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

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

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

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

3. Have been subjected to peer review.

Response: The Virginia Department of Health ("VDH") conducted its most recent review and issued its report on the scientific evidence on potential health effects of extremely low frequency ("ELF") EMF in 2000: "[T]he Virginia Department of Health is of the opinion that there is no conclusive and convincing evidence that exposure to extremely low frequency EMF emanated from nearby high voltage transmission lines is causally associated with an increased incidence of cancer or other detrimental health effects in humans."[44]

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

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

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

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

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

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

Recent epidemiologic studies of EMF and childhood leukemia include:

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

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

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

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

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

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

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

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

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

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

- Auger et al. (2019) examined the relationship between exposure to EMF during pregnancy and risk of childhood cancer in a cohort of 784,000 children born in Quebéc. Exposure was defined using residential distance to the nearest high-voltage transmission line or transformer station. The authors reported statistically non-significant associations between proximity to transformer stations and any cancer, hematopoietic cancer, or solid tumors. No associations were reported with distance to transmission lines.
- Crespi et al. (2019) investigated the relationship between childhood leukemia and distance from high-voltage lines and calculated magnetic-field exposure, separately and combined, within the California study population previously analyzed in Crespi et al. (2016) and Kheifets et al. (2017). The authors reported that neither close proximity to high-voltage lines nor exposure to calculated magnetic fields alone were associated with childhood leukemia; an association was observed only for those participants who were both close to high-voltage lines (< 50 meters) and had high calculated magnetic fields (≥ 0.4 microtesla [*i.e.*, ≥ 4 milligauss]). No associations were observed with low-voltage power lines (< 200 kV). In a subsequent study, Amoon et al. (2020) examined the potential impact of dwelling type on the associations reported in Crespi et al. (2019). Amoon et al. (2020) concluded that while the type of dwelling at which a child resides (*e.g.*, single-family home, apartment, duplex, mobile home) was associated with socioeconomic status and race or ethnicity, it was not associated with childhood leukemia and did not appear to be a potential confounder in the relationship between childhood leukemia and magnetic-field exposure in this study population.
- Swanson et al. (2019) conducted a meta-analysis of 41 epidemiologic studies of childhood leukemia and magnetic-field exposure published between 1979 and 2017 to examine trends in childhood leukemia development over time. The authors reported that while the estimated risk of childhood leukemia initially increased during the earlier period, a statistically non-significant decline in estimated risk has been observed from the mid-1990s until the present (*i.e.*, 2019).
- Talibov et al. (2019) conducted a pooled analysis of 9,723 cases and 17,099 controls from 11 epidemiologic studies to examine the relationship between parental occupational exposure to magnetic fields and childhood leukemia. No statistically significant association was found between either paternal or maternal exposure and leukemia (overall or by subtype). No associations were observed in the meta-analyses.

- Núñez-Enríquez et al. (2020) assessed the relationship between residential magnetic-field exposure and B-lineage acute lymphoblastic leukemia ("B-ALL") in children under 16 years of age in Mexico. The study included 290 cases and 407 controls matched on age, gender, and health institution; magnetic-field exposure was assessed through the collection of 24-hour measurements in the participants' bedrooms. While the authors reported some statistically significant associations between elevated magnetic-field levels and development of B-ALL, the results were dependent on the chosen cut-points.

- Seomun et al. (2021) performed a meta-analysis based on 33 previously published epidemiologic studies investigating the potential relationship between magnetic-field exposure and childhood cancers, including leukemia and brain cancer. For childhood leukemia, the authors reported statistically significant associations with some, but not all, of the chosen cut-points for magnetic-field exposure. The associations between magnetic-field exposure and childhood brain cancer were statistically non-significant. The study provided limited new insight as most of the studies included in the current meta-analysis, were included in previously conducted meta- and pooled analyses.

Recent epidemiologic studies of EMF and neurodegenerative diseases include:

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

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

- Koeman et al. (2015, 2017) analyzed data from the Netherlands Cohort Study of approximately 120,000 men and women who were enrolled in the cohort in 1986 and followed up until 2003. Lifetime occupational history, obtained through questionnaires, and job-exposure matrices on ELF magnetic fields and other occupational exposures were used to assign exposure to study subjects. Based on 1,552 deaths from vascular dementia, the researchers reported a statistically not significant association of vascular dementia with estimated exposure to metals, chlorinated solvents, and ELF magnetic fields. However,

because no exposure-response relationship for cumulative exposure was observed and because magnetic fields and solvent exposures were highly correlated with exposure to metals, the authors attributed the association with ELF magnetic fields and solvents to confounding by exposure to metals (Koeman et al., 2015). Based on a total of 136 deaths from ALS among the cohort members, the authors reported a statistically significant, approximately two-fold association with ELF magnetic fields in the highest exposure category. This association, however, was no longer statistically significant when adjusted for exposure to insecticides (Koeman et al., 2017).

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

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

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

- Vinceti et al. (2017) examined the association between ALS and calculated magnetic-field levels from high-voltage power lines in Italy. The authors included 703 ALS cases and 2,737 controls; exposure was assessed based on

residential proximity to high-voltage power lines. No statistically significant associations were reported and no exposure-response trend was observed. Similar results were reported in subgroup analyses by age, calendar period of disease diagnosis, and study area.

- Checkoway et al. (2018) investigated the association between Parkinsonism[45] and occupational exposure to magnetic fields and several other agents (endotoxins, solvents, shift work) among 800 female textile workers in Shanghai. Exposure to magnetic fields was assessed based on the participants' work histories. The authors reported no statistically significant associations between Parkinsonism and occupational exposure to any of the agents under study, including magnetic fields.

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

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

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

- Röösli and Jalilian (2018) performed a meta-analysis using data from five epidemiologic studies examining residential exposure to magnetic fields and

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

ALS. A statistically non-significant negative association was reported between ALS and the highest exposed group, where exposure was defined based on distance from power lines or calculated magnetic-field level.

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

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

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

- Huang et al. (2020) conducted a meta-analysis of 43 epidemiologic studies examining potential occupational risk factors for dementia or mild cognitive impairment. The authors included five cohort studies and seven case-control studies related to magnetic-field exposure. For both study types, the authors reported positive associations between dementia and work-related magnetic-field exposures. The paper, however, provided no information on the occupations held by the study participants, their magnetic-field exposure levels, or how magnetic-field levels were assessed; therefore, the results are difficult to interpret. The authors also reported a high level of heterogeneity among

studies. Thus, this analysis adds little, if any, to the overall weight of evidence on a potential association between dementia and magnetic fields.

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

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

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V. NOTICE

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

Response: The Project includes two new transmission corridors, each containing two single circuit 230 kV transmission lines, which will be constructed in new 120-foot-wide right-of-way. The first corridor contains two new 230 kV single circuit lines that will be constructed to source ("Unity Lines") three new substations located in the South Hill area of Mecklenburg County from either a new 500-230 kV Unity Switching Station in Lunenburg County ("Unity Option") or the expanded Heritage Switching Station in Brunswick County ("Heritage Option"). The second corridor contains two new 230 kV single circuit lines that will interconnect ("Substation Interconnect Lines") the three new substations in Mecklenburg County.

Attachment V.A provides a map showing the overhead Proposed and Alternative Routes for the Unity Lines, including Unity Proposed Route 2, Unity Alternative Route 1, Heritage Alternative Route 1, Heritage Alternative Route 2, and Heritage Route Variation 1.

Attachment V.A also shows the overhead Proposed and Alternative Routes for the Substation Interconnect Lines. For the Substation Interconnect Lines, there are two possible configurations for each Proposed and Alternative Route: Configuration 1 (Corridors A, B, and C) or Configuration 2 (Corridors A, B, and D). The Proposed and Alternative Routes of the Substation Interconnect Lines, as shown on Attachment V.A, include Interconnect Proposed Route 1 (Corridor A Route 1, Corridor B Route 1, and Corridor D Route 4), Interconnect Alternative Route 2 (Corridor A Route 1, Corridor B Route 1, and Corridor C Route 1), Interconnect Alternative Route 3 (Corridor A Route 1, Corridor B Route 1, and Corridor C Route 2) and Interconnect Alternative Route 4 (Corridor A Route 1, Corridor B Route 1, and Corridor D Route 2).

A written description of the Proposed and Alternative Routes for the Unity Lines and the Substation Interconnect Lines is as follows.

UNITY OPTION AND HERITAGE OPTION

Unity Route 2 (Proposed Route)

Unity Route 2 (Proposed Route) is approximately 11.1 miles in length. Starting at the proposed Unity Switching Station site (Unity Station 2 site), which is located approximately 0.4 mile east of Laurel Branch Road in Lunenburg County, the route initially heads south, primarily east of St. Johns Church Road, before crossing the Meherrin River. The route then continues south/southeast crossing Clover Road and Mecklenburg Avenue before terminating at the proposed Tunstall Substation site in Mecklenburg County.

The Proposed Route (Unity Route 2) will be constructed on new right-of-way supported by two side-by-side single circuit weathering steel monopoles with a minimum structure height of approximately 90 feet, a maximum structure height of approximately 140 feet, and an average proposed structure height of approximately 116 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

Unity Alternative Route 1

Unity Alternative Route 1 is approximately 12.3 miles in length. Starting at the Unity Switching Station site (Unity Station 1 site), which is located about 1.0 mile east of Oral Oaks Road in Lunenburg County, the route initially extends southwest, primarily east of Oral Oaks Road and west of Bagley Mills Road, before crossing the Meherrin River. The route then continues southeast/east crossing Chaptico Road and Mecklenburg Avenue before terminating at the proposed Tunstall Substation site in Mecklenburg County.

Unity Alternative Route 1 will be constructed on new right-of-way supported by two side-by-side single circuit weathering steel monopoles with a minimum structure height of approximately 90 feet, a maximum structure height of approximately 140 feet, and an average proposed structure height of approximately 118 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

Heritage Alternative Route 1

Heritage Alternative Route 1 would construct two overhead single circuit 230 kV lines from the Company's expanded Heritage Switching Station to the South Hill/La Crosse area. From Heritage Switching Station, the route initially heads south for 1.5 miles, paralleling the east side of the Company's existing right-of-way for Lines #503 and #570. The route then turns to the west for 3.0 miles and parallels the south side of the Company's existing right-of-way for Line #71. At this point, the route turns to the southwest, deviating away from Line #71 to avoid the Town of Lawrenceville, for 8.0 miles before rejoining Line #71. The route then turns to the west paralleling Line #71 and Line #40 for 9.1 miles before turning southwest, away from Line #40 for 1.2 miles and terminating at the Evans Creek Junction. Heritage Alternative Route 1 is approximately 22.8 miles in length.

Heritage Alternative Route 1 will be constructed on new right-of-way supported by two side-by-side single circuit weathering steel monopoles with a minimum structure height of approximately 90 feet, a maximum structure height of approximately 140 feet, and an average proposed structure height of approximately 118 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

Heritage Alternative Route 2

Heritage Alternative Route 2 would construct two overhead single circuit 230 kV lines from the Company's expanded Heritage Switching Station to the South Hill/La Crosse area. From Heritage Switching Station, the route initially heads south for 1.5 miles, paralleling the east side of the Company's existing right-of-way for Lines #503 and #570. The route then turns to the southwest for 5.2 miles and parallels the west side of an existing natural gas pipeline corridor. At this point, the route turns to the west, continuing to parallel the pipeline corridor for 3.9 miles before deviating to the southwest/west away from the pipeline corridor to avoid the Fort Christanna area for 5.1 miles. At this point, the route turns to the west and rejoins the pipeline corridor, paralleling it for 5.1 miles. The route then follows the same alignment as Heritage Alternative Route 1 for 4.0 miles to the Evans Creek Junction. Heritage Alternative Route 2 is approximately 24.8 miles in length.

