Dominion®

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

Before the State Corporation Commission of Virginia

Surry-Skiffes Creek 500 kV Transmission Line

Skiffes Creek-Whealton 230 kV Transmission Line

Skiffes Creek 500kV-230kV-115 kV Switching Station

Application No. 257

Case No. PUE-2012-00029

Filed: June 11, 2012

Volume II of VI

DIRECT TESTIMONY
OF
SCOT C. HATHAWAY
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUE-2012-00029

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

A. I am Scot C. Hathaway, and I am Vice President of Electric Transmission for Dominion Virginia Power. My office is located at 120 Tredegar Street, Richmond, Virginia. I am responsible for approximately 6,300 miles of transmission lines and over 400 substation assets providing service to the company's 2.4 million customers. These responsibilities include transmission and substation planning, development, construction, operations and maintenance, and compliance.

Q. What is your educational and professional background?

A. I am a 1982 graduate of Virginia Tech, with a bachelor's degree in geophysics. I also earned a master's degree in engineering management from Northwestern University in 1986. I joined Dominion Resources, Inc. ("Dominion") in 2000 and have held numerous energy trading, business development and management positions, including Managing Director-Energy Trading and Managing Director–Power Asset Management, responsible for the commercial management of a 7,000-megawatt diversified portfolio of generating assets in PJM and NEPOOL. I previously was Vice President–Business Development and assumed my current post in 2009. Prior to joining Dominion, I was Vice President–Development for FPL Energy Inc., and also have worked at Schlumberger Wireline

Services, the Gas Research Institute, and Indeck Energy Services. I am a Member of the North American Transmission FORUM.

Q. What is the purpose of your direct testimony?

A. In order to comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards by increasing transmission capacity, Dominion Virginia Power proposes to construct (a) approximately 7.4 miles of new 500 kV electric transmission line in the Counties of Surry and James City from the Company's existing 500 kV–230 kV Surry Switching Station in Surry County to a new 500 kV-230 kV-115 kV Skiffes Creek Switching Station in James City County to be constructed on a 51-acre parcel of land owned by the Company; (b) the proposed Skiffes Creek Switching Station; (c) approximately 20.2 miles of new 230 kV line in the Counties of James City and York and the Cities of Hampton and Newport News from the proposed Skiffes Creek Switching Station to the Company's existing Whealton Substation located in the City of Hampton; and (d) additional facilities at the existing Surry Switching Station and Whealton Substation (construction of (a) - (d), collectively, the "Project").

The purpose of my testimony is to provide management overview and background regarding the proposed Project and to introduce the Company witnesses who are submitting direct testimony in this proceeding on the need, routing and other information included in the Company's filing.

Q. Is the Company's proposed Project required by the public convenience and necessity?

A. Yes. As the testimony of Mr. Peter Nedwick, Consulting Engineer in Electric Transmission Planning, will show, this Project needs to be in service by summer (commencing June 1) of 2015 in order to maintain reliability of service to some 280,000 customers in the critical electric load area comprised of the Peninsula, Middle Peninsula and Northern Neck ("North Hampton Roads Load Area"). These customers include numerous military and industrial installations that are essential to our national defense, as well as many high technology manufacturing facilities that help support the economy by providing thousands of valuable jobs.

Mr. Nedwick will explain that the need for the Project is demonstrated through the ongoing electric transmission planning process conducted by the Company and PJM Interconnection, L.L.C. ("PJM"), the regional transmission organization the Company joined in 2005, as required by Virginia law and approved by the Commission in Case No. PUE-2000-00051, to determine whether the transmission system is capable of meeting federally mandated Reliability Standards established by NERC. This process includes the use of the same comprehensive power flow studies that have demonstrated the need for other transmission projects approved by the Commission. The Company's studies, which reflect the effects of the 2012 PJM Load Forecast, show that, if the proposed Project is not in service by the summer of 2015, numerous transmission lines in the area will overload and/or fall below their minimum voltage requirements under numerous facility loss contingencies, and thereby violate mandatory NERC Reliability Standards,

and the Company and its customers will be subject to the risk of cascading outages for a significant portion of its transmission system.

Mr. Nedwick will also testify that these NERC violations reflect two primary drivers. First, the Company has experienced consistent historical growth in demand for electric power in the North Hampton Roads Load Area, and this growth in demand is projected to continue into the future. Second, as stated in the Company's 2011 Integrated Resource Plan ("2011 Plan"), the Company has formally filed with PJM notices to retire by the end of 2014 three generating units, totaling 381 MW. Of these, Yorktown Power Station Unit #1 (159 MW) is located in the North Hampton Roads Load Area, and Chesapeake Power Station Units #1 and #2, each representing 111 MW of capacity, are located in the South Hampton Roads Load Area (the area south of the James River that includes the Counties of Southampton and Isle of Wight and the Cities of Suffolk, Chesapeake, Virginia Beach, Portsmouth and Norfolk, as well as the Counties of Camden, Gates, Currituck, Pasquotank and Perquimans in North Carolina). Power flow contingency studies conducted by the Company and PJM initially identified projected that thermal overloadings, voltage problems and right-of-way outages would begin to occur in the summer of 2019 with anticipated load growth. However, the loss of local generation capacity through these retirements, particularly at Yorktown Power Station in the North Hampton Roads Load Area, has the effect of accelerating to summer of 2015 the need to resolve these projected NERC criteria violations. Moreover, since the filing of the 2011 Plan, the Company has tentatively decided to retire an additional generation unit at Yorktown, Unit #2 (164 MW), by the end of 2014.

Mr. Nedwick will also explain that the 230 kV systems in the North Hampton Roads Load Area and the South Hampton Roads Load Area both have significant generation deficiencies, which means that neither 230 kV system can support the other without further straining its own system. Both 230 kV systems also provide critical support to the Company's lower voltage transmission systems in those load areas. Accordingly, the transmission system at 230 kV and below east of the City of Richmond requires, in addition to resolution of the identified 2015 NERC contingency violations and outages, bulk power reinforcement from remote generation sources west of Richmond by means of a new 500 kV source.

Q. How does the Company propose to address the need that has been identified?

A. The Company proposes to construct a new 500 kV transmission line from existing Surry Switching Station at Surry Power Station, a major generation station outside the Load Area, into the center of the Peninsula to serve a new 500 kV-230 kV-115 kV Skiffes Creek Switching Station, which the Company proposes to build in southern James City County, and a new 230 kV line from Skiffes Creek Switching Station east to the Company's existing Whealton Substation in the City of Hampton. These new transmission facilities will resolve all of the identified NERC contingency violations, and address the risk of cascading outages, by providing a new source of bulk power from the 500 kV system to support the 230 kV system in the North Hampton Roads Load Area and by relieving loading on that system through the addition of a new 230 kV source into the Peninsula east of Skiffes Creek. In addition to providing a solution for the near term contingencies that we face for 2015, this extension of the 500 kV system into the North and South Hampton Roads Load Area will provide a robust response to the longer term

issues on the generation deficient 230 kV system east of Richmond, as described by Mr. Nedwick.

Q. How will the Company's proposed routing for these new lines be presented?

A. Dominion Virginia Power will address its proposed routing of the line through the testimony of Ms. Elizabeth Harper, Senior Siting and Permitting Specialist in our Electric Transmission Department. Ms. Harper, who has extensive experience in routing transmission lines in the Company's service territory and has appeared often before the Commission on routing issues, will describe the Company's routing analysis and the factors that led the Company to select its Proposed and Alternate Routes. The Company was assisted in that effort by Natural Resource Group, LLC ("NRG"), and the testimony of Douglas J. Lake of NRG will sponsor NRG's exhaustive Environmental Routing Study, which is included as part of the application materials.

As Ms. Harper will explain, the Company's routing analysis began with consideration of existing rights-of-way between the origin and termination points for the proposed transmission line facilities selected by the Transmission Planning Department as viable electrical solutions. The termination point for the 500 kV line is the site of the Skiffes Creek Switching Station, and two viable origins for that line: the Company's existing Chickahominy Substation in Charles City County and the Surry Switching Station at the Company's Surry Power Station in Surry County. She also explains that the use of existing rights-of-way, which is promoted by Virginia law and the Federal Energy Regulatory Commission Guidelines used by the Commission, typically reduces the impacts and cost of new transmission lines. Accordingly, Ms. Harper provides a detailed

analysis of the available existing rights-of-way between the Skiffes Creek Substation site and Chickahominy Substation, on the one hand, and Surry Switching Station on the other.

Between Chickahominy Substation and the Skiffes Creek site, the analysis determined that an approximately 37.9 mile 500 kV line could be built within existing right-of-way (except for approximately 4 acres of new easement to be acquired immediately around Kingsmill Substation) by utilizing an existing improved transmission corridor west from Skiffes Creek to a point ("Lightfoot Junction") just north of Lightfoot Substation and an improved right-of-way from that point west to Chickahominy Substation. The remainder of the existing improved corridor between Lightfoot Junction and Chickahominy Substation was discarded because the Transmission Planning Department determined that construction of the new 500 kV line within that portion of the corridor would not be electrically acceptable. The resulting Chickahominy-Skiffes Creek route ("Chickahominy Alternative"), which is approximately 37.9 miles long, was extensively studied and input from the public and elected officials was solicited and considered.

The Company also evaluated possible routes from Surry Switching Station across the James River to the Skiffes Creek site. This effort produced the Surry-Skiffes Creek route ("Surry Alternative"), approximately 7.4 miles in length, of which 3.2 miles, or 43%, utilizes a combination of Company property at Surry Power Station and existing Company transmission right-of-way from Dow Chemical Substation to Skiffes Creek Switching Station. The remaining 4.2 miles is comprised of 3.5 miles of river crossing and 0.7 mile of new right-of-way from the river bank to Dow Substation.

Q. Please provide an overview of the selection of Dominion Virginia Power's Proposed Route for the new 500 kV facilities.

A. Ms. Harper describes the process by which, with the assistance of Company personnel and outside consultants, led by NRG, the Company conducted a comprehensive evaluation and comparison of these two routes to the Skiffes Creek site.

In addition to desktop surveys, the Company and its representatives gathered input from the public, elected representatives, government organizations and interested organizations covering a wide range of routing issues and impacts, including wetlands, current and future land use, threatened and endangered species, cultural (including archeological, historical, and visual) resources, natural heritage and recreational resources, airports and airfields, water (including rivers and riverbeds), and other impacts on the human and natural environment. The results of this effort, presented in detail in NRG's Environmental Routing Study and the Company's DEQ Supplement, provide a comprehensive set of data and information for comparison of the two routing alternatives. Ms. Harper's testimony shows that the Chickahominy Alternative has materially more homes, historic sites, wetlands, timber and natural area resources potentially impacted than the Surry Alternative. She also discusses the different impacts of each alternative's crossing of an important river that is part of the Captain John Smith Water Trail: the Chickahominy River in the case of the Chickahominy Alternative and the James River in the case of the Surry Alternative. Comparison of the two routes must also include a comparison of the costs to construct each one, which are estimated by Mr. Cox to be $115.5 million for the new 500 kV line from Chickahominy Substation and $56.3 million for the new 500 kV line from Surry Switching Station.

In addition to costing approximately $60 million more to construct, the greater length of the Chickahominy Alternative implicates more homes, historic sites, wetlands, timber and natural resource areas as potentially impacted, as well as properties and roads crossed, than the Surry Alternative. Based on these factors, the Company selected the Surry Alternative as the Proposed Route for the Project.[1] However, the Company is also presenting the Chickahominy Alternative for the Commission's consideration as an Alternate Route for the 500 kV line.

Q. How was the route for the new 230 kV Skiffes Creek-Whealton Line selected?

A. The origin and termination points of the new 230 kV line are established as the Skiffes Creek Switching Station and the existing Whealton Substation, and the Company holds an existing improved transmission right-of-way between those locations that will accommodate the new 230 kV line without need for expansion. Accordingly, the existing right-of-way was selected as the Proposed Route for the new 230 kV line.

Q. What types of facilities will be used for the construction of the Project?

A. Testimony regarding the design and construction of the new transmission line facilities will be provided by James Cox, Transmission Project Engineer in our Electric Transmission Engineering group, while Anthony J. Spears, Consulting Engineer in the Electric Transmission Substation Engineering group, will explain the work that will be required at Surry Switching Station, Skiffes Creek Switching Station and Whealton Substation.

[1] Ms. Harper also proposes for the Commission's consideration three James River Crossing Variations to the Proposed Route, which are discussed in detail in her testimony.

Mr. Cox will testify that, the new 500 kV line, utilizing either the Proposed Route or the Alternate Route, will be a combination of 500 kV single circuit galvanized steel lattice towers and galvanized steel monopoles supporting 3-1351.5 ACSR bundled conductors, with a transfer capability of 4325 MVA, and two fiber optic shield wires. The new Skiffes Creek-Whealton 230 kV line will be constructed using weathering steel monopoles, together with several steel H-frames structures in the vicinity of the Newport News/Williamsburg Airport, supporting 2-636 ACSR bundled conductors, with a transfer capability of 1047 MVA, and two fiber optic shield wires. He also sponsors the portions of the Appendix that provide cross-sections of the right-of-way that show the approximate average structure height for various segments of both the 500 kV Proposed and Alternate Routes and for the new 230 kV line. His testimony will provide the estimated total cost of the Project (2011 dollars) of $150.6 million using the Proposed Route, $155.4 million using the Proposed Route with the James River Crossing Variation 1, $153.0 million using the Proposed Route with the James River Crossing Variation 2, $154.5 million using the Proposed Route with the James River Crossing Variation 3, and $213.2 million using the Alternate Route. The testimony of Mr. Spears will describe the substation work and its estimated costs, which estimates are reflected in the total cost estimates provided by Mr. Cox.

The testimony of Mr. Cox also will describe the removal, modification and replacement of existing transmission structures that will be required in connection with the Project; explain how the Company proposes to implement low cost and effective means to improve the aesthetics of the Project; and provides calculations of the electric and magnetic fields for the proposed new 500 kV and 230 kV lines.

Q. Was consideration given to alternatives to construction of the proposed Project?

A. Yes. Alternatives are addressed in Section I.C of the Company's Appendix and the testimony of Mr. Nedwick. Three overhead transmission alternatives at 230 kV and 500 kV, underground alternatives at 230 kV and 500 kV, and generation alternatives were considered and rejected by the Company. In addition, an evaluation of transmission alternatives to the Project at 500 kV and 230 kV was made by PJM's Transmission Expansion Advisory Committee, which selected the proposed Project, including the 500 kV Surry-Skiffes Creek line, as the most robust and cost-effective transmission planning solution to the 2015 reliability impacts of the announced retirements. At its May 17, 2012 meeting, the PJM Board approved the Project to address the identified NERC contingencies and cascading outages for 2015. The Board also approved additional reliability projects proposed by the Company to resolve NERC criteria violations projected by 2016, which will be addressed in other, separate proceedings before the Commission. Mr. Nedwick's testimony also explains in detail why no transmission alternative at 230 kV fully addresses the identified NERC criteria violations and outages or provides the bulk power support needed to reduce the stress now being experienced on the Company's 230 kV system east of Richmond.

Q. Does this conclude your prefiled direct testimony?

A. Yes.

DIRECT TESTIMONY
OF
PETER NEDWICK
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUE-2012-00029

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

A. I am Peter Nedwick, and I am a Consulting Engineer in Electric Transmission Planning for Dominion Virginia Power. My office is located at 701 East Cary Street, Richmond, Virginia.

Q. What is your educational and professional background?

A. I am a 1984 graduate of The Pennsylvania State University with a Bachelor's Degree in Electrical Engineering. I am also a Registered Professional Engineer with the Commonwealth of Virginia (No. 0402 019479).

My experience with the Company includes System Protection, Distribution Planning and Transmission Planning. I started with the Company in June of 1984 as an Associate Engineer in the System Protection Group. I was transferred in 1986 to the Transmission Planning Group, where I was promoted to Engineer in 1987 and to Senior Engineer in 1991. While in that department, I was responsible for special operating studies and for planning the Company's electric transmission system for eastern Virginia and North Carolina.

In 1997 I was promoted to Staff Engineer and transferred to the Distribution Planning Department, where I served as that department's technical expert.

While with that department I was promoted to Consulting Engineer in 2000. In 2002 I was transferred to my present position in Electric Transmission Planning.

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

A. I am team leader of the transmission planners responsible for planning the Company's transmission system, including 500 kV facilities. I also coordinate the Company's involvement with PJM concerning planning and generation activities.

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

A. In order to comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards by increasing transmission capacity, Dominion Virginia Power proposes to construct (a) approximately 7.4 miles of new 500 kV electric transmission line in the Counties of Surry and James City from the Company's existing 500 kV-230 kV Surry Switching Station in Surry County to a new 500 kV-230 kV-115 kV Skiffes Creek Switching Station in James City County to be constructed on a 51-acre parcel of land owned by the Company; (b) the proposed Skiffes Creek Switching Station; (c) approximately 20.2 miles of new 230 kV line in the Counties of James City and York and the City of Newport News from the proposed Skiffes Creek Switching Station to the Company's existing Whealton Substation located in the City of Hampton; and (d) additional facilities at the existing Surry Switching Station and Whealton Substation (construction of (a) - (d), collectively, the "Project").

The new approximately 7.4-mile 500 kV line, to be designated Surry-Skiffes Creek Line #582, will be built using a combination of existing and new right-of-

way approximately 150 feet wide and will include an overhead crossing of the James River ("Proposed Route"). The Company is also presenting three variations to the 500 kV Proposed Route reflecting alternative crossings of the James River ("James River Crossing Variations") for consideration by the Virginia State Corporation Commission ("Commission"). The 500 kV Proposed Route utilizing the James River Crossing Variations 1, 2 and 3 is 8.0 miles, 7.2 miles and 7.5 miles, respectively. The Company is also proposing for the Commission's consideration an Alternate Route for the proposed 500 kV line approximately 37.9 miles in length in the Counties of Charles City, James City, and York, and the City of Williamsburg from the Company's existing Chickahominy Substation in Charles City County to the proposed Skiffes Creek Switching Station in James City County. This Alternate Route would construct the new 500 kV line almost entirely within existing transmission right-of-way, of which approximately 24.9 miles is unimproved and the remaining approximately 13.0 miles contains existing transmission facilities. The new 230 kV line, to be designated Skiffes Creek-Whealton Line #2138, will be built entirely within existing right-of-way, most of which is already cleared and utilized as a transmission corridor. The Proposed Route (and James River Crossing Variations) and Alternate Route for the new 500 kV line and the Proposed Route for the 230 kV line are described in Company Witness Elizabeth P. Harper's prefiled direct testimony.

My prefiled direct testimony will discuss the need for, and benefits of, the proposed Project. I am also sponsoring Sections I.A through I.C and I.E, I.F, I.H and I.I of the Appendix.

Q. Please provide an overview of the Company's transmission system and transmission planning process.

A. Dominion Virginia Power's transmission system is responsible for providing transmission service to the Company's retail customers and also to Appalachian Power Company (APCo), Old Dominion Electric Cooperative (ODEC), Northern Virginia Electric Cooperative (NOVEC), Central Virginia Electric Cooperative (CVEC), and Virginia Municipal Electric Association (VMEA) for redelivery to their retail customers in Virginia, as well as to North Carolina Electric Membership Corporation (NCEMC) and North Carolina Eastern Municipal Power Agency (NCEMPA) for redelivery to their customers in North Carolina. The Company needs to be able to maintain the overall, long-term reliability of its transmission system, as its customers require more power in the future.

Dominion Virginia Power is part of the Eastern Interconnection transmission grid, meaning it is interconnected, directly or indirectly, with all of the other transmission systems in the U.S. and Canada between the Rocky Mountains and the Atlantic coast, except Quebec and most of Texas. All of the transmission systems in the Eastern Interconnection are dependent on each other for support in moving bulk power through the transmission system and for reliability support. Dominion Virginia Power's service to its customers is extremely reliant on a robust and reliable regional transmission system.

Dominion Virginia Power also is part of the PJM Interconnection, L.L.C. ("PJM") regional transmission organization providing service to a large portion of the eastern United States. PJM is currently responsible for ensuring the reliability and

coordinating the movement of electricity through all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia. This service area has a population of about 58 million and on July 21, 2011, set a summer peak demand of 158,450 MW, of which Dominion Virginia Power's load portion was approximately 19,636 MW serving 2.4 million customers. On July 22, 2011 the Company set a new summer peak loading of 20,061 MW. Dominion Virginia Power's load zone is the third largest area in PJM behind only American Electric and Power Company and Commonwealth Edison.

PJM's regional transmission expansion planning process ("RTEPP"), including the Company's own planning criteria and analysis, is underway to produce PJM's 2012 Regional Transmission Expansion Plan ("RTEP"), which has identified the need for the construction of the proposed Project to relieve violations of mandatory NERC Reliability Standards by the summer of 2015. Dominion Virginia Power, along with other Transmission Owners in PJM, is actively involved in the development and the reliability assessment of the power flow models used in the RTEPP analysis. The active participation of the Transmission Owners in the development and assessment phases of this process is critical to ensure a comprehensive and accurate RTEP.

Q. Please describe the present transmission system in the vicinity of the proposed Project.

A. The load area to be served by the proposed Project is comprised of the Peninsula (Counties of Charles City, James City and York and Cities of Williamsburg,

Yorktown, Newport News, Poquoson and Hampton), Middle Peninsula (Counties of Essex, King William, King and Queen, Middlesex, Mathews and Gloucester and Cities of West Point) and Northern Neck (Counties of King George, Westmoreland, Northumberland, Richmond and Lancaster and the City of Colonial Beach) ("North Hampton Roads Load Area"). The North Hampton Roads Load Area is primarily served from two 230 kV transmission corridors and the generation facilities located at Yorktown Power Station. One corridor is the double circuit crossing of the James River alongside the James River Bridge crossing in the vicinity of Newport News Substation containing Surry-Winchester Line #214 and Chuckatuck-Newport News Line #263. The other is the Chickahominy to Yorktown corridor containing two 230 kV circuits, Chickahominy-Waller Line #2102 and Lanexa-Waller Line #2113, feeding into the North Hampton Roads Load Area. Appendix Attachments I.E.1 through I.E.3 show the Company's transmission system in the area of the proposed Project.

The transmission system in the vicinity of the proposed Project serves over 280,000 customers in the North Hampton Roads Load Area addressed in this application. A number of these customers, including Langley Air Force Base, Newport News Ship Building, Yorktown Naval Weapons Station and Fort Eustis, provide essential defense functions for the U.S. government. There are also many high technology facilities located in this area, including NASA, Canon, and Jefferson Labs, plus many large industrial customers like Owens-Brockway and Anheuser Busch. These customers, like other customers in the area, depend on reliable electric service for day-to-day operations.

