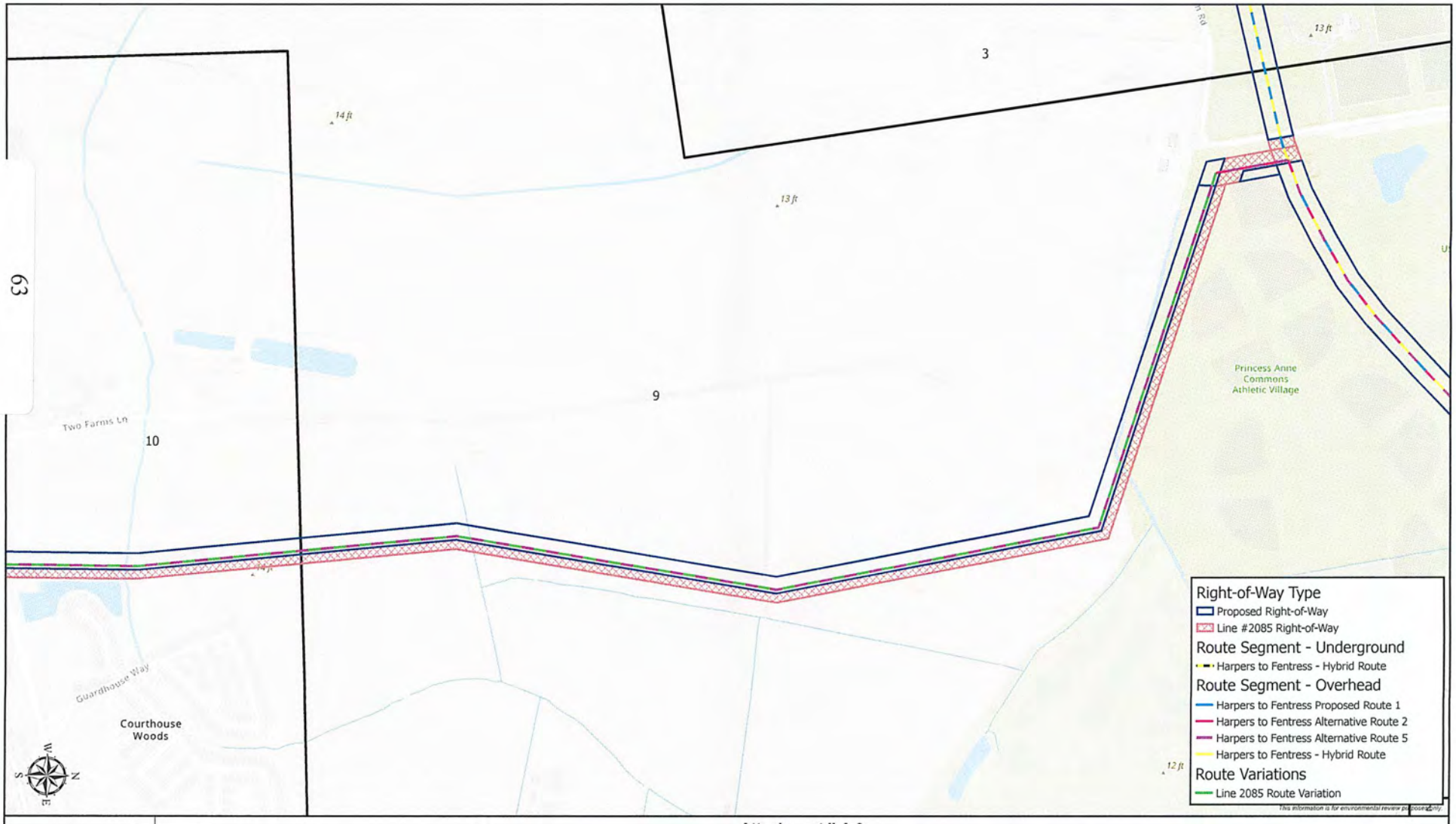

Attachment II.A.6
ROW Subject to Existing Easements
Coastal Virginia Offshore Wind Commercial Project
Dominion Virginia Power
Virginia Beach and Chesapeake, VA

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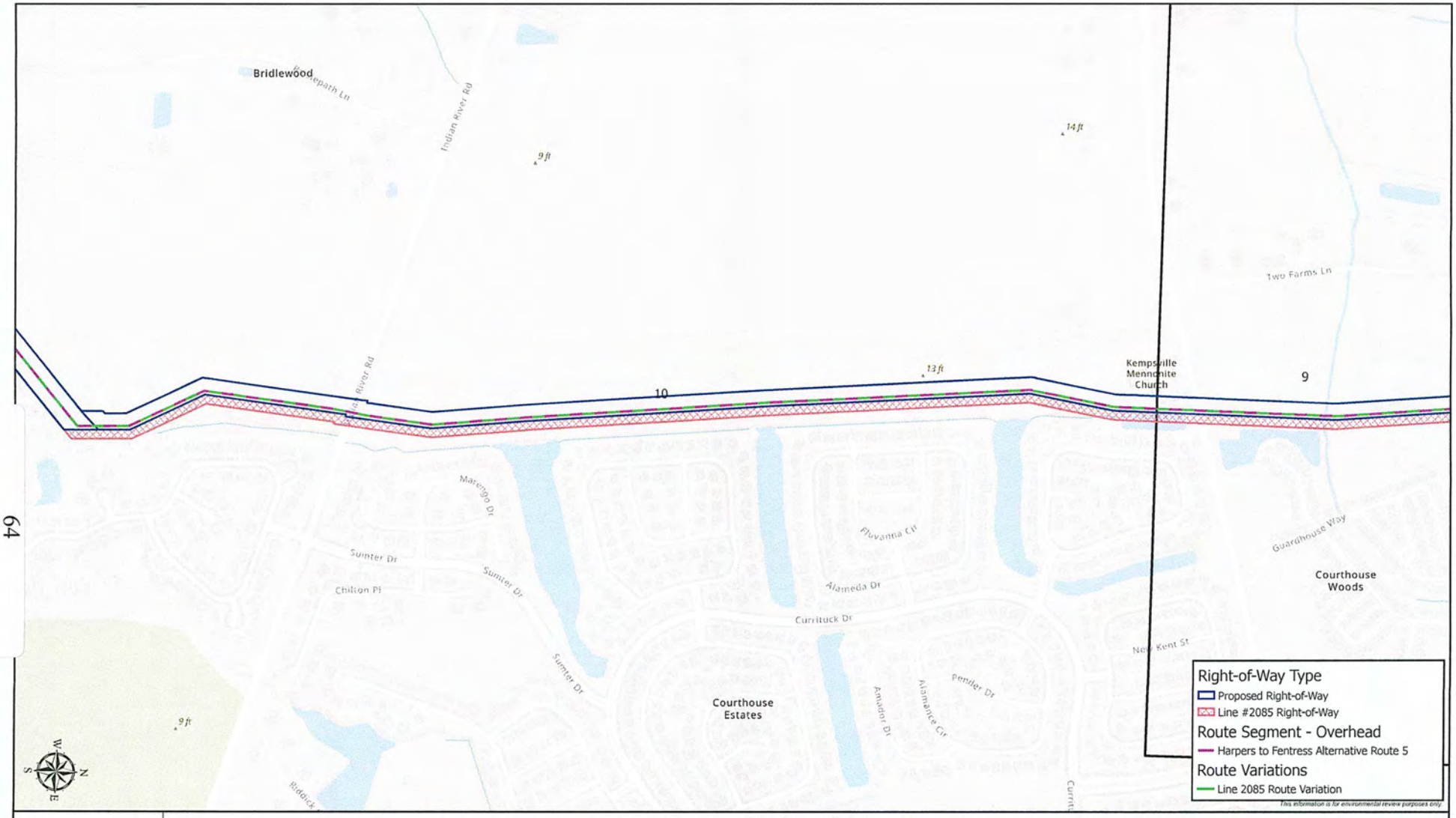

Attachment II.A.6
ROW Subject to Existing Easements
Coastal Virginia Offshore Wind Commercial Project
Dominion Virginia Power
Virginia Beach and Chesapeake, VA

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II. DESCRIPTION OF THE PROPOSED PROJECT

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

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

Response: As noted in Section II.A.4, the rights-of-way will vary from 65 feet to 225 feet wide, which is inclusive of existing and new rights-of-way. Clearing would not be required over certain portions of the proposed and alternative routes that overlap existing maintained rights-of-way. The locations of these existing rights-of-way are discussed above in Section II.A.6. Forestry activities may include limited trimming in order to maintain the existing right-of-way width or clearing of new right-of-way. In both cases, brush, trees, and old stumps are cut at ground level and may be ground or chipped. The right-of-way is not grubbed, thus leaving the root mass intact and the soil undisturbed. Tree removal is performed by machines with hydraulic cutters or by hand-cutting with power saws. Trees located outside of the right-of-way that are tall enough to potentially impact the transmission facilities, commonly referred to as "danger trees," may also need to be cut. Danger trees will be cut to be no more than three inches above ground level, limbed, and will remain where felled. Debris that is adjacent to homes will be disposed of by chipping or removal. In other areas, debris may be mulched or chipped as practicable. Danger tree removal will be accomplished by hand in wetland areas and within 100 feet of streams, if applicable. Care will be taken not to leave debris in streams or wetland areas. Matting may be used for heavy equipment in these areas. Erosion control devices will be used on an ongoing basis during all clearing and construction activities.

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

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

II. DESCRIPTION OF THE PROPOSED PROJECT

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

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

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

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

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

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

II. DESCRIPTION OF THE PROPOSED PROJECT

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

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

Response: The Company's route selection for a new transmission line typically begins with identification of the project "origin" and "termination" points provided by the Company's Transmission Planning Department. As discussed in Section I.C, in this case, the origin and termination points were provided by Dominion Generation, as the interconnection customer, consistent with PJM's review of the CVOW Commercial Project. This is followed by the development of a study area for the project. The study area represents a circumscribed geographic area from which potential routes that may be suitable for a transmission line can be identified.

For this project, the Company requested the services of Environmental Resources Management ("ERM") to help collect information within the study area, identity potential routes, perform a routing analysis comparing the route alternatives, and document the routing efforts in an Environmental Routing Study. ERM defined a study area for identifying potential alternatives for the onshore components of the Virginia Facilities, then mapped environmental, scenic, cultural, and historic resources, routing constraints, and routing opportunities (*e.g.*, abilities to utilize existing right-of-way) within this area. Data on the study area were compiled through publicly available Geographic Information Systems databases, internet research, and agency, property owner, stakeholder, and public outreach and engagement.

The purpose of this work was to characterize the environmental resources and conditions that could be affected by construction and operation of the Overhead Transmission Circuits, and to identify possible route alternatives for the proposed 230 kV transmission line circuits. The analysis considered land ownership, existing and potential future land uses, existing utilities and rights-of-way, recreational facilities, biological resources including sensitive species habitat, historic resources, the presence of environmental justice communities, visual resources, and community feedback.

Once the routing opportunities and constraints were identified and assessed, potential overhead and hybrid routes were identified within the study area between the Cable Landing Location and Fentress Substation. Efforts were made to co-locate routes with existing transmission lines and other linear corridor features, such as roads. In most cases, however, large scale (*i.e.*, point-to-point) co-location opportunities with existing transmission lines and other features were determined to be not viable due to bottlenecks caused by residential developments, city parks, and other constraints. The various existing transmission lines in the study area cross numerous residential developments and commercial areas where residential lots or commercial buildings have been built up to edges of the existing rights-of-way on one or both sides. These developments generally preclude the expansion of the right-of-way to accommodate development of a new transmission line entirely co-located with an existing line.

A single underground route was developed for the Onshore Export Circuits between the Cable Landing Location and Harpers Switching Station. In addition, a total of seven routes and four route variations initially were identified for the Overhead Transmission Circuits. Of these seven routes, one route was identified as the Proposed Route, two overhead, one hybrid route, and two route variations were identified as potentially viable alternatives to the Proposed Route and three routes were rejected as infeasible. The Proposed Route, the three viable alternatives routes, and the three routes rejected as infeasible, are discussed below. The route development process for the Onshore Export Circuits and Overhead Transmission Circuits is described in more detail in the Environmental Routing Study included with the Application.

ONSHORE EXPORT CIRCUITS

Cable Landing to Harpers Proposed Route

From the Cable Landing Location to the Harpers Switching Station, the approximately 4.4-mile underground route of the Onshore Export Circuits utilizes new right-of-way that has been agreed upon by SMR, the Navy, and the City of Virginia Beach, whose properties are impacted by the route. In particular, the alignment for the Onshore Export Circuits was developed in close coordination with SMR and NAS Oceana in order to avoid conflicts with the operation and future development of these military installations. See Attachments II.A.9.a and II.A.9.b for letters supporting the proposed route of the Cable Landing to Harpers Segment across the NAS Oceana and SMR properties, respectively. See also Attachment II.A.9.c for a letter of collaboration and cooperation to cross Virginia Beach City-owned land. As discussed in the following section, the Company continues to collaborate with the City of Chesapeake regarding crossing of City-owned land, and is aware of their support for the CVOW Project. Due to the support of this route by the landowners, the Company did not consider an alternative to this route. The estimated conceptual cost of the Onshore Export Circuits along the proposed route is provided in Section I.I.

OVERHEAD TRANSMISSION CIRCUITS

Harpers to Fentress Proposed Route 1

After exiting the Harpers Switching Station, Harpers to Fentress Proposed Route 1 proceeds southwest for about 2.3 miles across both private lands and lands owned by the City of Virginia Beach adjacent to or within the Southeastern Parkway and Greenbelt ("SEPG") study corridor. This segment of the route crosses Dam Neck and London Bridge roads and passes between the Prince George Estates, Mayberry, Pine Ridge, and Castleton residential subdivisions. The route then intersects and parallels the Company's existing Lines #2118/#147 corridor for a distance of approximately 1.8 miles, mostly crossing City-owned lands within or adjacent to the SEPG corridor. This segment passes south of the Castleton residential subdivision and between the Buyrn Farm North, Holland Pines, and Woods of Piney Grove residential subdivisions near Holland Drive.

After leaving the Company's existing transmission line corridor, Harpers to Fentress Proposed Route 1 continues in a southwesterly direction for about 2.1 miles, mostly crossing City-owned lands within the SEPG corridor, including an undeveloped portion of the Princess Anne Athletic Complex. This segment crosses the Company's existing Line #2085 right-of-way just west of Landstown Road and intersects with the Line #271 right-of-way just north of North Landing Road. The existing lattice structures for Line #271 also support idle Line #I-74.

At the intersection with Line #271, the three proposed Overhead Transmission Circuits join and follow the Line #271 corridor for 6.1 miles to the south/southwest to the Company's existing Pocaty Substation in Chesapeake. This section of the route requires a wreck-and-rebuild of the existing double circuit lattice structures for Lines #271/#I-74 with new double circuit monopole structures (to carry Line #271 and one Overhead Transmission Circuit), plus the construction of either an additional double circuit monopole structure or two additional single circuit structures (to carry the two remaining Overhead Transmission Circuits). The double circuit monopole structures would be installed in the route segment crossing the Highland Meadows/Highland Acres and Indian River Woods/Indian River Farms subdivisions in Virginia Beach where there is limited space to expand the existing right-of-way. Elsewhere along this segment, two new single circuit monopole structures would be installed.

The route segment along Line #271 next enters the City of Chesapeake south of Indian River Farms Park. The route segment initially crosses mostly forested lands, including private land, parcels owned by the City of Chesapeake, and two tracts owned by The Nature Conservancy. The Company continues to collaborate with the City of Chesapeake regarding crossing of City-owned land, and is aware of their support for the CVOW Project. See Attachment II.A.9.d for a letter supporting work on The Nature Conservancy land along the Proposed Route and Hybrid Alternative. This segment also crosses Corps-owned lands along the Intracoastal Waterway. South of the waterway, the route would mostly cross privately owned

agricultural lands in addition to crossing Mt. Pleasant and Blue Ridge Roads.

From the Pocaty Substation, Harpers to Fentress Proposed Route 1 follows the Company's existing Lines #2240/#I-74 corridor for 0.7 mile south, crossing Whittamore Road and passing along the east side of the Battlefield Golf Club. The route then heads west for 1.1 miles along the south side of the golf club before entering Fentress Substation. The route segment from the Pocaty to Fentress Substations requires a wreck-and-rebuild of the Company's existing Line #2240 double circuit lattice structures and their replacement with new double circuit monopole structures plus construction of two additional single circuit structures. The new double circuit structures would carry Line #2240 and one Overhead Transmission Circuit, and the new single-circuit monopole structures would each carry one Overhead Transmission Circuit.

The estimated conceptual cost of the Overhead Transmission Circuits along the Harpers to Fentress Proposed Route 1 is provided in Section I.I.

Of the three overhead routes and one hybrid route, Harpers to Fentress Proposed Route 1 is recommended as the environmentally preferred alternative for several reasons. It would be the shortest route and result in the least amount of previously undisturbed land. Additionally, 13.1 miles (92%) of the route would be within the SEPG study corridor and/or co-located with existing Company-owned transmission line corridors. Virtually the entire route within the City of Chesapeake would be co-located with the Company's Line #271 right-of-way, requiring only an additional 40 feet of new right-of-way to construct and operate the new Overhead Transmission Circuits. About 6.9 miles each of Harpers to Fentress Alternative Routes 2 and 5 would be within the SEPG corridor and/or planned to be within or adjacent to the Company's existing transmission lines.

Another factor is that Harpers to Fentress Proposed Route 1 would cross the most City-owned land (in part, reflecting its greater use of the SEPG corridor, much of which is owned by the City of Virginia Beach in Virginia Beach) and the least amount of private property. As noted above, crossing more City-owned lands rather than privately owned lands was considered an advantage because the Cities of Virginia Beach and Chesapeake have both been supportive of the Virginia Facilities and the use of City-owned lands for the new Overhead Transmission Circuits.

With regard to biological resources, Harpers to Fentress Proposed Route 1 would require the least clearing of forested lands, forested wetlands, and wetlands overall. Significantly more forested lands and forested wetlands would be affected by Harpers to Fentress Alternative Routes 2 and 5.

While Harpers to Fentress Proposed Route 1 would pass near a greater number of homes than Harpers to Fentress Alternative Routes 2 and 5, many of these homes are in areas where the route will be constructed within or adjacent to the Company's existing transmission rights-of-way. For example, where the Proposed Route 1 will

pass near the Holland Pines and Woods of Piney Grove subdivisions, it will be within or adjacent to the Lines #2118/#147 corridor; and where it would pass through or near the Highland Meadows, Highland Acres, Dewberry Farms, Indian River Woods, and Indian River Farms subdivisions, it is planned to be within or adjacent to the Lines #271/#I-74 corridor. In the latter area, the homes were built adjacent to the right-of-way after the transmission line was installed. Line #271 would be wrecked-and-rebuilt, and the new circuits installed within the existing right-of-way across these subdivisions.

The Harpers to Fentress Proposed Route 1 route crosses lands managed by the U.S. Navy, Corps, SMR, the Cities of Virginia Beach and Chesapeake, and The Nature Conservancy. In addition, this route also crosses the following conservation easements administered by the Navy and the City of Chesapeake: one Multi-Year Encroachment Protection Easement and three Naval Auxiliary Landing Field ("NALF") Fentress ("NALF Fentress") Encroachment Protection Easements. The Company has consulted with all of the entities that manage these lands and easements and anticipates no issues with securing right-of-way across the lands managed by these entities.

Harpers to Fentress Alternative Route 2

Harpers to Fentress Alternative Route 2 follows the same alignment as Harpers to Fentress Proposed Route 1 for approximately 5.5 miles from the Harpers Switching Station to a point just west of Landstown Road in the Princess Anne Athletic Complex. The route then heads south/southwest for about 1.8 miles across sparsely developed forested and agricultural lands primarily owned by the City of Virginia Beach and managed as part of the City's Interfacility Traffic Area ("ITA"). Portions of this segment of Harpers to Fentress Alternative Route 2 are aligned to follow a planned future expansion of Landstown Road based on information provided by staff from the City of Virginia Beach planning and transportation departments. After crossing Indian River Road, the route continues about 1.0 mile to the south across mostly forested private lands to the boundary between the Cities of Virginia Beach and Chesapeake.

Once in Chesapeake, Harpers to Fentress Alternative Route 2 heads east for approximately 0.9 mile, crossing the Intracoastal Waterway and adjacent federal lands managed by the Corps at a point about 0.6 mile northwest of the North Landing River Bridge. It then proceeds west for 2.6 miles across privately owned forested and agricultural parcels along the south side of the Intracoastal Waterway to an intersection with the Company's existing Line #271 right-of-way. From there, the route follows the same alignment as Harpers to Fentress Proposed Route 1 to the Pocaty Substation for a distance of about 1.6 miles. From the Pocaty Substation, Harpers to Fentress Alternative Route 2 continues to follow the same alignment as Harpers to Fentress Proposed Route 1 to the Fentress Substation for a distance of about 1.9 miles.

The estimated conceptual cost of the Overhead Transmission Circuits along the

Harpers to Fentress Alternative Route 2 is provided in Section I.I.

Harpers to Fentress Alternative Route 5

Harpers to Fentress Alternative Route 5 follows the same alignment as Harpers to Fentress Proposed Route 1 for approximately 5.5 miles from the Harpers Switching Station to the Company's existing Line #2085 right-of-way near Landstown Road at the Princess Anne Athletic Complex. It then follows the west side of Line #2085 for approximately 2.8 miles to the south. About 2.5 miles of this route segment cross primarily undeveloped (agricultural) lands owned by the City of Virginia Beach adjacent to (but on the opposite side of the existing transmission line from) the Courthouse Woods and Courthouse Estates residential subdivisions. The remainder of this segment, about 0.3 mile on the south side of Indian River Road, continues along Line #2085 across mostly forested privately owned parcels. The route then heads southeast away from Line #2085 for about 1.0 mile, crossing the Intracoastal Waterway about 0.1 mile downstream of the North Landing River Bridge and entering the City of Chesapeake.

South of the river, Harpers to Fentress Alternative Route 5 crosses Mt. Pleasant Road and a short segment (about 320 feet) of Corps land before heading south for about 3.9 miles, crossing 1.9 miles of undeveloped US Navy land along the edge of NALF Fentress and agricultural and forested private lands further south. This segment of the route crosses Mt. Pleasant, Blackwater, and Fentress Airfield roads, and parallels Blackwater Road for about 0.8 mile. Harpers to Fentress Alternative Route 5 then crosses the state designated scenic Pocaty River, turns west, and generally parallels the river through forested private lands for about 2.2 miles. It then heads east/northeast for about 4.6 miles across sparsely populated, privately owned, agricultural lands. Harpers to Fentress Alternative Route 5 then follows the Company's existing Line #2240 right-of-way for about 0.1 mile east to Fentress Substation.

The estimated conceptual cost of the Overhead Transmission Circuits along the Harpers to Fentress Alternative Route 5 is provided in Section I.I.

Harpers to Fentress Alternative Hybrid Route

The Harpers to Fentress Alternative Hybrid Route does not have a switching station located at Harpers Road. Instead, the Harpers to Fentress Alternative Hybrid Route would continue underground in a typical, three-wide, nine-circuit, duct bank configuration following the same alignment as Harpers to Fentress Proposed Route 1 to the Chicory Switching Station site near Princess Anne Road in Virginia Beach, a distance of about 4.5 miles. While the majority of the underground segment of the Harpers to Fentress Alternative Hybrid Route would be installed by surface trenching, this alternative would also require HDD installation of the transmission line beneath a large wetland complex east of Chestwood Drive, and two microtunnels to install the transmission line beneath Dam Neck and London Bridge Roads. For each of the trenchless installations, the three-wide, nine-circuit, duct

bank configuration would diverge into six HDDs/microtunnels to complete the crossing, then converge back to the standard underground configuration. At the Chicory Switching Station, the Harpers to Fentress Alternative Hybrid Route transitions to a typical, three-circuit, overhead configuration and follows the same path as Harpers to Fentress Proposed Route 1 to Fentress Substation in Chesapeake.

The estimated conceptual cost of the Overhead Transmission Circuits along the Harpers to Fentress Alternative Route 2 is provided in Section I.I.

Dam Neck Route Variation

The Dam Neck Route Variation provides an alternative to the alignment of Harpers to Fentress Proposed Route 1 and Harpers to Fentress Alternative Routes 2 and 5 where they pass between the residential developments of Prince George Estates, Mayberry, Castleton, and Pine Ridge (within the SEPG study corridor and/or adjacent to the Company's Lines #2118/#147 right-of-way) in Virginia Beach. Rather than continuing to the southeast after crossing Dam Neck Road, the route variation instead turns west to parallel the south side of Dam Neck Road for approximately 1.8 miles, primarily crossing privately owned agricultural and forested lands. At a point about 0.4 mile west of the crossing of London Bridge Road, the route then turns south and continues for approximately 1.0 mile across private and City-owned forested lands to the Company's existing Lines #2118/#147 corridor in the vicinity of West Neck Creek. This area of the route variation includes an approximately 0.5-mile-long crossing of City-owned undeveloped parkland at Holland Pines Park.

The Dam Neck Route Variation utilizing the Harpers to Fentress Alternative Routes 1, 2, or 5 would result in an additional net cost of approximately $14.2 million (2021 dollars).

Line #2085 Route Variation

The Line #2085 Route Variation provides an alternative to Harpers to Fentress Alternative Route 2 in the area between the Princess Anne Athletic Complex and the crossing of the Intracoastal Waterway to utilize Line #2085 corridor as a routing opportunity. The route variation deviates from Harpers to Fentress Alternative Route 2 near Landstown Road on the south side of the Princess Anne Athletic Complex and U.S. Field Hockey Complex. It then follows the west side of Line #2085 for approximately 2.8 miles to the south following the same alignment as Harpers to Fentress Alternative Route 5 across agricultural and forested lands on the west side of the Courthouse Woods and Courthouse Estates subdivisions. At a point about 0.3 mile south of Indian River Road, the route variation turns away from the Line #2085 corridor and continues west for approximately 1.6 miles, crossing both North Landing Road and the Intracoastal Waterway before rejoining Harpers to Fentress Alternative Route 2 on the west side of the waterway.

The Line #2085 Route Variation utilizing the Harpers to Fentress Alternative Route

2 would result in an additional net cost of approximately $28.8 million (2021 dollars).

Rejected Alternatives

The Company also reviewed and rejected two hybrid routes, one all underground route, two overhead route variations, and two underground crossings of the Intracoastal Waterway. The routes and route variations identified and eliminated from further consideration are discussed in detail in Section 3.2 of the Environmental Routing Study.

DEPARTMENT OF THE NAVY
NAVAL AIR STATION OCEANA
1750 TOMCAT BOULEVARD
VIRGINIA BEACH, VIRGINIA 23460-2191

17 Aug 2021

Gaylene Watson
Director Strategic Partnerships
Dominion Energy Virginia
2700 Cromwell Drive
Norfolk, VA 23509

Dear Ms. Watson,

SUBJECT: COASTAL VIRGINIA OFFSHORE WIND (CVOW) COMMERCIAL PROJECT – PREFERRED ROUTE THROUGH NAVAL AIR STATION (NAS) OCEANA, VIRGINIA BEACH

NAS Oceana recognizes that the CVOW project, which is supported by the Administration and Commonwealth of Virginia, is an important initiative that will serve as a catalyst for a new, renewable domestic energy supply to the region. To facilitate planning and approval of the approximately 2,600 MW CVOW project, NAS Oceana and Dominion Energy have coordinated on the preferred route from the oceanfront landing point of the cable system infrastructure on the State Military Reservation and through NAS Oceana. NAS Oceana is aware of Dominion Energy's coordination with the State Military Reservation, who is also in support of the CVOW project and the preferred route. The objective is to minimize impacts to the surrounding community, while reducing effects to ongoing activities at NAS Oceana and plans for future improvements at the installation. Additionally, selection of the underground route resolved land use conflicts associated with the Air Installations Compatible Use Zones (AICUZ) at NAS Oceana, within which overhead transmission lines are prohibited in areas designated as Accident Potential Zone (APZ) 1. Please see enclosed map that details the preferred utility route and proposed Switching Station through, and on, NAS Oceana property.

NAS Oceana looks forward to further coordination with Dominion Energy on the proposed CVOW project and the requested easement over Navy property to support the utility cable routing and switching station which will cover areas within Lake Christine and parcels of land to support the transmission cabling route and switching station. It is noted that while NAS Oceana supports the CVOW project concept, and the preferred route discussed herein, granting a real estate instrument is subject to, among other items, obtaining higher level Navy approval and satisfying all regulatory requirements.