Heritage Alternative Route 2 will be constructed on new right-of-way supported by two side-by-side single circuit weathering steel monopoles with a minimum structure height of approximately 90 feet, a maximum structure height of approximately 140 feet, and an average proposed structure height of approximately 118 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

Heritage Route Variation 1

Heritage Route Variation 1 provides an alternative to Heritage Alternative Route 1 in the area west of Lawrenceville to avoid a home along the Company's existing right-of-way for Line #71. Beginning west of Lawrenceville, the route variation extends west for 1.1 miles crossing Totaro Creek and several tributaries. It then turns southwest for 0.2 mile paralleling an existing electric distribution line across Union Woods Drive. The route then heads northeast for 1.1 miles before rejoining at Heritage Alternative Route 1. Heritage Route Variation 1 is approximately 2.4 miles in length.

Heritage Route Variation 1 will be constructed on new right-of-way supported by two side-by-side single circuit weathering steel monopoles with a minimum structure height of approximately 90 feet, a maximum structure height of approximately 140 feet, and an average proposed structure height of approximately 118 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

SUBSTATION INTERCONNECT LINES

Interconnect Proposed Route 1
Corridor A Route 1
Corridor B Route 1
Corridor D Route 4

Corridor A Route 1 is approximately 2.5 miles in length. Starting at the proposed Tunstall Substation, Corridor A Route 1 initially heads southeast for 1.4 miles, crossing Interstate 85 and the existing right-of-way for Dominion Energy Virginia's existing Line #40. The route then turns and continues east for 1.1 mile, crossing Country Club Road, before terminating at the Evans Creek Junction.

Corridor B Route 1 is approximately 1.3 miles in length. From the Evans Creek Junction, Corridor B Route 1 extends south for 1.3 miles across mostly forested land to its terminus at the proposed Evans Creek Substation site.

Corridor D Route 4 is approximately 3.2 miles in length. Corridor D Route 4 begins on the south side of the intersection of Corridor A Route 1 and the Company's existing Line #40. From that point, the route parallels Line #40 to the west for 0.3 mile. It then turns to the southwest and then south, paralleling the east side of I-85, for 1.4 miles, before turning west and crossing the interstate. The route then turns south and parallels the on/off ramps on the west side of the interstate for 0.5 mile. At this point, the route then turns and continues to the southwest for 1.0 mile, crossing Raines Street and Butts Street before terminating at the proposed Raines Substation site.

Interconnect Proposed Route 1 will be constructed on new right-of-way supported by two side-by-side single circuit weathering steel monopoles with a minimum structure height of approximately 100 feet, a maximum structure height of approximately 140 feet, and an average proposed structure height of approximately 113 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

Interconnect Alternative Route 2
Corridor A Route 1
Corridor B Route 1
Corridor C Route 1

Corridor A Route 1 is approximately 2.5 miles in length. Starting at the proposed Tunstall Substation, Corridor A Route 1 initially heads southeast for 1.4 miles, crossing Interstate 85 and the existing right-of-way for Dominion Energy Virginia's existing Line #40. The route then turns and continues east for 1.1 mile, crossing Country Club Road, before terminating at the Evans Creek Junction.

Corridor B Route 1 is approximately 1.3 miles in length. From the Evans Creek Junction, Corridor B Route 1 extends south for 1.3 miles across mostly forested

land to its terminus at the proposed Evans Creek Substation site.

Corridor C Route 1 is approximately 5.2 miles in length. Starting at the proposed Evans Creek Substation, Corridor C Route 1 extends west for 0.6 mile. The route then turns to the southwest and then south for 1.2 miles, crossing Highway 58 and the Tobacco Heritage Trail. The route next turns to the west and continues for 2.8 miles, crossing Marengo Road, I-85, and the Tobacco Heritage Trail at a second location. After crossing Country Lane, the route turns north for 0.6 mile and terminates at the proposed Raines Substation site.

Interconnect Alternative Route 2 will be constructed on new right-of-way supported by two side-by-side single circuit weathering steel monopoles with a minimum structure height of approximately 100 feet, a maximum structure height of approximately 140 feet, and an average proposed structure height of approximately 114 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

Interconnect Alternative Route 3
Corridor A Route 1
Corridor B Route 1
Corridor C Route 2

Corridor A Route 1 is approximately 2.5 miles in length. Starting at the proposed Tunstall Substation, Corridor A Route 1 initially heads southeast for 1.4 miles, crossing Interstate 85 and the existing right-of-way for Dominion Energy Virginia's existing Line #40. The route then turns and continues east for 1.1 mile, crossing Country Club Road, before terminating at the Evans Creek Junction.

Corridor B Route 1 is approximately 1.3 miles in length. From the Evans Creek Junction, Corridor B Route 1 extends south for 1.3 miles across mostly forested land to its terminus at the proposed Evans Creek Substation site.

Corridor C Route 2 is approximately 5.5 miles in length. From the proposed Evans Creek Substation, Corridor C Route 2 initially extends south for 1.5 mile, crossing Highway 58 and the Tobacco Heritage Trail. The route then turns west for 0.6 mile across a mix of forested and agricultural tracts. At this point, the route then follows the same alignment as Corridor C Route 1 to the proposed Raines Substation site.

Interconnect Alternative Route 3 will be constructed on new right-of-way supported by two side-by-side single circuit weathering steel monopoles with a minimum structure height of approximately 100 feet, a maximum structure height of approximately 140 feet, and an average proposed structure height of approximately 114 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.

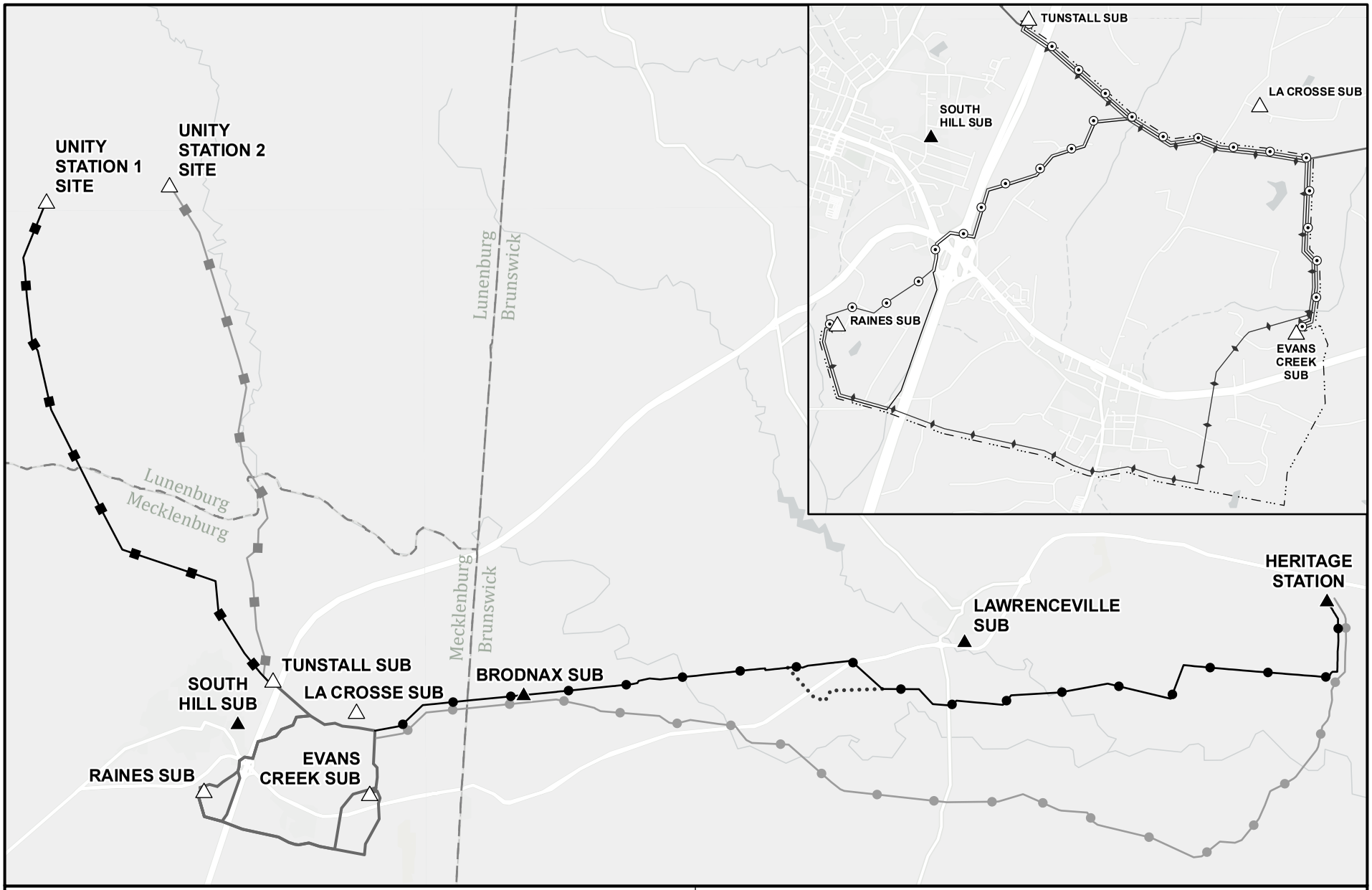
Interconnect Alternative Route 4
Corridor A Route 1
Corridor B Route 1
Corridor D Route 2

Corridor A Route 1 is approximately 2.5 miles in length. Starting at the proposed Tunstall Substation, Corridor A Route 1 initially heads southeast for 1.4 miles, crossing Interstate 85 and the existing right-of-way for Dominion Energy Virginia's existing Line #40. The route then turns and continues east for 1.1 mile, crossing Country Club Road, before terminating at the Evans Creek Junction.

Corridor B Route 1 is approximately 1.3 miles in length. From the Evans Creek Junction, Corridor B Route 1 extends south for 1.3 miles across mostly forested land to its terminus at the proposed Evans Creek Substation site.

Corridor D Route 2 is approximately 4.2 miles in length. The route begins at the same location as Corridor D Route 4 and follows the same alignment as Corridor D Route 4 for the first 2.2 miles. At this point, the route continues south paralleling the west side of I-85 for 1.1 miles. The route then turns to the west and then northwest for 0.9 mile crossing Rocky Branch Road and Country Lane before terminating at the Raines Substation.

Interconnect Alternative Route 4 will be constructed on new right-of-way supported by two side-by-side single circuit weathering steel monopoles with a minimum structure height of approximately 100 feet, a maximum structure height of approximately 140 feet, and an average proposed structure height of approximately 114 feet, based on preliminary conceptual design, not including foundation reveal and subject to change based on final engineering design.