Q. Why do the proposed facilities need to be built at this time?

A. The Project is necessary to assure that Dominion Virginia Power can continue to provide reliable electric service to its customers in the North Hampton Roads Load Area consistent with mandatory NERC Reliability Standards for transmission facilities and the Company's planning criteria. Power flow studies utilizing the 2012 PJM Load Forecast show that the Company's transmission facilities will not meet NERC Reliability Standards if the Project is not in service by the summer (commencing June 1) of 2015. The failure to address these projected NERC violations could lead to loss of service and potentially damage the Company's electrical facilities in this area, significantly impacting electric service and the region's economy. The proposed Project will fully address all of the projected NERC Reliability criteria violations and will enable the Company to maintain the overall long-term reliability of its transmission system.

Q. How do the mandatory NERC Reliability Standards relate to the need for the proposed Project?

A. Mandatory NERC Reliability Standards require that the interconnected transmission system be analyzed both in the near term (years 1-5) and long term (years 6 -10) for compliance with NERC Reliability Standards. NERC Reliability Standards require the identification of critical system conditions and the assessment of system performance for various events. These events fall into four basic categories: Categories A, B, C and D. NERC Reliability Standards provide for different system responses based on the severity of the system test (Category A is the least severe test and Category D is the most severe test). More specifically, the four contingency categories defined in the table are as follows:

Category A - No Contingencies; Category B - Event resulting in the loss of a single element; Category C - Event(s) resulting in the loss of two or more (multiple) elements; and Category D - Extreme event resulting in two or more (multiple) elements removed or cascading out of service. For Category A, B and C events, it is expected that the system will remain stable and that both thermal and voltage limits will remain within applicable ratings. NERC Reliability Standards require that the Planning Authority and Transmission Planner develop planning criteria to ensure compliance with NERC Reliability Standards. Maintaining future system reliability includes planning to anticipate the effect on the transmission system of projected increases in demand. The Company's Planning Criteria can be found in Exhibit A, page A-1, of the Company's Facility Connection Requirements at www.dom.com/business/electric-transmission/pdf/Facility_Connection_Requirements.pdf.

Q. Please continue.

A. Power flow studies conducted by PJM and the Company based on the assumptions used in the 2011 RTEP process, but utilizing the more recent 2012 PJM Load Forecast, show the following:

Category B: The Company's planning criteria provide that, under Critical System Conditions (where the largest generating unit which has the greatest effect in the area being studied is unavailable), the loss of any transmission facility should not cause any of the remaining transmission facilities to exceed 94% of its emergency rating, and the resulting voltage of the transmission system should not drop below 93%. The loss of Yorktown Unit #2 constitutes Critical System Conditions for

the North Hampton Roads load area, so power flow studies were performed with the Yorktown Unit #2 off-line. The results of these studies, provided in Appendix Attachments I.B.8, 9, 16, 17 and 18, violate the mandatory NERC thermal and reactive reliability criteria by summer of 2015, due to the overloading of the following 230 kV lines: Lanexa-Lightfoot-Waller Line #2113, Chuckatuck-Benns Creek-Newport News Line #263 and Surry-Poolesville-Winchester Line #214. Also, Appendix Attachments I.B.6, 7, 15 and 18 demonstrate an increase in severity of the Line #2013 overload for this critical system condition. Yorktown Unit #2 has been identified by PJM as a high risk unit in that it is greater than 40 years old and less than 400 MW in size and could be expected to retire at any time in the future. The Company has also tentatively determined that this unit will be retired by the end of 2014. Therefore, this unit would also have a low probability of continued operation in the future and also should no longer be considered as a generating unit that can be counted on to resolve reliability deficiencies on the transmission system.

Also by summer of 2015, even assuming Yorktown Unit #2 is in service, the loss of 230 kV Chickahominy-Lightfoot-Waller Line #2102 results in thermal loading on 230 kV Lanexa-Lightfoot-Waller Line #2113 being only 0.7% under the line's emergency rating (Appendix Attachment I.B.3). In summer 2016 this same contingency condition results in thermal overload of Line #2113 above 94% of its emergency rating (Appendix Attachment I.B.12).

Category C: Power flow studies show further that by the summer of 2015 and 2016, the Tower Line loss of 230 kV James River Crossing Lines #214 and Line

#263 results in a thermal overload (above 100% of its emergency rating) of 230 kV Lanexa-Lightfoot-Waller Line #2113 and Waller-Penniman-Kingsmill-Yorktown Line #209 (Appendix Attachments I.B.4 and 13) and low voltage conditions in the Peninsula-Newport News area. Further studies show that additional overloads also would occur on the following 230 kV lines if Yorktown Unit #2 retires: Chickahominy-Waller Line #2102, Waller-Denbeigh-Yorktown Line #285, Yorktown-Tabb-Peninsula Line #288, and Yorktown-Rock Landing-Warwick-Whealton Line #292 (Appendix Attachments I.B.10 and 19). Also a depressed voltage condition would occur for this contingency condition. Appendix Attachment I.B.21 (summer of 2021) further demonstrates the continued severity of these reliability deficiencies would increase over the next five years, as load grows in this load area, if these reliability deficiencies are left unresolved.

Category D: Finally, power flow studies show that, for an outage of the right-of-way between Chickahominy and Lanexa, a significant portion of the Company's system would be without service by summer of 2015. Specifically, these studies show that this right-of-way outage would cause a cascading outage ultimately impacting customers not only in the North Hampton Roads study area but also Northern Virginia, the City of Richmond area and North Carolina. These study results also indicate that many generating units located at Chesterfield, Four Rivers, North Anna, Possum Point and Surry Power Stations would be adversely impacted by this outage. Therefore, when analyzing potential solutions to the reliability deficiencies identified in Appendix Attachments I.B.5, 11, 14, 20 and 22, any solution that would place the new line providing the solution in the

existing right-of-way corridor located between Chickahominy and Lanexa Substations is not an electrically acceptable solution to this Category D violation.

The proposed Project will resolve all of these identified NERC criteria violations, which are summarized in Appendix Attachment I.B.23.

Q. How are the planned generation retirements in the area impacting the need for the proposed Project?

A. Power flow studies conducted by the Company initially indicated that the Project was required to be constructed by summer (commencing June 1) of 2019 in order to maintain compliance with NERC Reliability Standards. However, the Company's 2011 Integrated Resource Plan ("2011 Plan"), filed with the Commission on September 1, 2011, identified multiple generation units located in the area as projected to retire between 2014 and 2022. See Appendix Attachment I.A.3. On November 7, 2011, the Company filed notices with PJM to retire generating units at Chesapeake and Yorktown Power Stations. See Appendix Attachment I.A.4. Specifically, the Company notified PJM that three generation units located east of Richmond, Chesapeake Power Station Units #1 (111 MW) and #2 (111 MW) and Yorktown Power Station Unit #1 (159 MW), which total 381 MW of capacity, will be retired by December 31, 2014. Power flow studies of the effects of these retirements show that the projected in-service date of the Project must be accelerated from summer of 2019 to summer of 2015 to maintain compliance with mandatory NERC Reliability Standards. These studies do not reflect the revised retirement status of Yorktown Unit #2 (156 MW), which PJM has determined to be at-risk for retirement because it is a coal-fired unit more than

40 years old with a capacity of less than 400 MW. Although the 2011 Plan projected that this unit would be retired in 2022, the Company has tentatively determined that this unit will be retired by the end of 2014. The Company also notified PJM on November 7, 2011 that two more generating units at its Chesapeake Power Station, Units #3 (156 MW) and #4 (217 MW), totaling 373 MW of capacity, will be retired by December 31, 2015.

In addition to accelerating the need date for the Project, the generation retirements announced for Yorktown and Chesapeake Power Stations for 2015 and 2016 are expected to significantly impact the transfer of bulk power into and between the 230 kV systems that serve the North Hampton Roads Load Area and South Hampton Roads Load Area,[1] both of which are generation deficient. The North Hampton Roads Load Area is projected in 2016 to have a peak load of 2,183 MW and available generation capacity of 1,285 MW. This means that under normal operating conditions the North Hampton Roads Load Area will import approximately 41% of its bulk power requirements from other generating sources located outside of this area, and under the Company's critical system condition planning criteria (838 MW Yorktown Unit #3 is not in service) this deficiency increases to approximately 80% of that load area's bulk power requirements. These system conditions will be further exacerbated by future limitations on the operation of Yorktown Unit #3, which will be restricted due by new U.S. Environmental Protection Agency ("EPA") regulations to running only 5-8% of the time beginning in 2015 until the projected retirement of this unit

in 2022. As noted above, Yorktown Unit #2, which is over 40 years old and under 400 MW in size, also has a high probability of retiring due to the new EPA environmental regulations.[2]

The recently announced generation retirements are also expected to similarly impact the South Hampton Roads Load Area, which is projected to have a peak load of 3,991 MW and available local generation capacity of 1,701 MW. This means that under normal operating conditions the South Hampton Roads Load Area will import approximately 57% of its bulk power requirements, and under critical system conditions (907 MW Surry Unit #1 is not in service) this deficiency increases to approximately 80% of that load area's bulk power requirements.

Taken together, the North and South Hampton Roads Load Areas are importing approximately 3,200 MW of their bulk power requirements, and under critical system conditions this increases to over 4,000 MW, assuming roughly 1,100 MW of coal-fired generation capacity (Yorktown Units #2 and #3) that is at-risk for retirement remains in operation. If these at-risk generation units also retire by 2016, the bulk power import requirements of the North and South Hampton Roads Load Areas for that year would increase to 4,200 MW and 5,000 MW, respectively.

[1] The South Hampton Roads Load Area includes in Virginia the Counties of Southampton and Isle of Wight; the Cities of Suffolk, Chesapeake, Virginia Beach, Portsmouth and Norfolk; and in North Carolina the Counties of Camden, Gates, Currituck, Pasquotank and Perquimans.

[2] These units only need to provide 90 days notice to the PJM RTO before actually retiring.

The implications of these system conditions must be considered in evaluating transmission planning solutions east of the City of Richmond. First, the 230 kV systems in the North and South Hampton Roads Load Areas both have significant generation deficiencies, meaning that neither 230 kV system can support the other without further straining its own system. For example, addressing NERC criteria violations on the 230 kV system in North Hampton Roads by creating a new 230 kV feed into that load area from South Hampton Roads (*e.g.*, from Surry) would merely increase the supply requirements on the already stressed 230 kV system in generation deficient South Hampton Roads. Second, because the City of Richmond area is currently balanced between load and generation, the bulk power requirements for the North and South Hampton Roads Load Areas must come from generation resources located to the west of the City of Richmond. Accordingly, expansion of the 500 kV system in this area (east of Richmond) is needed to maintain reliable service, for both the near term and long term, to the Company's customers located in the North and South Hampton Roads Load Areas. The proposed Project will appropriately reinforce the 500 kV system east of the City of Richmond to provide a robust, cost effective solution for maintaining system reliability in these load areas experiencing significant generation retirements by 2015.

However, the NERC contingency conditions that the Company must resolve by the summer of 2015 will deteriorate after 2015, as load growth and the planned retirements of Chesapeake Power Station Units #3 and #4, totaling 373 MW, by the end of 2015 will combine to further increase the generation deficit east of Richmond, beginning for the summer of 2016. Moreover, these announced

retirements do not take into account the "at-risk" status of still more generation capacity in that area. This means that, even with the construction of the Project by summer of 2015, additional relief for the 230 kV system east of Richmond will be required by the summer of 2016.

Q. How does area growth contribute to the need for the proposed Project?

A. The need for the proposed transmission facilities is also being driven by continued load growth in the North Hampton Roads Load Area over the past ten years. The table in Appendix Attachment I.B.1 provides historical system coincidental summer peak loads (MW) for the North Hampton Roads Load Area over the period 2001 to 2011, and Appendix Attachment I.B.2 provides the anticipated summer peak loads (MW) for the North Hampton Roads Load Area through 2021. Summer peak loads are used because electrical equipment has lower thermal ratings in summer due to higher ambient temperatures. Over the 10-year period from 2002 to 2011, peak electrical demand for the North Hampton Roads Load Area grew from 1,767 MW to 1,969 MW, an increase of 11.4%. The projected loads in Appendix Attachment I.B.2 represent the Company's forecasted peaks based on actual loads and the 2011 and 2012 PJM Load Forecasts, and demonstrate the continued growth that is expected to occur in this area. The projected average annual (compound) growth rate for the North Hampton Roads Load Area is approximately 1.8% based on the 2012 PJM Load Forecast.

Q. Did the Company consider whether there are feasible alternatives to construction of the proposed transmission facilities?

A. Yes. Several transmission alternatives to the proposed 500 kV line from existing Surry Switching Station to the proposed Skiffes Creek Switching Station were considered, but rejected, for the reasons described below. Appendix Attachment I.C.1 compares the proposed 500 kV line to the feasible transmission alternatives. Alternatives to the proposed 500 kV line also were evaluated by PJM's Transmission Expansion Advisory Committee ("TEAC") as part of PJM's ongoing planning analysis of generation retirements in the PJM region. As a result of that analysis, presented at TEAC's April 27 meeting and summarized in the TEAC slides contained in Appendix Attachment I.C.2, and TEAC White Paper contained in Appendix Attachment 1.C.3, PJM's TEAC selected the Company's proposed Surry-Skiffes Creek 500 kV line as the best solution to address the identified NERC criteria violations. These recommendations were approved by the PJM Board on May 17, 2012. In addition, as part of its 2011 Integrated Resource Plan process, the Company considered, but rejected, feasible generation alternatives in favor of the proposed Project.

The proposed 230 kV Skiffes Creek-Whealton Line will be built entirely within an existing right-of-way, most of which is already improved as a transmission corridor; therefore, any alternative to this component of the proposed Project would require the addition of new 230 kV facilities in new rights-of-way at significant expense. Accordingly, there is no feasible transmission alternative for meeting the need for the new 230 kV line.

Q. What were the overhead transmission alternatives to the 500 kV line considered by the Company?

A. The Company considered three different overhead transmission alternatives to the 500 kV line. One option considered, a Surry-Skiffes Creek double circuit 230 kV line, would construct an approximately 7.4-mile long double circuit 230 kV tower line from Surry 230 kV Switching Station to the proposed Skiffes Creek Switching Station along the Proposed Route of the 500 kV line. The double circuit 230 kV structures would be on average approximately 16 feet taller than the structures for the Company's proposed 500 kV line. This alternative would require installation of three additional 230 kV breakers at Skiffes Creek Switching Station and three new 230 kV breakers at Surry 230 kV Switching Station. The changes required at the Skiffes Creek Switching Station and Whealton Substation for the proposed Project would also be required for this alternative. If this alternative were included, the estimated total project cost would be approximately $131.6 million.

This alternative would not resolve all of the identified NERC criteria violations. Moreover, as explained in Section I.B, constructing a new 230 kV line to Skiffes Creek from Surry, in the South Hampton Roads Load Area, would increase the load on the already stressed 230 kV transmission system in South Hampton Roads, which is also generation deficient and is projected in 2016 to have only enough generation capacity to serve 43% of the local load. The proposed 500 kV Surry-Skiffes Creek line, in contrast, would not strain the area's 230 kV transmission system but rather would permit the 500 kV system to support the transfer of bulk power into both North and South Hampton Roads Load Areas and

provide a more robust solution compared to merely shifting load between two generation deficient load areas on the 230 kV system. In addition, this alternative would require a reconfiguration of the 500 kV and 230 kV transmission facilities between Surry Power Station and Surry Switching Station and restrict, if not preclude, the Company's ability to extend an additional 500 kV line to the south out of Surry Power Station in the future. In terms of impacts, double circuit 230 kV structures would be on average approximately 16 feet taller, and their installation would require greater disturbance of the river bed, than those for a 500 kV line. This alternative was therefore rejected in favor of the proposed Project.

Construction of a Chickahominy-Skiffes Creek double circuit 230 kV line was also considered as an alternative to the 500 kV line. This alternative would construct an approximately 38-mile long double circuit 230 kV tower line from Chickahominy Substation to the proposed Skiffes Creek Switching Station. This alternative would follow the same route as the Alternate Route (Chickahominy-Skiffes Creek) for the Company's proposed 500 kV line. At Chickahominy Substation, three new 230 kV breakers would need to be installed, which could be achieved within the existing substation fence. At Skiffes Creek Switching Station three new 230 kV breakers would need to be installed. This alternative would also require installation of a 230-115 kV transformer and construction of the same 115 kV arrangement at Skiffes Creek Switching Station as described for the 500 kV Alternate Route (Chickahominy-Skiffes Creek). If this alternative were included, the estimated total project cost would be approximately $191 million.

This alternative would resolve all of the identified NERC criteria violations for 2015, but, because it would not resolve such violations projected for summer of 2021 and would not extend the 500 kV system into the North and South Hampton Roads Load Areas, it would not provide longer term relief to both stressed 230 kV systems in those areas and its significant estimated cost compared to the Company's Surry-Skiffes Creek 500 kV line. For these reasons, this alternative was rejected.

The third option considered as an alternative to the 500 kV line would require construction of a Chickahominy-Skiffes Creek 500 kV line through Lanexa Substation. As part of its analysis of the Chickahominy-Skiffes Creek 500kV line, the Company evaluated utilizing the Company's existing improved right-of-way through Charles City and New Kent Counties for the portion of that route between Chickahominy Substation and Lightfoot Junction, rather than the Company's existing unimproved right-of-way between those points that runs through Charles City and James City Counties. As discussed in Section I.B, however, power flow studies showed that building the new 500 kV line using the portion of the improved right-of-way between Chickahominy and Lanexa Substations does not resolve a Category D right-of-way outage in that section of the right-of-way that would result in a cascading outage ultimately interrupting service to customers not only in the North Hampton Roads area but also in Northern Virginia, the City of Richmond area and North Carolina. Construction of the 500 kV line through Lanexa also would have significant routing impacts, including the acquisition of significant additional right-of-way and the taking of a significant number of homes. Accordingly, the Alternate Route utilizes the

unimproved existing right-of-way from Chickahominy Substation through Charles City and James City Counties to Lightfoot Junction, which does not present Category D criteria violations. If this alternative were included, the estimated total project cost would be approximately $255.7 million.

Q. Did the Company consider an underground alternative to the proposed overhead 500 kV line?

A. Yes. An underground 230 kV line from Surry to Skiffes Creek would have the same electric deficiencies as Alternative No. 1, including failure to resolve all of the identified NERC criteria violations, as well as merely shifting load to the generation deficient North Hampton Roads Load Area. Moreover, based on the Company's recent experience constructing 8-mile 230 kV Hayes-Yorktown Line #2122, including a 3.8-mile submarine crossing of the Rappahannock River,[3] the estimated cost of the project, if this alternative were included, would be approximately $382.6 million for a hybrid line underground from Surry Power Station to the shore of James City County, where a transition, or terminal, station would be required to go from underground to overhead construction, and overhead from there to Skiffes Creek Switching Station. The estimated cost would be approximately $462.6 million for an underground line all the way to Skiffes Creek Switching Station.

[3] It should be noted that the Company's policy is not to construct underground transmission facilities if there is a feasible overhead route. This is because such underground construction presents certain reliability and operating issues and has a much higher cost, compared to overhead transmission facilities. The Company was required by the U.S. Coast Guard to use underground construction to cross the Rappahannock River for the Hayes-Yorktown project.

Underground lines at 500 kV have only been installed in a few places around the world and have been limited to 1000-1200 MVA. None has been installed with the minimum required 2000 MVA capacity of the Surry-Skiffes Creek 500 kV line. The only 500 kV underground in the U.S. is a short power station connector line installed between a hydro electric generation plant and an adjacent switchyard.

Q. What 500 kV project alternatives were considered by PJM?

A. The PJM TEAC evaluation of transmission alternatives[4] included the following options:

<u>500 kV Line: Chickahominy-Skiffes Creek vs Surry-Skiffes Creek</u>

The Surry-Skiffes Creek Proposed Route was selected over the Chickahominy-Skiffes Creek Alternative Route due to an estimated $50 million higher cost of the Alternate Route.

<u>Surry 230 Partial Alternative</u>

A merchant developer submitted a 230 kV alternative to the 500 kV portion of the Company's Project under which a new single circuit 230 kV Surry-Skiffes Creek line would be built along the Proposed Route along with a Phase Angle Regulator ("PAR") at Surry Switching Station in series with the new 230 line. TEAC selected the Company's 500 kV Project as more robust and lower cost by $11 million.

[4] To compare the estimated costs of alternatives, the PJM TEAC analysis used the cost estimates provided by the sponsor of the alternative, after excluding costs common to the alternatives. The power flow model used by TEAC for this analysis did not reflect certain generation retirements on the Company's system that occurred after the model was closed. TEAC's analysis included sensitivity criteria that track the Company's Critical System Conditions planning criteria.

Great Bridge and Surry 230 kV Alternative

TEAC also rejected an additional merchant developer alternative proposal that included building new 500 kV and 115 kV substations at Great Bridge with a 500-115 kV transformer and build a new single circuit 230 kV Surry-Skiffes Creek line with a PAR at Surry. This alternative was rejected by TEAC for failure to resolve all of the identified criteria violations.

Q. What generation alternatives to the proposed Project were considered by the Company?

A. The Company's analysis of potential generation retirements as part of its 2011 Plan process supports its rejection of feasible generation alternatives in favor of the proposed Project. The EPA has proposed and/or finalized a significant number of new regulations designed to regulate air, water, and solid waste constituents that are expected to affect continued operation of certain units in the Company's current fleet of generation resources. As part of its 2011 Plan process, the Company analyzed a number of future options for several of its older coal- and oil-fired generation units that may not be compliant with these impending environmental rules, some of which are already in effect, including the following:

- Mercury and Air Toxics Standards
- National Ambient Air Quality Standards for Sulfur Dioxide ("SO_2") and Ozone
- Clean Air Transport Rule, now known as the Cross-State Air Pollution Rule

- Greenhouse Gas New Source Performance Standards
- Additional Federal Carbon Dioxide regulations or legislation
- Coal Combustion Byproducts
- Clean Water Act Section 316(b) impairment and entrainment
- Effluent Discharges

These environmental regulations are affecting fossil fuel generation generally, but primarily coal units, which would require scrubbers or dry sorbent injection to address SO_2 and mercury and potentially selective catalytic reduction to address nitrogen oxides; baghouses to address mercury; changes to ash handling practices; and water intake improvements, and possibly cooling towers, to address Section 316(b).

