COMMONWEALTH OF VIRGINIA
STATE CORPORATION COMMISSION

APPLICATION OF

VIRGINIA ELECTRIC AND POWER COMPANY — CASE NO. PUR-2024-00032

For approval and certification of electric transmission facilities: 500-230 kV Aspen Substation, 500 kV Aspen-Goose Creek Line #5002, 500 kV and 230 kV Aspen-Golden Lines #5001 and #2333, 500-230 kV Golden Substation, and Lines #2081/#2150 Loop

APPLICATION OF

VIRGINIA ELECTRIC AND POWER COMPANY — CASE NO. PUR-2024-00044

For approval and certification of electric transmission facilities: 230 kV Apollo-Twin Creeks Lines, and Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo Substations

REPORT OF M. RENAE CARTER, SENIOR HEARING EXAMINER

November 1, 2024

I recommend the Commission issue certificates of public convenience and necessity for the Apollo-Twin Creeks Project, using the route proposed in that Application and for the Aspen-Golden Project, using Route 1AA as modified for the JKLH Belmont Landbay KK Variation and the Community Church Proposed Modified Segment.[1] Given the concerns about the Updated Hybrid Proposal's route, constructability, and cost and given the lack of environmental analysis and environmental justice analysis, I do not find the Updated Hybrid Proposal meets the statutory criteria for issuance of a certificate of public convenience and necessity, nor do I find that the total public interest is best served by the Updated Hybrid Proposal.

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[1] Concerning the JKLH Belmont Landbay KK Variation, this recommendation includes flexibility to microsite the Aspen-Golden Lines' route and structures on the JKLH Belmont Property. This recommendation also incorporates the ability to work with Allan Myers to determine possible solutions for siting the Aspen-Golden Lines on Allan Myers' property without interfering with this business's future construction plans.

CASE HISTORY

Aspen-Golden Application

On March 7, 2024, Virginia Electric and Power Company ("Dominion" or "Company") filed with the State Corporation Commission ("Commission") an application ("Aspen-Golden Application") for approval and certification of electric transmission facilities in Loudoun County, Virginia. Through the Aspen-Golden Application, Dominion seeks Commission approval to do the following (collectively, "Aspen-Golden Project"):[2]

1) Construct a new 500-230 kilovolt ("kV") Aspen Substation in Loudoun County, Virginia, entirely on Company-owned property. The 500 kV source to the Aspen Substation will be created by cutting the Company's existing overhead 500 kV Brambleton-Goose Creek Line #558 into the Aspen Substation, resulting in (i) 500 kV Aspen-Brambleton Line #558 and (ii) 500 kV Aspen-Goose Creek Line #597.

2) Construct a new 500 kV single circuit transmission line extending approximately 0.2 miles from the proposed 500-230 kV Aspen Substation to the Company's existing 500 kV Goose Creek Substation in Loudoun County, Virginia, named Aspen-Goose Creek Line #5002. Aspen-Goose Creek Line #5002 will be constructed entirely on Company-owned property or within existing right-of-way ("ROW") supported by one 500 kV single circuit monopole structure and will utilize three-phase triple-bundled 1351.5 Aluminum Conductor Steel Reinforced ("ACSR") conductors with a summer transfer capability of 4,357 megavolt amperes ("MVA").

3) Construct a new approximately 9.4-mile overhead 500 kV single circuit transmission line and a new 230 kV single circuit transmission line almost entirely on new ROW. The new

[2] Ex. 4 (Aspen-Golden Application) at 2-5.

transmission lines will originate at the 500 kV and 230 kV buses of the proposed Aspen Substation and continue to the proposed 500-230 kV Golden Substation, where the new lines will terminate, resulting in (i) 500 kV Aspen-Golden Line #5001, and (ii) 230 kV Aspen-Golden Line #2333 (collectively, "Aspen-Golden Lines"). The proposed Aspen-Golden Lines will be constructed on new ROW varying between 100 and 150 feet in width to support a 5/2 configuration on a combination of dulled galvanized steel double circuit three-pole or two-pole H-frame structures (150-foot-wide ROW) or monopole or two-pole structures (100-foot-wide ROW), as well as to accommodate the routing of the lines to their respective buses in the proposed Aspen and Golden Substations. The new 500 kV line will utilize three-phase triple-bundled 1351.5 ACSR conductors with a summer transfer capability of 4,357 MVA. The new 230 kV line will utilize three-phase twin-bundled 768.2 Aluminum Conductor Steel Supported/Trapezoidal Wire/High Strength ("ACSS/TW/HS") type conductor with a summer transfer capability of 1,573 MVA.

4) Construct the new 500-230 kV Golden Substation in Loudoun County, Virginia, on property to be obtained by the Company.

5) Loop the Company's existing 230 kV overhead Paragon Park-Sterling Park Line #2081 and Paragon Park-Sterling Park Line #2150, which are currently collocated on double circuit lattice towers, into and out of the proposed Golden Substation in Loudoun County, Virginia, resulting in (i) Golden-Sterling Park #2081, (ii) Golden-Sterling Park #2150, (iii) Golden-Paragon Park #2348, and (iv) Golden-Paragon Park #2351 (collectively, "Line Loop"). To cut the lines into the proposed Golden Substation, the Company will remove one existing double circuit lattice tower (Structure #2081/123 / #2150/183) and replace it with four dulled galvanized steel single circuit monopoles (Structures #2081/122A, #2150/182A, #2348/123A, and #2351/183A). The Line Loop will be constructed entirely within the existing transmission corridor ROW or on property to be obtained by the Company for the proposed Golden Substation. Temporary infrastructure may be installed within the existing transmission corridor to keep Lines #2081 and #2150 in service during construction of the Line Loop. The Company proposes to utilize three-phase twin-bundled 768.2 ACSS/TW/HS type conductor with a summer transfer capability of 1,573 MVA for the Line Loop, the rating of which will be limited to the rating of the existing lines.

The Company requested a Commission final order approving a desired in-service target date of June 1, 2028, for the Aspen-Golden Project, and a certificate of public convenience and necessity ("CPCN") sunset date of June 1, 2029, to accommodate adjustments to the Aspen-Golden Project schedule that could require up to a 12-month delay in the targeted in-service date.[3] The Commission docketed the Aspen-Golden Application as Case No. PUR-2024-00032.

Apollo-Twin Creeks Application

On March 27, 2024, Dominion filed with the Commission an application ("Apollo-Twin Creeks Application") for approval and certification of additional electric transmission facilities

[3] *Id.* at 11-12.

in Loudoun County, Virginia. Through the Apollo-Twin Creeks Application, Dominion seeks Commission approval to do the following (collectively, "Apollo-Twin Creeks Project"):[4]

1) Construct a new double circuit overhead 230 kV transmission line on entirely new ROW by cutting the Company's existing 230 kV Edwards Ferry-Pleasant View Line #203 at Structure #203/2 (collectively, "Apollo-Twin Creeks Lines"). From the cut-in location within the existing ROW, the Apollo-Twin Creeks Lines will extend approximately 1.9 miles within a predominantly 100-foot-wide ROW,[5] interconnecting the proposed Twin Creeks, Sycolin Creek, Starlight, and Lunar Substations and terminating at the proposed Apollo Substation. The proposed Apollo-Twin Creeks Lines will be supported primarily by double circuit galvanized steel monopoles and will utilize three-phase twin-bundled 768.2 ACSS/TW/HS type conductor with a summer transfer capability of 1,573 MVA.

2) Construct five new 230-34.5 kv substations in Loudoun County, Virginia, on property to be obtained by the Company, *i.e.*, the Twin Creeks Substation, Sycolin Creek Substation, Starlight Substation, Lunar Substation, and Apollo Substation.

The Company asserted the proposed route for the Apollo-Twin Creeks Lines collocates with, or runs parallel to, the proposed Aspen-Golden Lines and existing or planned utilities for approximately 79% of the Apollo-Twin Creeks Lines' total length, specifically with the Aspen-Golden Lines for 0.9 miles (48% of the Apollo-Twin Creeks Lines' length) and with existing and proposed water and sewer lines for 0.6 miles (31% of the Apollo-Twin Creeks Lines' length).[6] Where the Aspen-Golden Lines and the Apollo-Twin Creeks Lines are collocated, the ROW ranges from 200 to 260 feet wide.[7]

The Company requested a Commission final order approving a desired in-service target date of September 30, 2028, for the Apollo-Twin Creeks Project, and a CPCN sunset date of September 30, 2029, to accommodate adjustments to the Apollo-Twin Creeks Project schedule that could require up to a 12-month delay in the targeted in-service date.[8] The Commission docketed the Apollo-Twin Creeks Application as Case No. PUR-2024-00044. Concurrent with the filing of the Apollo-Twin Creeks Application, the Company filed the Motion of Virginia Electric and Power Company to Consolidate, for Procedural and Hearing Purposes Only, Case Nos. PUR-2024-00032 and PUR-2024-00044 ("Motion to Combine").

[4] Ex. 5 (Apollo-Twin Creeks Application) at 2-3.

[5] There are two segments where the ROW for the proposed Apollo-Twin Creeks Lines is 140 feet wide. The Company asserted a 0.2-mile segment of wider ROW is needed so the Apollo-Twin Creeks Lines can cross under the proposed Aspen-Golden Lines to enter the proposed Sycolin Creek Substation. The Company asserted a 0.1-mile segment of wider ROW is needed so the Apollo-Twin Creeks Lines can cross under the Aspen-Golden Lines when leaving the proposed Starlight Substation. *Id.* at 3 n.4.

[6] *Id.* at 5.

[7] *Id.* at 2 n.1.

[8] *Id.* at 8.

Procedural Matters

On April 17, 2024, the Commission issued an Order for Notice and Hearing, wherein it granted the Motion to Combine;[9] set one procedural and hearing schedule for both Case Nos. PUR-2024-00032 and PUR-2024-00044 ("Combined Cases"); and appointed a Hearing Examiner to conduct all further proceedings in the Combined Cases.

The following filed notices of participation in the Combined Cases: Lansdowne Conservancy ("Conservancy"); Theresa Ghiorzi ("Ms. Ghiorzi"); Loudoun County, Virginia ("Loudoun County" or "County"); JK Land Holdings, LLC ("JKLH"); NA Dulles Real Estate Investor, LLC ("Kincora"); Leesburg Pike Community Church ("Community Church"); Visa U.S.A. Inc. ("Visa"); Loudoun County Sanitation Authority ("Loudoun Water"); Philadelphia-Baltimore-Washington Laborers' District Council ("Laborers' Council"); Piedmont Environmental Council ("PEC"); and Allan Myers VA, Inc. ("Allan Myers").

On May 13, 2024, the Department of Environmental Quality ("DEQ") filed its report on the Aspen-Golden Project. On May 28, 2024, DEQ filed its report on the Apollo-Twin Creeks Project.

On or before August 14, 2024, the following respondents pre-filed testimony: Allan Myers, Community Church, Conservancy, Ms. Ghiorzi, JKLH, Kincora, Laborers' Council, Loudoun County, and Loudoun Water.

On August 21, 2024, Commission Staff ("Staff") pre-filed its testimony along with a Staff Report for each of the Combined Cases.

On September 4, 2024, Dominion pre-filed its rebuttal testimony.

Motions

Multiple motions were filed, and Hearing Examiner's Rulings issued, in the Combined Cases. Among other things, the Hearing Examiner entered, on May 1, 2024, a Protective Ruling and, on August 5, 2024, a Protective Ruling Providing Additional Protective Treatment for Extraordinarily Sensitive Customer-Specific Information.[10] Other rulings (i) postponed to September 18, 2024, the portion of the hearing wherein Dominion, Staff, and respondents would be afforded an opportunity to provide evidence in the Combined Cases; (ii) set a local public hearing at Belmont Ridge Middle School in Loudoun County, Virginia; and (iii) extended the public comment period to September 10, 2024.[11]

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[9] Though the title of the Motion to Combine used the term "[c[onsolidate," the Order for Notice and Hearing stated, "To the extent practicable, for all purposes including discovery, pre-filed testimony, and hearing dates, the procedural schedules in Case No. PUR-2024-00032 and Case No. PUR-2024-00044 shall be combined – without the cases or case numbers being consolidated – as set forth in this Order." Order for Notice and Hearing at 11, ¶ 4.

[10] Hearing Examiner's Protective Ruling (May 1, 2024); Hearing Examiner's Protective Ruling Providing Additional Protective Treatment for Extraordinarily Sensitive Customer-Specific Information (Aug. 5, 2024).

[11] Hearing Examiner's Ruling (May 15, 2024); Hearing Examiner's Ruling (July 10, 2024); and Senior Hearing Examiner's Ruling (July 26, 2024).

On July 9, 2024, Kincora filed NA Dulles Real Estate Investor, LLC's Motion for Partial Summary Judgment ("Motion for Partial Summary Judgment") concerning Dominion's condemnation authority over Loudoun Water's property, which the Aspen-Golden Lines are proposed to cross. As part of the Aspen-Golden Application, Dominion had proposed two options (known as Broad Run Variations A and B) for the Aspen-Golden Lines to traverse Loudoun Water's property. In the Motion for Partial Summary Judgment, Kincora reported that Loudoun Water opposes Broad Run Variation A and prefers Broad Run Variation B, while Dominion and Kincora prefer Variation A. Kincora asserted that Code § 25.1-102 provides Dominion the option to begin a condemnation proceeding against Loudoun Water if the Commission issues a CPCN for the Aspen-Golden Lines to cross Loudoun Water's property. Kincora requested the Commission enter an Order stating "that, pursuant to Va. Code § 25.1-102, the Commission can empower Dominion to condemn property owned by Loudoun Water."[12]

Kincora requested the Commission rule on the issue raised in the Motion for Partial Summary Judgment before the August 14, 2024, deadline for respondents to file their testimony and exhibits in the Combined Cases.[13] Kincora further requested that the Hearing Examiner certify this issue to the Commission, pursuant to 5 VAC 5-20-120 B of the Commission's Rules of Practice and Procedure, 5 VAC 5-20-10 *et seq.*, since this matter is "a legal issue of first impression."[14] The Hearing Examiner declined to certify to the Commission the Motion for Partial Summary Judgment.[15] Thereafter, the Hearing Examiner extended the deadlines for responses and reply to the Motion for Partial Summary Judgment.[16]

On August 27, 2024, Dominion, Loudoun Water, and Kincora jointly filed a Motion to Receive and Consider Proposed Stipulation and Recommendation, and for Expedited Consideration ("Motion on Stipulation"), along with a Proposed Stipulation and Recommendation ("Proposed Stipulation"). The Hearing Examiner entered a ruling suspending the time for responses and reply to the Motion for Partial Summary Judgment.[17] Through a subsequent ruling, among other things, the Hearing Examiner set deadlines for any responses and replies to the Motion on Stipulation.[18]

Paragraph (1) of the Proposed Stipulation requested a finding that "[i]f the [Commission] determines the Company has satisfied the requirements of Va. Code § 56-46.1 and the Utility Facilities Act, Va. Code § 56-265.1 *et seq.*, for the construction and operation of the [Aspen-Golden] Project, . . . overhead Broad Run Variation A, which is part of the Company's Proposed Route, meets the statutory criteria for approval and certification under these statutes and should be the selected routing variation between overhead Broad Run Variations A and B."[19] The Hearing Examiner declined to make this finding before taking evidence on the Aspen-Golden

[12] Motion for Partial Summary Judgment at 1-4, 10 (July 9, 2024).
[13] *Id.* at 3. *See also id.* at 10.
[14] *Id.* at 3. *See also id.* at 10.
[15] Hearing Examiner's Ruling at 3-4 (July 15, 2024).
[16] Hearing Examiner's Ruling (July 29, 2024); Hearing Examiner's Ruling (Aug. 13, 2024).
[17] Hearing Examiner's Ruling (Aug. 27, 2024).
[18] Hearing Examiner's Ruling (Aug. 28, 2024).
[19] Motion on Stipulation, Exhibit A, at 2-3 (filed Aug. 27, 2024).

Application, but the Hearing Examiner took Dominion's, Kincora's, and Loudoun Water's position under advisement.[20]

The Proposed Stipulation also included provisions that (i) relevant portions of Dominion's Aspen-Golden Application, accompanying documents, and direct testimony would be admitted into the record without cross-examination to the extent those documents relate to the selection of Broad Run Variation A or B; (ii) Kincora and Loudoun Water would withdraw the pre-filed testimony of their witnesses; and (iii) Kincora would withdraw the Motion for Partial Summary Judgment.[21]

Hearing

The hearing on the Combined Cases was held in three segments. During the first portion of the hearing, on August 6, 2024, eight public witnesses offered testimony by telephone on the Combined Cases.[22] The second portion was a local public hearing held on September 5, 2024, at Belmont Ridge Middle School in Loudoun County, Virginia. On this occasion 41 public witnesses provided live testimony on the Combined Cases.[23] The testimony of all public witnesses is summarized later in this Report.

The third portion of the hearing convened September 18, 2024, and continued into September 19, 20, 23, and 26, 2024. During this portion of the hearing, the Company, respondents, and Staff gave opening statements, provided their testimony, and gave closing arguments.[24] Dominion was represented by Vishwa B. Link, Esquire, Sarah B. Nielsen, Esquire, Anne Hampton Haynes, Esquire, Briana M. Jackson, Esquire, all of McGuireWoods, LLP; Timothy L. McHugh, Esquire, of Troutman Pepper Hamilton Sanders LLP; and David J. DePippo, Esquire, and Charlotte P. McAfee, Esquire, in-house counsel. Cody T. Murphey, Esquire, and John P. O'Malley, Esquire, both of Williams Mullen, appeared on behalf of JKLH. Claire M. Gardner, Esquire, and Brian R. Greene, Esquire, both with GreeneHurlocker, PLC, appeared on behalf of Community Church. Loudoun County was represented by Andrew R. McRoberts, Esquire, and Adam B. Winston, Esquire, both with Sands Anderson PC; and by Leo P. Rogers, Esquire, County Attorney for Loudoun County. The Conservancy was represented by Bryan S. Turner, Esquire, with the firm of Turner, Holden & Turner; and Brian R. Greene, Esquire, with GreeneHurlocker, PLC. Timothy G. McCormick, Esquire, and Christian F. Tucker, Esquire, both with Christian & Barton, LLP, represented Kincora. Jeffrey S. Poretz, Esquire, of Miles & Stockbridge, represented Loudoun Water. William T. Reisinger, Esquire, of ReisingerGooch PLC, represented PEC. Brian J. Petruska, General Counsel for Laborers' International Union of North America Mid-Atlantic, represented the Laborers' Council. Jasdeep S. Khaira, Esquire, with Gentry Locke, represented Visa. Ms. Ghiorzi represented herself. William H. Chambliss, General Counsel – Utilities, and William H. Harrison, IV, Associate General Counsel, represented Staff.

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[20] Hearing Examiner's Ruling at 4 (Aug. 28, 2024).
[21] Motion on Stipulation, Exhibit A, at 3-4 (filed Aug. 27, 2024).
[22] Transcript ("Tr.") at 14-64.
[23] *Id.* at 78-232.
[24] *See generally, id.* at 241-1871.

Allan Myers' counsel did not participate in the hearing. Toward the beginning of proceedings on September 18, 2024, after a brief discussion of the Motion on Stipulation and Proposed Stipulation, Loudoun Water and Kincora withdrew their witnesses' pre-filed testimony, and Kincora withdrew the Motion for Partial Summary Judgment. Counsel for Loudoun Water and Kincora were subsequently excused from the balance of the hearing.[25] Counsel for PEC was excused after opening statements but reserved the right to file comments on the Hearing Examiner's Report.[26] On the afternoon of September 19, 2024, Counsel for the Laborers' Council was excused from the balance of the hearing.[27]

Loudoun County pre-filed testimony that referenced an underground transmission line pilot incorporating a hybrid approval process, involving the Commission and local government, for several future transmission line projects, and involving a high wattage user rate to pay for these projects. During the hearing, the portions of Loudoun County witnesses' testimony addressing this issue were stricken; amended versions of the relevant testimony, excising discussion of such a pilot, were entered into the record.[28]

Public Comments

The Commission's Order for Notice and Hearing provided an opportunity for any interested person to file comments on the Aspen-Golden and Apollo-Twin Creeks Applications.[29] The original July 31, 2024 deadline for such comments was later extended until September 10, 2024.[30] A summary of these public comments follows.

Comments from Public Officials

Congresswoman Jennifer Wexton, Representative for the 10th Congressional District, urged the Aspen-Golden Lines be placed underground where feasible. She asserted undergrounding protects the economic value of homes and businesses in the area, protects the aesthetic quality of the area, and promotes environmental stewardship. She contended the additional costs of undergrounding are outweighed by the long-term value undergrounding will provide to communities and the environment. She asserted undergrounding will provide data to build an electric grid for future generations.[31]

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[25] *Id.* at 247-49, 266. Dominion's Aspen-Golden Application, accompanying documents, and direct testimony were admitted into the record with no cross-examination related to the selection of Broad Run Variation A or B. *Id.* at 249. Testimony summaries of Kincora's and Loudoun Water's witnesses are not included in this Report since they were withdrawn and not entered into the record.

[26] *Id.* at 341-43.

[27] *Id.* at 726-27.

[28] *See id.* at 369-72, 959-67. The versions of the testimony entered into the record are summarized herein. Ms. Ghiorzi objected to the removal of lines 32 through 39 of the pre-filed direct testimony of Loudoun County Witness Buddy Rizer. Her objection was noted for the record. *Id.* at 966. As relevant to Ms. Ghiorzi's objection, the direct testimony of Buddy Rizer was entered into the record excluding part of line 30, lines 31-36, and the beginning of line 37 of the pre-filed version of this testimony. *See* Ex. 23 (Rizer Direct) at 2.

[29] Order for Notice and Hearing at 23.

[30] Hearing Examiner's Ruling at 6 (May 15, 2024).

[31] Comments of Representative Jennifer Wexton, Member of Congress, 10th Congressional District (filed Sept. 17, 2024).

State Senators Russet Perry and Suhas Subramanyam, along with Delegates Kannan Srinivasan, Atoosa Reaser, David Reid, and Fernando Martinez, offered collective comments supporting undergrounding part or all of the Aspen-Golden Lines and recommending the industries creating the increase in energy demand contribute meaningfully to undergrounding costs. They discussed how undergrounding would preserve scenic assets and historic landscapes proximate to well-planned communities and asserted undergrounding offers reliability and resiliency benefits. The representatives also urged the Commission to consider options, including High Voltage Direct Current ("HVDC") or Advanced Conducting Material, to allow existing infrastructure to support additional power. They asserted undergrounding would both benefit Loudoun County and set precedent for responsible placement of electric infrastructure throughout Virginia and the United States.[32]

Delegate Geary Higgins, Member of the House of Delegates for the 30th District of Virginia, also urged that the Aspen-Golden Lines be placed underground where feasible. He posited undergrounding enhances public safety and protects the electric grid from weather-related outages, minimizes adverse impacts to community wellbeing and the local economy, and preserves scenic landscapes and historic assets. He further requested the Commission explore ways to carry more electricity across present infrastructure, such as by using direct current or advanced conductors. He asserted undergrounding would both benefit Loudoun County and set precedent for responsible placement of electric infrastructure throughout Virginia and the United States.[33]

The Coalition of Loudoun Towns is comprised of the Mayors of the following towns: Hamilton, Hillsboro, Leesburg, Lovettsville, Middleburg, Purcellville, and Round Hill. They requested the Commission require the Aspen-Golden Lines to be placed underground wherever feasible, claiming undergrounding preserves the aesthetic qualities and cultural heritage of Loudoun County and surrounding areas, preserves property values, and mitigates visual blight and health issues associated with overhead transmission lines. They suggested undergrounding to prevent the proliferation of a web of transmission lines across the area. They asserted undergrounding will provide electric resiliency during bad weather. They stressed that above-ground structures are outdated and should not be allowed simply because the energy industry has not coped well with the present electricity demand crisis.[34]

Juli Briskman, Vice Chair, Loudoun County Board of Supervisors and Algonkian District Supervisor, urged the Commission to approve undergrounding of the Aspen-Golden Lines wherever feasible, particularly where there is new and affordable housing that has been approved for construction. She stressed the County's careful planning of the Route 7 corridor and asserted undergrounding is the only way to protect homes, businesses, and other developments in the area. She also contended data centers, the cause for the need for increased energy, should contribute to paying for the undergrounding. She argued Dominion has not adequately

[32] Comments of State Senator Russet Perry, State Senator Suhas Subramanyam, Delegate Kannan Srinivasan, Delegate Atoosa Reaser, Delegate David A. Reid, and Delegate Fernando "Marty" Martinez (filed Aug. 27, 2024).
[33] Comments of Delegate Geary M. Higgins (filed Aug. 27, 2024).
[34] Comments of Coalition of Loudoun Towns (filed July 19, 2024, and Aug. 27, 2024).

considered undergrounding's benefits and should do so now since the data center industry is proliferating throughout Virginia.[35]

Comments from Members of the Public

Including the above-discussed comments, the Commission received approximately 290 comments total in the Combined Cases.[36] Commenters almost uniformly protested the overhead lines and/or advocated for undergrounding part or all of the transmission lines.[37] Concerns with overhead lines included:

- Negative health impacts;[38]
- Loss of scenic beauty to the area more generally and/or a neighborhood or home in particular;[39]
- Loss of tourism in the area;[40]
- Decreased property values;[41]
- Being stuck with an eyesore if Dominion later abandons the transmission line as data centers switch to green electricity sources;[42]
- Interference with Inova Loudoun Hospital's helipad operations;[43]
- Proximity of the proposed overhead lines to schools;[44]
- Diminished quality of life and community wellbeing;[45] and
- The use of outdated technology.[46]

Commenters promoted undergrounding for its perceived benefits, including:

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[35] Comments of Juli E. Briskman (filed Sept. 11, 2024).
[36] One comment discussed American Electric Power's rates. Comments of Concerned Citizen (filed June 20, 2024). One comment addressed the U.S. Department of Energy's designation of National Interest Electric Transmission Corridors. Comments of Robert Tatum (filed June 25, 2024). Two comments addressed the Golden-Mars transmission line. Two Comments of Jaime Comes (filed Sept. 4, 2024).
[37] *But see* Comments of Frederick Peters (filed Sept. 4, 2024); Two Comments of Ed Dalrymple (filed Sept. 10, 2024).
[38] *See, e.g.*, Comments of Carmen Ross (filed Apr. 19, 2024); Comments of Arelis Piscitelli (filed June 25, 2024).
[39] *See, e.g.*, Comments of James Clapper (filed Aug. 7, 2024); Comments of Bill Wright, Board of Directors President, Lansdowne on the Potomac Homeowners Association (filed Aug. 27, 2024); Comments of Board of Directors for Lansdowne Village Greens Homeowners Association (filed Aug. 27, 2024).
[40] *See, e.g.*, Comments of Robert Pollard (filed Sept. 9, 2024).
[41] *See, e.g.*, Comments of Reza Mousavi (filed June 25, 2024); Comments of Elvin Capestany (filed July 23, 2024); Comments of Samuel Allaire (filed Aug. 20, 2024); Comments of Jack Kelly, Board of Members President, Lansdowne Woods of Virginia Community Association, LLC (filed Aug. 27, 2024).
[42] *See, e.g.*, Comments of Charles H. and Kathleen K. Helein (filed Aug. 26, 2024); Comments of Curtis Scott (filed Sept. 4, 2024).
[43] *See, e.g.*, Comments of Marizol Curry (filed Aug. 8, 2024). *Cf.* Comments of Dave Di Pietro (filed Sept. 9, 2024) (expressing concern about conflicts between overhead lines and the Leesburg Airport's flight paths).
[44] *See, e.g.*, Comments of Kendall Perry (filed Sept. 6, 2024).
[45] *See, e.g.*, Comments of Jeffrey Getty (filed Aug. 7, 2024); Comments of Joanne Jiang (filed Aug. 8, 2024); Comments of Wesley and Judith Ballenger (filed Aug. 19, 2024).
[46] *See, e.g.*, Comments of Rev. Dr. Jean Wright, Chair, Friends Acting for Climate Today (filed Sept. 4, 2024).

- Protection of the area's beauty, scenic assets, and historic resources, and/or preservation of greenspace and wildlife habitat;[47]
- Preservation of the area for future generations;[48]
- Preservation of businesses' economic vitality;[49]
- Resiliency of electric service;[50]
- Continued prosperity for the area;[51]
- Lower infrastructure maintenance costs;[52]
- The long-term value outweighing the higher cost now;[53] and
- Implementing the will of the community.[54]

Some commenters requested the Commission require the transmission lines be placed underground and further require data centers to pay the additional costs for undergrounding.[55] Some asserted that data centers in particular are the cause of the additional need for electricity and that, without undergrounding, residents are being asked to bear a burden for the benefit of an industry that doesn't benefit them (at least not more than it benefits the rest of the world).[56] Some pointed out undergrounding high-voltage lines is feasible because other parts of the world do so.[57] At least one commenter questioned whether options to expand transmission capacity on existing infrastructure have been pursued.[58]

Some commenters combined their comments advocating undergrounding and preserving the current scenic and historic nature of Loudoun County with discussion against data centers themselves.[59] Two commenters requested the data centers be placed underground, moved elsewhere, or at least that the pace of their addition be slowed until environmental and safety concerns can be addressed.[60]

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[47] *See, e.g.*, Comments of Katharine Goodwin (filed June 25, 2024); Comments of Venkatesh Varakala (filed June 28, 2024); Comments of Mark Allen (filed Aug. 8, 2024); Comments of Wesley and Judith Ballenger (filed Aug. 19, 2024); Comments of Joe May (filed Aug. 27, 2024); Comments of Jeffrey R. Tombros, President, Belmont Homeowners Association (filed Aug. 27, 2024); Comments of Jack Kelly, Board of Members President, Lansdowne Woods of Virginia Community Association, LLC (filed Aug. 27, 2024).

[48] *See, e.g.*, Comments of Kathleen Hughes (filed Aug. 19, 2024); Comments of Jerry Kidwell (filed Aug. 26, 2024).

[49] Comments of Kevin Carter, Lansdowne Resort (filed Aug. 27, 2024).

[50] Comments of Paul Deschamps (filed July 15, 2024); Comments of Ramsin Toma (filed July 23, 2024); Comments of Joe May (filed Aug. 27, 2024); Comments of Katie Kusjanovic (filed Sept. 5, 2024).

[51] *See, e.g.*, Comments of Jonathan Jiang (filed Aug. 8, 2024); Comments of Board of Directors for Lansdowne Village Greens Homeowners Association (filed Aug. 27, 2024).

[52] *See, e.g.*, Comments of Paul Deschamps (filed July 15, 2024).

[53] *See, e.g.*, Comments of Shirley and Roger Fortuna (filed Aug. 26, 2024); Comments of Andrew Cather (filed Aug. 30, 2024).

[54] *See, e.g.*, Comments of Daniel Lazzari (filed Aug. 5, 2024); Comments of Dr. Carmen Ross (filed Aug. 20, 2024).

[55] *See, e.g.*, Comments of Guy Frankenfield (filed May 1, 2024); Comments of David Chow (filed July 23, 2024); Comments of Andrew Nagle (filed Aug. 12, 2024); Comments of Laura Oyhenart (filed Sept. 4, 2024).

[56] *See, e.g.*, Comments of Susan Manch, Waterford Foundation (filed Aug. 27, 2024); Comments of Justin Harrison (filed Aug. 28, 2024).

[57] *See, e.g.*, Comments of Stephen Hoffman (filed Aug. 26, 2024).

[58] Comments of Melissa Goldman (filed June 17, 2024).

[59] *See, e.g.*, Comments of Lucy Rota-Keller (filed June 25, 2024); Comments of Arianne Brennan (filed June 25, 2024); Comments of Chris Tandy (filed Sept. 3, 2024).