Attachment V.A
Notice Map
South Hill 230 kV Transmission LIne Project
Dominion Energy Virginia
Lunenburg, Mecklenburg, and Brunswick Counties, VA

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V. NOTICE

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

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

V. NOTICE

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

Response:

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

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

Ms. Trisha Beasley
Department of Environmental Quality
VWP Permit Manager, Northern Regional Office
13901 Crown Court
Woodbridge, Virginia 22193

Ms. Rene Hypes
Virginia Department of Conservation and Recreation
Division of Natural Heritage
600 East Main Street, 24th Floor
Richmond, Virginia 23219

Ms. Kristal McKelvey
Department of Conservation and Recreation, Planning Bureau
600 East Main Street, 17th Floor
Richmond, Virginia 23219

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

Ms. Amy M. Ewing
Virginia Department of Wildlife Resources
7870 Villa Park, Suite 400
Henrico, Virginia 23228

Mr. Keith Tignor
Virginia Department of Agriculture and Consumer Affairs
102 Governor Street
Richmond, Virginia 23219

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

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

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

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

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

Martha Little
Deputy Director
Virginia Outdoors Foundation
600 East Main Street, Suite 402
Richmond, Virginia 23219

Mr. Tommy Johnson
Residency Administrator
Virginia Department of Transportation
1013 West Atlantic St.
P.O. Box 249
South Hill, Virginia 23970

Mr. H. Wayne Carter, III
Mecklenburg County Administrator
P.O. Box 307
Boydton, Virginia 23917

Kim Callis
South Hill Town Manager
211 S. Mecklenburg Ave.
South Hill, Virginia 23970-2619

Tracy M. Gee
Lunenburg County Administrator
11413 Courthouse Road
Lunenburg, Virginia 23952

Everette L. Gibson
Lawrenceville Town Manager
400 N. Main Street
Lawrenceville, Virginia 23868

F.A. Hendrick
La Crosse Town Manager
115 South Main Street
La Crosse, Virginia 23950

Leslie R. Weddington
Brunswick County Administrator
228 N. Main Street, Suite 300
Lawrenceville, Virginia 23868

V. NOTICE

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

Response: In accordance with Va. Code § 15.2-2202 E, letters dated August 19, 2022, were delivered to the localities where the Project is located, including: Kim Callis, South Hill Town Manager; H. Wayne Carter, III, Mecklenburg County Administrator; Tracy M. Gee, Lunenburg County Administrator; Everette L. Gibson, Lawrenceville Town Manager; F.A. Hendrick, La Crosse Town Manager; and Leslie R. Weddington, Brunswick County Administrator. The letters stated the Company's intention to file this Application and invited the Towns and Counties to consult with the Company about the Project. These letters are included as Attachments V.D.1-6, respectively.

Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, VA 23219
DominionEnergy.com

August 19, 2022

Kim Callis
South Hill Town Manager
211 S. Mecklenburg Ave.
South Hill, VA 23970-2619

RE: Dominion Energy Virginia's Proposed South Hill Project, in Lunenburg, Mecklenburg, and Brunswick Counties, Virginia.

Dear Mr. Callis,

Dominion Energy Virginia (the "Company") is proposing to build a new 500-230 kV switching station ("Unity Station"), two new single circuit 230 kV transmission lines ("Unity Lines" and "Substation Interconnect Lines"), and three new 230-36.5 kV substations (the "Tunstall Substation," "Evans Creek Substation," and "Raines Substation") in the South Hill area of Mecklenburg County and in Lunenburg County, Virginia (collectively, the "South Hill Project" or the "Project"). The Company has identified proposed and alternative routes for the proposed Project originating from Unity Station, as shown in the attached map ("Unity Option").

As an electrically equivalent alternative, the Company has also identified proposed and alternative routes for the Project that would originate from the Company's existing 500-230 kV Heritage Switching Station ("Heritage Station") (the "Heritage Option"). As part of the Heritage Option, the existing Heritage Station would be expanded to accommodate two new single circuit 230 kV transmission lines ("Heritage Lines" and "Substation Interconnect Lines") to the three new substations. The Heritage Option would be constructed in Lunenburg, Mecklenburg, and Brunswick Counties, Virginia. See the attached map.

Both the Unity Option and the Heritage Option would require construction of the Tunstall, Evans Creek and Raines Substations, which would be connected by the Substation Interconnect Lines along one of the identified proposed or alternative routes, as shown on the attached map.

The Project is needed to provide service requested by a retail electric service customer at three new data center campuses located in the South Hill area of Mecklenburg County, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is preparing an application for a Certificate of Public Convenience and Necessity from the Virginia State Corporation Commission ("SCC"). Pursuant to Va. Code § 15.2-2202, the Company is writing to notify you of the proposed project in advance of this SCC filing. We respectfully request that you submit any comments or additional information you feel would have bearing on the Project within 30 days of the date of this letter. Enclosed is a Project Location Map depicting the routes and project location.

If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact me at (804) 239-6450 or charles.h.weil@dominionenergy.com.

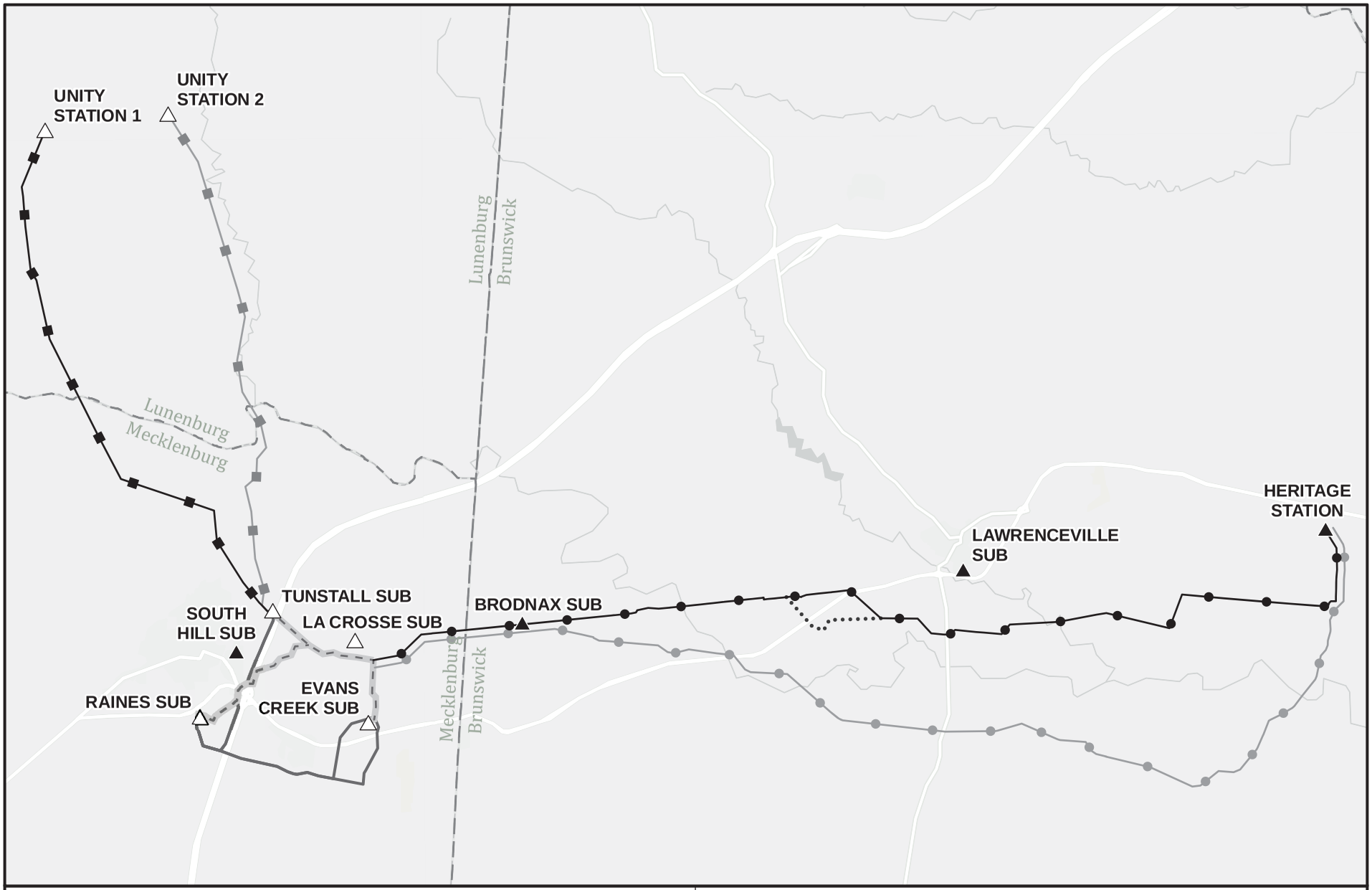
We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Sincerely,

Dominion Energy Virginia

Charles H. Weil, PE
Siting and Permitting

Attachment: Project Notice Map



Project Overview Map

South Hill Project

Dominion Energy Virginia

Lunenburg, Mecklenburg, and Brunswick Counties, VA

Dominion Energy

ERM

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Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, VA 23219
DominionEnergy.com

August 19, 2022

Mr. H. Wayne Carter, III
Mecklenburg County Administrator
P.O. Box 307
Boydton, VA 23917

RE: Dominion Energy Virginia's Proposed South Hill Project, in Lunenburg, Mecklenburg, and Brunswick Counties, Virginia.

Dear Mr. Carter,

Dominion Energy Virginia (the "Company") is proposing to build a new 500-230 kV switching station ("Unity Station"), two new single circuit 230 kV transmission lines ("Unity Lines" and "Substation Interconnect Lines"), and three new 230-36.5 kV substations (the "Tunstall Substation," "Evans Creek Substation," and "Raines Substation") in the South Hill area of Mecklenburg County and in Lunenburg County, Virginia (collectively, the "South Hill Project" or the "Project"). The Company has identified proposed and alternative routes for the proposed Project originating from Unity Station, as shown in the attached map ("Unity Option").

As an electrically equivalent alternative, the Company has also identified proposed and alternative routes for the Project that would originate from the Company's existing 500-230 kV Heritage Switching Station ("Heritage Station") (the "Heritage Option"). As part of the Heritage Option, the existing Heritage Station would be expanded to accommodate two new single circuit 230 kV transmission lines ("Heritage Lines" and "Substation Interconnect Lines") to the three new substations. The Heritage Option would be constructed in Lunenburg, Mecklenburg, and Brunswick Counties, Virginia. See the attached map.

Both the Unity Option and the Heritage Option would require construction of the Tunstall, Evans Creek and Raines Substations, which would be connected by the Substation Interconnect Lines along one of the identified proposed or alternative routes, as shown on the attached map.

The Project is needed to provide service requested by a retail electric service customer at three new data center campuses located in the South Hill area of Mecklenburg County, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is preparing an application for a Certificate of Public Convenience and Necessity from the Virginia State Corporation Commission ("SCC"). Pursuant to Va. Code § 15.2-2202, the Company is writing to notify you of the proposed project in advance of this SCC filing. We respectfully request that you submit any comments or additional information you feel would have bearing on the Project within 30 days of the date of this letter. Enclosed is a Project Location Map depicting the routes and project location.