This analysis included a review of the comparative costs to retrofit these existing units with new environmental control equipment, repower the units with an alternative fuel source, or retire the units from service, all while maintaining system reliability. As part of its analysis, the Company evaluated the existing two coal-burning generating units and one oil-burning generating unit at the Yorktown Power Station. The first option was to retrofit the Yorktown units to meet future environmental rules, which proved to be the most expensive option. The second option was to convert the units to burn oil or natural gas, but this option proved to be cost-prohibitive compared to retiring the units and constructing new transmission facilities to address the resulting system impacts. The Company also evaluated retiring the Yorktown units and replacing them with a new natural gas

generating facility in the North Hampton Roads Load Area, which would include significant upgrades to existing natural gas pipeline capacity that would be required to serve such a facility in that load area. The Company determined it would be more cost effective to address the system impacts resulting from the Yorktown retirements with the proposed electric transmission facilities. This analysis demonstrated that retrofitted, repowered or new generation in the area is not an economical alternative to the proposed Project for delivering reliable power to the North Hampton Roads Load Area in compliance with mandatory NERC Reliability Standards.

Q. How will the proposed Project affect economic development in Virginia, including, but not limited to, furtherance of the economic and job creation objectives of the Commonwealth Energy Policy set forth in Va. Code §§ 67-101 and 67-102?

A. The Project will help assure the future reliability of the Company's transmission system serving the over 280,000 customers in the North Hampton Roads Load Area, in light of continued load growth and planned generation retirements. A robust and reliable electric supply is an important part of economic development in Virginia. Our economy needs reliable electric energy and many businesses make expansion decisions on the basis of energy availability.

Q. Does this conclude your prepared direct testimony?

A. Yes.

DIRECT TESTIMONY
OF
JAMES COX
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUE-2012-00029

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

A. My name is James Cox and I am a Transmission Project Engineer in Electric Transmission Engineering for Dominion Virginia Power. My business address is 701 East Cary Street, Richmond, Virginia 23219.

Q. What is your educational and professional background?

A. I have a four year degree in Civil Engineering. I have worked with the Company for 30 years, with experience in Quality Assurance, Substation Engineering and Transmission Engineering. I started with the Company in 1982 in the Quality Assurance Group for power station construction. In 1985, I moved to the Substation Engineering Group for three years and then to the Transmission Engineering Group. I have been a Licensed Professional Engineer in the Commonwealth of Virginia since 1991.

Q. What are your responsibilities as a Transmission Project Engineer?

A. My responsibility is to engineer and design high voltage transmission lines.

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

A. In order to comply with mandatory North American Electric Reliability Corporation Reliability Standards by increasing transmission capacity, Dominion proposes to construct (a) approximately 7.4 miles of new 500 kV electric transmission line in the Counties of Surry and James City from the Company's existing 500 kV-230 kV Surry Switching Station in Surry County to a new 500 kV-230 kV-115 kV Skiffes Creek Switching Station in James City County to be constructed on a 51-acre parcel of land owned by the Company; (b) the proposed Skiffes Creek Switching Station; (c) approximately 20.2 miles of new 230 kV line in the Counties of James City and York and the City of Newport News from the proposed Skiffes Creek Switching Station to the Company's existing Whealton Substation located in the City of Hampton; and (d) additional facilities at the existing Surry Switching Station and Whealton Substation (construction of (a) - (d), collectively, the "Project").

The new approximately 7.4-mile 500 kV line, to be designated Surry-Skiffes Creek Line #582, will be built using a combination of existing and new right-of-way and will include an overhead crossing of the James River ("Proposed Route"). The Company is also presenting three variations to the 500 kV Proposed Route reflecting alternative crossings of the James River ("James River Crossing Variations") for consideration by the Virginia State Corporation Commission ("Commission"). The 500 kV Proposed Route utilizing the James River Crossing Variations 1, 2 and 3 is 8.0 miles, 7.2 miles and 7.5 miles, respectively. The Company is also proposing for the Commission's consideration an Alternate

Route for the proposed 500 kV line approximately 37.9 miles in length in the Counties of Charles City, James City, and York, and the City of Williamsburg from the Company's existing Chickahominy Substation in Charles City County to the proposed Skiffes Creek Switching Station in James City County. This Alternate Route would construct the new 500 kV line almost entirely within existing transmission right-of-way, of which approximately 24.9 miles is unimproved and the remaining approximately 13.0 miles contains existing transmission facilities. The new 230 kV line, to be designated Skiffes Creek-Whealton Line #2138, will be built entirely within existing right-of-way, most of which is already cleared and utilized as a transmission corridor.

I will describe the design characteristics of the 500 kV and the 230 kV transmission lines proposed in the Application, and I will provide electric and magnetic field ("EMF") data for the proposed facilities. I am sponsoring Sections I.D, I.G, II.A.3, II.A.6, II.B and IV of the Appendix. Some of the information in Sections I.G and IV has been provided to me by other Company personnel.

Q. Please describe the design of the proposed new 230 kV and 500 kV facilities.

A. The new 500 kV line, utilizing the Proposed Route (Surry-Skiffes Creek), the Proposed Route with the James River Crossing Variation, or the Alternate Route (Chickahominy-Skiffes Creek), will be a combination of 500 kV single circuit galvanized steel lattice towers and galvanized steel monopoles supporting 3-1351.5 ACSR bundled conductors, with a transfer capability of 4325 MVA, and

two fiber optic shield wires.[1] The new 230 kV Skiffes Creek-Whealton Line #2138 will be constructed using weathering steel monopoles, together with several steel H-frame structures in the vicinity of Newport News/Williamsburg International Airport, supporting 2-636 ACSR bundled conductors, with a transfer capability of 1047 MVA, and two fiber optic shield wires.

See Appendix Attachments II.A.3.A-J for the 500 kV Proposed Route (Surry-Skiffes Creek). See Appendix Attachments II.A.3.V1, V2 and V3 for the 500 kV James River Crossing Variations. See Appendix Attachments II.A.3.AA-PP for the 500 kV Alternate Route (Chickahominy-Skiffes Creek). See Appendix Attachments II.A.3.a-ll for the proposed 230 kV Skiffes Creek-Whealton line. In addition, maps of the Project showing mile posts and locational references corresponding to the above-referenced attachments, abbreviations for which are explained in Appendix Section II.A.3, are provided in Appendix H and Appendix I of the Environmental Routing Study prepared by Natural Resources Group, LLC included as part of the application materials.

The facilities to be installed at the proposed Skiffes Creek Switching Station, the existing Surry Switching Station (for the 500 kV Proposed Route) or Chickahominy Substation (for the 500 kV Alternate Route), and the Whealton Substation are described in detail in the direct testimony of Company Witness Anthony Spears.

Q. Will any existing facilities need to be removed or replaced in connection with

[1] The design of this line's crossing of the James River (Proposed Route) or the Chickahominy River (Alternate Route) is subject to final engineering.

the installation of the 500 kV line using the Proposed Route?

A. Yes. Line #582 is proposed to be built between Surry Switching Station and Skiffes Creek Switching Station along the Proposed Route. See Appendix Attachments II.A.3.A through J. Along the portion of the Proposed Route between Dow Chemical Substation and Skiffes Creek Switching Station, a section of existing 115 kV Line #34 will be rebuilt. From Dow Chemical Substation 0.96 mile of single circuit wood H-frames will be removed and replaced with double circuit 500 kV towers to support new Line #582 with 115 kV underbuild to support existing Line #34 with new conductor and shield wire. See Appendix Attachments II.A.3.E and F. Continuing, 0.51 mile of double circuit galvanized towers will be removed and replaced with double circuit 500 kV towers to support new Line #582 with 115 kV underbuild to carry existing Line #34 along with new conductor and shield wire. See Appendix Attachments II.A.3.G through J. With the installation of Skiffes Creek Switching Station, Line #209 and Line #285 will be cut, creating two new lines by re-numbering from Waller Substation to Skiffes Creek Switching Station. Line #58 will be cut, creating a new line by re-numbering from Lanexa Substation to Skiffes Creek Switching Station.

Q. What existing facilities need to modified to allow for the installation of the 500 kV line using the Alternate Route?

A. Between Lightfoot Junction and the existing Waller Substation, the northern side of the corridor contains 230 kV Lanexa-Waller Line #2113 and 115 kV Lanexa-Yorktown Line #58, both installed on double circuit wood H-frame structures, and the southern side contains 230 kV Chickahominy-Waller Line #2102 and 115

kV Lanexa-Yorktown Line #34, both installed on double circuit painted steel monopoles. See Appendix Attachment II.A.3.GG. The existing wood 3-pole H-frame structures on the northern side of the right-of-way would be removed and replaced by new galvanized steel single circuit 500 kV monopoles, which would support new 500 kV Line #582. Line #34 and Line #58 would be taken out of service in this section of right-of-way and back to Toano Substation. Existing 230 kV Line #2113 would be transferred to the existing double circuit painted steel monopoles in the southern side of the right-of-way to replace 115 kV Line #34. This would create the following configuration on the existing right-of-way between Lightfoot Junction and Waller Substation (see Appendix Attachment II.A.3.HH):

(a) On the northern side of the right-of-way (closest to Interstate 64) would be single circuit 500 kV steel monopole structures supporting new 500 kV Chickahominy–Skiffes Creek Line #582.

(b) 230 kV Lanexa-Waller Line #2113 and Chickahominy–Waller Line #2102 would be located on the existing double circuit painted steel monopole structures on the southern side of the right-of-way, except that Line #2102 would be moved to the opposite side of the monopole to accommodate substation access.

East of Waller Substation, the northern side of the corridor contains 230 kV Waller-Yorktown Line #209 and 115 kV Lanexa-Yorktown Line #58 on double circuit 3-pole wood H-frames. The corridor's southern side contains 230 kV

Waller-Yorktown Line #285 and 115 kV Lanexa-Yorktown Line #34, both on double circuit painted monopoles. See Appendix Attachment II.A.3.II. The existing wood 3-pole H-frames would be removed and replaced by new galvanized steel 500 kV monopoles on the northern side of the right-of-way to support new Line #582, and Line #34 and Line #58 would be taken out of service in this section of the right-of-way. The existing two 230 kV lines would be split at Skiffes Creek Switching Station into two separate lines: from Waller Substation to the proposed Skiffes Creek Switching Station, existing Waller-Yorktown Line #209 would be split into Waller–Skiffes Creek Line #2154 and Skiffes Creek-Yorktown Line #209, and existing Waller-Yorktown Line #285 would be split into Waller–Skiffes Creek Line #2146 and Skiffes Creek-Yorktown Line #285. Between Waller Substation and Skiffes Creek Switching Station new Line #582 would be supported by single circuit steel monopoles on the northern side of the right-of-way, and 230 kV Lines #2154 and Line #2146 would be installed on the existing 230 kV double circuit painted monopole structures located on the southern side of the right-of-way (see Appendix Attachment II.A.3.JJ), except for approximately 0.61 mile just west of Kingsmill Substation where new Line #582 occupies a separate right-of-way from the two 230 kV lines (see Appendix Attachments II.A.3.MM through PP). Because Kingsmill Substation is located on the separate right-of-way occupied by new Line #582, both 230 kV Lines #2146 and #2154 would be connected into Kingsmill to pickup the existing 230 kV transformer and to transfer one transformer from 115 kV to 230 kV.

The removal of the existing 115 kV facilities between Toano Substation and the proposed Skiffes Creek Switching Station would create two 115 kV Skiffes Creek-Yorktown Lines, #34 and #58, respectively, and two Lanexa-Toano 115 kV Lines, #169 and #177, from the old Line #34 and Line #58, respectively. At the proposed Skiffes Creek Switching Station site, a tap from Line #34, approximately 1.7 miles long, provides service to the Dow Chemical and Martins Hundred Substations. This tap would be placed in its own breaker bay and renumbered as 115 kV Line #7.

Q. Will the proposed 230 kV Skiffes creek-Whealton line require modifications to any existing facilities?

A. Yes. New Line #2138 from Skiffes Creek Switching Station to existing Whealton Substation will be located within existing right-of-way as follows:

Between the proposed Skiffes Creek Switching Station and C&O Junction (approximately 7.55 miles), which is part of Skiffes Creek – Yorktown Line #285, approximately 3.90 miles of existing double circuit weathering steel lattice towers will be replaced with double circuit weathering steel monopoles along with conductor and shield wire. Also, approximately 3.65 miles of existing double circuit painted steel monopoles will be painted and reused. This section will require replacing existing conductor and shield wire with new conductor and shield wire. See Appendix Attachments II.A.3.a through l.

Between C&O Junction and Grafton Junction are portions of Line #34, Line #58 and idle Line #209. Approximately 1.69 miles of wood double circuit 3-pole H-

frames, which support Line #58 and idle Line #209, will be replaced with double circuit weathering steel monopoles to support shield wire and conductor for the proposed new 230 kV line and Line #58. See Appendix Attachments II.A.3.m through r.

Between Grafton Junction and Harwoods Mill Junction are portions of Line #34, Line #58 and idle Line #209, approximately 1.46 miles of double circuit weathering steel lattice towers along with several double circuit steel H-frames, which support idle Line #209, will be replaced with double circuit steel monopoles and several double circuit steel H-frames along with conductor and shield wire. See Appendix Attachments II.A.3.s through x.

Between Harwoods Mill Junction and Union Carbide Tap are portions of Yorktown-Whealton Line #61 and Yorktown-Whealton Line #292. Approximately 6.12 miles of double circuit weathering steel lattice towers will be replaced with double circuit weathering steel monopoles and several single circuit weathering steel H-frames along with conductor and shield wire. See Appendix Attachments II.A.3.y through dd.

Between Union Carbide Tap and Whealton Substation are portions of Yorktown-Whealton Line #61, Whealton-Peninsula Line #99 and Yorktown-Whealton Line #292. Approximately 3.40 miles of double circuit weathering steel lattice towers and several painted steel monopoles will be replaced with new double circuit steel monopoles along with new conductor and shield wire. See Appendix Attachments II.A.3.ee through ll.

Q. In accordance with Section 10 of House Bill 1319 enacted by the 2008 General Assembly, please describe how the Company proposes to implement low cost and effective means to improve the aesthetics of the proposed overhead transmission line Project.

A. In addition to routing the proposed facilities to reasonably minimize visual impacts as discussed in Company Witness Elizabeth Harper's direct testimony, the Company chose the proposed structures for the 230 kV and 500 kV lines based on the following considerations balancing cost, construction considerations, and aesthetics:

<u>500 kV Proposed Route (Surry-Skiffes Creek)</u>

From Surry Switching Station eastward to the last angle before the James River, the Company plans to use double circuit galvanized steel monopoles to minimize the footprint of the line and to accommodate a future 500 kV transmission line to the south using the same structures. The last span before the river crossing will be single circuit ending on a single-circuit lattice angle tower.

The Company plans to use single circuit galvanized lattice towers from this angle and continuing across the James River (with or without one of the James River Crossing Variations) to the Company's existing Line #34 right-of-way. Lattice towers are the most economical structure for 500 kV line construction and will require less impacting foundation installation for the river crossing compared to other structure types.

From the Line #34 right-of-way to the proposed Skiffes Creek Switching Station,

the Company plans to use double circuit galvanized steel lattice towers with the ability to underbuild 115 kV Line #34, thereby minimizing the required expansion of the right-of-way and minimizing land use impacts and the amount of right-of-way cleared by collocating the 115 kV and 500 kV lines on the same structures.[2] These lattice towers are the most economical structure choice for this construction.

500 kV Alternate Route (Chickahominy-Skiffes Creek)

From Chickahominy Substation to the first angle past Jolly Pond Road (State Route 611), the Company proposes to use galvanized steel lattice towers to provide the most economical structure for 500 kV lines and also to permit the use of pipe pile foundations to minimize land disturbance in wetlands. For the crossing of the Chickahominy River, the Company proposes using two (2) 195-foot steel H-frames, one on shore and one within the river, with a horizontal configuration in order to keep their height below 200 feet above existing grade so they would not require FAA day/night lighting.

From the first angle past Jolly Pond Road to Lightfoot Junction, the Company proposes to use galvanized steel monopoles in order to minimize the footprint of the line as it traverses an extensive landfill area and to reasonably minimize visual impacts on James City County's Freedom Park.

From Lightfoot Junction to the proposed Skiffes Creek Switching Station, the

[2] To underbuild this portion of Line #34, a temporary line will be built along the edge of the expanded right-of-way to maintain service to Dow Chemical and Martin Hundred Substations while the existing facilities are removed and the proposed towers are installed.

Company will continue using single circuit galvanized steel monopoles to fit within the existing improved right-of-way and to be visually compatible with the existing painted steel monopole structures in the corridor.

230 kV Skiffes Creek-Whealton Line

From Skiffes Creek Switching Station to C&O Junction, the Company will (a) replace approximately 3.80 miles of existing double circuit weathering steel lattice towers with new double circuit weathering steel monopoles, one side of which will support the new 230 kV line, thereby replacing aging infrastructure with new self-supporting structures and facilitating construction by permitting installation of new foundations and structures while one side of the existing tower line remains energized and avoiding the need for a temporary line and associated additional right-of-way; and (b) install the new line on the empty side of approximately 3.65 miles of existing double circuit painted steel monopoles, thereby maintaining the existing visual characteristics and avoiding the cost of new facilities.

With the exception of a portion of the route in the vicinity of Newport News/Williamsburg International Airport, where several new steel H-frames will be used to maintain height limitations, the new line will be installed from C&O Junction to Whealton Substation on new double circuit weathering steel monopoles that will replace existing lattice towers and steel/wood H-frames and will be visually compatible with existing parallel structures.

Q. What is the estimated construction cost for the proposed Project?

A. The estimated total cost of the proposed Project using the Proposed Route for the 500 kV line is approximately $150.6 million. The estimated total Project cost for the 500 kV Proposed Route (Surry-Skiffes Creek) using the James River Crossing Variation 1 is approximately $155.4 million, Variation 2 is approximately $153.0 million and Variation 3 is approximately $154.5 million. The estimated total cost of the proposed Project using the Alternate Route for the 500 kV line is approximately $213.2 million. All estimates are in 2011 dollars.

Q. How long will it take to construct the proposed Project?

A. The in-service date for the proposed Project is May of 2015. Regardless of whether the 500 kV portion of the proposed Project is constructed using the Proposed Route, the Proposed Route using one of the James River Crossing Variations, or the Alternate Route, the estimated construction time for the Project is 18 months. A period of 12 months will be needed for engineering, material procurement, right-of-way acquisition, and construction permitting.

Q. Have you made calculations of the EMF for the proposed lines?

A. Yes, and they are shown in Section IV.A of the Appendix for various loading conditions expected to occur at the edges of the right-of-way. Magnetic field levels ranging from 3.532 milligauss ("mG") to 57.615 mG were calculated at the edges of the right-of-way for the proposed 500 kV line using the Proposed Route based on average and peak loading expected to occur in 2016 when the Project goes into service. The calculated magnetic field levels for the proposed 500 kV line using the Alternate Route range from 2.972 mG to 68.753 mG, and the calculated magnetic field levels for the 230 kV Skiffes-Whealton line range from

0.801 mG to 39.062 mG.

Q. The information you have provided in Section IV.A of the Appendix shows the calculated maximum EMF at the edge of the rights-of-way. How do the strengths of the maximum magnetic fields at the edge of the right-of-way compare to magnetic fields found elsewhere?

A. The field strengths shown in Appendix Section IV.A can be compared to those created by other electrical sources. For example, a hair dryer produces 300 mG or more, a copy machine can produce 90 mG or more, and an electric power saw can produce 40 mG or more, depending on the circumstances and operation of these devices. The strength of the field received by the person operating these devices would, of course, depend on the distance between the device and the person operating it. Magnetic field strength diminishes rapidly as distance from the source increases. The decrease is proportional to the inverse square of the distance. For example, a hypothetical magnetic field strength of 10 mG at the edge of the right-of-way (defined as 50 feet from the centerline) would decrease to 2.5 mG at a point 50 feet outside of the right-of-way.

Q. Does this conclude your prefiled direct testimony?

A. Yes, it does.

DIRECT TESTIMONY
OF
ANTHONY J. SPEARS
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUE-2012-00029

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

A. My name is Anthony J. (Tony) Spears, and I am a Consulting Engineer in Substation Engineering for Dominion Virginia Power. My business address is 2400 Grayland Avenue, Richmond, Virginia 23220.

Q. What is your educational and professional background?

A. I graduated in 1987 with a Bachelor of Science degree in Electrical Engineering from the University of Louisville. I also possess an Associate degree in Applied Science (1984), Electrical Engineering Technology, from the University of Louisville. My experience with the Company includes Electrical Equipment Engineering and Substation Engineering. From 1997 to 2001, I was responsible for leading a team associated with the design of new substations and upgrades to existing substations. My role since 2001 has been conceptual design, scope development and cost estimating for all substation construction within the Company.

Q. What are your responsibilities as a Consulting Engineer?

A. I am responsible for conceptual design, scope development and cost estimating for new high voltage transmission switching stations, transmission substations and distribution substations.

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

A. In order to comply with mandatory North American Electric Reliability Corporation Reliability Standards by increasing transmission capacity, Dominion Virginia Power proposes to construct (a) approximately 7.4 miles of new 500 kV electric transmission line in the Counties of Surry and James City from the Company's existing 500 kV-230 kV Surry Switching Station in Surry County to a new 500 kV-230 kV-115 kV Skiffes Creek Switching Station in James City County to be constructed on a 51-acre parcel of land owned by the Company; (b) the proposed Skiffes Creek Switching Station; (c) approximately 20.2 miles of new 230 kV line in the Counties of James City and York and the City of Newport News from the proposed Skiffes Creek Switching Station to the Company's existing Whealton Substation located in the City of Hampton; and (d) additional facilities at the existing Surry Switching Station and Whealton Substation (construction of (a) - (d), collectively, the "Project").

The new approximately 7.4-mile 500 kV line, to be designated Surry-Skiffes Creek Line #582, will be built using a combination of existing and new right-of-way and will include an overhead crossing of the James River ("Proposed Route"). The Company is also presenting three variations to the 500kV Proposed Route reflecting alternative crossings of the James River ("James River Crossing

Variations") for the consideration by the Virginia State Corporation Commission ("Commission"). The 500 kV Proposed Route utilizing the James River Crossing Variations 1, 2 and 3 is 8.0 miles, 7.2 miles and 7.5 miles, respectively. The Company is also proposing for the Commission's consideration an Alternate Route for the proposed 500 kV line approximately 37.9 miles in length in the Counties of Charles City, James City, and York, and the City of Williamsburg from the Company's existing Chickahominy Substation in Charles City County to the proposed Skiffes Creek Switching Station in James City County. This Alternate Route would construct the new 500 kV line almost entirely within existing transmission right-of-way, of which approximately 24.9 miles is unimproved and the remaining approximately 13.0 miles contains existing transmission facilities. The new 230 kV line, to be designated Skiffes Creek-Whealton Line #2138, will be built entirely within existing right-of-way, most of which is already cleared and utilized as a transmission corridor. The Proposed Route (and James River Crossing Variation) and Alternate Route for the new 500 kV line and the Proposed Route for the 230 kV line are described in Company Witness Elizabeth P. Harper's prefiled direct testimony.