[60] Comments of Maurice Rudiselle (filed Sept. 16, 2024); Comments of Marilyn Silvey (filed Sept. 16, 2024).

Some also claimed the Commission should approve undergrounding for the transmission lines since the Commission's mission statement includes balancing interests of citizens, customers, and companies.[61]

Approximately 115 individuals signed a petition submitted through the Commission's comment portal. The petition rejected Dominion's Aspen-Golden overhead lines proposal as not well planned and as harmful to Route 7 and other areas along the Aspen-Golden Lines corridor. The petition urged undergrounding of the Aspen-Golden Lines in accordance with Loudoun County's undergrounding proposal to protect specific scenic and cultural resources in the area as well as Inova Loudoun Hospital, schools, and Community Church. The petition decried Dominion's proposal as using outdated technology that will harm greenspace to serve 21st-century energy demand. Finally, the petition asserted irreparable harm would result if the Aspen-Golden Lines were placed entirely overhead.[62]

Finally, a few comments made specific requests, including the following:

- Bike Loudoun requested the Commission condition approval of the Aspen-Golden Project on Dominion working with Loudoun County to determine the feasibility of creating a shared use bike and pedestrian path in the transmission line ROW. Bike Loudoun claimed this request is consistent with corridor #6 of the Loudoun County Bike & Pedestrian Master Plan and with item #50 of the Possible Secondary Uses of Rights-of-Way, in the Commission's Guidelines for Transmission Line Applications.[63]

- James Hanna asked the Commission, when it approves undergrounding for part of the Aspen-Golden Lines, also to "call for a [s]tate-wide initiative to formulate and adopt a high voltage transmission line undergrounding policy" to set forth: the benefits of undergrounding; how those benefits align with stakeholder interests; undergrounding cost elements; and funding options, including electricity ratepayers, local tax revenues, and industrial consumers whose funding might be tapped through undergrounding utility tax assessment districts.[64]

- Alfred and Irene Ghiorzi requested the Commission deny approval of the Aspen-Golden Application so that the Aspen Substation may be considered along with the Mid-Atlantic Resiliency Link project through Virginia and so there is time to analyze an HVDC underground pilot for the Aspen-Golden 500 kV lines.[65]

- Susan Carroll, for Inova Loudoun Hospital, filed comments supporting Aspen-Golden Belmont Park Variation A over Variation B, asserting Variation B may put the hospital into a zoning noncompliance situation. Ms. Carroll indicated she had not been able to review Loudoun County's Updated Hybrid Proposal but would not object to it if the

[61] *See, e.g.*, Comments of Charles H. and Kathleen K. Helein (filed Aug. 26, 2024); Comments of Kelvin Shields (filed Sept. 11, 2024).
[62] Comments of Shea Brady (filed Sept. 11, 2024).
[63] Bike Loudoun Comments (filed May 31, 2024), by Mark Norman.
[64] Comments of James Hanna (filed Sept. 4, 2024).
[65] Comments of Alfred and Irene Ghiorzi (filed Sept. 9, 2024).

Commission approved it, stating it would eliminate risk to the hospital's helicopter operations.[66]

SUMMARY OF THE RECORD

Project Descriptions

Aspen-Golden Project

Overview. The Aspen-Golden Project comprises multiple parts, as follows:[67]

- The new Aspen Substation, which will be connected to the transmission grid by cutting the 500 kV Brambleton-Goose Creek Line, resulting in Aspen-Brambleton Line #558 and Aspen-Goose Creek Line #597, both of which will operate at 500 kV;
- The new 0.2-mile Aspen-Goose Creek Line #5002 which, together with Aspen-Goose Creek Line #597, will bring two new sources to the area by connecting Goose Creek Substation to the area grid via the proposed Aspen Substation. To accomplish this objective, substation line terminal upgrade work will be required at the 500 kV Goose Creek Substation to terminate Aspen-Goose Creek Lines #597 and #5002;
- A new approximately 9.4-mile overhead 500 kV line (Aspen-Golden Line #5001) and an overhead 230 kV line (Aspen-Golden Line #2333), both single circuit transmission lines, to be constructed almost entirely on new ROW. These lines will stretch from the new Aspen Substation to another new substation, the Golden Substation.
- The Line Loop, to connect the Golden Substation to the transmission grid. The lines that compose the Line Loop will provide a new 230 kV source from the Aspen/Goose Creek area into Data Center Alley via the Golden Substation.

Substations. As proposed, the Aspen Substation will be sited on Dominion-owned property, east of existing 500 kV Brambleton – Goose Creek Line #558 and west of the intersection of Cochran Mill Road and Samuels Mill Court.[68] The Golden Substation will be sited several miles away, on approximately 8.5 acres of property that Dominion will purchase.[69] This substation will be sited to the west of the Company's Paragon Park Substation, east of State Route 28 (Sully Road), and north of the Washington & Old Dominion ("W&OD") Trail.[70] Dominion plans to equip both the Aspen and Golden Substations with circuit breakers, line terminals, transformer banks, and capacitor banks to accommodate initial and future load growth. Due to space constraints, the 500 kV and 230 kV infrastructure will be constructed with gas insulated switchgear. The Company also plans to perform work at existing Goose Creek, Brambleton, Paragon Park, and Sterling Park Substations related to the Aspen-Golden Project. Work at the Brambleton, Paragon Park, and Sterling Park Substations is considered minor and not included in the total Aspen-Golden Project cost.[71]

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[66] Comments of Susan Carroll, President, Inova Loudoun Hospital (filed Sept. 11, 2024).
[67] Ex. 4 (Aspen-Golden Application) at 2-5.
[68] *See, e.g.*, *id.* at Attached Appendix, p. 195.
[69] *See, e.g.*, *id.* at Attached Appendix, pp. 331-32.
[70] *See*, e.g., Ex. 38 (Aspen-Golden Staff Report) at Attachment 6, p. 8.
[71] Ex. 4 (Aspen-Golden Application) at Attached Appendix, pp. 331-32.

Route. Aspen-Golden 500 kV Line #5001 and 230 kV Line #2333 will originate at the 500 kV and 230 kV buses of the proposed Aspen Substation and terminate, after approximately 9.4 miles, at two corresponding buses in the proposed Golden Substation.[72] These lines comprise Route 1, the Belmont Park Segment (A/B), and the Broad Run Segment (A/B). Schematically, the route of Aspen-Golden Lines can be visualized as:[73]

Start (Aspen) → Route 1 → Belmont Park Segment → Route 1 → Broad Run Segment → Route 1 → End (Golden)

The first portion of Route 1 begins at the proposed Aspen Substation, with Line #5001 starting from the north portion of the substation and Line #2333 starting from the east. The lines head along separate ROWs for approximately 0.2 miles, cross the existing transmission corridor for 230 kV Lines #227 and #274, and then merge.[74] Continuing east, Lines #5001 and #2333 cross the southern edge of the proposed Twin Creeks Substation, cross Cochran Mill Road and Goose Creek, and continue southeast for approximately 0.6 miles where they cross between two proposed buildings on a planned data center campus. The lines then veer north for approximately 0.5 miles, passing the proposed Sycolin Creek and Starlight Substations. North of the Starlight Substation, the Aspen-Golden Lines turn east for 0.9 miles, cross between two proposed data center campuses, cross over Belmont Ridge Road, and pass along the western side of an undeveloped land parcel planned as a data center campus. Route 1 next turns southeast and parallels Route 7 for about 0.6 miles until reaching the Belmont Park Segment. Altogether, the first portion of Route 1 is approximately 2.9 miles long.[75]

The Belmont Park Segment is approximately 0.6 miles long. Variation A calls for Lines #5001 and #2333 to continue on the south side of Route 7. For Variation B, approximately 0.3 miles west of Claiborne Parkway, the lines would turn northeast for 0.1 miles, cross over Route 7, and parallel the north side of Route 7 for 0.4 miles. The lines would cross Lansdowne Boulevard and then cross back over to the south side of Route 7 approximately 0.3 miles east of Claiborne Parkway.[76]

After the Belmont Park Segment, Route 1 continues along the south side of Route 7 for about 2.4 miles, crossing Ashburn Village Boulevard and Loudoun County Parkway. Before reaching the George Washington Boulevard Bridge, the Aspen-Golden Lines turn south for 0.3 miles, cross Russell Branch Parkway, and then turn southwest for 0.3 miles crossing parts of two land parcels that have been designated by the Loudoun County Board of Supervisors as open space easements. Thereafter, Route 1 turns south for 0.3 miles and reaches the Broad Run Segment. Altogether, this portion of Route 1 is approximately 3.3 miles long.[77]

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[72] *See, e.g.*, *id.* at 3.

[73] *See, e.g.*, *id.* at Attached Appendix, p. 195. "Route 1" is the term Dominion uses for all parts of the Aspen-Golden Route that are not part of Belmont Park Variation A or B or Broad Run Variation A or B. *Id.* at 7.

[74] *Id.* at Attached Appendix, p. ii n.4.

[75] *Id.* at Attached Appendix, p. 195. The Twin Creeks, Sycolin Creek, and Starlight Substations are proposed as part of the Apollo-Twin Creeks Project.

[76] *Id.* at Attached Appendix, pp. 198-99.

[77] *Id.* at Attached Appendix, pp. 195-96. The Company indicated it informed the County, on February 8, 2024, that it prefers to cross the open space easements to avoid residential development, minimize environmental impacts, and maximize collocation with buried utilities. The Company stated it will need Loudoun County Board of Supervisors approval to cross the open space easements. Dominion explained that if such approval is not received, Route 1

The Broad Run Segment runs approximately 2.2 miles to 2.3 miles, for Variations A and B, respectively. Broad Run Variation A begins approximately 0.1 miles north of Beaverdam Run, continues south for 0.2 miles, then parallels Loudoun County Parkway for 1.3 miles. Variation A then crosses Reuse Lane, Aquiary Way, Gloucester Parkway, and Coach Gibbs Drive before turning southeast for 0.3 miles along the W&OD Trail and Dominion's existing ROW for Lines #227 and #274, at the point where the ROW crosses with existing Lines #2143, #2207, and #2165. Variation A then continues northeast for 0.2 miles and southeast for 0.2 miles, ending near Pacific Boulevard. Variation A is collocated with Loudoun County Parkway for 1.3 miles and with existing Dominion transmission lines for 0.3 miles.[78]

Broad Run Variation B begins approximately 0.1 miles north of Beaverdam Run, turns east for 0.4 miles, then south for 0.8 miles across Loudoun Water's Broad Run Water Reclamation Facility property, following an existing Dominion overhead distribution line and a buried sewer utility ROW and access road. It next crosses Broad Run and continues south for 0.2 miles, then crosses Gloucester Parkway. It then continues south for 0.6 miles, passes the BECO Substation, and continues south for another 0.2 miles before crossing Pacific Boulevard, where it ends. Variation B is collocated with buried water and sewer lines and Dominion's future 230 kV BECO-DTC line for 0.8 miles and with overhead electric distribution lines for 0.4 miles.[79]

After the Broad Run Segment, Route 1 resumes. The Aspen-Golden Lines continue together for 0.1 miles before splitting into separate paths, with Line #5001 heading east into the proposed Golden Substation and Line #2333 heading south and east for 0.3 miles before turning and entering the Golden Substation from the south.[80]

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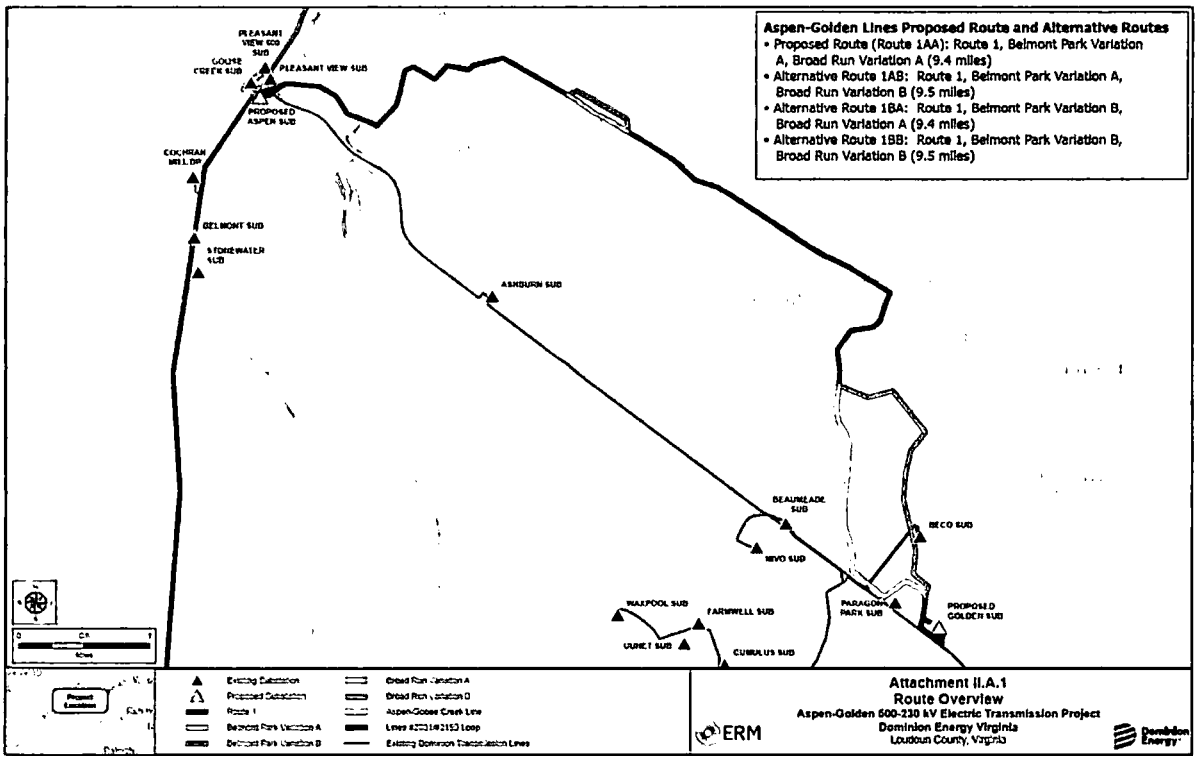
would cease to be viable, and the Company would revert to aligning Route 1 along one of several rejected alternatives. *Id.* at Attached Appendix, p. 196.

[78] *Id.* at Attached Appendix, p. 201.

[79] *Id.* at Attached Appendix, pp. 202-03.

[80] *Id.* at 3 n.5 and Attached Appendix, p. 196.

Dominion selected Route 1AA, consisting of Route 1, Belmont Park Variation A, and Broad Run Variation A, though the Company proposed all four alternatives (1AA, 1AB, 1BA, 1BB) for notice purposes and for Commission consideration.[81] Route 1AA is shown in the dark blue, light blue, dark blue, and orange lines on the diagram below. Route 1AB is shown with dark blue, light blue, dark blue, and red lines. Route 1 BA is shown with dark blue, green, dark blue, and orange lines. Route BB is shown with dark blue, green, dark blue, and red lines.[82]



ROW. Dominion proposed to construct the Aspen-Golden Lines on new ROW varying in width between 100 and 150 feet. Where the proposed Aspen-Golden Lines are collocated with the proposed Apollo-Twin Creeks Lines (*i.e.*, the western portion of the dark blue line depicted above), the ROW will vary in width from 200 to 260 feet.[83]

Structures. The Aspen-Golden Application reflects that this project will require 79 structures, including dulled galvanized steel double circuit three-pole, H-frame, monopole, and two-pole structures.[84] The Aspen-Golden Lines' structures will support a 5/2 configuration, *i.e.*, a vertical alignment among the structures so that one position on the structures will carry the 500 kV circuit and a separate position on the structures will carry the 230 kV circuit.[85] Along Dominion's preferred Route 1AA, the structures for the Aspen-Golden Lines will have a

[81] *Id.* at 8-9.
[82] *Id.* at Attached Appendix, p. 161.
[83] *Id.* at 4 and n.6 and Attached Appendix, pp. 179-89.
[84] *Id.* at 4 and Attached Appendix, pp. 214-23.
[85] *Id.* at 4, n.7.

minimum height of 120 feet, a maximum height of 196 feet, and an average height of 171 feet.[86] The one pole required for Aspen-Goose Creek Line #5002 will stand 190 feet tall.[87] The structures required for the Line Loop will have a minimum height of 105 feet, a maximum height of 115 feet, and an average height of 110 feet.[88]

Cost. The total estimated cost for the Aspen-Golden Project is approximately $700.1 million, which comprises approximately $176.9 million for transmission work (assuming Route 1AA) and approximately $523.2 million for substation work. The transmission related costs will fluctuate, depending on which route alternative is constructed.[89] The costs for the 230 kV components of the Aspen-Golden Project are allocated 100% to PJM Interconnection, L.L.C's ("PJM") DOM Zone, while the costs for the 500 kV components of the Project are allocated among other PJM Zones in addition to the DOM Zone.[90]

Need. Dominion asserted the Aspen-Golden Project is necessary (i) to maintain the transmission system's structural integrity and reliability; (ii) to maintain and improve service to customers, including those in the Eastern Loudoun Load Area, an area generally north and west of the Dulles International Airport that includes Loudoun County's Data Center Alley; (iii) to address load growth in the Eastern Loudoun Load Area; and (iv) to resolve violations of mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards, beginning in summer 2028. Dominion explained that PJM, the regional transmission organization of which the Company is a part, has designated the Aspen-Golden Project as a "baseline project resolving several system reliability criteria violations."[91]

Schedule. Dominion proposed an Aspen-Golden Project in-service date of June 1, 2028, with construction expected to begin around June 2025. Dominion estimated approximately 44 months will be needed for detailed engineering, procurement of materials, permitting, real estate, and Aspen-Golden Project construction.[92]

Undergrounding. Dominion did not propose an underground option for the Aspen-Golden Lines. The Company did, however, retain a consultant, Black & Veatch Corporation ("Black & Veatch"), to study the feasibility of undergrounding the Aspen-Golden Lines.[93] Additionally, RLC Engineering, PLLC ("RLC") developed an initial undergrounding proposal ("Initial Hybrid Proposal") for the Conservancy.[94] RLC later developed, for Loudoun County, a proposal to underground a portion of the Aspen-Golden Lines ("Updated Hybrid Proposal") whereby an approximately three-mile stretch of the Aspen Golden Lines – generally from the

[86] *Id.* at Attached Appendix, p. 233.
[87] *Id.* at Attached Appendix, pp. 223-24, 233.
[88] *Id.* at Attached Appendix, pp. 231, 233.
[89] *Id.* at Attached Appendix, p. 55. Transmission line costs for the alternatives are as follows: Route 1AB, $176.4 million; Route 1BA, $184.9 million, and Route 1BB, $179.2 million. *Id.*
[90] *Id.* at Attached Appendix, pp. 56-58.
[91] *See, e.g.*, Ex. 4 (Aspen-Golden Application) at 2 and Attached Appendix, pp. 1-3.
[92] *See, e.g., id.* at 10.
[93] Ex. 47 (Moulton Rebuttal) at 3 and Attached Rebuttal Schedule 1.
[94] *See, e.g.*, Tr. at 661-62 (Conroy).

proposed Sycolin Creek Substation to just past Community Church on Route 7 – would be placed underground.[95]

Apollo-Twin Creeks Project

Overview. The Apollo-Twin Creeks Project comprises the following:[96]

- A new overhead double circuit 230 kV transmission line extending approximately 1.9 miles from a cut-in on the Edwards Ferry-Pleasant View line to the new Apollo Substation; and
- The construction of five substations: Twin Creeks, Sycolin Creek, Starlight, Lunar, and Apollo.

Route and Lines. The Apollo-Twin Creeks Project was designed to serve three data centers (Customers A, B, and C, located at corresponding Campuses A, B, and C) in eastern Loudoun County. The proposed 1.9-mile route of the Apollo-Twin Creeks Lines generally follows the location of these three customers and interconnects the substations serving these customers to Dominion's electric grid. Schematically, the route of the lines is as follows:[97]

Pleasant View/Edwards Ferry cut-in (start) → Twin Creeks → Sycolin Creek → Starlight → Lunar → Apollo (end)

From the cut-in of the Edwards Ferry-Pleasant View Line #203, the Apollo-Twin Creeks Route heads south for approximately 0.2 miles, following the Luck Stone quarry property line and Loudoun Water utility lines, then connects with the Twin Creeks Substation. The route continues southeast for approximately 0.2 miles to a point just north of Cochran Mill Road. Here, the route begins to parallel and collocate with the Aspen-Golden Lines. After crossing Cochran Mill Road, the route continues southeast across Customer A's property for approximately 0.4 miles. The route next crosses Goose Creek, just north of a former quarry that is now a reservoir, about 0.2 miles northeast of Dominion's Lines #227 and #274. The route continues south across the Milestone Reservoir property for 0.1 miles before turning northeast, where it connects to the Sycolin Creek Substation. Continuing northeast, the route crosses Customer B's property for approximately 0.3 miles to the south side of the Starlight Substation. At this point, the route of the Apollo-Twin Creeks Lines separates from the Aspen-Golden Lines. The Apollo-Twin Creeks Lines continue for 0.2 miles and then enter the Starlight Substation, then proceed north for approximately 0.4 miles across Customer C's property connecting to the Lunar Substation and then continuing on to, and terminating at, the Apollo Substation south of Route 7 and east of Goose Creek.[98]

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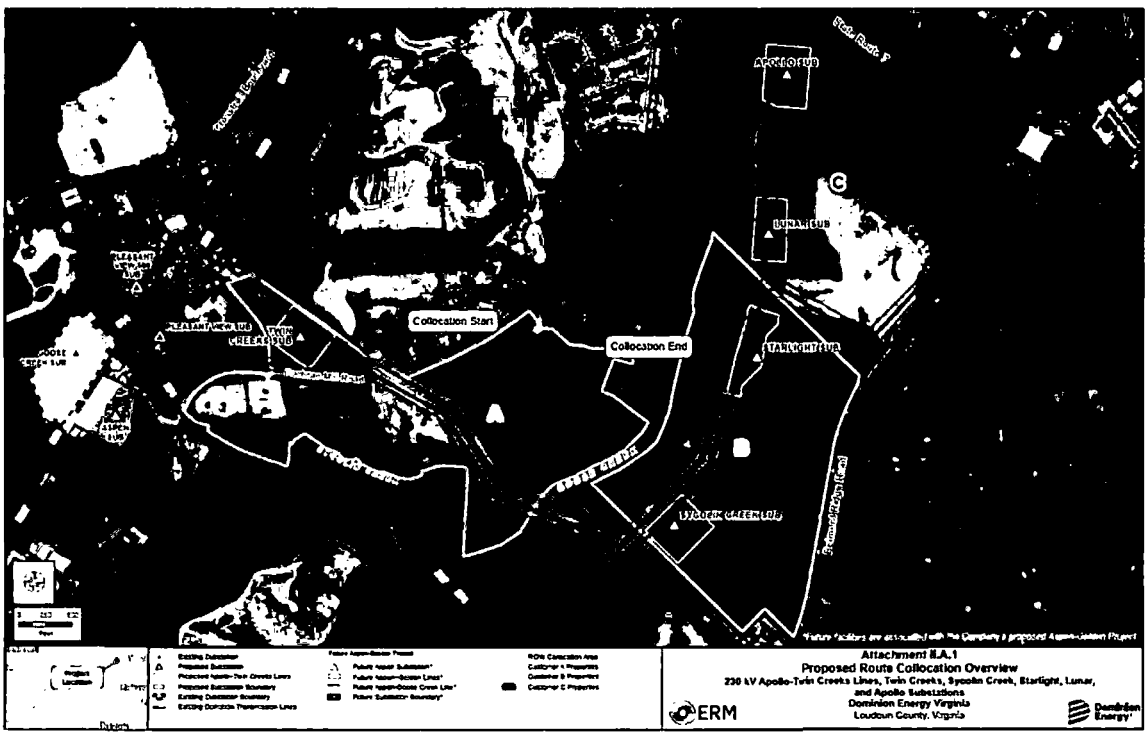
[95] *See, e.g.*, Ex. 20 (Conroy Direct) at 3, 5, and Attached Exhibit BC-3. The Black & Veatch feasibility study and the Updated Hybrid Proposal were the subject of considerable discussion during the hearing and are mentioned here to help the reader understand the testimony summaries below.
[96] Ex. 5 (Apollo-Twin Creeks Application) at 2-3.
[97] *Id.* at Attached Appendix, pp. iii and 6.
[98] *Id.* at Attached Appendix, pp. 88-89.

The Apollo-Twin Creeks Project will result in the following lines:[99]

Origin Station	Termination Station	Line Name and Number
Pleasant View	Twin Creeks	Pleasant View-Twin Creeks Line #2320
Edwards Ferry	Twin Creeks	Edwards Ferry-Twin Creeks Line #203
Twin Creeks	Sycolin Creek	Sycolin Creek-Twin Creeks Line #2316
Twin Creeks	Sycolin Creek	Sycolin Creek-Twin Creeks Line #2317
Sycolin Creek	Starlight	Starlight-Sycolin Creek Line #2334
Sycolin Creek	Starlight	Starlight-Sycolin Creek Line #2335
Starlight	Lunar	Lunar-Starlight Line #2340
Starlight	Lunar	Lunar-Starlight Line #2341
Lunar	Apollo	Apollo-Lunar Line #2342
Lunar	Apollo	Apollo-Lunar Line #2343

The diagram below depicts the Apollo-Twin Creeks Route, including the collocation with the Aspen-Golden Lines. The dark blue line represents the 500 kV/230 kV Aspen-Golden Route, while the magenta line represents the 230 kV Apollo-Twin Creeks Route. The five substations and lines marking the property boundaries of Customer A (orange), Customer B (yellow), and Customer C (purple) are also depicted. Note the other purple lines in the diagram represent existing Dominion transmission lines.[100]



[99] *Id.* at Attached Appendix, p. 6.
[100] *Id.* at Attached Appendix, p. 73.

Substations. As proposed, the Apollo-Twin Creeks Project includes construction of five new substations. Details of these substations are as follows:[101]

Substation	Acreage	To be constructed with:
Twin Creeks	4.7	Four 112 MVA 230-34.5 kV transformers One 230 kV ring bus with a six-breaker circuit configuration
Sycolin Creek	4.7	Two 112 MVA 230-34.5 kV transformers One 230 kV ring bus with a four-circuit breaker configuration
Starlight	4.5	Two 84 MVA 230-34.5 kV transformers One six 230 kV ring bus with a six-circuit breaker configuration
Lunar	4.0	Two 112 MVA 230-34.5 kV transformers One 230 kV gas insulated switchgear ring bus with a six-circuit breaker configuration
Apollo	5.0	Two 84 MVA 230-34.5 kV transformers One 230 kV ring bus with a five-circuit breaker configuration

The substations will also have room to accommodate future load growth. Due to size restrictions, the Company will utilize gas insulated switchgear equipment at the Lunar Substation. Customer C will pay an excess facilities charge for this equipment. The Apollo-Twin Creeks Project also will require minor work at the Edwards Ferry and Pleasant View Substations, including line terminal and protection updates and control enclosures. This work is not a component of the Apollo-Twin Creeks Project, and its costs are not included in the Apollo-Twin Creeks Project cost estimate.[102]

ROW. Dominion proposed to construct the Apollo-Twin Creeks Lines on entirely new ROW. The ROW width is predominantly 100 feet, though it will extend to 140 feet in two locations. The first expansion, approximately 0.2 miles long, will allow the Apollo-Twin Creeks Lines to pass under the proposed Aspen-Golden Lines to enter the proposed Sycolin Creek Substation. The second expansion, approximately 0.1 miles long, enables the Apollo-Twin Creeks Lines to leave the proposed Starlight Substation and pass under the Aspen-Golden Lines. Where the Aspen-Golden Lines are collocated with the Apollo-Twin Creeks Lines, the ROW will vary in width from 200 to 260 feet.[103]

The Apollo-Twin Creeks Route crosses 14 privately owned parcels, nine (64%) of which are owned by Customers A, B, and C.[104]

Structures. The Apollo-Twin Creeks Lines would be supported by 13 structures: nine dulled galvanized steel monopole double dead-end structures; three two-pole double dead-end

[101] *Id.* at Attached Appendix, pp. 130-31.
[102] *Id.* at Attached Appendix, pp. 130-31 and n.33.
[103] *Id.* at Attached Appendix, pp. i-ii and n.3, and p.78 n.28.
[104] *Id.* at Attached Appendix, p. 89.

structures; and one monopole suspension structure.[105] The structures will have a minimum height of 85 feet, a maximum height of 135 feet, and an average height of 112 feet.[106]

Cost. The total estimated cost for the Apollo-Twin Creeks Project is approximately $299.0 million, which comprises approximately $32.7 million for transmission work and approximately $266.3 million for substation work. Substation-specific costs are as follows:[107]

Twin Creeks	$63.4 million
Sycolin Creek	$39.2 million
Starlight	$40.6 million
Lunar	$73.2 million
Apollo	$50.0 million

The costs for the Apollo-Twin Creeks Project are allocated 100% to PJM's DOM Zone.[108]

Need. Dominion asserted the Apollo-Twin Creeks Project is necessary (i) to serve three new data center campuses in the Leesburg Load Area, which Dominion defined as an area bounded by Leesburg Pike on the north, Crosstrail Boulevard on the west, State Route 267 (Dulles Greenway) and State Route 625 (Ashburn Farm Parkway) to the south, and State Route 901 (Claiborne Parkway) and the Ashburn Community on the east; (ii) to maintain reliable service for load growth in the area; and (iii) to comply with mandatory NERC Reliability Standards. More specifically, the Twin Creeks Substation is needed to serve Customer A; the Sycolin Creek and Starlight Substations are needed to serve Customer B; and the Lunar and Apollo Substations are needed to serve Customer C. Dominion explained that PJM designated the Apollo-Twin Creeks Project as a supplemental project to interconnect new load.[109]

Schedule. Dominion proposed an Apollo-Twin Creeks Project in-service date of September 30, 2028, with construction expected to begin around March 2025. Dominion estimated it will need approximately 47 months, after the Commission issues a CPCN, for detailed engineering, procurement of materials, permitting, real estate, and construction. Given the possibility of delays, Dominion requested the Commission's final order approve both an in-service target date of September 30, 2028, and a CPCN sunset date of September 30, 2029.[110]

Dominion Direct Testimony

With the Aspen-Golden and Apollo-Twin Creeks Applications, Dominion offered the direct testimony of the following witnesses: Kunal S. Amare, Matthew B. Vinson, Kamlesh A. Joshi, James P. Young, and Jacob M. Rosenberg.

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[105] *Id.* at Attached Appendix, pp. 98-103.
[106] *Id.* at Attached Appendix, pp. 98-100 and 217. The Apollo-Twin Creeks Application indicated that these structure heights do not account for those structures that are within the substations' footprints. *Id.* at Attached Appendix, p. 97 n.31.
[107] *Id.* at Attached Appendix, p. 41.
[108] *Id.* at Attached Appendix, p. 42.
[109] *See, e.g., id.* at Attached Appendix, pp. 1-5, 17.
[110] *See, e.g., id.* at Attached Appendix, pp. 39-40.