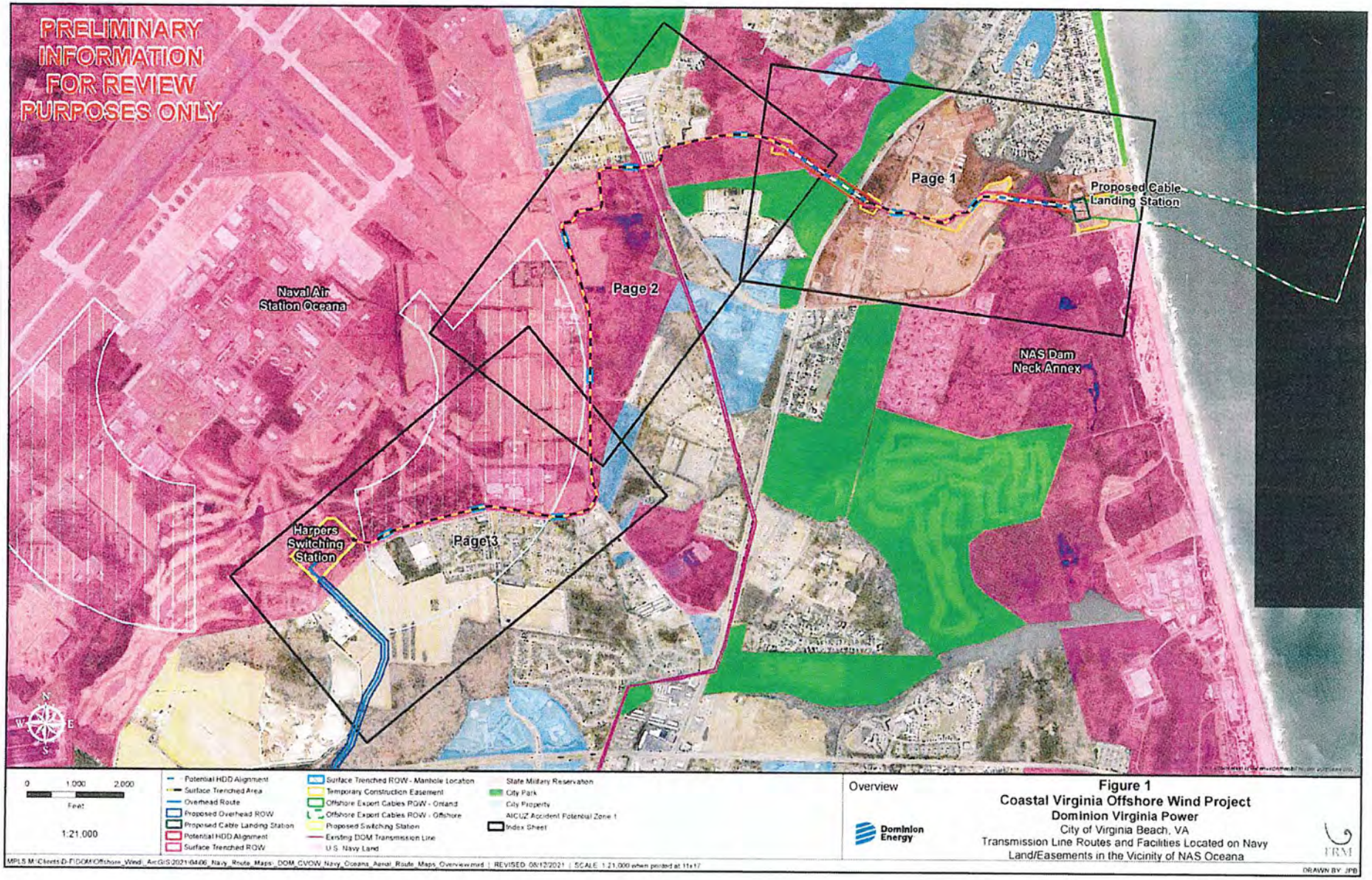
SUBJECT: COASTAL VIRGINIA OFFSHORE WIND (CVOW) COMMERCIAL PROJECT – PREFERRED ROUTE THROUGH NAVAL AIR STATION (NAS) OCEANA, VIRGINIA BEACH

NAS Oceana looks forward to continued coordination with Dominion Energy for the CVOW project. Please contact Rich Riker by email at richard.r.riker4.civ@us.navy.mil or by phone at 757-433-3050 with questions if you require further information.

Sincerely,

R. L. HOLMES

Enclosure: 1. DOM CVOW Navy Oceana Aerial Route Maps Combined



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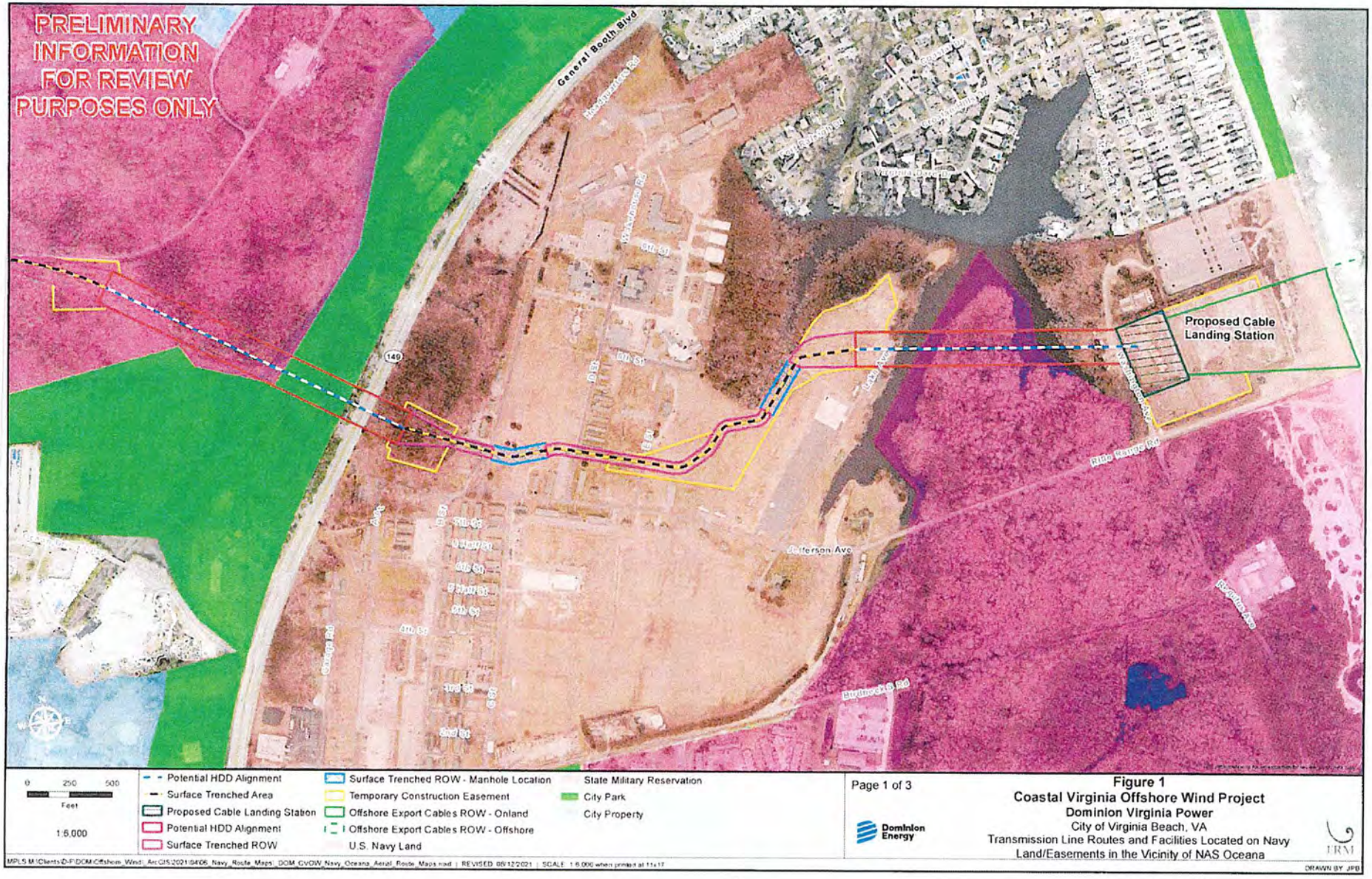
Enclosure (1)


PRELIMINARY
INFORMATION
FOR REVIEW
PURPOSES ONLY
General Booth Blvd
Proposed Cable
Landing Station
Jefferson Ave
Birdneck Rd
Rifle Range Rd
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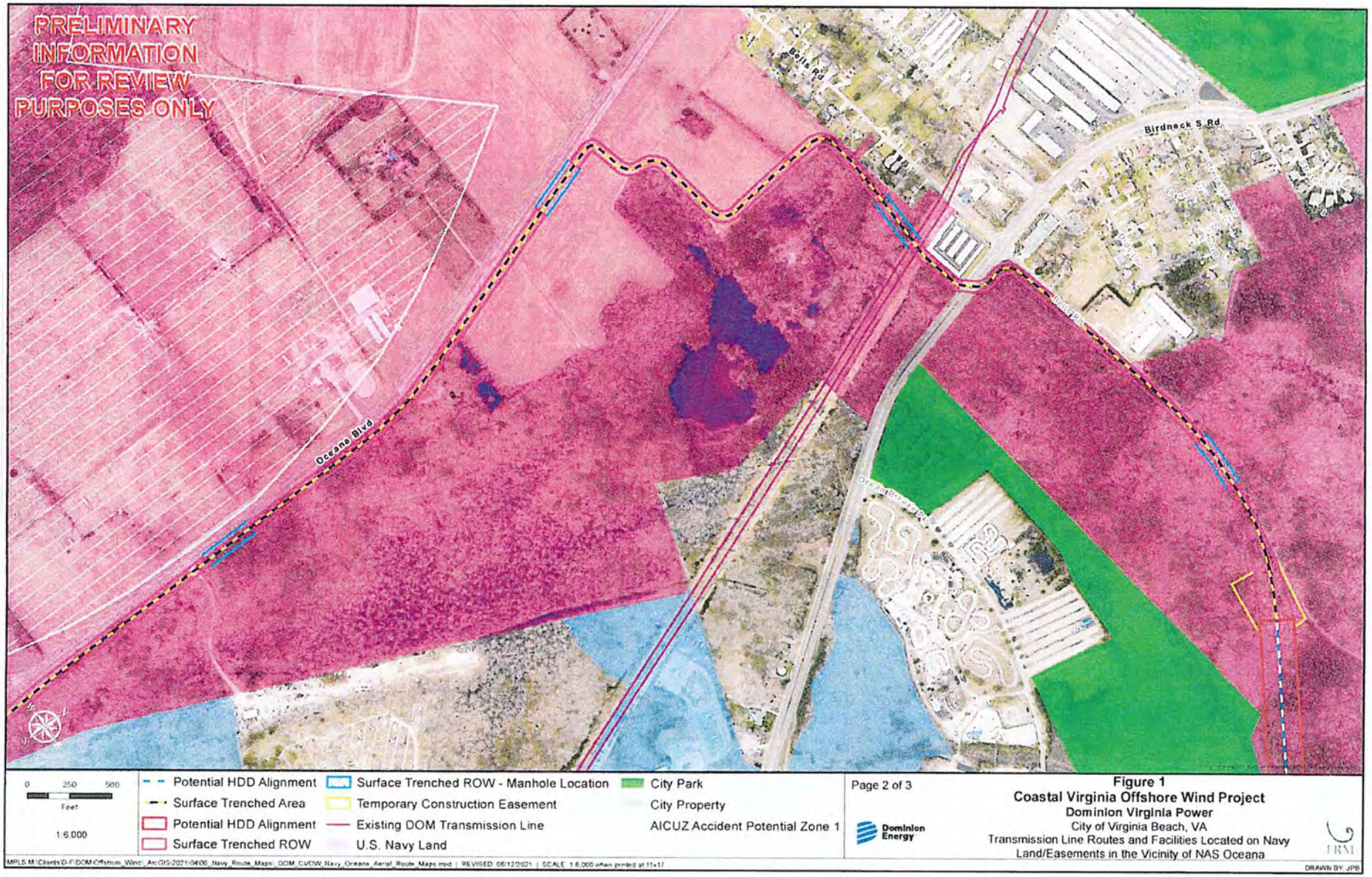
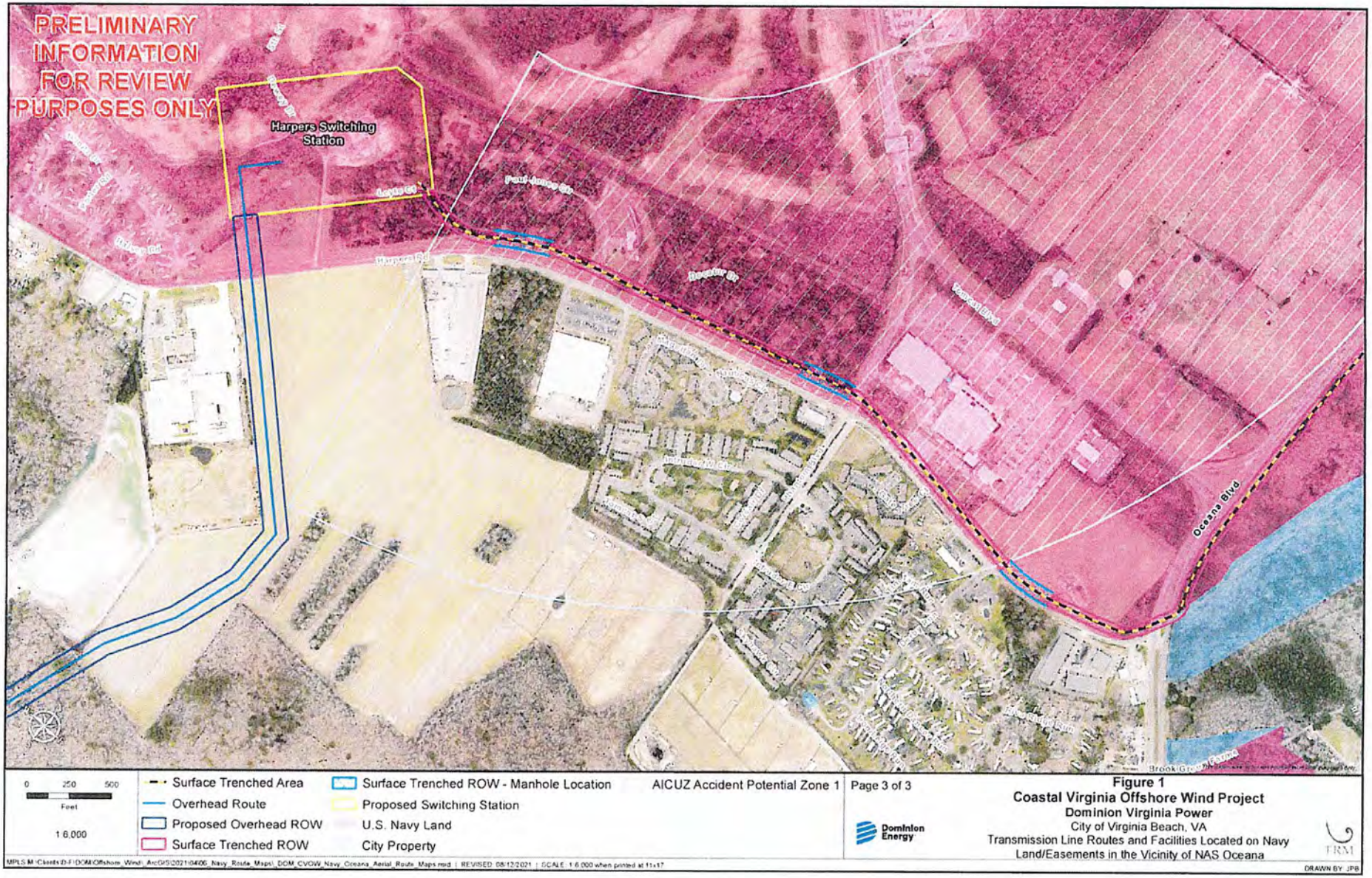
Feet
1:6,000
Potential HDD Alignment
Surface Trenched Area
Proposed Cable Landing Station
Potential HDD Alignment
Surface Trenched ROW
Surface Trenched ROW - Manhole Location
Temporary Construction Easement
Offshore Export Cables ROW - Onland
Offshore Export Cables ROW - Offshore
U.S. Navy Land
State Military Reservation
City Park
City Property
Page 1 of 3
Dominion Energy
Figure 1
Coastal Virginia Offshore Wind Project
Dominion Virginia Power
City of Virginia Beach, VA
Transmission Line Routes and Facilities Located on Navy Land/Easements in the Vicinity of NAS Oceana
ERM
DRAWN BY: JPB


PRELIMINARY
INFORMATION
FOR REVIEW
PURPOSES ONLY
Bells Rd
Birdneck S Rd
Oceana Blvd
0 250 500
Feet
1:6,000
Potential HDD Alignment
Surface Trenched Area
Potential HDD Alignment
Surface Trenched ROW
Surface Trenched ROW - Manhole Location
Temporary Construction Easement
Existing DOM Transmission Line
U.S. Navy Land
City Park
City Property
AICUZ Accident Potential Zone 1
Page 2 of 3
Dominion Energy
Figure 1
Coastal Virginia Offshore Wind Project
Dominion Virginia Power
City of Virginia Beach, VA
Transmission Line Routes and Facilities Located on Navy Land/Easements in the Vicinity of NAS Oceana
DRAWN BY: JPB


PRELIMINARY
INFORMATION
FOR REVIEW
PURPOSES ONLY
Harpers Switching Station
Harpers Rd
Powder Dr
Tropical Blvd
Oceana Blvd
0 250 500
Feet
1:6,000
Surface Trenched Area
Overhead Route
Proposed Overhead ROW
Surface Trenched ROW
Surface Trenched ROW - Manhole Location
Proposed Switching Station
U.S. Navy Land
City Property
AICUZ Accident Potential Zone 1
Page 3 of 3
Dominion Energy
Figure 1
Coastal Virginia Offshore Wind Project
Dominion Virginia Power
City of Virginia Beach, VA
Transmission Line Routes and Facilities Located on Navy Land/Easements in the Vicinity of NAS Oceana
DRAWN BY: JPB

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COMMONWEALTH of VIRGINIA

TIMOTHY P. WILLIAMS
MAJOR GENERAL
THE ADJUTANT GENERAL

DEPARTMENT OF MILITARY AFFAIRS
Adjutant General's Office
Building 316, Fort Pickett

BLACKSTONE, VIRGINIA
23824-6316

June 24, 2021

Mr. Scott Lawton
Dominion Energy, Inc.
707 East Main Street
Richmond, VA 23219

Re: Coastal Virginia Offshore Wind (CVOW) Project -Route selection
Camp Pendleton, State Military Reservation (SMR), Virginia Beach

Dear Mr. Lawton,

The SMR is a state owned military installation, in the possession of the Virginia Department of Military Affairs (VDMA) and is used by the Virginia National Guard (VaARNG) as a training facility, as well all branches of the military and other federal, state, and community agencies and organizations. VDMA-VaARNG recognizes that the CVOW project, which is supported by the administration, is an important initiative with an aggressive schedule. To facilitate planning and approval of the CVOW project, VDMA-VaARNG, Dominion, and DGS have coordinated on the selection of a preferred route, from the oceanfront landing point of the cable system infrastructure leased by Virginia Beach, and through SMR, to route alternatives located west of the SMR property (see enclosed map).

Process

The selection process for the CVOW project cables route, and the identification of locations for structural support components, were guided by several factors.

- Mission-driven programs of VDMA-VaARNG, and those of the installation's tenants and other users;
- Existing infrastructure serving SMR and the previously installed transatlantic (or subsea) cable and the CVOW test pilot cable;
- Consideration of the residential Croatan neighborhood to the north and the U.S. Navy's Dam Neck facility to the south;
- Environmental factors, including compliance with
    - National Environmental Policy Act (NEPA) which involved identifying wetlands; and

- National Historic Preservation Act (NHPA) protected properties within the installation, which is listed in the National Register of Historic Places and the Virginia Landmarks Register as the Camp Pendleton State Military Reservation Historic District.

The overall objective, realized in the route that was selected, minimizes impacts, while reducing effects to ongoing activities at SMR and plans for future improvements at the installation.

Specific Locations within the Route

The "**Transition Vault**" location was selected to avoid interference with the existing transatlantic cable landing at the Croatan Beach parking lot, at the northernmost portion of SMR, and the CVOW test pilot landing at the southern reach of the SMR beachfront. A centrally-placed landing closer to the oceanfront is not an option, due to training needs, supported by a restrictive use easement in favor to the U. S. Navy, and the hazard of running cables close to the beachfront Rifle Range surface, where live munitions are used.

The selected route for conveying the CVOW cables **west from the Transition Vault, extending under Lake Christine**, minimizes risks to the existing transatlantic and CVOW test pilot cables. This route relies on one location for the HDD equipment to install conduits for both the offshore landing and Lake Christine crossing. The alternative of two HDD sites, one to the north and one to the south, would result in avoidable impacts. Engineering obstacles that could threaten the transatlantic cable and utilities infrastructure make the northern option undesirable; and this location would also place disruptive construction activities close to the Croatan neighborhood at SMR's northern edge. The southern location would involve complex engineering challenges, passing through unstable soils, while interfering with use of the only east-west roadway at SMR that accesses the Rifle Range and the beachfront. This location would also come close to several significant properties that are considered historically significant, as "contributing" cultural resources in the Camp Pendleton Historic District.

The selected cable route extending from **Lake Christine to the western HDD site**, located at the western portion of SMR, follows a path that avoids significant impacts to historic buildings and to wetlands, while also minimizing disruption to military training programs. With this route, one building, which is a minor "contributing" resource in the Camp Pendleton Historic District and is in failing condition, will be removed. The proposed western HDD location will involve tree clearing, and a minor degree of incursion into a wetlands area nearby, which is lessened with the selection of the chosen location, instead of a more northerly HDD site which was also considered. The northern site option would also have necessitated removal of additional trees in this wooded zone along SMR's western extent, which buffers SMR from General Booth Boulevard edging the installation's western boundary. The selected western HDD location will involve the removal of another building considered "contributing" in the

Camp Pendleton Historic District, but avoids more extensive impacts to other historic properties that would result from construction at the northern location. As a consulting party in the NEPA and NHPA processes, VDMA-VaARNG intends to continue to work closely with Dominion, and with other state and federal agencies involved in review and approval of the CVOW project, to address the mitigation of impacts to natural and cultural resources as needed.

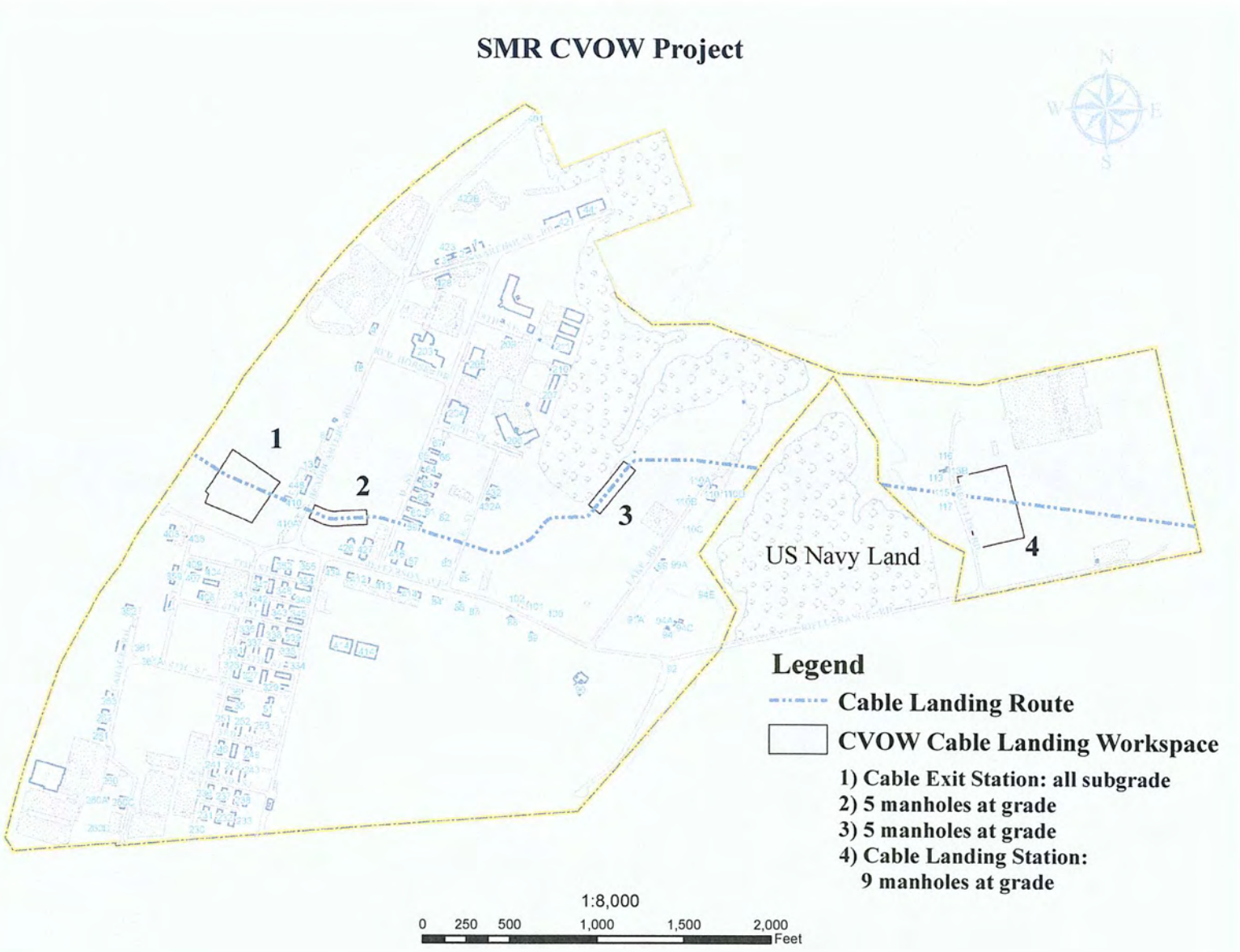
VDMA-VaARNG looks forward to continued coordination with Dominion for the CVOW project. Please contact me by email at charlton.t.dunn.civ@mail.mil or by phone at (540) 290-0183 with questions or require further information.

DUNN.CHARLTON.TODD.1049404634 Digitally signed by DUNN.CHARLTON.TODD.1049404634 Date: 2021.06.25 16:56:59 -04'00'

CHARLTON T. DUNN
COL, EN, VaARNG
ACofS, Facilities
Engineering and Management

Enclosure

CC: Holly Law Eve, Director, DGS Division of Real Estate & Facilities Management
Katheryn Surface Burks, Senior Assistant Attorney General/Real Estate Section Chief, OAG


SMR CVOW Project
1
2
3
4
US Navy Land
Legend
Cable Landing Route
CVOW Cable Landing Workspace
1) Cable Exit Station: all subgrade
2) 5 manholes at grade
3) 5 manholes at grade
4) Cable Landing Station:
9 manholes at grade
1:8,000
0 250 500 1,000 1,500 2,000
Feet

City of Virginia Beach

ROBERT "BOBBY" D. DYER
MAYOR

MUNICIPAL CENTER
BUILDING 1
2401 COURTHOUSE DRIVE, ROOM 234
VIRGINIA BEACH, VA 23456-9001
(757)-385-4581
FAX (757) 385-5626

October 22, 2021

Bonita Billingsley Harris
Reginal Director, Easter Region
Dominion Energy Virginia
2700 Cromwell Drive
Norfolk, VA 23509

Dear Mrs. Harris:

On behalf of the City of Virginia Beach, I am writing to express the City Council's strong support for offshore wind.

Since the development of the Virginia Offshore Wind Technology Advancement Project (VOWTAP), City Council has been quite optimistic about the opportunities created by a larger offshore wind project. For Virginia Beach, offshore wind represents an engine for economic growth and job creation, bringing well-paying, quality jobs to Hampton Roads. Furthermore, offshore wind will play a key role in the decarburization of our economy, which is an especially urgent need for coastal communities that are vulnerable to sea levels rising and recurrent flooding.

City Council has been please by Dominion Energy's efforts to develop the Coastal Virginia Offshore wind ("CVOW") Commercial Project. Over the last several years, Dominion Energy has actively engaged the community, businesses, and other interested groups in Hampton Roads to listen, learn and gather feedback on CVOW. When the Company published potential routes for the transmission lines needed to connect the offshore wind energy to Virginia electrical grid, Dominion Energy conducted public events, workshops, roundtables, and small-group and individual meetings. While the City Council recognizes the need for this necessary infrastructure, we are especially pleased with the Company's commitment to solicit and collect feedback from the community and implement changes based on that input.

As this project moves forward, the City Council of Virginia encourages Dominion Energy to minimize the crossing of private properties and use open space and/or overlap with existing infrastructure where possible. We trust that Dominion Energy will continue to be an engaged and receptive partner, as they have demonstrated to be throughout the entirety of this process.

To ensure the success of offshore wind in Hampton Roads, we are committed to working with Dominion Energy throughout this project, including collaborating and cooperating on electric transmission right-of-way needs that cross city-owned land and easement rights. We look forward to continued collaboration as we work together to make offshore wind a reality for Virginia.

Sincerely,

Robert M. "Bobby" Dyer
Mayor, City of Virginia Beach

The Nature Conservancy
Protecting nature. Preserving life.

The Nature Conservancy in Virginia
530 E. Main St. Suite 800
Richmond VA 23219

tel (804) 644-5800
fax (804) 644-1685
nature.org

October 29, 2021

Mr. Robert Bisha
Environmental Technical Advisor
Dominion Energy Services, Inc.
120 Tredegar St.
Richmond, VA 23219

Re: Potential CVOW-C crossing of TNC land along Intracoastal Waterway, City of Chesapeake, VA

Dear Mr. Bisha:

The Nature Conservancy (TNC) understands that one of Dominion's alternative routes for the on-shore transmission portion of the Commonwealth of Virginia Offshore Wind Commercial Project (CVOW-C) would cross properties owned by TNC in the City of Chesapeake, VA. The properties are identified as City of Chesapeake Tax Parcel 0510000000560 located on the north side of the intracoastal waterway (ICW) and Tax Parcel 0500000000630 located south of the ICW. We understand the proposed crossing would involve expansion of an existing Dominion transmission line easement. Dominion provided TNC the attached map depicting a total of +/- 1.60 acres of existing forested wetland cover on TNC land that would need to be cleared for the proposed transmission line expansion.

TNC supports the deployment of renewable energy. While TNC would prefer to see no loss of existing forest resulting from construction of the proposed transmission line, we are willing to allow an expansion of the transmission line corridor that will result in +/- 1.60 acres of forest loss on TNC land.

TNC understands Dominion would like to acquire an easement over the proposed +/- 1.60-acre area encompassing the proposed transmission line expansion. TNC is willing to convey such an easement over the +/- 1.60-acre area to Dominion. TNC will expect to receive full fair market value for the area impacted by the easement. TNC will also expect to be compensated for any diminution of value to the residual parcels resulting from construction of the transmission line. The easement's fair market value and the diminution of value to the residual will be determined by a qualified appraiser. Expenses for the appraisal will be covered by Dominion. TNC may decide to have the appraisal report reviewed by another appraisal firm. Payment for the easement and compensation for diminution in value to the residual will be made by Dominion to TNC.

TNC tracts to be impacted by the proposed transmission line construction are recognized as "match" property for a United State Fish & Wildlife Service (USFWS) North American Wetlands Conservation Act (NAWCA) grant awarded to TNC (NAWCA Grant Agreement 14-0009-92-1218, dated 2/27/1992). TNC has consulted with USFWS regarding Dominion's proposed transmission line expansion. USFWS has determined that sale of a transmission easement over the proposed +/- 1.60 acres by TNC to Dominion is an allowable disposal of NAWCA match property. TNC understands disposal of the property will extinguish all encumbrances on the easement acreage as they relate to the NAWCA grant agreement.