The 500 kV Proposed Route will require work at the Company's existing Surry Switching Station, the 500 kV Alternate Route would require work at the Company's existing Chickahominy Substation, and the proposed 230 kV Skiffes Creek-Whealton line will require work at the Company's existing Whealton Substation. In addition, the Project requires minimal work at Lanexa and Yorktown Substations primarily involving relay checks and upgrades.

My prefiled direct testimony will describe the proposed Skiffes Creek Switching Station and other substation work to be done as part of the Project. I am also sponsoring Section II.C of the Appendix and the cost estimates provided in Section I.G of the Appendix for this substation work.

Q. Please describe the work to be done at Skiffes Creek Switching Station.

A. The construction of Dominion Virginia Power's proposed Skiffes Creek Switching Station includes the installation of one (1) new 500 kV terminal, five (5) new 230 kV terminals and three (3) new 115 kV terminals. This work will include the addition of two (2) 500 kV 4000A circuit breakers, eight (8) 500 kV 4000A switches, five (5) 500 kV coupling capacitor voltage transformers ("CCVTs"), one (1) 500 kV 4000A wave trap, seven (7) 500-230 kV 280 MVA transformers, four (4) single circuit and two (2) double circuit steel backbones (by Transmission), ten (10) 230 kV 3000A breakers, twenty-one (21) 230 kV 3000A switches, twenty-one (21) 230 kV CCVTs, five (5) 230 kV 3000A wave traps, twenty-eight (28) 180 kV metal oxide 144 kV MCOV station class arresters, five (5) 115 kV 3000A breakers, twelve (12) 115 kV 2000A switches, fifteen (15) 115 kV CCVTs, three (3) 115 kV 1600A wave traps, twelve (12) 90 kV metal oxide 74 kV MCOV station class arresters, and associated 500-230-115 kV bus work.

The station will require a 178.2 MVAR 230 kV capacitor bank which will include the addition of one (1) 230 kV 3000A switch, one (1) 230 kV 3000A 50 kA syncounous close breaker, and three (3) 180 kV metal oxide 144 kV MCOV lightning arresters. Also, additional 230 kV and 115 kV bus work and switches will be initially installed for a future second 230-115kV transformer.

Appendix Attachments II.C.1 and II.C.2 provide a detailed one-line diagram and the proposed arrangement of the proposed Skiffes Creek Switching Station.

Q. What additional substation work will be required for the 500 kV Proposed Route?

A. Work at Dominion Virginia Power's Surry Switching Station includes the addition of one (1) new 500 kV terminal, one (1) 500 kV 4000A circuit breaker, one (1) 500 kV 4000A switch, three (3) 500 kV CCVTs, and one (1) 500 kV 4000A wave trap.

Appendix Attachments II.C.3 and II.C.4 provide a detailed one-line diagram and the proposed arrangement of the Surry Switching Station.

Q. What additional substation work will be required for the 500 kV Alternate Route?

A. Work at Dominion Virginia Power's Chickahominy Substation would include the addition of: one (1) new 500 kV terminal; three (3) 500 kV, 4000A circuit breakers; six (6) 500 kV, 4000A switches; six (5) 500 kV CCVTs; and two (2) 500 kV, 4000A wave traps.

Appendix Attachments II.C.5 and II.C.6 provide a detailed one-line diagram and the proposed arrangement of the Chickahominy Substation.

Q. Please describe the work required at the Company's existing Whealton Substation for the proposed 230 kV Skiffes Creek-Whealton Line #2138.

A. Work at Dominion Virginia Power's Whealton Substation includes the addition of one (1) new 230 kV terminal. This work will include the addition of two (2) 230 kV 3000A breakers, one (1) 230 kV 1200A 40 kA circuit switcher for Transformer #1, five (5) 230 kV 3000A switches, four (4) 230 kV CCVTs, two (2) 230 kV 3000A wave traps, and three (3) 180 kV metal oxide 144 kV MCOV station class arresters.

Appendix Attachments II.C.7 and II.C.8 provide a detailed one-line diagram and the proposed arrangement of the Whealton Substation.

Q. What is the estimated cost of the substation work?

A. The estimated cost of the Skiffes Creek Switching Station and other substation work required for the proposed Project utilizing the 500 kV Proposed Route is approximately $47.9 million. The estimated cost of the Skiffes Creek Switching Station and other substation work required for the proposed Project utilizing the 500 kV Alternate Route is approximately $51.3 million.

Q. Does this conclude your prefiled direct testimony?

A. Yes, it does.

DIRECT TESTIMONY
OF
ELIZABETH P. HARPER
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUE-2012-00029

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

A. My name is Elizabeth Harper, and I am a Senior Siting and Permitting Specialist, Electric Transmission Right-of-Way, for the Company. My business address is One James River Plaza, 701 East Cary Street, Richmond, Virginia 23219.

Q. What is your educational and professional background?

A. I received a Bachelor of Arts degree from the College of William and Mary. I joined the Surveying Section of Dominion Virginia Power's Transmission and Distribution Projects Department in 1980. In 1986, I moved into the department's Route Selection and Substation Siting group.

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

A. My responsibilities include identification of appropriate routes for transmission lines and sites for substations, 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 comply with mandatory North American Electric Reliability Corporation Reliability Standards by increasing transmission capacity, Dominion Virginia Power proposes to construct (a) approximately 7.4 miles of new 500 kV electric transmission line in the Counties of Surry and James City from the Company's existing 500 kV-230 kV Surry Switching Station in Surry County to a new 500 kV-230 kV-115 kV Skiffes Creek Switching Station in James City County to be constructed on a 51-acre parcel of land owned by the Company; (b) the proposed Skiffes Creek Switching Station; (c) approximately 20.2 miles of new 230 kV line in the Counties of James City and York and the City of Newport News from the proposed Skiffes Creek Switching Station to the Company's existing Whealton Substation located in the City of Hampton; and (d) additional facilities at the existing Surry Switching Station and Whealton Substation (construction of (a) - (d), collectively, the "Project").

The new approximately 7.4-mile 500 kV line, to be designated Surry-Skiffes Creek Line #582, will be built using a combination of existing and new right-of-way and will include an overhead crossing of the James River ("Proposed Route"). The Company is also presenting three variations to the 500 kV Proposed Route reflecting alternative crossings of the James River ("James River Crossing Variations") for consideration by the Virginia State Corporation Commission ("Commission"). The 500 kV Proposed Route utilizing the James River Crossing Variations 1, 2 and 3 is 8.0 miles, 7.2 miles and 7.5 miles, respectively. The Company is also proposing for the Commission's consideration an Alternate Route for the proposed 500 kV line approximately 37.9 miles in length in the Counties of Charles City, James City and York, and the City of Williamsburg from the

Company's existing Chickahominy Substation in Charles City County to the proposed Skiffes Creek Switching Station in James City County. This Alternate Route would construct the new 500 kV line almost entirely within existing transmission right-of-way, of which approximately 24.9 miles is unimproved and the remaining approximately 13.0 miles contains existing transmission facilities. The new 230 kV line, to be designated Skiffes Creek-Whealton Line #2138, will be built entirely within existing right-of-way, most of which is already cleared and utilized as a transmission corridor.

The purpose of my testimony is to discuss the selection and impacts of the 500 kV Proposed Route, the Proposed Route with James River Crossing Variations, the Alternate Route and the 230 kV Skiffes Creek-Whealton line, which are shown on Attachment II.A.2 of the Appendix to the Application. In addition, I am sponsoring Sections II.A.1, 2, 4, 5, 7 through 9, III and V of the Appendix. I am also sponsoring the DEQ Supplement.

Q. How did the Company's Project team begin its analysis and the process of route selection for the proposed 230 kV and 500 kV transmission lines?

A. The Company's route selection procedure for new transmission lines begins with identification of the project "origin" and "termination" points provided by the Company's Transmission Planning Department and then the creation of a study area for the project. For this Project, the Company's Transmission Planning Department determined that a 500 kV line was required to a new Skiffes Creek Switching Station, to be located on property Dominion Virginia Power has owned for a number of years in southern James City County for that purpose, and that a 230 kV line was required from the new switching station continuing into the existing Whealton Substation in the City of Hampton. Two

viable electrical alternatives were identified for the 500 kV line into the new Skiffes Creek Switching Station: a 500 kV line from the existing Surry Switching Station at the Company's Surry Power Station in Surry County and a 500 kV line from the Company's existing Chickahominy Substation in Charles City County.

Due to the length of the Project and the amount of information that would need to be collected and compared during route selection, the Company obtained the services of Natural Resource Group, LLC ("NRG'). NRG provided a detailed analysis of the Project area and performed a routing analysis comparing the alternative routes for the proposed 500 kV line in an Environmental Routing Study included as part of the application materials.

The Company's route selection for the proposed Project first identified and reviewed the availability of existing rights-of-way. This approach generally minimizes impacts on the natural and human environments and is consistent with FERC Guideline #1, which states that existing rights-of-way should be given priority when adding new transmission facilities, and §§ 56-46.1 C and 56-259 of the Code of Virginia ("Va. Code"), which also promote the use of existing rights-of-way for new transmission facilities. Existing transmission right-of-way is available for the entirety of the proposed 230 kV line from the proposed Skiffes Creek Switching Station to the existing Whealton Substation (20.2 miles long), so no other routing alternatives were considered for that portion of the Project. For the majority of the proposed 230 kV line, an existing line will be removed from the existing right-of-way and replaced with a double circuit configuration that will support both the existing and proposed 230 kV lines. In some locations, there are already existing double circuit single pole structures that will support the proposed line. Using

the existing right-of-way for the proposed 230 kV line minimizes the environmental, residential and land-use impacts compared to selecting a new corridor through this highly populated area. Given the availability of the right-of-way, it is not reasonable to incur additional costs or create new impacts through the acquisition of new right-of-way easements for this portion of the Project.

Based on analysis of the routing options for the 500 kV line, the Company selected the route from the Company's existing Surry Switching Station to the proposed Skiffes Creek Switching Station as the 500 kV Proposed Route and also identified three James River Crossing Variations as alternatives for the Proposed Route's crossing of the James River. In addition, the Company has identified another route from the Company's existing Chickahominy Substation to the proposed Skiffes Creek Switching Station for the Commission's consideration as the 500 kV Alternate Route.

Q. What existing rights-of-way were identified for possible use for the 500 kV line?

A. Dominion Virginia Power has an existing transmission right-of-way in James City County that is occupied by a portion of existing 115 kV Line #34 from a tap point within the Skiffes Creek Switching Station property to the existing Dow Chemical Substation, which is located between U.S. Route 60 and the James River. The length of this right-of-way is approximately 1.7 miles long, and the existing easement ranges in width from 80 feet to 130 feet. This right-of-way, as well as Company-owned property at Surry Power Station from Surry Switching Station to the James River, could be incorporated into the route for a 500 kV line from the Surry Switching Station to the proposed Skiffes Creek Switching Station. Expansion of this existing 115 kV right-of-way would be possible with the purchase and removal of one single family dwelling that may include associated

outbuildings.

There are two existing transmission line right-of-way corridors that both begin at the Chickahominy Substation in Charles City County and converge at a point just north of the Lightfoot Substation in James City County. For ease of discussion this point of convergence will be referred to as "Lightfoot Junction."

Dominion Virginia Power has an existing and occupied transmission line corridor between the Chickahominy Substation and the location of the proposed Skiffes Creek Switching Station that ranges from 200 to 188 feet wide. The section of this occupied transmission line corridor between the Chickahominy Substation and Lightfoot Junction (approximately 23.2 miles) crosses portions of Charles City, New Kent, and James City Counties and serves the Providence Forge, Lanexa and Toano Substations. This existing corridor presently contains a 230 kV line and 115 kV line collocated on steel lattice structures and a 115 kV line and 230 kV line collocated on wood pole structures. The Company has determined that the 115 kV lines can be removed from Toano Substation to the proposed Skiffes Creek Switching Station, and the 230 kV line on the wooden structures can be moved to the existing double circuit steel structures, thereby allowing the new 500 kV line to be constructed within this existing right-of-way where the wooden pole structures would be removed. Accordingly, no additional right-of-way easements would be required between Toano Substation and Lightfoot Junction. However, no existing lines can be removed from the corridor between Chickahominy Substation and Toano Substation, so the right-of-way would require expansion on one or the other side of the existing right-of-way between these two substations to allow construction of the new 500 kV line. An additional 125 feet of new right-of-way would be required where

the new structures would be adjacent to the existing steel lattice structures, and 115 feet of additional right-of-way would be required where the new structures would be adjacent to the wood pole structures. The Environmental Routing Study refers to such expansion of this right-of-way on its northern or southern sides as the "Chickahominy to Lightfoot North and South Alternatives."

The other right-of-way from Chickahominy Substation that was considered for the 500 kV line is unimproved right-of-way that ranges from 150 feet to 250 feet wide between Chickahominy Substation and Lightfoot Junction. This existing right-of-way crosses Charles City County and the Chickahominy River, and enters into James City County. This unimproved easement is approximately 24.9 miles in length and was purchased in the 1970s for future transmission use. This existing right-of-way would be sufficient for the proposed 500 kV line with no additional easements required. The Environmental Routing Study refers to the route along this right-of-way as the "Chickahominy Alternative."

From Lightfoot Junction continuing south to the site of the proposed Skiffes Creek Switching Station for a distance of approximately 13.0 miles, the Company owns easement for a transmission line right-of-way that is occupied by two 230 kV lines and two 115 kV lines. This is a continuation of the transmission line easement that comes from the Chickahominy Substation, past Lanexa Substation to Lightfoot Junction. The line arrangement is the same as previously described, except that at Lightfoot Junction the double circuit 230 kV steel lattice structures change to double circuit 230 kV steel poles. This existing right-of-way easement typically ranges in width from 200 feet wide to 188 feet wide where it is adjacent to Interstate 64. Again, the 115 kV lines would be

removed and the existing 230 kV lines would be rearranged resulting in the space required for construction of the proposed 500 kV line. The use of this right-of-way would not require any additional width, with an exception in the vicinity of Kingsmill Substation, where some 230 kV line rearrangement would be necessary and require the acquisition of approximately 4.0 acres of new easement immediately around that substation.

A Colonial Pipeline Company ("Colonial") right-of-way crosses Charles City County, crosses the Chickahominy River near the Route 5 Bridge, enters James City County, and continues to the general area of the proposed Skiffes Creek Switching Station. This refined petroleum product pipeline right-of-way is 50 feet wide. If a full 150-foot wide right-of-way were required parallel to this pipeline, over 500 acres of new easement would need to be acquired for the new right-of-way. However, this existing pipeline right-of-way is in close proximity to residential areas in James City County (approximately 25 existing subdivisions), and the purchase and removal of many homes would be necessary. The Company determined it was not reasonable to continue studying this right-of-way as a 500 kV line alternative.

There is also an existing pipeline corridor that crosses the James River from the vicinity of the Surry Power Station, enters James City County and eventually intersects with the existing right-of-way of the 115 kV Line #34, as noted above. This corridor includes two Columbia Gas Transmission natural gas pipelines and one Colonial Pipeline Company refined petroleum products pipeline. The pipeline companies have indicated they do not wish to share their easements with an electric transmission line, so a transmission line easement a full 150 feet wide would be required for a length of approximately 0.8 mile

before the Colonial pipeline intersects the existing 115 kV Line #34 right-of-way that continues north for approximately 1.0 mile to the Skiffes Creek Switching Station site.

Q. Please describe the route selection process for the 500 kV line.

A. Initially, the Company focused the routing efforts for the 500 kV line on the alternatives that began at the Chickahominy Substation. An in-house investigation was also made concerning the constructability of a line from the existing Surry Switching Station to the proposed Skiffes Creek Switching Station that would include a substantial James River crossing, referred to by the Environmental Routing Study as the "Surry Alternative." The Company sent letters to federal and state agencies describing a project that began at the Chickahominy Substation and introducing the consultants who would be contacting them for additional information. As detailed in Section III.B of the Appendix, Dominion Virginia Power and NRG met with local government staff in Charles City County, James City County, the City of Williamsburg, York County, and the Cities of Newport News and Hampton to investigate the comprehensive plans and existing and future land use in those localities. In addition, Williamsburg Environmental Group, Inc. ("WEG") performed desktop surveys to help determine and compare wetland impacts and examined state records concerning threatened and endangered species. Cultural Resources, Inc. researched known cultural resources to aid in the comparison of the existing corridors. NRG identified and mapped existing land use, environmental, visual, and cultural features within the vicinity of the proposed Project area, using various mapping resources, Geographic Information System ("GIS") databases, agency websites and databases, county and municipal land use plans and communication with agency staff, stakeholders and elected officials.

Open Houses were held on January 9, 10, and 11, 2012 in James City County, Charles City County, and the City of Newport News, respectively. NRG and Dominion Virginia Power also met with Langley Air Force Base officials and Newport News/Williamsburg International Airport officials in this same timeframe to investigate any possible conflicts with the approaches to those landing fields, particularly from the proposed 230 kV line to Whealton.

In comparing the alternative routes out of the Chickahominy Substation, it became apparent that the Chickahominy to Lightfoot North and South Alternatives were significantly more impacting to homeowners than the Chickahominy Alternative. The Chickahominy Alternative has 91 homes within 500 feet of the edge of the right-of-way between the Chickahominy Substation and the Lightfoot Junction, compared to 473 or 438 homes, respectively, within 500 feet of the Chickahominy to Lightfoot North and South Alternatives. The Chickahominy Alternative has four homes within the existing right-of-way that are encroaching into the Dominion Virginia Power right-of-way, and the Company is requiring the removal of those homes irrespective of the proposed Project. In contrast, the Chickahominy to Lightfoot North and South Alternatives would require the purchase and removal of 15 or 17 homes, respectively, if the Company were to expand that right-of-way to accommodate the new 500 kV line. In addition, expanding the route to the north or south would require 310 or 312 acres of additional easement, respectively, resulting in the clearing of 171 acres or 209 acres, respectively, of forest land. There were also several areas of constraints where expansion would impact a wetlands mitigation bank if expanded to the north side, or a pipeline pumping station if expanded to the south side. A new transmission line corridor would need to be

considered to avoid those constraints.

In addition to the foregoing routing issues, the Company's Transmission Planning Department determined that building a new 500 kV line between the Chickahominy Substation and the Lanexa Substation was not an acceptable electrical solution and would increase the total cost of the Project by approximately $105 million. Sections I.B and I.C of the Appendix provide a discussion of that issue, as does the prefiled direct testimony of Company Witness Peter Nedwick. Accordingly, Dominion Virginia Power determined that the Chickahominy to Lightfoot North and South Alternatives should no longer be considered a viable alternative for the 500 kV line. However, the routing data regarding those routes has been retained and is included in the Environmental Routing Study as Appendix H.

The Surry Alternative electrical solution to build the 500 kV line from the Surry Switching Station was also studied. Initial contact with state and federal agencies and Dominion Virginia Power's review of possible construction methods did not show that there were insurmountable issues that would prevent continued consideration of the route. The Company sent letters to federal and state agencies describing this alternative route as beginning at the Surry Switching Station, crossing the river and continuing to the proposed Skiffes Creek Switching Station. Additional contact was made with Langley Air Force Base and Fort Eustis concerning Felker Army Airfield ("Felker Airfield"). When considering a route across the James River, it was determined that the terminal instrument procedures ("TERPS") non-precision approach of that airfield could be penetrated by the height of one of the tallest structures required to maintain proper wire clearances over one of the navigational channels in the James River. This obstruction

would be to the edge of this approach area, and Dominion Virginia Power is consulting with the U.S. Department of Defense ("DOD") about this issue through the Manager of Felker Airfield. To address the possibility that the DOD may determine that the Proposed Route cannot be mitigated and should not be constructed, the Company has developed James River Crossing Variation 1 for the Proposed Route. Several routes were considered for this variation, one of which crossed the eastern edge of state-owned Hog Island Wildlife Management Area ("Hog Island WMA"). However, after consultation with the Virginia Department of Game and Inland Fisheries ("VDGIF"), which manages the Hog Island WMA, it was determined that they, in association with the U.S. Fish and Wildlife Service, will not permit a route over that property. To remove any structures from the TERPS non-precision approach, the James River Crossing Variation 1 is routed in the river offshore adjacent to the shoreline of the eastern side of the Hog Island WMA before turning northeast across the river. James City County and Surry County were contacted for input on land use pertaining to these 500 kV Surry-Skiffes Creek routes and another Open House was held March 26, 2012.

To take advantage of the existing pipeline corridor that includes two Columbia Gas Transmission natural gas pipelines and one Colonial refined petroleum products pipeline that cross the James River from the vicinity of the Surry Nuclear Station into James City County, and to respond to the comments from the BASF property owner and James City County Planning staff concerning division of the BASF property and perceived impacts to the economic development of that property, Dominion Virginia Power also presents James River Crossing Variations 2 and 3 for the Commission's consideration. Variation 2 parallels the southern side of the pipelines across the James River and enters the

northern side of the BASF property and continues across several other properties to a point common with the Proposed Route. Variation 3 is similar on land to Variation 2, but the river crossing is positioned to avoid any obstruction to the TERPS non-precision approach discussed above.

Q. Why were the Proposed and Alternate Routes selected for the 500 kV line?

A. The Surry Alternative is 7.4 miles long with a James River crossing that is 3.5 miles long. This route is the most direct and constructible alignment across the James River to the existing Dow Chemical Substation in order to take advantage of using the existing transmission line right–of-way between the Dow Chemical Substation and the proposed Skiffes Creek Switching Station site. The location of the route as it enters James City County places it between a capped landfill area to the south and the more industrial footprint to the north. Other variations to the James River crossing are also being offered for the Commission's consideration to address specific concerns or constraints, but this route offers the greatest distance from sites such as the Hog Island WMW, Carter's Grove, Kingsmill on the James residential area and Kingsmill Resort. In order to maintain appropriate clearances to the navigation channels in the James River, four of the transmission line structures would need to be up to approximately 295 feet tall (final heights to be determined by final engineering) and because they are taller than 200 feet, would require lighting per Federal Aviation Administration ("FAA") regulations. Some impacts to the oyster grounds would be expected in those areas where piles would need to be driven for structure foundations. Both navigation channels and a spoils area used by the U.S. Army Corps of Engineers ("COE") can be avoided with proper placement of structures. A combination of both setbacks from the channels and construction of a

fender system would be used to protect the structures from maritime shipping traffic. This length of the James River has been designated a Virginia Scenic River and is also included in the Captain John Smith Chesapeake National Historic Trail ("NHT"). There will be a view of the transmission line crossing the river from several locations along the James River where the river and associated views are an important part of the area's visual appeal. Some of those locations include Carter's Grove, a historical plantation with original buildings dating from 1750 and designated a National Historic Landmark, and Kingsmill. There are industrial uses on either side of the river in this vicinity of the James River that include the Surry Power Station in Surry County, a variety of industrial properties in James City County, and the Fort Eustis military base just to the south, as is the "ghost fleet," a collection of retired naval vessels that are temporarily anchored offshore from Fort Eustis.