Kunal S. Amare is a Consulting Engineer in the Company's Electric Transmission Planning Department. He is responsible for planning the Company's electric transmission system for voltages of 69 kV through 500 kV.[111] He sponsored or co-sponsored those sections of the Aspen-Golden and Apollo-Twin Creeks Application Appendices describing Dominion's electric transmission system and the need for, and benefits of, the proposed projects, as follows:[112]

- Executive Summary: This section provides a high-level overview of the need for and components of the project, estimated conceptual cost, and project schedule.
- Section I.A: This section details the primary justifications for the project.
- Section I.B: This section details the engineering justifications for the project.
- Section I.C: This section describes the present system and details how the project will effectively satisfy present and projected future load demand requirements.
- Section I.D: For the Aspen-Golden Application, this section describes critical contingencies and associated violations due to the inadequacy of the existing system. This section is not applicable to the Apollo-Twin Creeks Project.
- Section I.E: This section explains alternatives, if any, to the project.
- Section I.G: This section provides a system map of the affected area.
- Section I.H: This section provides the desired project in-service date and the estimated construction time.
- Section I.J: This section provides information about the project if approved by PJM.
- Section I.N: This section provides the proposed and existing generating sources, distribution circuits or load centers planned to be served by all new substations, switching stations, and other ground facilities associated with the project.
- Section II.A.3: This section provides color maps of existing or proposed ROW in the project vicinity.
- Section II.A.10: This section provides details of the construction plans for the project, including requested and approved line outage schedules.

During the hearing, Mr. Amare testified that projects such as the Aspen-Golden Project, that PJM considers reliability projects, support the entire PJM area, not particular customers.[113] He also explained that PJM's final forecast considers its own load forecast, which traditionally has been a minimum forecast, along with distribution company and customer forecasts.[114]

Matthew B. Vinson is a Consulting Engineer in the Company's Electric Transmission Line Engineering Department. He is responsible for the estimating, conceptual, and final design of high voltage transmission line projects from 69 kV to 500 kV.[115] He sponsored or

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[111] Ex. 6 (Amare Direct) at 1 (Aspen-Golden Application).
[112] *Id.* at Summary Page and 4 (Aspen-Golden Application) and at Summary Page and 3 (Apollo-Twin Creeks Application). *See also* Letter from Vishwa B. Link, Esquire, of McGuireWoods LLP, dated September 5, 2024, to Bernard Logan, Clerk of the Commission, filed in the Combined Cases ("Dominion First Witness Adoption Notice") at 1 (noting Mr. Amare's adoption of the pre-filed direct testimony of Brittany S. Rieckmann in the Apollo-Twin Creeks Application).
[113] *See, e.g.*, Tr. at 410-15 (Amare).
[114] *Id.* at 435-36 (Amare).
[115] Ex. 7 (Vinson Direct) at 1 (Aspen-Golden Application).

co-sponsored those sections of the Aspen-Golden and Apollo-Twin Creeks Application Appendices describing the design characteristics of the transmission facilities for the projects and discussing electric and magnetic field ("EMF") levels, as follows:[116]

- Executive Summary: This section provides a high-level overview of the need for and components of the project, estimated conceptual cost, and project schedule.
- Section I.A: This section details the primary justifications for the project.
- Section I.F: This section describes any lines or facilities that will be removed, replaced, or taken out of service upon completion of the Aspen-Golden Project. This section is not applicable to the Apollo-Twin Creeks Project.
- Section I.I: This section provides the estimated total project cost.
- Section II.A.5: This section provides drawings of the ROW cross section showing typical transmission line structure placements.
- Sections II.B.1 to II.B.2: These sections provide the line design and operational features of the project, as applicable.
- Sections II.B.3 to II.B.5: These sections provide supporting structure details along the project's proposed (and alternative, if applicable) routes. Section II.B.4, which concerns proposed structures for feasible alternative routes, is not applicable to the Apollo-Twin Creeks Project. Section II.B.5, which concerns structure details for lines being rebuilt, is not applicable to either project.[117]
- Section II.B.6: This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section IV: This section provides analysis on the health aspects of EMF levels.
- Section V.A: This section provides the proposed route description and structure heights for notice purposes.

During the hearing, Mr. Vinson testified that reconductoring or upgrading existing infrastructure would not adequately meet the reliability needs for the area. He added that Dominion uses ACSS/TW/HS conductors, with improved ampacity, on 230 kV circuits to achieve maximum ampacity given currently available technology.[118]

Kamlesh A. Joshi is a Senior Electrical Engineer in the Transmission and Distribution Services Department at Burns & McDonnell. He is responsible for evaluating substation project requirements, feasibility studies, conceptual physical design, scope development, preliminary engineering and cost estimating for high voltage transmission and distribution substations.[119] He sponsored or co-sponsored the following sections of the Aspen-Golden and Apollo-Twin Creeks Application Appendices:[120]

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[116] *Id.* at Summary Page and 4 (Aspen-Golden Application) and at Summary Page and 3 (Apollo-Twin Creeks Application). *See also* Dominion First Witness Adoption Notice at 1 (noting Mr. Vinson's adoption of the pre-filed direct testimony of Shannon L. Snare in the Apollo-Twin Creeks Application).

[117] *See* Ex. 4 (Aspen-Golden Application) at Attached Appendix, p. 234; Ex. 5 (Apollo-Twin Creeks Application) at Attached Appendix, pp. 97-105.

[118] Tr. at 446-48 (Vinson).

[119] Ex. 8 (Joshi Direct) at 1 (Aspen-Golden Application).

[120] *Id.* at Summary Page and 4 (Aspen-Golden Application) and at Summary Page and 3 (Apollo-Twin Creeks Application). *See also* Dominion First Witness Adoption Notice (noting Mr. Joshi's adoption of the pre-filed direct testimony of George C. Brimmer in the Apollo-Twin Creeks Application).

- Executive Summary: This section provides a high-level overview of the need for and components of the project, estimated conceptual cost, and project schedule.
- Section I.A: This section details the primary justifications for the project.
- Section I.I: This section provides the estimated total project cost.
- Section II.C: This section describes and furnishes one-line diagrams of the substations associated with the project.

James P. Young is an Environmental Services Electric Transmission Environmental Specialist III for the Company. He sponsored Sections V.B through V.D of the Application Appendices, related to public notice of each project. In addition, he co-sponsored the DEQ Supplement with Company Witness Rosenberg and the following sections of the Aspen-Golden and Apollo-Twin Creeks Application Appendices:[121]

- Section I.H (for Apollo-Twin Creeks Application only): This section provides the desired project in-service date and the estimated construction time.
- Section II.A.11: This section details how the construction of the project follows the provisions discussed in Attachment 1 of the Transmission Appendix Guidelines.
- Section III. This section details the impact of the proposed project on scenic, environmental, and historic features.

Jacob M. Rosenberg is a Principal Consultant with Environmental Resources Management ("ERM"). He is responsible for supporting transmission line projects by handling communications with property owners and other stakeholders impacted by proposed electric transmission projects. Additionally, he communicates the impacts and benefits of Dominion's proposed projects to the public by functioning as a liaison between the community and the Company's Electric Transmission Team.[122] He sponsored the Environmental Routing Study, he co-sponsored the DEQ Supplement with Company Witness Young, and he sponsored or co-sponsored the following portions of the Aspen-Golden and Apollo-Twin Creeks Application Appendices, as follows:[123]

- Executive Summary: This section provides a high-level overview of the need for and components of the project, estimated conceptual cost, and project schedule.

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[121] Ex. 43 (Young) at Summary Page and 4 (Aspen-Golden Application) and at Summary Page and 3 (erroneously numbered as the second page 2) (Apollo-Twin Creeks Application). *See also* Letter from Vishwa B. Link, Esquire, of McGuireWoods LLP, dated September 12, 2024, to Bernard Logan, Clerk of the Commission, filed in the Combined Cases ("Dominion Second Witness Adoption Notice") at 1-2 and Attachments 1 and 2 (noting those portions of the pre-filed direct testimony of Laura P. Meadows in the Aspen-Golden Application that Mr. Young is adopting, and those portions of the pre-filed direct testimony of Craig R. Hurd in the Apollo-Twin Creeks Application that Mr. Young is adopting).

[122] Ex. 9 (Rosenberg Direct) at 1 (Aspen-Golden Application).

[123] *Id.* at Summary Page and 6-7 (Aspen-Golden Application) and Summary Page and 5 (Apollo-Twin Creeks Application). *See also* Dominion First Witness Adoption Notice at 1 (noting Mr. Rosenberg's adoption of the pre-filed direct testimony of Roya P. Smith in the Apollo-Twin Creeks Application); Dominion Second Witness Adoption Notice at 1-2 and Attachments 1 and 2 (noting those portions of the pre-filed direct testimony of Laura P. Meadows in the Aspen-Golden Application that Mr. Rosenberg is adopting and those portions of the pre-filed direct testimony of Craig R. Hurd in the Apollo-Twin Creeks Application that Mr. Rosenberg is adopting).

- Section I.A: This section details the primary justifications for the project.
- Section I.H (for Apollo-Twin Creeks Application only): This section provides the desired project in-service date and the estimated construction time.
- Section II.A.1: This section provides the length of the proposed corridor and viable alternatives to the project.
- Section II.A.2: This section provides a map showing the project route in relation to notable points close to the project.
- Section II.A.4: This section explains why the existing ROW is inadequate to serve the need.
- Sections II.A.6 to II.A.8: These sections provide detail regarding the ROW for the project.
- Section II.A.9: This section describes the proposed route selection procedures and details alternative routes considered.
- Section II.A.11: This section details how the construction of the project follows the provisions discussed in Attachment 1 of the Transmission Appendix Guidelines.
- Section II.A.12: This section identifies the counties and localities through which the project will pass and provides General Highway Maps for these localities.
- Sections II.B.3 to II.B.4: These sections provide supporting structure details along the project's proposed (and alternative, if applicable) routes. Section II.B.4, which concerns proposed structures for feasible alternative routes, is not applicable to the Apollo-Twin Creeks Project.[124]
- Section II.B.6: This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section III: This section details the impact of the project on scenic, environmental, and historic features.
- Section V.A: This section provides the proposed project route description and structure heights for notice purposes.

During the hearing, Mr. Rosenberg walked through a map showing the Aspen-Golden Route, the Apollo-Twin Creeks Route, an underground route considered by Company consultant Black & Veatch, and Loudoun County's Updated Hybrid Proposal.[125] He testified that since the Company did not have Loudoun County's dataset, the Company positioned the Underground Hybrid Proposal by georeferencing points such as road ROW and parcel lines. He asserted, "And with a pretty high degree of certainty, you've placed that in an accurate location that is to scale."[126]

On cross-examination, Mr. Rosenberg also addressed what Dominion perceived as flaws with the Initial Hybrid Proposal RLC had developed for the Conservancy, which were discussed in a February 2024 meeting. Mr. Rosenberg stated these perceived flaws include ROW width,

[124] *See* Ex. 4 (Aspen-Golden Application) at Attached Appendix, p. 234; Ex. 5 (Apollo-Twin Creeks Application) at Attached Appendix, pp. 97-105.
[125] Tr. at 454-523 (Rosenberg). *See also* Ex. 10 (Ruling ¶ 2 Exhibit Map).
[126] Tr. at 670-71 (Rosenberg). *See also id.* at 783-84 (in which counsel for Loudoun County noted, with regard to the depiction of the Updated Hybrid Proposal on Exhibit 10, that "the shape files didn't get to the Company in time.").

cables per phase in the Initial Hybrid Proposal, and the need for workspace where the underground line passes under roadways, waterbodies, or wetlands.[127]

When asked if any underground transmission line in Loudoun County, not just the Aspen-Golden Updated Hybrid Proposal, would face three additional issues Dominion pointed out – soil compaction, potential damage to underground utilities, and the prevalence of hard diabase rock – Mr. Rosenberg responded, "For the most part, with the distinction that a trenched line in other areas of the [C]ounty could encounter, say, less adverse geologic conditions where diabase rock is not present so close to the surface."[128] He acknowledged Dominion did not drill test or conduct other soil testing methods along the route of Loudoun County's Updated Hybrid Proposal but instead relied on U.S. Geologic Survey and Virginia state agency information, as well as maps of the area showing quarry sites.[129] He asserted that given the engineering and routing issues surrounding underground line options, the Company did not need to perform drill testing.[130]

Mr. Rosenberg also was cross-examined about the Company's 44-month construction estimate for the proposed overhead Aspen-Golden Lines versus Black & Veatch's 47-month construction estimate for an 8.5-mile underground route for the Aspen-Golden Lines. Mr. Rosenberg distinguished these estimates, asserting that the Company's experience with overhead line construction means it is more familiar with the construction and permitting required, and thus renders the overhead construction estimate more accurate. Conversely, he testified that the 47-month estimate for underground construction is "this isolated, like perfect condition" for undergrounding that does not account for issues such as vested land rights, unknowns surrounding buried utilities, and construction methods.[131] He revisited this topic on redirect examination, testifying that the 44-month timeframe for overhead construction includes detailed engineering, materials procurement, permitting, real estate, and construction.[132]

Mr. Rosenberg emphasized an underground 3.7-mile line in Chino Hills, California was built entirely along that electric utility's already-owned ROW, meaning Southern California Edison "had . . . a clear right-of-way where [it] could have all of [its] workspace contained within something the company owned." He noted in the case of the Aspen-Golden Lines, Dominion owns only "a few smaller slivers of existing distribution rights-of-way."[133]

Respondent Testimony

Multiple respondents provided testimony. Summaries of these testimonies, in alphabetical order by respondent full name, follow.

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[127] *Id.* at 547-53 (Rosenberg).
[128] *Id.* at 609-10 (Rosenberg).
[129] *Id.* at 611-12 (Rosenberg).
[130] *Id.* at 663-64 (Rosenberg).
[131] *Id.* at 619, 622-25 (Rosenberg). *See also* Ex. 47 (Moulton Rebuttal) at Attached Rebuttal Schedule 1, p. 18 for an indication that the Black & Veatch-designed underground line was 8.5 miles long.
[132] Tr. at 665-66 (Rosenberg).
[133] *Id.* at 620-21 (Rosenberg).

Allan Myers VA, Inc.

For context, the 500 kV and 230 kV Aspen-Golden Lines each proceed from separate structures at the proposed Aspen Substation and converge on the Allan Myers property, north of Cochran Mill Road.[134]

Allan Myers offered the testimony of **Curtis Hall**, Senior Vice President of Asphalt and Paving for Allan Myers. Mr. Hall testified that Allan Myers is located at 42050 Cochran Mill Road, Leesburg, Virginia, on approximately ten acres, and that Allan Myers' property will be negatively impacted by the Aspen-Golden Lines. Specifically, he explained the Aspen-Golden route traverses the southern portion of Allan Myers' property, and Dominion proposes to locate two transmission structures on the property. According to Mr. Hall, Allan Myers plans to build an approximately 3,500 square foot multi-purpose building on this portion of the property within two to three years. If the Aspen-Golden Lines are built as proposed, the planned building location would be in the 150-foot ROW required for the Aspen-Golden transmission structures. Mr. Hall averred that Dominion's Guidelines for Use of Real Estate Encumbered by Electric Transmission Rights of Way and Dominion's proposed Transmission Right of Way Agreement (VA) prohibit construction of the multi-purpose building in the ROW for the Aspen-Golden Lines. Mr. Hall asserted the multi-purpose building cannot be moved elsewhere on Allan Myers' property without negatively impacting current operations and storage area. Mr. Hall requested that Dominion modify the Aspen-Golden Route to allow construction of the multi-purpose building.[135]

JK Land Holdings, LLC

For context, the record discussed at least three properties JKLH owns that will be impacted by one or both of the Aspen-Golden and Apollo-Twin Creeks Projects. These are: JKLH's "Customer A" Property, with a data center to be served by the Twin Creeks Substation; JKLH's "Belmont Property," an approximately 108-acre parcel of land JKLH owns near the southeast corner of the intersection of Route 7 and Belmont Ridge Road, located between mileposts 2.0 and 2.9 of the proposed Aspen-Golden Route, which JKLH plans to develop as a data center; and JKLH's "Telos Property," located to the west of Community Church, where a data center may be built in the future. These are shown on the map below. The Customer A Property is at the tip of the orange arrow on the map. The Belmont Property is at the tip of the dark blue arrow. The Telos Property is marked approximately at the tip of the aqua blue arrow.[136]

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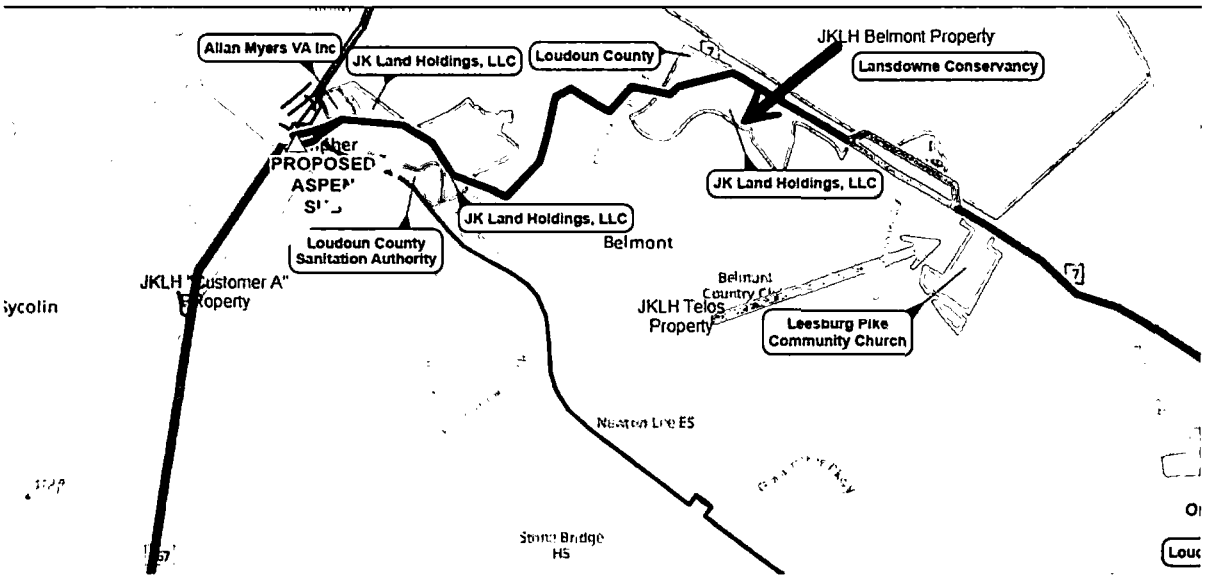
[134] *Id.* at 463-65 (Rosenberg).

[135] Ex. 17 (Hall Direct) at 1-2 and Attached Exhibits 1-4.

[136] The map is a portion of Ex. 12 (Yudd Direct) at Attached Exhibit A. For the markings of the properties and their uses, *see also id.* at 6-7 and Attached Exhibit B; Ex. 11 (Tock Direct) at 2; Ex. 10 (Ruling ¶ 2 Exhibit Map) at pp. 1 of 5A and 2 of 5A; Tr. at 497-98 (Rosenberg). The Hearing Examiner added the orange, dark blue, and aqua blue arrows with their corresponding labels for clarity and better visibility of the subject properties on the map.



JKLH's testimony mainly addresses the Belmont Property. They also refer to the "Site Plan" for the Belmont Property. This document, filed with Loudoun County, is "Belmont Landbay KK Data Center, Plan Number STPL-2023-0025." The Site Plan originally was submitted to Loudoun County on behalf of the prior property owner, Toll Brothers, Inc. The Site Plan was assigned to JKLH in connection with JKLH's acquisition of the Belmont Property in February 2024. The Site Plan includes two 504,000 square-foot, three-story data centers able to provide up to 300 MW of power to users of each building, a construction laydown area, an equipment yard, and an office building.[137] With this background, summaries of the pre-filed testimony of JKLH's witnesses, Charles Yudd, Clayton Tock, Brian C. Andrews, and Andrew M. Forrest, follow.

Charles Yudd is Director of Land Planning and Development for JKLH. He described his previous career, including 27 years working for Loudoun County in the areas of land use and zoning, among other responsibilities. He also stated that he was the executive in charge of the Loudoun County zoning ordinance rewrite, which resulted in adoption of a new zoning ordinance on December 13, 2023.[138] Mr. Yudd described JKLH as one of the largest developers of data center sites in Northern Virginia, with projects in both Loudoun and Prince William Counties. He also discussed JKLH's commitment to conservation.[139]

According to Mr. Yudd, JKLH owns, through subsidiaries, nine properties affected by the Aspen-Golden Project and/or the Apollo-Twin Creeks Project. Specifically, he noted that JKLH owns the property that will host Data Center A and the Twin Creeks Substation discussed in the Apollo-Twin Creeks Application. He stated JKLH does not oppose the proposed Apollo-Twin Creeks Route.[140]

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[137] Ex. 11 (Tock Direct) at 3-4 and attached Exhibit A; Ex. 12 (Yudd Direct) at 10-11.
[138] Ex. 12 (Yudd Direct) at 1-2.
[139] *Id.* at 3-4.
[140] *Id.* at 6-7.

Mr. Yudd focused on the impact of the Aspen-Golden Project to JKLH's Belmont Property, contending the proposed Aspen-Golden Route "will completely eliminate JKLH's ability to develop the Belmont Property efficiently, effectively, and productively as an economically viable data center project – the sole purpose for which JKLH paid $185,000,000 to acquire the Belmont Property."[141] He averred the proposed Aspen-Golden Route would impact the Belmont Property in such a way that the Site Plan submitted to Loudoun County would be impossible to develop. He testified the proposed route would cross the drive aisle, parking area, and equipment yard of Data Center Building B on the Belmont Property Site Plan, and Dominion's proposal includes locating a transmission structure in the area proposed for the equipment yard.[142] Mr. Yudd asserted Dominion failed to consider the equipment that must be housed at the equipment yard, some pieces of which are 70 feet tall. He also claimed Dominion's proposal would interfere with JKLH's ability to install, maintain, and service the cooling and mechanical equipment around Data Center Building B's perimeter.[143]

Mr. Yudd explained that Loudoun County allowed data center development by right (*i.e.*, through approval of the Loudoun County Department of Building and Development and without further Board of Supervisors' approval[144]) until December 13, 2023, on properties zoned as Office Park, like the Belmont Property. The Board of Supervisors removed the by-right data center use for Office Park-zoned properties as of December 13, 2023. However, JKLH determined, when purchasing the Belmont Property, that it could continue to develop the Belmont Property for data center use by right because of a resolution the Board of Supervisors passed at the same time it removed the by-right data center use option. The resolution provided that site plans accepted for review before December 13, 2023, would continue to be reviewed pursuant to the previous ordinance allowing by-right data center use "provided the applicant does not make any substantial modification(s) to such application."[145] Mr. Yudd maintained that even if the Site Plan could be amended to reduce Data Center Building B's size to accommodate Dominion's proposed Aspen-Golden Route, the act of amending the Site Plan could forfeit any owner's ability to develop the Belmont Property as a data center. He averred that "the change of the Site Plan with respect to the reduction in size of Belmont Data Center Building B required to avoid the Proposed Route would constitute 'substantial modification' under the . . . [r]esolution."[146]

Mr. Yudd explained that if the Site Plan were assessed under the new zoning ordinance, JKLH would have to expend "substantial additional time and expense" to ty to obtain a special exception from Loudoun County to place a data center on the Belmont Property, which exception is granted by the Board of Supervisors. In Mr. Yudd's opinion, such a situation "likely jeopardizes any data center development on the Belmont Property."[147] He stated the 2019 Loudoun County Comprehensive Plan shows the Belmont Property in an area planned for suburban mixed use, a designation that does not include data centers as a core, complementary, or conditional land use and thus raises concern as to whether the Board of Supervisors would

[141] *Id.* at 5-6.
[142] *Id.* at 9-10.
[143] *Id.* at 11-12.
[144] *Id.* at 15.
[145] *Id.* at 11-13.
[146] *Id.* at 13-14.
[147] *Id.* at 17.

approve a special exception for a data center on the Belmont Property. He also discussed recent Board of Supervisors' actions that appear to reflect less openness to data centers.[148]

Mr. Yudd discussed two options that would allow JKLH to develop the Site Plan with minimal adverse impact: (i) the Freedom Center Variation, discussed in the Aspen-Golden Application; and (ii) the Belmont Landbay KK Variation, described in more detail by JKLH Witness Andrews. Mr. Yudd recommended approval of the second option.[149] In discussing these choices, Mr. Yudd stressed that the Loudoun Freedom Center is not a planned development but only part of a prior submission that is subject to change by JKLH. He emphasized that JKLH will donate part of its property to the African American Cemetery for the Enslaved at Belmont ("African American Cemetery"), for development of the Loudoun Freedom Center, if one of these options is approved but stressed that if the Belmont Property cannot be developed as an economically viable data center, JKLH would not be in a position to donate the property.[150]

Mr. Yudd explained the Belmont Landbay KK Variation was jointly developed by Dominion, JKLH, and Pastor Michelle Thomas (owner of the African American Cemetery) to offer a solution that allows construction of the Aspen-Golden Project, the Belmont Property data center campus, and the Loudoun Freedom Center. This variation makes minimal changes to the proposed Aspen-Golden Route between mileposts 2.1 and 2.4 to keep the transmission line and ROW from crossing the equipment yard. Additionally, under this variation, the transmission line infrastructure and ROW would only marginally encroach into the drive aisle of Data Center Building B on the Belmont Property. This variation would allow the proposed Aspen-Golden Project's adverse impacts to be avoided or reasonably minimized to the greatest extent reasonably practicable. Mr. Yudd requested the Commission approve the proposed Aspen-Golden Route with the Belmont Landbay KK Variation and provide Dominion and JKLH latitude to microsite this variation to accommodate construction needs.[151]

Clayton Tock, P.E., is a Principal at Urban, Ltd ("Urban") and Manager of Urban's Chantilly office, testifying on behalf of JKLH. Mr. Tock stated that among other things, Urban assists JKLH on matters such as new site analysis, rezoning, site plans, site survey, and construction administration. Specifically, Urban is working with JKLH on developing the Belmont Property, including work with design professionals and obtaining permits required for the Belmont Property Site Plan.[152]

Mr. Tock explained how the proposed Aspen-Golden Route would interfere with construction and maintenance of Belmont Property Data Center Building B. He stated the proposed route crosses over Data Center Building B's drive aisle and encroaches approximately 83 feet into the equipment yard, which houses backup generators, transformers, and switch gear.

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[148] *Id.* at 17-19.
[149] *Id.* at 20-21.
[150] *Id.* at 22-25, 27.
[151] *Id.* at 25-27. In comments approximately two weeks before JKLH filed its testimony, Pastor Thomas stated the Freedom Center and the African American community are most negatively impacted by the route proposed in the Aspen-Golden Application. Pastor Thomas stated she had requested Dominion move the Aspen-Golden Lines westward to ensure boundary protection for the African American Cemetery. Comments of Pastor Michelle Thomas (filed July 31, 2024).
[152] Ex. 11 (Tock Direct) at 1-3.

Some of these items will be placed on a structural raised equipment yard to service the upper floors of Data Center Building B. To construct and maintain this equipment, a crane with a boom extending upward of 120 feet is needed. Mr. Tock explained that the height of the transmission conductors over the drive aisle and equipment yard would prevent such cranes from being able to place this equipment and maintain equipment both in the equipment yard and on Data Center Building B's rooftop.[153]

Mr. Tock next discussed the unavoidability of the proposed Aspen-Golden Route's impacts to the Belmont Property Site Plan. He explained that the most Data Center Building B may be shifted is 15 feet to the west, meaning the proposed route would still encroach into the equipment yard by approximately 68 feet. Nor, he testified, can the equipment yard be located outside the proposed route's ROW because of (i) a stream on the Belmont Property, and (ii) the configuration of the power lines serving the inner-most data halls in Data Center Building B. Mr. Tock claimed the only way to avoid negative impacts from the Aspen-Golden Route would be to shrink the depth of Data Center Building B, which in his opinion "would result in a data center building that is not marketable to a prospective purchaser or tenant."[154] Mr. Tock agreed either the Freedom Center Variation or the Belmont Landbay KK Variation would avoid adverse impacts to the Belmont Property and the Site Plan.[155]

As for the Freedom Center Variation, Mr. Tock testified that Urban coordinated with Forrest Environmental Services, Inc., to conduct electromagnetic and ground penetrating radar surveys of the portion of the Belmont Property within the ROW of the Freedom Center Variation. Due to time constraints, the entire area of the Belmont Property between the stream and the African American Cemetery was not surveyed. Rather, the survey boundaries were chosen based on the anticipated locations of the transmission poles for the Freedom Center Variation. No unmarked graves were found in the surveyed areas. Mr. Tock reported that Pastor Thomas expressed support for the Freedom Center Variation in November 2023, and that this variation would allow the Belmont Property to be developed consistent with the Site Plan.[156]

According to Mr. Tock, coordination continued among JKLH, Dominion, and Pastor Thomas to develop the Belmont Landbay KK Variation. This variation shifts the Aspen-Golden Project ROW between mileposts 2.1 and 2.4 to keep it away from the equipment yard. This variation also causes only marginal encroachment in the Data Center Building B drive aisle. Further, this variation accommodates a crane to place necessary equipment for data center operation in the equipment yard. Mr. Tock recommended the Commission approve the Belmont Landbay KK Variation with latitude for Dominion and JKLH to microsite this variation. He explained microsite approval is needed because ongoing maintenance concerns and actual site conditions may require minor deviations of approximately 25 feet. Mr. Tock also reported that Pastor Thomas most recently expressed support for the Belmont Landbay KK Variation.[157]

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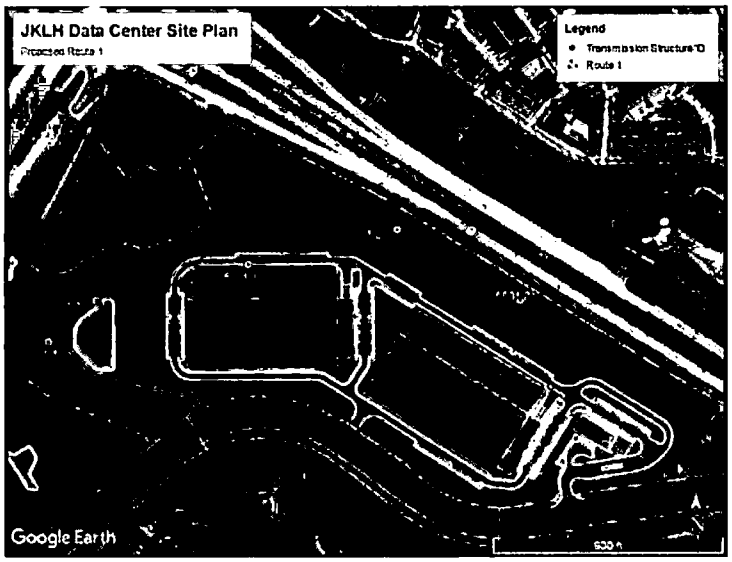
[153] *Id.* at 5-9.
[154] *Id.* at 10-12.
[155] *Id.* at 12, 15.
[156] *Id.* at 13-15 and Attached Exhibit G.
[157] *Id.* at 15-18 and Attached Exhibit I.