If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact me at (804) 239-6450 or charles.h.weil@dominionenergy.com.

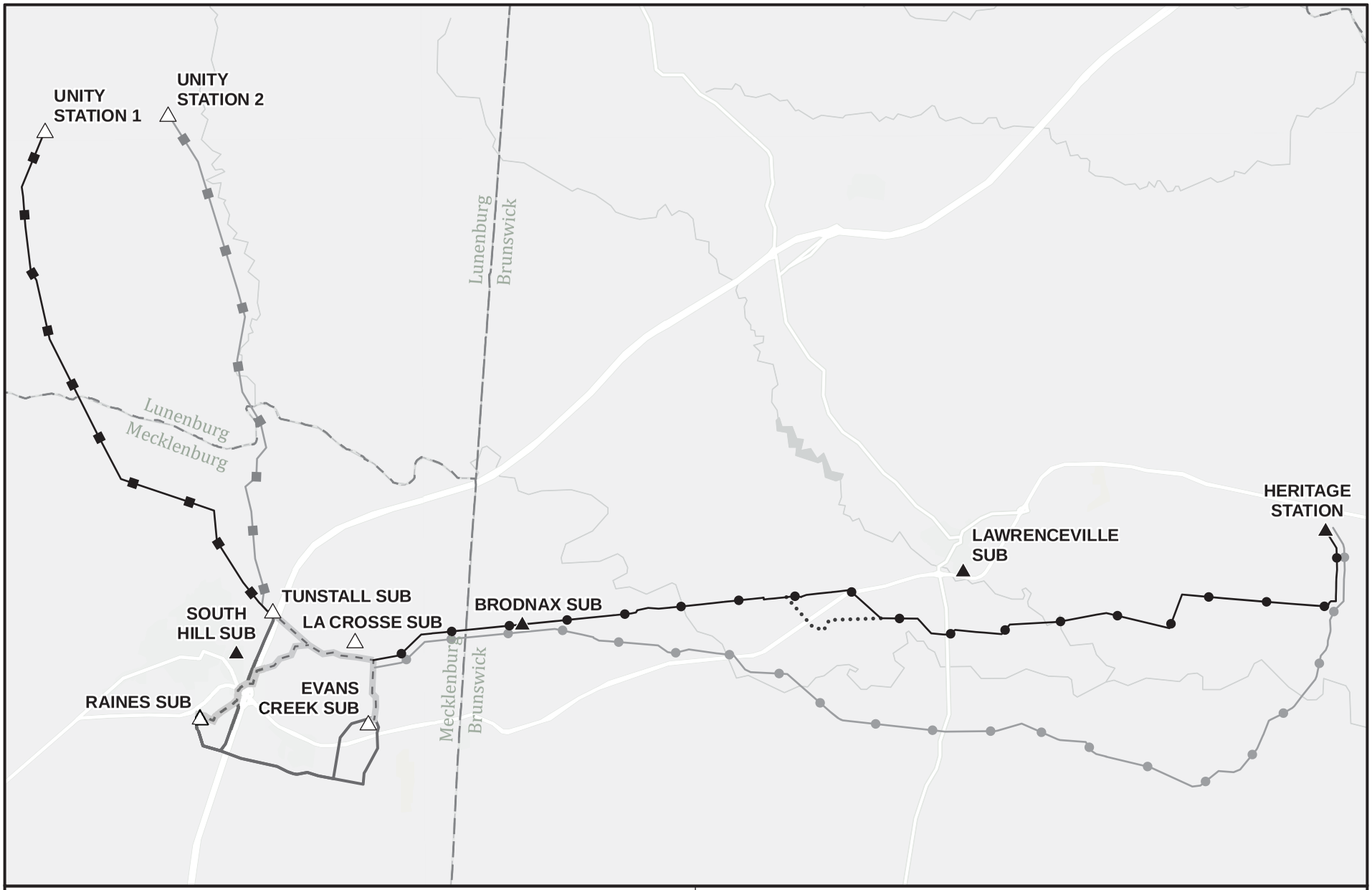
We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Sincerely,

Dominion Energy Virginia

Charles H. Weil, PE
Siting and Permitting

Attachment: Project Notice Map



Project Overview Map

South Hill Project

Dominion Energy Virginia

Lunenburg, Mecklenburg, and Brunswick Counties, VA

Dominion Energy

ERM

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Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, VA 23219
DominionEnergy.com

August 19, 2022

Tracy M. Gee
Lunenburg County Administrator
11413 Courthouse Road
Lunenburg, VA 23952

RE: Dominion Energy Virginia's Proposed South Hill Project, in Lunenburg, Mecklenburg, and Brunswick Counties, Virginia.

Dear Ms. Gee,

Dominion Energy Virginia (the "Company") is proposing to build a new 500-230 kV switching station ("Unity Station"), two new single circuit 230 kV transmission lines ("Unity Lines" and "Substation Interconnect Lines"), and three new 230-36.5 kV substations (the "Tunstall Substation," "Evans Creek Substation," and "Raines Substation") in the South Hill area of Mecklenburg County and in Lunenburg County, Virginia (collectively, the "South Hill Project" or the "Project"). The Company has identified proposed and alternative routes for the proposed Project originating from Unity Station, as shown in the attached map ("Unity Option").

As an electrically equivalent alternative, the Company has also identified proposed and alternative routes for the Project that would originate from the Company's existing 500-230 kV Heritage Switching Station ("Heritage Station") (the "Heritage Option"). As part of the Heritage Option, the existing Heritage Station would be expanded to accommodate two new single circuit 230 kV transmission lines ("Heritage Lines" and "Substation Interconnect Lines") to the three new substations. The Heritage Option would be constructed in Lunenburg, Mecklenburg, and Brunswick Counties, Virginia. See the attached map.

Both the Unity Option and the Heritage Option would require construction of the Tunstall, Evans Creek and Raines Substations, which would be connected by the Substation Interconnect Lines along one of the identified proposed or alternative routes, as shown on the attached map.

The Project is needed to provide service requested by a retail electric service customer at three new data center campuses located in the South Hill area of Mecklenburg County, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is preparing an application for a Certificate of Public Convenience and Necessity from the Virginia State Corporation Commission ("SCC"). Pursuant to Va. Code § 15.2-2202, the Company is writing to notify you of the proposed project in advance of this SCC filing. We respectfully request that you submit any comments or additional information you feel would have bearing on the Project within 30 days of the date of this letter. Enclosed is a Project Location Map depicting the routes and project location.

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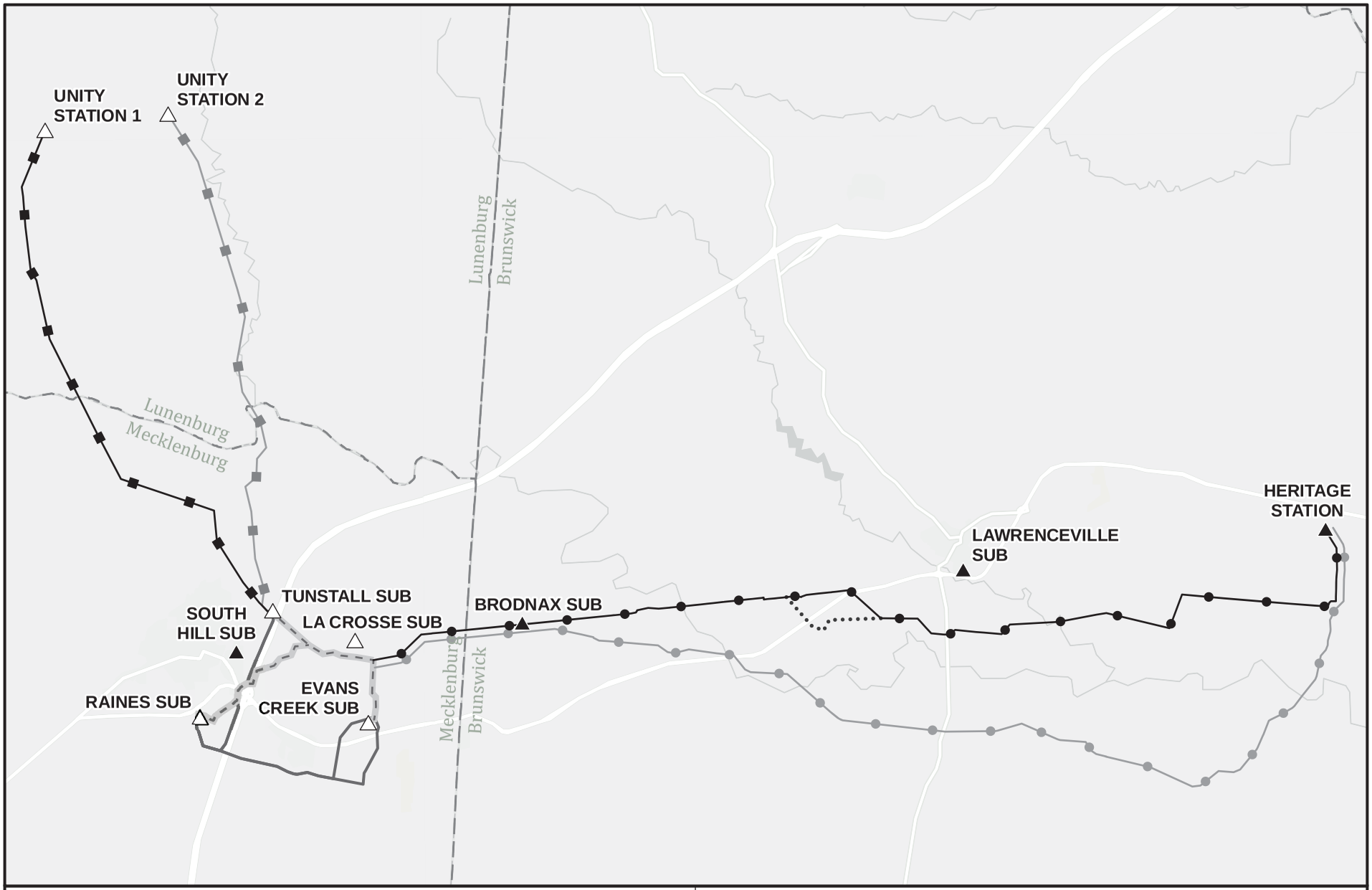
We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Sincerely,

Dominion Energy Virginia

Charles H. Weil, PE
Siting and Permitting

Attachment: Project Notice Map



Project Overview Map

South Hill Project

Dominion Energy Virginia

Lunenburg, Mecklenburg, and Brunswick Counties, VA

Dominion Energy

ERM

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Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, VA 23219
DominionEnergy.com

August 19, 2022

Everette L. Gibson
Lawrenceville Town Manager
400 N. Main Street
Lawrenceville, VA 23868

RE: Dominion Energy Virginia's Proposed South Hill Project, in Lunenburg, Mecklenburg, and Brunswick Counties, Virginia.

Dear Mr. Gibson,

Dominion Energy Virginia (the "Company") is proposing to build a new 500-230 kV switching station ("Unity Station"), two new single circuit 230 kV transmission lines ("Unity Lines" and "Substation Interconnect Lines"), and three new 230-36.5 kV substations (the "Tunstall Substation," "Evans Creek Substation," and "Raines Substation") in the South Hill area of Mecklenburg County and in Lunenburg County, Virginia (collectively, the "South Hill Project" or the "Project"). The Company has identified proposed and alternative routes for the proposed Project originating from Unity Station, as shown in the attached map ("Unity Option").