There are four known archaeological sites within the Surry Alternative right-of-way, and two architectural sites within 1.5 miles of this route; one of those is within one half mile of the proposed line. There is an eagle nest site within 750 feet of the route. This route would require removal of approximately 20.1 acres of trees, but those trees are predominantly on industrial property whose purpose is not for the production of timber. Approximately 0.6 acre of that forest is forested wetlands. This route would require the acquisition of approximately 18.3 acres of additional right-of-way easements and would require that a single family dwelling be purchased and removed. Approximately 84 residences are within 500 feet of the proposed right-of-way, comprised mainly of mobile homes on the west side of the right-of-way and a townhome complex to the east of the right-of-way, many of which are already within 500 feet of the existing 115 kV line. The

estimated cost of the Project with the Surry Alternative for the 500 kV line is approximately $150.6 million.

The Surry Alternative with the James River Crossing Variation 1 is similar on land to the route described above, but is 8.0 miles long with a river crossing distance of 4.1 miles. This alternative turns north in the river to place the channel crossing structures outside of the TERPS non-precision approach at the Felker Airfield. Because of its location within the James River, a greater amount of the privately leased oyster grounds would have structures located within them. The route has one eagle nest within 750 feet and another between 750 and 1,320 feet. It will require 18.2 acres of new or additional easement. This crossing places the western side of the river crossing closer to Carter's Grove and Kingsmill visually, but it enters James City County with the Proposed Route at the eastern side of the river crossing. The estimated cost of the Project with the Surry Alternative and James River Crossing Variation 1 is approximately $155.4 million. The increased cost relative to the Surry Alternative is due to the longer length and two heavy angle structures within the river.

The Surry Alternative with the James River Crossing Variation 2 parallels the southern edge of the existing pipeline corridor crossing the James River. This crossing will not impact any oyster grounds, but will have a structure within the TERPS non-precision approach at Felker Airfield. This is a route that responds to the concerns of the BASF property owner and the James City County Planning staff about the Surry Alternative dividing the BASF property and impacting possible future redevelopment. The route enters the northern side of the BASF property and parallels the southern side of the Colonial pipeline easement, picking its way between the pipeline easement and a

warehouse building until it intersects with the existing 115 kV Line #34 right-of-way. This route would require approximately 18.4 acres of new easement, and crosses several parcels that are zoned for industrial use, including one parcel that belongs to the James City County Economic Development Authority (the "Authority"). The ability to negotiate for easement with the Authority is unknown, which is essential in order for the James River Crossing Variations 2 and 3 to be viable routes. Differences with the other James River Crossing alternative routes in the amount of forest land to be cleared and forested wetlands impacted are minimal. This route shares the same archaeological and architectural sites with the other James River Crossing Variations being considered and has one eagle nest within 750 feet. Additional efforts to definitively locate the pipelines may be required to ensure that this route will not jeopardize the integrity of those facilities. Where this route lands on the James River shore is over 0.5 mile closer to Carter's Grove than the Surry Alternative or the Surry Alternative with James River Crossing Variation 1. The estimated cost of the Project with the Surry Alternative and James River Crossing Variation 2 is approximately $153.0 million.

The Surry Alternative with the James River Crossing Variation 3 enters the northern edge of the BASF property in the same general location as Variation 2 to address the concerns with future development of the BASF property, but has been configured to avoid any obstruction with the TERPS non-precision approach at Felker Airfield. This route would require approximately 18.7 acres of additional easement and crosses the same properties noted in the James River Crossing Variation 2. Differences to forested land and forested wetlands cleared are similar to the other routes, as are archaeological and architectural resources. This route has one eagle nest within 750 feet and one between 750 and 1,320

feet. In addition to landing on the James City County shore 0.5 mile closer to Carter's Grove, this route requires an angle structure in the direct view of Carter's Grove, approximately 0.8 mile from its river entrance. The estimated cost of the Project with the Surry Alternative and James River Crossing Variation 3 is approximately $154.5 million.

The Chickahominy Alternative is 37.9 miles long, of which 24.9 miles would be located on the existing, unimproved right-of-way that was purchased in the 1970s, and the remaining 13.0 miles of which would be located on existing, improved right-of-way already occupied by transmission line facilities. It crosses the Chickahominy Wildlife Management Area ("Chickahominy WMA") for a distance of 2.6 miles, all on uncleared but existing right-of-way. The Chickahominy River crossing will require two structures approximately 195 feet tall; one on the west bank of the river, and the other within the eastern side of the river. The Chickahominy River is difficult to access in this crossing location except by water. Because of that, this portion of the river has not been developed significantly and has maintained its undisturbed environment. The Chickahominy River Indian Tribe considers the Chickahominy River to be important to their heritage and sacred to the tribe. This portion of the Chickahominy River also is included in the Captain John Smith Chesapeake NHT. Despite the difficulties of access, interested parties have noted concern about the visual impact of a 500 kV line crossing the pristine environment of the Chickahominy River at this location.

There are 10 known archaeological sites within the right-of-way of the Chickahominy Alternative Route and 18 architectural sites within 1.5 miles of this route; 11 of those are within one half mile of the route. Interested parties have noted concern about the visual impact to those historic resources. There are three eagle nest sites; one within 750 feet of

the route and two between 750-1,320 feet of the route. Clearing the existing right-of-way will require the removal of 420.5 acres of trees, with the majority of those acres being privately held and used for timber production. Of those forested lands, 106.9 acres are forested wetlands and would require mitigation for their removal. The route would require the acquisition of approximately 4.0 acres of additional right-of-way easement around the Kingsmill Substation for some rearrangement of the existing 230 kV lines into the substation. There are four residences encroaching within the existing right-of-way in Charles City County. Dominion Virginia Power has contacted those owners to remove those residences, independent of this proposed Project. Three of those have been or are being relocated. The property owner for the remaining home is determining how best to remove the home from the right-of-way. There are 1,129 homes within 500 feet of the right-of-way based on the most recent aerial photography. Of those, 91 are within 500 feet of the uncleared right-of-way, and the others are along the existing occupied right-of-way between Lightfoot Junction and the proposed Skiffes Creek Switching Station. However, ongoing construction, particularly within the Colonial Heritage development, will most likely increase that number of homes along the uncleared right-of-way during the Commission's review of the proposed Project. The Chickahominy Alternative would cross a number of other public properties besides the Chickahominy WMA, including Freedom Park, the Warhill Sports Complex, the Waller Mill Park, the Colonial National Historical Park Colonial Parkway, and the Williamsburg Country Club. The addition of the proposed 500 kV line would modify the appearance of the existing right-of-way due to the replacement of the wood pole structures that average approximately 56.5 feet tall with single pole 500 kV line structures averaging approximately 125 feet tall; however,

the adjacent structures that will remain in the right-of-way are approximately 105 feet tall. The estimated cost of the Project with the Chickahominy Alternative for the 500 kV line is $213.2 million.

Typically, the use of existing right-of-way consistent with FERC Guideline #1 reduces cost because additional right-of-way is not required. Using existing right-of-way also typically reduces environmental, residential and land use impacts because less right-of-way acquisition and clearing is required. The existing undeveloped right-of-way for the Chickahominy Alternative has never been cleared from edge to edge.

A detailed comparison of direct and potential impacts of the Chickahominy Alternative and Surry Alternative, including the three James River Crossing Variations, is provided in Table 4-1 of NRG's Environmental Routing Study. This analysis shows that, compared to the Surry Alternative, the Chickahominy Alternative crosses, or is within 500 feet, 200 feet or 100 feet of, many more single family and multi-unit residences; crosses many more existing subdivision and planned developments, private parcels, roads, recreational areas and trails; and crosses, or is within 0.5 mile, 0.5-1.0 mile or 1.0-1.5 miles of, many more archaeological and historic sites. The Chickahominy Alternative also crosses significantly more forested land, open marshland, wetland and perennial waterbodies and will require much more forest land to be cleared and forested wetlands to be converted to scrub shrub community. These greater impacts of the Chickahominy Alternative are driven by both its greater length and the differences in geography and state of development of the areas it crosses, compared to the Surry Alternative. The greater length of the Chickahominy Alternative also drives its much higher cost to construct. Both alternatives cross the Captain John Smith Chesapeake

NHT, although the Surry Alternative has a much longer crossing of the James River than the span of the Chickahominy River crossed by the Chickahominy Alternative. The Chickahominy Alternative collocates with approximately 13.0 miles of existing improved transmission right-of-way, or 34% of its total length. The Surry Alternative collocates with 3.17 miles of Company property and existing improved transmission right-of-way, representing 43% of its total length (like collocation for James River Crossing Variation 1 is 40%, Variation 2 is 36%, and Variation 3 is 34%). The transmission structures (which would average approximately 110-135 feet tall) and conductors of the new 500 kV line would constitute a new visual impact for the 23 miles of unimproved right-of-way for the Chickahominy to Lightfoot Junction segment of the Chickahominy Alternative. The Surry Alternative structures (of which four would be approximately 295 feet tall and the rest would average approximately 150-155 feet tall) would present a new visual impact for the 4.2 miles of the Surry Alternative between Surry Power Station and the Company's existing 115 kV transmission right-of-way in James City County. Because they are so different in length and areas crossed, each alternative has significantly different impacts. Based on the greater overall impacts of the Chickahominy Alternative, and its much higher estimated cost, the Company selected the Surry Alternative as the 500 kV Proposed Route.

The Surry Alternative has the advantage of being the most direct, the furthest from the Hog Island WMA, the easier and less expensive of the two routes to construct, and the farther of the two routes from Jamestown Island, Carter's Grove and Kingsmill. Both the Surry Alternative and the Surry Alternative with James River Crossing Variation 1 also have been routed to avoid landfills to the south in James City County, restricted waters in

the vicinity of Fort Eustis, and to minimize airspace penetration. As of the filing of this Application, the DOD has not indicated if the obstruction of the TERPS non-precision approach to Felker Airfield at Fort Eustis is acceptable or could be mitigated. Dominion Virginia Power offers the Surry Alternative with the James River Crossing Variation 1 to be used only if the DOD objects to the Proposed Route. The Company expects to receive DOD's determination in the near future.

The Surry Alternative with either of the James River Crossing Variations 2 or 3 has many of the same attributes as the Surry Alternative with the James River Crossing Variation 1, including shorter length, and thereby, less impacts to cultural resources, forested land, forested wetlands, homes within 500 feet, 200 feet and 100 feet, existing subdivision and planned developments, private parcels, roads, recreational areas and trails, compared to the Chickahominy Alternative. The Surry Alternative with James River Crossing Variations 2 and 3 both cost significantly less than the Chickahominy Alternative. Variations 2 and 3 also have the advantage of not dividing the BASF property, but that same trait places them closer within the view of Carter's Grove. The Surry Alternative with James River Crossing Variation 2 will require careful location and construction to avoid jeopardizing the integrity of the natural gas and refined petroleum products pipelines in the existing corridor. James River Crossing Variation 3 avoids the TERPS non-precision approach to Felker Airfield, but places an angle structure in direct view from the river entrance of Carter's Grove. Both Variations 2 and 3 cross several parcels that are zoned for industrial use, including one parcel that belongs to the Authority, as previously noted. Though these two Variations address certain concerns, because of their overall impacts the Company does not recommend them over the Proposed Route or the

Surry Alternative with James River Crossing Variation 1.

If the Commission approves the Proposed Route or any of its Variations, the Company will continue to preserve the 24.9 miles of unimproved right-of-way between Chickahominy Substation and Lightfoot Junction for possible use in the future and will continue to monitor for encroachments into this right-of-way.

Q. Please describe the Proposed Route for the 500 kV line.

A. The Proposed Route for the new 500 kV line from the Surry Switching Station to the proposed Skiffes Creek Switching Station is approximately 7.4 miles long and includes a crossing of the James River approximately 3.5 miles in length. The route originates at the Surry Switching Station and continues east for a distance of 1.4 miles paralleling an unnamed service road and a canal associated with the Surry Power Station. Before leaving the shoreline in Surry County, the route turns southeast for 0.2 mile to a point in the river, then pivots northeast and crosses the James River for approximately 3.5 miles. There are two navigational channels within the James River at this location; the western channel is used primarily for barge traffic, and the eastern channel is the federal channel maintained by the COE. Adjacent to the eastern channel on the land side is a spoils area associated with the channel's maintenance. Dominion Virginia Power estimates that there will be approximately 16 structures required in the river, of which four structures will be up to approximately 295 feet tall (height to be determined pending final engineering) to maintain the required clearance of 180 feet between mean high water and the lowest sag of the conductor. The U.S. Coast Guard has based this clearance on the vertical clearance of the U.S. Route 17 James River Bridge plus the additional clearance required for a 500 kV line. There are privately leased oyster grounds in the James River

at this location that will require easements or encroachment agreements from the lessees for the structure foundations. There is an eagle nest in close proximity to the route in Surry County. After coming onshore in James City County, the route continues for approximately 0.4 mile crossing a thin strip of beach, forested land, Baseline Road and a tidal stream channel feeding Wood Creek. The route then turns to the north for approximately 0.3 mile, crossing Utility Street, to reach the Dow Chemical Substation. From the substation location to the proposed Skiffes Creek Switching Station, the route would continue for approximately 1.5 miles to the north, crossing U.S. Route 60. Then the route pivots to the northwest for approximately 0.2 mile to its terminus at the proposed Skiffes Creek Switching Station. This last approximately 1.7 miles would utilize an existing Dominion Virginia Power right-of-way that currently contains a portion of 115 kV Line #34 and ranges from 80 to 130 feet in width. This existing right-of-way would need to be expanded by 20-70 feet to attain a width of 150 feet to accommodate the 500 kV line. The new 500 kV line will be installed on double circuit structures to also carry the existing 115 kV line as an underbuild. Where the route crosses U.S. Route 60, there is a single family home that will need to be acquired and removed due to the expanded right-of-way.

Q. Please describe the Proposed Route for new 500 kV Line #582 using the James River Crossing Variation 1.

A. Dominion Virginia Power is in the process of consulting with the DOD through the Manager of Felker Airfield, who is requesting comments regarding one structure of the proposed crossing of the James River that penetrates the TERPS non-precision approach of the Felker Airfield at Fort Eustis. To address the possibility that the DOD may

determine that the Proposed Route cannot be mitigated and should not be constructed, Dominion Virginia Power has developed a Proposed Route with the James River Crossing Variation 1. The Proposed Route using the James River Crossing Variation 1 is approximately 8.0 miles long with a river crossing approximately 4.1 miles long that would require 17 structures in the James River.

The terrestrial portion of this route in Surry County is the same as that of the Proposed Route. After turning southeast for 0.2 mile to a point in the river, this route turns northeast for 0.6 mile, pivots north for approximately 1.0 mile offshore from the eastern side of the Hog Island WMA, and turns east for 2.5 miles to the shoreline of James City County. With only a minor deviation of the route as it comes onshore, the terrestrial portion of this route in James City County is substantially the same as the Proposed Route.

Q. Please describe the Proposed Route for new 500 kV Line #582 using the James River Crossing Variation 2.

A. The terrestrial portion of this route in Surry County is the same as that of the Proposed Route. After turning southeast for 0.2 mile to a point in the river, this route then pivots northeast 3.7 miles across the James River, paralleling the southern edge of an existing pipeline corridor that extends between the general area of Surry Power Station and the same industrial area that the previous routes cross and includes two natural gas pipelines and one refined petroleum products pipeline. Upon coming onshore in James City County, the route continues 0.8 mile to follow the southern edge of the southernmost pipeline, picking its way between the pipeline easement and a warehouse building until it intersects with the existing 115 kV Line #34 right-of-way. From this point, the route is

the same as the Proposed Route, continuing 0.9 mile to the north and crossing U.S. Route 60, then pivoting northwest 0.2 mile to its terminus at the proposed Skiffes Creek Switching Station site. The total length of this route is 7.2 miles long with a river crossing approximately 3.8 miles long that would require 15 structures in the James River.

Q. Please describe the Proposed Route for new 500 kV Line #582 using the James River Crossing Variation 3.

A. This route is similar to Variation 2, but the river crossing is positioned to avoid the TERPS non-precision approach of the Felker Airfield at Fort Eustis.

The terrestrial portion of this route in Surry County is the same as that of the Proposed Route. After turning southeast for 0.2 mile to a point in the river, this route then pivots northeast 0.6 mile to follow the existing pipeline corridor, turns north for 0.6 mile offshore adjacent to the shoreline of the eastern side of Hog Island WMA, turns northeast 2.4 miles crossing the James River, and then pivots to the southeast for 0.5 mile to the shoreline of James City County. The route continues for 0.1 mile crossing the thin strip of beach and the pipeline corridor, to a point just south of the Colonial Pipeline Company refined petroleum products pipeline, from where it will follow the same route as that described in Variation 2. The total length of this route is 7.5 miles long with a river crossing approximately 4.1 miles long that would require 16 structures in the James River.

Q. Please describe the Alternate Route for the 500 kV line.

A. The Alternate Route from Chickahominy to Skiffes Creek is approximately 37.9 miles

long. It consists of two sections. The first section begins at the Chickahominy Substation in Charles City County and extends approximately 24.9 miles to Lightfoot Junction in James City County. Lightfoot Junction does not represent a facility, but rather denotes a point of convergence between the undeveloped existing right-of-way portion of the route, and an existing Dominion Virginia Power transmission right-of way. The second section of the Alternate Route would be constructed within this existing right-of-way for approximately 13.0 miles to the proposed Skiffes Creek Switching Station in southern James City County.

The Alternate Route between Chickahominy Substation to Lightfoot Junction would utilize an easement Dominion Virginia Power obtained in the 1970s and ranges in width between 150 and 250 feet wide, but was never cleared of vegetation or developed. In Charles City County, the existing easement crosses some pasture or farm land, but the majority of the land is used for timber production. There are a number of historic resources within one-half mile of the existing right-of-way. Most of the land is owned by private owners until it enters the Chickahominy WMA on the west side of the Chickahominy River and crosses the Chickahominy River. The Chickahominy WMA is maintained by VDGIF and is used for hunting and recreation.

Starting at the Chickahominy Substation on Chambers Road in Charles City County, this section of the Alternate Route parallels the existing 500 kV Line #567 south for approximately 0.8 mile, crossing Old Union Road (Route 603) before turning southeast for approximately 2.4 miles across forested and agricultural land, crossing Barnetts Road (Route 609). The route pivots southeast for approximately 8.1 miles, across an area that consists predominately of undeveloped forest with some open pasture and a few

agricultural tracts, crossing Samaria Lane (Route 630), Adkins Road (Route 618), Greenyard Estate Way and Greenyard Estate Lane near their intersection, Courthouse Road (Route 155), Sturgeon Point Road (Route 614), and Cypress Bank Road. The route then turns southeast for approximately 1.5 miles, crossing The Glebe Lane (Route 615), which is generally an open area of agricultural land and an area of local historic significance. Turning southeast, the route continues approximately 5.4 miles across Willow Bank Road and Wilcox Neck Road (Route 623) and enters the Chickahominy WMA before crossing the Chickahominy River.

The Chickahominy River crossing is approximately 0.3 mile long and would require one structure within the eastern side of the river to maintain the required clearances between mean high water and the lowest point in the sag of the conductors, and to avoid constructing a structure over 200 feet tall that the FAA would require to be lighted. The clearance height is based on the Route 5 Bridge (John Tyler Memorial Highway) approximately 4.4 miles downriver and the additional clearances required for a 500 kV line.

Entering James City County, the Alternate Route within the unimproved right-of-way continues 6.4 miles, crossing Yarmouth Island, which is comprised of tidal marsh and forest, some of which is forested wetlands. The Alternate Route crosses private properties and Jolly Pond Road (Route 611) before turning northeast to cross a James City County landfill that is no longer in use, and other James City County property where Freedom Park is located. This portion of Freedom Park is an area of trails built mainly for mountain bike use at this time. Crossing Jolly Pond Road a second time, the route continues through the Colonial Heritage residential development that has occupied

residences and future residences under several stages of construction and planning.

The route then joins the improved and occupied right-of-way at Lightfoot Junction and turns southeast approximately 13.0 miles to continue to the proposed Skiffes Creek Switching Station in James City County. In this occupied right-of-way, two existing 115 kV lines will be removed and an existing 230 kV line moved to an existing double circuit transmission line structure. The transmission line structures that currently carry both the 230 kV line to be relocated and one of the 115 kV lines will be removed and replaced with the proposed 500 kV line to Skiffes Creek. This portion of the route crosses portions of James City County, York County, and the City of Williamsburg, ending at the site of the proposed Skiffes Creek Switching Station. This portion of the route has experienced commercial and residential growth around the existing right-of-way.

From Lightfoot Junction, the Alternate Route initially proceeds approximately 3.4 miles to the southeast, crossing Centerville Road, Stadium Road, Route 199, Old Towne Road (Route 658), Chisel Run Road, and Waltz Farm Drive at its intersection with Meredith Way. The route then turns to the southeast for approximately 5.5 miles and crosses Richmond Road (U.S. Route 60) and Mooretown Road (Route 603), enters York County and crosses Waller Mill Road (Route 713) and Route 132 before entering the City of Williamsburg. The route then crosses Capital Landing Road (Route 5) and Merrimac Trail (Route 143) and reenters York County. In York County it crosses the Colonial Parkway, Hubbard Lane (Route 716), Queens Creek Road (Route 642), Wilkins Drive (Route 720) and Pinetree Road before reaching Interstate 64. The route then pivots slightly to the southeast and proceeds adjacent to Interstate 64 for approximately 2.0 miles, crossing Penniman Road (Route 641) and Route 199, before continuing behind the

Williamsburg Country Club and across an Interstate 64 interchange for U.S. Route 60 and Route 143. Before entering James City County for a second time and crossing the Merrimac Trail (Route 143) and Pocahontas Trail (U.S. Route 60) to the existing Kingsmill Substation, the route splits into two separate, existing rights-of-way with each section following an existing right-of-way. To the north, the existing right-of-way is 150 feet wide and currently contains a line of 230/115 kV wood pole structures (Lines #209 and #58). The existing structures would be removed and replaced with metal poles carrying a single circuit 500 kV line that would be placed in the center of the right-of-way. To the south, the existing right-of-way is 100 feet wide and contains a line of steel pole structures with 230 and 115 kV lines (Lines #285 and #34). The 115 kV line would be replaced with a second 230 kV line, turning the structures into a double circuit 230 kV line. The route of the new double circuit 230 kV line would also include a tie-in to the Kingsmill Substation, which would require approximately 4.0 acres of new right-of-way.