During the hearing, Mr. Tock testified that the underground portion of Loudoun County's Updated Hybrid Proposal appears to overlap "a little bit" with a stormwater management facility on the JKLH property.[158] He indicated that JKLH would have to modify its site plan with Loudoun County and such a change could possibly impact the property's grandfathered status, though he noted, "We don't know how [Loudoun] County would rule on that."[159]

Brian C. Andrews, a Principal with Brubaker & Associates, Inc., testified on behalf of JKLH.[160] He asserted JKLH's Belmont Property and its planned Belmont Landbay KK data center project would be adversely affected if Dominion constructed the Aspen-Golden Project along its proposed route.[161] He clarified he was not making any recommendation as to the need for the Aspen-Golden Project and was testifying only as to the portion of the proposed Aspen-Golden route between mileposts 2 and 2.4, in the vicinity of the JKLH Belmont Landbay KK data center development.[162]

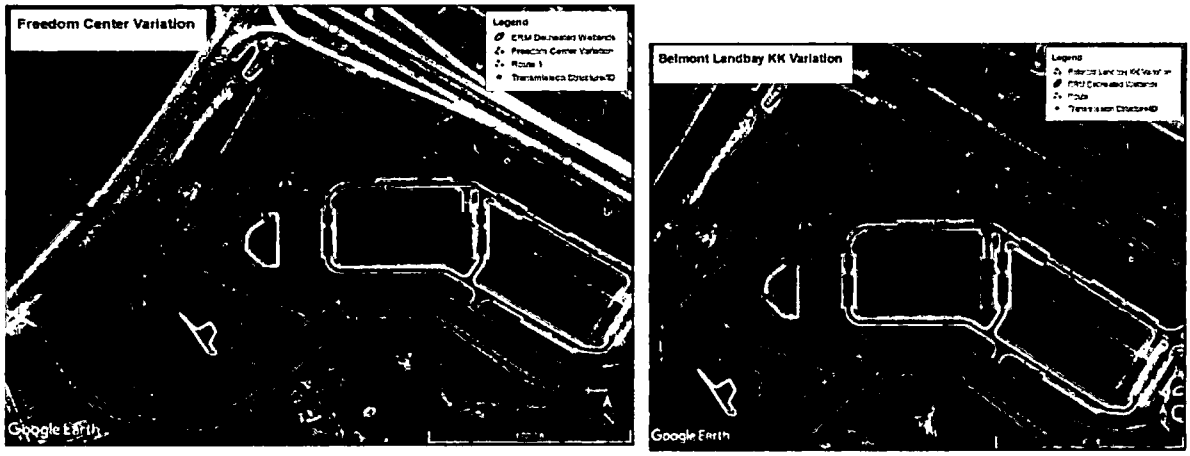
Specifically, Mr. Andrews claimed that construction of the proposed Aspen-Golden Route would bar JKLH from building a data center on JKLH's property consistent with the site plan filed with Loudoun County. He described two route alternatives that would allow for construction of the data center on the Belmont Property in accordance with the Site Plan: (i) the Freedom Center Variation; and (ii) the Belmont Landbay KK Variation. Mr. Andrews explained the Belmont Landbay KK Variation is preferred by both JKLH and Pastor Thomas, who intends to develop the Loudoun Freedom Center on land JKLH will donate if the Belmont Landbay KK Variation is approved.[163]



Mr. Andrews included figures showing the proposed Aspen-Golden Route, the Freedom Center Variation, and the Belmont Landbay KK Variation.[164] He provided the "JKLH Data Center Site Plan: Proposed Route 1" figure, which he asserted illustrates the proposed Aspen-Golden Route (blue line) in direct conflict with the footprint of one of the data center buildings.[165] He also described the Freedom Center Variation (green line), which would shift the Aspen-Golden Route northwest and across the

[158] Tr. at 530-31, 535 (Tock).
[159] *Id.* at 531-32 (Tock).
[160] Ex. 13 (Andrews Direct) at 1, 4.
[161] *Id.* at 4.
[162] *Id.* at 6.
[163] *Id.* at 11-12, 18.
[164] The figures may be found *id.* at 11, 13, and 17.
[165] *Id.* at 10-11.

creek running through the Belmont Property. The Belmont Landbay KK Variation (shifted green line), he stated, would also shift the Aspen-Golden Route northwest but would allow the transmission line structures to remain on the south side of the creek on the Belmont Property.[166]



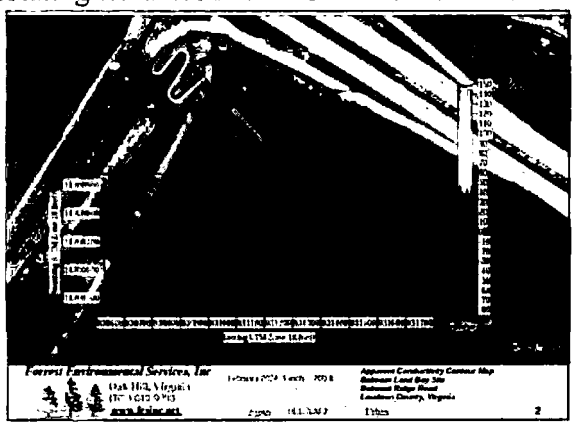
Mr. Andrews described the Freedom Center Variation as an alternative originally proposed by JKLH, which Dominion "prematurely rejected due to cultural resource concerns that should have been alleviated" by a study conducted by JKLH Witness Forrest. Mr. Andrews took issue with Dominion's claim that this variation would potentially impact unmarked gravesites at the African American Cemetery, noting Mr. Forrest's opinion that it is unlikely unmarked graves are on JKLH's Belmont Property. Mr. Andrews also disagreed with Dominion's claim the Freedom Center Variation would create increased wetland and waterbody impacts. Mr. Andrews testified the impacts to wetlands would be nearly identical to the impacts from the proposed Aspen-Golden Route since the creek is roughly in the middle between the proposed route and Freedom Center Variation. Finally, he disagreed that the Freedom Center Variation would prevent development of the Loudoun Freedom Center. He testified that if the Freedom Center Variation is approved and JKLH obtains other project approvals, JKLH would be able to donate the land to Pastor Thomas for the Loudoun Freedom Center.[167]

According to Mr. Andrews, the Belmont Landbay KK Variation was jointly developed by Dominion, JKLH, and Pastor Thomas. Mr. Andrews stated this variation would allow for the construction of the data center campus, the Loudoun Freedom Center, and the Aspen-Golden Project. He described the benefits of this variation, including that it is only 18 feet longer than the comparable portion of the proposed Aspen-Golden Route, would have the same number of structures, and would keep the Aspen-Golden Lines on the south side of the creek on the Belmont Property. Mr. Andrews stated he does not expect any material difference in cost between this variation and the proposed route. He requested that the Commission approve the Belmont Landbay KK Variation and afford JKLH and Dominion latitude to microsite this variation to accommodate construction and maintenance needs, such as a 25-foot adjustment to the ROW, based on field conditions and the Site Plan.[168]

[166] *Id.* at 12, 16.
[167] *Id.* at 13-15.
[168] *Id.* at 16-19.

Andrew M. Forrest is the President of Forrest Environmental Services, Inc., and a registered Professional Geologist with the Commonwealth of Virginia. He testified on behalf of JKLH and presented the results of a geophysical survey of JKLH's Belmont Property, along with his conclusion that there is unlikely to be any unmarked grave sites or other buried anthropogenic material on the Belmont Property.[169]

Mr. Forrest explained that on February 15-17, 2024, his company conducted ground penetrating radar and electromagnetic surveys on three sites (the green polygons in the diagram) totaling ten acres in the northwest corner of the Belmont Property, between the creek on the Belmont Property and the African American Cemetery/ Loudoun Freedom Center site (marked by the dark pink "X" in the diagram), in an attempt to locate grave sites and other anthropogenic material. He testified that the survey data collections were consistent with industry standards.[170]



Mr. Forrest gave his "professional opinion, to a reasonable degree of scientific certainty, that buried grave sites and other buried material would be highly unlikely on the Belmont Property based on [his] survey and based on the surface characteristics of the Belmont Property."[171] He explained that the creek and presence of large boulders in the survey areas and in the vicinity of those areas may inhibit burial activity.[172]

Lansdowne Conservancy

Tom Jeavons, President of Lansdowne Conservancy, testified on behalf of the Conservancy. He supported Loudoun County's proposal to underground parts of the Aspen-Golden Lines. He testified that if the Commission does not require Dominion to underground the Aspen-Golden Lines, the Conservancy supports Belmont Park Variation A over Belmont Park Variation B.[173]

Mr. Jeavons explained the Conservancy is an overarching property owners' association composed of all who own property in the Conservancy, some of whom also are members of sub-associations. Members of the Conservancy include: Lansdowne Resort, Inova Loudoun Hospital, National Conference Center, Saul Shopping Center, numerous office and medical buildings, condominium owners, and various homeowners' associations (the latter of which include Lansdowne on the Potomac Homeowners' Association, Lansdowne Village Green

[169] Ex. 14 (Forrest Direct) at 1-2.
[170] *Id.* at 3-5. The diagram may be found *id.* at 6 and on attached Exhibit B, p. 6 (unnumbered). The Hearing Examiner added the dark pink "X" for better visibility of the approximate site of the African American Cemetery and Loudoun Freedom Center.
[171] *Id.* at 8.
[172] *Id.* at 8-9.
[173] Ex. 15 (Jeavons Direct) at 1-2.

Homeowners' Association and the Lansdowne Woods Condo Associations). Mr. Jeavons reported the combined real estate assets of the Conservancy have an assessed value of over $3.3 billion.[174]

Mr. Jeavons discussed the influx of data centers into Loudoun County in the past 15 years and data centers' peak demand and energy usage, as indicated in Dominion's 2023 Integrated Resource Plan. He asserted the Aspen-Golden Application raises the question, "[H]ow do we ensure reliable electricity service for the behemoth needs of a single industry while at the same time being thoughtful and considerate to those who live in or near the data center communities?"[175] He urged the Commission to balance the need for power with the adverse impacts overhead transmission lines have on the local community, claiming "now is the time to introduce undergrounding as an alternative to overhead transmission lines and towers."[176] Mr. Jeavons suggested a pilot program to collect data about underground lines would benefit the public by providing an opportunity to learn more about underground lines' costs and reliability, in addition to other matters. He advocated for the Updated Hybrid Proposal as a plan that "ensure[s] the safe and reliable delivery of power where it is needed while preserving the scenic beauty and property values throughout Loudoun County."[177]

Mr. Jeavons acknowledged undergrounding is more expensive but insisted the Commission has not treated cost as the dispositive factor when deciding transmission line applications. He testified that undergrounding has economic benefits, including preventing property devaluation. He noted the growing backlash against data centers, arguing that proliferation of above-ground power lines is a major factor causing the outcry. He acknowledged officials in Loudoun County and elsewhere in Virginia are placing zoning and development constraints to protect properties and suggested that without appropriate measures, property owner backlash will continue, hindering both data center and economic development. He declared that undergrounding is an effective way to strike the right balance of welcoming the data center industry while shielding property owners from the negative impacts of overhead transmission lines.[178]

Mr. Jeavons claimed undergrounding the Aspen-Golden Lines is the only appropriate solution. Nonetheless, should the Commission decide not to require undergrounding, Mr. Jeavons advocated for Belmont Park Variation A over Belmont Park Variation B. He listed several concerns with Variation B, including:[179]

- Variation B would require two crossings of Route 7;
- Variation B would require more transmission structures;
- More residences fall within 250 feet of Variation B than Variation A;
- Variation B would have a higher impact on traffic; and

[174] *Id.* at 2.
[175] *Id.* at 3-4.
[176] *Id.* at 5.
[177] *Id.* at 5-6.
[178] *Id.* at 6-8.
[179] *Id.* at 8-9.

- Variation B's transmission structures would be closer to Inova Loudoun Hospital and its helipad.

He also discussed property-related concerns. First, he asserted that placing the Aspen-Golden Lines on the north side of Route 7, as Belmont Park Variation B would do, violates the Conservancy's restrictive covenant against above-ground utilities. This restrictive covenant is written in the Second Amended and Restated Declaration for Lansdowne ("Lansdowne Declaration"), recorded in Loudoun County land records. He claimed the restrictive covenant is a valuable real estate interest for all property owners governed by the Lansdowne Declaration. He testified that the Lansdowne Declaration and related Design Guidelines, which include the rules and regulations adopted pursuant to the Lansdowne Declaration, require utilities to be installed underground, "and Dominion is not exempt from that requirement."[180] He claimed that installation of the transmission infrastructure as proposed in Belmont Park Variation B would breach the restrictive covenant.[181]

Next, Mr. Jeavons contended that installation of the transmission infrastructure as proposed in Belmont Park Variation B would violate the scenic easement described by Loudoun County witnesses and would adversely impact property values in the Conservancy. Finally, he claimed Belmont Park Variation B would require the taking of real estate from Inova Loudoun Hospital and the Camden Apartments, again in violation of the restrictive covenants and restrictive scenic easement granted to the Loudoun County Board of Supervisors in 1991. He clarified that the scenic easement is imposed within 300 feet of the north side of Route 7.[182]

Mr. Jeavons provided a copy of the Lansdowne Declaration as an attachment to his testimony. Lansdowne Declaration Article 8, § 8.2 (k) reads in pertinent part: "Except for hoses and the like which are reasonably necessary in connection with construction activities or normal landscape maintenance, no water pipe, sewer pipe, gas pipe, drainage pipe, television cable or other similar transmission line shall be installed or maintained upon any Lot above the surface of the ground."[183] Similarly, in summarizing the restrictions and covenants applicable to Lansdowne, the Design Guidelines refer to Lansdowne Declaration § 8.2 (k) and state in pertinent part: "Other than as reasonably necessary for construction activities, all utilities must be installed below the surface of the ground."[184]

Leesburg Pike Community Church

Charles Whitlow, Lead Pastor of Leesburg Pike Community Church and Chancellor of Virginia Academy, testified on behalf of Community Church. He agreed with Loudoun County that the Aspen-Golden Lines should be placed underground. He contended that if the Commission does not require undergrounding, it should require Dominion "to site the poles in a

[180] *Id.* at 9. A copy of the Lansdowne Declaration is located *id.* at Attached Exhibit TJ-1.
[181] *Id.* at 9-10.
[182] *Id.* at 10.
[183] *Id.* at Attached Exhibit TJ-1, p. 48.
[184] *Id.* at Attached Exhibit TJ-2, p. 8.

way that causes the least impact to the Community Church's current and proposed uses for its land."[185]

Pastor Whitlow described Community Church's history. He stated that currently the church has approximately 4,000 members and is associated with a school, Virginia Academy, attended by approximately 1,000 students, whose curriculum encourages academics, fine arts, and athletics. He added that the church hosts summer camps for first through sixth graders. He noted that both the athletics and summer camp programs use land that would be in the ROW of the proposed Aspen-Golden Lines.[186]

Pastor Whitlow also described Community Church's expansion plans, for which it has already spent about $475,000 in architectural and engineering fees. He asserted Community Church plans to add playgrounds, a multi-use sports field, and signage to the front of its property, in the area Dominion has selected for its transmission line ROW. He added that the sports field and playgrounds will also be used by i9 Sports, a local children's recreational sports program. The land at issue now houses a berm, a pond, and a grassy area, the latter two of which already are used for outdoor activities and sports. Pastor Whitlow stated that if the Aspen-Golden Lines are built as proposed, Community Church would have to obtain an easement from Dominion for these activities.[187]

According to Pastor Whitlow, in addition to interfering with outdoor activities, the 183-foot transmission structures Dominion plans to build near the church would interfere with the Community Church steeple.[188] He commented that this steeple, which is lit up at night, and the church's placement along Route 7 were the church founder's dream to help the church serve the community. He classified the steeple as an iconic landmark in Loudoun County. He took issue with Dominion's analysis that the Aspen-Golden Lines would have a minor impact to Community Church as a visually sensitive resource. In short, he testified the transmission line would impede Community Church's plans for serving the community and its members in the future. Undergrounding, he asserted, would solve these problems by eliminating any impediments to Community Church's plans.[189]

Should the Commission not require the undergrounding, Pastor Whitlow requested the Commission require Dominion to factor in Community Church's current and future uses of its land when Dominion sites the Aspen-Golden Lines' steel monopoles. He noted that the front of the church's property is approximately 700 feet long, and Dominion indicated the distance between its poles should be 760 feet. He urged Dominion to avoid placing poles on Community Church's property to minimize adverse impact to the church.[190]

[185] Ex. 16 (Whitlow Direct) at 1-2.
[186] *Id.* at 3-4.
[187] *Id.* at 4-5 and Attached Exhibit CW-2.
[188] *Id.* at 5-6 and Attached Exhibit CW-3.
[189] *Id.* at 2, 5-7 and attached Exhibit CW-4.
[190] *Id.* at 7 and Attached Exhibit CW-5.

Loudoun County

Loudoun County offered the testimonies of the following witnesses: William Patrick Giglio, Buddy Rizer, Brian A. Conroy, and the collective testimony of Richard N. Olsen and William C. Harvey.[191]

William Patrick Giglio is Senior Planner in the Community Planning Division of the Loudoun County Department of Planning and Zoning. He explained that among other duties, he reviews legislative applications for their conformance to the policies set forth in the Loudoun County 2019 General Plan. He is also project manager and author of amendments to the 2019 General Plan and assists with the Data Center Locations and Design Comprehensive Plan and Zoning Ordinance Amendment project. He testified on Loudoun County's policies concerning land use and development, heritage and environmental resources, and electrical infrastructure.[192]

Specifically, Mr. Giglio asserted the 2019 General Plan's electrical policies stress electrical providers considering high-voltage corridors should minimize impacts on roadways, heritage resources, and existing residential communities and should consider undergrounding where possible. He opined that "Dominion has not adequately considered options for undergrounding a portion of the proposed route to mitigate impacts and to maintain the visual characteristic and sense of place established by the existing employment, business and residential uses in the Route 7 corridor."[193]

Mr. Giglio described the background of the 2019 General Plan and how this document, along with the Loudoun County 2019 Countywide Transportation Plan, compose the Comprehensive Plan. He explained that for many years, Loudoun County has sought to protect the rural and agricultural portions of the County to the west and have focused development in the eastern, suburban portions of the County. He stressed the importance to Loudoun County of protecting and preserving its natural, environmental, and heritage resources.[194]

In Mr. Giglio's opinion, "As demand for electrical power continues, consideration should be given to the appearance and location of electrical generation facilities, substations and power lines to ensure these facilities are adequately screened and buffered to reduce the visual impact of these facilities on neighboring uses and the community as called for in the policies of the 2019 General Plan." He explained that in residential and mixed-use place types (area designations), the 2019 General Plan calls for consultation between Loudoun County and electrical providers to identify opportunities to underground high-voltage power lines. He claimed such consultation has been "perfunctory" in actual practice, without leading to meaningful undergrounding.[195]

Mr. Giglio described how Loudoun County personnel were engaged in review of the Aspen-Golden Lines starting in fall 2022 and periodically discussed routing, land uses, visual impacts, and impacts to heritage and environmental resources with Dominion. He reported that

[191] During the hearing, Mr. Olsen adopted this collective testimony as his own. Tr. at 1073 (Olsen).
[192] Ex. 22 (Giglio Direct) at 1-2.
[193] *Id.* at 2-3.
[194] *Id.* at 4-6.
[195] *Id.* at 7-8 and Attached Exhibit WPG-3, pp. Chapter 6-23 and Chapter 6-24. The quotations are found *id.* at 7-8.

even since the filing of the Aspen-Golden Application, Loudoun County has proposed undergrounding a portion of the Aspen-Golden Route along Route 7 and has discussed routing along Broad Run Variations A and B. He testified that Loudoun County supports undergrounding an approximately three-mile portion of the Aspen-Golden Lines adjoining Route 7 from approximately the intersection of Belmont Ridge Road to Ashburn Village Boulevard. This area includes Lansdowne and Belmont, two master-planned residential communities; Inova Loudoun Hospital; Howard Hughes Medical Institute Janelia Research Campus; Community Church; heritage resources including the African American Cemetery, Belmont Manor, Belmont Chapel and Cemetery, and Janelia; and various office parks and commercial retail spaces. He asserted undergrounding this portion of the Aspen-Golden Lines is in keeping with the 2019 General Plan's electrical policies, and this segment was selected for undergrounding by Loudoun County because it comprises the greatest concentration of residential uses and heritage resources within the Aspen-Golden Route's viewshed.[196]

Mr. Giglio described how the Loudoun County Comprehensive Plan has identified the portion of Route 7 from Goose Creek to Route 28 as an important gateway corridor, and how much of the road frontage along Route 7 incorporates features to create a campus-like view, including large landscape buffers. He noted the Loudoun County Zoning Ordinance requires a 100-foot Gateway Corridor Buffer with enhanced landscaping through this portion of Leesburg Pike. He contended Dominion's proposed location of the Aspen-Golden Lines, with 180-foot structures adjacent to the road and within required buffers "significantly compromises the visual quality of" this part of the road and views from nearby properties, and "are in direct conflict with the intent and purpose of the County's Gateway Corridor Buffer adjoining Route 7 . . . to provide a landscaped buffer between the roadway and existing uses."[197] Mr. Giglio also provided his understanding that the Lansdowne property has open space easements to maintain a forested buffer and to visually screen the community from the roadway, and that the Belmont Manor house has a historic viewshed easement to maintain both the viewshed of the home and views to the north toward Route 7.[198]

Mr. Giglio faulted Dominion for not addressing visual impacts of the Aspen-Golden Lines to Belmont Manor and to homes and businesses in and near Lansdowne and Belmont and for not considering the diminution in property values along Route 7 from the Aspen-Golden Lines. He also expressed dissatisfaction with the current process involving informal discussions between a locality and a public utility about undergrounding options.[199]

Mr. Giglio described how Loudoun County is working on an amendment to the Comprehensive Plan to adopt a map identifying existing high-voltage corridors as a feature in the 2019 General Plan and to express preference for use of these existing corridors to collocate and develop future high voltage transmission corridors.[200] He testified the amendment would "help electric providers better identify places where the County would support transmission corridors" and would help such providers locate transmission lines "in areas where they would be with

[196] *Id.* at 10-12.
[197] *Id.* at 13.
[198] *Id.* at 14.
[199] *Id.* at 15-16.
[200] *Id.* at 19.

similar uses and/or finding means to mitigate impacts should they have to pass through residential areas or areas where they are not in keeping with that design characteristic."[201] He clarified that the County's current "policies actually talk about [and] encourage the safe grouping and bearing of utility lines and facilities" but do not incorporate a map reflecting places in the County for co-location of transmission corridors.[202]

Mr. Giglio attached to his testimony a copy of Loudoun County Department of Planning and Zoning's March 21, 2024 correspondence to Dominion providing feedback on the proposed Aspen-Golden Lines. The letter summarized:[203]

> Loudoun County policies support the establishment of the proposed 500-230kV Aspen to Golden Transmission Line to meet electric demand for the area while ensuring the structural integrity and reliability of the transmission system. County staff reviewed the primary Route 1 and four alternative routes. The County supports the construction of Route 1, Belmont Park Variation A, and the Broad Run Variation A route which parallel Leesburg Pike (Route 7) and Loudoun County Parkway (Route 607) as it provides the most direct route and results in the least impact on environmental resources. [The Department of Planning and Zoning] recommends that Dominion [] work with the County to consider options for burying portions of the proposed transmission route adjoining Leesburg Pike to reduce and mitigate potential visual impacts on historic resources, roadways, and existing and future uses proximate to the proposed transmission corridor in conformance with the electrical polices of the 2019 [General Plan]. [The Department of Planning and Zoning] also recommends that Dominion [] continue to work with the County to achieve policy goals regarding the protection of environmental and heritage resources as outlined in the 2019 [General Plan] and discussed in this correspondence.

During the hearing, Mr. Giglio confirmed these statements accurately reflect Loudoun County's position.[204] He also stated Loudoun County is advocating for the Updated Hybrid Proposal because it maintains the design characteristics of the area for which undergrounding is proposed, considering "the long-term vision of this area for where our communities and our businesses are and also our policies are for trying to mitigate those impacts . . . particularly when they come in proximity to heritage resources, environmental resources, key transportation corridors, as well as residential communities."[205]

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[201] Tr. at 842 (Giglio).
[202] *Id.* at 894 (Giglio).
[203] Ex. 22 (Giglio Direct) at Attached Exhibit WPG-4, p. 6. (Internal citations omitted.).
[204] Tr. at 974-76 (Giglio).
[205] *Id.* at 837-38 (Giglio).

Mr. Giglio also went into further detail about the County's zoning for the Route 7 corridor. He explained that the portion of Route 7 starting around Goose Creek and going to Route 28 has been set aside as a landscaped corridor since at least 2001. He testified that in previous County plans, this area was "called a keynote employment area, and this is where we envisioned large-scale office, you know, international companies; however, with the market the way it is, things changed, and that's why our comprehensive plan now designates it as a suburban mixed use and also suburban employment area."[206] On cross-examination, he confirmed that utilities are allowed, and are present, in the 100-foot corridor setbacks.[207]

Mr. Giglio also testified during the hearing that the labels on his Exhibit WPG-5 reflect place types, which are a component of Loudoun County's 2019 General Plan, and that data centers are not in the use list for either the "suburban mixed use" or "suburban neighborhood" place types but are permissible in the "suburban industrial" and "suburban employment" place types.[208] He clarified that JKLH's Belmont Property and JKLH's Telos Property have active site plans for data centers "because the underlying zoning permitted the data center use on these properties."[209] He also confirmed that Vantage and Belmont Innovation (Campuses C and B, respectively, in the Apollo-Twin Creeks Application) have active site plans, and all four of these entities with active site plans "are actively pursuing construction at the moment."[210]

Mr. Giglio described the interplay of the 2019 General Plan's place types and the County's zoning. He explained, "Generally, what you'd like to do is have your [underlying] zoning and the type of uses that are in those zoning districts align with your plan's vision for what's to develop there. . . . [A]nd the County has not done that in the past to try and align those. So that's where the discrepancies are in those and why they don't align with the actual plan vision of those place types in our comprehensive plan."[211]

Also, during the hearing, Mr. Giglio clarified that a business with a grandfathered land parcel still goes through site plan review with Loudoun County's building and development department. He explained that during this process, the business may make changes that "cannot be substantial changes" but can be "minor tweaks." He indicated such minor changes include "if a road moves a little bit or parking changes" and include moving a stormwater pond.[212] He confirmed the four buildings on the Belmont Innovation property, owned by SDC Capital Partners, LLC ("Sentinel") and situated near the proposed Sycolin Creek and Starlight Substations, have been approved as part of the County legislative process and that the size of these buildings "can be smaller and, again, would be recognized as being a minor change at that

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[206] *Id.* 838-40, 860 (Giglio).
[207] *Id.* 998-99 (Giglio).
[208] *Id.* at 1006-08 (Giglio).
[209] *Id.* at 1001-04 (Giglio).
[210] *Id.* at 1011-15 (Giglio). The Vantage property is "Campus C," and the Belmont Innovation property is "Campus B," in the Apollo-Twin Creeks Application. *Compare* Ex. 10 (Ruling ¶ 2 Exhibit Map) *with* Ex. 5 (Apollo-Twin Creeks Application) at Attached Appendix, pp. 4-5, 8.
[211] Tr. at 1009 (Giglio).
[212] *Id.* at 834-35 (Giglio).

point because you're not increasing the degree of conformity there."[213] On redirect examination, Mr. Giglio testified that:[214]

> our building and development department would be the group that would make that determination in terms of the – how substantial that change would be and whether it was, you know, permissible in terms of our definition of the microchange and the minor changes, the little tweaks that are often necessary because of changes in the construction design or suddenly there's new discovery of, you know, some type of rock or whatever we have in an area or if there's underground utilities or whatever that may be.

Buddy Rizer is Executive Director of Economic Development for Loudoun County. He stated that he has worked for Loudoun County for over 17 years, during which time he has promoted the growth of the data center industry in the County. He further stated he participated in the development of the 2019 Comprehensive Plan and is charged with seeing it successfully implemented. He asserted Loudoun County is committed to keeping its status as the hub of the data center industry and its appeal as both a historical and rural escape from urbanization. He supported undergrounding power lines to provide more resilient and reliable power infrastructure, which he asserted is crucial for the data center industry and County residents.[215]

Mr. Rizer provided a brief history of the data center industry in Loudoun County and General Assembly incentives supporting that industry. He testified that in the past 15 years, in just Loudoun County, over 40 million square feet of data centers have been built, with 4 million additional square feet in development and a further 8-10 million square feet likely to be developed. He touted Loudoun County's moniker as "Data Center Alley." He explained the attractiveness of Northern Virginia as a data center market given its proximity to Washington, D.C., where many data center customers are, and as a home to dense and expanding fiber infrastructure, a skilled and educated workforce, and low power rates.[216]

Mr. Rizer discussed the burgeoning need for electric power to supply data center development, and Loudoun County citizens' and organizations' growing concern about, and opposition to, the impact of overhead transmission lines on their community. He posited that undergrounding may provide a long-lasting solution that preserves landscape, maintains Loudoun County's history and beauty, and provides power that is less prone to outages. He specifically explained that data center chips require more power than before, and that cooling those chips also requires much electricity. He affirmed that "[i]n my 18 years, power lines [are] the number one discussion, the number one complaint, and the biggest challenge, I think, we're facing."[217]

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[213] *Id.* at 847-48 (Giglio).
[214] Tr. 1024-25 (Giglio).
[215] Ex. 23 (Rizer Direct) at 1-3.
[216] *Id.* at 3-5.
[217] *Id.* at 5-7; Tr. at 1032, 1046 (Rizer). The quotation is found at Tr. at 1046.