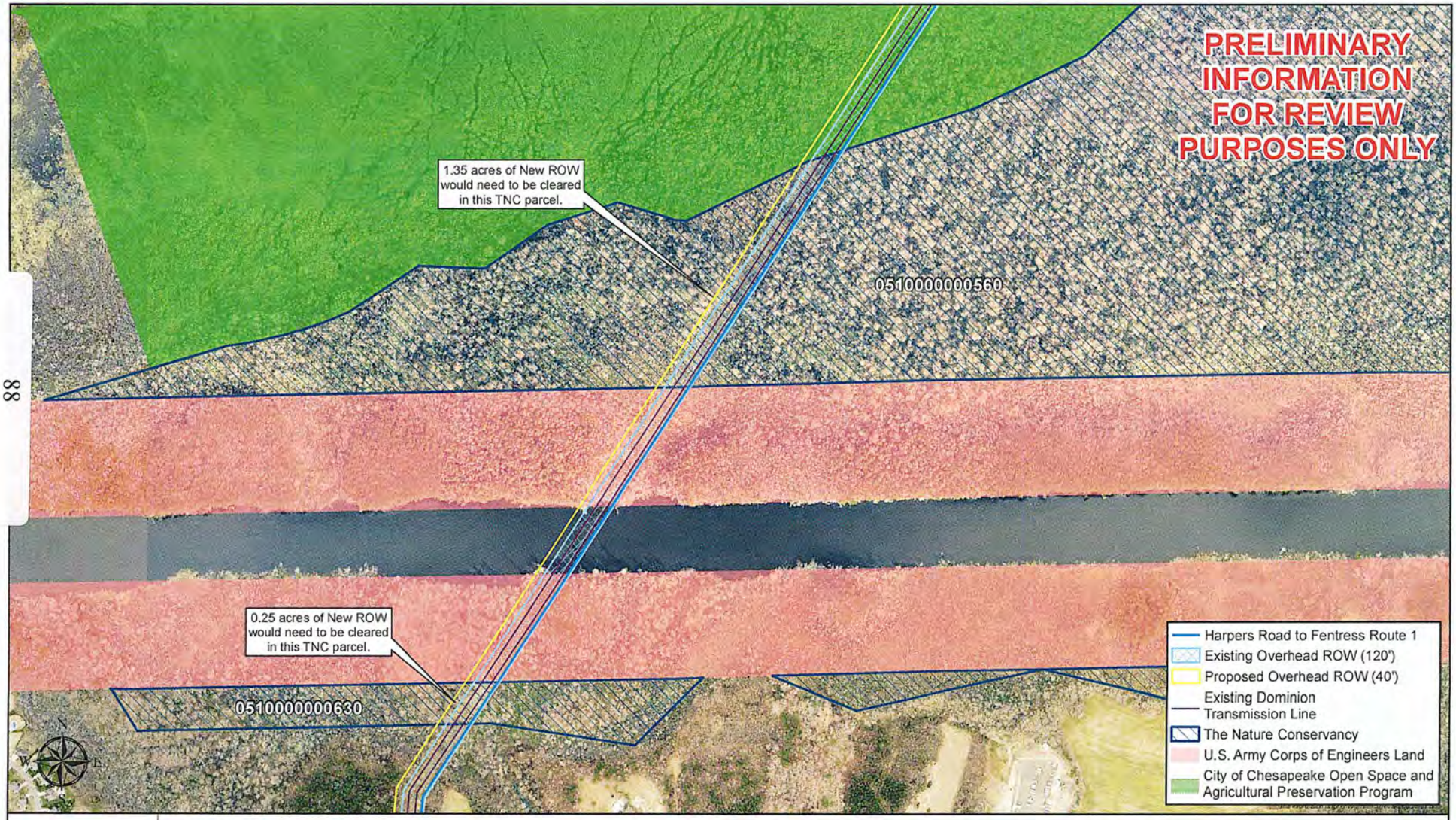
TNC will consult with USFWS on how funds from sale of the easement and compensation for diminution to the residual will be used to offset loss of habitat value resulting from the right of way expansion.

Sincerely,

Brian van Eerden
Director, VA Pinelands Program

attachment: TNC Parcel Crossings map (6/2/21)

cc: Judy Dunscomb, TNC


PRELIMINARY INFORMATION FOR REVIEW PURPOSES ONLY
1.35 acres of New ROW would need to be cleared in this TNC parcel.
0.25 acres of New ROW would need to be cleared in this TNC parcel.
0510000000560
0510000000630
Harpers Road to Fentress Route 1
Existing Overhead ROW (120')
Proposed Overhead ROW (40')
Existing Dominion Transmission Line
The Nature Conservancy
U.S. Army Corps of Engineers Land
City of Chesapeake Open Space and Agricultural Preservation Program
N
W
E
S
0 250 500
Feet
1:6,000
Dominion Energy
Coastal Virginia Offshore Wind Project
Dominion Virginia Power
Virginia Beach and Chesapeake, VA
The Nature Conservancy Parcel Crossings
ERM
MPLS M:\Clients\D-F\DOM\Offshore_Wind_ArcGIS\2021\06_DOM_CVOW_TNC_Route_1.mxd | REVISED: 06/02/2021 | SCALE: 1:6,000 when printed at 11x17
DRAWN BY: JPB

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: To limit service disruption to the affected load area, the Company plans to take segments of Lines #271 and #2240 out of service during construction of the Line #271 Partial Rebuild and the Line #2240 Rebuild. Additionally, the Company plans to take outages at the Fentress Substation during construction of the Fentress Substation Expansion. Assuming a final order by August 5, 2022, as requested in Section I.H, the current plan is to start construction of the Virginia Facilities by August 1, 2023, and complete all construction by July 31, 2025.

The Company will take outages of Lines #271 and #2240 in order to wreck and rebuild COR-TEN® lattice structures supporting those lines and the Overhead Transmission Lines.

The Company will take substation bus outages in the Fentress Substation in order to expand the substation to accommodate the new Overhead Transmission Lines.

The proposed outages will occur during the Fall 2023 through Spring 2025.

The Company has requested line outages from PJM but has not yet received approval. It is customary for PJM to not grant approval of the outages until shortly before the outages are expected to occur and, therefore, they may be subject to change.

When the final outage is complete, the Line #271 Partial Rebuild Project, the Line #2240 Rebuild, and the Fentress Substation Expansion will be complete.

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: The Company utilized Guideline #1 (existing rights-of-way should be given priority when adding additional facilities) by siting portions the routes for the proposed Overhead Transmission Circuits within the existing transmission corridor wherever feasible, as discussed in Section II.A.9. The Harpers to Fentress Proposed Route 1 will utilize 7.9 miles of existing right-of-way.

Consistent with Guideline #2, the route of the transmission line will avoid or minimize impacts to the maximum extent practicable on national historic places listed in the National Register of Historic Places ("NRHP"). The Cable Landing to Harpers Proposed Route of the Onshore Export Circuits will cross Camp Pendleton Historic District, which is listed in the NRHP. However, since this route will be constructed underground, it will not significantly alter the character of the resource. In addition, the Harpers to Fentress Proposed Route 1 will cross the NRHP-listed Albemarle & Chesapeake Canal Historic District. However, since the proposed route will be constructed along the Company's existing Line #271 at this location, this will minimize the impact on this resource. A Stage I Pre-Application Analysis prepared by ERM on behalf of the Company, which is included with the Environmental Routing Study as Attachment 2.H.1 of the DEQ Supplement, will be submitted to the Virginia Department of Historic Resources ("VDHR"). The Stage I Pre-Application Analysis discusses cultural resources within the Virginia Facilities project area.

The Company has communicated with local, state, and federal agencies and relevant private organizations 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 has consulted with NAS Oceana, SMR, the Cities of Virginia Beach and Chesapeake, the Norfolk District of the United Army Corps of Engineers, and The Nature Conservancy. See Section III.B 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 right-of-way, constructing facilities, and maintaining rights-of-way after construction. Moreover, secondary uses of right-of-way that are consistent with the safe maintenance and operation of facilities are permitted.

II. DESCRIPTION OF THE PROPOSED PROJECT

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

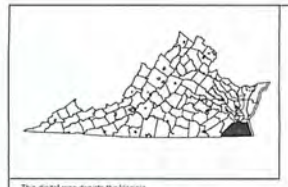
12. a. Detail counties and localities through which the line will pass. If any portion of the line will be located outside of the Applicant's certificated service area: (1) identify each electric utility affected; (2) state whether any affected electric utility objects to such construction; and (3) identify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

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

Response: a. Starting onshore at the Cable Landing Location, the proposed Virginia Facilities traverse a total of approximately 18.6 miles the Cities of Virginia Beach and Chesapeake, and are located entirely within Dominion Energy Virginia's service territory.

b. Three copies of the map of the Virginia Department of Transportation "General Highway Map" for the Cities of Virginia Beach and Chesapeake have been marked as required and filed with the Application. A reduced copy of the map is provided as Attachment II.A.12.b.

Southeastern Metropolitan Area 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 October 19, 2021. Other Company facilities previously authorized by the SCC may be depicted on prior SCC approved county maps.

Legend

- Proposed 230kV Transmission Line
- Proposed 230kV Line Rebuild
- Idle 115 kV
- Idle 230 kV
- 69 kV
- 115 kV
- 230 kV
- 500 kV
- Proposed Switching Station
- Existing Substation
- Number of Lines of Structures/ Number of Circuits
- First Landing State Park
- Military Bases

Provider Service Territory

- VEPCO
- CEC

Miles
2 1 0 2 4 6

*VDOT and other road data obtained from NavteQ and County data, current as of July 2011.

Southeastern Metropolitan Area
Cities of Chesapeake Portsmouth
Norfolk Virginia Beach Suffolk

Attachment II.A.12.b

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

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

Response: The Offshore Export Circuits will be designed and operated at 230 kV with no anticipated voltage upgrade and will have a transfer capability of 3,051 MVA.

The Onshore Export Circuits will be designed and operated at 230 kV with no anticipated voltage upgrade and will have a transfer capability of 3,051 MVA.

The Overhead Transmission Circuits will be designed and operated at 230 kV with no anticipated voltage upgrade and will have a transfer capability of 1,572 MVA.

As rebuilt, Line #271 will be designed and operated at 230 kV with no anticipated voltage upgrade and will have a transfer capability of 1,572 MVA.

As rebuilt, Line #2240 will be designed and operated at 230 kV with no anticipated voltage upgrade and will have a transfer capability of 1,572 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:

Offshore Export Circuits

For the Offshore Export Circuits, the Company proposes to utilize three 3-core copper and/or aluminum-conductor 230 kV subsea cables, for a total of nine Offshore Export Circuits. The Offshore Export Circuits were designed based on the energy capacity needs of the CVOW Project, as well as consideration of site-specific installation conditions, including seabed temperature, burial depth, and seabed thermal resistivity. The design of the Offshore Export Circuits will be further refined based on the results of the system studies, geotechnical surveys, and landfall design. See Attachment II.A.5.e for configurations of typical copper and/or aluminum conductor subsea cable.

Onshore Export Circuits

For the Onshore Export Circuits, the Company proposes to utilize a 230 kV 4000 kcmil Cu cross-linked polyethylene ("XLPE") XLPE cable at all onshore trenchless crossing locations and a 230 kV 5000 kcmil Al XLPE cable in a three duct bank configuration at all open trench installations. The proposed design optimizes right-of-way requirements along with material and installation costs while maintaining the Offshore Export Circuits' energy capacity requirement of 852 Amp/339 MVA per circuit. The detailed Onshore Export Circuit design will continue to develop as more information on underground conditions and existing underground infrastructure becomes available. See Attachment II.A.5.d for the proposed configuration of the Onshore Export Circuits.

Overhead Transmission Circuits

For the Overhead Transmission Circuits, the Company proposes to utilize a twin-bundled 768.2 ACSS/TW (20/7) conductor type per phase, which is a Company standard for new 230 kV construction. This conductor provides the required 3,948 Amp/1,572 MVA line rating.

For the Line #271 Partial Rebuild, the Company proposes to utilize a twin-bundled 768.2 ACSS/TW (20/7) conductor type per phase, which is a Company standard for new 230 kV construction. This conductor provides the required 3,948 Amp/1,572 MVA line rating.

For the Line #2240 Rebuild, the Company proposes to utilize a twin-bundled 768.2 ACSS/TW (20/7) conductor type per phase, which is a Company standard for new

230 kV construction. This conductor provides the required 3,948 Amp/1,572 MVA line rating.

See Attachments II.A.5.a-c for the proposed configuration of the Overhead Transmission Circuits along Harpers to Fentress Proposed Route 1.

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

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

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

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

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

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

e. the foundation material;

f. the average width at cross arms;

g. the average width at the base;

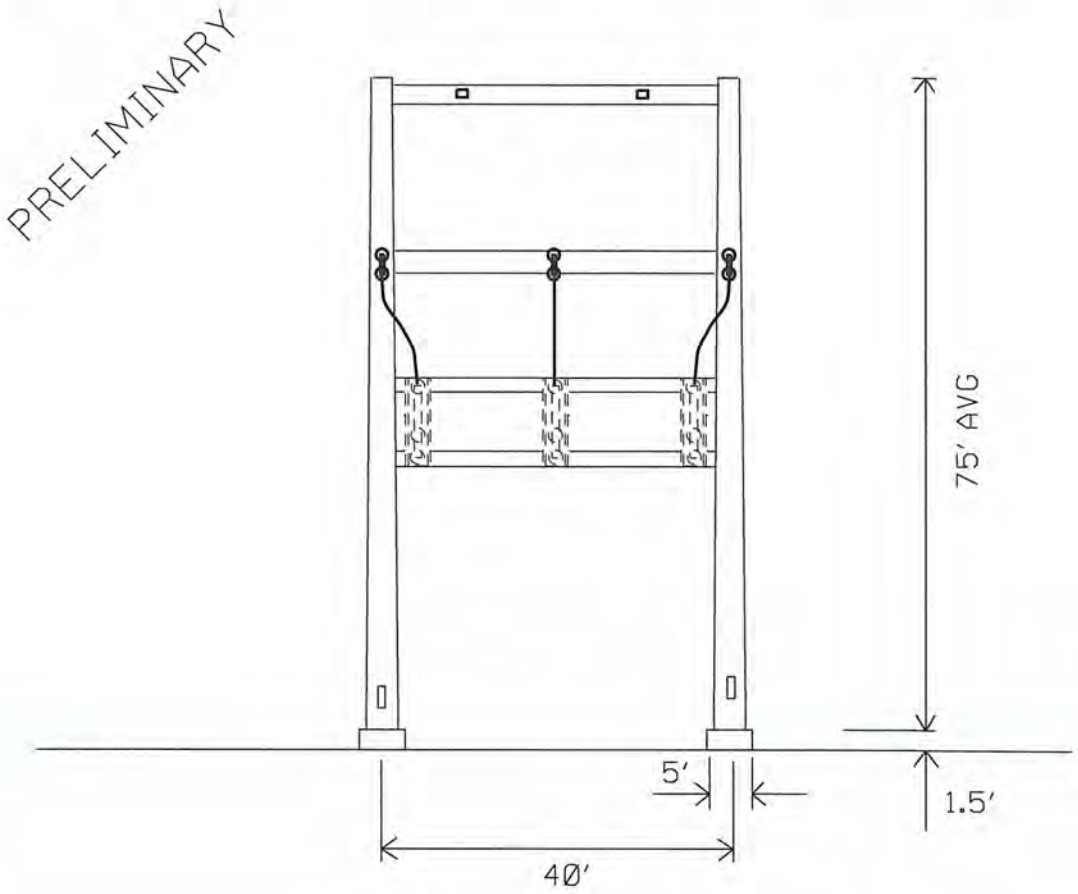
h. the maximum, minimum and average structure heights;

i. the average span length; and

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

Response: See Attachments II.B.3.i-vi.

STRUCTURE 2252/1, 2253/1, 2254/1 & HARPERS 2252/117, 2253/117, 2254/117



PROPOSED STRUCTURE

a. MAPPING THAT IDENTIFIES EACH PORTION OF THE PREFERRED ROUTE: SEE ATTACHMENT II.B.5

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE: STANDARD SUBSTATION STRUCTURE

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W: 6 STRUCTURES AND 0.22 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL: GALVANIZED STEEL WAS SELECTED TO MATCH TYPICAL SUBSTATION STRUCTURES AND EQUIPMENT

e. FOUNDATION MATERIAL: CONCRETE

f. AVERAGE WIDTH AT CROSSARM: 40 FEET

g. AVERAGE WIDTH AT BASE: 5 FEET

h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 75 FEET AT ALL LOCATIONS MEASURED FROM GROUNDLINE AT STRUCTURE CENTERLINE

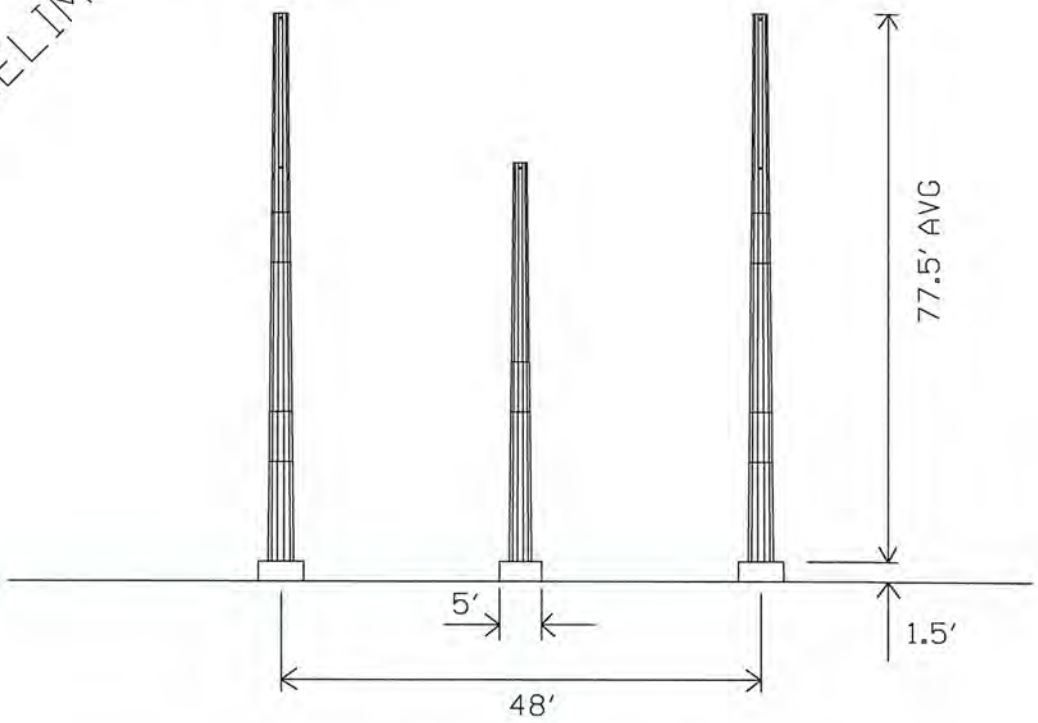
i. AVERAGE SPAN LENGTH: 200 FEET

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

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

$DGNSPEC$

STRUCTURE 271/1, 271/2, 2128/1A, 2128/1B



PROPOSED STRUCTURE

a. MAPPING THAT IDENTIFIES EACH PORTION OF THE PREFERRED ROUTE: SEE ATTACHMENT II.B.5

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE: HORIZONTAL CONFIGURATION ALLOWS CIRCUIT TO CROSS UNDER EXISTING CIRCUITS.

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W: 4 STRUCTURES & 0.30 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL: WEATHERING STEEL WAS SELECTED TO MATCH AESTHETICALLY WITH CO-LOCATED TRANSMISSION STRUCTURES AND BLEND INTO WOODED AREAS.

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

g. AVERAGE WIDTH AT BASE: 5 FEET

h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 80 FEET, 75 FEET, AND 77.5 FEET RESPECTIVELY

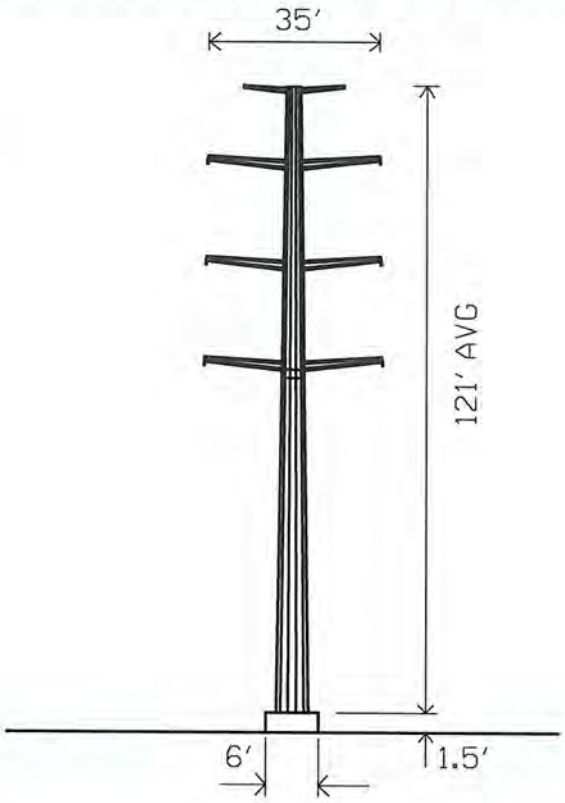
i. AVERAGE SPAN LENGTH: 400 FEET

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

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

$DGNSPEC$

STRUCTURE 2252/3-2252/13, 2252/15-2252/65, 2253/24(2254/24)-2253/25(2254/25), 2253/49(2254/49)-2253/53(2254/53), 2253/57(2254/57)-2253/61(2254/61), 2128/1, 2128/2



PRELIMINARY

PROPOSED STRUCTURE

a. MAPPING THAT IDENTIFIES EACH PORTION OF THE PREFERRED ROUTE: SEE ATTACHMENT II.B.5

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE: SHARED STRUCTURES FOR NEW 230KV CIRCUIT AND EXISTING 230KV CIRCUIT (LINE 271). MONOPOLES HAVE SMALLER FOOTPRINT COMPARED TO LATTICE TOWERS AND USE LESS ROW WIDTH COMPARED TO H-FRAMES.

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W: 76 STRUCTURES & 10.1 MILES.

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL: WEATHERING STEEL WAS SELECTED TO MATCH AESTHETICALLY WITH CO-LOCATED TRANSMISSION STRUCTURES AND BLEND INTO WOODED AREAS.

e. FOUNDATION MATERIAL: CONCRETE

f. AVERAGE WIDTH AT CROSSARM: 35 FEET

g. AVERAGE WIDTH AT BASE: 6 FEET

h. MAX, MIN, AND AVERAGE STRUCTRE HEIGHTS: 170 FEET, 105 FEET, AND 121 FEET RESPECTIVELY

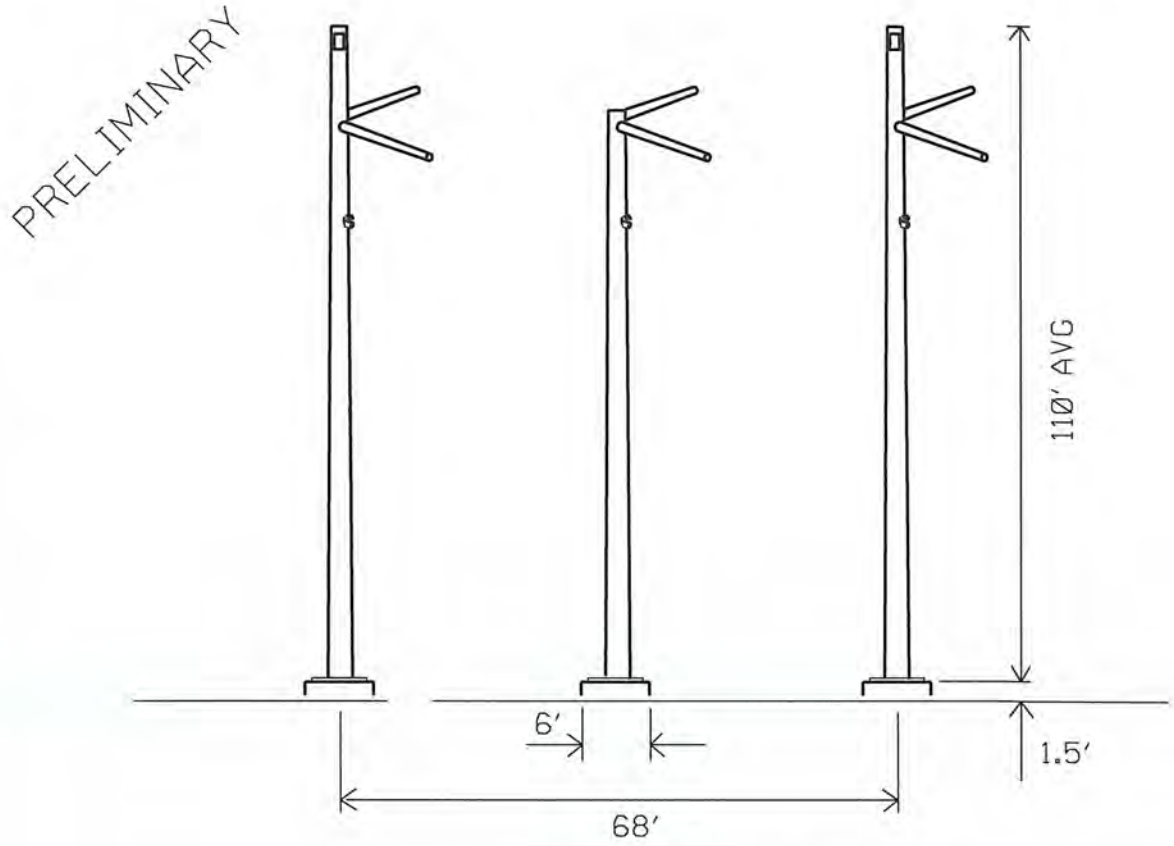
i. AVERAGE SPAN LENGTH: 700 FEET

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

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

$DGNSPEC$

STRUCTURE 588/254



PROPOSED STRUCTURE

a. MAPPING THAT IDENTIFIES EACH PORTION OF THE PREFERRED ROUTE: SEE ATTACHMENT II.B.5

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE: MAINTAINS HORIZONTAL CONFIGURATION INTO SUBSTATION BACKBONE

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W: 1 STRUCTURE & 0.10 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL: WEATHERING STEEL WAS SELECTED TO MATCH AESTHETICALLY WITH ADJACENT TRANSMISSION STRUCTURES AND BLEND INTO WOODED AREAS.

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

g. AVERAGE WIDTH AT BASE: 6 FEET

h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 110 FEET AT ALL LOCATIONS

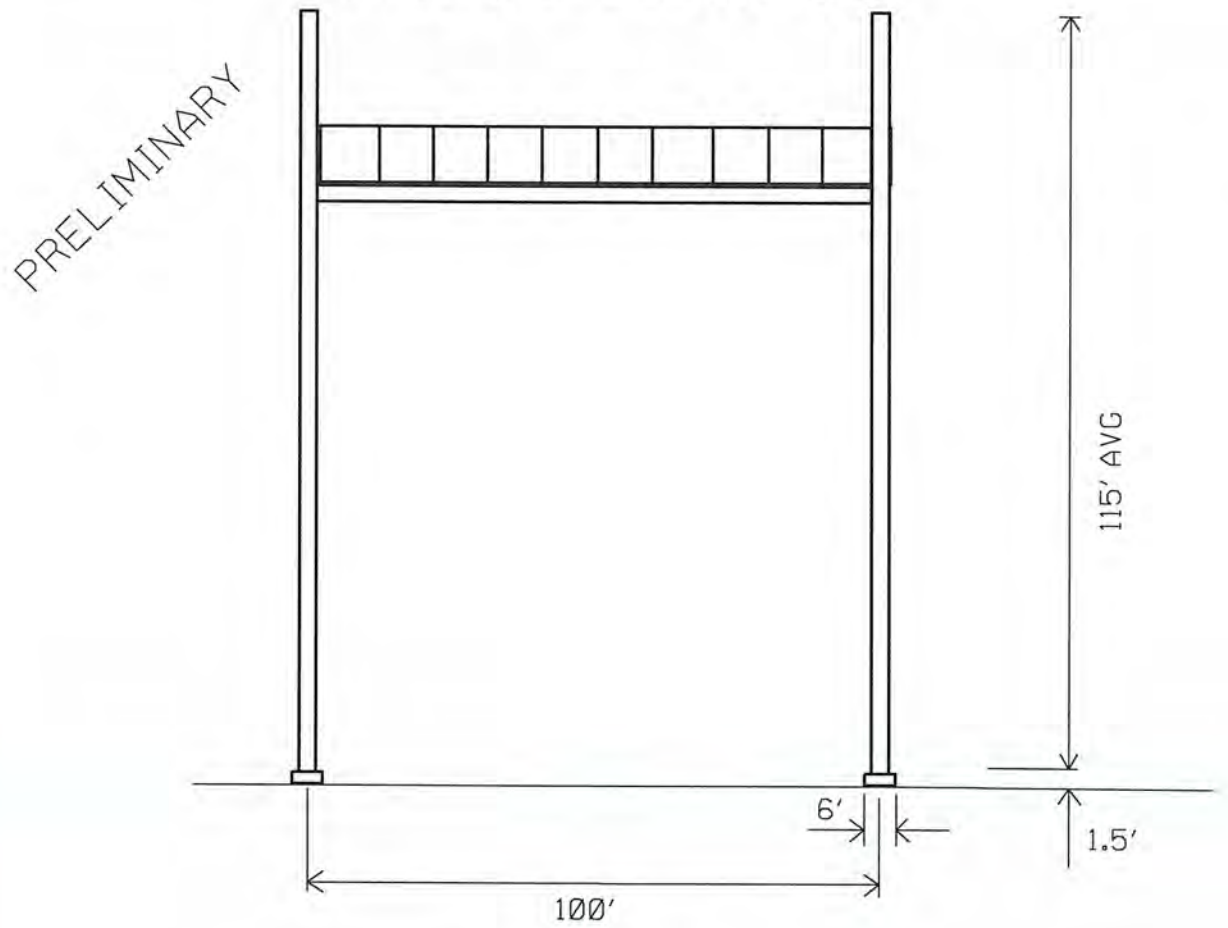
i. AVERAGE SPAN LENGTH: 540 FEET

j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS: 30.9 FEET

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

$DGNSPEC$

STRUCTURE FENTRESS 588



PROPOSED STRUCTURE

a. MAPPING THAT IDENTIFIES EACH PORTION OF THE PREFERRED ROUTE: SEE ATTACHMENT II.B.5

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE: STANDARD SUBSTATION STRUCTURE

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W: 1 STRUCTURE AND 0.07 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL: GALVANIZED STEEL WAS SELECTED TO MATCH TYPICAL SUBSTATION STRUCTURES AND EQUIPMENT

e. FOUNDATION MATERIAL: CONCRETE

f. AVERAGE WIDTH AT CROSSARM: 100 FEET

g. AVERAGE WIDTH AT BASE: 6 FEET

h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 115 FEET AT ALL LOCATIONS

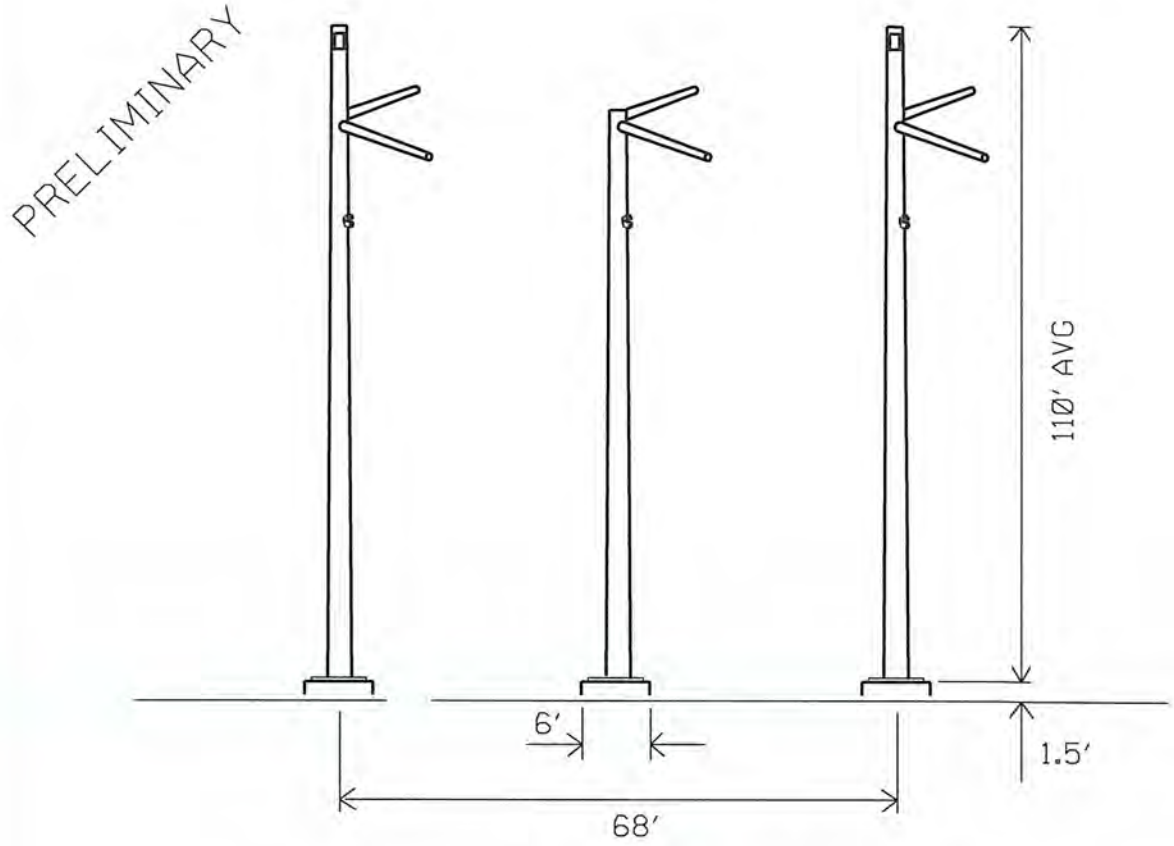
i. AVERAGE SPAN LENGTH: 350 FEET

j. MINIMUM CONDUCTOR-GROUND CLEARANCE UNDER MAXIMUM OPERATING CONDITIONS: 30.9 FEET

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

$DGNSPEC$

STRUCTURE 588/254



PROPOSED STRUCTURE

a. MAPPING THAT IDENTIFIES EACH PORTION OF THE PREFERRED ROUTE:
SEE ATTACHMENT II.B.5

b. RATIONALE FOR THE SELECTION OF THE STRUCTURE TYPE:
MAINTAINS HORIZONTAL CONFIGURATION INTO SUBSTATION BACKBONE

c. NUMBER OF EACH TYPE OF STRUCTURE AND LENGTH OF EACH PORTION OF THE R/W:
1 STRUCTURE & 0.10 MILES

d. STRUCTURE MATERIAL AND RATIONALE FOR THE SELECTION OF SUCH MATERIAL:
WEATHERING STEEL WAS SELECTED TO MATCH AESTHETICALLY WITH ADJACENT TRANSMISSION STRUCTURES AND BLEND INTO WOODED AREAS.