As an electrically equivalent alternative, the Company has also identified proposed and alternative routes for the Project that would originate from the Company's existing 500-230 kV Heritage Switching Station ("Heritage Station") (the "Heritage Option"). As part of the Heritage Option, the existing Heritage Station would be expanded to accommodate two new single circuit 230 kV transmission lines ("Heritage Lines" and "Substation Interconnect Lines") to the three new substations. The Heritage Option would be constructed in Lunenburg, Mecklenburg, and Brunswick Counties, Virginia. See the attached map.

Both the Unity Option and the Heritage Option would require construction of the Tunstall, Evans Creek and Raines Substations, which would be connected by the Substation Interconnect Lines along one of the identified proposed or alternative routes, as shown on the attached map.

The Project is needed to provide service requested by a retail electric service customer at three new data center campuses located in the South Hill area of Mecklenburg County, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is preparing an application for a Certificate of Public Convenience and Necessity from the Virginia State Corporation Commission ("SCC"). Pursuant to Va. Code § 15.2-2202, the Company is writing to notify you of the proposed project in advance of this SCC filing. We respectfully request that you submit any comments or additional information you feel would have bearing on the Project within 30 days of the date of this letter. Enclosed is a Project Location Map depicting the routes and project location.

If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact me at (804) 239-6450 or charles.h.weil@dominionenergy.com.

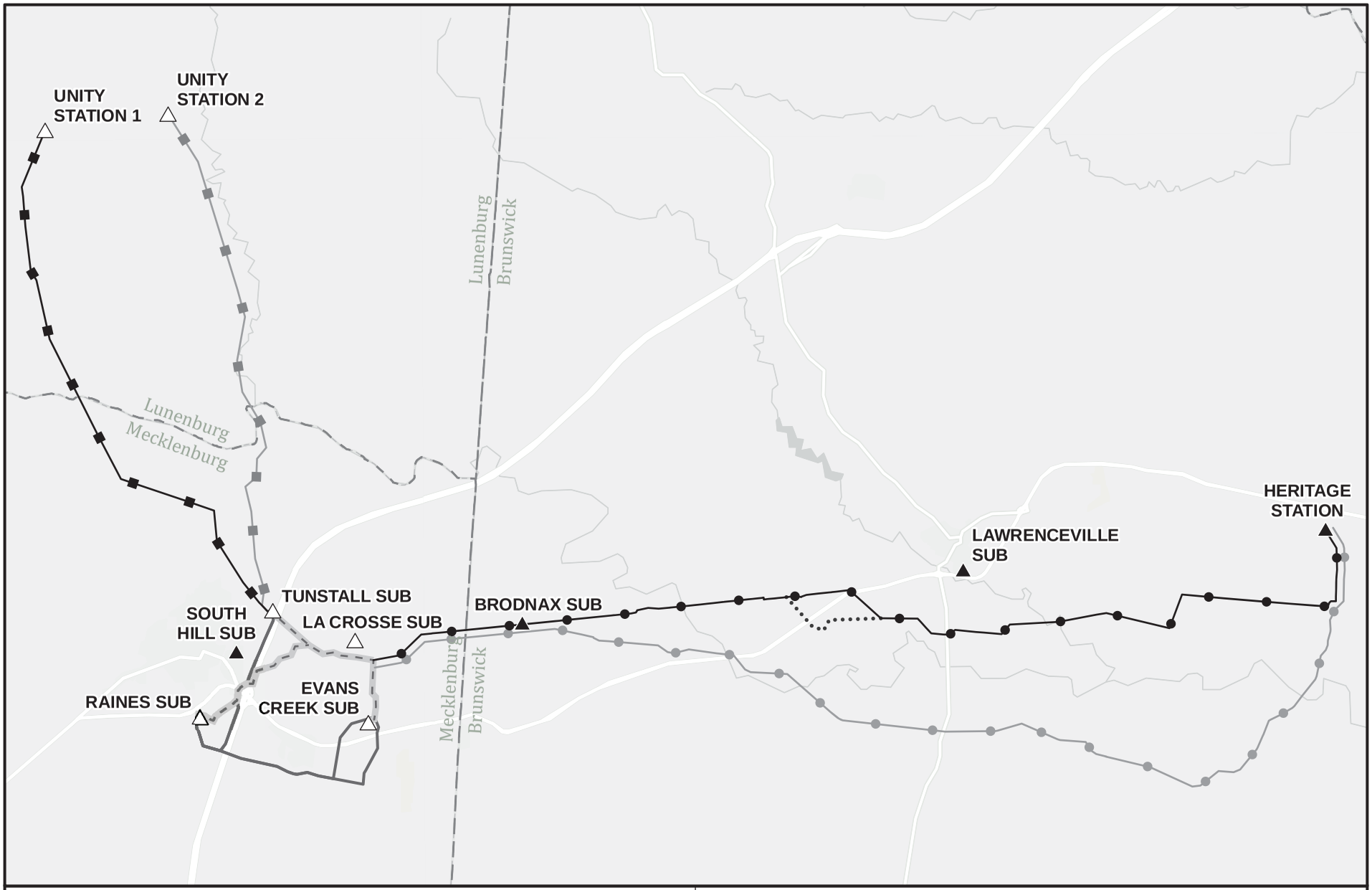
We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Sincerely,

Dominion Energy Virginia

Charles H. Weil, PE
Siting and Permitting

Attachment: Project Notice Map



Project Overview Map

South Hill Project

Dominion Energy Virginia

Lunenburg, Mecklenburg, and Brunswick Counties, VA

Dominion Energy

ERM

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Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, VA 23219
DominionEnergy.com

August 19, 2022

F.A. Hendrick
La Crosse Town Manager
115 South Main Street
La Crosse, VA 23950

RE: Dominion Energy Virginia's Proposed South Hill Project, in Lunenburg, Mecklenburg, and Brunswick Counties, Virginia.

Dear Mr. Hendrick,

Dominion Energy Virginia (the "Company") is proposing to build a new 500-230 kV switching station ("Unity Station"), two new single circuit 230 kV transmission lines ("Unity Lines" and "Substation Interconnect Lines"), and three new 230-36.5 kV substations (the "Tunstall Substation," "Evans Creek Substation," and "Raines Substation") in the South Hill area of Mecklenburg County and in Lunenburg County, Virginia (collectively, the "South Hill Project" or the "Project"). The Company has identified proposed and alternative routes for the proposed Project originating from Unity Station, as shown in the attached map ("Unity Option").

As an electrically equivalent alternative, the Company has also identified proposed and alternative routes for the Project that would originate from the Company's existing 500-230 kV Heritage Switching Station ("Heritage Station") (the "Heritage Option"). As part of the Heritage Option, the existing Heritage Station would be expanded to accommodate two new single circuit 230 kV transmission lines ("Heritage Lines" and "Substation Interconnect Lines") to the three new substations. The Heritage Option would be constructed in Lunenburg, Mecklenburg, and Brunswick Counties, Virginia. See the attached map.

Both the Unity Option and the Heritage Option would require construction of the Tunstall, Evans Creek and Raines Substations, which would be connected by the Substation Interconnect Lines along one of the identified proposed or alternative routes, as shown on the attached map.

The Project is needed to provide service requested by a retail electric service customer at three new data center campuses located in the South Hill area of Mecklenburg County, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is preparing an application for a Certificate of Public Convenience and Necessity from the Virginia State Corporation Commission ("SCC"). Pursuant to Va. Code § 15.2-2202, the Company is writing to notify you of the proposed project in advance of this SCC filing. We respectfully request that you submit any comments or additional information you feel would have bearing on the Project within 30 days of the date of this letter. Enclosed is a Project Location Map depicting the routes and project location.

If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact me at (804) 239-6450 or charles.h.weil@dominionenergy.com.

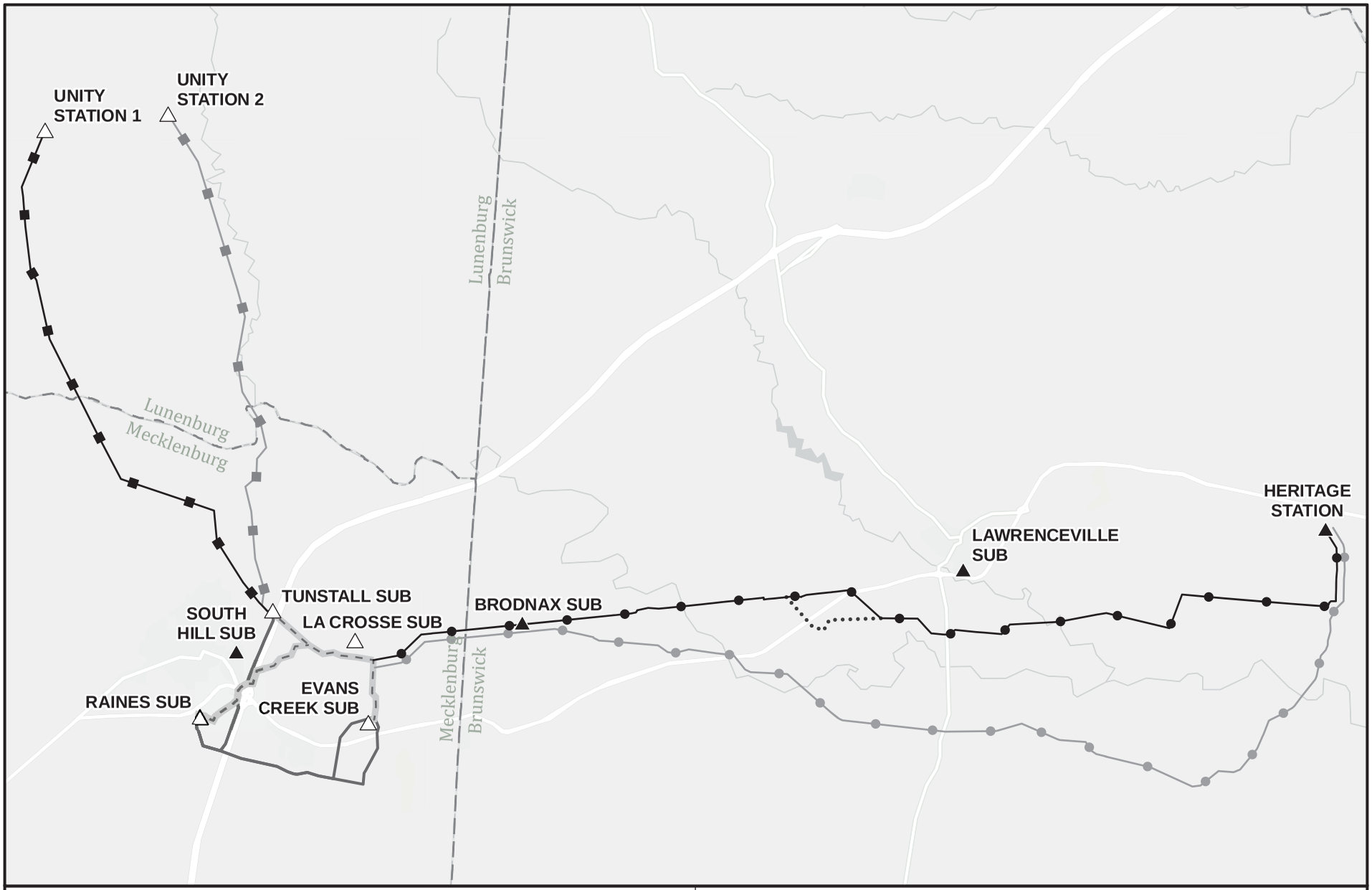
We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Sincerely,

Dominion Energy Virginia

Charles H. Weil, PE
Siting and Permitting

Attachment: Project Notice Map



Project Overview Map

South Hill Project

Dominion Energy Virginia

Lunenburg, Mecklenburg, and Brunswick Counties, VA

Dominion Energy

ERM

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Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, VA 23219
DominionEnergy.com

August 19, 2022

Leslie R. Weddington
Brunswick County Administrator
228 N. Main Street, Suite 300
Lawrenceville, VA 23868

RE: Dominion Energy Virginia's Proposed South Hill Project, in Lunenburg, Mecklenburg, and Brunswick Counties, Virginia.