During the hearing, Mr. Rizer testified to his relationship with Dominion, stating he has "worked very closely in partnership with Dominion, really since the beginning, on identifying the right places to put the data centers and projecting out the demand and working with them very closely on the electrical agreements and interfacing with the companies for – for a long time."[218] He added, "[W]e have been clear and Dominion has been aware for 15 years that not having power lines along Route 7 was a County priority. ... We anticipate we're going to continue to be in the data center business, and we're trying to find new ways to approach that and to balance that."[219]

During cross-examination, Mr. Rizer testified that because of data centers, Loudoun County has grown its tax base to nearly 50% commercial and 50% residential, and the County is projected to take in tax revenues of $850 million to $1 billion from data centers in fiscal year 2025.[220] He posited that data center tax revenues "make everything better, including lowering the tax rate on our citizens by $0.42 on the dollar. It's the reason that we can . . . build world-class schools, it's the reason that we can provide the greatest road network in Northern Virginia, and expand our health and services, that we can put a penny of our tax rate toward affordable housing." He stated he is not aware of the County setting aside any funds specifically for undergrounding.[221] He further testified that data centers provide a broader benefit to internet users generally, noting that "this is one of the most important hubs in the world."[222]

Mr. Rizer acknowledged during live testimony that "there will have to be new lines to come into the County for sure" to serve data centers in the future.[223] He indicated that meeting the in-service date to serve the data centers is important because "projects . . . are waiting to come online" and that if the Aspen-Golden Project is delayed, data center projects will experience delays, with data center companies experiencing stranded capital, and with those companies and the County both experiencing lost revenues.[224]

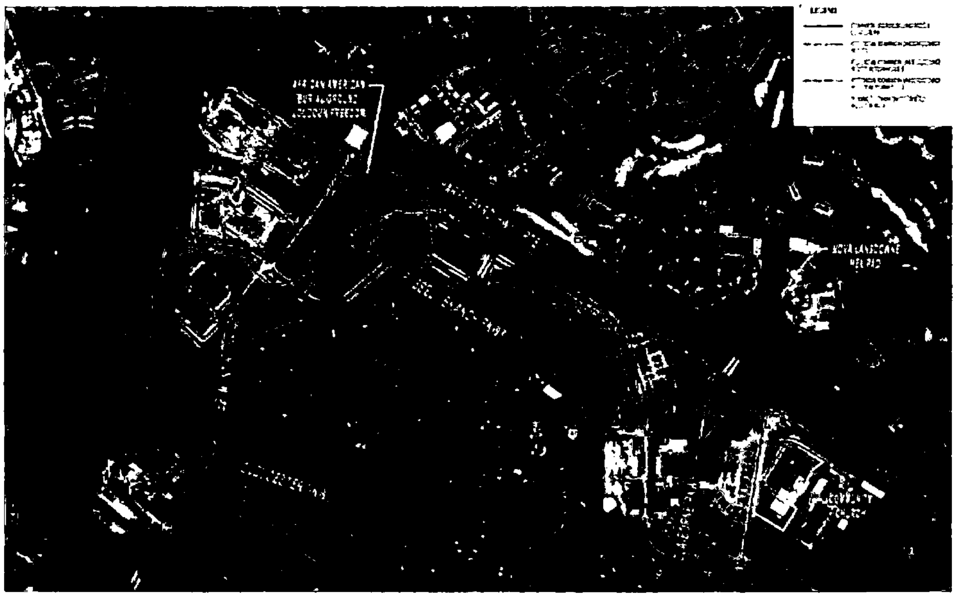
Mr. Rizer contended the County should invest in undergrounding technology research and development (i) to drive down the cost of this technology, reducing financial barriers, and (ii) to expand the County's knowledge on this topic to make undergrounding more feasible and to implement best practices. He posited that "[e]mbracing innovation in energy generation, storage, usage and delivery technologies will position us at the forefront of sustainable and aesthetically considerate power solutions, without a prohibitive increase in power costs landing on the average customers' shoulders."[225]

During the hearing, Mr. Rizer asserted it is Loudoun County's responsibility "to be a leader and an innovator in all aspects of the industry," emphasizing that the County should "continue to innovate and look for new ways to ... deliver services. And I think that it's important that, as a leader in this industry, that we are taking a leadership role in finding the new

[218] Tr. at 1031 (Rizer).
[219] *Id.* at 1065 (Rizer).
[220] *Id.* at 1060-61 (Rizer).
[221] *Id.* at 1051 (Rizer).
[222] *Id.* at 1042-43 (Rizer).
[223] *Id.* at 1041 (Rizer).
[224] *Id.* at 1037, 1059-60 (Rizer).
[225] Ex. 23 (Rizer Direct) at 8-9.

ways and learning."[226] He acknowledged undergrounding is expensive and testified that "what we would like to understand is how we can make sure that the ... costs are responsible, especially for our citizens, on the delivery of all this infrastructure."[227]

Brian A. Conroy, P.E., is Manager of Power System Studies for RLC. He testified that he both oversees and participates in transmission and distribution studies that include estimating, forecasting, production modeling, and other economic analyses. He discussed an undergrounding alternative for a portion of the Aspen-Golden Route.[228] The alternative is composed of: following Dominion's proposed overhead route (aqua blue line) from the proposed Aspen Substation to the proposed Sycolin Creek Substation; constructing a transition station (options are shown in the diagram in magenta, orange, and red boxes to the left of Belmont Ridge Road), undergrounding the next three miles of the proposed Aspen-Golden Lines (red line), and constructing a second transition substation east of Community Church (red box in the lower right corner of the diagram), with the remainder of the Aspen-Golden Route being overhead and following Dominion's proposal.[229] Mr. Conroy reported that in total, the underground segment would be three miles long, shorter than the Chino Hills, California 3.7-mile 500 kV underground line constructed by Southern California Edison.[230]



ASPEN TO GOLDEN - POTENTIAL UNDERGROUND ROUTE
03.09.2024

Mr. Conroy testified about the scope of RLC's review of the Aspen-Golden Project and how it assessed alternative routes and related constraints, resulting in a conceptual underground layout that was shared with Dominion in February 2024. RLC received Dominion's feedback and modified its proposal accordingly. Dominion's concerns and RLC's adjustments, made in the Updated Hybrid Proposal, were as follows:[231]

[226] Tr. at 1045, 1053 (Rizer).
[227] *Id.* at 1053-54 (Rizer).
[228] Ex. 20 (Conroy Direct) at 1-2.
[229] *Id.* at 5, 14, and Attached Exhibits BC-3 and BC-4.
[230] *Id.* at 8, 12. The diagram is located *id.* at Attached Exhibit BC-5.
[231] *Id.* at 5-7, 11.

Dominion Concern	RLC Adjustment
Original RLC design lacked enough cables per phase to meet MVA ratings.	Modified design to include 4 cables per phase for both the 230 kV and 500 kV lines.
The vault size appeared too small.	Adjusted the vault size to 10'x30'x10'.
The transition station footprints were too small.	Adjusted the transition station footprints to 470 x 700 feet and 539 x 550 feet.
The cables for both lines were in a common duct bank.	Modified the design to provide separate duct banks for the 230 kV and 500 kV lines.
The distance between splice vaults was too long.	Adjusted the distance between splice vaults to meet Dominion's criteria.
Rock and fracture rock are common geologic conditions in the area.	Reviewed geological surveys on adjacent parcels and provided a cost estimate assuming the project would encounter 30% rock.
The ROW was not wide enough to accommodate necessary design modifications.	Adjusted the ROW width to 100 feet for duct banks and 150 feet for splice vault locations.

Mr. Conroy noted that environmental and geological details would be assessed in the more detailed design. He testified that RLC has found the depth of bedrock in the area of the transmission line varies from 2.5 feet to 13.5 feet. He indicated that these details, regulatory and permitting risks, and other risks all are inputs into the conceptual estimate.[232]

Mr. Conroy maintained Dominion did not fully evaluate a partial undergrounding alternative. He based his assessment on adverse impacts of the overhead Aspen-Golden Lines to several features along the proposed Aspen-Golden Route, including the heliport at Inova Loudoun Hospital; the Loudoun Freedom Center and African American Cemetery; Belmont Manor; the Lansdowne scenic easement; the Belmont viewshed easement; and residential development. Loudoun County's Updated Hybrid Proposal, Mr. Conroy asserted, greatly mitigates adverse impacts to these features.[233] During the hearing in this case, Mr. Conroy clarified that photo renditions attached to his testimony, purportedly showing the impacts from various viewpoints of the impact of an overhead transmission line versus an underground line, actually show the impact of an overhead transmission line versus the existing conditions when the photos were taken. For example, the photos continue to show trees and other large vegetation that would be impermissible in the ROW of an underground line.[234]

In further support of the Updated Hybrid Proposal, Mr. Conroy dismissed Dominion's claims of infeasibility. He stressed that the alternative does not cross Goose Creek or Broad Run, and the cost estimate includes a 1,000-foot allowance for trenchless excavation (and a 2,000-foot allowance if contingency is included). He claimed that given the ability to isolate an underground transmission line's cables during an outage, 75% of the line's flow can continue until a repair is complete, which is not an option with an overhead line. He also asserted other residential and commercial delivery requests in the area could be served from overhead portions

[232] *Id.* at 7, 13, 16.
[233] *Id.* at 7-8 and Attached Exhibit BC-3.
[234] *See* Tr. at 750-54 (Conroy).

of the Aspen-Golden Lines, by a planned duct bank, or by local distribution, including Belmont Innovation, Vantage, Belmont Data Center, Belmont Park, and Ashburn Chase.[235]

Mr. Conroy reported that RLC assumed the following dates when developing the Updated Hybrid Proposal:[236]

Activity	Milestone Dates
Engineering	10/01/2024 through 12/31/2025 (electrical/civil)
Planning / Approvals	03/01/2024 through 10/01/2026 (including federal, state, local, environmental, and utility approvals, etc.)
Cable Procurement	06/01/2025 through 12/31/2026 (assumes 18-month lead time)
Construction	10/01/2026 through 06/01/2028

Mr. Conroy calculated the cost of the Updated Hybrid Proposal to be $1.112 billion, which is $423 million more than the overhead line's cost of $689 million. He calculated the underground portion of the Updated Hybrid Proposal to be $478 million.[237] He testified this figure is subject to a -50% to +200% margin of error.[238]

Mr. Conroy listed the critical routing and location decisions RLC made in developing the Updated Hybrid Proposal, including:[239]

- Locating transition stations where there is adequate space;
- Locating the route where there is appropriate width;
- Locating splice vaults, with the expanded ROW requirement, where there is enough width to accommodate them while spacing them close together enough for cable pulling and reel size;
- Accommodating both existing and planned developments and existing uses such as the Inova Loudoun Hospital helipad; and
- Avoiding culturally significant sites and preserving existing viewshed and scenic easements.

Mr. Conroy concluded that while Dominion's proposed overhead Aspen-Golden Route appears feasible, it does not reasonably minimize adverse impacts to scenic assets, historic districts, and the environment of the area addressed by the hybrid underground option, in his opinion. He asserted the hybrid alternative is both feasible and would minimize adverse impacts in a sensitive area along the route.[240]

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[235] Ex. 20 (Conroy Direct) at 8-10, 13-16; Tr. at 780-81 (Conroy).
[236] Ex. 20 (Conroy Direct) at 9, 12, 15, and Attached Exhibit BC-3, pp. 6-7.
[237] *Id.* at 9, 15-16, and Attached Exhibit BC-3 at 1.
[238] Tr. at 746-47 (Conroy). *Compare* the Updated Hybrid Proposal, Ex. 20 (Conroy Direct) at Attached Exhibit BC-3, p. 6 (§ 1.4), *with* the Initial Hybrid Proposal, Ex. 47 (Moulton Rebuttal) at Attached Rebuttal Schedule 2, p. 8 (§ 1.4).
[239] Ex. 20 (Conroy Direct) at 17. *See also id.* at Attached Exhibit BC-2.
[240] *Id.* at 18.

During the hearing, Mr. Conroy compared the Updated Hybrid Proposal schedule with one provided by Black & Veatch in its undergrounding study. Mr. Conroy concluded the two schedules were "very similar" in breaking out timeframes for engineering, permitting, cable procurement, and construction and that RLC's cost-per-mile for the Updated Hybrid Proposal is in line with the costs shown in the Black & Veatch report.[241]

Mr. Conroy also took issue with Dominion's assumption that the Company would have to install transition stations to serve future customers along the Aspen-Golden Route. Mr. Conroy asserted that 230 kV gas insulated switchgear equipment could be used to feed these customers electricity from underground. He stated this equipment would occupy less space compared to an above-ground structure.[242] He also indicated that "[o]nce you're within the substation fence, the ... gas insulated switch gear and the transformer are a certain height. The overhead structures, if they were there, would be much taller in those substations."[243]

Mr. Conroy confirmed that the Updated Hybrid Proposal, the underground line considered in the Black & Veatch study, and Dominion's proposed Aspen-Golden Route are each a "conceptual plan" and that, specifically with the Updated Hybrid Proposal, his intent was to prove the underground line's feasibility and provide a cost estimate for this alternative.[244] He testified that "with a conceptual design, there's a lot of details that need to fall out over time," and designing interfaces to serve future customers with 230 kV service could "be planned into the detail design."[245]

When asked about the feasibility of using HVDC for the Aspen-Golden Lines, Mr. Conroy indicated this option is typically used where there are stability issues. He also stated the Aspen-Golden Lines, being under ten miles in length, are relatively short for HVDC use and that HVDC requires additional equipment, specifically a converter station at each end of the HVDC line.[246]

Richard N. Olsen, MAI, testified on behalf of Loudoun County.[247] He discussed both his and his colleague's, Mr. William C. Harvey's, extensive training and education in real estate appraisal and appraisal review.[248] He explained that Loudoun County requested Messrs. Olsen and Harvey to develop a combination of mass and single property appraisals reflecting the unimpaired and impaired values of residential properties along an approximately 4.5-mile long segment of Route 7 near Loudoun County Parkway to Belmont Ridge Road, and an approximately 2.0-mile long segment of Route 7 near Ashburn Village Boulevard to Belmont Ridge Road. According to Mr. Olsen, these areas are expected to be affected detrimentally by

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[241] Tr. at 683-84, 697 (Conroy).
[242] *Id.* at 699-701 (Conroy).
[243] *Id.* at 712 (Conroy).
[244] *Id.* at 688-89 (Conroy).
[245] *Id.* at 703-04 (Conroy). Mr. Conroy later clarified that in response to a discovery question, he mentioned the idea of serving two future data centers from underground. He testified this idea was "[n]ot even conceptual. It was more strategic, here's ways we could do it." *Id.* at 745 (Conroy).
[246] *Id.* at 710-13 (Conroy).
[247] The testimony was pre-filed as the joint testimony of Richard N. Olsen, MAI, and William C. Harvey, CCIM, MAI, but during the hearing Mr. Olsen adopted the testimony as his own. Tr. at 1073 (Olsen).
[248] Ex. 24 (Olsen Direct) at 1-2.

the overhead aerial lines and structures of the planned 500 kV and 230 kV lines from the Aspen-Golden Project. Loudoun County also requested Messrs. Olsen and Harvey provide an opinion on the economic benefit of undergrounding the transmission lines along the approximately 2.0-mile stretch of Route 7 near Ashburn Village Boulevard and Belmont Ridge Road.[249]

Mr. Olsen testified that he and Mr. Harvey studied and analyzed the effect that existing high voltage overhead transmission lines ("HVOTLs") have on residential property values in Loudoun County and applied their results to the 4.5-mile and 2.0-mile segments noted above. Mr. Olsen stated their valuation process followed a model set forth in *The Appraisal of Real Estate* (15th ed. 2020).[250]

According to Mr. Olsen, he and Mr. Harvey based their mass appraisal on the sales comparison approach to value. They took property assessments as of January 1, 2024, developed by the Loudoun County Commissioner of the Revenue's office, and adjusted them to present time using an assessment-to-sales ratio developed using recent sales. Similarly, they based their single property appraisals on the sales comparison approach, using paired sales analysis. Mr. Olsen explained this analysis compares properties impacted by HVOTLs with unimpaired properties with similar characteristics in the same location. Essentially, by analyzing real estate transactions comparable to the properties along the route segments at issue, Mr. Olsen averred he and Mr. Harvey were able to ascertain the impact of the 500 kV and 230 kV transmission lines and structures on nearby residential properties along those segments.[251]

For their analysis, Messrs. Olsen and Harvey used an assessment-to-sales ratio of 1.124, or 112.4%, to increase the January 1, 2024 assessments to current value based on July 2024 sales data for 25 properties.[252] Next, they developed case studies to determine diminution in value due to a property's location vis-à-vis already-existing 500 kV/230 kV transmission infrastructure. The case studies revealed a diminution in value of between -1.0% and -19.2%, with an average diminution of -8.5%.[253]

Mr. Olsen reported the results of the analysis as follows:[254]

Item	4.5-mile segment	2.0-mile segment
Number of residential properties in the area	4,210	1,830
01/01/24 assessed value	$2,638,614,000	$1,391,379,610
Current rounded unimpaired value (01/01/24 value x 1.124)	$2,965,000,000	$1,565,000,000
Impaired value (-8.5% adjustment)	$2,712,975,000	$1,431,975,000
Difference between current and impaired value	$252,025,000	$133,025,000

[249] *Id.* at 2-3.
[250] *Id.* at 7-8 and Attached Exhibit WH-3.
[251] *Id.* at 10-14. *See also* Tr. at 1110 (Olsen) (explaining sales comparison is an approach, but paired sales is an analysis that "isolates a difference to show whether there is or isn't an impact to overall value due to that isolated characteristic").
[252] Ex. 24 (Olsen Direct) at 14 and Attached Exhibit WH-7.
[253] *Id.* at 14-15 and Attached Exhibit WH-8.
[254] *Id.* at 14-18. Data for residential properties in these areas is located *id.* at Attached Exhibits WH-5 and WH-6.

Mr. Olsen concluded "that the geographic area that will be potentially impacted by Dominion's planned 500/230 kV lines and towers extends for a quarter mile to the north and south for most of the approximate Route 7 and 2.0-mile-long segments and extends to as much as three-quarters of a mile at the southwestern corner of the zone where the planned 500/230 kV lines and towers head south."[255] He also asserted that the diminution in property values from power lines that Dominion recognizes (a decrease of 4% - 6%) "closely parallels" what he and Mr. Harvey found in peer-reviewed appraisal literature and the results of their own case studies for the Combined Cases.[256]

Mr. Olsen testified he viewed this analysis as conservative since he and Mr. Harvey could have used the upper end of the range of negative impacts, -19.2%, which would have more than doubled the above-noted damages estimates. Mr. Olsen also recognized several high-rise residential properties outside the impact zone may be impaired by their view of the 500 kV/230 kV transmission lines and structures. Further, he mentioned damages of approximately 451 non-residential properties within the impact zone were not included in the estimates. He noted that the area also may suffer additional, qualitative damages including "the impairment to the lands encumbered with conservation and open space easements, residential common areas, and Loudoun County's gateway corridor that fall within [their] estimated impact zone."[257]

Finally, Mr. Olsen discussed the economic benefit likely to result from the 500 kV/230 kV transmission lines and structures if the lines were placed underground along the approximately 2.0-mile segment. He estimated the economic benefit would be not less than $133,025,000.[258]

During the hearing, Mr. Olsen responded to critiques of his and Mr. Harvey's analysis by Dominion Witness Colorito, who claimed the numerous differences between Messrs. Olsen's and Harvey's control and case pairings resulted in their analysis being unreliable.[259] Mr. Olsen testified there are numerous differences between properties, and what one buyer will pay for a particular home feature versus what another buyer would pay cannot be precisely measured. He testified, "And so, therefore, [*The Appraisal of Real Estate*], 15th Edition, that speaks to these issues, allows the appraiser to use their art of appraising and adjustments to be based on judgment and experience." He averred the adjustments he and Mr. Harvey made are "supported by the expectations of users for these type of similar assignments and the trillion-dollar collateral mortgage market that these appraisers utilize."[260]

Mr. Olsen modified his analysis during the hearing to remove five pairings in his paired sales analysis, four of which were duplicates and one because the case sale was outside the 0.25-mile impact zone.[261] He testified his paired sales analysis was based on homes near an

[255] *Id.* at 16 and Attached Exhibits WH-10, WH-11, and WH-12.
[256] *Id.* at 17. For the 4% to 6% property value impact recognized by Dominion, the testimony refers to a YouTube video. The Hearing Examiner could not open the video link provided in the testimony.
[257] *Id.* at 18.
[258] *Id.* at 19.
[259] Tr. at 1080 (Olsen).
[260] *Id.* at 1092 (Olsen).
[261] *Id.* at 1123, 1136-42 (Olsen).

existing 500 kV/230 kV line that he believes is approximately 100 feet tall (shorter than the proposed Aspen-Golden Lines), though he did not physically measure the height of the existing transmission line.[262]

In trying to isolate the impact of the transmission line on case sales, Mr. Olsen stated he and Mr. Harvey made certain adjustments (such as for lot size and square footage of the home above-grade and below-grade) based on their experience and judgment (*i.e.*, the art of appraisal) of what is acceptable to lenders for whom Messrs. Olsen and Harvey do work.[263] When asked about the size differences between case and control properties, Mr. Olsen explained that he and Mr. Harvey "were kind of hamstrung in finding those case sales . . . within that quarter mile impact" and could not find a more suitable transmission line to use for comparison purposes with "the number of sales – of case studies that were available within a recent time frame that we were trying to ascertain."[264]

Philadelphia-Baltimore-Washington Laborers' District Council

The Laborers' Council offered the testimony of **Marshall Brown**, Director of the Laborers-Employer Cooperation and Education Trust ("LECET") for the Laborers' International Union of North America's Mid-Atlantic Region. Mr. Brown explained that Mid-Atlantic LECET covers, among other areas, Virginia, Maryland, Pennsylvania, and Washington, D.C. He testified that the Laborers' Council represents over 6,300 workers, including thousand residing in Virginia. He added that LECET's goal is to expand markets and work opportunities for union members and contractors.[265]

Mr. Brown recommended that Dominion underground the Aspen-Golden Project where feasible and prioritize the hiring of local workers and workers from Virginia when constructing the Aspen-Golden Project. Among other things, he highlighted that undergrounding the Aspen-Golden Project will: preserve host communities' property values; lower transmission line maintenance costs in the long-term; protect public health by reducing exposure to EMF and reducing the risks of overhead lines and poles falling during storms; minimize disruption to local ecosystems and habitats; and provide resiliency and reliability benefits.[266]

As for employment, Mr. Brown estimated the Aspen-Golden Project will create numerous direct and indirect jobs during construction. He asserted local workers spend their earnings in the local community, use local healthcare facilities, and pay local and state taxes. He further averred local workers produce a higher quality product because, as residents of the local area, they have an interest in a project's long-term success.[267]

Mr. Brown contended that since 2019, workers who are part of the Laborers' International Union of North America's Mid-Atlantic Region have logged nearly 20 million

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[262] *Id.* at 1130, 1134-35 (Olsen).
[263] *Id.* at 1150-59, 1180 (Olsen). *See also id.* at 1169-76 (in which Mr. Olsen indicated he used the art of appraisal to adjust for the presence of a fireplace and for upgrades to homes over $1 million in sales price).
[264] *Id.* at 1164-65 (Olsen).
[265] Ex. 19 (Brown Direct) at 1-2.
[266] *Id.* at 3-4.
[267] *Id.* at 4-5.

hours installing underground pipelines, work that is comparable to installing underground transmission lines. Both types of projects, he argued, involve laying pipe or conduit; backfilling by compacting soil to restore the ground surface; testing infrastructure to ensure its functionality and integrity prior to commercial operation; and complying with safety protocols and industry requirements and standards.[268]

Theresa Ghiorzi

Theresa Ghiorzi testified on her own behalf. A resident of Loudoun County, she stated that her property would not be directly impacted by either the Aspen-Golden or the Apollo-Twin Creeks Projects, but she indicated that her and her family members' "properties are likely to be impacted by the 500kV lines proposed to import power for these data centers."[269]

Concerning the five proposed substations that are part of the Apollo-Twin Creeks Project, Ms. Ghiorzi asserted the specific data centers that will use these substations should pay for them. She argued data centers should have their own rate classification. As an example of such treatment, Ms. Ghiorzi provided a copy of an Ohio Power Company application with the Public Utilities Commission of Ohio, wherein that utility sought approval of two tariffs for data centers – one for stationary data centers and one for mobile, or cryptocurrency mining, customers.[270]

Ms. Ghiorzi contended the general public does not need the 500 kV and 230 kV transmission lines that are part of the Aspen-Golden Project. She argued that "data centers are private use for private gain" and that eminent domain laws do not allow the taking of "property rights of one set of property owners so that a different set of private property owners can achieve their own development and economic aspirations."[271]

Ms. Ghiorzi also charged that NextERA did not seek adequate community and stakeholder feedback in designing the route of the Mid-Atlantic Resiliency Link.[272]

Staff Testimony

Aspen-Golden Project

Staff offered a Staff Report, along with the testimony of Schuyler Ingram and Jeff Dodson, each adopting portions of the Staff Report.

Schuyler Ingram, a Utilities Engineer in the Division of Public Utility Regulation ("PUR"), adopted the following portions of the Staff Report: Introduction; Project Details – the Line General Description, the Routing Description, and ROW; Project Cost; Construction

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[268] *Id.* at 5.
[269] Ex. 18 (Ghiorzi Direct) at 1.
[270] *Id.* at 1-2 and Attached Exhibit 1.
[271] *Id.* at 2-3. The testimony at this point referred to "the 500kv and 230kv transmission lines in Case No. PUR-2024-00044," (*id.* at 2) but that case number refers to the Apollo-Twin Creeks Project, which has no 500 kV line component. Since the Aspen-Golden Project incorporates both 500 kV and 230 kV lines, it appears the reference to Case No. PUR-2024-00044 may have been a typographical error.
[272] *Id.* at 3-5 and Attached Exhibits 2 and 3.

Schedule; Environmental, Science and Historic Impacts of the Project; Staff's Analysis of the Routes; Environmental Justice; Economic Development; Coordinated Environmental Review; and Conclusions and Recommendations.[273]

During the hearing, Mr. Ingram addressed Item #24 in the attachment to Staff's "Guidelines for Transmission Line Applications Filed Under Title 56 of the Code of Virginia." This item reads, "If an overhead line must be routed across uniquely scenic, recreational, or historic areas or rivers, the feasibility of placing the lower voltage line underground should be considered. And if the line must be placed overhead, it should be located on a right-of-way least visible from areas of public view."[274] Mr. Ingram affirmed Dominion fulfilled this guideline. He stated the Company "did consider the undergrounding, they did provide information in their [Aspen-Golden A]pplication regarding the scenic, recreational, and historic areas, and we've been able to evaluate that in regards to the overhead routing."[275]

Jeff Dodson, a Senior Utilities Engineer in the Division of PUR, adopted the following portions of the Staff Report: Existing and Future Facilities; Need for the Project; Staff's Analysis of the Need for the Project; Demand-Side Management Considerations; Project Details – Substations and Proposed Structures and Conductors; and Transmission Alternatives – Undergrounding.[276]

During the hearing, Mr. Dodson testified that given the short time between the filing of testimony discussing the Updated Hybrid Proposal and the date for the filing of Staff's testimony, Staff was unable to include its review of the Updated Hybrid Proposal in the Staff Report.[277] However, he offered live testimony addressing this proposal.

Generally, Mr. Dodson classified Staff's concerns with the Updated Hybrid Proposal into three categories: timing constraints, constructability, and cost. As for timing constraints, Mr. Dodson worried that Dominion would need extra time to solicit bids for the procurement of conductor specially designed for the Aspen-Golden Project. Should Dominion not meet PJM's June 1, 2028 in-service date for this project, Mr. Dodson indicated reliability violations can occur, leading to financial penalties and an increased risk of power outages or power system instability, as well as possible damage to the electric system from overloading. He noted that if overloading results in damage to breakers, transformers, and certain other equipment with long lead times for replacement, an extended outage could occur, affecting customers beyond Loudoun County since most of Virginia is served from the 500 kV system.[278]

As for constructability issues, Mr. Dodson mentioned that Dominion may face time and practical challenges in relocating existing utilities, acquiring property rights, and securing permits. Additionally, he noted undergrounding the Aspen-Golden Project likely will require trenchless excavation to cross the Claiborne Parkway/Route 7 cloverleaf intersection, requiring

[273] Ex. 27 (Ingram Direct) at 1-2.
[274] Tr. at 1260-62 (Ingram).
[275] *Id.* at 1263-64 (Ingram).
[276] Ex. 37 (Dodson Direct) at 1-2.
[277] Tr. at 1298-99 (Dodson).
[278] *Id.* at 1286-89 (Dodson).

additional ROW for drilling rigs, entry and exit pits, cable storage and materials, and to make room for construction crews and vehicles. Mr. Dodson stated Staff agrees with Dominion that the ROW width provided in the Updated Hybrid Proposal may not be adequate for trenchless excavation. He added additional width may be required for spacing between the underground cables as well, to dissipate heat.[279]

Mr. Dodson also discussed the unpredictability of the area's geologic conditions given the presence of shallow bedrock. He explained excavating such rock could require drilling, blasting, or other specialized techniques. He hypothesized that if the Updated Hybrid Proposal's 30% bedrock estimate is too low, there could be significant impacts to both project time and cost to overcome this challenge.[280]

As for cost, Mr. Dodson reported the Updated Hybrid Proposal's estimated cost to underground three miles of the Aspen-Golden Lines is $478 million, exceeding by approximately $307 million the proposed cost to construct the entire 9.4-mile Aspen-Golden Project overhead and 8.7 times higher than the cost of constructing those same three miles overhead. He noted Dominion's undergrounding estimate, which is higher than RLC's, is "at least $502 million, excluding expenses for permitting, real estate acquisition, transition station design and construction, and any required trenchless crossings."[281] He opined that given the minimal precedent for undergrounding 500 kV circuits and the uncertainties surrounding underground construction, "the potential for significant cost increases remains high."[282]

Mr. Dodson distinguished the Chino Hills, California undergrounding project, pointing out the Chino Hills project's purpose was to connect a renewable generation facility to a load area; it was not built to address reliability concerns. He further noted the Chino Hills project was built entirely through company-owned ROW. He added that the Aspen-Golden Project is for "a 500 kV circuit with a much higher required capacity than Chino Hills as well as a 230 kV circuit."[283]

Mr. Dodson opined that the Updated Hybrid Proposal is not "complete enough for an actual project" given the issues Staff identified. He stressed the novelty of undergrounding a 500 kV line. He reported Staff's conclusion "that the overhead route remains the only feasible and economical option for the Aspen-Golden [L]ines to address the need identified in the Company's [A]pplication."[284]

On cross-examination, Mr. Dodson agreed that data that could be acquired from undergrounding a 500 kV line, including data on topics such as permitting, cable cost and installation, lead times to procure items, construction, soil impacts, and line operation and

[279] *Id.* at 1287, 1289-90 (Dodson).
[280] *Id.* at 1290-91 (Dodson).
[281] *Id.* at 1291-92, 1294-95 (Dodson). The quotation appears *id.* at 1292.
[282] *Id.* at 1292 (Dodson).
[283] *Id.* at 1296-97 (Dodson).
[284] *Id.* at 1297-98 (Dodson).

maintenance. However, he testified the opportunity to gain this information does not outweigh Staff's concerns about undergrounding the Aspen-Golden Lines.[285]

Mr. Dodson stated Staff considers community concerns along with other factors when evaluating transmission line projects.[286] He stressed that "conductor is really the cornerstone of the design" for an underground transmission project, "[b]ut, as of right now, we don't have a conductor."[287]

The **Staff Report** included the following:

Introduction. Staff provided a brief overview of the Aspen-Golden Project and the procedural history of the Aspen-Golden Case.[288]

Existing and Future Facilities. Staff described the 230 kV and 500 kV transmission corridors already in the Eastern Loudoun Load Area, some of which contain multiple transmission lines.[289]

Need. Staff reviewed the need for the Aspen-Golden Project, including Dominion calculations of load growth in the Eastern Loudoun Load Area reflecting load growth from 798 MW in 2013, to 2,699 MW in 2022, with further anticipated growth of 112%, to 5,734 MW by 2032.[290] Staff discussed PJM's study findings that this load growth will lead to multiple contingency scenarios causing NERC reliability violations impacting the Eastern Loudoun Load Area by the summer of 2028.[291] Staff verified PJM's power flow models and confirmed the projected violations without the Aspen-Golden Project. Staff further verified, through power flow modeling, that the Aspen-Golden Project resolves the reliability standards violations cited by Dominion. Staff concluded the Aspen-Golden Project will address the projected NERC violations starting in the summer of 2028 and will ensure the transmission systems' structural integrity and reliability to accommodate overall load growth in the area.[292]

Demand-Side Management. Staff agreed with Dominion that demand-side management measures alone are insufficient to eliminate the need for the Aspen-Golden Project.[293]

Project Details. Staff reviewed the main components of the Aspen-Golden Project, along with the project's proposed cost and schedule.[294]

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[285] *Id.* at 1300-04, 1318 (Dodson). *See also* demonstrative Ex. 39 (Underground Pilot Data List) for a listing of the types of data counsel for the Conservancy suggested could be studied through the Updated Hybrid Proposal.
[286] Tr. at 1305 (Dodson).
[287] *Id.* at 1312 (Dodson).
[288] Ex. 38 (Aspen-Golden Staff Report) at 1-3.
[289] *Id.* at 3-4. *See also id.* at Attachment 1 for a map of the existing transmission lines in the Eastern Loudoun Load Area.
[290] *Id.* at 4-5. Note these figures reflect Eastern Loudoun Load Area summer loads. The Company noted forecasted values are based on the 2023 PJM load forecast. *Id.* at Attachment 9 (Company Response to Staff Interrogatory No. 3-10).
[291] *Id.* at 5.
[292] *Id.* at 7.
[293] *Id.* at 7-8.
[294] *See generally, id.* at 9-24, 44.

Environmental, Scenic, and Historic Impacts. Staff reviewed these impacts by considering land use, existing and planned dwellings, historic features, and wetlands.