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

g. AVERAGE WIDTH AT BASE: 6 FEET

h. MAX, MIN, AND AVERAGE STRUCTURE HEIGHTS: 110 FEET AT ALL LOCATIONS

i. AVERAGE SPAN LENGTH: 540 FEET

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

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

$DGNSPEC$

II. DESCRIPTION OF THE PROPOSED PROJECT

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: See the table below for the approximate maximum, minimum, and average structure heights for each of the proposed and alternative routes, based on preliminary conceptual design, excluding foundation reveal and subject to change based on final engineering design. The structure heights provided for the routes identified in the table below include the rebuilt sections of Lines #271 and #2240.

Route	No. of Structures	Min. Structure Height (feet)	Max. Structure Height (feet)	Avg. Structure Height (feet)
Harpers to Fentress Proposed Route 1	354	75	170	121
Harpers to Fentress Alternative Route 2	375	75	170	120
Harpers to Fentress Alternative Route 5	515	75	170	116
Harpers to Fentress Alternative Hybrid Route	243	75	170	122
Dam Neck Route Variation	75	110	170	124
Line #2085 Route Variation	135	100	170	113

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 Attachment II.B.5 for existing and proposed structure locations along the proposed route for the Overhead Transmission Circuits.

For the Line #271 Partial Rebuild and Line #2240 Rebuild along the Proposed Route of the Overhead Transmission Circuits, the table below provides the existing and proposed structure heights. The proposed approximate structure heights are from the conceptual design created to estimate the cost of the proposed Virginia Facilities along this section and are subject to change based on final engineering design. The approximate structure heights exclude foundation reveal and assume equal leg lengths based on the centerline ground elevation.

Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft.)	Proposed Structure Height (ft.)	Attachment II.B.3 Structure Type
2240/1A	2240/1	90	75	Attachment II.B.3.ii
2240/1	2240/2	110	75	Attachment II.B.3.ii
2240/2	2240/3 (2252/3)	145	125	Attachment II.B.3.iii
2240/3	2240/4 (2252/4)	130	130	Attachment II.B.3.iii
2240/4	2240/5 (2252/5)	125	125	Attachment II.B.3.iii
2240/5	2240/7 (2252/7)	130	125	Attachment II.B.3.iii
2240/6	2240/8 (2252/8)	120	125	Attachment II.B.3.iii
2240/7	2240/9 (2252/9)	125	125	Attachment II.B.3.iii
2240/8	2240/11 (2252/11)	130	125	Attachment II.B.3.iii
2240/9	2240/13 (2252/13)	130	130	Attachment II.B.3.iii
I-74/33	2252/14	120	125	Attachment II.B.3.iv
271/11	271/12 (2252/16)	130	135	Attachment II.B.3.iii
271/12	271/13 (2252/17)	130	125	Attachment II.B.3.iii

Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft.)	Proposed Structure Height (ft.)	Attachment II.B.3 Structure Type
271/13	271/15 (2252/19)	130	125	Attachment II.B.3.iii
271/14	271/16 (2252/20)	130	125	Attachment II.B.3.iii
271/15	271/18 (2252/22)	125	125	Attachment II.B.3.iii
271/16	271/19 (2252/23)	125	125	Attachment II.B.3.iii
271/17	271/21 (2252/25)	130	110	Attachment II.B.3.iii
271/18	271/23 (2252/27)	125	125	Attachment II.B.3.iii
271/19	271/25 (2252/29)	180	170	Attachment II.B.3.iii
271/20	271/26 (2252/30)	180	170	Attachment II.B.3.iii
271/21	271/28 (2252/32)	130	125	Attachment II.B.3.iii
271/22	271/29 (2252/33)	130	125	Attachment II.B.3.iii
271/23	271/30 (2252/34)	125	125	Attachment II.B.3.iii
271/24	271/32 (2252/36)	130	125	Attachment II.B.3.iii
271/25	271/33 (2252/37)	125	125	Attachment II.B.3.iii
271/26	271/35 (2252/39)	130	125	Attachment II.B.3.iii
271/27	271/36 (2252/40)	130	125	Attachment II.B.3.iii
271/28	271/37 (2252/41)	130	125	Attachment II.B.3.iii
271/29	271/39 (2252/43)	130	125	Attachment II.B.3.iii
271/30	271/40 (2252/44)	120	125	Attachment II.B.3.iii
271/31	271/41 (2252/45)	125	130	Attachment II.B.3.iii
271/32	271/42 (2252/46)	120	120	Attachment II.B.3.iii
271/33	271/44 (2252/48)	130	115	Attachment II.B.3.iii
271/34	271/46 (2252/50)	130	125	Attachment II.B.3.iii
271/35	271/48 (2252/52)	130	125	Attachment II.B.3.iii

Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft.)	Proposed Structure Height (ft.)	Attachment II.B.3 Structure Type
271/36	271/50 (2252/54)	130	105	Attachment II.B.3.iii
271/37	271/53 (2252/57)	130	115	Attachment II.B.3.iii
271/38	271/55 (2252/59)	130	110	Attachment II.B.3.iii
271/39	271/56 (2252/60)	125	110	Attachment II.B.3.iii
271/40	271/58 (2252/62)	130	130	Attachment II.B.3.iii
271/41	271/59 (2252/63)	130	110	Attachment II.B.3.iii
271/42	271/61	125	130	Attachment II.B.3.iii
2128/1	2128/1	110	115	Attachment II.B.3.iii
2128/2	2128/2	110	110	Attachment II.B.3.iii
588/254	588/254	105	110	Attachment II.B.3.vi
588/256	588/255	120	115	Attachment II.B.3.v
Minimum		90	75	
Maximum		180	170	
Average		128	122	

Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
271/42	271/61	125	130

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

MPLS M:\Clients\D-F\DOM\Offshore_Wind_ArcGIS\SCC_Appendix_Figures\SCC_Appendix.aprx | REVISED: 10/28/2021 | SCALE: 1:1,500 when printed at 11x17

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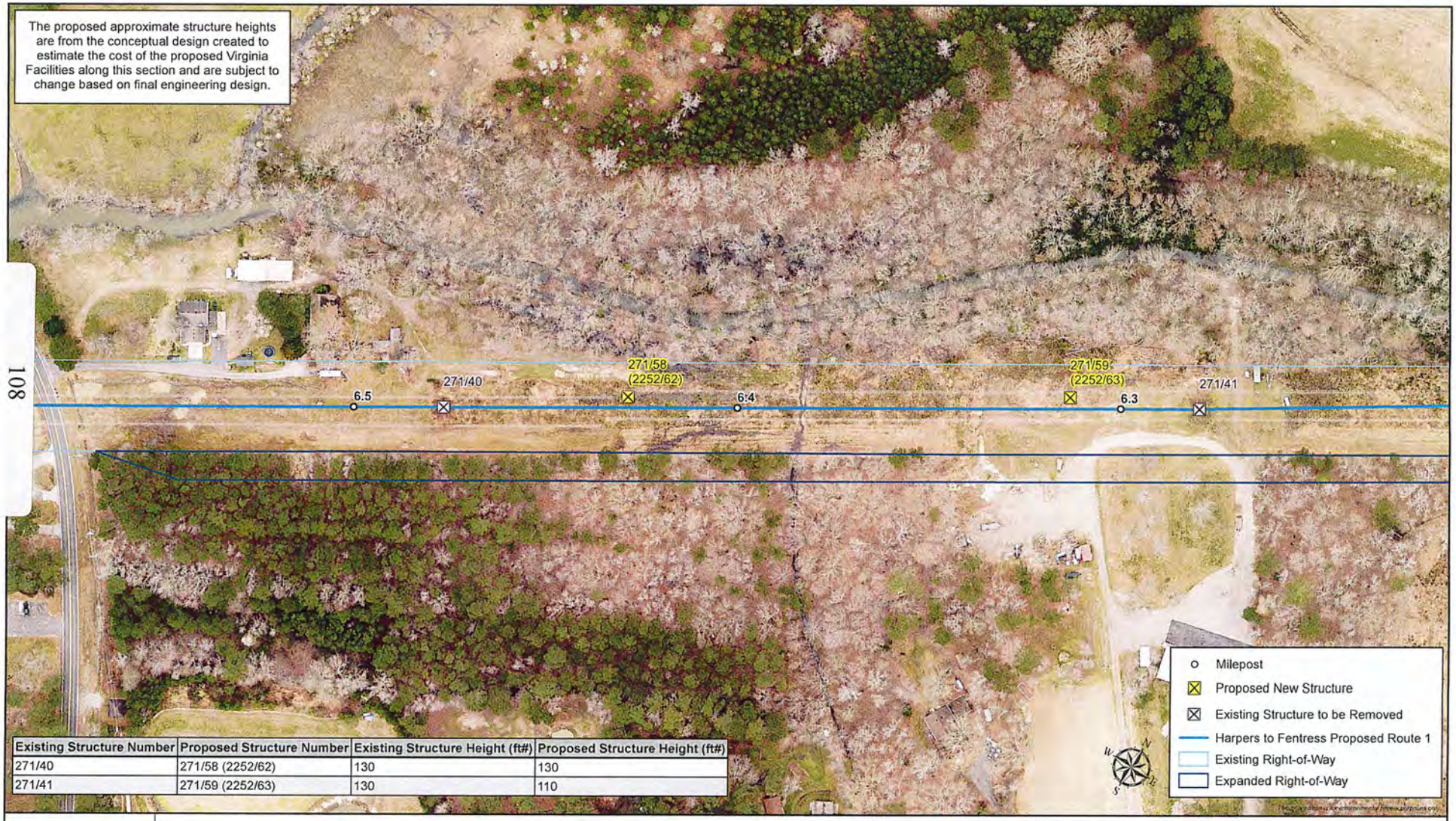

Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
271/40	271/58 (2252/62)	130	130
271/41	271/59 (2252/63)	130	110

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
271/38	271/55 (2252/59)	130	110
271/39	271/56 (2252/60)	125	110

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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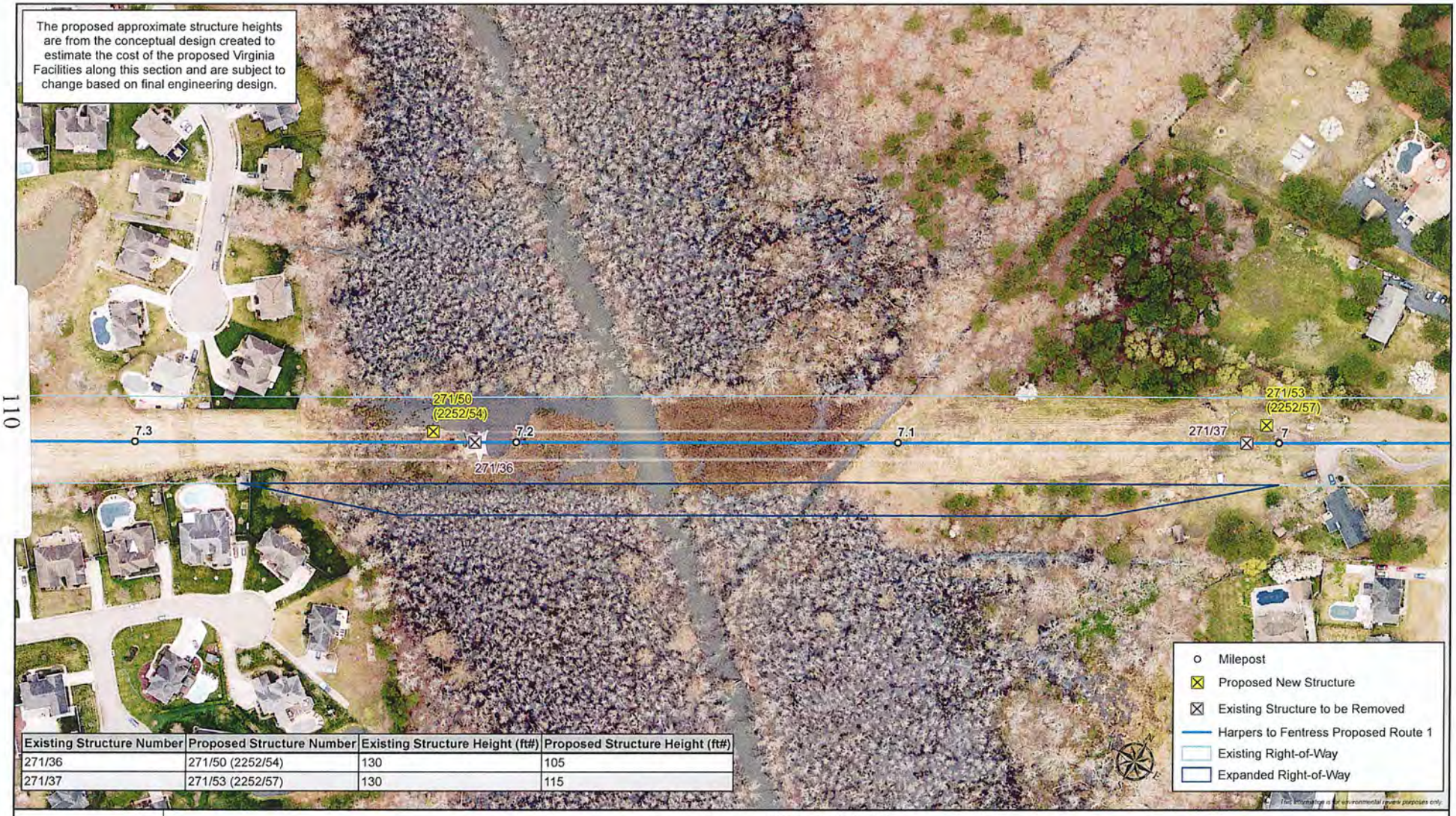

Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
271/36	271/50 (2252/54)	130	105
271/37	271/53 (2252/57)	130	115

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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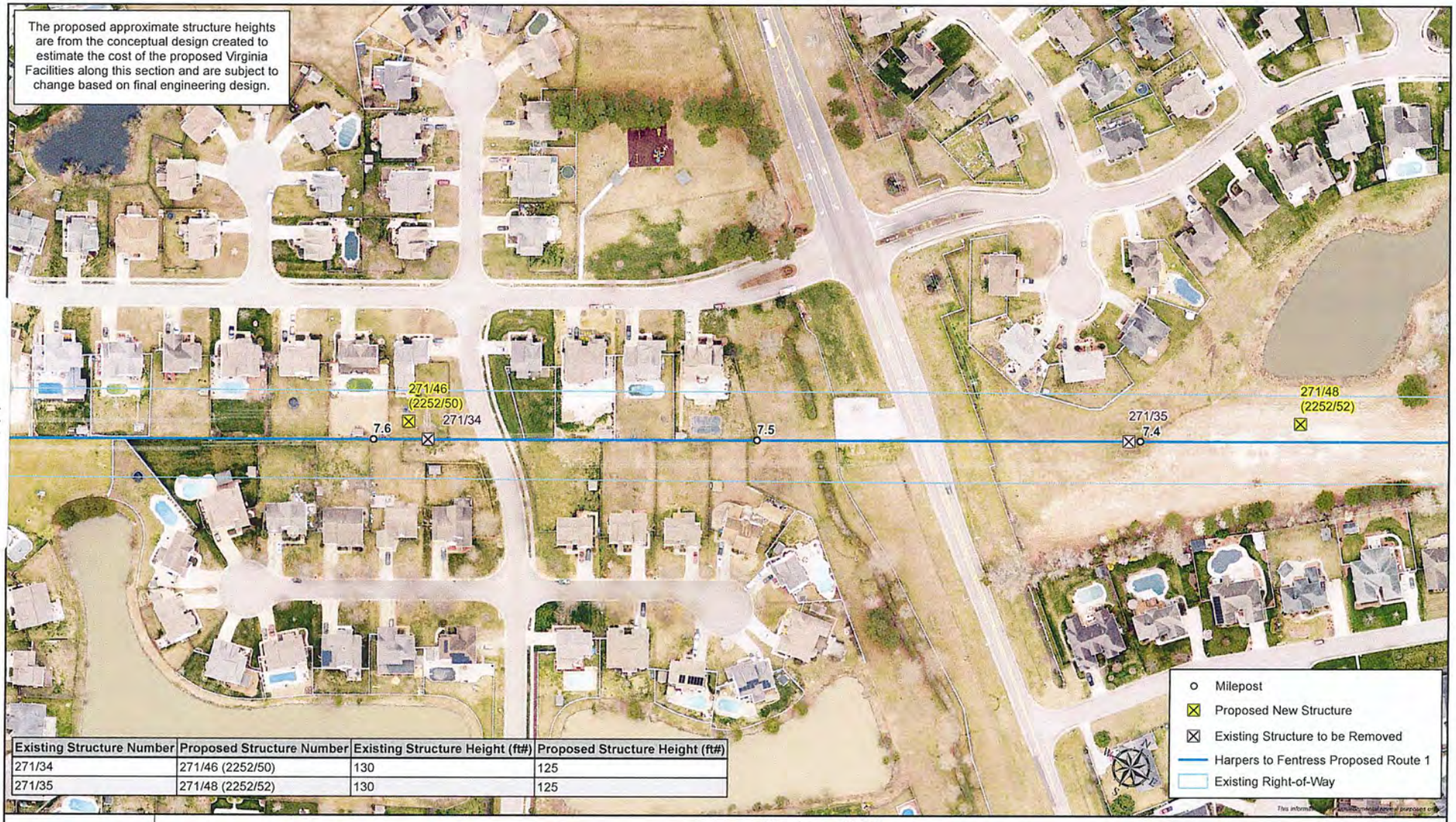

Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
271/34	271/46 (2252/50)	130	125
271/35	271/48 (2252/52)	130	125

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
271/32	271/42 (2252/46)	120	120
271/33	271/44 (2252/48)	130	115

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
271/30	271/40 (2252/44)	120	125
271/31	271/41 (2252/45)	125	130

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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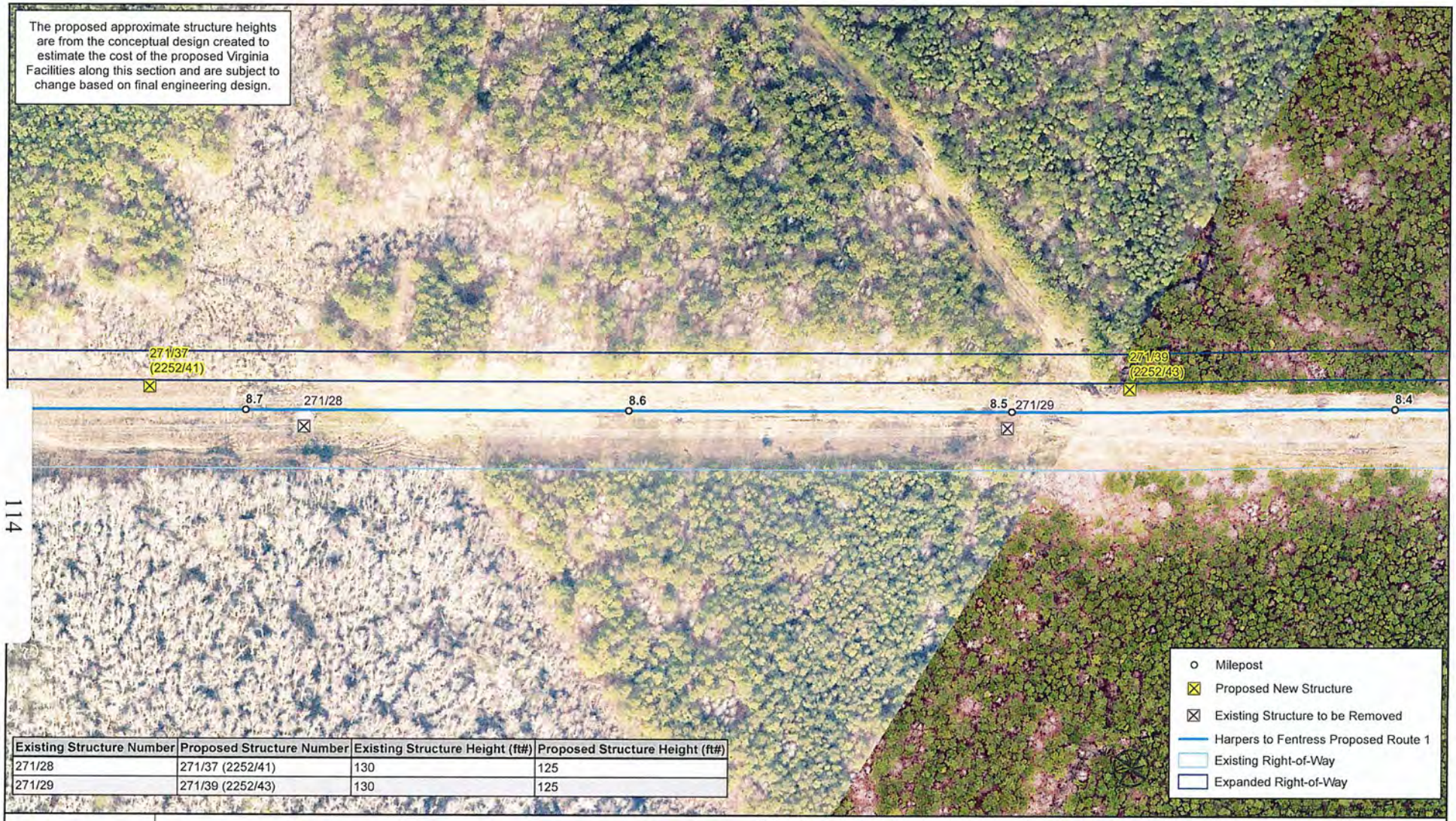

Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
271/28	271/37 (2252/41)	130	125
271/29	271/39 (2252/43)	130	125

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
271/26	271/35 (2252/39)	130	125
271/27	271/36 (2252/40)	130	125

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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DRAWN BY: NAD

The proposed approximate structure heights are from the conceptual design created to estimate the cost of the proposed Virginia Facilities along this section and are subject to change based on final engineering design.

Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
271/24	271/32 (2252/36)	130	125
271/25	271/33 (2252/37)	125	125

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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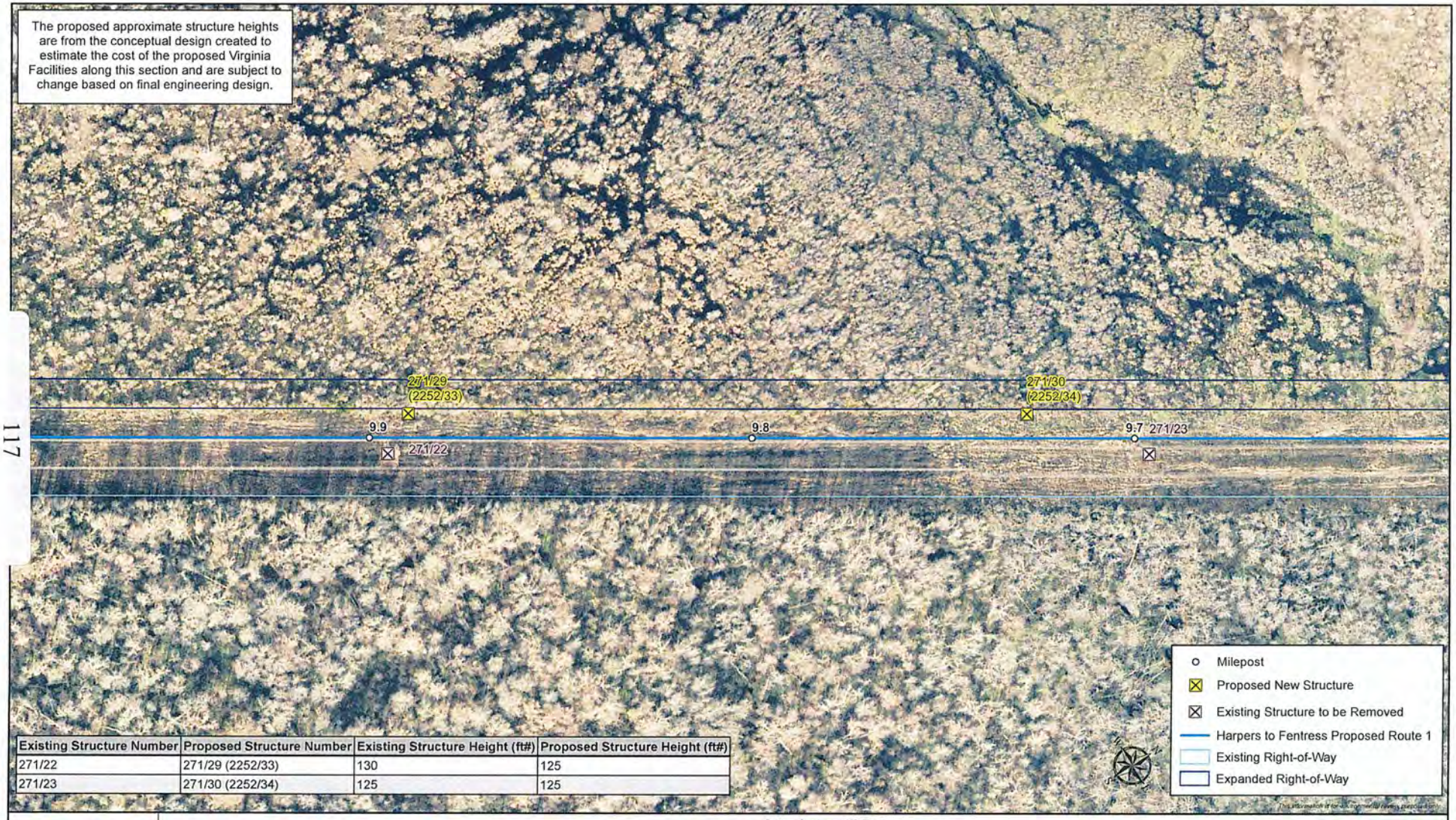
The proposed approximate structure heights are from the conceptual design created to estimate the cost of the proposed Virginia Facilities along this section and are subject to change based on final engineering design.



Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
271/22	271/29 (2252/33)	130	125
271/23	271/30 (2252/34)	125	125

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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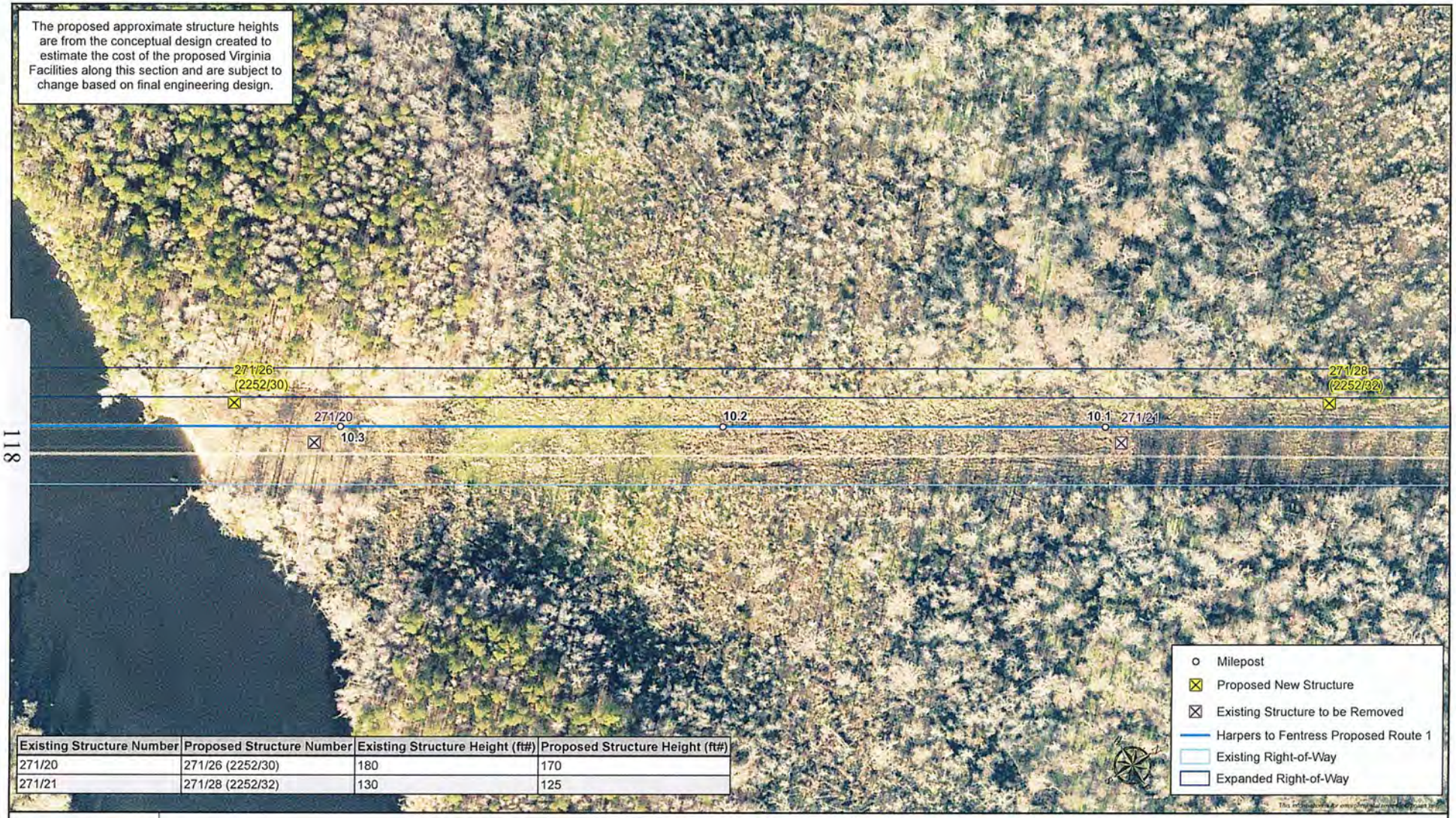

Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
271/20	271/26 (2252/30)	180	170
271/21	271/28 (2252/32)	130	125

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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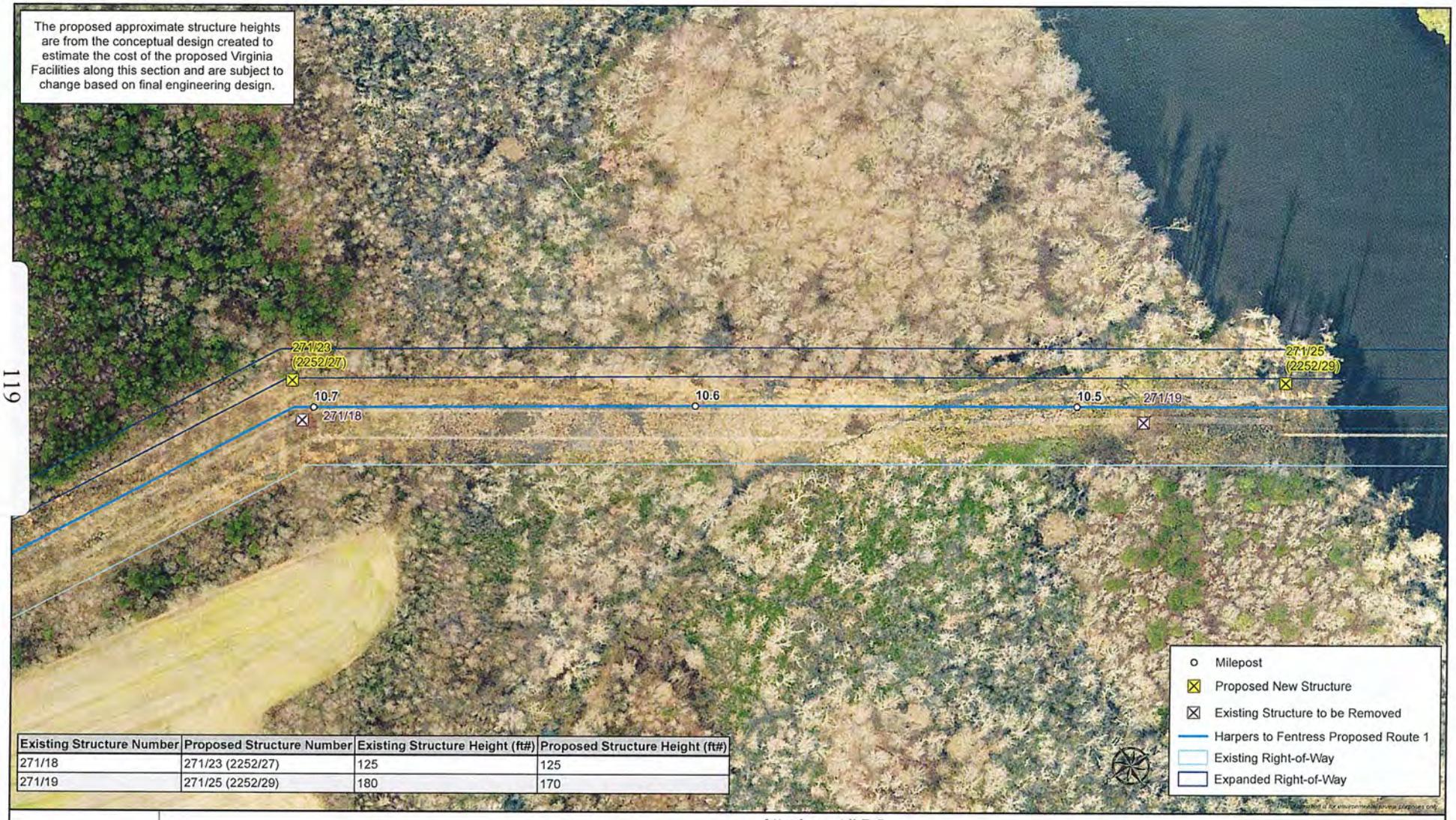
The proposed approximate structure heights are from the conceptual design created to estimate the cost of the proposed Virginia Facilities along this section and are subject to change based on final engineering design.



Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
271/18	271/23 (2252/27)	125	125
271/19	271/25 (2252/29)	180	170

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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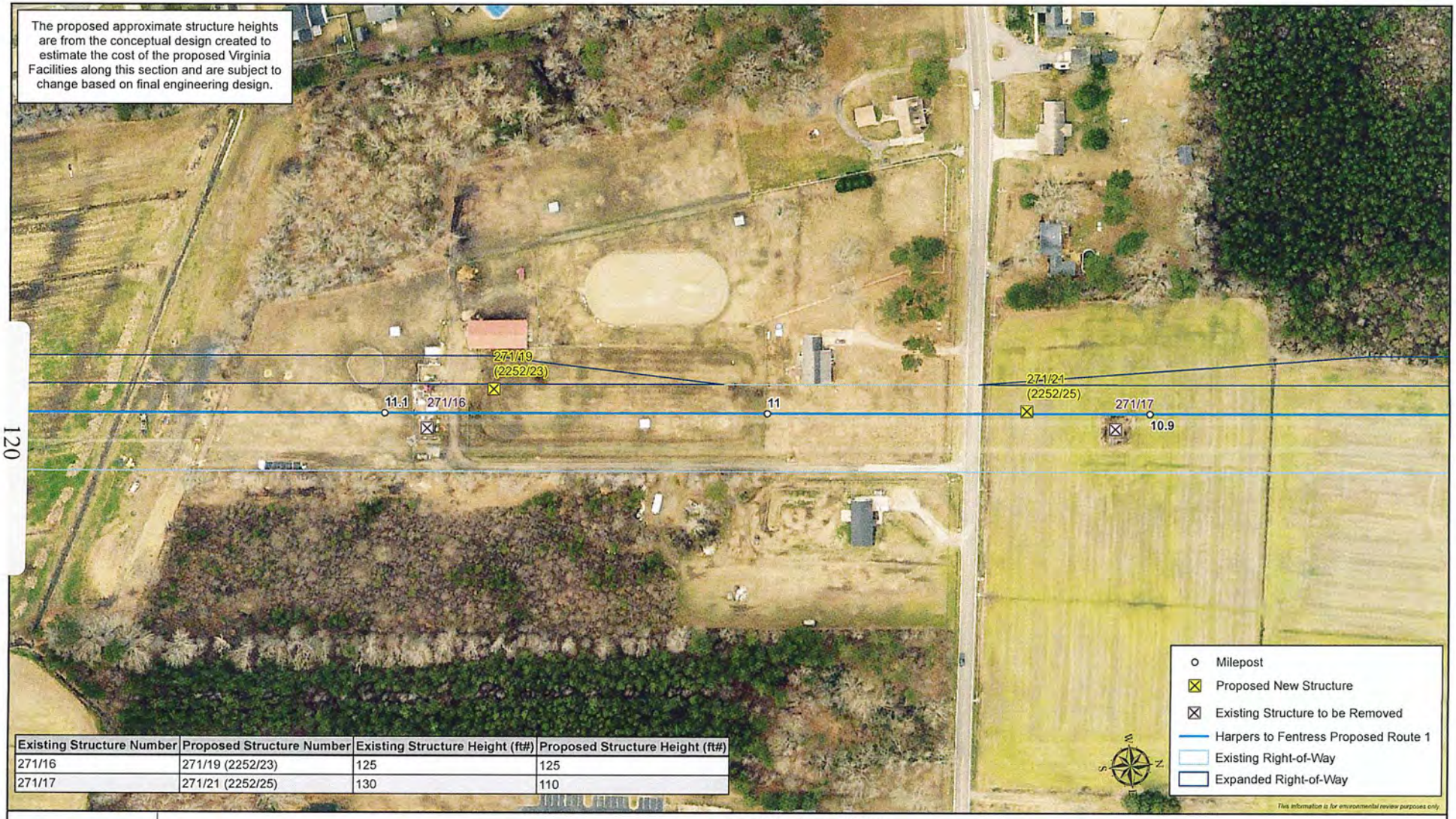

Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
271/16	271/19 (2252/23)	125	125
271/17	271/21 (2252/25)	130	110

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
271/14	271/16 (2252/20)	130	125
271/15	271/18 (2252/22)	125	125

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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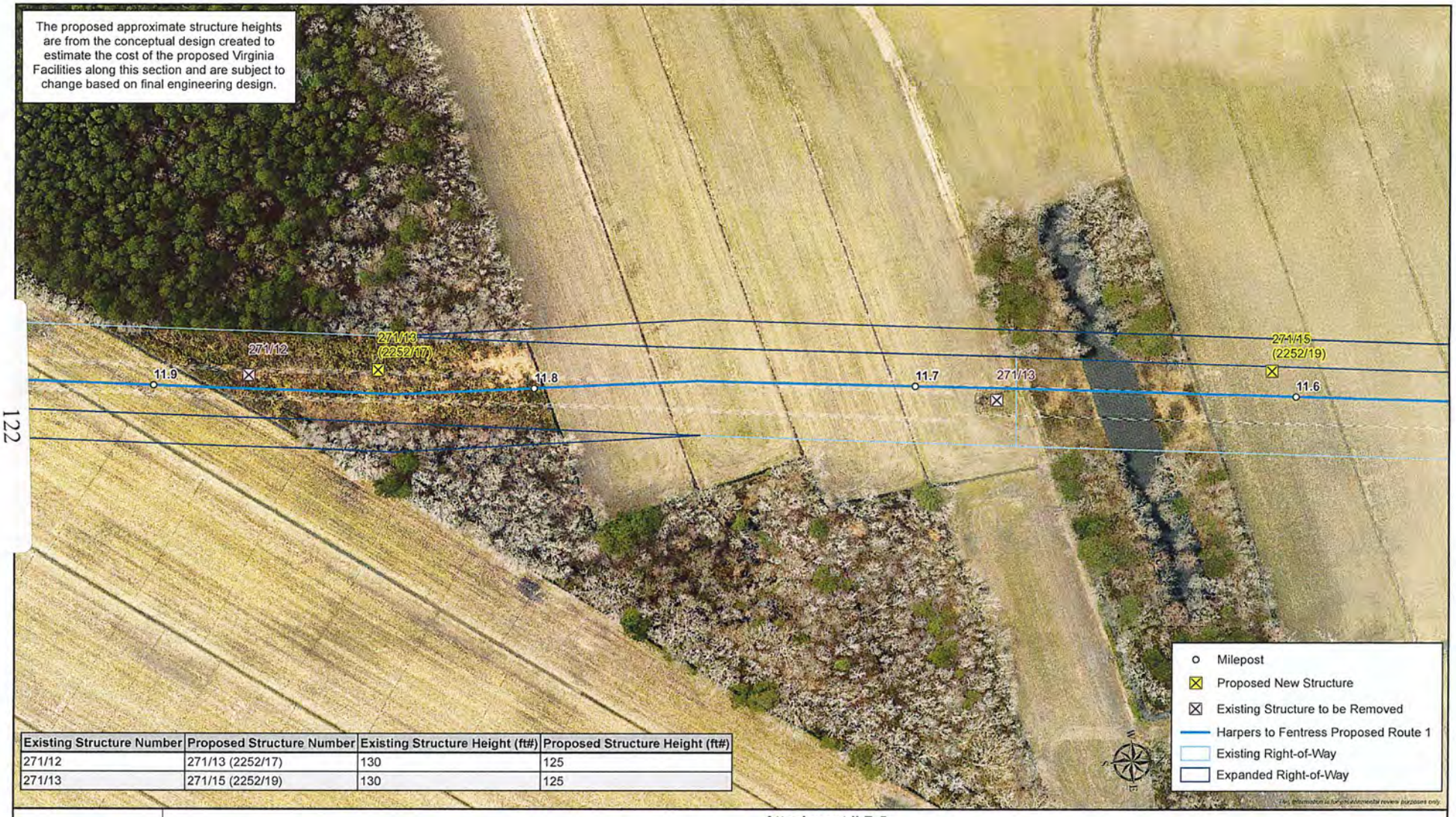

Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
271/12	271/13 (2252/17)	130	125
271/13	271/15 (2252/19)	130	125

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
I-74/33	2252/14	120	125
271/11	271/12 (2252/16)	130	135

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
2240/8	2240/11 (2252/11)	130	125
2240/9	2240/13 (2252/13)	130	130

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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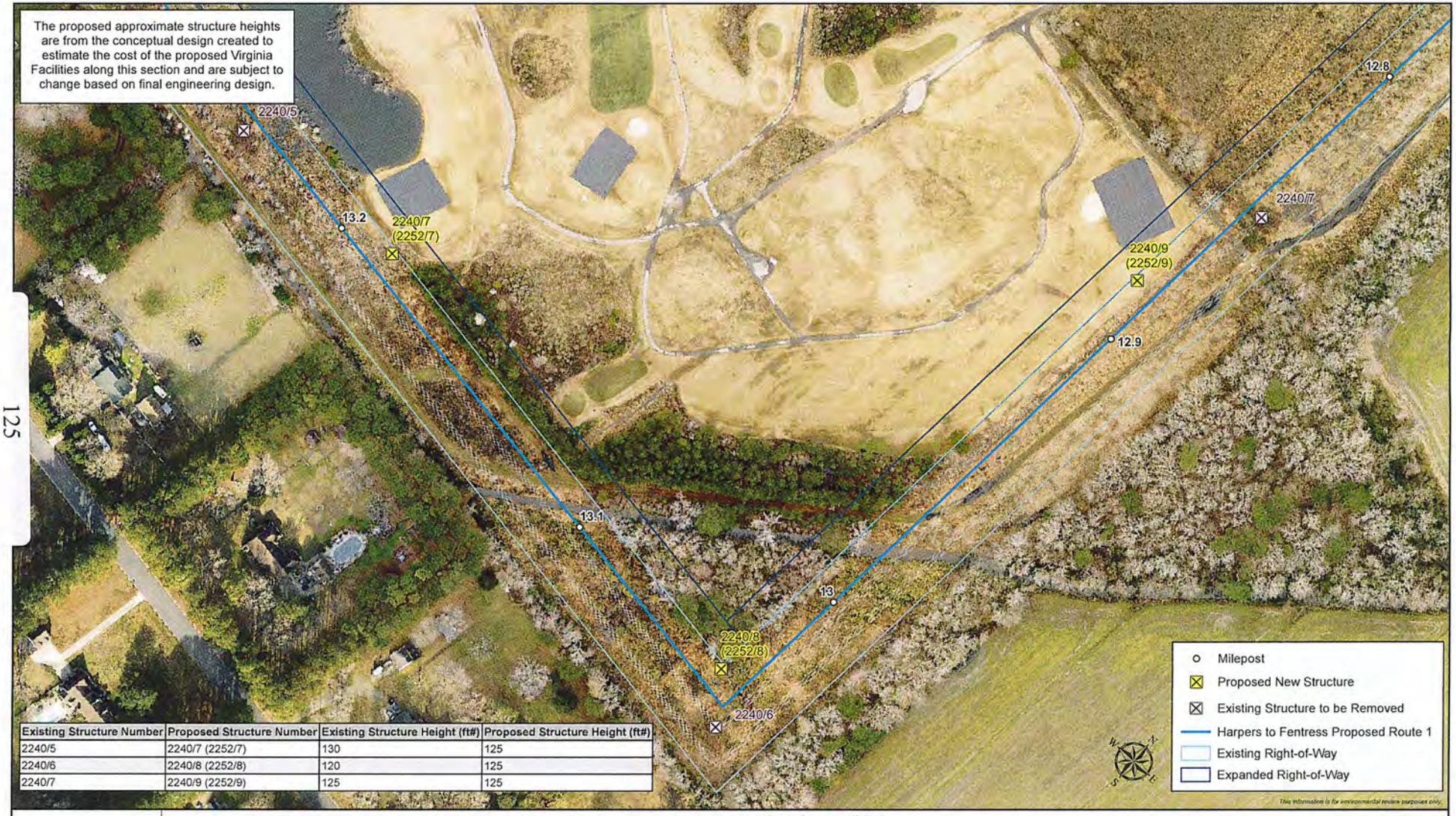

Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
2240/5	2240/7 (2252/7)	130	125
2240/6	2240/8 (2252/8)	120	125
2240/7	2240/9 (2252/9)	125	125

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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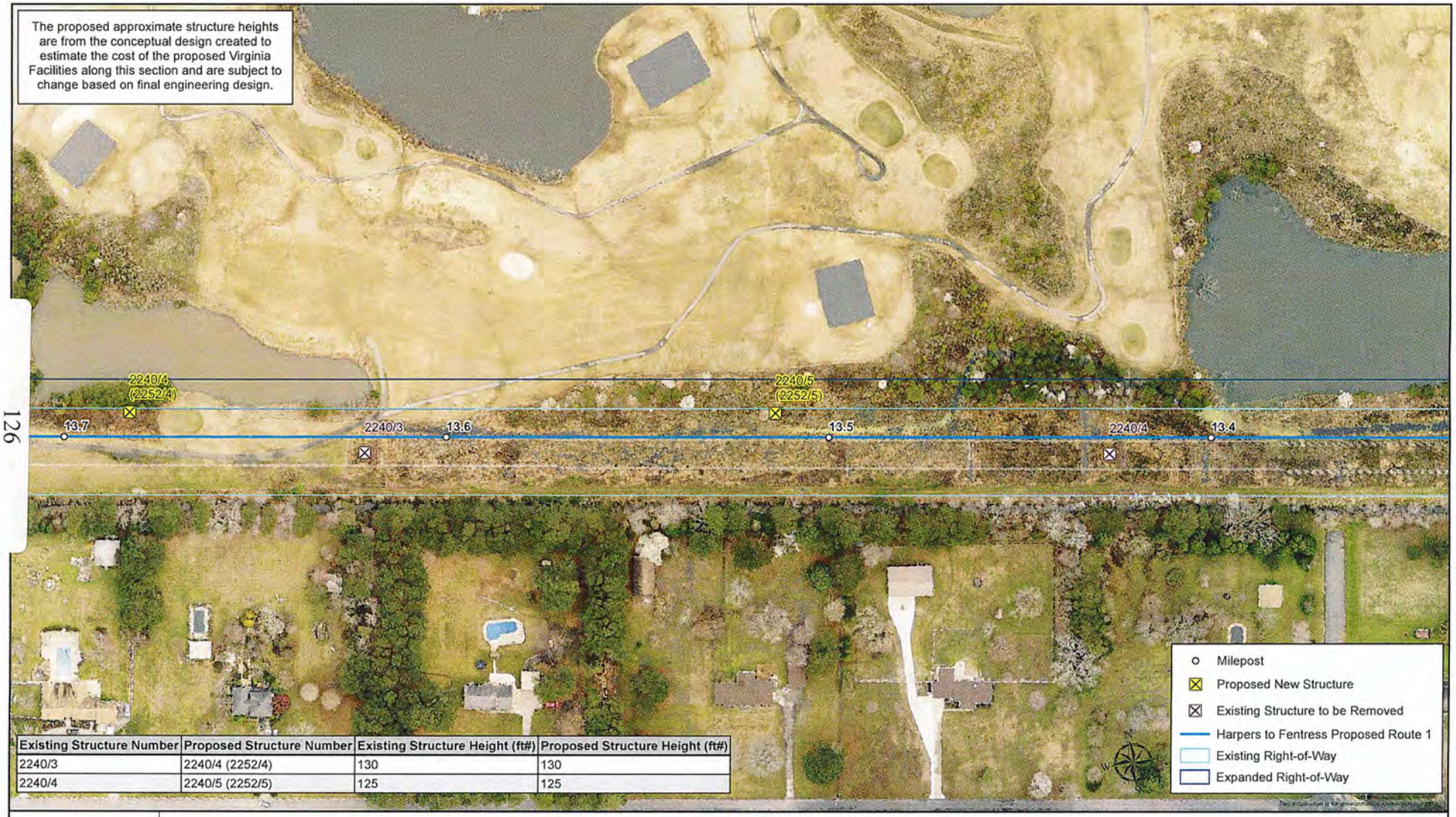

Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
2240/3	2240/4 (2252/4)	130	130
2240/4	2240/5 (2252/5)	125	125

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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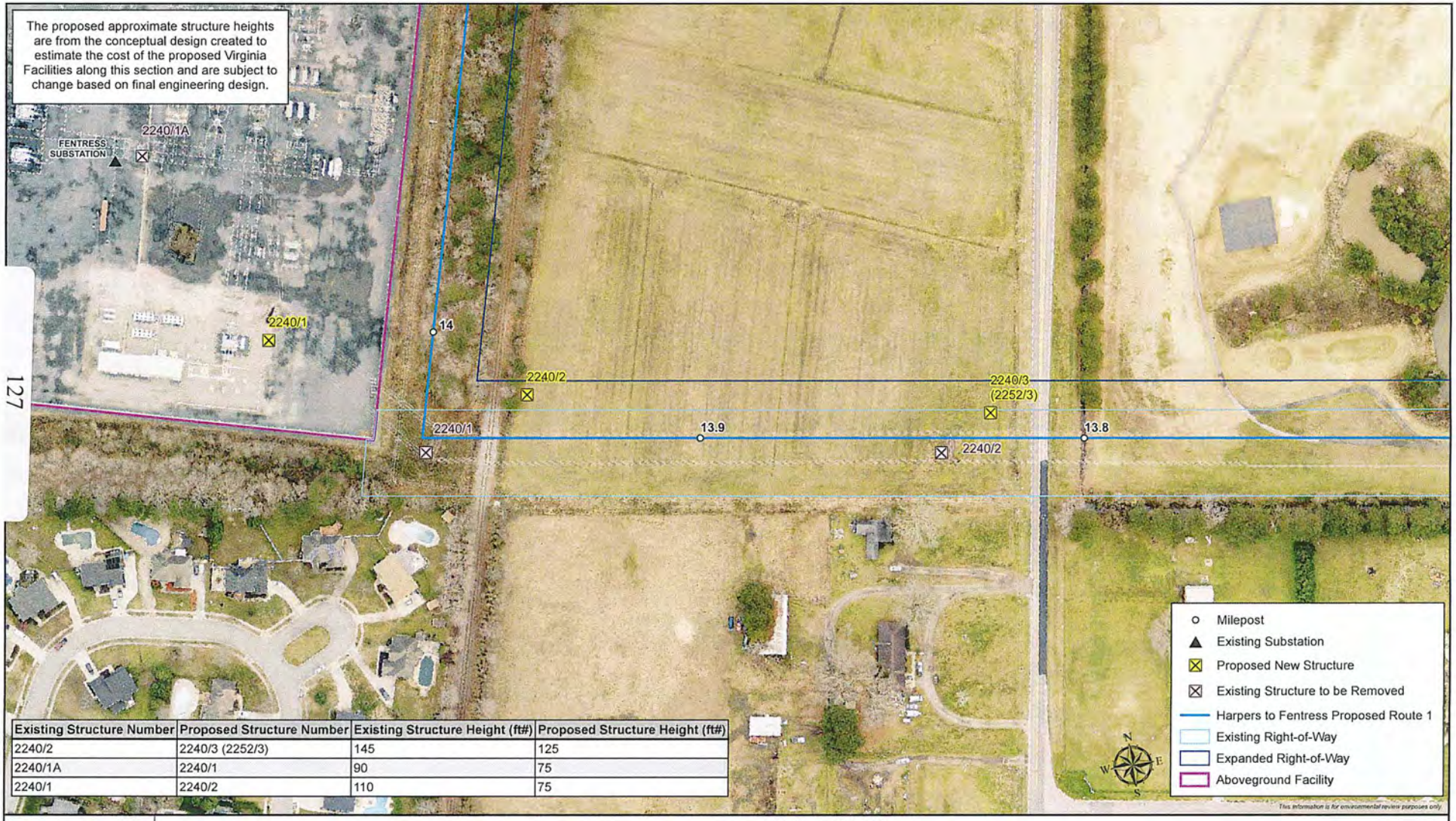

Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
2240/2	2240/3 (2252/3)	145	125
2240/1A	2240/1	90	75
2240/1	2240/2	110	75

127

0 50 100
Feet
1:1,500

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

MPLS M:\Clients\D-F\DOM\Offshore_Wind_ArcGIS\SCC_Appendix_Figures\SCC_Appendix.aprx | REVISED: 10/28/2021 | SCALE: 1:1,500 when printed at 11x17

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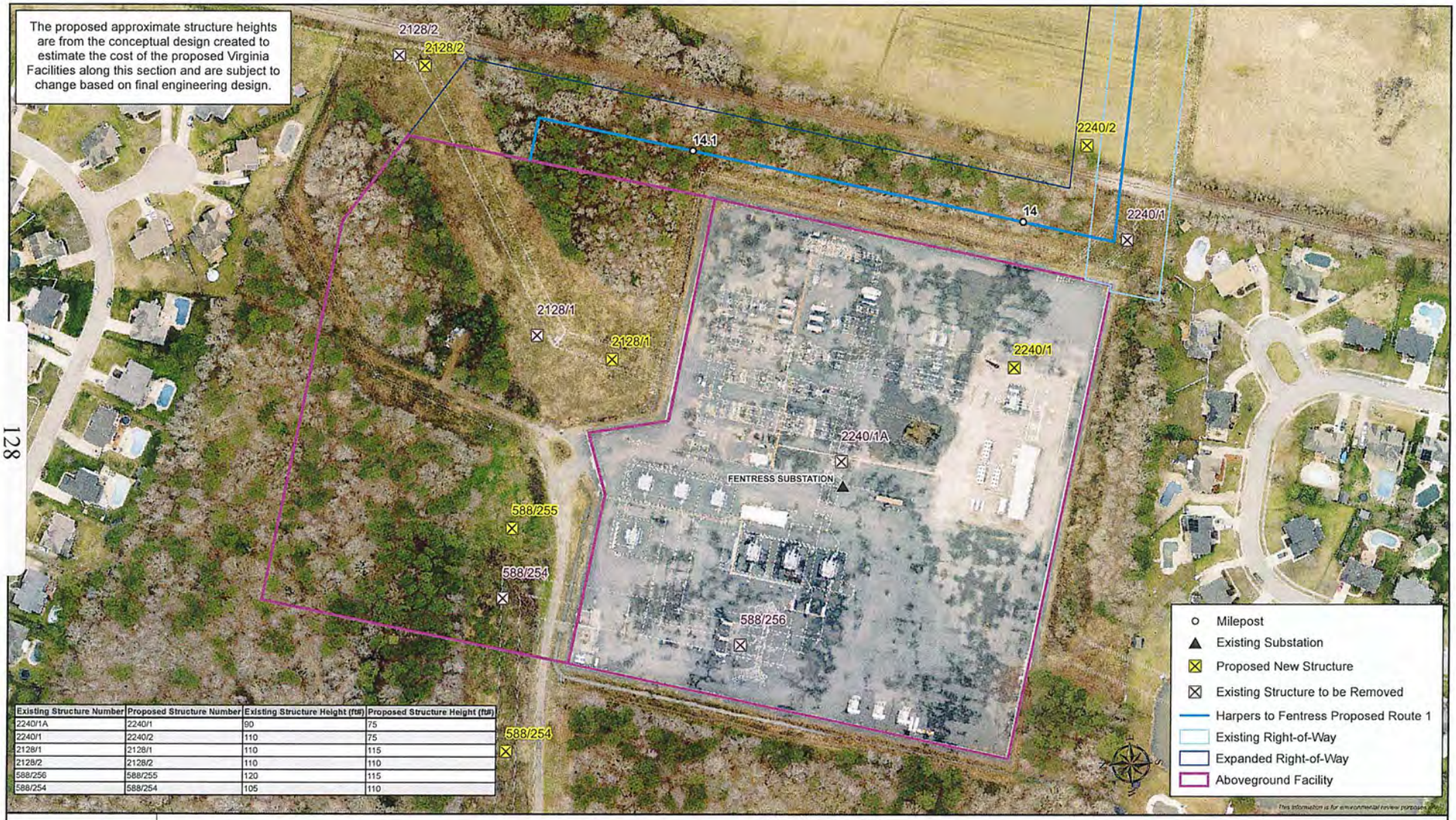

Existing Structure Number	Proposed Structure Number	Existing Structure Height (ft#)	Proposed Structure Height (ft#)
2240/1A	2240/1	90	75
2240/1	2240/2	110	75
2128/1	2128/1	110	115
2128/2	2128/2	110	110
588/256	588/255	120	115
588/254	588/254	105	110

0 50 100
Feet
1:1,700

Dominion Energy

Attachment II.B.5
Proposed Structure Height Map Set
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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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.a.i-vi for representative photos of existing typical structures along Lines #271, #2240, #2128, #588, and idle Line #I-74, that are being removed.