Dear Ms. Weddington,

Dominion Energy Virginia (the "Company") is proposing to build a new 500-230 kV switching station ("Unity Station"), two new single circuit 230 kV transmission lines ("Unity Lines" and "Substation Interconnect Lines"), and three new 230-36.5 kV substations (the "Tunstall Substation," "Evans Creek Substation," and "Raines Substation") in the South Hill area of Mecklenburg County and in Lunenburg County, Virginia (collectively, the "South Hill Project" or the "Project"). The Company has identified proposed and alternative routes for the proposed Project originating from Unity Station, as shown in the attached map ("Unity Option").

As an electrically equivalent alternative, the Company has also identified proposed and alternative routes for the Project that would originate from the Company's existing 500-230 kV Heritage Switching Station ("Heritage Station") (the "Heritage Option"). As part of the Heritage Option, the existing Heritage Station would be expanded to accommodate two new single circuit 230 kV transmission lines ("Heritage Lines" and "Substation Interconnect Lines") to the three new substations. The Heritage Option would be constructed in Lunenburg, Mecklenburg, and Brunswick Counties, Virginia. See the attached map.

Both the Unity Option and the Heritage Option would require construction of the Tunstall, Evans Creek and Raines Substations, which would be connected by the Substation Interconnect Lines along one of the identified proposed or alternative routes, as shown on the attached map.

The Project is needed to provide service requested by a retail electric service customer at three new data center campuses located in the South Hill area of Mecklenburg County, and to comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The Company is preparing an application for a Certificate of Public Convenience and Necessity from the Virginia State Corporation Commission ("SCC"). Pursuant to Va. Code § 15.2-2202, the Company is writing to notify you of the proposed project in advance of this SCC filing. We respectfully request that you submit any comments or additional information you feel would have bearing on the Project within 30 days of the date of this letter. Enclosed is a Project Location Map depicting the routes and project location.

If you would like to receive a GIS shapefile of the transmission line routes to assist in the project review or if there are any questions, please do not hesitate to contact me at (804) 239-6450 or charles.h.weil@dominionenergy.com.

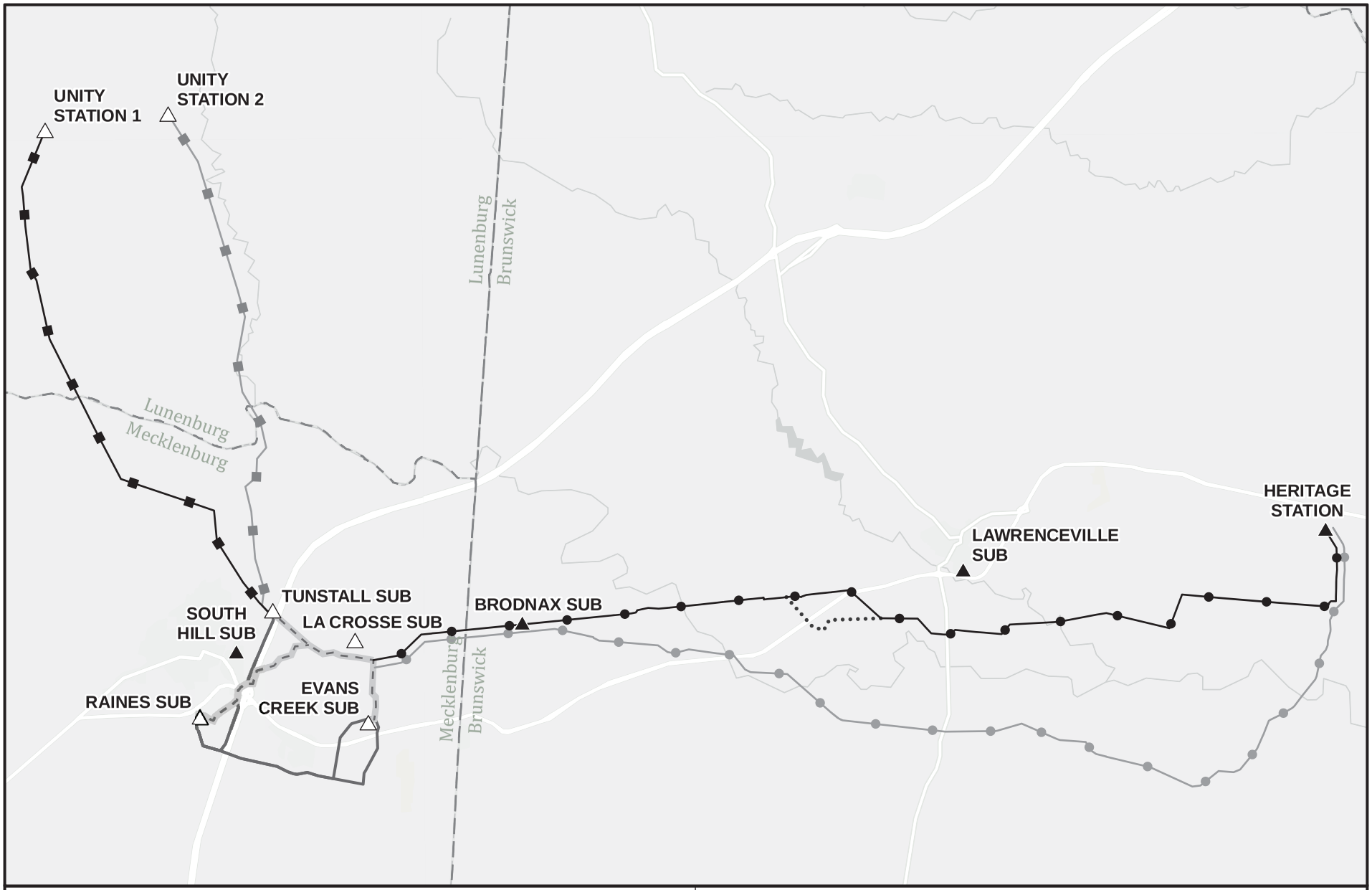
We appreciate your assistance with this project review and look forward to any additional information you may have to offer.

Sincerely,

Dominion Energy Virginia

Charles H. Weil, PE
Siting and Permitting

Attachment: Project Notice Map



Project Overview Map

South Hill Project

Dominion Energy Virginia

Lunenburg, Mecklenburg, and Brunswick Counties, VA

Dominion Energy

ERM

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COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

APPLICATION OF	)	
	)	
VIRGINIA ELECTRIC AND POWER COMPANY	)	Case No. PUR-2022-00167
	)	
For approval and certification of electric transmission facilities: 230 kV Lines #2259 and #2262, 500-230 kV Unity Switching Station, 230-36.5 kV Tunstall, Evans Creek, Raines Substations, and 230 kV Substation Interconnect Lines	)	

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

Kunal S. Amare

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

Emmanuel J. Dobson

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

Chloe A. Genova

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

Mohammad M. Othman

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

Chuck H. Weil

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

Jon M. Berkin, PhD

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

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Kunal S. Amare

Title: Engineer III – Electric Transmission Planning

Summary:

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

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

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

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

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

DIRECT TESTIMONY
OF
KUNAL S. AMARE
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00167

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

A. My name is Kunal S. Amare, and I am an Engineer III in the Electric Transmission Planning Department for the Company. My business address is 10900 Nuckols Road, Glen Allen, Virginia 23060. A statement of my qualifications and background is provided as Appendix A.

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

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

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

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

- Tap the Company's future Finneywood-Rawlings 500 kV Line #593 between Structures #593/128 and #593/129 in order to construct a new 500-230 kV switching station ("Unity Switching Station" or "Unity Station") located within existing right-of-way and on property obtained by the Company ("Unity Station 2 site") in Lunenburg County, Virginia. The proposed Unity Switching Station will be

constructed to source three new substations located in the South Hill area of Mecklenburg County.

- Construct two new approximately 11.1-mile 230 kV single circuit lines—Tunstall-Unity Lines #2259 and #2262—sourced from the proposed Unity Station to a junction ("Unity Junction") where the proposed lines terminate at the proposed Tunstall Substation (collectively, the "Unity Lines. The Unity Lines will be supported by two side-by-side single circuit weathering steel monopoles and utilize three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA. The proposed Unity Lines will utilize new 120-foot-wide right-of-way for the entire length of the route.

- Construct two new 230 kV single circuit lines, totaling approximately 7.0 miles in length, which interconnect three new substations beginning from the Unity Junction via a combination of three corridors ("Corridors A, B, and D") (collectively, the "Substation Interconnect Lines"). The Substation Interconnect Lines will be supported primarily by two side-by-side single circuit weathering steel monopoles and utilize three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA. The proposed Substation Interconnect Lines will utilize new 120-foot-wide right-of-way for the entire length of the route.

- Construct three new 230-36.5 kV substations in the South Hill area of Mecklenburg County, Virginia (the "Tunstall Substation," "Evans Creek Substation," and "Raines Substation") served by the new Substation Interconnect Lines (collectively, the "Interconnect Substations").

- Conduct system protection upgrades and relay settings at the Company's future Finneywood Switching Station and Rawlings Substation.

The Unity Station, Unity Lines, Substation Interconnect Lines, Interconnect Substations, and related station work are collectively referred to as the "South Hill 230 kV Transmission Line Project" or "Project."

The purpose of my testimony is to describe the Company's electric transmission system and the need for, and benefits of, the proposed Project. I am sponsoring Sections I.G, I.J, I.K, I.M, II.A.3, and II.A.10 of the Appendix. Additionally, I co-sponsor the Executive Summary and Section I.A with Company Witnesses Emmanuel J. Dobson, Chloe A. Genova, Mohammad M. Othman, Chuck H. Weil, and Jon M. Berkin; Sections I.B, I.C, I.D, I.E, and I.N with Company Witness Emmanuel J. Dobson; Section I.H with

Company Witnesses Emmanuel J. Dobson and Chuck H. Weil; and Section I.L with Company Witness Chloe A. Genova.