Land Use. Notable features of Route 1 include that 83%, or 5.5 miles, of this route is on land that permits data center development as a by-right use. Route 1 crosses one publicly owned park with an existing Company easement. Route 1 also would require clearing of approximately 55.2 acres of forested land.[295]

Belmont Park Variation A crosses four privately owned land parcels as well as Virginia Department of Transportation ("VDOT") ROW. Construction would require clearing approximately 2.3 acres of forested land. While 0.2 miles of land along Variation A is zoned as Residential or Rural Commercial, about twice that amount (0.4 miles) of land along Belmont Park Variation B is zoned as Housing. Variation B crosses five privately owned land parcels and involves two crossings of Route 7 as well as one crossing of Lansdowne Boulevard. Construction of this variation would require clearing of approximately 2.3 acres of forested land. Inova Loudoun Hospital's helipad is approximately 960 feet to the north of Variation B. Inova Health expressed concern that Variation B would impact helipad operations, while Variation A would not have such an impact if the transmission line incorporates visual markers.[296]

Broad Run Variation A would cross six privately owned land parcels, and one parcel owned by Loudoun Water. Construction would require clearing of approximately 9.1 acres of forested land. Broad Run Variation B would cross seven privately owned land parcels, and one parcel owned by Loudoun Water. It would also cross 0.5 miles of existing Loudoun County Board of Supervisors open space easements along Gloucester Parkway. Construction of this variation would require clearing of approximately 19.5 acres of forested land.[297]

Dwellings. Staff reported the following dwellings in relation to the Aspen-Golden Project:[298]

Portion of Line	Within 500 Feet of Centerline	Within 250 Feet of Centerline	Within 100 Feet of Centerline
Route 1 - Existing	2 single-family 1 multi-family	1 single-family	0
Route 1 – Planned	11 single-family 89 multi-family	27 multi-family	0
Belmont A – Existing	1 multi-family	0	0
Belmont A – Planned	90 residential units	34 single-family	3 single-family
Belmont B - Existing	10 multi-family	3 multi-family	0
Belmont B – Planned	28 single-family	0	0
Broad Run A	0 existing or planned		
Broad Run B	0 existing or planned		

[295] *Id.* at 25.
[296] *Id.* at 25-27.
[297] *Id.* at 27-28.
[298] *Id.* at 28-29.

According to the Staff Report, Dominion has coordinated with the landowner and resident of the home within 250 feet of the centerline of Route 1 to minimize potential impacts of the Aspen-Golden Project to this home. Further, Belmont Park Variation A would cross an approved residential development for approximately 0.1 miles, but no construction on this development had begun as of March 2024, and Dominion adjusted the ROW to avoid crossing approved residential lots.[299]

Historic Resources. The Staff Report identified the portions of the Aspen-Golden Project with historic resource impacts projected by Dominion and the Virginia Department of Historic Resources ("DHR"), as follows:[300]

Resource	Impact
African American Cemetery	Route 1 – Moderate Impact Belmont Park (A or B) – Moderate Impact
Belmont Chapel and Cemetery	Route 1 – Minimal Impact Belmont Park (A or B) – Minimal Impact
Belmont Manor	Route 1 – Moderate Impact Belmont Park (A or B) – Minimal Impact
Cooke's Mill	Route 1 – Minimal Impact
Janelia/Howard Hughes Research Center	Route 1 – Moderate Impact Belmont Park (A or B) – Moderate Impact
W&OD Railroad Historic District	Route 1 – Minimal Impact Broad Run (A or B) – Minimal Impact

Wetlands. All portions of the Aspen-Golden Lines cross land with a medium or higher probability of containing wetlands or waterbodies, reported by Staff as follows:[301]

- Route 1: 15.4%, or 16.1 acres, with 6.4 acres being forested wetlands
- Belmont Park Variation A: 11.6%, or 0.8 acres, with 0.7 acres being forested wetlands
- Belmont Park Variation B: 32%, or 2.5 acres, with1.8 acres being forested wetlands
- Broad Run Variation A: 22%, or 6.6 acres, with 5.3 acres being forested wetlands
- Broad Run Variation B: 59%, or 18.0 acres, with 14.4 acres being forested wetlands

Additionally, Route 1 crosses 32 waterbodies, including 27 intermittent streams and three perennial waterbodies. Broad Run Variation A crosses five waterbodies, three intermittent streams and two perennial waterbodies. Broad Run Variation B crosses six waterbodies, including three intermittent streams and three perennial waterbodies. Also, the Staff Report states Dominion expects Broad Run Variation B would affect more than two contiguous acres of forested wetlands, meaning a U.S. Army Corps of Engineers ("USACE") Individual Permit would be necessary.[302]

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[299] *Id.*
[300] *Id.* at 29-33.
[301] *Id.* at 33-34.
[302] *Id.*

Staff's Analysis: Staff did not oppose the proposed routes for Aspen-Goose Creek Line #5002 or the Line Loop, noting these lines use existing ROW and thus minimize impacts to land use.[303] Staff agreed with Dominion's rationale for developing Route 1 and did not oppose this route for the Aspen-Golden Lines. Staff pointed to the following benefits of Route 1:[304]

- It maximizes collocation along major roadways and existing utility corridors.
- It avoids existing homes and businesses to the greatest extent possible.
- It collocates with the Apollo-Twin Creeks Lines across Goose Creek and three data center campuses.
- This alignment permits a future tie into Starlight Substation to avoid a potential reliability violation.
- This alignment would allow the Aspen-Golden Lines to serve two potential future data centers between Belmont Ridge Road and Ashburn Village Boulevard.

As for the Belmont Park Segment, Staff favored Variation A over Variation B though Staff admitted both options are electrically viable. Staff pointed to the following concerns with Variation B:[305]

- It could hamper emergency helicopter operations at Inova Loudoun Hospital.
- It requires two crossings of Route 7, requiring extensive coordination with VDOT.
- It would require more structures (seven, instead of four for Variation A).
- It is approximately $8 million more expensive than Variation A.

As for the Broad Run Segment, Staff did not oppose Broad Run Variation A but also considered Broad Run Variation B to be a viable option based on a totality of considerations such as type of land impacted, easements crossed, and collocation opportunities. Staff also noted the choice of segment depends on approval from Loudoun Water, since either variation requires crossing its Broad Run Facility property.[306]

Overall, Staff stated it does not oppose Route 1AA or Route 1AB and considers Route 1BA and 1BB as less favorable.[307]

Transmission Alternatives. The Staff Report discussed alternatives Dominion considered to the Aspen-Golden Project. One would involve a new 500-230 kV line from the proposed Aspen Substation to the Commanders Substation. Dominion determined this option was infeasible for several reasons, partly because this site is constrained by zoning issues and an open space easement. Staff did not object to Dominion's rejection of this alternative.[308]

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[303] *Id.* at 35, 38.
[304] *Id.* at 35-36.
[305] *Id.* at 36.
[306] *Id.* at 37.
[307] *Id.* at 38.
[308] *Id.* at 38-39.

Dominion also considered two other overhead transmission line corridors, one along the W&OD Trail and a second along the Dulles Greenway/Waxpool Road corridor. The major reason Dominion rejected the W&OD Trail option was insufficient ROW without viable options to obtain more ROW due to homes in the area and the improbability of acquiring new ROW along Loudoun County-owned park lands or School Board-owned lands. The Dulles Greenway/Waxpool Road option's challenges included that this corridor is 1.9 miles to 2.0 miles south of the proposed Aspen and Golden Substations, necessitating additional connecting infrastructure. This option also would require condemnation and removal of residences and the crossing of multiple existing overhead 230 kV lines. Staff concurred with the rejection of these options.[309]

The Staff Report next reviewed Dominion's consideration of full and partial undergrounding of the Aspen-Golden Lines. Dominion named several challenges to the all-underground option, including the need for four transition stations, each of which would require six acres within a fenced area and additional area beyond the fence, land which is lacking particularly at the Golden Substation site. Dominion also stated it would have to employ special construction methods to cross underneath Goose Creek and Broad Run, likely requiring the condemnation of existing buildings. Dominion also stated it would alter the overhead route so that it could make the underground route as short as possible, putting the line closer to residential areas and potentially causing greater environmental impacts. Dominion further pointed to the paucity of 500 kV transmission lines underground worldwide and in the United States, increased project cost (approximately a 500% increase, to over $1 billion), and time constraints as additional challenges to the all-underground option. Staff concluded that "[w]hile acknowledging the visual advantages of an underground route, Staff concurs that an all-underground option is not practical for the proposed Project, especially given the availability of a viable overhead option and the high cost and cost uncertainty associated with the all-underground option."[310]

Staff next discussed Dominion's consideration of undergrounding a 2.0-mile segment of Route 1 from Belmont Ridge Road to Ashburn Village Boulevard. Though Staff stated it "lacked the necessary details to determine the viability of this option at this time," Staff opined that similar challenges would exist for a hybrid underground option as for the all-underground option. These include the need for transition stations, routing challenges, need to condemn buildings and relocate gas and water utilities, impacts to homes, challenges serving future data centers, and delays to the Project's in-service date.[311]

Environmental Justice. Staff next addressed environmental justice. Staff reported the Company's findings that there are 48 Census Block Groups ("CBGs") within the Aspen-Golden Project study area, 12 of which are crossed by at least one of the project's routing options. Of these 12, four CBGs have populations of color; two CBGs have populations with limited English-speaking households; three CBGs appear to include both populations of color and limited English-speaking households; and one CBG appears to have both of those qualities in

[309] *Id.* at 39-42.
[310] *Id.* at 42-45 and Attachment 9 (Company Response to Staff Interrogatory No. 3-13 and Company Responses to Loudoun County Interrogatory Nos. 2-4, 2-5, and 2-8).
[311] *Id.* at 45-46.

addition to low-income populations. Staff reviewed Dominion's outreach efforts to these communities and recommended the Company continue engaging them to address concerns that may be identified as the Aspen-Golden Project progresses. Staff stated the project does not appear to adversely impact any goal of the Virginia Environmental Justice Act.[312]

Economic Development. Staff noted the Company's representation that the Aspen-Golden Project is needed to meet electric load requirements and to serve future load growth in the Eastern Loudoun Load Area, which in turn will facilitate economic growth in the Commonwealth. Staff declared future development in the area is reasonably foreseeable. Staff further commented there would be minimal additional work to maintain and operate the project after its construction, and thus there would be a negligible impact on job creation from the Aspen-Golden Project.[313]

Conclusion. Staff stated it does not oppose Dominion's request for a CPCN to construct and operate the Aspen-Golden Project. Staff opined that Belmont Park Variation A and Broad Run Variation A are optimal routes for the Aspen-Golden Lines but noted Broad Run Variation B also is a viable route.[314]

Apollo-Twin Creeks Project

Staff offered a Staff Report, along with the testimony of Jason Brannick and Mr. Dodson, each adopting portions of the Staff Report.

Jason Brannick, a Utilities Engineer in the Division of PUR, adopted the following portions of the Staff Report: Introduction; Existing and Future Facilities; Project Details; Project Costs; Construction Schedule; Environmental, Science and Historic Impacts of the Project; Environmental Justice; Economic Development; Coordinated Environmental Review; Wetland Impacts Consultation; and Conclusions and Recommendations.[315]

Mr. Dodson adopted the following portions of the Staff Report: Need for the Project; Staff's Analysis of the Need for the Project; and Demand-Side Management Considerations.[316]

The **Staff Report** included the following:

Introduction. Staff provided a brief overview of the Apollo-Twin Creeks Project and the procedural history of the Apollo-Twin Creeks.[317]

Existing and Future Facilities. Staff described the 230 kV and 500 kV transmission corridors already in the Apollo-Twin Creeks Project area, as well as the facilities Dominion proposes to construct as the Aspen-Golden Project.[318]

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[312] *Id.* at 46, 48.
[313] *Id.* at 47.
[314] *Id.* at 48.
[315] Ex. 28 (Brannick Direct) at 1-2.
[316] Ex. 35 (Dodson Direct) at 1-2.
[317] Ex. 36 (Apollo-Twin Creeks Staff Report) at 1-2.
[318] *Id.* at 2.

Need. Staff reviewed Dominion's assertions that the Apollo-Twin Creeks Project is needed so the Company can provide electric service to three data center campuses in the project area. Staff reported these campuses collectively will require 1,372 MW of power, as follows: 300 MW for Customer A, 555 MW for Customer B, and 517 MW for Customer C. The current substations in the area, Edwards Ferry, Ashburn, and Pleasant View, have limited capacity and would violate NERC reliability criteria if they were used to serve the data center campuses. Staff explained the Company plans to serve these customers with new substations, as follows:[319]

Campus	New Substation	Initial Summer Peak Load Projection	Summer Peak Load Growth to	Targeted In-Service Date
A	Twin Creeks	84 MW in 2025	300 MW in 2035	June 2026
B	Sycolin Creek	6 MW in 2026	300 MW in 2036	September 2026
B	Starlight	18 MW in 2028	255 MW in 2038	February 2028
C	Lunar	12 MW in 2026	278 MW in 2036	June 2028
C	Apollo	27 MW in 2027	239 MW in 2037	March 2028

Without the proposed Twin Creeks Substation, Staff reported Campus A would cause reliability violations at the existing Pleasant View and Ashburn Substations by 2024. Staff indicated Customer A initially would be served with bridging power, limited to approximately 30 MVA, from the Pleasant View Substation. Staff further stated Dominion asserts the Twin Creeks Substation would experience reliability violations and transformer overloads by 2026 if it were to serve both the full power loads of Customers A and B. Accordingly, Dominion has proposed to construct the Sycolin Creek and Starlight Substations to serve Customer B. Dominion has no plans to provide bridging power to Customer B. According to the Staff Report, Dominion claims Campus C requires power from both the proposed Lunar and Apollo Substations because the existing Edwards Ferry Substation would experience reliability violations by 2028 and transformer overloads by 2026 if it were to serve Customer C. Dominion intends to provide Customer C with bridging power from the Edwards Ferry Substation, limited to approximately 30 MVA. Staff reported both Campuses B and C require two substations each since the Company's Facility Interconnections Requirement document requires total load at any distribution substation not to exceed 300 MW of directly connected load. This requirement is to ensure system reliability and remain compliant with NERC reliability criteria.[320]

The Staff Report explained that based on the projected load the proposed five substations are expected to serve, in the future Dominion will need to connect these substations to a third energy source to avoid a potential reliability violation. Thus, when needed, Dominion intends to cut the proposed 230 kV Aspen-Golden Line #2333 into and out of the proposed Starlight Substation, creating the third energy source for these substations.[321]

Staff verified the load ramp schedules of Customers A, B, and C, as well as the power flows projecting reliability violations. Staff confirmed both that these violations would occur and that the Apollo-Twin Creeks Project addresses the violations. Staff confirmed Dominion's

[319] *Id.* at 3-4.
[320] *Id.* at 4-5 and n.19.
[321] *Id.* at 6.

planning studies showing the five substations are needed to meet projected load demand, avoid overloads, and comply with NERC reliability standards. Staff also agreed the Apollo-Twin Creeks Lines are necessary to interconnect the five substations.[322]

Demand-Side Management. Staff agreed with Dominion that demand-side management measures alone are insufficient to eliminate the need for the Aspen-Golden Project.[323]

Project Details. Staff reviewed the main components of the Apollo-Twin Creeks Project, including Dominion's estimated project cost and schedule.[324]

Environmental, Scenic, and Historic Impacts. Staff reviewed these impacts of the Apollo-Twin Creeks Project by considering the following categories: land use, dwellings, historic features, and wetlands.

Land Use. According to the Staff Report, Dominion avers the Project crosses a variety of land uses, including undeveloped forest land, land being used for mineral extraction, the forested Goose Creek Scenic Valley Buffer, and land now owned by industrial and data center developers. Of the 36.8 acres of forested land the Apollo-Twin Creeks Project will impact, approximately 35.4 acres are already planned for development and are likely to be cleared before Dominion begins construction of the Apollo-Twin Creeks Project.[325]

Dwellings. Staff reported there are no dwellings in the proposed Apollo-Twin Creeks Project's ROW, or within 100 feet of the ROW centerline, though there is one home within 500 feet and one home within 250 feet of the proposed centerline. Also, there are plans to locate 12 data center or warehouse structures within 500 feet of the centerline of the proposed ROW.[326]

Historic Resources. The Staff Report noted there are six historic resources within 1.0 miles of the Apollo-Twin Creeks Project. According to Dominion, the Project will have no impact on three of these. The Project will have a minimal impact on the W&OD Railroad Historic District, Cooke's Mill, and the African American Cemetery.[327]

Wetlands. Staff reported the Apollo-Twin Creeks Project crosses approximately 1.0 acres of land with a medium or higher probability of containing wetlands or waterbodies, including riverine wetlands. The project's proposed route also crosses waterbodies seven times, including crossings of Goose Creek and two intermittent tributaries to Goose Creek[328]

Environmental Justice. Staff next addressed environmental justice. Staff reported the Company's findings that there are 16 CBGs within one mile of the proposed route of the Apollo-Twin Creeks Project, two of which are crossed by the Project. Staff reported Dominion does not

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[322] *Id.* at 6-7.
[323] *Id.* at 7.
[324] *See generally, id.* at 7-14 and Attachments 2, 3, and 4.
[325] *Id.* at 14-15.
[326] *Id.* at 15.
[327] *Id.*
[328] *Id.* at 16.

expect disproportionately high or adverse impacts to these communities or to the broader community surrounding the project. Staff agreed with the Company's assessment.[329]

Economic Development. Staff noted the Company's representation that the Apollo-Twin Creeks Project is needed to provide electric service requested by Customers A, B, and C; to maintain reliable service for overall load growth in the area; and to comply with mandatory NERC reliability standards. Staff commented there would be minimal additional work to maintain and operate the project after its construction, and thus there would be a negligible impact on job creation from the project.[330]

Conclusion. Staff concluded Dominion has reasonably shown the need for the Apollo-Twin Creeks Project. Staff found Dominion's proposed route for the project to be optimal because it maximizes opportunities for collocation and crosses the properties of Customers A, B, and C for much of its length. Staff further found the proposed route appears to avoid or reasonably minimize impacts to existing residences, scenic assets, historic districts, and the environment. Staff concluded the Apollo-Twin Creeks Project does not appear to adversely impact any goal of the Virginia Environmental Justice Act. Staff therefore did not oppose Commission issuance of a CPCN for construction and operation of the Apollo-Twin Creeks Project.[331]

DEQ Reports

Aspen-Golden Project

On May 13, 2024, DEQ filed the DEQ Report, summarizing the Aspen-Golden Project's potential impacts to natural and cultural resources in Virginia.[332] DEQ stated that the following agencies joined with DEQ in review of the Project:[333]

- Department of Conservation and Recreation ("DCR");
- Virginia Department of Health ("VDH");
- DHR;
- Virginia Marine Resources Commission ("VMRC");
- Department of Wildlife Resources ("DWR");
- Department of Aviation ("DOAV");
- VDOT; and
- Virginia Outdoors Foundation ("VOF").

The DEQ Report listed numerous permits and approvals that are likely prerequisites to the Aspen-Golden Project's construction.[334] In addition to these requirements of local, state, or

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[329] *Id.*
[330] *Id.* at 17.
[331] *Id.* at 18.
[332] Ex. 30 (Aspen-Golden DEQ Report) at Cover Letter, p. 1 (unnumbered).
[333] *Id.* at 1. DEQ indicated the Virginia Department of Agriculture and Consumer Services, Department of Forestry, Northern Virginia Regional Commission, and Loudoun County also were invited to comment. *Id.*
[334] *See id.* at 3-5.

federal law, the DEQ Report included several recommendations made by the reviewing agencies for the Commission's consideration. These are:[335]

- Follow DEQ's recommendations for construction activities to avoid and minimize impacts to wetlands to the maximum extent possible;
- Follow DEQ's recommendations regarding erosion and sediment control and stormwater management, as applicable;
- Reduce solid waste at the source, reuse it and recycle it to the maximum extent practicable, as applicable;
- Coordinate with DCR's Division of Natural Heritage ("DNH") regarding its recommendations for invasive species management, avoidance of impacts to cores, and to obtain an update on natural heritage information as necessary;
- As recommended by DHR:
  - Perform comprehensive cultural resources surveys, in accordance with DHR guidelines, by qualified professionals before constructing any Commission-approved alternative;
  - Evaluate all identified resources for listing in the Virginia Landmarks Register ("VLR") / National Register of Historic Places ("NRHP");
  - Assess potential direct and indirect impacts to all VLR/NRHP-eligible or -listed resources, including previously inaccessible properties; and
  - Avoid, minimize, and/or mitigate moderate to severe impacts to VLR/NRHP-eligible or -listed resources by Dominion in consultation with DHR and other stakeholders.[336]
- Coordinate with VDH regarding its recommendations to protect public drinking water sources;
- Follow the principles and practices of pollution prevention to the maximum extent practicable;
- Limit the use of pesticides and herbicides to the extent practicable; and
- Coordinate with VOF if the Aspen-Golden Project area changes or if the project does not begin within 24 months.

The DEQ Report also recorded DCR-DNH's recommendation that the Aspen-Golden Project avoid the Ashburn Quarry Conservation site during construction. Finally, the DEQ Report offered DCR-DNH's corrections to the Aspen-Golden Application's DEQ Supplement.[337]

Apollo-Twin Creeks Project

On May 28, 2024, DEQ filed the DEQ Report, summarizing the Apollo-Twin Creeks Project's potential impacts to natural and cultural resources in Virginia.[338] DEQ stated that the following agencies joined with DEQ in review of the Project:[339]

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[335] *See generally, id.* at 6-7.
[336] *Id.* at 21.
[337] *Id.* at 18-19.
[338] Ex. 29 (Apollo-Twin Creeks DEQ Report) at Cover Letter, p. 1 (unnumbered).
[339] *Id.* at 1. DEQ indicated VDOT, the Virginia Department of Agriculture and Consumer Services, Department of Forestry, Northern Virginia Planning District Commission, and Loudoun County also were invited to comment. *Id.*

- DCR;
- VDH;
- DHR;
- VMRC;
- VOF;
- DOAV; and
- DWR.

The DEQ Report listed numerous permits and approvals that are likely prerequisites to the Apollo-Twin Creeks Project's construction.[340] In addition to these requirements of local, state, or federal law or regulations, the DEQ Report included recommendations made by the reviewing agencies for the Commission's consideration. These are:[341]

- Follow DEQ's recommendations for construction activities to avoid and minimize impacts to wetlands to the maximum extent possible;
- Follow DEQ's recommendations regarding erosion and sediment control and stormwater management, as applicable;
- Take precautions to minimize emissions, particularly during periods of high ozone;
- Reduce solid waste at the source, reuse it, and recycle it to the maximum extent practicable, as applicable;
- Coordinate with DCR-DNH to obtain an update on natural heritage information and to discuss their recommendations to protect natural heritage resources, avoid impacts to cores, and develop an invasive species management plan as needed;
- As recommended by DHR:
  - Perform comprehensive cultural resources surveys, in accordance with DHR guidelines, by qualified professionals before constructing any Commission-approved alternative;
  - Evaluate all identified resources for listing in the VLR/NRHP;
  - Assess potential direct and indirect impacts to all VLR/NRHP-eligible or -listed resources, including previously inaccessible properties; and
  - Avoid, minimize, and/or mitigate moderate to severe impacts to VLR/NRHP-eligible or -listed resources by Dominion in consultation with DHR and other stakeholders;[342]
- Coordinate with VDH regarding its recommendations to protect public drinking water sources;
- Coordinate with VOF if the Apollo-Twin Creeks Project area changes or the project does not start for 24 months;
- Follow the principles and practices of pollution prevention to the maximum extent practicable;
- Limit the use of pesticides and herbicides to the extent practicable;

[340] These are detailed *id.* at 3-5.
[341] *See generally, id.* at 6-7.
[342] *Id.* at 20.

- Follow DOAV's recommendations regarding continued coordination with the Federal Aviation Administration ("FAA") concerning potential impacts created for Virginia Public-Use Airports' development and safety; and
- Coordinate with DWR regarding its recommendations to protect the Green Floater and minimize adverse impacts from linear utility projects and instream work.

In addition to the above summary of recommendations, the DEQ Report offered DCR-DNH's corrections to the Apollo-Twin Creeks Application's DEQ Supplement.[343]

Dominion Rebuttal Testimony

Dominion offered rebuttal testimony of the following witnesses: Kunal S. Amare, Matthew B. Vinson, Kamlesh A. Joshi, James P. Young, Lori Schuelke, Robert E. Richardson, Lawrence J. Colorito, Jr., Gabor Mezei, Shane A. Moulton, and Jacob M. Rosenberg.

Kunal S. Amare, Consulting Engineer in the Company's Electric Transmission Planning Department, reiterated the need for the Aspen-Golden and Apollo-Twin Creeks Projects; commented on the Staff Reports in each of the Combined Cases; discussed the Updated Hybrid Proposal; and discussed the concept of a data center rate class.[344]

Need. Mr. Amare summarized the need for the Aspen-Golden Project. He focused on load flow studies showing the negative impacts of projected load growth on the system that will cause thermal overloads by summer 2028. He testified that if the Aspen-Golden Project and other planned projects are not implemented, "the identified reliability violations will severely impact the transmission system's ability to provide reliable service to Dominion Energy Virginia's customers in the Eastern Loudoun Load Area."[345] Mr. Amare also confirmed the Apollo-Twin Creeks Project is needed to ensure the Company can provide requested electric service to three data centers while maintaining reliable electric service at NERC reliability standards for current customers along with anticipated load growth of 1,372 MW in the Leesburg Load Area.[346]

During the hearing, Mr. Amare refuted concerns that demand in the Eastern Loudoun Load Area will not materialize, noting that Dominion interconnects multiple data centers every year and confirming that "the Company's confident that the demand will actually materialize."[347]

In response to the suggestion that Dominion can delay interconnecting future customers, Mr. Amare affirmed that for the Aspen-Golden Project, "delaying interconnection is not a remedy for this kind of reliability project" and can be done only if the project were customer driven, as is the case for the Apollo-Twin Creeks Project.[348] He noted that delaying customer connections if the Aspen-Golden Project does not meet its in-service date is one planned

[343] *Id.* at 17-19.
[344] Ex. 40 (Amare Rebuttal) at 1, 5.
[345] *Id.* at 2-3.
[346] *Id.* at 3-4.
[347] Tr. at 1321 (Amare). For context, *see also id.* at 337-38 (Reisinger).
[348] *Id.* at 1323 (Amare).

contingency, but "not the only one."[349] In response to the suggestion that pushing back the Aspen-Golden Project in-service date will not result in NERC violations, Mr. Amare responded that there "will be multiple thermal violations as listed in the [Application] [A]ppendix if the in-service date of this project is not met," including the potential for damage to existing lines from overheating, which could cause widespread outages throughout Virginia.[350]

Response to Staff Reports. Mr. Amare expressed the Company's appreciation for Staff's investigation of the Aspen-Golden and Apollo-Twin Creeks Projects. He clarified that the proposed Sycolin Creek Substation projected peak load is expected to occur in September 2026, not in summer 2026. He affirmed this update has no effect on the need for the Apollo-Twin Creeks Project.[351]

Updated Hybrid Proposal. Mr. Amare asserted Dominion's proposed overhead Aspen-Golden Routes (1AA, 1AB, 1BA, and 1BB) "are the only robust and reliable long-term solution to meet the identified need for the Aspen-Golden Project," and noted PJM classified this project "as a critical baseline reliability project" that must be operational by June 1, 2028.[352] He explained that, assuming a Commission final order by October 28, 2024, the Company could meet PJM's deadline. Such a schedule would provide 44 months to construct the overhead lines and perform related activities such as engineering, materials procurement, and permitting. He claimed that, by contrast, constructing an all-underground alternative would require approximately 47 months solely for construction, excluding time for other activities such as procuring long lead equipment, relocating existing utilities, closing roads, and accounting for permitting and outage delays. He further claimed that undergrounding a three-mile segment of the Aspen-Golden Lines would require approximately 36 months solely for construction. He contended these timeframes would apply if undergrounding were viable, which he denied is the case. He briefly summarized the reasons other Dominion rebuttal witnesses gave as to the infeasibility of undergrounding, including: inadequate ROW widths, encroachment on or crossing of multiple existing utilities, the time it will take to drill and blast through diabase rock that will likely be encountered during undergrounding, and multiple issues with the Updated Hybrid Proposal.[353]

Rates and Cost Responsibility. Mr. Amare responded to testimony that high-wattage customers or data centers be made into a special customer class that would pay for undergrounding costs. He asserted the Combined Cases are to obtain project approvals, not cost recovery, and thus this concept is beyond the scope of the Combined Cases. He further claimed Dominion's entire transmission system is a 500 kV loop, throughout which there are no direct connections to individual customers. He contended that even the 230 kV Apollo-Twin Creeks Project, which will provide electric service to three data center customers, also allows Dominion to maintain reliable service while accommodating growth in the Leesburg Load Area. He

[349] *Id.* at 1326 (Amare).
[350] *Id.* at 1323-24 (Amare).
[351] Ex. 40 (Amare Rebuttal) at 6-8.
[352] *Id.* at 8-10.
[353] *Id.* at 9-11.

concluded the Aspen-Golden and Apollo-Twin Creeks Projects will benefit all customers and that it is equitable for all customers to pay for the costs of these projects.[354]

Matthew B. Vinson, a Consulting Engineer in Dominion's Electric Transmission Line Engineering Department, addressed the concerns of Community Church and the Belmont Landbay KK Variation suggested by JKLH witnesses.

Community Church Concerns. To assuage the concerns of Community Church, Mr. Vinson stated Dominion determined it could shift the location of two transmission structures, so that one structure would no longer be centered on the Community Church steeple viewable from Route 7, and shift a third structure to accommodate the height changes of the two structures whose location is being moved ("Community Church Proposed Modified Segment"). Under this modification, the height of one pole would decrease from 190 feet to 170 feet, while the heights of two structures that were originally 175 feet would increase to 180 feet and 185 feet. He confirmed this modification does not require additional structures or structure configurations beyond what was originally proposed. He reported that, in response to the Community Church Proposed Modified Segment, Community Church "stated that these changes addressed its concerns with the Company's proposed overhead Aspen-Golden Lines over its property."[355]

During the hearing, Mr. Vinson affirmed that, both at the time of the Application's filing and with the Community Church Proposed Modified Segment, the proposed project includes one overhead structure on Community Church's property.[356]

Belmont Landbay KK Variation. Mr. Vinson confirmed Dominion can accommodate the Belmont Landbay KK Variation and reported the Company will continue working with JKLH to microsite the locations of the structures along this variation. Though the structure heights for the up-to-four structures to be relocated is unknown, Mr. Vinson averred they are anticipated to be similar to what was originally proposed, with similar average heights. He also confirmed this modification does not require additional structures or structure configurations beyond what was included in the Aspen-Golden Application Appendix.[357]

Clarifications. During the hearing, Mr. Vinson clarified that of the 44 months provided in the timeline for the Aspen-Golden Project, the Company allotted 24 months for construction. He indicated Dominion believes construction can occur in 18 months but added a six-month buffer to account for unforeseen delays or outages. He also testified that the Company's total Aspen-Golden Project cost of $171 million includes approximately $61 million for real estate costs to construct Aspen-Golden Route 1AA.[358]

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[354] *Id.* at 11-12.
[355] Ex. 41 Vinson Rebuttal) at 2-4.
[356] Tr. at 1339 (Vinson).
[357] Ex. 41 (Vinson Rebuttal) at 4-5.
[358] Tr. at 1337-38, 1340-41 (Vinson). *See also* Ex. 42 (Site Summary Report).

Kamlesh A. Joshi is a Senior Electrical Engineer in the Transmission and Distribution Services Department at Burns & McDonnell. He responded to testimony of Loudoun County and of Ms. Ghiorzi.