(b) See Attachment II.B.6.b.i-ix for representative photos of proposed structures along the proposed route of the Overhead Transmission Circuits.

(c) Photosimulations for planned transmission structures at identified historic locations within one mile of the proposed routes of the Onshore Export Circuits and the Overhead Transmission Circuits are included in Attachments II.B.6.c.1 and II.B.6.c.2, respectively. The tables below summarize the impacts by route on the identified historic locations.

Onshore Export Circuits – Proposed Route
Cable Landing Location to Harpers Switching Station

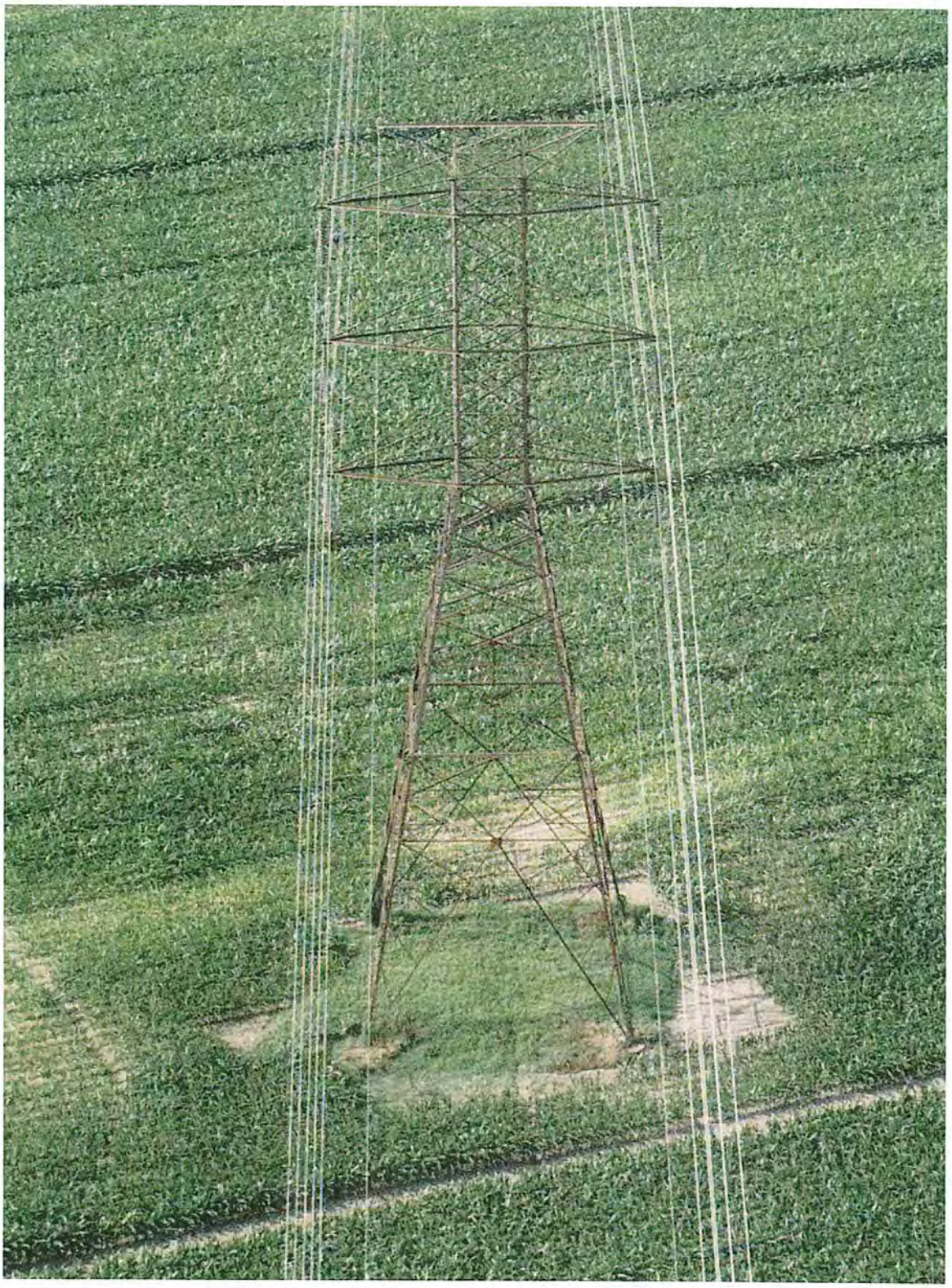
Historic Property	Impact	Attachment
Bell House (VDHR ID 134-0003)	Minimal	II.B.6.c.1 (Figures 2-6)
Camp Pendleton/State Military Reservation Historic District (VDHR ID 134-0413	Severe	II.B.6.c.1 (Figures 7-15)
Building 1 (VDHR ID 134-0413-0110)	No impact	II.B.6.c.1 (Figures 16-18)
Winford White House (VDHR ID 134-0917)	No impact	II.B.6.c.1 (Figures 19-21)

Overhead Transmission Circuits – Proposed Route
Harpers Switching Station to Fentress Substation

Historic Property	Impact	Attachment
Albemarle & Chesapeake Canal (VDHR ID 131-0044)	Minimal	II.B.6.c.2 (Figures 2-4)
Centreville-Fentress Historic District (VDHR ID 131-5071)	Minimal	II.B.6.c.2 (Figures 5-15)
Albemarle & Chesapeake Canal Historic District (VDHR ID 131-5333)	Minimal	II.B.6.c.2 (Figures 16-18)
Jonathan Woodhouse/William Woodhouse (VDHR ID 134-0038)	No impact	II.B.6.c.2 (Figures 19-23)

Historic Property	Impact	Attachment
Thomas Lovett House/Rollingswood Academy (VDHR ID 134-0072)	No impact	II.B.6.c.2 (Figures 24-26)
St. John's Baptist Church (VDHR ID 134-0702)	No impact	II.B.6.c.2 (Figures 27-29)

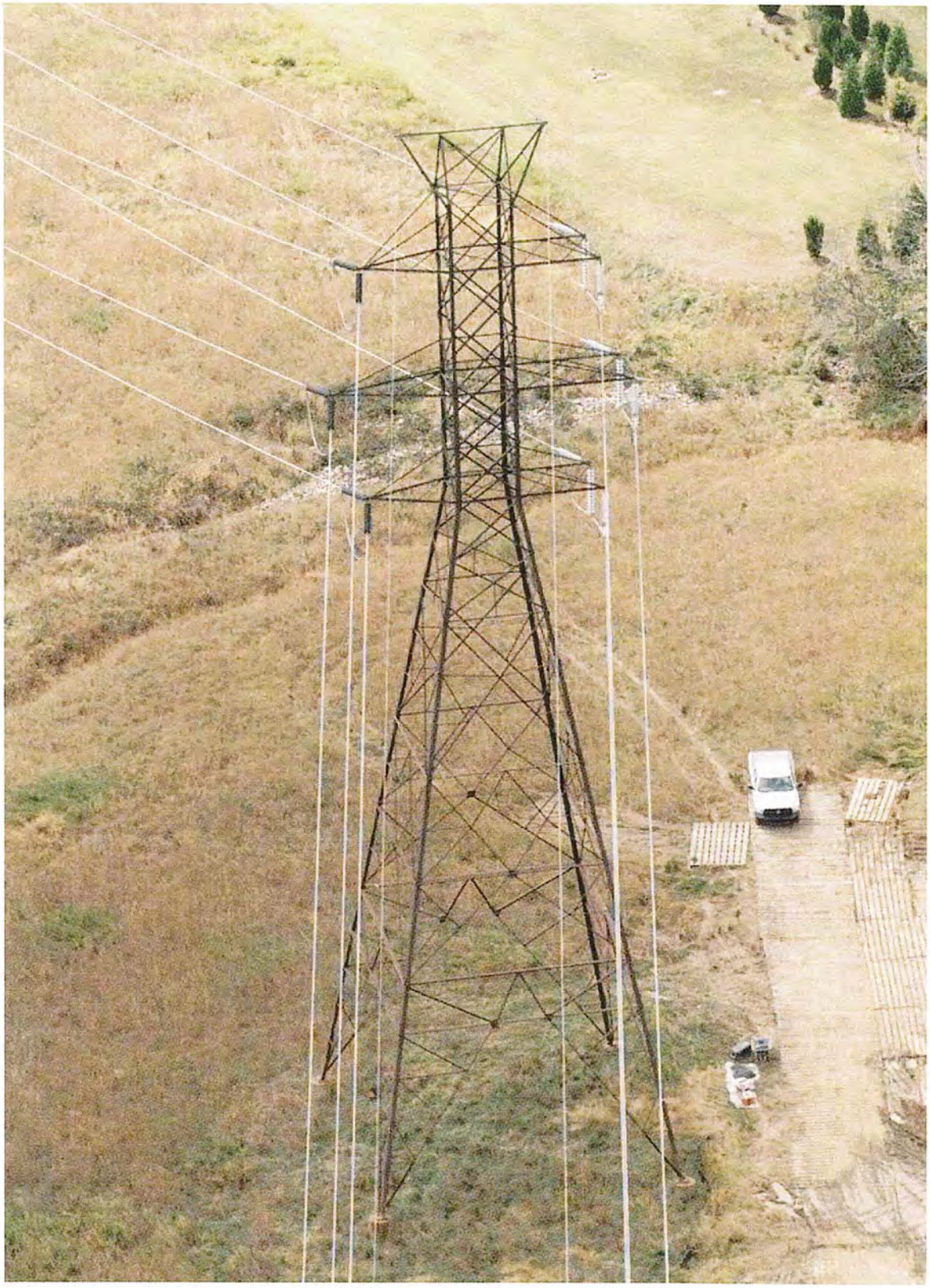
See Attachments III.B.12.a and III.B.12.b for visual simulations of the proposed and alternative routes, respectively, from key locations.



Photograph provided by Dominion Energy

Existing Structure Type:
230 kV Double Circuit Weathering Steel Lattice Tower (Suspension)

Dominion Energy®



Existing Structure Type:
230 kV Double Circuit Weathering Steel Lattice Tower (Double Deadend)

Dominion Energy

Photograph provided by Dominion Energy

Existing Structure Type:
500 kV Single Circuit Weathering Steel Lattice Tower (Double Deadend)

Attachment II.B.6.a.iii

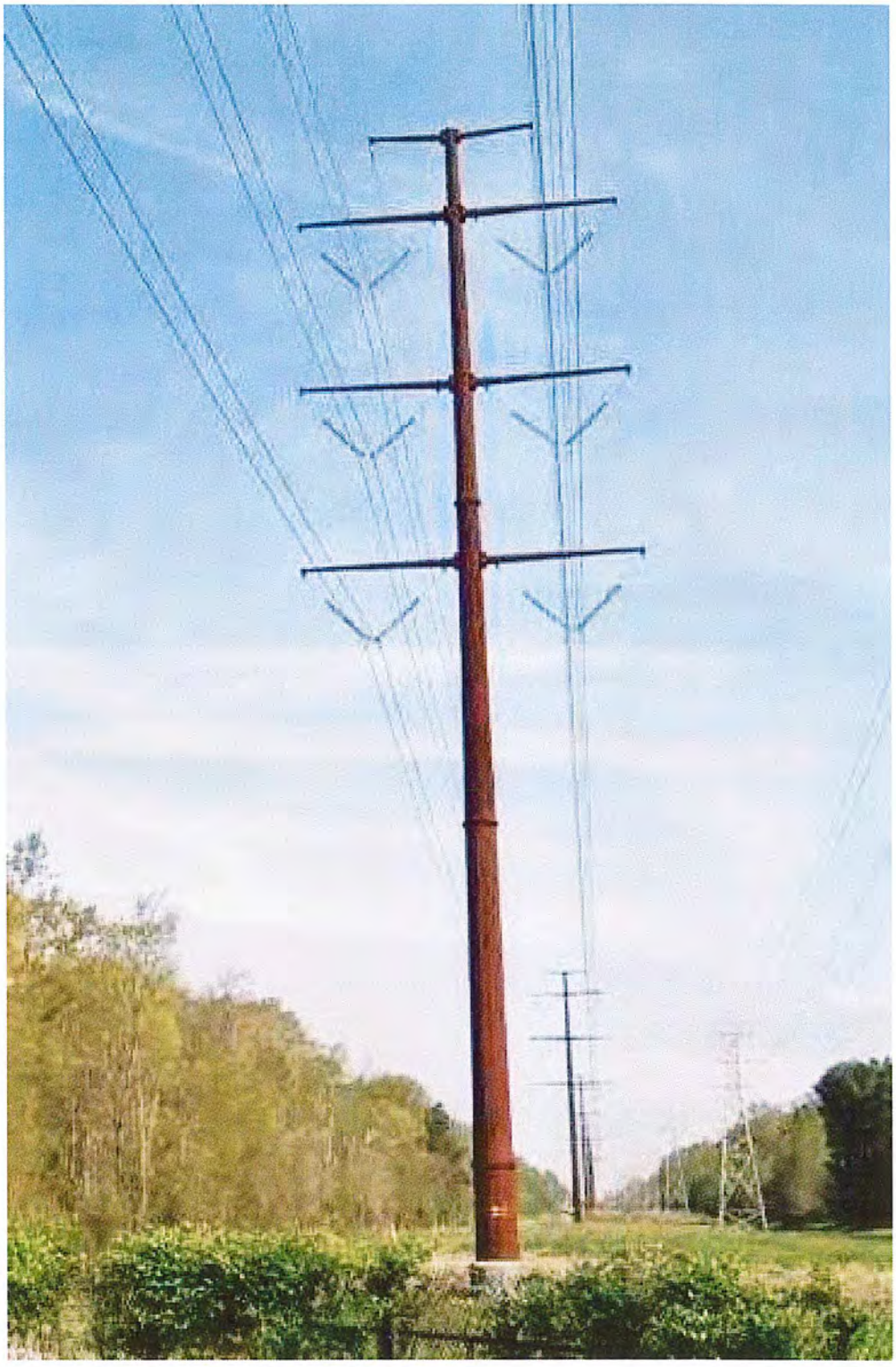
Existing Structure Type:
230 kV Single Circuit Steel Monopole (Double Deadend)

Dominion Energy®

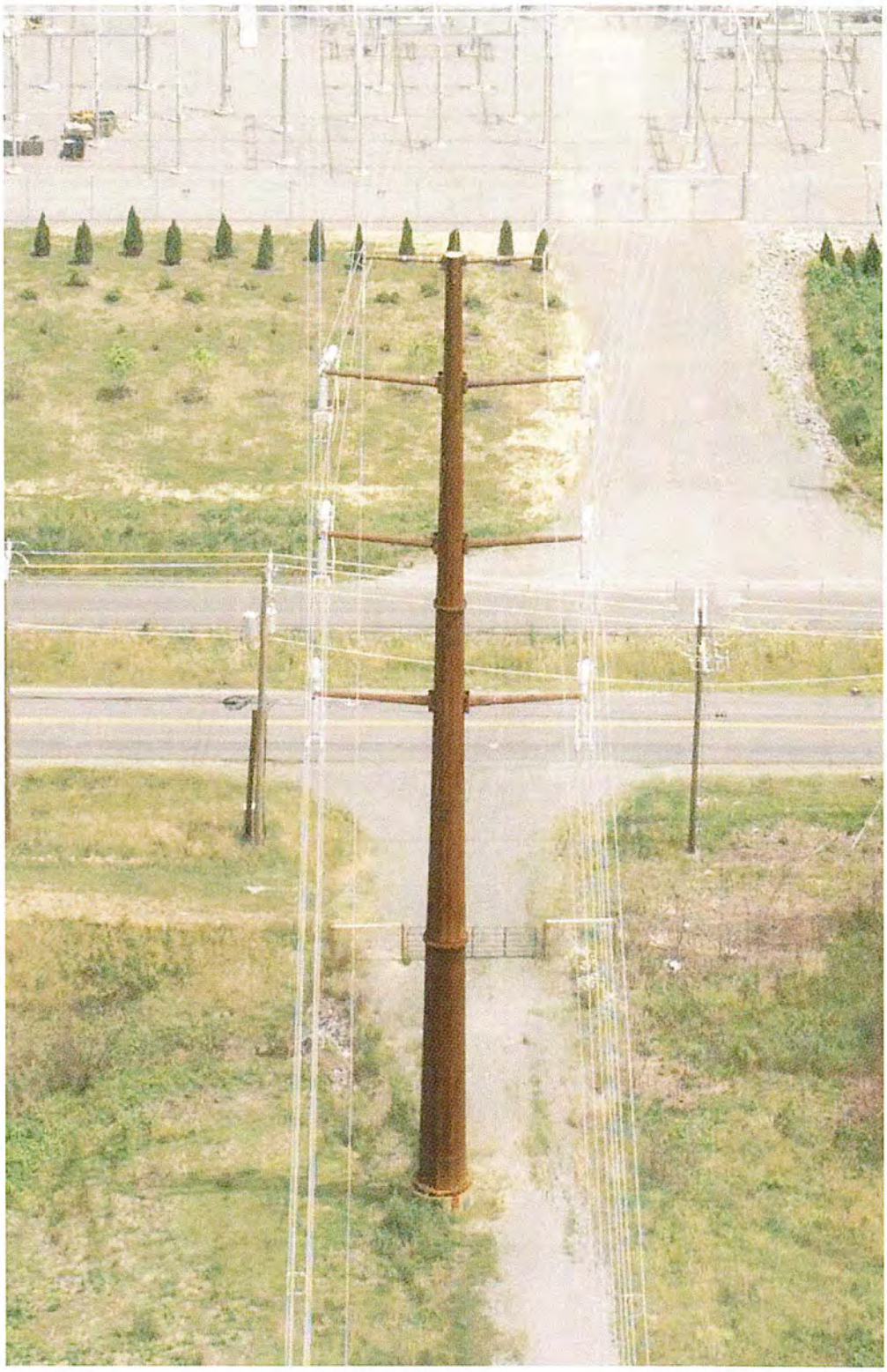
Existing Structure Type:
500 kV Single Circuit H-Frame

Dominion Energy®

Existing Structure Type:
500 kV Single Circuit Backbone



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



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

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

Dominion Energy

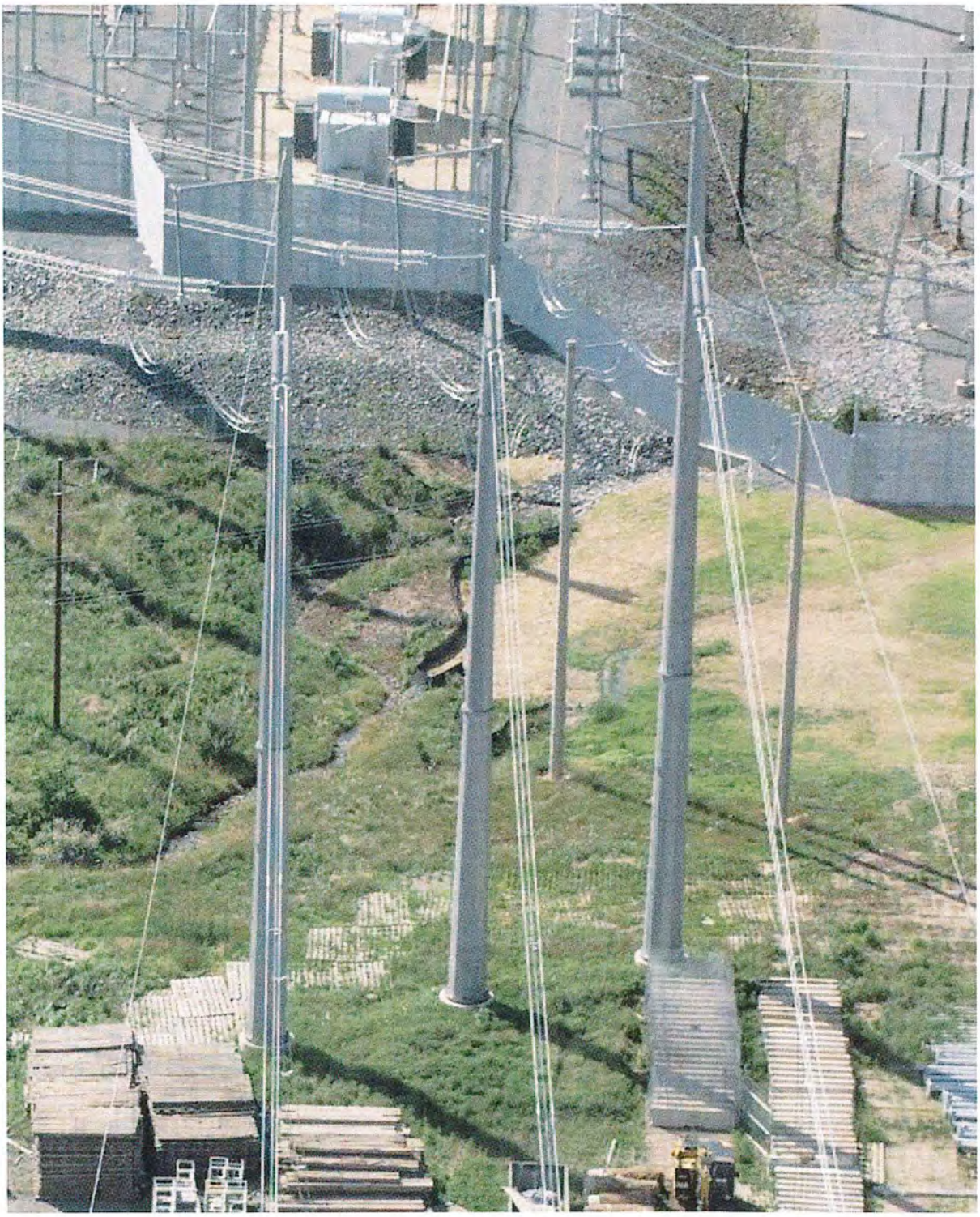
Proposed Structure Type:
230 kV Single Circuit Steel Monopole (Double Deadend)

Dominion Energy

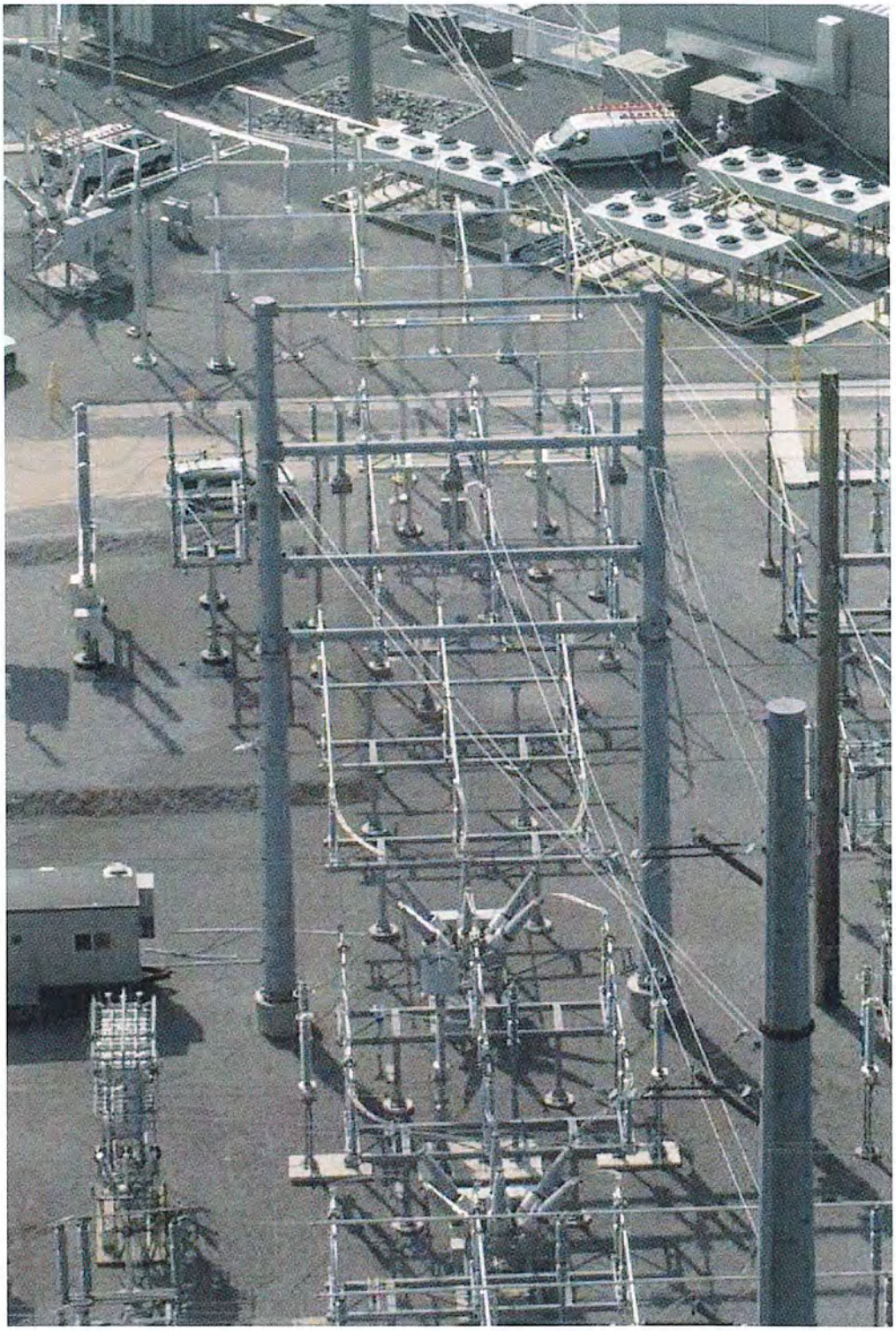
Proposed Structure Type:
230 kV Single Circuit Steel 3-Pole (Double Deadend)

Proposed Structure Type:
230 kV Double Circuit Steel 3-Pole (Double Deadend)

Dominion Energy



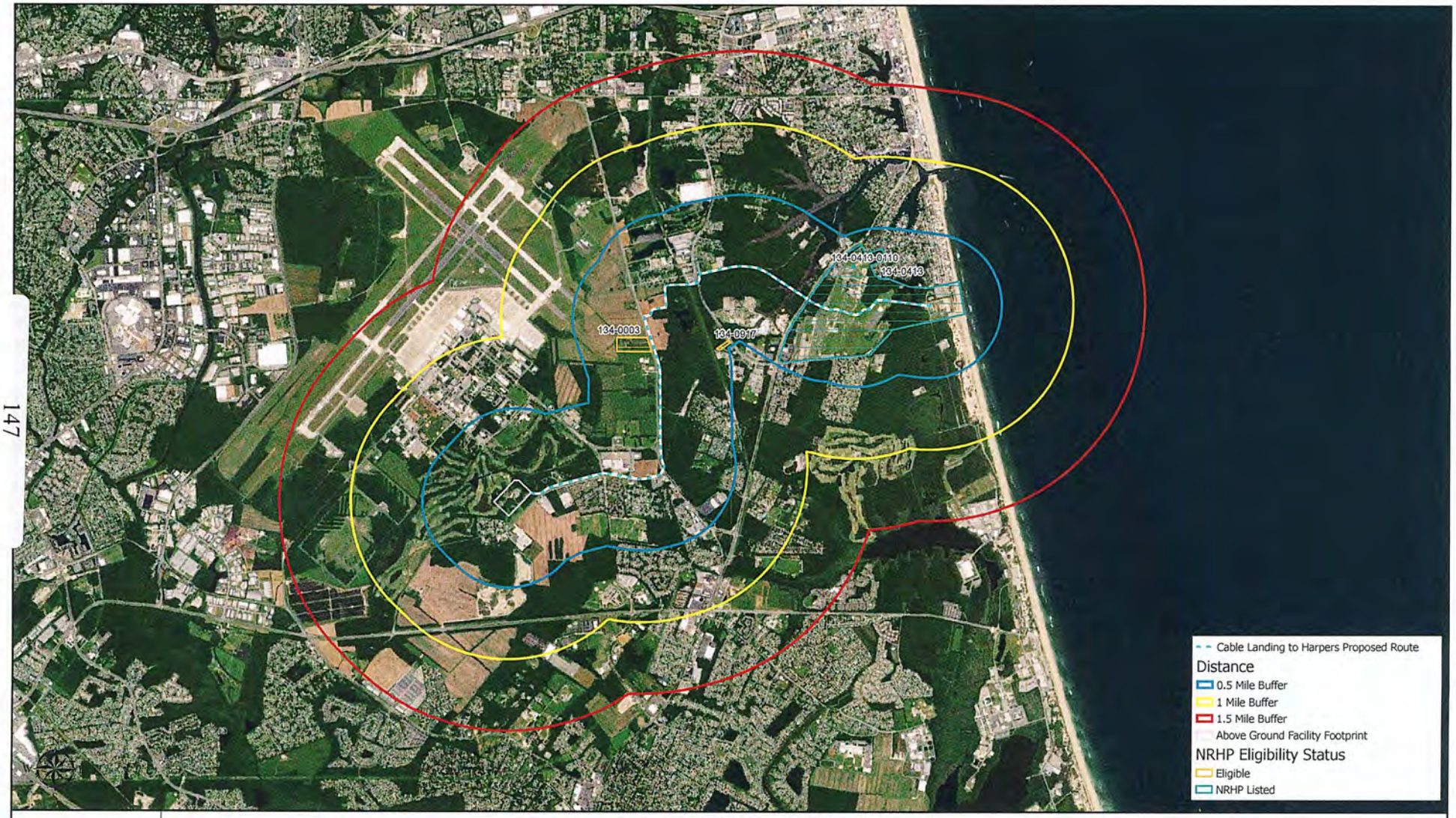
Proposed Structure Type:
500 kV Single Circuit Steel 3-Pole (Suspension)
***structures will be weathering steel**



Proposed Structure Type:
500 kV Single Circuit Backbone

Attachment II.B.6.b.ix

PHOTOSIMULATIONS – CLH
ATTACHMENT II.B.6.c.1



Attachment II.B.6.c.1 - Figure 1
Architectural Resources: Cable Landing to Harpers Proposed Route
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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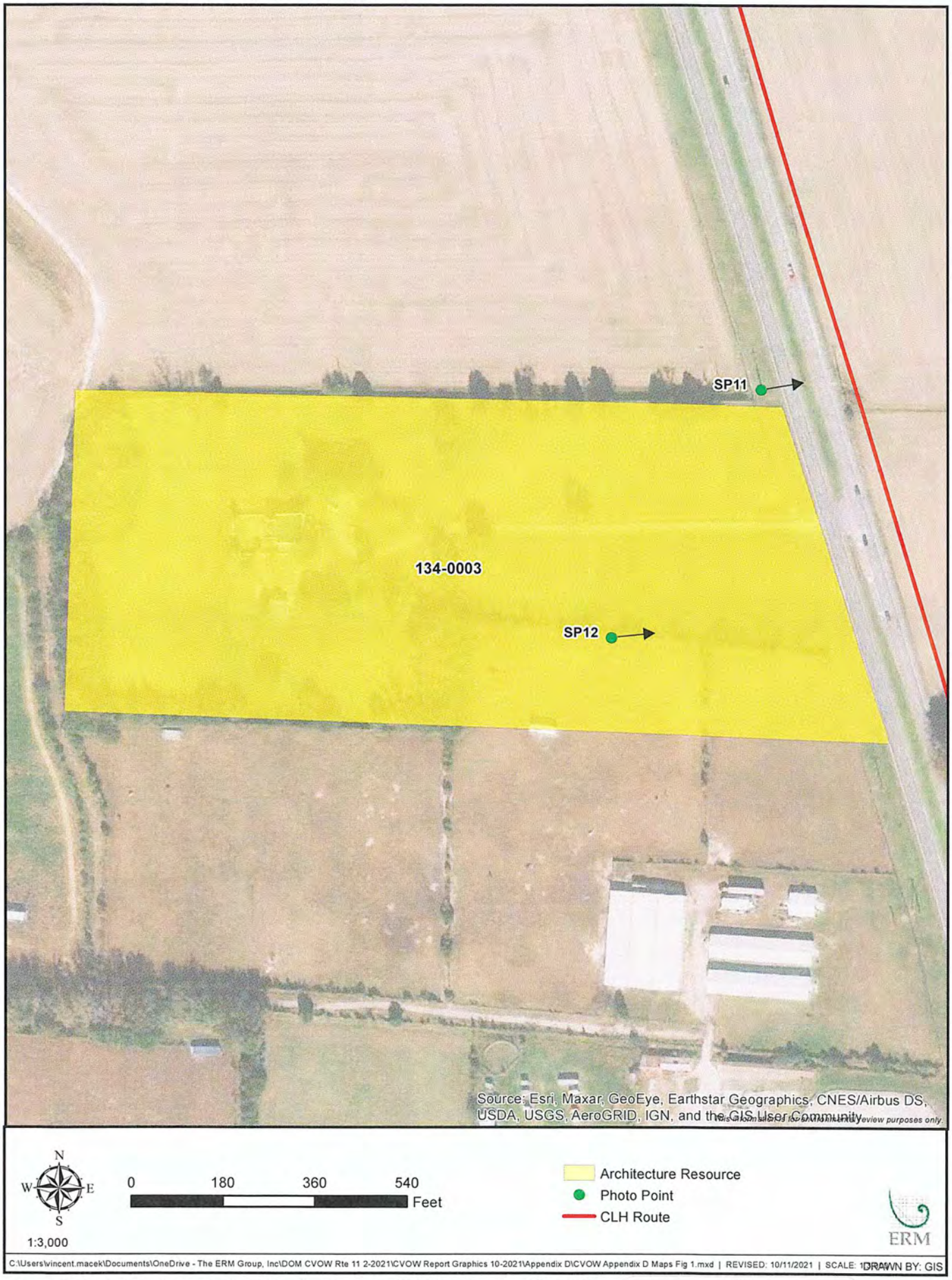


Figure 2: Aerial photograph depicting land use and photo view for 134-0003.