From the Kingsmill Substation, the two routes continue to the southeast for approximately 1.8 miles, cross U.S. Route 60 again, and parallel Interstate 64, before converging at Tadich Drive after crossing a mobile home development. The route then continues for an additional 0.3 mile and terminates at the site of the proposed Skiffes Creek Switching Station.

Q. Please describe the route for the 230 kV Skiffes Creek-Whealton Line #2138.

A. The proposed Skiffes Creek-Whealton 230 kV Transmission Line will consist of a new, approximately 20.2-mile-long 230 kV transmission line between the proposed Skiffes Creek Switching Station and the existing Whealton Substation. This new transmission line will be constructed within Dominion Virginia Power's existing right-of-way and will

cross parts of James City County, York County, the City of Newport News, and the City of Hampton. From the proposed Skiffes Creek Switching Station, the line will proceed in a southeasterly direction for 3.7 miles, crossing U.S. Route 60, Green Mount Industrial Park, and Skiffes Creek to enter the City of Newport News, before crossing U.S. Route 60 again near the Newport News Fire Training Facility, and a CSX railroad track. After crossing the railroad, the route turns to the southeast to parallel the CSX corridor for a distance of 1.9 miles across the Lee Hall Reservoir and Fort Eustis Boulevard (Route 105) and Industrial Park Drive. The route then pivots northeast for 1.9 miles, crossing Industrial Park Drive again, Interstate 64 to parallel another CSX railroad corridor across Jefferson Avenue (Route 143) and Shields Road, entering York County before crossing Richneck Road (Route 636). The route then turns in a southeasterly direction for a distance of 7.3 miles to travel around the eastern perimeter of the Newport News/Williamsburg International Airport, crossing Denbigh Boulevard (Route 173), the Harwoods Mill Reservoir, Oriana Road (Route 620), Harwoods Mill Reservoir again, and through the Villages of Kiln Creek Residential Golf Community, crossing Talleyho Drive and Kiln Creek Parkway twice as it enters the City of Newport News. The existing right-of-way continues around the eastern side of Interstate 64 and Victory Boulevard, and crosses Victory Boulevard, Lake View Drive, Old Oyster Point Road, and Interstate 64. The route then continues in a southeasterly direction for 5.5 miles through commercial and residential areas; it enters the eastern side of Oyster Point of Newport News crossing Omni Way, Diligence Drive and J. Clyde Morris Boulevard (U.S. Route 17). The existing right-of-way then enters a more residential area, crossing Rumson Avenue, Courtney Avenue, Bruton Avenue, Harpersville Road, Benns Road, Robinson Drive and

Hampton Roads Center Parkway before entering the City of Hampton Roads. The remainder of the existing right-of-way passes through residential development and crosses the following subdivision roads: Tripp Terrace, Devore Avenue, Michael Woods Drive, Dunn Circle, Castle Haven Road, Whetstone Drive, Ridgecrest Drive and Sherry Dell Drive, Todds Lane (Route 152), Lundy Lane, the intersection of Cordova and Whealton Road, Albany Drive and Hazelwood Road into Dominion Virginia Power's existing Whealton Substation located between Hazelwood Road and Threechopt Road, one block north of Mercury Boulevard (U.S. Route 258).

Q. What activities have been and will be undertaken to reasonably minimize adverse impacts of the proposed Project on the environment?

A. Within the parameters of the electrical requirements for this Project, Dominion Virginia Power and our consultants have diligently worked to obtain relevant information from local, state and federal resources, mapping resources and public input in order to identify and thoroughly compare and evaluate the routing opportunities for this Project and ultimately select a Proposed Route, including several river crossing variations, and an Alternate Route, that reasonably minimize impacts on the environment for the Commission's consideration.

As I have explained, in addition to its significantly lower cost compared to the other routes considered, the Proposed Route was chosen because, compared to the Alternate Route, it requires less forest cleared, impacts less wetlands and requires less conversion of forested wetlands to a scrub shrub community, has fewer archaeological impacts, fewer homes within 500 feet and generally has fewer visual impacts than the alternative. Compared to the other James River Crossing Variations, it is the most direct and

constructible route and is placed the furthest from Carters Grove, Jamestown Island and Kingmill.

Besides the desktop surveys that were made to aid in the comparison of the alternative routes supporting this application, further environmental studies of the route approved by the Commission will be done in consultation with the relevant agencies, such as COE, the Virginia Marine Resources Commission ("VMRC"), the Virginia Department of Conservation and Recreation ("VDCR"), VDGIF, the Virginia Department of Environmental Quality ("VDEQ") and the Virginia Department of Historic Resources ("DHR"), to determine the actual location and type of wetlands, to look for those species that are endangered, threatened or a species of concern, and to locate archaeological resources within the proposed rights-of-way for the Proposed and Alternate Routes and historical architectural resources in the Project area.

The Company will continue to coordinate with the applicable local, state and federal agencies to provide the information they need to determine the permitting requirements and associated mitigation measures deemed necessary for this Project. Dominion Virginia Power will meet those requirements and execute any associated mitigation measures to obtain the necessary approvals for the construction of the Project.

Q. How has the Company approached the environmental review and permitting process for the proposed Project?

A. The Company developed the DEQ Supplement that is attached to this application based on previous Company coordination with the VDEQ. The DEQ Supplement contains, in addition to a summary description of the proposed Project, information on impacts and

the status of agency review with respect to: air quality; water withdrawals and discharges; wetlands; solid and hazardous waste; natural heritage and endangered species; erosion and sediment control; archeological, historic, scenic, cultural and architectural resources; use of pesticides and herbicides; geology and mineral resources; wildlife resources; recreation, agricultural and forest resources; and transportation infrastructure. The DEQ Supplement also discusses the permits that will be required and includes comment letters and other materials that Dominion Virginia Power has obtained regarding the proposed Project from relevant agencies as a result of the Company's own efforts.

Q. What contacts have you made within the local communities crossed by the proposed Project and other local authorities?

A. In early September 2011, the Company informed several elected officials and representatives and staff of Charles City, James City, New Kent, and York Counties and the Cities of Williamsburg, Newport News and Hampton, to let them know a project was proposed in the area and further information would be forthcoming. The Counties of Charles City and James City requested meetings with Company representatives to discuss the location of the unoccupied easements that were acquired by the Company in the 1970s for future transmission use.

Initial notifications of the Project considering the Chickahominy Alternative for the 500 kV line occurred in September 2011 and included the following: Senator Tommy Norment; Neil Morgan, Newport News City Manager; Mary Bunting, Hampton City Manager; Jack Tuttle, City of Williamsburg City Manager; George S. Hrichak, York County Board of Supervisors Chairman; James Middaugh, James City County Administrator; Mary Jones, James City County Board of Supervisors Chairman; Delegate

Joe Morrissey, Charles City County; Senator Donald McEachin; James Icenhour, James City County Supervisor.

On September 19, 2011, letters were mailed to 575 property owners crossed by the Chickahominy Alternative and the proposed 230 kV Skiffes Creek-Whealton line to explain that a new transmission line project was being considered and they might see survey crews on their property who were obtaining environmental data. See Appendix Attachment III.B.1.

On December 1, 2011, letters were mailed to 3,900 property owners crossed by or adjacent to the Project utilizing the Chickahominy Alternative to make them aware that the Project was moving forward, and an Open House would be held in January. See Appendix Attachment III.B.2. In early December, representatives of Dominion Virginia Power and NRG met with local Planning Department staff from the impacted Counties and Cities to investigate existing and proposed land use plans and discuss the schedule for the Project.

Additional notifications of the Project considering the Chickahominy Alternative included the following:

December 6, 2011	James City County – Douglas Powell, Assistant County Administrator, Melissa Brown, Zoning Administrator, and Tammy Rosario, Principal Planner Charles City County – Allyson Finchum, Director of Planning, and John Bragg, Jr., Deputy Zoning Administrator City of Williamsburg – Reed Nestor – Planning Director and Deputy Planning Director Carolyn Murphy
December 7, 2011	York County – Al Maddalene, Chief of Development

	and Compliance, and Sam Daniel, County Planner
	City of Hampton – Keith Cannady, Planning Division Manager – Community Development, and David Stromber, City Planner
	City of Newport News – Sheila McAllister, Director of Planning
January 6, 2012	New Kent County – G. Cabell Lawton, IV, and Rodney A. Hathaway, Assistant County Administrator

On December 7, 2011, the Project, including the Chickahominy Alternative, was presented to the Charles City County Board of Supervisors at their request. In late December a second notification was mailed to the same 3,900 property owners with specific information for Open Houses on the Project to be held in January. See Appendix Attachment III.B.3. Additionally, newspaper advertisements for the Open Houses ran in six local publications in mid-December and early January. See Appendix Attachment III.B.4. Attendance at the three Open Houses was as follows:

January 9, 2012	Warhill High School, Williamsburg, 70 attendees
January 10, 2012	Charles City Social Center, 135 attendees
January 11, 2012	Woodside High School, Newport News, 35 attendees

In January additional investigation was made to understand any impacts the Project could have on local airports and it was noted that clearances to existing conditions could be maintained.

January 10, 2012	Langley Air Force Base
January 11, 2012	Newport News/Williamsburg International Airport

Company representatives presented the Project, including the Chickahominy Alternative to the James City County Board of Supervisors during their Work Session on January 24,

2012, to the Charles City County NAACP Board on the evening of February 6, 2012, and to the Charles City County Board of Supervisors on February 14, 2012, as several new members had recently been seated.

In January and February 2012, Company representatives met or spoke with officials with the following agencies to gather information on the feasibility of the 500 kV Surry Alternative:

January 18, 2012	U.S. Army Corps of Engineers
January 19, 2012	Virginia Department of Historic Resources
February 8, 2012	Felker Army Airfield, Fort Eustis
February 10 and 28, 2012	Virginia Department of Game and Inland Fisheries

Having determined in the latter part of February, after coordination with numerous agencies, that the 500 kV Surry Alternative was a reasonable alternative to consider, Company representatives informed representatives and staffs of Surry and James City County that this route was being studied. Additional notifications of the Project, including considering the 500 kV Surry Alternative included the following:

February 27, 2012	Senator Tommy Norment
March 8, 2012	James City County Administrator, James Middaugh Chairman, Board of Supervisors, Mary Jones Charles City County Supervisors William Coada, Vice-Chair Floyd Miles and Chairman Gilbert Smith Interim County Administrator Jacqueline Wallace
March 9, 2012	Senator Donald McEachin, Delegate Joe Morrissey, NAACP President Brenda Jones-Cotman and Chickahominy Tribal Council Chief Stephen Adkins
March 12, 2012	James River Association, Executive Director Bill Street

March 19, 2012	Surry County – Ronda Mack, Director of Planning James City County – Tammy Rosario, Principal Planner
May 17, 2012	James City County Administrator, James Middaugh, Chairman, Board of Supervisors, Mary Jones

Letters were sent March 13, 2012 to 65 property owners crossed by or adjacent to the 500 kV Surry Alternative to advise them of this route being studied, and inviting them an Open House on March 26, 2012 at the James River Elementary School in James City County. See Appendix Attachment III.B.5. An advertisement for the Open House ran in five local newspapers on March 14, 2012 and March 21, 2012. See Appendix Attachment III.B.6. Follow-up letters and a revised map showing the Surry Alternative were mailed to everyone previously notified along the Chickahominy Alternative for the 500 kV line (approximately 2,100 parcels) on March 15, 2012. See Appendix Attachment III.B.7. The March 26th open house was attended by over 110 residents. Additionally, a private neighborhood association open house was held in Colonial Heritage on April 19; over 100 residents attended.

On April 2, 2012, Company representatives also met with VDEQ to present the proposed Project. Concurrent with the Application being filed with the Commission, the Project website is being updated to reflect the Company's selection of the Surry-Skiffes Creek route as the 500 kV Proposed Route for the Project. Letters providing this update are being mailed to all previously contacted property owners.

Additional information was provided to the public through numerous interviews with the local media and through an internet website dedicated to the Project at http://www.dom.com/about/electric-transmission/skiffes/index.jsp.

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

A. Yes. In addition to the foregoing communications with the impacted localities, and in accordance with Va. Code § 15.2-2202, letters dated March 14, 2012 (provided as Appendix Attachment III.B.8) were sent to the following local officials advising of the Company's intention to file this application and inviting a consultation with the Company about the Project and proposed transmission facilities:

- Mr. Tyrone W. Franklin, Surry County Administrator
- Mr. Robert C. Middaugh, James City County Administrator
- Mr. Neil A. Morgan, Newport News City Manager
- Mr. James O. McReynolds, York County Administrator
- Ms. Mary Bunting, Hampton City Manager
- Ms. Jacqueline W. Wallace, Interim Charles City County Administrator
- Mr. Jackson C. Tuttle, City of Williamsburg Manager

Q. Does this complete your prefiled direct testimony?

A. Yes, it does.

DIRECT TESTIMONY
OF
DOUGLAS J. LAKE
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUE-2012-00029

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

A. My name is Douglas J. Lake. I am employed as a Technical Director and Senior Vice President with Natural Resource Group, LLC ("NRG"). My business address is 1000 IDS Center, 80 South Eighth Street, Minneapolis, Minnesota 55402.

Q. What is your educational and professional background?

A. I earned a Bachelor of Science degree from Marietta College and a Master of Science degree from the University of New Hampshire. I have 32 years of experience working in the energy-related consulting field including 24 years working with 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 I was employed for eight (8) years with Chas. T. Main engineers, eight (8) years with Ebasco/Foster Wheeler engineers and 15 years with NRG, a privately owned consulting company specializing in the siting, licensing and environmental construction compliance of large, multi-state energy transportation facilities.

My professional experience related to electric transmission line projects includes the direct management of field studies, impact assessments and agency negotiations associated with the routing and licensing of multiple transmission line projects in the northeast including the management and/or supervision of the routing and permitting of a 140-mile 450 kV DC new greenfield transmission line. 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, and sensitive habitats and land uses. Within the last several years I have managed or directed the identification and evaluation of over 800 miles of 345 kV transmission line route alternatives for NV Energy in Nevada and am currently directing and managing the routing and state and federal permitting of a 900-mile-long 500 kV DC transmission line in Wyoming, Idaho, Utah and Nevada for TransCanada.

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

A. NRG has extensive experience in the routing and feasibility assessments of energy transportation projects. It has assisted its clients in the identification, evaluation and selection of linear energy facilities for the past 19 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. NRG uses data-intensive Geographic Information System spatial and dimensional analysis and the most current and refined data layers and aerial photography resources

available in the identification, evaluation and selection of transmission line routes. In addition to Virginia Electric and Power Company ("Dominion Virginia Power" or the "Company"), its clients include some of the largest energy companies in the United States, Canada and the world, including ExxonMobil, TransCanada, NVEnergy, Niagara Mohawk, Kinder Morgan, BP, Enbridge Energy and others. NRG also routinely assists the staff of the Federal Energy Regulatory Commission and the U.S. Forest Service in the identification and/or evaluation of linear energy routes to support federal National Environmental Policy Act evaluations. NRG 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 the Company 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, currently pending before the Commission in Case No. PUE-2011-00113. NRG'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 comply with mandatory North American Electric Reliability Corporation Reliability Standards by increasing transmission capacity, Dominion

proposes to construct (a) approximately 7.4 miles of new 500 kV electric transmission line in the Counties of Surry and James City from the Company's existing 500 kV-230 kV Surry Switching Station in Surry County to a new 500 kV-230 kV-115 kV Skiffes Creek Switching Station in James City County to be constructed on a 51-acre parcel of land owned by the Company; (b) the proposed Skiffes Creek Switching Station; (c) approximately 20.2 miles of new 230 kV line in the Counties of James City and York and the City of Newport News from the proposed Skiffes Creek Switching Station to the Company's existing Whealton Substation located in the City of Hampton; and (d) additional facilities at the existing Surry Switching Station and Whealton Substation (construction of (a) - (d), collectively, the "Project").

The new approximately 7.4-mile 500 kV line, to be designated Surry-Skiffes Creek Line #582, will be built using a combination of existing and new right-of-way and will include an overhead crossing of the James River ("Proposed Route"). The Company is also presenting three variations to the 500 kV Proposed Route reflecting alternative crossings of the James River ("James River Crossing Variations") for the consideration by the Virginia State Corporation Commission ("Commission"). The 500 kV Proposed Route utilizing the James River Crossing Variations 1, 2 and 3 is 8.0 miles, 7.2 miles and 7.5 miles, respectively. The Company is also proposing for the Commission's consideration an Alternate Route for the proposed 500 kV line approximately 37.9 miles in length in the Counties of Charles City, James City, and York, and the City of Williamsburg from the Company's existing Chickahominy Substation in Charles City County to

the proposed Skiffes Creek Switching Station in James City County. This Alternate Route would construct the new 500 kV line almost entirely within existing transmission right-of-way, of which approximately 24.9 miles is unimproved and the remaining approximately 13.0 miles contains existing transmission facilities. The new 230 kV line, to be designated Skiffes Creek-Whealton Line #2138, will be built entirely within existing right-of-way, most of which is already cleared and utilized as a transmission corridor.

NRG was engaged on behalf of the Company to assist it in the identification and evaluation of route alternatives for the proposed 500 kV and 230 kV transmission lines 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 materials filed by the Company in this proceeding. I am also co-sponsoring, with Company Witness Elizabeth P. Harper, portions of Sections II and III of the Appendix.

Q. Does this conclude your prefiled direct testimony?

A. Yes, it does.

BEFORE THE

STATE CORPORATION COMMISSION

OF VIRGINIA

APPLICATION OF

VIRGINIA ELECTRIC AND POWER COMPANY

FOR APPROVAL OF ELECTRIC FACILITIES

Surry-Skiffes Creek 500 kV Transmission Line

Skiffes Creek-Whealton 230 kV Transmission Line

Skiffes Creek 500 kV-230 kV-115 kV Switching Station

Application No. 257

DEQ Supplement

Case No. PUE-2012-00029

Filed June 11, 2012

Table of Contents

Page

Based on consultations with the Department of Environmental Quality ("DEQ"), Virginia Electric and Power Company ("Dominion Virginia Power" or the "Company") has developed this DEQ Supplement to facilitate review and analysis of the proposed Project by DEQ and other relevant agencies.

1. Project Description

In order to comply with mandatory North American Electric Reliability Corporation Reliability Standards by increasing transmission capacity, Dominion Virginia Power proposes to construct (a) approximately 7.4 miles of new 500 kV electric transmission line in the Counties of Surry and James City from the Company's existing 500 kV-230 kV Surry Switching Station in Surry County to a new 500 kV-230 kV-115 kV Skiffes Creek Switching Station in James City County to be constructed on a 51-acre parcel of land owned by the Company; (b) the proposed Skiffes Creek Switching Station; (c) approximately 20.2 miles of new 230 kV line in the Counties of James City and York and the City of Newport News from the proposed Skiffes Creek Switching Station to the Company's existing Whealton Substation located in the City of Hampton; and (d) additional facilities at the existing Surry Switching Station and Whealton Substation (construction of (a) - (d), collectively, the "Project").

The Company's route selection procedure for new transmission lines begins with identification of the project "origin" and "termination" points provided by the Company's Transmission Planning Department and then the creation of a study area for the Project. For this Project, the Company's Transmission Planning Department determined that a 500 kV line was required to a new Skiffes Creek Switching Station to be located on property Dominion Virginia Power has owned for a number of years in southern James City County for that purpose, and that a 230 kV line was required from the new switching station continuing into the existing Whealton Substation in the City of Hampton. Two viable electrical alternatives were identified for the 500 kV line into the new Skiffes Creek Switching Station: a 500 kV line from the existing Surry Switching Station at the Company's Surry Power Station in Surry County or a 500 kV line from the Company's existing Chickahominy Substation in Charles City County.

Existing transmission right-of-way is available for the entirety of the proposed 230 kV line from the proposed Skiffes Creek Switching Station to the existing Whealton Substation (20.21 miles long), so no other routing alternatives were considered for that portion of the Project. For the majority of the proposed 230 kV line, an existing line will be removed from the existing right-of-way and replaced with a double circuit configuration that will support both the existing and proposed 230 kV lines. In some locations, there are already existing double circuit single pole structures that will support the proposed line. Using developed, existing right-of-way for the entire length of the proposed 230 kV line minimizes the environmental, residential and land-use impacts compared to selecting a new corridor through this highly populated area. Given the availability of the right-of-way, it is not reasonable to incur additional costs from the acquisition of new right-of-way easements for this portion of the Project.

Due to the length of the Project and the amount of information that would need to be collected and compared during route selection, the Company obtained the services of Natural Resource Group, LLC ("NRG"), which specializes in the routing of electric transmission projects. With the assistance of NRG, the Company fully evaluated the existing right-of-way to be used for the entirety of the proposed 230 kV Skiffes Creek-Whealton line, and identified and considered four preliminary routes for the 500 kV transmission line: the "Chickahominy Alternative" from the Company's existing Chickahominy Substation to the proposed Skiffes Creek Switching Station ("Chickahominy-Skiffes Creek"), a significant portion of which uses uncleared, undeveloped existing right-of-way; the "Chickahominy North and South Alternatives," using developed existing right-of-way from the Chickahominy Substation to the Skiffes Creek Switching Station, a significant portion of which would need to be expanded by approximately 115-125 feet in width on either the northern or southern side; and the "Surry Alternative" from the Company's existing Surry Switching Station to the proposed Skiffes Creek Switching Station ("Surry-Skiffes Creek") using a combination of existing and new right-of-way.

The Company rejected the Chickahominy North and South Alternatives from further consideration as explained in Appendix Section I.C, but the routing data regarding those routes has been

retained and is included in the Environmental Routing Study prepared by NRG, which is included as part of the application materials. The Company retained the remaining two preliminary routes for further evaluation, refinement, and stakeholder comment through the Company's public outreach process. Based on this analysis of the routing options for the 500 kV line, the Company selected the Surry Alternative as the 500 kV Proposed Route. The Company also identified three James River Crossing Variations ("James River Crossing Variations 1, 2 and 3") as alternatives for the Proposed Route's crossing of the James River. In addition, the Company has identified the Chickahominy Alternative for consideration by the State Corporation Commission ("Commission") as an alternative route ("500 kV Alternate Route").