Response to Loudoun County Witnesses. Mr. Joshi addressed a statement by Mr. Giglio concerning the size of the transition station that would be required if the Aspen-Golden Lines were undergrounded. Mr. Joshi clarified two transition stations would be required, one at each end of the underground portion of the transmission lines. These transition stations would require seven acres each (not including required setbacks, buffers, access roads, and a stormwater pond) for equipment to accommodate both the 500 kV and 230 kV lines. The equipment would "include, at a minimum, transmission line backbone structures, switches, shunt reactors, circuit breakers for the shunt reactors, underground to overhead gateways, a control house, security enclosure, and bus arrangements." According to Mr. Joshi, this equipment would likely stand from 35 to 120 feet tall and would be installed inside a 20-foot-high security fence.[359]

During the hearing, Mr. Joshi confirmed the seven-acre requirement for a 5/2 transition station, not including a stormwater management pond, Loudoun County-required setbacks, access roads, and buffers. He also indicated a 230 kV-only transition station would require a two-acre footprint for one 230 kV line making an overhead-to-underground transition, which acreage again does not include stormwater facilities, setbacks, access roads, and buffers. He explained a buffer for either a substation or a transition station is a 15- to 20-foot space outside the fence for security, holding a security post if required, the fence post, and crushed rock.[360] He further testified a 230 kV air-insulated substation would require approximately five acres for an overhead line, and two additional acres if an underground line is coming into the substation.[361]

When asked to explain why a 5/2 transition station would require seven acres, when the Company previously indicated it would only require five acres, Mr. Joshi explained that at the time of the earlier estimate, the Company was still studying this issue. He confirmed a transition station for the Aspen-Golden Project would require seven acres including shunt reactors and road access within the substation. He testified the shunt reactors are required by Company policy in this instance "to maintain the planning and the equipment group requirements."[362]

Mr. Joshi also testified concerning the height of infrastructure at transition stations. He explained that the minimum height of the low bus is 30 feet on the 230 kV side, and 35 feet on the 500 kV side. He stated that where the overhead line would come into the transition station, the transmission line dead-end structures would be the tallest infrastructure, at 120 feet.[363]

According to Mr. Joshi, Loudoun County did not account for other transition stations that may be required to serve JKLH's Belmont Property or Telos Property. Mr. Joshi posited that both properties may require a 230 kV transition station tapped from Aspen-Golden 230 kV Line #2333 to serve these data centers. He asserted the 5.7 acres JKLH set aside on its Belmont

[359] Ex. 26 (Joshi Rebuttal) at 2-3.
[360] Tr. at 1201-02, 1226-27 (Joshi).
[361] *Id.* 1224-25, 1241 (Joshi).
[362] *Id.* at 1236-40.
[363] *Id.* at 1232-33 (Joshi).

Property and the 2.7 acres JKLH set aside on its Telos Property are insufficient to accommodate such transition stations and the additional infrastructure needed to serve these delivery points. On cross-examination, Mr. Joshi testified that the 2.7 acres set aside for electric infrastructure on the JKLH Telos Property would be insufficient for an air-insulated substation, and the Company would have to evaluate a gas insulated switchgear substation option.[364] When asked if it is feasible, using gas insulated switchgear technology, to fit a 230 kV transition station and a substation on the 5.7-acre set-aside for electric infrastructure on the JKLH Belmont Property, Mr. Joshi responded he "cannot guarantee that right now."[365] He stressed that the Company's standard practice to serve delivery points "is to not tap the 230 kV line. The standard practice is to cut and loop out the 230 kV lines with the four-breaker ring bus configuration, which will be expandable to six as an ultimate configuration for reliability purposes," meaning "we will need two 230 kV underground lines coming to that space. Hence, the minimum 2-acres area will not satisfy this requirement."[366]

As to cost for the Updated Hybrid Proposal, Mr. Joshi asserted certain components were not included in Loudoun County Witness Conroy's underground transmission line estimate worksheet, as follows:

- 500 kV shunt reactors: $10.4 million
- 230 kV shunt reactors: $9 million
- Associated breakers, disconnect switches, and arresters $2 million

He stated this entire cost should be multiplied by two, one set of costs for the transition station on each side of the underground line.[367]

In response to the question whether customer delivery points from the Updated Hybrid Proposal could be served from underground instead of via a transition station, Mr. Joshi stated the gas insulated switchgear option "will be a stretch and it will be considerably [more] expensive than the [air-insulated] option."[368]

Response to Ms. Ghiorzi. Mr. Joshi clarified, contrary to Ms. Ghiorzi's assertions, that the Apollo-Twin Creeks Project substations "are not for the sole and exclusive use of any specific data center" but "have been designed with additional capacity that potentially can be allocated to accommodate future electrical utility needs within the local area surrounding the data centers."[369]

James P. Young, Environmental Services Electric Transmission Environmental Specialist III for Dominion, addressed environmental concerns raised in the DEQ Reports on the

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[364] Ex. 26 (Joshi Rebuttal) at 4-5; Tr. at 1241-42 (Joshi). Mr. Joshi more generally testified that gas insulated switchgear facilities are more expensive than their air-insulated counterparts, noting "the difference in cost between an air-insulated substation and a comparable [gas insulated switchgear] substation would be approximately double the cost." Tr. at 1208 (Joshi).
[365] Tr. at 1255 (Joshi).
[366] *Id.* at 1203-04 (Joshi).
[367] *Id.* at 1218-19, 1251-52 (Joshi).
[368] *Id.* at 1252 (Joshi).
[369] Ex. 26 (Joshi Rebuttal) at 6.

Aspen-Golden and Apollo-Twin Creeks Projects, environmental impacts of undergrounding the Aspen-Golden Lines, and permitting concerns with Loudoun County's Updated Hybrid Proposal. Mr. Young testified that Dominion does not object to the "Summary of Findings and Recommendations" in the Aspen-Golden and Apollo-Twin Creeks DEQ Reports. He did, however, address specific recommendations within the DEQ Reports.[370]

Aspen-Golden DEQ Report – Locating Wells. Mr. Young discussed the VDH Office of Drinking Water's recommendation that the Company field-verify locations of wells within a 1,000-foot radius of the Aspen-Golden Project site to protect them from accidental damage during construction. Mr. Young explained that water wells within the 1,000-foot radius may be beyond the transmission line corridor and on private property, in which case Dominion has no ability or right to field-mark them. Mr. Young referred to the Company's proposal to plot and call out the wells on the Erosion and Sediment Control plans to flag them for Dominion's construction team, and VDH's agreement in a prior case that such approach is reasonable. Mr. Young confirmed Dominion intends to follow this approach and will coordinate with VDH's Office of Drinking Water as needed.[371]

Apollo-Twin Creeks DEQ Report – Work Restrictions during Songbird Nesting Season. Mr. Young expressed strong opposition to DWR's recommendation that Dominion conduct significant tree removal and ground-clearing activities outside the timeframe of March 15 to August 15, the primary songbird nesting season. He requested the Commission reject this recommendation. He explained Dominion intends to receive all permits and begin construction of the Apollo-Twin Creeks Line upon receipt of a Commission final order, which the Company expects by March 2025. He averred construction would take at least one year, overlapping with the recommended songbird nesting season restriction. Given that tree removal and ground clearing are the first construction step, he estimated adoption of this recommendation would delay the Apollo-Twin Creeks Project schedule by three months. He expressed concern that this delay could be compounded by time-of-year restrictions related to the Northern Long-eared Bat, imperiling the Company's ability to meet the project's in-service date and potentially increasing project costs. Mr. Young offered that the Company would coordinate with DWR to minimize songbird-related impacts from the project.[372]

During the hearing, Mr. Young reiterated the request that the Commission reject this DWR recommendation on the basis that the Company will coordinate with the agency to minimize impacts to songbirds. He added that there is overlap between the Apollo-Twin Creeks Project clearing and other tree-clearing activities associated with other projects in the area. He testified, "[A]nd so with being able to coordinate once we get a final approved alignment, at that point, we'll actually know what impacts would be occurring and be able to coordinate more effectively with DWR in trying to minimize those impacts."[373]

Mr. Young also stated during the hearing that there are no regulatory updates related to the Northern Long-eared Bat and the Tri-colored Bat beyond what the Company has already

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[370] Ex. 43 (Young) at 1-4.
[371] *Id.* at 4-5, 31. *See also* Ex. 4 (Aspen-Golden Application) at DEQ Supplement, pp. 61-62 and Attachment 2.P.2.
[372] Ex. 43 (Young) at 5, 32-33.
[373] Tr. at 1349-51 (Young).

reported. He explained that specific to the Aspen-Golden and Apollo-Twin Creeks Projects, the Company does not foresee any restrictions related to these animals due to a lack of hibernacula or roost trees in the transmission corridors. He affirmed Dominion monitors regulatory changes to determine the impact both on specific projects and the Company's program.[374]

Apollo-Twin Creeks DEQ Report – Recommendation on Green Floater. Mr. Young addressed DWR's recommendations that in-stream work in Goose Creek or tributaries occur outside the restricted times of April 15 through June 15 and August 15 through September 30; that the Company conduct in-stream activities during low-flow or no-flow conditions; and that the Company implement strict erosion and sediment control measures. Mr. Young affirmed the Company implements and adheres to strict requirements of erosion and sediment control and stormwater management laws and regulations as required by DEQ. He also clarified Dominion does not anticipate conducting in-stream work for the Apollo-Twin Creeks Project. He confirmed that if such work is required, the Company will coordinate with DWR and DEQ and adhere to requirements associated with the Green Floater through the permitting process. He requested the Commission reject these DWR recommendations.[375]

Both DEQ Reports – Petroleum Release Sites. Mr. Young addressed the DEQ Division of Land Protection and Revitalization's ("DEQ-DLPR") statement that the Aspen-Golden Project should evaluate five petroleum release sites to determine the location, nature, and extent of release and each release's impact on the Aspen-Golden Project. He noted a similar request by DEQ-DLPR in the Apollo-Twin Creeks DEQ Report, wherein DEQ-DLPR recommended further evaluation of three petroleum release sites to determine the location, nature, and extent of release and each release's impact on the Apollo-Twin Creeks Project. The three petroleum release sites referenced in the Apollo-Twin Creeks DEQ Report are the same as three of the five petroleum release sites referenced Aspen-Golden DEQ Report. The petroleum release sites are:[376]

Aspen Report?	Apollo Report?	Pollution Complaint No.	Occurrence or Report Date	Date Closed
Yes	No	19901824	June 1990	1994
Yes	No	19910186	August 8, 1990	1995
Yes	Yes	20223034	Unspecified	March 2022
Yes	Yes	19880981	July 1988	June 1995
Yes	Yes	19921766	1991	1993

Mr. Young asserted these release sites do not require further study because of their regulatory status as closed, the time elapsed since closure, and the location of the release sites. Specifically, he represented "[i]t is the Company's understanding that the DEQ deems a site closed once no further risk to the general public has been identified, although petroleum residue might remain." As to time elapsed since closure, he testified that four of the five complaints were closed between 29-34 years ago, with the fifth complaint closed over two years ago. As to

[374] *Id.* at 1355-56 (Young).
[375] Ex. 43 (Young) at 5, 33-34.
[376] *Id.* at 6-9, 11-13.

the sites' locations, he averred that none are within the ROW of either the Aspen-Golden or Apollo-Twin Creeks Lines, though some sites are within 100-200 feet of a project's centerline.[377]

Mr. Young requested the Commission reject any requirement for the Company to evaluate these sites further. He noted that if contaminated soils are found during construction, Dominion will coordinate with the regulatory agency and ensure the soils are correctly discarded.[378]

Both DEQ Reports – Ecological Cores. Mr. Young stated that the DEQ Reports for both projects include a recommendation from DCR-DNH that the Company avoid impacts to ecological cores and, when avoidance is unachievable, that the Company minimize the impact area and concentrate any impact at the edges of cores to allow the most interior portion of the core to remain intact. Mr. Young asserted Dominion already tries to avoid ecological cores where feasible and to minimize impacts where impacts are unavoidable or impracticable. He testified that all ecological cores crossed by the proposed and alternate routes of the Aspen-Golden Lines or within a substation site that is part of the Apollo-Twin Creeks Project are ranked as C4 (Moderate) or C5 (General), the lowest two rankings of ecological integrity. He further explained that four of these six ecological cores are fragments because they do not meet the requirement that an ecological core comprise "at least 100 acres of continuous interior, natural cover."[379] He noted several of these cores already contain transmission or distribution lines or other clearing activity. The largest (182-acre) ecological core, he explained, has already experienced clear-cutting of approximately 75.9 acres to accommodate the campuses of data center Customers B and C. He shared that "[t]he Proposed Routes for both Projects cross through or are directly adjacent to the permitted limits of disturbance of either development to reduce further impact to the core."[380] Mr. Young stated some of the core fragments also have been or are proposed for clearing to make way for other developments. He emphasized the Company has collocated the Aspen-Golden and Apollo-Twin Creeks Lines together and has collocated portions of these lines along existing infrastructure such as roads and buried utility lines to minimize the fragmentation of ecological cores or forests. He requested the Commission reject DCR-DNH's recommendation about ecological cores.[381]

Both DEQ Reports – Rare Species Survey. Mr. Young addressed DCR-DNH's agreement with Dominion that habitat for rare plants associated with diabase soils in the areas of the Aspen-Golden and Apollo-Twin Creeks Projects is poor habitat not requiring survey. He added that DCR-DNH also suggested rare species surveys be conducted "where rare species are possible within the project area" instead of "informing construction crews about the rare species and requesting they identify them in the field . . .." He asked the Commission to reject this request for expert surveys where rare species are possible for both the Combined Cases and for future projects. He asserted that since rare species are not endangered or threatened, they do not enjoy regulatory protections. He claimed a survey requirement would lead to additional project

[377] *Id.* at 9-10, 13-14. The quotation is located *id.* at 9.
[378] *Id.* at 10-11, 14-15.
[379] *Id.* at 15-16.
[380] *Id.* at 16-18.
[381] *Id.* at 18-20.

costs and delays. He confirmed Dominion will coordinate with required agencies during the ultimate project design stage.[382]

Mr. Young also requested the Commission reject DCR-DNH's request that Dominion use botanists to identify rare species for the same reasons as it should reject the survey requirement. He emphasized that overhead transmission construction minimally disturbs the ground compared to other utility development and explained the Company's use of matting and placement of heavy equipment to limit soil disturbance. He testified that disturbances during project construction are stabilized upon sequential development, and the Company reseeds the disturbed area with an approved seed mix.[383]

Both DEQ Reports – Invasive Species Management Plan. Mr. Young discussed DCR-DNH's recommendation that Dominion develop and implement an invasive species management plan as part of its ROW maintenance practices and inventory the Aspen-Golden and Apollo-Twin Creeks Projects areas for invasive species. Mr. Young explained Dominion already has an Integrated Vegetation Management Plan ("IVMP") that incorporates multiple methods to control vegetation, including invasive species. He asserted the IVMP is consistent with the standards of national organizations and incorporates mowing and/or selective approved herbicide applications to destroy vegetation threatening the transmission system while promoting the retention of desirable flora. He averred developing a separate invasive species plan for these two project areas could increase costs and create project delays. He confirmed the Company and DCR-DNH have been in communications about an addendum to Dominion's IVMP addressing invasive species. DCR provided a response to Dominion's proposed addendum in January 2024, and the addendum is not yet finalized. Mr. Young requested the Commission reject this agency suggestion based on Dominion's existing IVMP and its ongoing coordination with DCR-DNH.[384]

Both DEQ Reports – ROW Restoration and Maintenance. Mr. Young reported DCR-DNH recommends Dominion's ROW restoration and maintenance practices include revegetation using native species, with robust monitoring and an adaptive plan if initial revegetation attempts are unsuccessful or an outbreak of invasive species emerges. Mr. Young represented that Dominion's IVMP already addresses revegetation and maintenance of transmission ROWs. He requested the Commission reject this recommendation.[385]

Both DEQ Reports – Response to DCR Comments. Mr. Young acknowledged a typographical error DCR pointed out in each of the DEQ Reports concerning documented state-listed plants. He agreed there is one state-listed plant in the area of the projects, Torrey's Mountain-mint. He noted Dominion and DCR-DNH also agree that a survey for this species is not recommended due to unsuitable habitat conditions.[386]

Mr. Young also noted two slightly differing recommendations in the two DEQ Reports, both aiming to ensure Dominion's compliance with the Virginia Endangered Species Act (Code

[382] *Id.* at 20-21. The quotation is located *id.* at 20.
[383] *Id.* at 21-23.
[384] *Id.* at 24-26.
[385] *Id.* at 26-27.
[386] *Id.* at 27-28.

§ 29.1-563 *et seq.*) to protect the Peregrine Falcon. Mr. Young acknowledged the Peregrine Falcon is a threatened species and is aware a falcon nest is being monitored within the Ashburn Quarry Conservation Site. This nest is approximately 0.8 miles from the edge of the ROW of the Apollo-Twin Creeks and Aspen-Golden Projects. Mr. Young explained that since the February 15 through July 15 time-of-year restriction applies only to activities within 600 feet of an active nest, this restriction does not apply to the Aspen-Golden and Apollo-Twin Creeks Projects. He further indicated the projects do not utilize the steep slopes of the quarry area to which the Peregrine Falcon is attracted. He confirmed the Company will coordinate with DWR or other appropriate agencies if active Peregrine Falcon nests are located within 600 feet of the projects' ROW and that the Company is committed to avoiding and reducing impacts to this species.[387]

Environmental Impacts of Undergrounding. Mr. Young addressed the assertion of Laborers' Council Witness Brown that undergrounding minimizes disruption to local ecosystems and wildlife and preserves natural landscape. He explained that when installing overhead transmission lines, the Company timbers forested areas down to open meadow/shrub habitat and utilizes matting in sensitive resource areas, leaving stumps and root taps of trees and shrubs to limit disturbance. He also noted wildlife relocate during construction and return to the area once overhead line construction is completed. Conversely, Mr. Young described how underground transmission lines require a fully maintained ROW denuded of tree and shrub habitat, including root systems that could interfere with the underground line. To achieve such an environment, all root systems and stumps are removed during construction, reducing ecosystem functions below what is maintainable in an overhead line context. He also noted underground lines require more time to be constructed and, post-construction, there are more limitations on permitted landscaping within the ROW of the underground line. He concluded that underground lines "have a more direct impact to vegetative management, local ecosystems and wildlife, preservation of the natural landscape, and biodiversity" when compared to overhead lines.[388]

During the hearing, Mr. Young explained that when constructing an underground facility, "you will strip everything off of that face of your right-of-way, and then overhead facility, you will not. You will basically be limiting your ground disturbance . . . which typically is going to be associated with where each individual structure is located and designated access." He indicated that allowable vegetation under overhead lines includes shrubs and smaller woody species of plants, whereas allowable vegetation in the ROW for an underground facility is grass or turf.[389]

Permitting Concerns with the Updated Hybrid Proposal. Lastly, Mr. Young expressed concern regarding permitting of Loudoun County's Updated Hybrid Proposal. He explained that the underground alignment would require excavation of large trenches along the entire corridor of the underground portion of the Aspen-Golden Lines, directly impacting the stream channel and riparian corridor in the area. He claimed undergrounding in this area would require a Nationwide Permit 57 from the USACE, which permit in turn is based on whether DEQ issues a Clean Water Act section 401 water quality certification. Given the environmental impacts of any

[387] *Id.* at 28-30.
[388] *Id.* at 34-37.
[389] Tr. at 1371-73 (Young). The quotation is found *id.* at 1372-73.

underground route in the region where JKLH has property, Mr. Young surmised DEQ would require an individual DEQ Virginia Water Protection permit. He explained DEQ only issues an individual permit after considering reasonable alternatives to a project and finding the proposal seeking the individual permit is the Least Environmentally Damaging Practicable Alternative. He posited DEQ could not find the Hybrid Underground Proposal to be such an alternative since an overhead line alternative would have fewer impacts to the riparian area as well as lesser impacts on natural resources and the affected community.[390]

When asked whether DEQ would have to consider the overhead proposal a practicable alternative if the Commission were to order the Company to construct the Updated Hybrid Proposal, Mr. Young responded that "the Company did not present the underground [proposal], and we do not believe that it is constructible or permittable."[391]

Mr. Young also claimed the alignment of the Updated Hybrid Proposal passes immediately adjacent to the African American Cemetery, a protected historic resource, and directly conflicts with plans to develop the Loudoun Freedom Center. He announced, "The Company does not propose and will not accept such an alignment" and that it is not feasible, constructable, or the least impactful option.[392] Additionally, Mr. Young took issue with a ground penetrating radar survey of portions of the JKLH Belmont Property to search for evidence of unmarked burials. He averred that the survey did not cover the two underground route options proposed to go across the JKLH Belmont Property and that further analysis is required.[393]

During the hearing, Mr. Young revisited a potential issue with undergrounding the Updated Hybrid Proposal through the JKLH Belmont Property, specifically through its stormwater facility. He opined that there are issues with trying to go around or underneath this facility and "all of those, I think, would have a significant impact on the permitting risk of the hybrid project itself."[394] He faulted the Updated Hybrid Proposal for failing to recognize the environmental resources on the JKLH Belmont Property where the underground line is proposed to be situated. He explained his opinion that it is infeasible to place the underground line on the Belmont Property due the presence of a retaining wall and a stream corridor.[395]

Mr. Young also criticized the Updated Hybrid Proposal for its lack of consideration of regulatory permitting. He explained environmental review analysis is conducted to identify sensitive resources and determine how to avoid them or minimize impacts to them. He stated these determinations directly affect "engineering constructability costs, permitting requirements, and time frames and ultimately, the feasibility and practicality of the project." H asserted that "finding out after a line is sited and approved by the [Commission] that [the] line will have significant impacts on environmental, historical, cultural, and scenic resources [that] may render the project unpermittable also [is] ultimately unacceptable."[396]

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[390] Ex. 43 (Young) at 37-41.
[391] Tr. at 1388 (Young).
[392] Ex. 43 (Young) at 41.
[393] Tr. at 1393-95 (Young).
[394] *Id.* at 1356-57 (Young).
[395] *Id.* at 1376-81 (Young).
[396] *Id.* at 1359-61. Quotations may be found *id.* at 1360.

Community Church View Concerns. On cross-examination, Mr. Young affirmed the Company will work to minimize impacts of the Updated Hybrid Proposal's eastern 5/2 transition station on Community Church. He indicated such discussions could occur after a determination of where and how the transition station would be situated, after full design, after the Company performs its due diligence, and after the Company applies for approval through Loudoun County's site and specifications process.[397]

Lori Schuelke is the Director of the Electric Transmission Construction group for Dominion. She addressed Laborers' Council Witness Brown's recommendation that Dominion prioritize hiring local workers and workers from Virginia in constructing the projects. She explained Dominion's typical construction hiring practices. Specifically, Dominion solicits construction bids or uses established master service agreements from companies Dominion has selected who have demonstrated they can perform the required work. She indicated the Company has such agreements with union and non-union companies. She explained the selected companies are responsible for acquiring the labor needed to construct the project, which may include workers from Loudoun County, Virginia, Hispanic, and other environmental justice communities. She stated detailed plans with percentages of workforce from various communities, including types of construction crafts, are not currently available.[398]

Robert E. Richardson is a Communications Consultant for Dominion. He addressed public comments related to the community outreach process. He explained how starting in 2023, Dominion discussed the Aspen-Golden and Apollo-Twin Creeks Projects with individual property owners, community members, and particular neighborhoods, including Belmont, Lansdowne, and One Loudoun. He discussed how the Company's online GeoVoice tool was populated with the routing options for the projects on May 10, 2023, to provide users with location-specific information in relation to the projects' routing options. He stated information learned during community meetings is shared with the project team and incorporated. He emphasized that during this process, routing has not yet been finalized.[399]

Mr. Richardson also described how Dominion assigns a Communications Consultant to each project, who is available to discuss their designated project by email or telephone with members of the community. He indicated he has corresponded by email with Ms. Lucy Rota-Keller and with Ms. Marina Rota, both of whom expressed concerns about community input for the Aspen-Golden and Apollo-Twin Creeks Projects. He also described his interactions with Mr. Daniel Lazzari, who commented that Dominion should involve communities earlier in the planning process.[400]

Lawrence J. Colorito, Jr., is a Senior Managing Director for Valbridge Property Advisors. He stated he has appraised property in Loudoun County since 1992, particularly focusing on the region east of and including Leesburg, where the Aspen-Golden and Apollo-Twin Creeks Projects are located. He testified that research about the effects of HVOTLs on property values is a mature area of research. He contended that research before and after 2010

[397] *Id.* at 1364-67 (Young).
[398] Ex. 32 (Schuelke Rebuttal) at 1-2.
[399] Ex. 33 (Richardson Rebuttal) at 1-4.
[400] *Id.* at 5-6 and Rebuttal Schedules 1-4.

has consistently shown that property value is not significantly impacted by proximity to HVOTLs and that observed impacts diminish as distance from the HVOTLs grows.[401]

Mr. Colorito alleged Loudoun County Witnesses Harvey and Olsen failed to properly consider the overall conclusions of peer-reviewed appraisal literature since the 1960s, which "is not an assumption that all properties with any view of power lines will experience average diminution in value of 1-10%, as they suggest." Rather, Mr. Colorito alleged the literature's overarching conclusion is that there are no consistent findings.[402]

Mr. Colorito testified he was hired to determine whether the Harvey/Olsen analysis conducted on behalf of Loudoun County was credible and compliant with the Uniform Standards of Professional Appraisal Practice.[403] He described paired sales analysis, the type of analysis employed by Messrs. Harvey and Olsen in their case study. He claimed that under this analysis, the goal is to isolate the value impact of one characteristic, with the optimal comparison being the sales price of the same property before and after the characteristic was introduced. He contended Messrs. Harvey and Olsen compared non-identical properties and did not provide any explanation for differences between case sales properties (those impacted by an existing transmission line corridor) and control sales properties (those not so impacted). Among other things, Mr. Colorito charged that Messrs. Harvey's and Olsen's case properties and control properties differed in square footages, lot sizes, locations, number of bedrooms, number of baths, and other amenities. He noted that in 34 of the 38 pairing originally presented in Mr. Olsen's testimony, the control (non-impacted) property is markedly larger than the case (impacted) property, which could account for the control property's higher sales price. He opined that "conclusions reached based on data that is this dissimilar and in one consistent direction calls the reliability of the conclusions into question," with the ultimate result being "that the variable in question (proximity to HVOTLs) cannot be reliably isolated as a cause of any difference in case and control property sales prices." Mr. Colorito also took issue with the Harvey/Olsen case study for using properties within the same distance from the transmission line as both control (non-impacted) and case (impacted) properties. Because proximity to HVOTLs was not properly isolated, Mr. Colorito asserted the conclusion of Messrs. Harvey and Olsen is not supported, *i.e.*, their case study does not validate that using an average 8.5% loss, the Aspen-Golden Project would result in hundreds of millions of dollars of property value diminution.[404]

During the hearing, Mr. Colorito testified that to his knowledge and based on his searching, the term "art of the appraisal" is not in *The Appraisal of Real Estate*, 15th Edition. He took issue with the use of a $50 per square foot adjustment to account for the difference in above-grade dwelling area between the case sale and the control sale in the Harvey/Olsen analysis. Mr. Colorito claimed $50 per square foot is not reasonable or market oriented. He updated the analysis using $150 per square foot, which he asserted is more market oriented. With this change, Mr. Colorito determined the average difference in price for a case sale would be only 0.9% less than a control sale, markedly less than the Harvey/Olsen analysis

[401] Ex. 45 (Colorito Rebuttal) at 1-6.
[402] *Id.* at 6-7.
[403] Tr. at 1409 (Colorito).
[404] Ex. 45 (Colorito Rebuttal) at 7-15 and Attached Rebuttal Schedules 5-7. Quotations are found *id.* at 11-12.

determination of an 8.2% decrease. Mr. Colorito testified that a 0.9% difference is "within the margin of error for no adjustment at all."[405]

According to Mr. Colorito, the Harvey/Olsen analysis makes so many unsupported adjustments between case and control sales that "[i]t's impossible to tell . . . whether or not the difference that falls out of the bottom of their analysis is due to the condition they are trying to isolate or whether it's due to this myriad of other differences that the sales they are trying to compare to each other had."[406]

Further, based on the errors described during Mr. Olsen's live testimony, Mr. Colorito asserted the results of the Harvey/Olsen analysis are not credible because they violate two industry standards requiring an appraiser not to commit a substantial error or provide service in a careless or negligent manner.[407]

Mr. Colorito discussed comments from members of the public, Loudoun County Witness Rizer, and Laborers' Council Witness Brown expressing concern about the negative impact of overhead transmission lines on property values. Mr. Colorito reiterated that literature on this topic is mature and consistent and does not support the conclusion that overhead power lines significantly decrease property values. He emphasized that the neighborhoods of Lansdowne on the Potomac and Regency at Belmont will not be crossed by the Aspen-Golden Lines, and that there are only 10 dwellings within 500 feet of the Aspen-Golden Project as a whole. Finally, Mr. Colorito disagreed with public witness William R. Wright's assertion that property values would decrease around 20%, amounting to an approximately $360 million decrease in property values impacting the community. Mr. Colorito stated he was not provided with the bases for Mr. Wright's assertions and believes Mr. Wright's conclusion is not supportable.[408]

Gabor Mezei, M.D., Ph.D., is a Principal Scientist in the Health Sciences Practice of Exponent, Inc. He testified in response to comments concerning EMF.

Scientific Research. Dr. Mezei summarized that effects of exposure to EMF on health have been heavily researched over the past 50 years, and has been regularly reviewed, using well-established scientific methods, on behalf of national and international health, scientific, and government agencies. He asserted, "None of these agencies that relied on valid scientific methods concluded EMF exposure ... from power lines and substations, is the cause of any adverse health effects."[409]

Dr. Mezei discussed how effects of EMF have been studied using three approaches and how reviews by scientific panels of all these approaches represent consensus opinions. He testified that multiple scientific, health, and government agencies reviewed the cumulative scientific evidence over the most recent 25 years, and none concluded that the evidence confirms

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[405] Tr. at 1412-18 (Colorito); Ex. 46 (Revised Paired Sales Analysis). The quotation is located at Tr. at 1417. Note the 8.2% was determined by removing five paired sales from the original Harvey/Olsen analysis with Mr. Olsen's consent. *See* Tr. at 1123, 1136-42 (Olsen).

[406] Tr. at 1422-25 (Colorito). The quotation is found *id.* at 1425.

[407] *Id.* at 1419-21 (Colorito).

[408] Ex. 45 (Colorito Rebuttal) at 15-17.

[409] Ex. 34 (Mezei Rebuttal) at 1-3. The quotation is located *id.* at 3.

adverse long-term health impacts from exposure to EMF at levels below scientifically established exposure guidelines. Dr. Mezei noted that limited evidence of childhood leukemia, and other evidence for cancer and non-cancer health outcomes in children and adults, were inadequate according to these agencies' reviews. He also emphasized the conclusion of the International Commission on Non-Ionizing Radiation Protection in 2010 that since there is not a causal relationship between EMF and childhood leukemia, there is no health benefit from reducing EMF exposure. He reviewed similar findings by other agencies as well.[410]

Dr. Mezei reported many agencies' concerns with the BioInitiative Working Group, which suggests childhood leukemia and other health outcomes are linked to EMF exposure, for not following widely accepted scientific methods, selecting studies that support its conclusions, and relying heavily on only one scientific approach.[411]

EMF Measurement. According to Dr. Mezei, there are no federal standards for 60-Hertz EMF exposure, but there are scientifically based exposure guidelines. He stated the International Commission on Non-Ionizing Radiation Protection's reference level for 60 Hertz, developed in 2010, is 4.2 kilovolts per meter ("kV/m") for electric fields, and 2,000 milligauss ("mG") for magnetic fields. The comparable levels developed by the International Committee of Electromagnetic Safety in 2019 are 5 kV/m and 9,040 mG. He pointed out that the Aspen-Golden Application reported that 66.443 mG is the highest magnetic-field level at projected average loading, and 113.403 mG is the highest at projected peak loading. The Apollo-Twin Creeks Application reported that 42.592 mG is the highest magnetic-field level at projected average loading, and 71.921 mG is the highest at projected peak loading. These levels, Dr. Mezei concluded, are well below the international commissions' limits.[412]

Response to Public Comments and Testimony. Dr. Mezei acknowledged some property owners' concerns related to EMF and health, expressed during open houses and through the Company's GeoVoice online tool. He reiterated that no health, scientific, and government agencies have found EMF exposure at levels below scientifically established exposure guidelines either causes or contributes to adverse health outcomes in children or adults. He specifically confirmed scientific literature has not confirmed causality between breast cancer and residential or occupational exposure to EMF. He also stated research has not confirmed EMF adversely impacts the health, behavior, or productivity on wild or domestic animals.[413]

Dr. Mezei also addressed several written comments expressing concerns about exposure to EMF. In addition to reiterating other scientific conclusions on EMF exposure, Dr. Mezei confirmed no scientifically valid reviews by health and scientific agencies identified either epilepsy or seizure disorder as an outcome of EMF exposure from power lines. He also confirmed the World Health Organization and other organizations have concluded there is inadequate evidence to show an association between EMF exposure and adverse impacts on human reproduction.[414]

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[410] *Id.* at 4-10.
[411] *Id.* at 10-11.
[412] *Id.* at 12-13.
[413] *Id.* at 13-16.
[414] *Id.* at 16-20.