Attachment II.B.6.c.1: Photosimulations

Existing View

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	413278E 4074652N
View Direction:	90 degrees
Viewpoint Elevation:	29 feet
Distance to Route:	155 feet
Horizontal Field of View:	

Date of Photography:	5th April 2021 10:52
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

Figure 3:
Viewpoint SP11 - CLH Route
On grass next to Oceana Boulevard by sign 134-0003

Coastal Virginia Offshore Wind

Attachment II.B.6.c.1: Photosimulations

Yellow line shows approximate position of proposed underground cable route (a dashed line means its location is behind foreground features)

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	413278E 4074652N
View Direction:	90 degrees
Viewpoint Elevation:	29 feet
Distance to Route:	155 feet
Horizontal Field of View:	

Date of Photography:	5th April 2021 10:52
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

Figure 4:
Viewpoint SP11 - CLH Route
On grass next to Oceana Boulevard by sign 134-0003

Coastal Virginia Offshore Wind

Attachment II.B.6.c.1: Photosimulations

Existing View

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	410163E 4074606N
View Direction:	70 degrees
Viewpoint Elevation:	26 feet
Distance to Route:	541 feet
Horizontal Field of View:	

Date of Photography:	5th April 2021 10:52
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

VIEWPOINT CONTEXT

Figure 5:
Viewpoint SP12 - CLH Route

On grass to southeast of 134-0003

Coastal Virginia Offshore Wind

Attachment II.B.6.c.1: Photosimulations

Yellow line shows approximate position of proposed underground cable route (a dashed line means its location is behind foreground features)

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	410163E 4074606N
View Direction:	70 degrees
Viewpoint Elevation:	26 feet
Distance to Route:	541 feet
Horizontal Field of View:	

Date of Photography:	5th April 2021 10:52
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

Figure 6:
Viewpoint SP12 - CLH Route

On grass to southeast of 134-0003

Coastal Virginia Offshore Wind

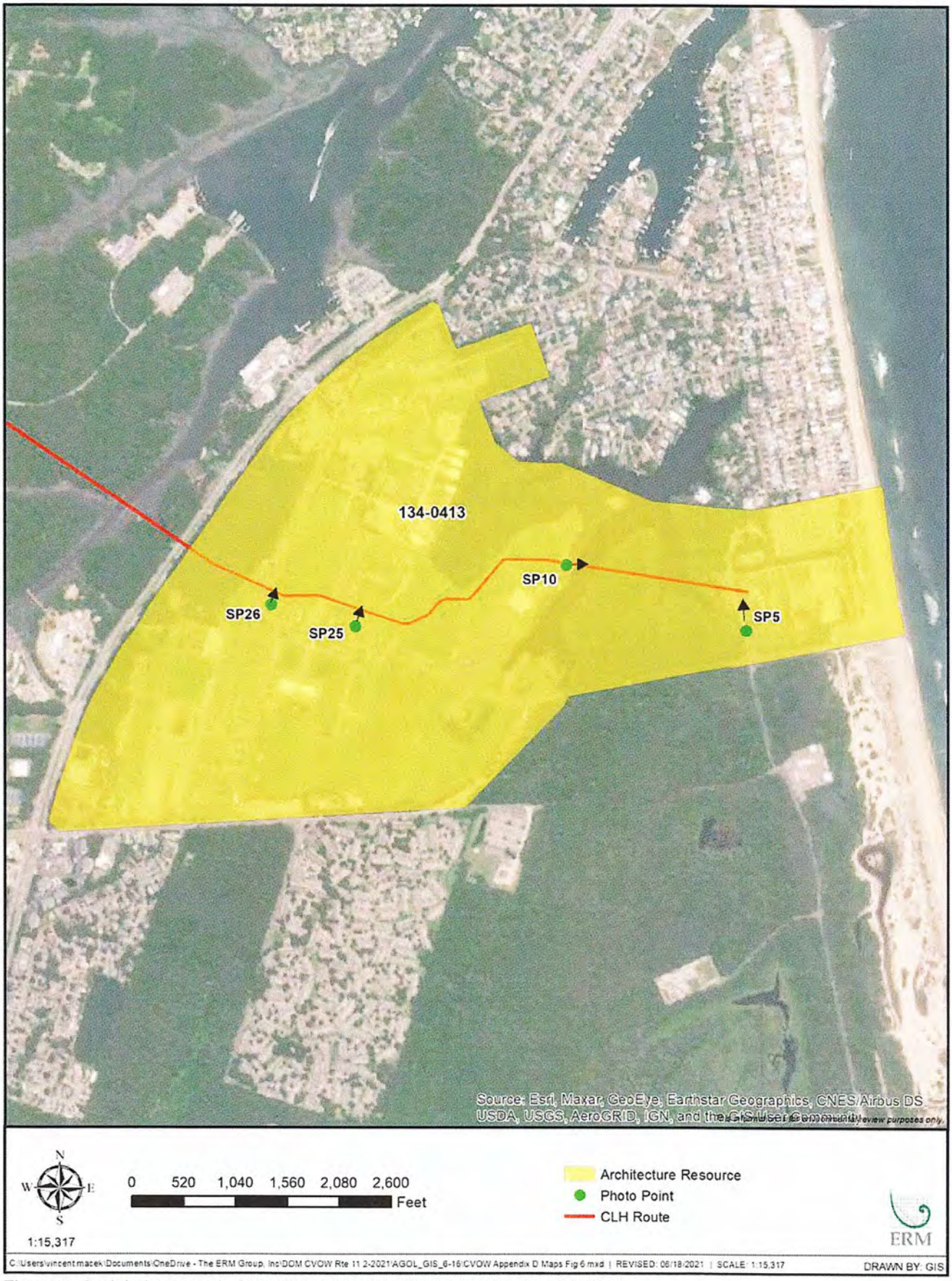


Figure 7: Aerial photograph depicting land use and photo view for 134-0413.

Attachment II.B.6.c.1: Photosimulations

Existing view

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	413436E 4074902N
View Direction:	318 degrees
Viewpoint Elevation:	13 feet
Distance to Route:	136 feet
Horizontal Field of View:	90 degrees

Date of Photography:	31st March 2021 11:56
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

Figure 8:
Viewpoint SP5 - CLH Route

On Regulus Road northwest of 134-0413

Coastal Virginia Offshore Wind

Attachment II.B.6.c.1: Photosimulations

Yellow line shows approximate position of proposed underground cable route (a dashed line means its location is behind foreground features)

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	413436E 4074902N
View Direction:	318 degrees
Viewpoint Elevation:	13 feet
Distance to Route:	136 feet
Horizontal Field of View:	90 degrees

Date of Photography:	31st March 2021 11:56
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

Figure 9:
Viewpoint SP5 - CLH Route

On Regulus Road northwest of 134-0413

Coastal Virginia Offshore Wind

Attachment II.B.6.c.1: Photosimulations

Existing View

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	413028E 4075014N
View Direction:	110 degrees
Viewpoint Elevation:	10 feet
Distance to Route:	35 feet
Horizontal Field of View:	

Date of Photography:	30th March 2021 10:59
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

VIEWPOINT CONTEXT

Figure 10:
Viewpoint SP10 - CLH Route

Parking lot on end of Lake Road 134-0413

Coastal Virginia Offshore Wind

Attachment II.B.6.c.1: Photosimulations

Yellow line shows approximate position of proposed underground cable route (a dashed line means its location is behind foreground features)

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	413028E 4075014N
View Direction:	110 degrees
Viewpoint Elevation:	10 feet
Distance to Route:	35 feet
Horizontal Field of View:	

Date of Photography:	30th March 2021 10:59
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

VIEWPOINT CONTEXT

Figure 11:
Viewpoint SP10 - CLH Route

Parking lot on end of Lake Road 134-0413

Coastal Virginia Offshore Wind

Attachment II.B.6.c.1: Photosimulations

Existing view

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	412495E 4074861N
View Direction:	335 degrees
Viewpoint Elevation:	16 feet
Distance to Route:	140 feet
Horizontal Field of View:	

Date of Photography:	31st March 2021 14:25
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

Figure 12:
Viewpoint SP25 - CLH Route
Jefferson Avenue between buildings 57 and 83
134-0413

Coastal Virginia Offshore Wind

Attachment II.B.6.c.1: Photosimulations

Yellow line shows approximate position of proposed underground cable route (a dashed line means its location is behind foreground features)

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	412495E 4074861N
View Direction:	335 degrees
Viewpoint Elevation:	16 feet
Distance to Route:	140 feet
Horizontal Field of View:	

Date of Photography:	31st March 2021 14:25
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

Figure 13:
Viewpoint SP25 - CLH Route
Jefferson Avenue between buildings 57 and 83
134-0413

Coastal Virginia Offshore Wind

Attachment II.B.6.c.1: Photosimulations

Existing View

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	412495E 4074861N
View Direction:	347 degrees
Viewpoint Elevation:	13 feet
Distance to Route:	116 feet
Horizontal Field of View:	

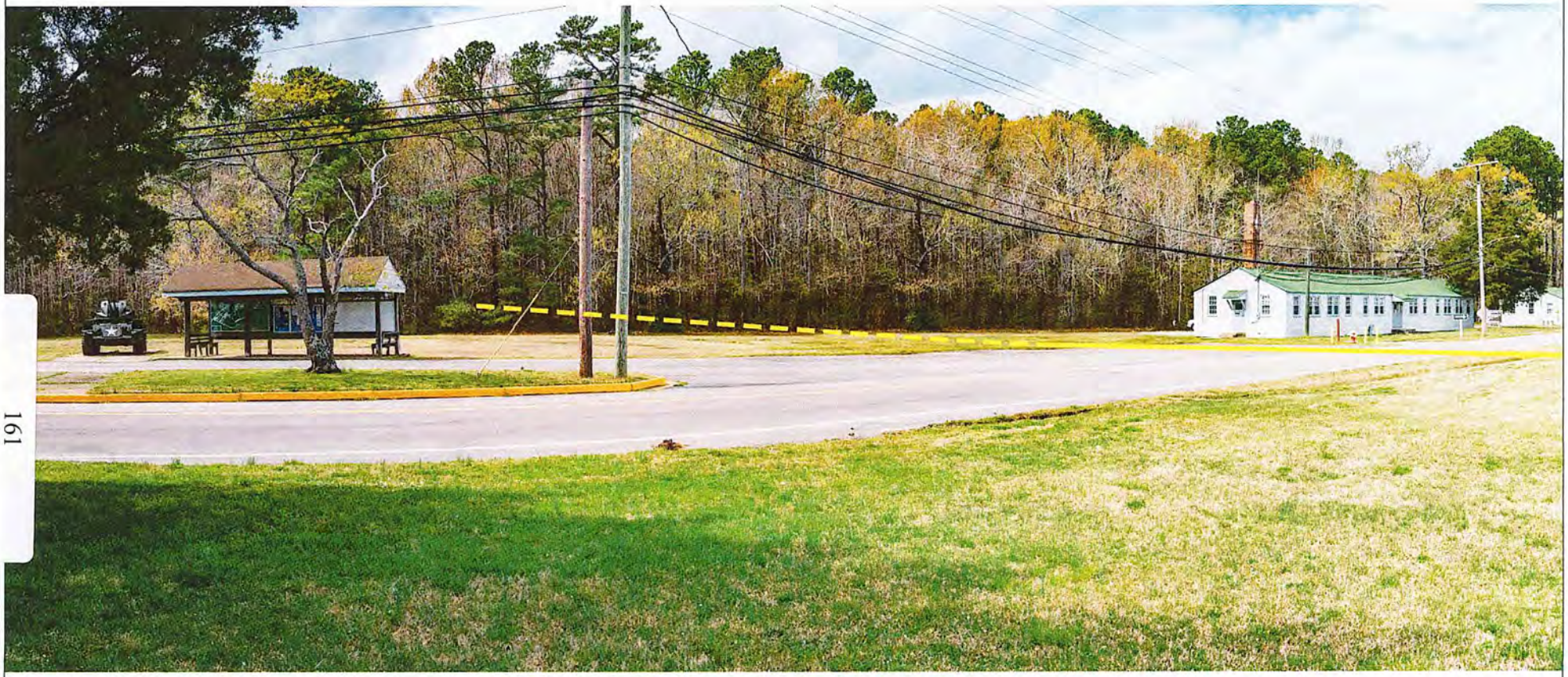
Date of Photography:	31st March 2021 15:03
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

VIEWPOINT CONTEXT

Figure 14:
Viewpoint SP26 - CLH Route

In field to west of church 134-0413

Coastal Virginia Offshore Wind



Attachment II.B.6.c.1: Photosimulations

Yellow line shows approximate position of proposed underground cable route (a dashed line means its location is behind foreground features)

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	412495E 4074861N
View Direction:	347 degrees
Viewpoint Elevation:	13 feet
Distance to Route:	116 feet
Horizontal Field of View:	

Date of Photography:	31st March 2021 15:03
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

Figure 15:
Viewpoint SP26 - CLH Route

In field to west of church 134-0413

Coastal Virginia Offshore Wind

Figure 16: Aerial photograph depicting land use and photo view for 134-0413-0110.

Attachment II.B.6.c.1: Photosimulations

Existing view

Viewpoint Location UTM Zone 18N:	412602E 4075392N
View Direction:	180 degrees
Viewpoint Elevation:	16 feet
Distance to Route:	1509 feet
Horizontal Field of View:	90 degrees

Date of Photography:	31st March 2021 08:02
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

Figure 17:
Viewpoint SP1 - CLH Route

On Warehouse Road south of 134-0413-0110

Coastal Virginia Offshore Wind

Attachment II.B.6.c.1: Photosimulations

Yellow line shows approximate position of proposed underground cable route (a dashed line means its location is behind foreground features)

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	412602E 4075392N
View Direction:	180 degrees
Viewpoint Elevation:	16 feet
Distance to Route:	1509 feet
Horizontal Field of View:	90 degrees

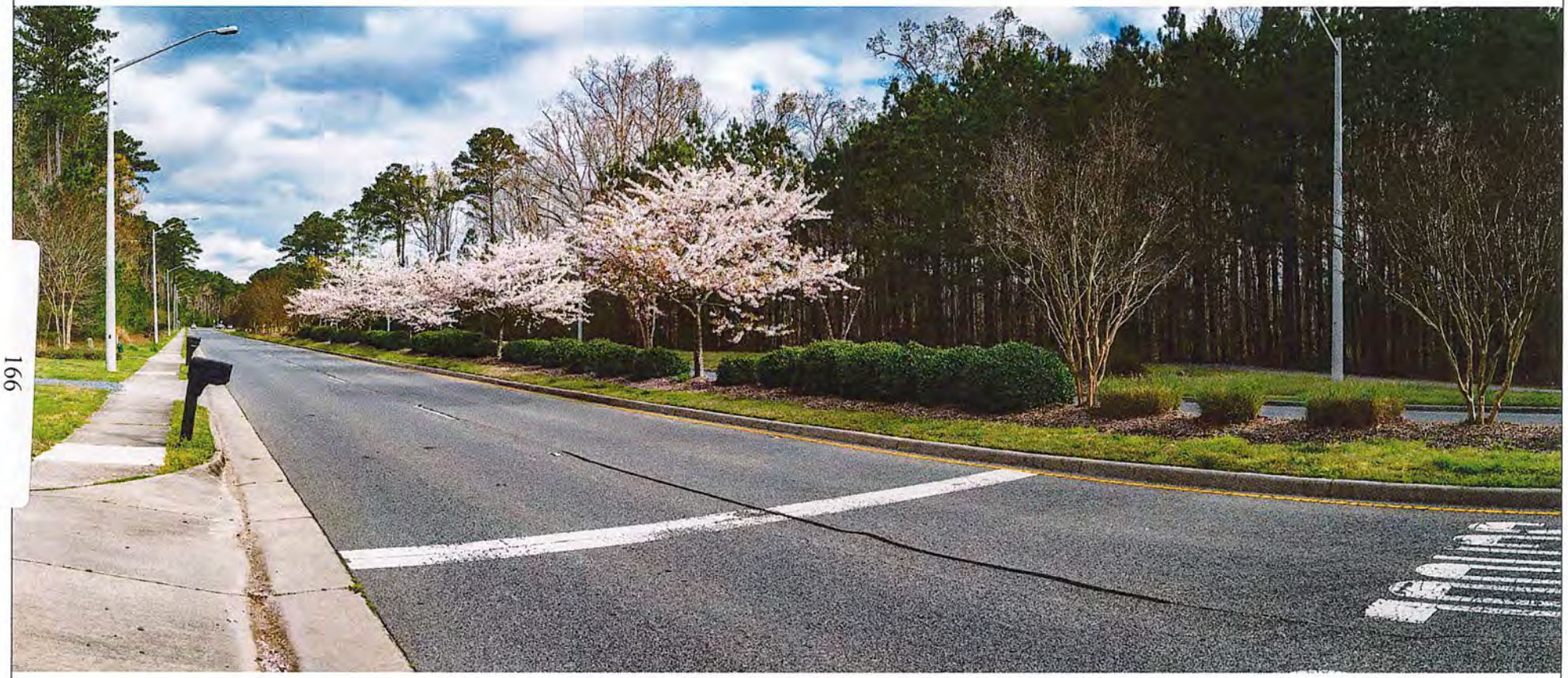
Date of Photography:	31st March 2021 08:02
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

Figure 18:
Viewpoint SP1 - CLH Route

On Warehouse Road south of 134-0413-0110

Coastal Virginia Offshore Wind

Figure 19: Aerial photograph depicting land use and photo view for 134-0917.



Attachment II.B.6.c.1: Photosimulations

Existing view

Dominion Energy® ERM

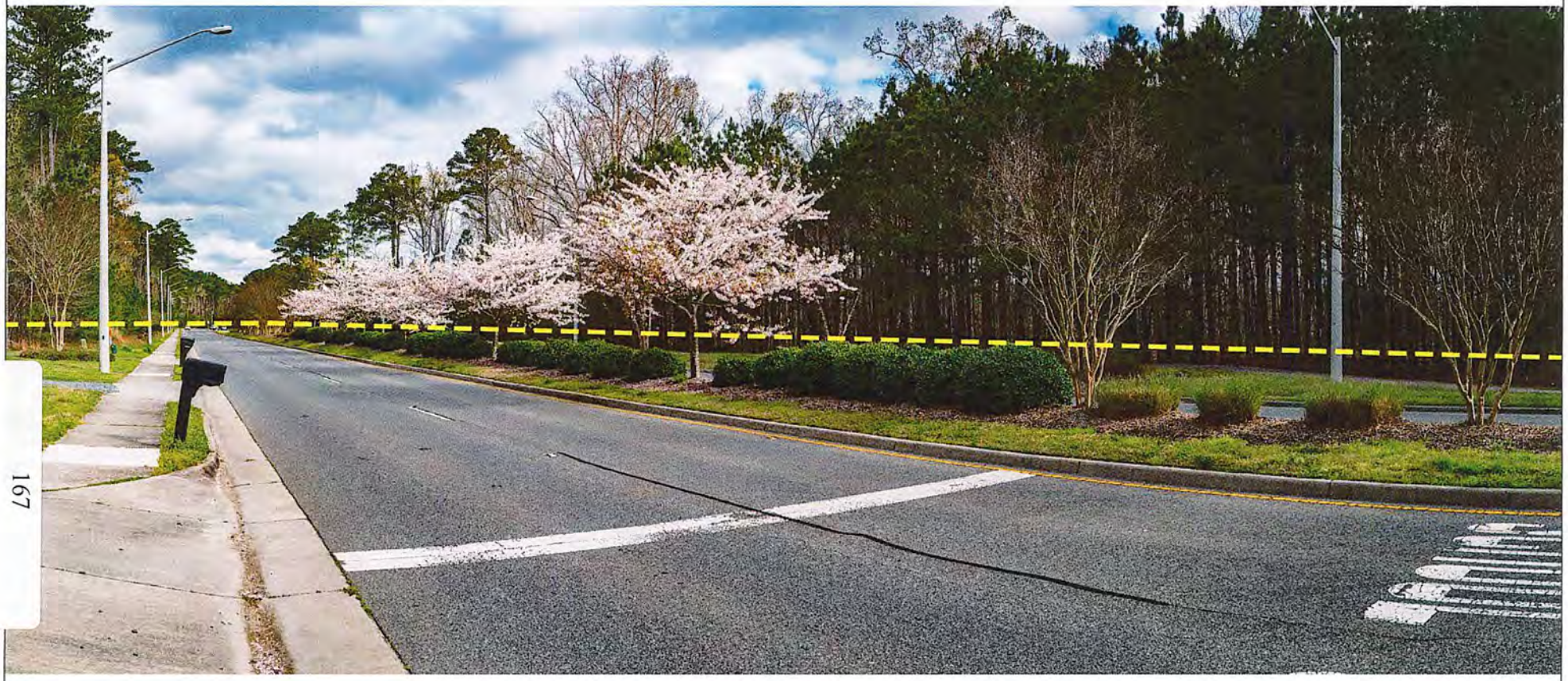
Viewpoint Location UTM Zone 18N:	411190E 4074638N
View Direction:	360 degrees
Viewpoint Elevation:	16 feet
Distance to Route:	2341 feet
Horizontal Field of View:	

Date of Photography:	2nd April 2021 09:10
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

Figure 20:
Viewpoint SP13 - CLH Route

On Birdneck Road northwest of 134-0917

Coastal Virginia Offshore Wind



Attachment II.B.6.c.1: Photosimulations

Yellow line shows approximate position of proposed underground cable route (a dashed line means its location is behind foreground features)

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	411190E 4074638N
View Direction:	360 degrees
Viewpoint Elevation:	16 feet
Distance to Route:	2341 feet
Horizontal Field of View:	

Date of Photography:	2nd April 2021 09:10
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

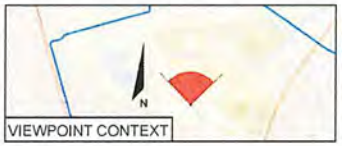
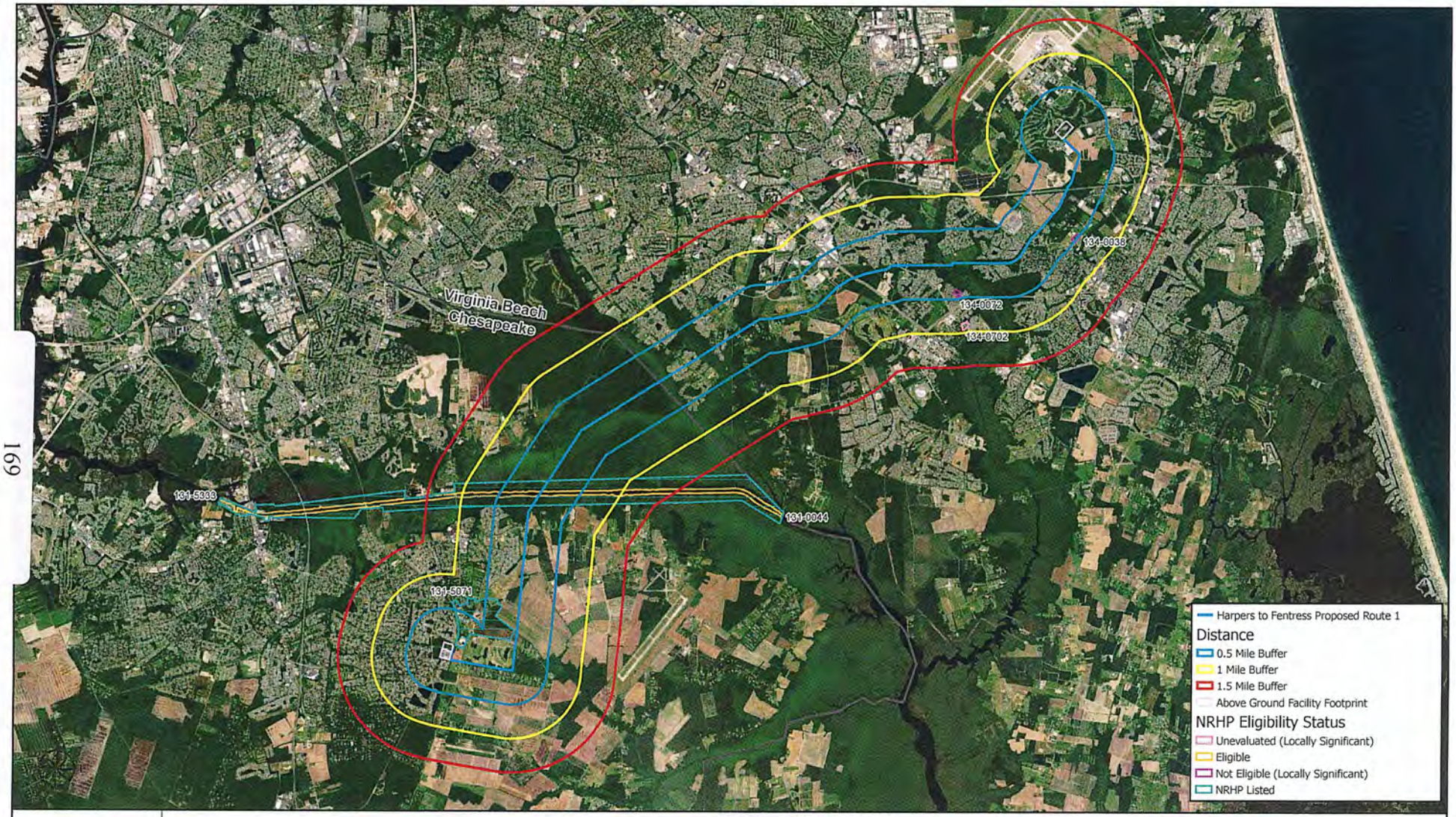


Figure 21
Viewpoint SP13 - CLH Route

On Birdneck Road northwest of 134-0917

Coastal Virginia Offshore Wind

PHOTOSIMULATIONS – HF ROUTE 1
ATTACHMENT II.B.6.c.2



Attachment II.B.6.c.2 - Figure 1
Architectural Resources: Harpers to Fentress Proposed Route 1
Coastal Virginia Offshore Wind Commercial Project - Virginia Facilities
Dominion Energy Virginia
Virginia Beach and Chesapeake, VA

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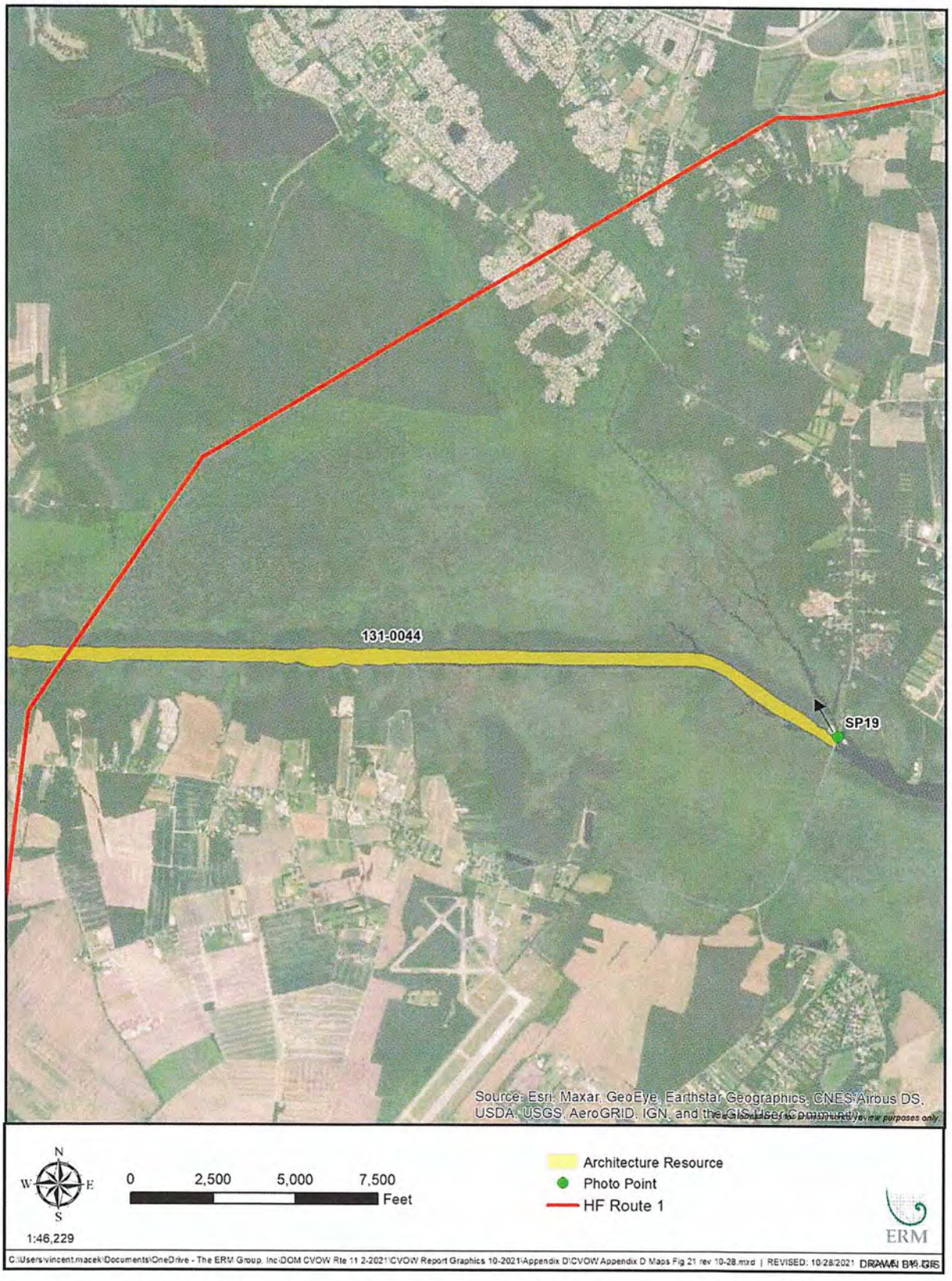


Figure 2. Aerial photograph depicting land use and photo view for 131-0044.