A complete description of the route evaluation and selection process is provided in the Environmental Routing Study. Figure 1 in Appendix A of the Environmental Routing Study provides an overview map of the Project area. The Environmental Routing Study also describes the evaluation criteria and the rationale for identifying the Proposed and Alternate Routes. Descriptions of the 500 kV Proposed Route, Proposed Route utilizing the James River Variations, and Alternate Routes, the Skiffes Creek Switching Station, and the 230 kV Skiffes Creek-Whealton line are provided below. For maps of the Project showing mileposts and locational references used in this Supplement, see Appendices I and J to the Environmental Routing Study. The following provides a guide to the location references and abbreviated terms used in this Supplement and those maps:

Abbreviated terms:

MP = Milepost
(S) = 500 kV Proposed Route (Surry-Skiffes Creek) Map Mileposts
(JV1) = 500 kV James River Crossing Variation 1 Map Mileposts
(JV2) = 500 kV James River Crossing Variation 2 Map Mileposts
(JV3) = 500 kV James River Crossing Variation 3 Map Mileposts
(C) = 500 kV Alternate Route (Chickahominy-Skiffes Creek) Map Mileposts
(W) = 230 kV Skiffes Creek-Whealton Map Mileposts

Location References:

Surry Switching Station (S) MP 0.00
Dow Chemical Substation (S) MP 5.80
Chickahominy Substation (C) MP 0.07
Jolly Pond Angle (C) MP 21.15
Lightfoot Junction (C) MP 24.94
Waller Substation (C) MP 29.95
230kV-500kV R/W Split (C) 35.75
Skiffes Creek Switching Station (W) 0.00
C&O Junction (W) MP 7.55
Grafton Junction (W) MP 9.24
Harwoods Mill Junction (W) MP 10.70
Union Carbide Tap (W) MP 16.82
Whealton Substation (W) MP 20.22

500 kV Proposed Route (Surry-Skiffes Creek)

The Proposed Route for the new 500 kV line from the Surry Switching Station to the proposed Skiffes Creek Switching Station is approximately 7.42 miles long and includes a crossing of the James

River approximately 3.53 miles in length. The route originates at the Surry Switching Station and continues east for a distance of 1.38 miles paralleling an unnamed service road and a canal associated with the Surry Power Station. Before leaving the shoreline in Surry County, the route turns southeast for 0.23 mile to a point in the river, then pivots northeast and crosses the James River for approximately 3.48 miles. There are two navigational channels within the James River at this location; the western channel is used primarily for barge traffic, and the eastern channel is the federal channel maintained by the U.S. Army Corps of Engineers ("COE"). Adjacent to the eastern channel on the land side is a spoils area associated with the channel's maintenance. Dominion Virginia Power estimates that there will be approximately 16 structures required in the river, of which four structures will be up to approximately 295 feet tall (height to be determined pending final engineering) to maintain the required clearance of 180 feet between mean high water and the lowest sag of the conductor. The U.S. Coast Guard ("USCG") has based this clearance on the vertical clearance of the U.S. Route 17 James River Bridge plus the additional clearance required for a 500 kV line. There are privately leased oyster grounds in the James River at this location that will require easements or encroachment agreements from the lessees for the structure foundations. There is an eagle nest in close proximity to the route in Surry County. After coming onshore in James City County, the route continues for approximately 0.38 mile crossing a thin strip of beach, forested land, Baseline Road and a tidal stream channel feeding Wood Creek. The route then turns to the north for approximately 0.30 mile, crossing Utility Street, to reach the Dow Chemical Substation. From the substation location to the proposed Skiffes Creek Switching Station, the route would continue for approximately 1.45 miles to the north, crossing U.S. Route 60. Then the route pivots to the northwest for approximately 0.19 mile to its terminus at the proposed Skiffes Creek Switching Station. This last approximately 1.64 miles would utilize an existing Dominion Virginia Power right-of-way that currently contains a portion of 115 kV Line #34 and ranges from 80 to 130 feet in width. This existing right-of-way would need to be expanded by 20-70 feet to attain a width of 150 feet to accommodate the 500 kV line. The new 500 kV line will be installed on double circuit structures to also carry the existing 115 kV line as an underbuild. Where the route crosses U.S. Route 60, there is a single family home that will need to be acquired and removed due to the expanded right-of-way.

500 kV Proposed Route (Surry-Skiffes Creek) with the James River Crossing Variation 1

Dominion Virginia Power is in the process of consulting with the U.S. Department of Defense ("DOD") through the Manager of Felker Army Airfield at Fort Eustis ("Felker Airfield"), who is requesting comments regarding one structure of the proposed crossing of the James River that penetrates the terminal instrument procedures ("TERPS") non-precision approach of the Felker Airfield. To address the possibility that the DOD may determine that the Proposed Route cannot be mitigated and should not be constructed, Dominion Virginia Power has developed a Proposed Route with the James River Crossing Variation 1. The Proposed Route using the James River Crossing Variation 1 is approximately 7.95 miles long with a river crossing approximately 4.10 miles long that would require 17 structures in the James River.

The terrestrial portion of this route in Surry County is the same as that of the Proposed Route. After turning southeast for 0.23 mile to a point in the river, this route turns northeast for approximately 0.55 mile, pivots north for approximately 1.02 miles offshore from the eastern side of the Hog Island Wildlife Management Area ("Hog Island WMA"), and turns east for approximately 2.46 miles to the shoreline of James City County. With only a minor deviation of the route as it comes onshore, the terrestrial portion of this route in James City County is substantially the same as the Proposed Route.

500 kV Proposed Route (Surry-Skiffes Creek) with the James River Crossing Variation 2

The terrestrial portion of this route in Surry County is the same as that of the Proposed Route. After turning southeast for 0.23 mile to a point in the river, this route then pivots northeast 3.72 miles

across the James River, paralleling the southern edge of an existing pipeline corridor that extends between the general area of Surry Power Station and the same industrial area that the previous routes cross and includes two natural gas pipelines and one refined petroleum products pipeline. Upon coming onshore in James City County, the route continues 0.80 mile to follow the southern edge of the southernmost pipeline, picking its way between the pipeline easement and a warehouse building until it intersects with the existing 115 kV Line #34 right-of-way. From this point, the route is the same as the Proposed Route, continuing 0.85 miles to the north and crossing U.S. Route 60, then pivoting northwest 0.19 mile to its terminus at the proposed Skiffes Creek Switching Station site. The total length of this route is 7.17 miles long with a river crossing approximately 3.81 miles long that would require 15 structures in the James River.

500 kV Proposed Route (Surry-Skiffes Creek) with the James River Crossing Variation 3

This route is similar to Variation 2, but the river crossing is positioned to avoid the TERPS non-precision approach of the Felker Airfield at Fort Eustis.

The terrestrial portion of this route in Surry County is the same as that of the Proposed Route. After turning southeast for 0.23 mile to a point in the river, this route then pivots northeast 0.55 mile to follow the existing pipeline corridor, turns north for 0.64 mile offshore adjacent to the shoreline of the eastern side of Hog Island WMA, turns northeast 2.39 miles crossing the James River, and then pivots to the southeast for 0.45 mile to the shoreline of James City County. The route continues for 0.05 mile crossing the thin strip of beach and the pipeline corridor, to a point just south of the Colonial Pipeline Company refined petroleum products pipeline, from where it will follow the same route as that described in Variation 2. The total length of this route is 7.50 miles long with a river crossing approximately 4.12 miles long that would require 16 structures in the James River.

500 kV Alternate Route (Chickahominy-Skiffes Creek)

The Alternate Route from Chickahominy to Skiffes Creek is approximately 37.89 miles long. It consists of two sections. The first section begins at the Chickahominy Substation in Charles City County and extends approximately 24.93 miles to Lightfoot Junction in James City County. Lightfoot Junction does not represent a facility, but rather denotes a point of convergence between the undeveloped existing right-of-way portion of the route, and an existing Dominion Virginia Power transmission right-of way. The second section of the Alternate Route would be constructed within this existing right-of-way for approximately 12.96 miles to the proposed Skiffes Creek Switching Station in southern James City County.

Chickahominy to Lightfoot Junction Section

The Alternate Route between Chickahominy Substation to Lightfoot Junction would utilize an easement Dominion Virginia Power obtained in the 1970s and ranges in width between 150 and 250 feet wide, but was never cleared of vegetation or developed. In Charles City County, the existing easement crosses some pasture or farm land, but the majority of the land is used for timber production. There are a number of historic resources within one-half mile of the existing right-of-way. Most of the land is owned by private owners until it enters the Chickahominy Wildlife Management Area ("Chickahominy WMA") on the west side of the Chickahominy River and crosses the Chickahominy River. The Chickahominy WMA is maintained by the Virginia Department of Game and Inland Fisheries ("VDGIF") and is used for hunting and recreation.

Starting at the Chickahominy Substation on Chambers Road in Charles City County, this section of the Alternate Route parallels the existing 500 kV Line #567 south for approximately 0.78 mile,

crossing Old Union Road (Route 603) before turning southeast for approximately 2.39 miles across forested and agricultural land, crossing Barnetts Road (Route 609). The route pivots southeast for approximately 8.09 miles, across an area that consists predominately of undeveloped forest with some open pasture and a few agricultural tracts, crossing Samaria Lane (Route 630), Adkins Road (Route 618), Greenyard Estate Way and Greenyard Estate Lane near their intersection, Courthouse Road (Route 155), Sturgeon Point Road (Route 614), and Cypress Bank Road. The route then turns southeast for approximately 1.50 miles, crossing The Glebe Lane (Route 615), which is generally an open area of agricultural land and an area of local historic significance. Turning southeast, the route continues approximately 5.42 miles across Willow Bank Road and Wilcox Neck Road (Route 623) and enters the Chickahominy WMA before crossing the Chickahominy River.

The Chickahominy River crossing is approximately 0.32 mile long and would require one structure within the eastern side of the river to maintain the required clearances between mean high water and the lowest point in the sag of the conductors, and to avoid constructing a structure over 200 feet tall that the Federal Aviation Administration ("FAA") would require to be lighted. The clearance height is based on the Route 5 Bridge (John Tyler Memorial Highway) approximately 4.65 miles downriver and the additional clearances required for a 500 kV line.

Entering James City County, the Alternate Route within the unimproved right-of-way continues 6.43 miles, crossing Yarmouth Island, which is comprised of tidal marsh and forest, some of which is forested wetlands. The Alternate Route crosses private properties and Jolly Pond Road (Route 611) before turning northeast to cross a James City County landfill that is no longer in use, and other James City County property where Freedom Park is located. This portion of Freedom Park is an area of trails built mainly for mountain bike use at this time. Crossing Jolly Pond Road a second time, the route continues through the Colonial Heritage residential development that has occupied residences and future residences under several stages of construction and planning.

Lightfoot Junction to Skiffes Creek Section

The route then joins the improved and occupied right-of-way at Lightfoot Junction and turns southeast approximately 12.96 miles to continue to the proposed Skiffes Creek Switching Station in James City County. In this occupied right-of-way, two existing 115 kV lines will be removed and an existing 230 kV line moved to an existing double circuit transmission line structure. The transmission line structures that currently carry both the 230 kV line to be relocated and one of the 115 kV lines will be removed and replaced with the proposed 500 kV line to Skiffes Creek. This portion of the route crosses portions of James City County, York County, and the City of Williamsburg, ending at the site of the proposed Skiffes Creek Switching Station. This portion of the route has experienced commercial and residential growth around the existing right-of-way.

From Lightfoot Junction, the Alternate Route initially proceeds approximately 3.39 miles to the southeast, crossing Centerville Road, Stadium Road, Route 199, Old Towne Road (Route 658), Chisel Run Road, and Waltz Farm Drive at its intersection with Meredith Way. The route then turns to the southeast for approximately 5.47 miles and crosses Richmond Road (U.S. Route 60) and Mooretown Road (Route 603), enters York County and crosses Waller Mill Road (Route 713) and Route 132 before entering the City of Williamsburg. The route then crosses Capital Landing Road (Route 5) and Merrimac Trail (Route 143) and reenters York County. In York County it crosses the Colonial Parkway, Hubbard Lane (Route 716), Queens Creek Road (Route 642), Wilkins Drive (Route 720) and Pinetree Road before reaching Interstate 64. The route then pivots slightly to the southeast and proceeds adjacent to Interstate 64 for approximately 1.98 miles, crossing Penniman Road (Route 641) and Route 199, before continuing behind the Williamsburg Country Club and across an Interstate 64 interchange for U.S. Route 60 and Route 143. Before entering James City County for a second time and crossing the Merrimac Trail (Route

143) and Pocahontas Trail (U.S. Route 60) to the existing Kingsmill Substation, the route splits into two separate, existing rights-of-way with each section following an existing right-of-way. To the north, the existing right-of-way is 150 feet wide and currently contains a line of 230/115 kV wood pole structures (Lines #209 and #58). The existing structures would be removed and replaced with metal poles carrying a single circuit 500 kV line that would be placed in the center of the right-of-way. To the south, the existing right-of-way is 100 feet wide and contains a line of steel pole structures with 230 and 115 kV lines (Lines #285 and #34). The 115 kV line would be replaced with a second 230 kV line, turning the structures into a double circuit 230 kV line. The route of the new double circuit 230 kV line would also include a tie-in to the Kingsmill Substation, which would require approximately four acres of new right-of-way.

From the Kingsmill Substation, the two routes continue to the southeast for approximately 1.82 miles, cross U.S. Route 60 again, and parallel Interstate 64, before converging at Tadich Drive after crossing a mobile home development. The route then continues for an additional 0.30 mile and terminates at the site of the proposed Skiffes Creek Switching Station.

230 kV Skiffes Creek-Whealton Line

The proposed Skiffes Creek-Whealton 230 kV Transmission Line will consist of a new, approximately 20.2-mile-long 230 kV transmission line between the proposed Skiffes Creek Switching Station and the existing Whealton Substation. This new transmission line will be constructed within Dominion Virginia Power's existing right-of-way and will cross parts of James City County, York County, the City of Newport News, and the City of Hampton. From the proposed Skiffes Creek Switching Station, the line will proceed in a southeasterly direction for 3.69 miles, crossing U.S. Route 60, Green Mount Industrial Park, and Skiffes Creek to enter the City of Newport News, before crossing U.S. Route 60 again near the Newport News Fire Training Facility, and a CSX railroad track. After crossing the railroad, the route turns to the southeast to parallel the CSX corridor for a distance of 1.86 miles across the Lee Hall Reservoir and Fort Eustis Boulevard (Route 105) and Industrial Park Drive. The route then pivots northeast for 1.94 miles, crossing Industrial Park Drive again, Interstate 64 to parallel another CSX railroad corridor across Jefferson Avenue (Route 143) and Shields Road, entering York County before crossing Richneck Road (Route 636). The route then turns in a southeasterly direction for a distance of 7.27 miles to travel around the eastern perimeter of the Newport News/Williamsburg International Airport, crossing Denbigh Boulevard (Route 173), the Harwoods Mill Reservoir, Oriana Road (Route 620), Harwoods Mill Reservoir again, and through the Villages of Kiln Creek Residential Golf Community, crossing Talleyho Drive and Kiln Creek Parkway twice as it enters the City of Newport News. The existing right-of-way continues around the eastern side of Interstate 64 and Victory Boulevard, and crosses Victory Boulevard, Lake View Drive, Old Oyster Point Road, and Interstate 64. The route then continues in a southeasterly direction for 5.45 miles through commercial and residential areas; it enters the eastern side of Oyster Point of Newport News crossing Omni Way, Diligence Drive and J. Clyde Morris Boulevard (U.S. Route 17). The existing right-of-way then enters a more residential area, crossing Rumson Avenue, Courtney Avenue, Bruton Avenue, Harpersville Road, Benns Road, Robinson Drive and Hampton Roads Center Parkway before entering the City of Hampton Roads. The remainder of the existing right-of-way passes through residential development and crosses the following subdivision roads: Tripp Terrace, Devore Avenue, Michael Woods Drive, Dunn Circle, Castle Haven Road, Whetstone Drive, Ridgecrest Drive and Sherry Dell Drive, Todds Lane (Route 152), Lundy Lane, the intersection of Cordova and Whealton Road, Albany Drive and Hazelwood Road into Dominion Virginia Power's existing Whealton Substation located between Hazelwood Road and Threechopt Road, one block north of Mercury Boulevard (U.S. Route 258).

Skiffes Creek Switching Station

The Skiffes Creek Switching Station will be constructed on a 51-acre parcel in James City County. The parcel is located in a forested area and is crossed by a Dominion Virginia Power existing electric transmission line right-of-way. The parcel is bounded to the west by forested land, to the south by Dominion Virginia Power's right-of-way, to the north by a railroad and State Route 143 north of the railroad, and to the east by more forested land.

2. Environmental Analysis

A. Air Quality

Construction of the Project will require that trees be cleared on the right-of way. On the 500 kV Proposed Route (Surry-Skiffes Creek), most of the logs from those trees would be removed and the remaining limbs and branches chipped and spread on the upland portions of the right-of-way. On the 500 kV Alternate Route (Chickahominy-Skiffes Creek), those trees would be windrowed on the right-of-way in rural areas not in the vicinity of homes or public use areas. For the 230 kV Skiffes Creek-Whealton line, only minimal clearing is expected in the existing right-of-way. The Company does not expect to burn cleared material, but, if necessary, the Company will coordinate with the responsible locality to obtain these permits and will comply with any conditions set forth by the locality. Equipment and vehicles that are powered by gasoline or diesel motors will be used during the construction of the line so there will be exhaust from those motors. During construction, if the weather is dry for an extended period of time, there will be airborne particles from the use of vehicles and equipment within the right-of-way. However, minimal earth disturbance will take place and vehicle speed, which is often a factor in airborne particulate, will be kept to a minimum. Erosion and sedimentation control is addressed in Section 2.G of this Supplement.

B. Water Source

(No water source is required for transmission lines so this discussion will focus on waterbodies that will be crossed by the proposed transmission lines.)

NRG identified and mapped waterbodies in the Project area using publicly available Geographic Information System ("GIS") databases, USGS topographic maps, and recent (2011) digital aerial photography.

Both the 500 kV Proposed Route (Surry-Skiffes Creek) and the 500 kV Proposed Route with the James River Crossing Variation 1 cross Wood Creek and the James River. The 500 kV Proposed Route with James River Crossing Variations 2 and 3 cross the James River but avoid crossing Wood Creek. Construction of the 500 kV Proposed Route would require crossing of the James River between MPs S1.5 and S5.1 in a location identified by the VDGIF as confirmed anadromous fish waters. The 500 kV Proposed Route traverses the James River for approximately 18,902 feet in this location. James River Crossing Variation 1 would cross anadromous fish waters between MPs S1.5 and JV1-4.0 for approximately 21,754 feet. James River Crossing Variation 2 would cross anadromous fish waters between MPs S1.5 and JV2-3.7 for approximately 20,170 feet. James River Crossing Variation 3 would cross anadromous fish waters between MPs S1.5 and JV3-4.0 for approximately 21,806 feet.

The VDGIF Anadromous Fish Use dataset also identified Wood Creek/Skiffes Creek as potential anadromous fish waters. Construction of the 500 kV Proposed Route or James River Crossing Variation 1 would require crossing of the Wood Creek/Skiffes Creek between MPs S5.8 and S5.9 in proximity to a location identified by the VDGIF as potential anadromous fish waters. The 500 kV Proposed Route and

James River Crossing Variation 1 traverse Wood Creek/Skiffes Creek for approximately 300 feet in this location. This crossing is capable of being spanned without affecting Wood Creek/Skiffes Creek. The James River is considered to be a navigable water, and crossing the James River in this location will require a permit and/or coordination with the COE.

The 500 kV Proposed Route will require the placement of approximately 16 structures within the James River. Seventeen in-stream structures would be required for the 500 kV Proposed Route with the James River Crossing Variation 1, 15 in-stream structures would be required for the 500 kV Proposed Route with the James River Crossing Variation 2, and the 500 kV Proposed Route with the James River Crossing Variation 3 would require 16 in-stream structures. Each structure in the James River will consist of a lattice structure with four support foundations and will require a total of approximately 20 piles; approximately five piles per foundation connected together at the top with a poured in-place concrete cap. Each pile will be driven into the subsurface below the river bottom to the required design depth. Vertical and battered piles will be utilized to satisfy design requirements. Anticipated maximum dimensions for the concrete cap are 12-foot by 12-foot by 6-foot. The top of the cap will be installed approximately 15 feet above the waterline. Total structure footprint with foundations will require a total area of approximately 90-feet by 90-feet for structures taller than 200 feet in height and 60-feet by 60-feet for structures less than 200 feet in height. A fender system consisting of driven piles will also be placed along the channel side of the those structures to protect them from collisions with ship traffic. The fenders will be approximately 100 linear feet.

Assembly and installation of all river structures will proceed in the same manner as for land construction but from barges, and conductors and shield wires will likely be initially pulled by boat across the river. Additionally, structures will be located in the James River at least 250 feet from the edge of designated shipping lanes and outside of designated dredge spoil areas, per direction from the COE and the USCG.

500 kV Alternate Route (Chickahominy-Skiffes Creek)

The 500 kV Alternate Route crosses Scotts Pond in James City County, and Waller Mill and Williamsburg Country Club Lake Reservoirs in York County. Scotts Pond is a small (approximately 6-acre) waterbody located adjacent to Route 199 to the east in James City County. The Alternate Route crosses Scotts Pond near MP C26.8. Waller Mill Reservoir is a 360-acre reservoir owned by the City of Williamsburg located within the boundaries of Waller Mill Park. The Alternate Route crosses the Waller Mill Reservoir between MPs C29.6 and C29.8. Williamsburg Country Club Lake Reservoir is an approximately 13-acre waterbody located adjacent to the Williamsburg Golf Course. The Alternate Route crosses Williamsburg Country Club Lake Reservoir between MPs C35.2 and C35.3.

The proposed average 900-foot span between transmission line structures should be adequate to span Scotts Pond, Waller Mill Reservoir, and Williamsburg Country Club Lake. The remaining streams and other surface water crossings are also narrow enough that they can likely be spanned with normal range of spacing and height of the structures. Since no additional tree clearing or areas outside of the existing right-of-way will be required at these locations, construction and operation of the Project would not significantly affect surface water features along the Alternate Route.