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

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS
OF
KUNAL S. AMARE

Kunal S. Amare received a Master of Science degree in Electrical Engineering from Virginia Polytechnic Institute and State University in 2016. He received a Bachelor of Technology degree in Electrical Engineering from the University of Mumbai in 2014. He has been licensed as a Professional Engineer in the State of Texas since 2019. He has been employed with the Company in the Transmission Planning team since June 2020. Prior to working with Dominion, Mr. Amare worked with Entergy Services LLC in the Transmission Planning Department from 2017–2020. Mr. Amare is skilled in Transmission Planning, Transient Stability Analysis, Renewable Energy Systems, and Electromagnetic Transient Analysis.

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

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Emmanuel J. Dobson

Title: Engineer III – Distribution Planning Group

Summary:

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

- Section I.A (co-sponsored with Company Witnesses Kunal S. Amare, Chloe A. Genova, Mohammad M. Othman, Chuck H. Weil, and Jon M. Berkin): This section details the primary justifications for the proposed project.

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

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

- Section I.D (co-sponsored with Company Witness Kunal S. Amare): Although not applicable to the proposed project, this section, when applicable, describes critical contingencies and associated violations due to the inadequacy of the existing system.

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

- Section I.H (co-sponsored with Company Witnesses Kunal S. Amare and Chuck H. Weil): This section provides the desired in-service date of the proposed project and the estimated construction time.

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

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

DIRECT TESTIMONY
OF
EMMANUEL J. DOBSON
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00167

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

A. My name is Emmanuel J. Dobson, and I am an Engineer III in the Company's Distribution Planning Group. My business address is 600 E. Canal Street, Richmond, Virginia 23219. A statement of my qualifications and background is provided as Appendix A.

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

A. I am responsible for planning the Company's electric distribution system that serves data centers. My areas of responsibilities are throughout the Company's Virginia service territory.

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

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

- Tap the Company's future Finneywood-Rawlings 500 kV Line #593 between Structures #593/128 and #593/129 in order to construct a new 500-230 kV switching station ("Unity Switching Station" or "Unity Station") located within existing right-of-way and on property obtained by the Company ("Unity Station 2 site") in

Lunenburg County, Virginia. The proposed Unity Switching Station will be constructed to source three new substations located in the South Hill area of Mecklenburg County.

- Construct two new approximately 11.1-mile 230 kV single circuit lines—Tunstall-Unity Lines #2259 and #2262—sourced from the proposed Unity Station to a junction ("Unity Junction") where the proposed lines terminate at the proposed Tunstall Substation (collectively, the "Unity Lines. The Unity Lines will be supported by two side-by-side single circuit weathering steel monopoles and utilize three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA. The proposed Unity Lines will utilize new 120-foot-wide right-of-way for the entire length of the route.

- Construct two new 230 kV single circuit lines, totaling approximately 7.0 miles in length, which interconnect three new substations beginning from the Unity Junction via a combination of three corridors ("Corridors A, B, and D") (collectively, the "Substation Interconnect Lines"). The Substation Interconnect Lines will be supported primarily by two side-by-side single circuit weathering steel monopoles and utilize three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA. The proposed Substation Interconnect Lines will utilize new 120-foot-wide right-of-way for the entire length of the route.

- Construct three new 230-36.5 kV substations in the South Hill area of Mecklenburg County, Virginia (the "Tunstall Substation," "Evans Creek Substation," and "Raines Substation") served by the new Substation Interconnect Lines (collectively, the "Interconnect Substations").

- Conduct system protection upgrades and relay settings at the Company's future Finneywood Switching Station and Rawlings Substation.

The Unity Station, Unity Lines, Substation Interconnect Lines, Interconnect Substations, and related station work are collectively referred to as the "South Hill 230 kV Transmission Line Project" or "Project."

The purpose of my testimony is to describe the Company's electric distribution system and the need for, and benefits of, the proposed Project. I co-sponsor the Executive Summary and Section I.A with Company Witnesses Kunal S. Amare, Chloe A. Genova, Mohammad M. Othman, Chuck H. Weil, and Jon M. Berkin. Additionally, I co-sponsor Sections I.B, I.C, I.D, I.E, and I.N of the Appendix with Company Witness Kunal S.

Amare; and Section I.H with Company Witnesses Kunal S. Amare and Chuck H. Weil.

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

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS
OF
EMMANUEL J. DOBSON

Emmanuel J. Dobson received a Bachelor of Science degree in Electrical Engineering from Clemson University in 2007. He has been employed by the Company since 2013. Mr. Dobson's experience with the Company includes substation engineering (6 years) and distribution planning (2.5 years). Prior to working for the Company, Mr. Dobson worked as an electrical plant engineer and a reliability engineer for six years.

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

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Chloe A. Genova

Title: Engineering Technical Specialist II

Summary:

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

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

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

- Section I.A (co-sponsored with Company Witnesses Kunal S. Amare, Emmanuel J. Dobson, Mohammad M. Othman, Chuck H. Weil, and Jon M. Berkin): This section details the primary justifications for the proposed project.
- Section I.I. (co-sponsored with Company Witness Mohammad M. Othman): This section provides the estimated total cost of the proposed project.
- Section I.L (co-sponsored with Company Witness Kunal S. Amare): This section, when applicable, provides details on the deterioration of structures and associated equipment.
- Sections II.B.3 to II.B.5 (co-sponsored with Company Witness Chuck H. Weil): These sections, when applicable, provide supporting structure details along the proposed and alternative routes.
- Section II.B.6 (co-sponsored with Company Witnesses Chuck H. Weil and Jon M. Berkin): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section V.A (co-sponsored with Company Witnesses Chuck H. Weil and Jon M. Berkin): This section provides the proposed route description and structure heights for notice purposes.

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

DIRECT TESTIMONY
OF
CHLOE A. GENOVA
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00167

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

A. My name is Chloe A. Genova, and I am an Engineering Technical Specialist II in the Electric Transmission Line Engineering Department of the Company. My business address is 10900 Nuckols Road, Glen Allen, Virginia 23060. A statement of my qualifications and background is provided as Appendix A.

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

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

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

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

- Tap the Company's future Finneywood-Rawlings 500 kV Line #593 between Structures #593/128 and #593/129 in order to construct a new 500-230 kV switching station ("Unity Switching Station" or "Unity Station") located within existing right-of-way and on property obtained by the Company ("Unity Station 2 site") in Lunenburg County, Virginia. The proposed Unity Switching Station will be

constructed to source three new substations located in the South Hill area of Mecklenburg County.

- Construct two new approximately 11.1-mile 230 kV single circuit lines—Tunstall-Unity Lines #2259 and #2262—sourced from the proposed Unity Station to a junction ("Unity Junction") where the proposed lines terminate at the proposed Tunstall Substation (collectively, the "Unity Lines. The Unity Lines will be supported by two side-by-side single circuit weathering steel monopoles and utilize three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA. The proposed Unity Lines will utilize new 120-foot-wide right-of-way for the entire length of the route.

- Construct two new 230 kV single circuit lines, totaling approximately 7.0 miles in length, which interconnect three new substations beginning from the Unity Junction via a combination of three corridors ("Corridors A, B, and D") (collectively, the "Substation Interconnect Lines"). The Substation Interconnect Lines will be supported primarily by two side-by-side single circuit weathering steel monopoles and utilize three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA. The proposed Substation Interconnect Lines will utilize new 120-foot-wide right-of-way for the entire length of the route.

- Construct three new 230-36.5 kV substations in the South Hill area of Mecklenburg County, Virginia (the "Tunstall Substation," "Evans Creek Substation," and "Raines Substation") served by the new Substation Interconnect Lines (collectively, the "Interconnect Substations").

- Conduct system protection upgrades and relay settings at the Company's future Finneywood Switching Station and Rawlings Substation.

The Unity Station, Unity Lines, Substation Interconnect Lines, Interconnect Substations, and related station work are collectively referred to as the "South Hill 230 kV Transmission Line Project" or "Project."

The purpose of my testimony is to describe the design characteristics of the transmission facilities for the proposed Project and to discuss electric and magnetic field ("EMF") levels. I am sponsoring Sections I.F, II.A.5, II.B.1, II.B.2, and IV of the Appendix. Additionally, I co-sponsor the Executive Summary and Section I.A with Company Witnesses Kunal S. Amare, Emmanuel J. Dobson, Mohammad M. Othman, Chuck H. Weil, and Jon M. Berkin; Section I.I with Company Witness Mohammad M. Othman;

Section I.L with Company Witness Kunal S. Amare; Sections II.B.3 to II.B.5 with Company Witness Chuck H. Weil; and Sections II.B.6 and V.A with Company Witnesses Chuck H. Weil and Jon M. Berkin.

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

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS
OF
CHLOE A. GENOVA

Chloe A. Genova received a Bachelor of Science degree in Civil Engineering Technology from the Pennsylvania College of Technology in 2018. She currently possesses an Engineer-in-Training certification in Virginia. She worked as a contractor for Dominion Energy for three years before being hired as a full-time employee in July 2021. Ms. Genova's experience with the Company includes Overhead Electric Transmission Line Design (July 2018–Present).

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

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Mohammed M. Othman

Title: Engineer III – Substation Engineering

Summary:

Company Witness Mohammed M. Othman sponsors or co-sponsors the following sections of the Appendix describing the substation work to be performed for the proposed Project as follows:

- Section I.A (co-sponsored with Company Witnesses Kunal S. Amare, Emmanuel J. Dobson, Chloe A. Genova, Chuck H. Weil, and Jon M. Berkin): This section details the primary justifications for the proposed project.

- Section I.I (co-sponsored with Company Witness Chloe A. Genova): This section provides the estimated total cost of the proposed project.

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

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

DIRECT TESTIMONY
OF
MOHAMMAD M. OTHMAN
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00167

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

A. My name is Mohammad M. Othman, and I am an Engineer III in the Substation Engineering section of the Electric Transmission group of the Company. My business address is 2400 Grayland Avenue, Richmond, Virginia 23220. A statement of my qualifications and background is provided as Appendix A.

Q. What are your responsibilities as a Consulting Engineer?

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

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

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

- Tap the Company's future Finneywood-Rawlings 500 kV Line #593 between Structures #593/128 and #593/129 in order to construct a new 500-230 kV switching station ("Unity Switching Station" or "Unity Station") located within existing right-of-way and on property obtained by the Company ("Unity Station 2 site") in

Lunenburg County, Virginia. The proposed Unity Switching Station will be constructed to source three new substations located in the South Hill area of Mecklenburg County.

- Construct two new approximately 11.1-mile 230 kV single circuit lines—Tunstall-Unity Lines #2259 and #2262—sourced from the proposed Unity Station to a junction ("Unity Junction") where the proposed lines terminate at the proposed Tunstall Substation (collectively, the "Unity Lines. The Unity Lines will be supported by two side-by-side single circuit weathering steel monopoles and utilize three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA. The proposed Unity Lines will utilize new 120-foot-wide right-of-way for the entire length of the route.

- Construct two new 230 kV single circuit lines, totaling approximately 7.0 miles in length, which interconnect three new substations beginning from the Unity Junction via a combination of three corridors ("Corridors A, B, and D") (collectively, the "Substation Interconnect Lines"). The Substation Interconnect Lines will be supported primarily by two side-by-side single circuit weathering steel monopoles and utilize three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA. The proposed Substation Interconnect Lines will utilize new 120-foot-wide right-of-way for the entire length of the route.