Attachment II.B.6.c.2: Photosimulations

Existing View

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	401735E 4064096N
View Direction:	336 degrees
Viewpoint Elevation:	10 feet
Distance to Route:	2915 feet
Horizontal Field of View:	90 degrees

Date of Photography:	6th April 2021 13:42
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

VIEWPOINT CONTEXT

Figure 3:
Viewpoint SP19 - HF Route 1
On Mt. Pleasant Road/North Landing Road bridge- 131-0044 and 131-5333

Virginia Offshore Wind

Attachment II.B.6.c.2: Photosimulations

Transmission Line-over-Photo Image - No elements of the proposed development will be visible from this location due to foreground screening

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	401735E 4064096N
View Direction:	336 degrees
Viewpoint Elevation:	10 feet
Distance to Route:	2915 feet
Horizontal Field of View:	90 degrees

Date of Photography:	6th April 2021 13:42
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

VIEWPOINT CONTEXT

Figure 4:
Viewpoint SP19 - HF Route 1
On Mt. Pleasant Road/North Landing Road bridge- 131-0044 and 131-5333

Virginia Offshore Wind

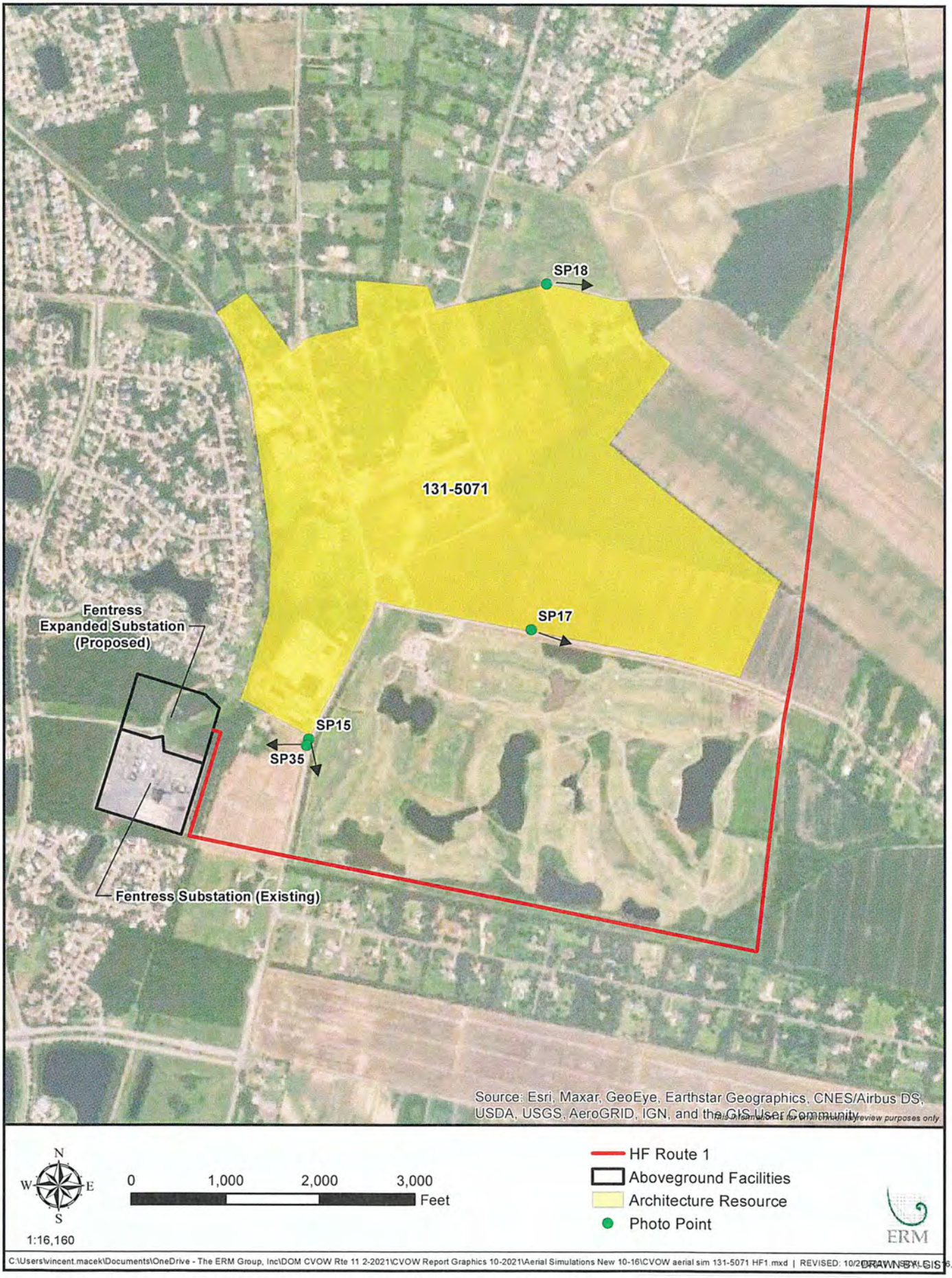


Figure 5: Aerial photograph depicting land use and photo view for 131-5071.

Attachment II.B.6.c.2: Photosimulations

Existing View

Dominion Energy ERM

Viewpoint Location UTM Zone 18N:	394102E 4061222N
View Direction:	90 degrees
Viewpoint Elevation:	20 feet
Distance to Route:	3962 feet
Horizontal Field of View:	90 degrees

Date of Photography:	6th April 2021 10:53
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

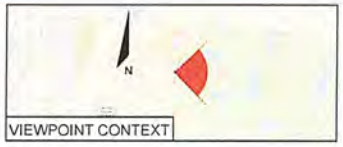


Figure 6:
Viewpoint SP15a - HF Route 1

On Centerville Turnpike east of 131-5071

Virginia Offshore Wind

Attachment II.B.6.c.2: Photosimulations

Photomontage showing proposed development - HF Route 1

Viewpoint Location UTM Zone 18N:	394102E 4061222N
View Direction:	90 degrees
Viewpoint Elevation:	20 feet
Distance to Route:	3962 feet
Horizontal Field of View:	90 degrees

Date of Photography:	6th April 2021 10:53
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

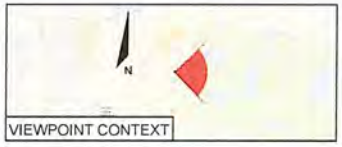


Figure 7:
Viewpoint SP15a - HF Route 1

On Centerville Turnpike east of 131-5071

Virginia Offshore Wind

Attachment II.B.6.c.2: Photosimulations

Existing View

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	394102E 4061222N
View Direction:	195 degrees
Viewpoint Elevation:	20 feet
Distance to Route:	856 feet
Horizontal Field of View:	90 degrees

Date of Photography:	6th April 2021 10:53
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

Figure 8:
Viewpoint SP15b - HF Route 1

On Centerville Turnpike south of 131-5071

Virginia Offshore Wind

Attachment II.B.6.c.2: Photosimulations

Photomontage showing proposed development - HF Route 1

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	394102E 4061222N
View Direction:	195 degrees
Viewpoint Elevation:	20 feet
Distance to Route:	856 feet
Horizontal Field of View:	90 degrees

Date of Photography:	6th April 2021 10:53
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

VIEWPOINT CONTEXT

Figure 9:
Viewpoint SP15b - HF Route 1

On Centerville Turnpike south of 131-5071

Virginia Offshore Wind

Attachment II.B.6.c.2: Photosimulations

Existing View

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	394378E 4061514N
View Direction:	140 degrees
Viewpoint Elevation:	13 feet
Distance to Route:	2255 feet
Horizontal Field of View:	90 degrees

Date of Photography:	6th April 2021 11:44
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

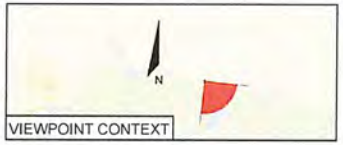


Figure 10:
Viewpoint SP17 - HF Route 1

On Whittamore Road south of 131-5071

Virginia Offshore Wind

Attachment II.B.6.c.2: Photosimulations

Photomontage showing proposed development - HF Route 1

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	394378E 4061514N
View Direction:	140 degrees
Viewpoint Elevation:	13 feet
Distance to Route:	2255 feet
Horizontal Field of View:	90 degrees

Date of Photography:	6th April 2021 11:44
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

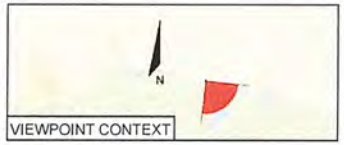


Figure 11:
Viewpoint SP17 - HF Route 1

On Whittamore Road south of 131-5071

Virginia Offshore Wind

Attachment II.B.6.c.2: Photosimulations

Existing View

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	394749E 4062435N
View Direction:	66 degrees
Viewpoint Elevation:	23 feet
Distance to Route:	2409 feet
Horizontal Field of View:	90 degrees

Date of Photography:	6th April 2021 14:08
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

VIEWPOINT CONTEXT

Figure 12:
Viewpoint SP18 - HF Route 1

On Blue Ridge Road east of 131-5071

Virginia Offshore Wind

Attachment II.B.6.c.2: Photosimulations

Photomontage showing proposed development - HF Route 1

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	394749E 4062435N
View Direction:	66 degrees
Viewpoint Elevation:	23 feet
Distance to Route:	2409 feet
Horizontal Field of View:	90 degrees

Date of Photography:	6th April 2021 14:08
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

VIEWPOINT CONTEXT

Figure 13:
Viewpoint SP18 - HF Route 1

On Blue Ridge Road east of 131-5071

Virginia Offshore Wind

Attachment II.B.6.c.2: Photosimulations

Existing View

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	394107E 4061242N
View Direction:	266 degrees
Viewpoint Elevation:	19 feet
Distance to Route:	685 feet
Horizontal Field of View:	90 degrees

Date of Photography:	27th August 2021 2:30pm
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

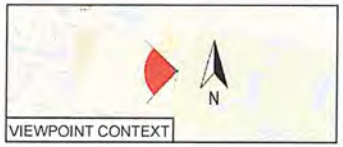


Figure 14:
Viewpoint SP35 - HF Route 1

On Centerville Turnpike south of 131-5071

Virginia Offshore Wind

Attachment II.B.6.c.2: Photosimulations

Photomontage showing proposed development - HF Route 1

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	394107E 4061242N
View Direction:	266 degrees
Viewpoint Elevation:	19 feet
Distance to Route:	685 feet
Horizontal Field of View:	90 degrees

Date of Photography:	27th August 2021 2:30pm
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

VIEWPOINT CONTEXT

Figure 15:
Viewpoint SP35 - HF Route 1

On Centerville Turnpike south of 131-5071

Virginia Offshore Wind

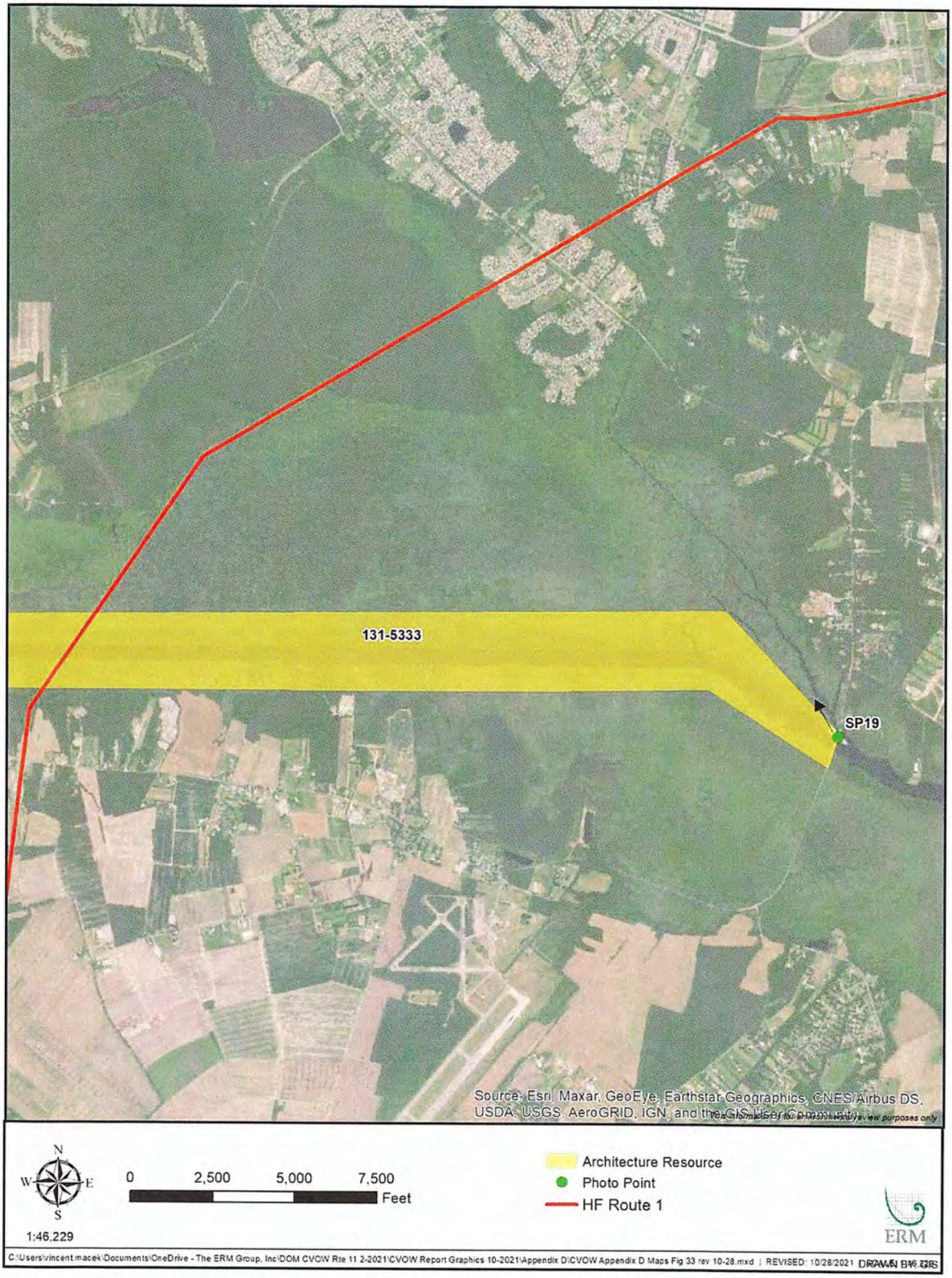


Figure 2. Aerial photograph depicting land use and photo view for 131-5333.

Attachment II.B.6.c.2: Photosimulations

Existing View

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	401735E 4064096N
View Direction:	336 degrees
Viewpoint Elevation:	10 feet
Distance to Route:	2915 feet
Horizontal Field of View:	90 degrees

Date of Photography:	6th April 2021 13:42
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

VIEWPOINT CONTEXT

Figure 17:
Viewpoint SP19 - HF Route 1
On Mt. Pleasant Road/North Landing Road bridge- 131-0044 and 131-5333

Virginia Offshore Wind

Attachment II.B.6.c.2: Photosimulations

Transmission Line-over-Photo Image - No elements of the proposed development will be visible from this location due to foreground screening

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	401735E 4064096N
View Direction:	336 degrees
Viewpoint Elevation:	10 feet
Distance to Route:	2915 feet
Horizontal Field of View:	90 degrees

Date of Photography:	6th April 2021 13:42
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

Figure 18:
Viewpoint SP19 - HF Route 1
On Mt. Pleasant Road/North Landing Road bridge- 131-0044 and 131-5333

Virginia Offshore Wind

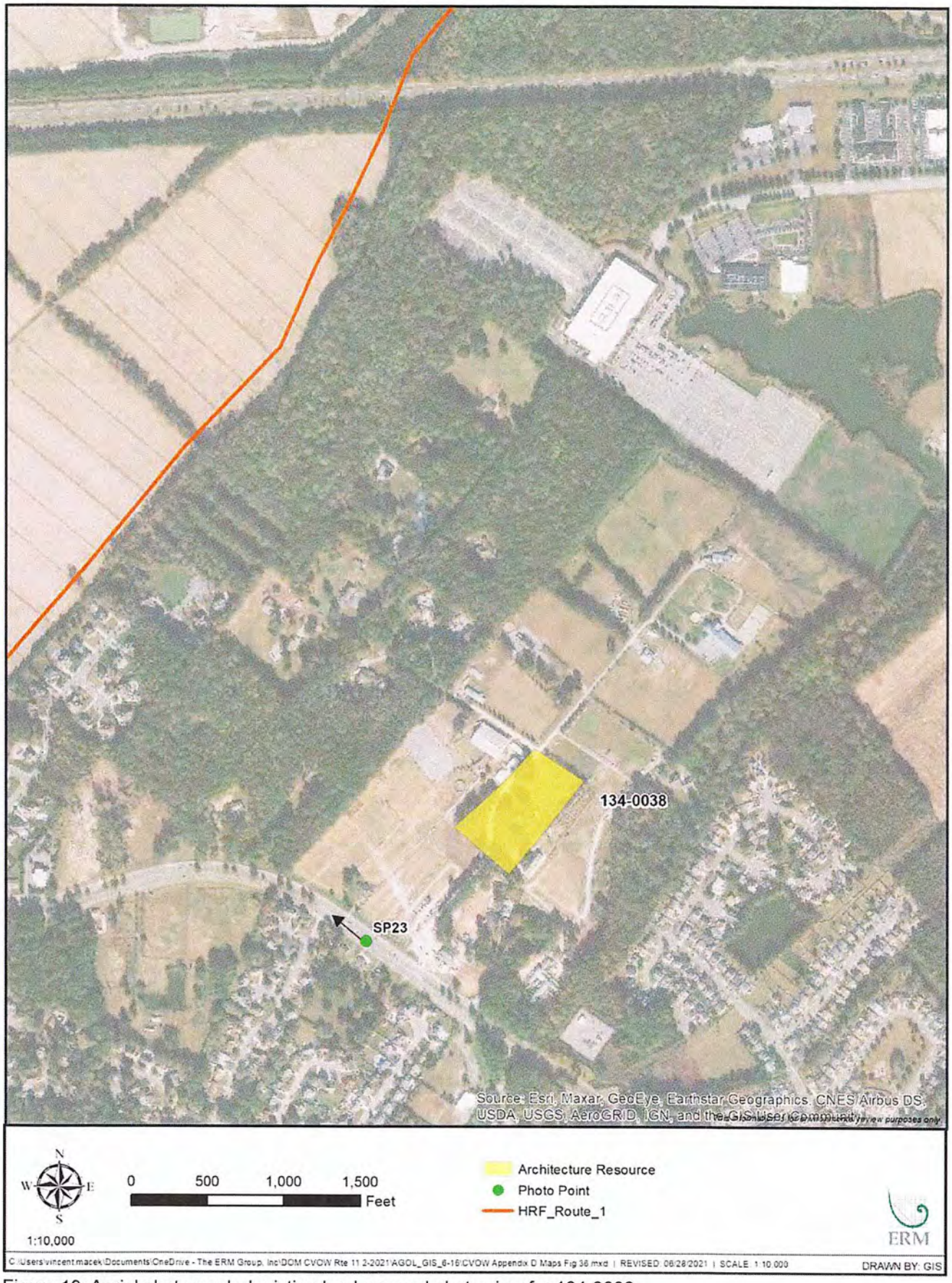


Figure 19: Aerial photograph depicting land use and photo view for 134-0038.

Attachment II.B.6.c.2: Photosimulations

Existing View

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	408678E 4070209N
View Direction:	242 degrees
Viewpoint Elevation:	16 feet
Distance to Route:	3490 feet
Horizontal Field of View:	90 degrees

Date of Photography:	2nd April 2021 10:03
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

VIEWPOINT CONTEXT

Figure 20:
Viewpoint SP23a - HF Route 1

On London Bridge Road southwest of 134-0038

Virginia Offshore Wind

Attachment II.B.6.c.2: Photosimulations

Transmission Line-over-Photo Image - No elements of the proposed development will be visible from this location due to foreground screening

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	408678E 4070209N
View Direction:	242 degrees
Viewpoint Elevation:	16 feet
Distance to Route:	3490 feet
Horizontal Field of View:	90 degrees

Date of Photography:	2nd April 2021 10:03
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

VIEWPOINT CONTEXT

Figure 21:
Viewpoint SP23a - HF Route 1

On London Bridge Road southwest of 134-0038

Virginia Offshore Wind

Attachment II.B.6.c.2: Photosimulations

Existing View

Dominion Energy® ERM

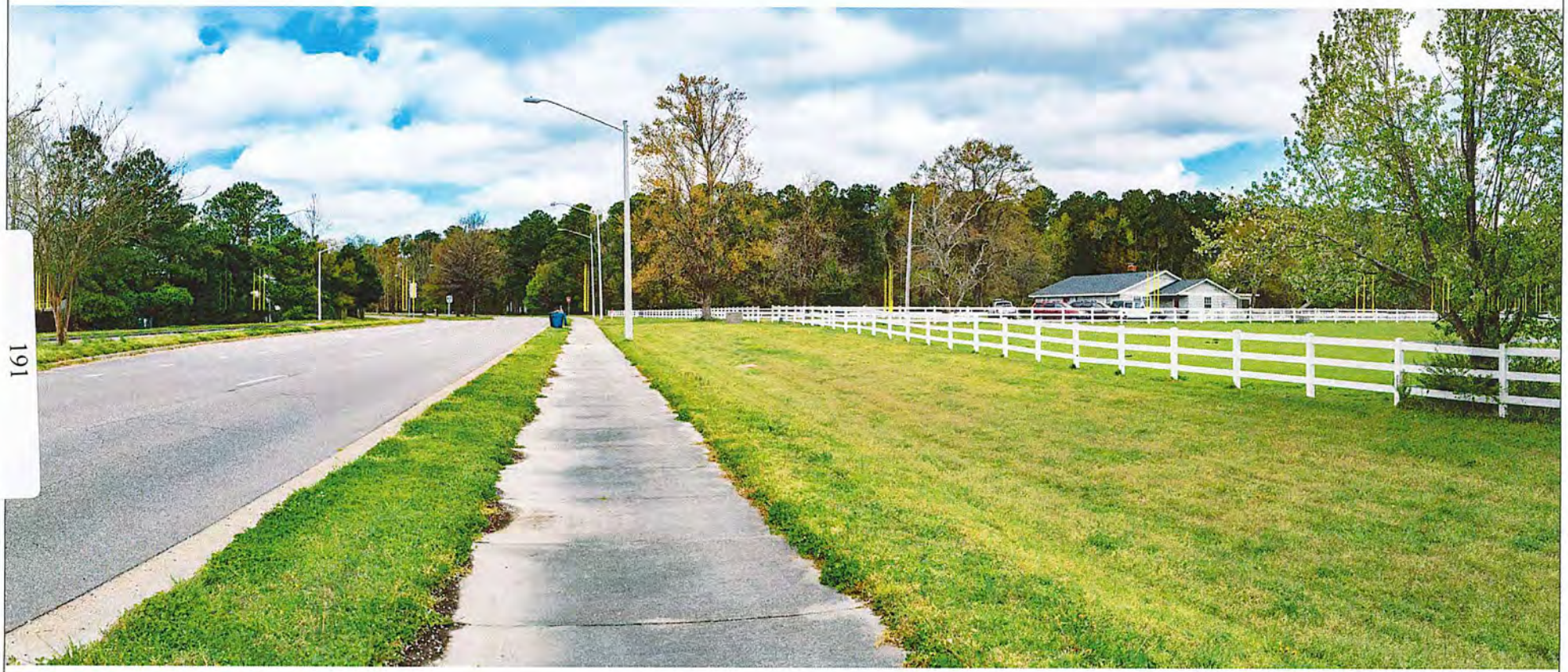
Viewpoint Location UTM Zone 18N:	408678E 4070209N
View Direction:	317 degrees
Viewpoint Elevation:	16 feet
Distance to Route:	3490 feet
Horizontal Field of View:	90 degrees

Date of Photography:	2nd April 2021 10:03
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

Figure 22:
Viewpoint SP23b - HF Route 1

On London Bridge Road southwest of 134-0038

Virginia Offshore Wind



Attachment II.B.6.c.2: Photosimulations

Transmission Line-over-Photo Image - No elements of the proposed development will be visible from this location due to foreground screening

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	408678E 4070209N
View Direction:	317 degrees
Viewpoint Elevation:	16 feet
Distance to Route:	3490 feet
Horizontal Field of View:	90 degrees

Date of Photography:	2nd April 2021 10:03
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

Figure 23:
Viewpoint SP23b - HF Route 1

On London Bridge Road southwest of 134-0038

Virginia Offshore Wind

Figure 24: Aerial photograph depicting land use and photo view for 134-0072.

Attachment II.B.6.c.2: Photosimulations

Existing View

Dominion Energy

ERM

Viewpoint Location UTM Zone 18N:	405960E 4069349N
View Direction:	5 degrees
Viewpoint Elevation:	16 feet
Distance to Route:	1587 feet
Horizontal Field of View:	90 degrees

Date of Photography:	2nd April 2021 11:17am
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

VIEWPOINT CONTEXT

Figure 25:
Viewpoint SP24 - HF Route 1

On Hammer Stone Court north of 134-0072

Virginia Offshore Wind

Attachment II.B.6.c.2: Photosimulations

Transmission Line-over-Photo Image - No elements of the proposed development will be visible from this location due to foreground screening

Viewpoint Location UTM Zone 18N:	405960E 4069349N
View Direction:	5 degrees
Viewpoint Elevation:	16 feet
Distance to Route:	1587 feet
Horizontal Field of View:	90 degrees

Date of Photography:	2nd April 2021 11:17am
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

VIEWPOINT CONTEXT

Figure 26:
Viewpoint SP24 - HF Route 1

On Hammer Stone Court north of 134-0072

Virginia Offshore Wind

Figure 27: Aerial photograph depicting land use and photo view for 134-0702.

Attachment II.B.6.c.2: Photosimulations

Existing View

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	406130E 4068784N
View Direction:	317 degrees
Viewpoint Elevation:	13 feet
Distance to Route:	4690 feet
Horizontal Field of View:	90 degrees

Date of Photography:	2nd April 2021 2:16pm
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

Figure 28:
Viewpoint SP22 - HF Route 1

On Holland Road west of 134-0702

Virginia Offshore Wind

Attachment II.B.6.c.2: Photosimulations

Transmission Line-over-Photo Image - No elements of the proposed development will be visible from this location due to foreground screening

Dominion Energy® ERM

Viewpoint Location UTM Zone 18N:	406130E 4068784N
View Direction:	317 degrees
Viewpoint Elevation:	13 feet
Distance to Route:	4690 feet
Horizontal Field of View:	90 degrees

Date of Photography:	2nd April 2021 2:16pm
Camera:	Nikon D800
Lens:	Nikkor 50mm 1.4
Camera Height:	5 feet

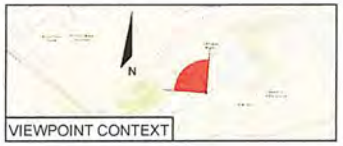


Figure 29:
Viewpoint SP22 - HF Route 1

On Holland Road west of 134-0702

Virginia Offshore Wind