Dr. Mezei addressed the testimony of Laborers' Council Witness Brown, who stated undergrounding transmission lines significantly reduces EMF exposure. While Dr. Mezei agreed magnetic field levels from underground lines diminish quicker with distance compared to overhead transmission lines, he noted that magnetic field levels directly above an underground line may be higher than comparable levels directly under an overhead line.[415]

Shane A. Moulton is a Supervisor in the Company's Electric Underground Transmission Line Engineering Department. He addressed comments and testimony relating to underground transmission line engineering.[416]

Pre-Application Undergrounding Options. Mr. Moulton testified Dominion retained Black & Veatch to conduct an underground transmission line feasibility study for the Aspen-Golden Lines and retained ERM to determine routing options for any feasible underground lines. He reported that based on these analyses, Dominion determined an all-underground option was infeasible. He also discussed the Company's analysis of the two-mile Initial Hybrid Proposal prepared by RLC. According to Mr. Moulton, Dominion shared concerns about this option with multiple stakeholders during a meeting on February 15, 2024. These concerns addressed length, need for more ROW and the crossing of a large network of existing buried utility lines, challenging geologic conditions caused by diabase bedrock, the need for two or more transition stations, cost, and ability of this underground option to meet PJM's in-service date of June 1, 2028. He testified Dominion found it infeasible to present to the Commission either a hybrid or an all-underground option for the Aspen-Golden Lines considering that, even if such could be constructed, it would not meet system reliability and in-service date requirements.[417]

Loudoun County's Updated Hybrid Proposal. Mr. Moulton noted he found the three-mile undergrounding proposal cursory and lacking in detail. Despite Mr. Conroy's claims that the Updated Hybrid Proposal addresses the Company's concerns, (such as footprint of transition stations and ROW width), Mr. Moulton explained most of the Company's concerns remain unaddressed, and others were inadequately addressed, including:[418]

- *ROW width*: Loudoun County's proposed 100-foot-wide ROW, consisting of 60 feet of permanent ROW and 40 feet of temporary ROW, is sufficient only under limited conditions. In conceptual planning, Dominion typically estimates a permanent ROW of 85 to 115 feet to allow for unknowns such as existing underground utilities, field conditions, and higher native soil thermal resistivity (which would require additional separation between the 500 kV and 230 kV duct banks). Micro-tunnel and horizontal directional drill installation also would require wider ROWs.[419]

- *Cable Phase*: While the Updated Hybrid Proposal incorporates four cables per phase for both the 230 kV and 500 kV Aspen-Golden Lines, Dominion requires five cables

[415] *Id.* at 18-19.
[416] Ex. 47 (Moulton Rebuttal) at 1-2.
[417] *Id.* at 2-6.
[418] *Id.* at 6-7.
[419] *Id.* at 7-10.

per phase for the 500 kV line. Even if Dominion used only four cables per phase for the 500 kV line, fewer cables would mean more heat in each cable, requiring wider ROW.[420]

- *Trenchless Excavation Allowance*: The Updated Hybrid Proposal assumes trenched construction with a 1,000-foot allowance for trenchless construction under roads the underground lines would cross. The proposal further included another allowance of 1,000 feet of trenchless excavation as contingency. VDOT will not allow trenched construction to cross major roadways absent specific circumstances. Thus, Mr. Moulton found the assumption for trenched construction with limited contingencies for trenchless construction to be unrealistic.[421]

- *Rock*: Mr. Moulton faulted the Updated Hybrid Proposal's estimate that the Aspen-Golden Project would encounter 30% rock. He stated the proposal does not estimate the impact that encountering rock would have on the project's construction schedule, even if 30% were a reasonable assumption. He reiterated that unknowns related to the type and amount of rock the project may encounter, as well as the time necessary to excavate that rock are of major concern to the Company when considering undergrounding options.[422]

- *Construction Timeline*: The 20-month timeframe to construct the three-mile underground portion is unrealistic. The estimate provided by Dominion consultant Burns & McDonnell is 36 months, not including ROW acquisition, relocating existing utilities, and permitting, and not considering delays associated with long-lead equipment, labor availability, and ability to close roads.[423]

- *Cost*: The Updated Hybrid Proposal's $478 million cost estimate to underground the three-mile segment, and pay for transition stations, also is unrealistic. Dominion's consultant's estimate is $502 million, not including costs for permitting, real estate acquisition, transition station design and construction, or trenchless crossings. Mr. Moulton also faulted the Updated Hybrid Proposal for not estimating any costs for real estate acquisition.[424]

- *Future Development*: Loudoun County Witness Conroy suggested several future residential and commercial developments could be served by the electric distribution system and that two commercial delivery points may be served by the overhead portion of the Aspen-Golden Lines. Mr. Moulton responded that serving future delivery points from existing underground lines is possible but is more expensive, takes more time, and results in longer outage durations than serving these areas from overhead lines. He also worried that available ROW to accommodate the underground infrastructure to maintain existing circuit ratings would not be available

[420] *Id.* at 10-12.
[421] *Id.* at 12-13.
[422] *Id.* at 13-14.
[423] *Id.* at 14-15. *See also* Tr. at 1469-73 (Moulton).
[424] Ex. 47 (Moulton Rebuttal) at 14-16.

for any new circuit needed for the tapped line. He argued pre-designing future delivery points into initial underground installation is the only way to ensure delivery points are properly served.[425]

- *Dissimilarity with Chino Hills Line*: Mr. Moulton distinguished the Aspen-Golden Project's proposed underground portion from the Chino Hills Line in number of lines (Chino Hills involved one 500 kV line only); cables per phase (two for Chino Hills but five for the Aspen-Golden 500 kV Line); amps to be delivered at project completion (2,300 for Chino Hills; 9,000 for the Aspen-Golden Project); and ROW (the Aspen-Golden Project ROW is constrained by existing conditions). He added that the fact the Aspen-Golden underground portion would be shorter than Chino Hills does not change his assessment.[426]

Engineering and Practicality Concerns with the Updated Hybrid Proposal. During the hearing, Mr. Moulton explained that "the golden rule for underground engineering" is to meet the base project requirement, and "[t]he way to do that is maintain the project's ampacity," which for the Aspen-Golden Project is "5,000 amps for the 500 kV line, [and] 4,000 amps for the 230 kV line."[427] He described how maintaining ampacity is a balancing act among an underground project's thermal resistivity of soil, depth of duct bank, the mutual heating effect between duct banks, and number of cables per phase. As to these engineering considerations, Mr. Moulton faulted the Updated Hybrid Proposal for its thermal resistivity assumption of 1.15 degrees Celsius per centimeter watt, which limits the depth of the duct banks or requires more separation between duct banks, jeopardizing the 60-foot permanent ROW in the Updated Hybrid Proposal. Also, to make the Aspen-Golden Lines fit a 60-foot permanent ROW, Mr. Moulton calculated the lines' depth must be no lower than eight feet. However, given the multiple likely underground utilities the Aspen-Golden Lines will encounter, Mr. Moulton hypothesized that it is likely the lines would have to be placed deeper than eight feet, and he stated the Company would assume around 15 feet in early planning.[428]

To these faults, Mr. Moulton added the concern about practicality. He explained that "in real world conditions," the Company needs to allow a construction buffer on either side of the ROW to accommodate unknowns that might be encountered during construction, such as underground utilities or an existing distribution-related duct bank.[429]

On cross-examination, Mr. Moulton agreed that "in an ideal world," it would be possible to use a duct bank with a 60-foot permanent ROW; that it is "unlikely, but possible" that the underground line could be narrower than 60 feet at points; and that it is possible to move utilities or otherwise avoid utilities depending on the circumstances.[430] He confirmed that Dominion believes a more prudent assumption for a permanent ROW is 85 to 115 feet, and he stated the Company strives to maintain a consistent ROW width.[431]

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[425] *Id.* at 17-18.
[426] *Id.* at 18-19.
[427] Tr. at 1451-52 (Moulton).
[428] *Id.* at 1451-64 (Moulton).
[429] *Id.* at 1465 (Moulton).
[430] *Id.* at 1534-37 (Moulton).
[431] *Id.* at 1538-39 (Moulton).

Live Testimony on Underground Hybrid Proposal Timeline. During the hearing, Mr. Moulton explained Dominion used Burns & MacDonnell to propose a timeline for the Updated Hybrid Proposal. He testified to this consulting firm's experience, including: work on the Chino Hills project; construction management experience with a 500 kV underground line; and work with Dominion on the Haymarket, Glebe, and Coastal Virginia Offshore Wind projects. He testified that he would rely on the 36-month construction schedule Burns & MacDonnell developed, over the Black & Veatch and RLC estimates, because the Burns & MacDonnell schedule was developed based on more, and more recent, information about utilities and bedrock in the area. Additionally, Burns & MacDonnell had the advantage of input from a Dominion construction employee who had experience with undergrounding the Company's Beaumeade-NIVO transmission line in Loudoun County. This employee provided information on how much progress could be made daily while trenching through the rock in Loudoun County.[432]

Mr. Moulton also explained the types of construction-related delays the Updated Hybrid Proposal could face, including excavating and removing rock, scheduling outages for existing utilities to be moved, encountering undocumented utilities, securing specialized equipment and contractors who are able and certified to do the work, and working with VDOT on traffic modifications. He emphasized the limited nature of the contractors and equipment required for the Updated Hybrid Proposal, stating, "[W]e are heavily dependent on the material and equipment that's in current circulation and we can't dictate that timeline, so we're at their mercy when it comes to coordinating that."[433]

When asked on cross-examination about Black & Veatch's timeline of 47 months for detailed design, permitting, ROW, and real estate acquisition, including 25 months for construction activities to underground an 8.5-mile transmission line, Mr. Moulton responded that this estimate is two-and-a-half years old and was made with the information Black & Veatch had at the time, which he had earlier explained was "extreme high-level" and "done more or less in an engineering vacuum."[434] He also explained that Dominion has used Black & Veatch for engineering exercises but has never used that company for procurement or construction activities.[435]

Trenchless Construction Cost and Overall Cost of the Updated Hybrid Proposal. Mr. Moulton estimated there would be three or four instances of trenchless excavation to cross roads as part of the Updated Hybrid Proposal. He discussed RLC's estimate of $5 million for 1,000 linear feet of trenchless excavation, with additional contingency of a bit less than $5 million for another 1,000 linear feet of trenchless excavation. Mr. Moulton testified that

[432] Id. at 1469-73 (Moulton). *See also Application of Virginia Electric and Power Company, For approval and certification of Beaumeade-NIVO 230 kV Underground Transmission line and 230-34.5 kV NIVO Substation under Va. Code § 56-46.1 and the Utility Facilities Act, Va. Code § 56-265.1 et seq., and as a pilot project pursuant to HB 1319*, Case No. PUE-2008-00063, 2009 S.C.C. Ann. Rep. 319, Final Order (May 29, 2009) (approving a double circuit 230 kV underground transmission line of approximately 0.71 miles in Loudoun County, Virginia), these facts of which I take judicial notice.

[433] Tr. at 1474-80 (Moulton). The quotation is found *id.* at 1479-80.

[434] *Id.* at 1448-49, 1510-11 (Moulton). The quotations are found *id.* at 1449.

[435] *Id.* at 1517 (Moulton).

though length is one factor in the cost of trenchless excavation, there are costs for mobilization, demobilization, and materials as well. These latter factors have a larger impact on cost than length of the trenchless segment. By way of comparison, Mr. Moulton offered that Dominion's Glebe project involves micro-tunneling two 1,000-foot sections, and these will cost around $40 million to complete. He averred micro-tunneling is similar to jack-and bore and contended RLC's estimate is still "off by a factor of four."[436]

On cross-examination, Mr. Moulton explained that 1,000 feet is a linear length only, and RLC did not apply the technical requirements of five or six bores per location, which would increase the 1,000 feet to 5,000 feet. He testified the requirement for five to six bores at each location was in the Black & Veatch report index. He asserted that using drilled feet is a better representation of cost and schedule impacts to a project than the measure of linear feet.[437]

As to overall cost, Mr. Moulton made a few adjustments to RLC's Transmission Line Estimate Worksheet, including adjusting for 30% rock and increasing contingency from 10% to 40%, which he averred better matches the Company's experience. He determined a new estimate of just over $1 billion for the Updated Hybrid Proposal, in contrast to RLC's $478 million estimate. These figures represent the cost for only the underground portion of the Aspen-Golden Lines.[438]

Also pertaining to cost, Mr. Moulton admitted RLC's proposal could be amended to include five cables, instead of four, in the 500 kV duct bank. This change would not alter the ROW width but would increase costs.[439]

Benefits of Undergrounding v. Overhead Construction. Mr. Moulton addressed Loudoun County's assertion that its Updated Hybrid Proposal would perform better than an overhead alternative. He explained that while overhead lines experience more unplanned outages, those unplanned outages underground lines do experience last longer, and the lines cannot provide reliable service during outages.[440]

Mr. Moulton also disagreed with Laborers' Council Witness Brown that underground transmission lines have lower long-term maintenance costs and promote safety, resilience, economic stability, and community well-being. He reported Dominion's experience with underground lines has shown routine and corrective operation and maintenance costs are as much as six times higher than comparable overhead costs on an annual per-circuit-mile basis. Moreover, he asserted the costs to design, procure, and construct an underground line is five times higher than for an overhead line in the same or a similar area. Mr. Moulton also rejected Mr. Brown's claim that underground lines are a better solution for maintaining the transmission system's structural integrity and reliability. In explaining that unplanned outages for underground lines last longer than those for overhead lines, Mr. Moulton shared that a section of

[436] *Id.* at 1481-85 (Moulton). The quotation is found *id.* at 1485. *See also* Ex. 48 (Email exchange between VDOT and Dominion from September 11, 2024).
[437] Tr. at 1518-21 (Moulton).
[438] *Id.* at 1486-94 (Moulton).
[439] *Id.* at 1543 (Moulton).
[440] Ex. 47 (Moulton Rebuttal) at 20-22.

underground cable can take weeks to months to complete depending on location and crew availability. He further noted underground repair materials can take months to procure and be installed, which, more than fault detection, is the cause for the long outage time.[441]

In response to Loudoun County Witness Conroy's testimony on the ability to isolate individual underground cables, allowing 75% of the line to continue providing energy while one cable is awaiting repair, Mr. Moulton agreed isolation is possible, but only in particular circumstances, such as when there is switching equipment at both ends of the line. He also explained if multiple cables share a manhole, all cables in that manholes must be shut off until repairs are made. Mr. Moulton also asserted most underground cable failures occur at terminations, near electrical hazards, in which case it is unlikely other cables can remain energized. Finally, he claimed fault detection technology for overhead lines is superior to that for underground lines.[442]

Dominion's Undergrounding Experience. Mr. Moulton sponsored an exhibit showing the Company's experience undergrounding lines of 230 kV or greater. He spoke to how this experience might be related to undergrounding a 500 kV line. He testified that the electrical technology to underground a 500 kV line is proven, and installation techniques would be similar to undergrounding both a 230 kV and a 500 kV line, though undergrounding a 500 kV line is a larger scale project than undergrounding a 230 kV line. He summarized that higher voltage lines "require more capacity, and ultimately, it's more of an impact. It's a larger construction; it's a larger excavation, requires more cables per phase, which is more material."[443]

Mr. Moulton also testified that, in Dominion's experience, on a per-circuit-mile basis, there were 5.28 times more outages on underground transmission lines than overhead transmission lines in 2022 if one excludes outages lasting only a fraction of a second.[444]

Jacob M. Rosenberg is a Principal Consultant with ERM. As a preliminary matter, he described ERM's routing methodology for new transmission line projects, which he averred ERM followed in identifying routes for the Aspen-Golden and Apollo-Twin Creeks Projects. He affirmed ERM studied multiple underground routing solutions, but none were viable or feasible.[445]

Community Church's Routing Concerns. Mr. Rosenberg stated that Community Church's plans for a soccer/athletic field and walking trail adjacent to Route 7 may be accommodated despite the Aspen-Golden Lines Route 1 ROW overlapping the planned athletic field by approximately ten feet. He stated recreation fields and trails are often approved uses within ROW for overhead transmission lines. Similarly, he testified Community Church's planned monument sign, if below a certain height, would be an acceptable use in the ROW,

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[441] *Id.* at 22-24. The pre-filed testimony stated the cost to design, procure, and construct an underground line is five to 10 times higher than for an overhead line in the same or a similar area. In live testimony, Mr. Moulton revised that estimate to "somewhere around five [times]." Tr. at 1549-50, 1552 (Moulton).
[442] Ex. 47 (Moulton Rebuttal) at 24-25.
[443] Tr. at 1496-1501 (Moulton). The quotation is found *id.* at 1500-01. *See also* Ex. 49 (230+ kV Underground Chart).
[444] *Id.* at 1547-48 (Moulton).
[445] Ex. 50 (Rosenberg Rebuttal) at 1, 3-5.

except for where the poles would be sited. As to the three playgrounds Community Church is planning, Mr. Rosenberg indicated playgrounds are not permitted in ROW but can be located adjacent to ROW. He concluded it does not appear these facilities would be prevented by the Aspen-Golden Lines. In response to concerns about locations of transmission poles, Mr. Rosenberg explained a route adjustment, the Community Church Proposed Modified Segment, as part of which Structure #5001/28 / #2333/28 would be moved 370 to the west, toward the north-most corner of the church's property. In all, this modification would require the Company to shift the locations of three poles (one on the church's property and two on commercial properties) and modify their heights to keep Structure #5001/28 / #2333/28 from being centered on Community Church's Route 7 frontage. Mr. Rosenberg asserted the Community Church Proposed Modified Segment resolves the church's concerns.[446]

JKLH Belmont Property Routing Concerns. Mr. Rosenberg testified the Company does not support the Freedom Center Variation but does support the Belmont Landbay KK Variation. He agreed Dominion will need authority to microsite the line route and structures to best accommodate all planned uses in the area, since the Company has not yet been able to determine what conditions on the property may impact construction. He clarified that the Belmont Landbay KK Variation is 27 feet longer than the proposed Aspen-Golden Lines Route and results in: at least 0.1 acres more tree clearing, 0.3 acres more wetland impacts, and a slightly closer position to the Loudoun Freedom Center and African American Cemetery. He acknowledged this variation also aligns the ROW on top of a stream the Company initially tried to avoid. He termed these additional impacts "slight" considering the minimized impact to JKLH's Belmont Property and the agreement of JKLH, the Company, and Pastor Thomas.[447]

During the hearing, Mr. Rosenberg addressed the ground penetrating radar survey that was performed by a JKLH consultant. Mr. Rosenberg testified that the surveyed area was limited and does not cover at least one of the Updated Hybrid Proposal's underground options through the JKLH Belmont Property.[448]

Allan Myers Routing Concerns. Mr. Rosenberg stated the Company was unaware, until Allan Myers Witness Hall filed testimony, that Allan Myers is planning a building with which Aspen-Golden Route 1 would interfere. Mr. Rosenberg testified the Company cannot route around this development but is committed to working with Allan Myers to consider micrositing or other solutions that may allow the building to be constructed elsewhere on Allan Myers' property. He stated Dominion also is willing to consider a change to the route alignment, though any changes will require negotiation with those impacted, input from VDOT, and engineering verification.[449]

Updated Hybrid Proposal. Mr. Rosenberg took issue with several aspects of the Updated Hybrid Proposal, as follows:

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[446] *Id.* at 5-11 and Attached Rebuttal Schedule 2.
[447] *Id.* at 11-14 and Rebuttal Schedule 5.
[448] Tr. at 1586-87 (Rosenberg).
[449] Ex. 50 (Rosenberg Rebuttal) at 14-16.

- *No Inspection of or Estimate for Relocating Existing Utilities*: Mr. Rosenberg asserted one of the difficult aspects of routing and installing underground transmission lines concerns the network of already-present utilities such as what exists throughout the study area and along Route 7. Such utilities may cause project risk and uncertainty and can even cause an underground route to be infeasible.[450]

- *Estimate of Encountering 30% Rock*: Mr. Rosenberg averred the likelihood of encountering solid bedrock along the Updated Hybrid Route is a certainty. While drilling or cutting through this rock is possible, it must be done slowly and at substantially increased cost. He also noted the ground penetrating radar survey conducted by JKLH's consultant found bedrock at eight feet depth in the area, meaning the bedrock is close to the surface. and "hitting the diabase is almost a certainty for almost the entire portion of the County's underground route." He posited encountering this rock would impact routing and timing of constructing an underground route.[451]

- *Issues with Start and End-Point Transition Stations*: Mr. Rosenberg explained Loudoun County proposed one potential and two alternative transition stations at the start of the undergrounding portion of the Updated Hybrid Proposal. All three are on property owned by Sentinel, within an approved data center development. All three options would overlap with Sentinel's plans for future buildings and/or substations, and Sentinel has stated any taking associated with the starting-point transition station would cause it irrevocable economic harm, resulting in lost revenue for Loudoun County. Mr. Rosenberg reported Sentinel has obtained all necessary zoning approvals and is fully vested, and it unclear how these vested rights can be superseded other than through condemnation. He also asserted two of the three starting-point transition station locations have insufficient land mass for a 5/2 transition station. The one starting-point transition station option that may have enough land also encroaches on the Starlight Substation footprint in addition to interfering with Sentinel's plans. Mr. Rosenberg also indicated the ending-point transition station proposal is on land owned by BF Saul Real Estate, is encumbered by a proffer at odds with a transition station, sits on top of gas infrastructure and part of an archaeological site, and could visually impact Community Church.[452]

- *Encroachments on Other Properties*. Mr. Rosenberg claimed the underground ROW and a potential splice area may impact the proposed Belmont Cove residential development, likely eliminating 20 or more townhouse lots and future homesites. There is also a ROW encroachment on the Intersport Performance Auto Repair Service & Storage building.[453]

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[450] *Id.* at 16-18.
[451] *Id.* at 18-19 and Attached Rebuttal Schedules 7 and 8; Tr. at 1588-91 (Rosenberg). The quotation is found at Tr. at 1591.
[452] Ex. 50 (Rosenberg Rebuttal) at 19-22 and Attached Rebuttal Schedules 9 and 10.
[453] *Id.* at 22-23 and Attached Rebuttal Schedule 9.

- *Future Delivery Points.* Mr. Rosenberg reported two planned developments, JKLH's Belmont Property and Telos Property, are planned for data center development and will require 230 kV service. The areas JKLH has set aside for substations will not also accommodate 230 kV transition stations. For the JKLH Telos Property in particular, the Company would have to provide service by constructing an additional segment of overhead line, either 0.5 miles from the transition station to the east of Community Church or 2.5 miles from the starting-point transition station. Either option places an overhead line in the place where Loudoun County seeks to have an underground line.[454]

- *Lesser Impact Caused by Undergrounding.* Mr. Rosenberg disagreed with Loudoun County that visual and other impacts will be greatly mitigated by undergrounding. Rather, he asserted undergrounding mitigates some visual impacts while creating others, such as visual impacts from transition stations. He also noted both overhead and underground lines require clearing of vegetation. He asserted overhead lines are less impactful environmentally because undergrounding the Aspen-Golden Lines requires wider ROW, trenched installation, and clearing for the transition stations. He disagreed with Loudoun County Witness Conroy's illustrations depicting existing conditions as representative of conditions with underground lines. Mr. Rosenberg argued existing conditions do not account for transition stations and cleared ROW. He took issue with individual photo depictions in Mr. Conroy's testimony as well.[455]

Other Objections to Loudoun County Testimony. Mr. Rosenberg objected to Mr. Conroy's claim that Dominion did not fully evaluate a hybrid underground alternative. Mr. Rosenberg asserted the Black & Veatch underground feasibility study examined end-to-end underground options and was comprehensive, so it did not need to assess small segments of the Aspen-Golden Lines for feasibility. He recited factors making the Aspen-Golden Lines infeasible for undergrounding, including geological challenges, existing utilities, and the presence of multiple data centers. He also faulted Mr. Conroy's claim that undergrounding will not disturb wetlands and waterbodies crossed by the Aspen-Golden Lines. According to Mr. Rosenberg, trenched undergrounding will create significant disruption, and Loudoun County did not mention horizontal directional drilling or account for the workspaces and ROW needed for such installation. Mr. Rosenberg disagreed with Mr. Conroy's claim that the transition stations at either end of the Updated Hybrid Proposal are located on property zoned for data center use. Mr. Rosenberg pointed out that the easternmost transition station would be on industrial land with no planned data center and would impact views from Community Church. Finally, Mr. Rosenberg claimed Mr. Conroy overlooked the additional transition stations or overhead lines that will be needed to serve two future data centers.[456]

Mr. Rosenberg also disagreed with Loudoun County Witness Conroy's claim that Dominion's overhead routes do not reasonably minimize adverse impact on scenic assets, historic districts, and the environment. He posited that Dominion thoroughly considered such impacts. He noted the proposed Aspen-Golden Route does not cross historic districts and would

[454] *Id.* at 23-25.
[455] *Id.* at 25-30 and Attached Rebuttal Schedule 12.
[456] *Id.* at 30-33.

create only low-to-moderate visual impacts to scenic assets like Belmont Manor and Janelia, which already are surrounded by development. He emphasized the portion of the Aspen-Golden Route analogous to the portion proposed for undergrounding in the Updated Hybrid Proposal parallels a highly trafficked highway, crosses four planned data centers, avoids existing and planned residential areas, and avoids the African American Cemetery.[457]

Mr. Rosenberg criticized Loudoun County Witness Giglio's claim that the Updated Hybrid Proposal is in keeping with the electrical policies in the County's 2019 General Plan. Mr. Rosenberg asserted Dominion considered these policies, though the 2019 General Plan does not include much in the way of such policies. He testified that the Aspen-Golden Project uses improved conductor technology and new monopole structure types, is efficient in terms of cost and long-term maintenance, and uses the minimum amount of ROW. He disagreed that the Updated Hybrid Proposal minimizes impacts on key travel corridors, sensitive cultural and historic resources, and residential communities as called for in the 2019 General Plan, given the proposed placement of the transition stations. He maintained that the Aspen-Golden Project route was optimized to collocate with roadways, cross commercial and industrial uses, and avoid residences as much as possible. He emphasized that if the most important directive of the 2019 General Plan is to avoid existing residences, the proposed Aspen-Golden Route is compliant with the 2019 General Plan. Finally, Mr. Rosenberg sought to correct Mr. Giglio's claim that the Aspen-Golden Lines are in the viewshed of numerous historic resources. Mr. Rosenberg asserted the lines will have only a minimal impact on the W&OD Trail and Houghs/Cook Mavens Mill, and they will have no impact on Broad Run Ridge and Toll House.[458]

Specifically, as to Belmont Manor, during the hearing Mr. Rosenberg discussed the wording of the Belmont Manor Viewshed Easement. He alleged the wording of the easement indicates its purpose is to maintain an unobstructed view of the Belmont Manor house from Route 7, *i.e.*, to provide someone driving on Route 7 a view of that historic structure. He testified Aspen-Golden Route 1AA would place two structures along the Belmont Viewshed Easement.[459]

Further, Mr. Rosenberg discounted Mr. Giglio's characterization of the portion of Route 7 from Goose Creek to Route 28 as an important gateway corridor in Loudoun County's Comprehensive Plan. Mr. Rosenberg testified that the 2019 General Plan does not mention this segment and that this portion of Route 7 "has no clearly defined purpose or import as a gateway corridor."[460] During cross-examination, Mr. Rosenberg and counsel for Loudoun County had a lively discussion about the County's 2019 General Plan, its Comprehensive Plan, and Loudoun County's land use planning with regard to data centers.[461]

Underground Pilot Program. Mr. Rosenberg averred the Aspen-Golden Project is not suitable for an underground pilot program because it is not a small-scale project designed to test feasibility, effectiveness, or the impact of underground technology and construction prior to

[457] *Id.* at 48-49.
[458] *Id.* at 33-36, 49-53.
[459] Tr. at 1602-03, 1665-66 (Rosenberg); Ex. 52 (Belmont Viewshed Easement).
[460] Ex. 50 (Rosenberg Rebuttal) at 53-54.
[461] Tr. at 1640-48 (Rosenberg cross-examination by Winston).

large-scale implementation. Rather, the Aspen-Golden Project is complex and large in size, will be built in a constrained area, and requires new ROW. He defined Southern California Edison's Chino Hills line as a pilot that, despite being in company-owned ROW with no existing utilities or existing development, still doubled that project's proposed construction timeline. He asserted the Aspen-Golden Project cannot tolerate a delay of its in-service date and faces obstacles like existing underground utilities that need to be crossed or possibly relocated.[462]

Undergrounding Impacts. Mr. Rosenberg disagreed with Mr. Giglio's claim that Dominion's pre-application process does not appropriately consider undergrounding. Mr. Rosenberg explained Dominion met with Loudoun County staff, elected officials, and community members multiple times to discuss routing and informed them as soon as the Company determined undergrounding was infeasible. In response to Conservancy Witness Jeavons' claim that undergrounding is the best option to preserve scenic beauty, Mr. Rosenberg reiterated his concern that undergrounding could result in four transition stations within a three-mile segment, impacting neighborhoods and historic resources. He alleged that overhead construction preserves scenic beauty by keeping the Aspen-Golden Lines away from residences and protected scenic areas. He further argued undergrounding would not minimize impacts to Community Church because it would require a transition station directly east of the church, as close as 100 feet from the church's property. He added that Community Church is likely to be affected by a future double circuit 230 kV overhead line to serve the JKLH Telos Property, resulting in even greater visual impacts to the church.[463]

Responses to Public Witnesses. In response to public witnesses who testified on August 6, 2024, Mr. Rosenberg affirmed the Company considered scenic assets and historic areas during the routing process. He noted only a few specific resources, such as Belmont Manor, have designated scenic protections. He explained that even with these scenic protections in place, the area of Loudoun County the Aspen-Golden Lines will traverse has become substantially more developed in the past 40 years. He asserted overhead transmission lines are visually consistent with the existing level of development in the area, particularly considering the proposed Aspen-Golden route crosses seven existing and planned data center sites. He emphasized undergrounding incurs its own set of visual impacts.[464]

In response to testimony from public witnesses Badger and Frankenfield as to the impact on views from their homes, Mr. Rosenberg stated that a visual impact analysis does not consider specific views from individual residences. Rather, residences are considered in the aggregate using representative views. Nevertheless, Mr. Rosenberg provided photo simulations to further depict visual impacts of the Aspen-Golden Lines on the Regency at Belmont community. He explained these simulations show the transmission lines and structures are visible in the distance, with the forms, lines, and colors of the transmission lines being similar to, but taller than, existing landscape elements. He reported Dominion concluded the Aspen-Golden Lines would have a moderate visual impact on visually sensitive resources.[465]

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[462] Ex. 50 (Rosenberg Rebuttal) at 37-38 and Attached Rebuttal Schedule 13.
[463] *Id.* at 40-43.
[464] *Id.* at 44-46.
[465] *Id.* at 46-48 and Attached Rebuttal Schedule 15.