- Construct three new 230-36.5 kV substations in the South Hill area of Mecklenburg County, Virginia (the "Tunstall Substation," "Evans Creek Substation," and "Raines Substation") served by the new Substation Interconnect Lines (collectively, the "Interconnect Substations").

- Conduct system protection upgrades and relay settings at the Company's future Finneywood Switching Station and Rawlings Substation.

The Unity Station, Unity Lines, Substation Interconnect Lines, Interconnect Substations, and related station work are collectively referred to as the "South Hill 230 kV Transmission Line Project" or "Project."

The purpose of my testimony is to describe the work to be performed as part of the Project. As it pertains to station work, I sponsor Section II.C of the Appendix. Additionally, I co-sponsor the Executive Summary and Section I.A with Company Witnesses Kunal S. Amare, Emmanuel J. Dobson, Chloe A. Genova, Chuck H. Weil, and Jon M. Berkin; and Section I.I of the Appendix with Company Witness Chloe A. Genova.

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

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS
OF
MOHAMMAD M. OTHMAN

Mohammad M. Othman received a Bachelor of Science degree in Electrical Engineering from Virginia Commonwealth University in 2008. Mr. Othman's responsibilities include the evaluation of the substation project requirements, development of scope documents and schedules, preparation of estimates and proposals, preparation of specifications and bid documents, material procurement, design substation physical layout, development of detailed physical drawings, bill of materials, electrical schematics and wiring diagrams. Mr. Othman joined the Dominion Energy Virginia Substation Engineering department in 2010 as an Engineer II and was later promoted to Engineer III, the title he currently holds.

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

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Chuck H. Weil

Title: Electric Transmission Local Permitting Consultant

Summary:

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

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

Additionally, Mr. Weil co-sponsors the following portion of the Appendix:

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

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

DIRECT TESTIMONY
OF
CHUCK H. WEIL
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00167

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

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

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

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

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

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

Mecklenburg, Virginia, to:

- Tap the Company's future Finneywood-Rawlings 500 kV Line #593 between Structures #593/128 and #593/129 in order to construct a new 500-230 kV switching station ("Unity Switching Station" or "Unity Station") located within existing right-of-way and on property obtained by the Company ("Unity Station 2 site") in Lunenburg County, Virginia. The proposed Unity Switching Station will be constructed to source three new substations located in the South Hill area of Mecklenburg County.

- Construct two new approximately 11.1-mile 230 kV single circuit lines—Tunstall-Unity Lines #2259 and #2262—sourced from the proposed Unity Station to a junction ("Unity Junction") where the proposed lines terminate at the proposed Tunstall Substation (collectively, the "Unity Lines. The Unity Lines will be supported by two side-by-side single circuit weathering steel monopoles and utilize three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA. The proposed Unity Lines will utilize new 120-foot-wide right-of-way for the entire length of the route.

- Construct two new 230 kV single circuit lines, totaling approximately 7.0 miles in length, which interconnect three new substations beginning from the Unity Junction via a combination of three corridors ("Corridors A, B, and D") (collectively, the "Substation Interconnect Lines"). The Substation Interconnect Lines will be supported primarily by two side-by-side single circuit weathering steel monopoles and utilize three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA. The proposed Substation Interconnect Lines will utilize new 120-foot-wide right-of-way for the entire length of the route.

- Construct three new 230-36.5 kV substations in the South Hill area of Mecklenburg County, Virginia (the "Tunstall Substation," "Evans Creek Substation," and "Raines Substation") served by the new Substation Interconnect Lines (collectively, the "Interconnect Substations").

- Conduct system protection upgrades and relay settings at the Company's future Finneywood Switching Station and Rawlings Substation.

The Unity Station, Unity Lines, Substation Interconnect Lines, Interconnect Substations, and related station work are collectively referred to as the "South Hill 230 kV Transmission Line Project" or "Project."

The purpose of my testimony is to provide an overview of the route and permitting for the proposed Project. I sponsor Sections II.A.12 and V.B to V.D of the Appendix.

Additionally, I co-sponsor the Executive Summary and Section I.A with Company Witnesses Kunal S. Amare, Emmanuel J. Dobson, Chloe A. Genova, Mohammad M. Othman, and Jon M. Berkin; Section I.H with Company Witnesses Kunal S. Amare and Emmanuel J. Dobson; Sections II.A.1, II.A.2, II.A.4, II.A.6 to II.A.9, II.A.11, and III with Company Witness Jon M. Berkin; Sections II.B.3 to II.B.5 with Company Witness Chloe A. Genova; and Sections II.B.6 and V.A with Company Witnesses Chloe A. Genova and Jon M. Berkin. Finally, I co-sponsor the DEQ Supplement with Company Witness Jon M. Berkin.

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

A. Yes. In accordance with Va. Code § 15.2-2202 E, letters dated August 19, 2022, were delivered to Kim Callis, South Hill Town Manager; H. Wayne Carter, III, Mecklenburg County Administrator; Tracy M. Gee, Lunenburg County Administrator; Everette L. Gibson, Lawrenceville Town Manager; F.A. Hendrick, La Crosse Town Manager; and Leslie R. Weddington, Brunswick County Administrator, where the Project is located. The letters stated the Company's intention to file this Application and invited the Towns and Counties to consult with the Company about the Project. These letters are included as Attachments V.D.1-6 to the Appendix.

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

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS
OF
CHUCK H. WEIL

Mr. Chuck H. Weil graduated from Virginia Tech in 2012 with a Bachelor of Science in Civil and Environmental Engineering. He has a professional license in Civil Engineering. He was previously a transportation engineer with various consulting firms and the City of Suffolk, Virginia before joining Dominion Energy Virginia as an Engineer II in the Siting and Permitting Group in 2019.

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

WITNESS DIRECT TESTIMONY SUMMARY

Witness: Jon M. Berkin, PhD

Title: Partner, Environmental Resource Management

Summary:

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

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

- Section I.A (co-sponsored with Company Witnesses Kunal S. Amare, Emmanuel J. Dobson, Chloe A. Genova, Mohammad M. Othman, and Chuck H. Weil): This section details the primary justifications for the proposed project.
- Section II.A.1 (co-sponsored with Company Witness Chuck H. Weil): This section provides the length of the proposed corridor and viable alternatives to the proposed project.
- Section II.A.2 (co-sponsored with Company Witness Chuck H. Weil): This section provides a map showing the route of the proposed project in relation to notable points close to the proposed project.
- Section II.A.4 (co-sponsored with Company Witness Chuck H. Weil): This section explains why the existing right-of-way is not adequate to serve the need.
- Sections II.A.6 to II.A.8 (co-sponsored with Company Witness Chuck H. Weil): These sections provide detail regarding the right-of-way for the proposed project.
- Section II.A.9 (co-sponsored with Company Witness Chuck H. Weil): This section describes the proposed route selection procedures and details alternative routes considered.
- Section II.A.11 (co-sponsored with Company Witness Chuck H. Weil): This section details how the construction of the proposed project follows the provisions discussed in Attachment 1 of the Transmission Appendix Guidelines.
- Section II.B.6 (co-sponsored with Company Witnesses Chloe A. Genova and Chuck H. Weil): This section provides photographs of existing facilities, representations of proposed facilities, and visual simulations.
- Section III (co-sponsored with Company Witness Chuck H. Weil): This section details the impact of the proposed project on scenic, environmental, and historic features.
- Section V.A (co-sponsored with Company Witnesses Chloe A. Genova and Chuck H. Weil): This section provides the proposed route description and structure heights for notice purposes.

Finally, Dr. Berkin co-sponsors the DEQ Supplement filed with this Application with Company Witness Chuck H. Weil.

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

DIRECT TESTIMONY
OF
JON M. BERKIN, PhD
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUR-2022-00167

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

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

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

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

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

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

Case No. PUR-2019-00215.

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

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

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

- Tap the Company's future Finneywood-Rawlings 500 kV Line #593 between Structures #593/128 and #593/129 in order to construct a new 500-230 kV switching station ("Unity Switching Station" or "Unity Station") located within existing right-of-way and on property obtained by the Company ("Unity Station 2 site") in Lunenburg County, Virginia. The proposed Unity Switching Station will be constructed to source three new substations located in the South Hill area of Mecklenburg County.

- Construct two new approximately 11.1-mile 230 kV single circuit lines—Tunstall-Unity Lines #2259 and #2262—sourced from the proposed Unity Station to a junction ("Unity Junction") where the proposed lines terminate at the proposed Tunstall Substation (collectively, the "Unity Lines. The Unity Lines will be supported by two side-by-side single circuit weathering steel monopoles and utilize three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA. The proposed Unity Lines will utilize new 120-foot-wide right-of-way for the entire length of the route.

- Construct two new 230 kV single circuit lines, totaling approximately 7.0 miles in length, which interconnect three new substations beginning from the Unity Junction via a combination of three corridors ("Corridors A, B, and D") (collectively, the "Substation Interconnect Lines"). The Substation Interconnect Lines will be supported primarily by two side-by-side single circuit weathering steel monopoles and utilize three-phase twin-bundled 768.2 ACSS/TW type conductor with a summer transfer capability of 1,573 MVA. The proposed Substation Interconnect Lines will utilize new 120-foot-wide right-of-way for the entire length of the route.

- Construct three new 230-36.5 kV substations in the South Hill area of Mecklenburg County, Virginia (the "Tunstall Substation," "Evans Creek Substation," and "Raines Substation") served by the new Substation Interconnect Lines (collectively, the "Interconnect Substations").

- Conduct system protection upgrades and relay settings at the Company's future Finneywood Switching Station and Rawlings Substation.

The Unity Station, Unity Lines, Substation Interconnect Lines, Interconnect Substations, and related station work are collectively referred to as the "South Hill 230 kV Transmission Line Project" or "Project."

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

The purpose of my testimony is to introduce and sponsor the Environmental Routing Study, which is included as part of the Application filed by the Company in this proceeding. Additionally, I co-sponsor the Executive Summary and Section I.A with Company Witnesses Kunal S. Amare, Emmanuel J. Dobson, Chloe A. Genova, Mohammad M. Othman, and Chuck H. Weil; Sections II.A.1, II.A.2, II.A.4, II.A.6 to II.A.9, II.A.11, and III with Company Witness Chuck H. Weil; and Sections II.B.6 and V.A with Company Witnesses Chloe A. Genova and Chuck H. Weil. Lastly, I co-sponsor the DEQ Supplement with Company Witness Chuck H. Weil.

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

A. Yes, it does.

APPENDIX A

BACKGROUND AND QUALIFICATIONS OF JON M. BERKIN

Jon M. Berkin earned a Bachelor of Arts degree from Boston University and a Master of Arts and a Doctoral degree from Bryn Mawr College. He has approximately 30 years of experience working in the energy-related consulting field specializing in the siting and regulatory permitting of major linear energy facilities, including both interstate and intrastate electric transmission lines and gas and oil pipelines throughout the United States. During this time, he was employed for 5 years with R. Christopher Goodwin and Associates, Inc. and 24 years with ERM, a privately-owned consulting company specializing in the siting, licensing and environmental construction compliance of large, multi-state energy transportation facilities.

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

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