In addition to public water supply reservoirs, scattered lakes and ponds, the Alternate Route crosses several stream systems, including: Possum Run, Bradley Run, East Run, Stony Run, Collins Run, Dockman Swamp, Tonyham Swamp, Barrows Creek, Parson Creek, Blackstump Creek, Chickahominy River, Gordon Creek, Colby Swamp, Yarmouth Creek, Longhill Swamp, Chisel Run, Queen's Creek, Whiteman Swamp, Rhine River, King's Creek, Skiffes Creek, and their associated tributaries.

The Chickahominy River meanders throughout much of the area north of the Alternate Route before flowing to the south across the Alternate Route between MPs C18.2 and C18.5, eventually outfalling to the James River. Construction of the Alternate Route would require crossing the Chickahominy in a location identified by the VDGIF as confirmed anadromous fish waters. The Alternate Route traverses the Chickahominy River for approximately 1,840 feet in this location. The Chickahominy River south of Walker Dam Lock is considered to be a navigable waterbody, and crossing the Chickahominy River in this location would require a permit and/or coordination with the COE.

A transmission line structure would be required to be placed in the water for the crossing of the Chickahominy River. It would consist of a 195-foot-tall steel pole H-frame structure requiring two foundations. The poured in-place concrete top portion of the pile supported foundation for each H-frame leg would consist of a concrete cap with a concrete pedestal extending above the cap top. Anticipated maximum dimensions for the concrete cap and pedestal are 20-foot by 20-foot by 6-foot thick and 10-foot by 10-foot by a field determined thickness, respectively. The top of the concrete pedestal would be installed approximately 10 feet above the waterline. Total structure footprint with foundations would be approximately 56-feet by 20-feet. The two foundations would be constructed in a similar manner as described above for the James River.

230 kV Skiffes Creek-Whealton Line

The 230 kV Skiffes Creek-Whealton line crosses Harwoods Mill in York County and Lee Hall Reservoir in the City of Newport News. Harwoods Mill Reservoir is a 265-acre impoundment that is the terminal reservoir for the City of Newport News water supply system. Water is pumped into Harwoods Mill from Chickahominy, Diascund, and Little Creek reservoirs. The Skiffes Creek-Whealton transmission corridor crosses Harwoods Mill Reservoir two times - between MPs W10.4 and W10.5 and between MPs W11.8 and W12.0. Construction of the Skiffes Creek to Whealton Section will require reconfigured crossings of Harwoods Mill Reservoir; however, no additional right-of-way will be required. The existing right-of-way is 250 feet in width between MPs W10.99 and W11.92; however, only approximately 150 feet of the right-of-way has been cleared of vegetation. Due to the proximity of the existing right-of-way to Newport News/Williamsburg International Airport, Dominion Virginia Power will need to clear the remaining 100 feet of its existing right-of-way to accommodate the construction of additional structures in this area. No additional clearing will be required elsewhere along the 230 kV Skiffes Creek-Whealton line.

Lee Hall is a 230-acre reservoir owned by the City of Newport News. The reservoir is located within the Newport News Park. Lee Hall Reservoir is located a few miles to the west of Newport News and is easily visible from Interstate 64 and State Route 143. Both roads have bridges that cross the reservoir. The bridges of these two roads divide the upper and middle basins of the reservoir. The middle and lower basins are connected by pipe, and fishing is prohibited from the lower basin.

In addition to public water supply reservoirs, scattered lakes and ponds, the route crosses several stream systems, including: Skiffes Creek, Warwick River, Poquoson River, Brick Kiln Creek, Newmarket Creek, and their associated tributaries.

The waterbodies crossed by the 230 kV Skiffes Creek-Whealton line can be spanned with normal spacing and height of the structures. Since only minimal clearing of the existing right-of-way will be required, construction and operation of the Project would not significantly affect surface water features along this transmission line route.

Construction of the 230 kV Skiffes Creek-Whealton line will require crossing Skiffes Creek between MPs W18.2 and W18.5 in a location identified by the VDGIF as potential anadromous fish

waters. The 230 kV Skiffes Creek-Whealton line traverses Skiffes Creek for approximately 750 feet in this location and will likely be spanned without impacts on Skiffes Creek. Skiffes Creek is considered to be a navigable water, and crossing Skiffes Creek in this location will require a permit and/or coordination with the COE.

Skiffes Creek Switching Station

The Skiffes Creek Switching Station is sited primarily within an upland, forested area. Skiffes Creek and its associated wetlands are located approximately 800 feet south of the existing right-of-way. An unnamed tributary to Skiffes Creek and its associated floodplain wetlands are located within the Project corridor approximately 1,300 feet southeast of Tadich Drive.

Conclusion

With the exception of the James River and Chickahominy Rivers, no transmission structures are anticipated to be placed in streams for the proposed new facilities. Any clearing required at these locations will be performed by hand within 100 feet of the streams, and vegetation less than three inches in diameter will be left undisturbed. The Company will seek to avoid crossing these streams with equipment, but, if it is necessary, culverts will be used as indicated in the Company's Erosion and Sediment Control Specifications approved annually by the Department of Conservation and Recreation. A Wetlands Impact Analysis was performed (see Section 2.D below), and structures will be placed to avoid wetland areas whenever possible.

A Joint Permit Application ("JPA") will be submitted for review to the VMRC, Local Wetland Boards, DEQ and the COE to cross jurisdictional waterways and for any impacts to jurisdictional waters. The VMRC typically issues a permit to encroach over state-owned subaqueous land, and DEQ has a Water Protection General Permit for Utilities (WP2). The local wetland boards have authority over tidal shores. Correspondence from the COE regarding the Project is provided in Attachment 2.B.

C. Discharge of Cooling Waters

No discharge of cooling waters is associated with the Project.

D. Tidal and Non-tidal Wetlands

NRG has identified wetlands within the Project area using data provided by the Williamsburg Environmental Group, Inc. ("WEG"). WEG employed several offsite desktop data resources to map wetlands. A copy of WEG's report is included in Appendix F of the Environmental Routing Study. These sources included the U.S. Geological Survey ("USGS") 7.5 minute series topographic quadrangle maps, the National Wetland Inventory Online Maps from the U.S. Fish and Wildlife Service ("FWS"), soils data from the Natural Resources Conservation Service Web Soil Survey, Digital Orthophoto Quarter Quads dating from March of 1994, and aerial photography dating from 2005. WEG did not field delineate wetlands within the Project area.

While most wetlands will be spanned, forested wetlands (PFO1-4) and scrub-shrub wetlands (PSS1-7) will require at least initial vegetation clearing, and forested wetlands will be permanently converted to scrub-shrub wetlands. All wetlands will require protective matting to be installed to support construction vehicles and equipment and materials during construction.

500 kV Proposed Route (Surry-Skiffes Creek)

Approximately 2.64 acres of wetlands (not including the James River) crossed by the Surry Alternative would be implicated during construction. These areas include 0.62 acre of forested wetlands (24%), 0.82 acre of emergent and scrub-shrub wetlands (31%), and 1.20 acres of tidal wetlands (45%). Construction of this route will require the permanent conversion of 0.62 acre of forested wetlands to a scrub-shrub community.

If the James River Crossing Variation 1 were incorporated into the 500 kV Proposed Route, about 2.64 acres of wetlands (not including the river) crossed would be implicated during construction. These areas include 0.62 acre of forested wetlands (23%), 0.82 acre of emergent and scrub-shrub wetlands (31%), and 1.20 acres of tidal wetlands (45%). Construction of this route would require the permanent conversion of 0.62 acre of forested wetlands to a scrub-shrub community.

If James River Crossing Variation 2 were incorporated into the 500 kV Proposed Route, about 1.17 acres of wetlands (not including the river) crossed would be implicated during construction. These areas include 0.73 acre of forested wetlands (62%), and 0.44 acre of emergent and scrub-shrub wetlands (38%). Construction of this route would require the permanent conversion of 0.73 acre of forested wetlands to a scrub-shrub community.

If James River Crossing Variation 3 were incorporated into the 500 kV Proposed Route, about 1.17 acres of wetlands (not including the river) crossed would be implicated during construction. These areas include 0.73 acre of forested wetlands (62%), and 0.44 acre of emergent and scrub-shrub wetlands (38%). Construction of this route would require the permanent conversion of 0.73 acre of forested wetlands to a scrub-shrub community.

500 kV Alternate Route (Chickahominy-Skiffes Creek)

Based on WEG's Offsite Wetland and Waters Analysis data, the Chickahominy Alternative would cross about 7.55 miles of wetland habitat, and would require the clearing and/or disturbance of up to about 145.61 acres of wetland area. Of the 145.61 acres of wetland habitat that could be disturbed along this route, about 106.91 acres (73%) consist of forested wetlands, while about 31.33 acres (22%) consist of scrub-shrub wetlands, and 7.37 acres (5%) consist of tidal wetlands. All tidal wetlands are associated with the Chickahominy River crossing.

230 kV Skiffes Creek-Whealton Line

Based on WEG's Offsite Wetland and Waters Analysis data, the 230 kV Skiffes Creek-Whealton line will cross about 4.32 miles of wetland habitat and will require the clearing and/or disturbance of up to approximately 80.30 acres of wetland area. The existing right-of-way measures 250 feet in width between MPs W10.99 and W11.92; however, only approximately 150 feet of the right-of-way has been cleared of vegetation. Due to the proximity of the existing right-of-way to Newport News/Williamsburg International Airport, Dominion Virginia Power will need to clear the remaining 100 feet of its existing right-of-way to accommodate the construction of additional structures in this area. No additional clearing will be required elsewhere along the Skiffes Creek to Whealton Section. Of the 80.30 acres of wetland habitat that could be disturbed along this route, about 76.36 acres consist of scrub-shrub wetlands (95%), and 2.33 acres (3%) consist of tidal wetlands and 1.61 acres of forested wetlands (2%). The remaining 13% consists of freshwater streams, lakes and ponds. All tidal wetlands are associated with the crossing of Skiffes Creek.

Skiffes Creek Switching Station

The Skiffes Creek Switching Station is sited primarily within an upland, forested area. Skiffes Creek and its associated wetlands are located approximately 800 feet south of the existing right-of-way. An unnamed tributary to Skiffes Creek and its associated floodplain wetlands are located within the Project corridor approximately 1,300 feet southeast of Tadich Drive. The Skiffes Creek Switching Station will be sited in order to minimize impacts to the onsite wetlands to the extent practicable.

E. Solid and Hazardous Waste

A database search was conducted to identify solid and hazardous waste sites within the existing and proposed rights-of-way for this Project. The database included Federal CERCLIS, EPA and RCRA information, and DEQ's Solid Waste Management Facilities/Landfill Site (SWF/LF) and Voluntary Remediation Program ("VRP") databases.

A summary of the information from the EPA and DEQ databases regarding sites within or directly adjacent to the study area and within 0.5 mile of the Proposed and Alternate Routes centerlines and the 230 kV Skiffes Creek-Whealton line is provided in Attachment 2.E.1 and depicted on Figure 2.E.1. Comments received from James City County on the Proposed Route are provided in Attachment 2.E.2.

Care will be taken to operate and maintain construction equipment to prevent any fuel or oil spills. Any waste created by the construction crews will be disposed of in a proper manner and recycled where appropriate and will be further detailed in the Company's stormwater pollution prevention plan, a component of the Virginia Stormwater Management Program, which will be submitted to the Virginia Department of Conservation and Recreation ("VDCR").

F. Natural Heritage, Threatened and Endangered Species

In order to identify areas of ecological significance within the Project area, NRG obtained a copy of the VDCR Natural Heritage Resources ("NHR") screening dataset. Species occurrence data was also obtained from the VDCR's NHR Program and from the VDGIF to identify locations within the study area that potentially support protected species. NRG also conducted county queries of the VDCR NHR website, the VDGIF Virginia Fish and Wildlife Information Service website, and reviewed the FWS, Virginia Field Office county lists. Species occurrences reported by the FWS and VDCR NHR datasets were evaluated against the VDGIF's digital EnviroReview Listed SppObs data, and the VDCR's Element Occurrence Representations ("EOReps") datasets. To obtain the most current eagle nest data, NRG reviewed the Center for Conservation Biology ("CCB") "VAEagles" website, which provides information about the Virginia bald eagle population including the results of the CCB's annual eagle nest survey. If deemed necessary, surveys will be conducted at the appropriate time to determine if these species are present, and Dominion Virginia Power will coordinate with VDGIF and VDCR as appropriate to minimize any impact on these resources. The agency/county lists of threatened and endangered species are provided in Attachment 2.F.1.

500 kV Proposed Route (Surry-Skiffes Creek)

The VDCR data identified two Conservation Sites crossed by the 500 kV Proposed Route. If any of the James River Crossing Variations were incorporated into the Proposed Route, the resulting route would cross these same two sites in the same locations. The 500 kV Proposed Route crosses the Gravel Neck Conservation Site (MPs S0.8 to S1.3) and the Powerplant Outfall Habitat Zone (MPs S1.3 to S1.7). The James River Crossing Variations 1, 2 and 3 also cross the Gravel Neck Conservation Site (MPs S0.8

to S1.3) and the Powerplant Outfall Habitat Zone (MPs S1.3 to JV1-0.1, S1.3 to JV2-0.1, and S1.3 to JV3-0.1, respectively). Both sites have a NHR biodiversity ranking of B5 and are identified as having at least one state-listed species present. Both of these areas are located in Surry County, adjacent to the cooling water canal and extend into Hog Island WMA. The 500 kV Proposed Route, including Variations 1, 2 or 3, spans approximately 0.35 mile of the Gravel Neck Conservation Site and 0.33 mile of the Powerplant Outfall Habitat Zone. The Surry County portion of the 500 kV Proposed Route would be located within existing right-of-way; therefore, no additional clearing would be required. The 500 kV Proposed Route is not located within any areas identified by the VDCR as Karst Screening Areas. If any of the James River Crossing Variations were incorporated into the Proposed Route, the resulting route also would not be located within any areas identified by the VDCR as Karst Screening Areas.

The FWS county lists, VDCR's NHR Program and VDGIF identify ten federally listed species protected under the Endangered Species Act that have the potential to occur within the Proposed Route. These species include the Atlantic Sturgeon (*Acipenser oxyrinchus*) small whorled pogonia, the sensitive joint-vetch (*Aeschynomene virginica*), the bald eagle (*Haliaeetus leucocephalus*), narrow-leaved spatterdock (*Nuphar sagittifolia*), New Jersey rush (*Juncus caesariensis*), banded sunfish (*Enneacanthus chaetodon*), Eastern big-eared bat (*Corynorhinus rafinesquii macrotis*), barking treefrog (*Hyla gratiosa*), and Mabee's salamander (*Ambystoma mabeei*).

The FWS county lists, VDCR's NHR Program and VDGIF identify four (4) federal species of concern ("SOCs") and non-listed species that may potentially occur within the corridor for the Proposed Route, including Virginia least trillium (*Trillium pusillum var. virginianum*), creamflower tick-trefoil (*Desmodium ochroleucum*), the mountain camellia (*Stewartia ovata*), and the rare skipper (*Problema bulenta*).

Species occurrences reported by the FWS Virginia Field Office county lists were evaluated against the VDGIF's digital EnviroReview Listed SppObs data, and the VDCR's Element EOReps datasets, which display species occurrences at the local level. The VDCR EOReps and VDGIF Listed SppObs datasets did not identify any species occurrences intersecting the right -of-way for the Proposed Route.

Based on the CCB 2011 survey, the Primary Management Zone of Nest SU0901 is intersected by the right-of-way for the 500 kV Proposed Route and James River Crossing Variations between MPs S1.3 and S1.6 in Surry County. The Secondary Management Zone of Nest SU0901 is intersected by the right-of-way for the 500 kV Proposed Route and James River Crossing Variation 1 from MP S1.1 to MP S1.8 and from MP S-1.1 to MP JV1-0.2, respectively. The Secondary Management Zone of Eagle Nest SU0501 is intersected by the right-of-way for James River Crossing Variations 1 and 3, from MP JV1-1.0 to MP JV1-1.5 and from MP JV3-1.0 to MP JV3-1.4, respectively.

500 kV Alternate Route (Chickahominy-Skiffes Creek)

The VDCR data identified seven Conservation Sites crossed by the Alternate Route, two of which are identified as having state-listed species present. One of the seven sites in the study area is ranked B1 (Outstanding priority), four sites are ranked B2 (Very High priority); one is ranked B3 (High priority); and one of the seven sites is ranked B5, the lowest ranking, which indicates that the area is "of general biodiversity significance." In addition the VDCR data identified three General Location Areas, all of which were identified as "vascular plant" locations with no further detail provided. The Alternate Route is not located within any areas identified by the VDCR as Karst Screening Areas.

The FWS county lists, VDCR's NHR Program and VDGIF identify 13 federal and state-listed species protected under the federal Endangered Species Act ("ESA") and the Virginia ESA that have the

potential to occur within the right-of-way of the Alternate Route. These species include the Atlantic sturgeon (*Acipenser oxyrinchus*), small whorled pogonia (*Isotria medeoloides*), swamp pink (*Helonias bullata*), sensitive joint-vetch, the bald eagle, Harper's fimbristylis (*Fimbristylis perpusilla*), narrow-leaved spatterdock, New Jersey rush, canebrake rattlesnake (*Crotalus horridus*), tiger salamander (*Ambystoma tigrinum*), barking treefrog, peregrine falcon (*Falco peregrinus*) and Mabee's salamander.

The FWS county lists, VDCR's NHR Program and VDGIF identify four federal SOCs and non-listed species that may potentially occur within the Alternate Route corridor, including the Virginia least trillium, winter quillwort (*Isoetes hyemalis*), the mountain camellia and the rare skipper.

The VDCR EOReps dataset identified one occurrence of the small whorled pogonia within the Alternate Route. The occurrence was documented in 2005 in association with the Lightfoot Conservation Site and is located between MPs C24.2 and C24.3 in James City County. An isolated occurrence of the Mountain Camellia was documented within the Lightfoot to Skiffes Creek Section of the Alternate Route. The Mountain Camellia occurrence was documented within the Grove Creek Conservation Site in 2002 between MPs C35.8 and C36.2 in James City County.

Based on the CCB's 2011 survey, the Primary Management Zone of Eagle Nest JC1101 intersects the Alternate Route corridor between MPs C19.4 and C19.5 in James City County. The VAEagles website also indicates Secondary Management Zone of Eagle Nest JC0404 intersects the Alternate Route corridor between MPs C18.9 and C19.1 in James City County, and the Secondary Management Zone of Eagle Nest JC0403 intersects the Alternate Route corridor between MPs C19.2 and C19.8 in James City County.

230 kV Skiffes Creek-Whealton Line

The VDCR data identified two Conservation Sites crossed by the 230 kV Skiffes Creek-Whealton line. The Grafton Ponds Conservation Site and the Airport-TABB Conservation Site are both identified as having state-listed species present. The NHR ranks Grafton Ponds as B2 – Very High priority, and Airport-TABB as B5 – general interest conservation lands. The proposed Skiffes Creek-Whealton line is not located within any areas identified by the VDCR as Karst Screening Areas.

The FWS county lists, VDCR's NHR Program and VDGIF identify 15 federally listed species protected under the federal ESA and the Virginia ESA that have the potential to occur within the 230 kV Skiffes Creek-Whealton route. These species include the Atlantic sturgeon, small whorled pogonia, sensitive joint vetch, Northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*), piping plover (*Charadrius melodus*), bald eagle, Harper's fimbristylis, narrow-leaved spatterdock, New Jersey Rush, canebrake rattlesnake, tiger salamander, barking treefrog, gull-billed tern (*Gelochelidon nilotica*), peregrine falcon, and Mabee's salamander.

The FWS county lists, VDCR's NHR Program and VDGIF identify nine (9) federal SOCs and non-listed species that may potentially occur within the Skiffes Creek-Whealton corridor, including the Virginia least trillium, Cuthbert's turtlehead (*Chelone cuthbertii*), false hop sedge (*Carex lupuliformis*), lance-leaved loosestrife (*Lythrum lanceolatum*), mountain camellia, pine-barren reed grass (*Calamovilfa brevipilis*), slender marsh pink (*Sabatia campanulata*), umbrella flatsedge (*Cyperus diandrus*), and the rare skipper.

Based on species occurrence data from the VDCR and VDGIF, the 230 kV Skiffes Creek-Whealton line right-of-way intersects the documented occurrences of three state-listed species, including Harper's fimbristylis, the canebrake rattlesnake (*crotalus horridus*) and Mabee's Salamander (*Ambystoma mabeei*). The 230 kV Skiffes Creek-Whealton line right-of-way also intersects the documented

occurrences of six non-listed species, including Cuthbert's turtlehead, false hopsedge, lance-leaved loosestrife, pine-barren reed-grass, slender marsh pink, and umbrella flatsedge.

NRG and Dominion Virginia Power observed one bald eagle perching on an existing transmission structure within the existing right-of-way for the Skiffes Creek-Whealton line right-of-way during January 2012. A nest was observed at the top of the structure, located in Harwoods Mill Park, York County, in proximity to MP W11.1. A nest in proximity to this location was not reported by CCB, VDCR of VDGIF data. Additional surveys may be required prior to construction to determine the ownership and activity level of the nest. If an eagle nest is identified in this location, Dominion Virginia Power will work with the appropriate jurisdictional agencies to minimize any impacts to this species.

Based on the CCB's 2011 survey, the proposed 230 kV Skiffes Creek-Whealton line Section does not intersect any primary or secondary management zones as identified in The Bald Eagle Protection Guidelines for Virginia (2000).

Skiffes Creek Switching Station

The proposed Skiffes Creek Switching Station is not located within any areas identified by the VDCR as Conservation Sites, General Location Areas, or Karst Screening Areas.

The FWS county lists, VDCR's NHR Program, and VDGIF identify seven federally listed species protected under the federal ESA and the Virginia ESA that have the potential to occur within the Skiffes Creek Switching Station parcel. These species include the Atlantic sturgeon, sensitive joint vetch, the small whorled pogonia, narrow-leaved spatterdock, New Jersey rush, bald eagle, and Mabee's salamander. The Atlantic sturgeon primarily inhabits marine waters close to shore and is not likely to occur within the limits of the Skiffes Creek Switching Station parcel. Species-specific surveys may be required prior to construction to determine the potential, if any, of the proposed Project to affect these species. If identified, Dominion Virginia Power would work with the VDCR to minimize any impacts to these species.

Based on species occurrence data from the FWS, VDCR and VDGIF, no State or Federal listed SOCs have been documented within the vicinity of parcel on which the Skiffes Creek Switching Station will be developed. The FWS county lists, VDCR's NHR Program, and VDGIF identify two federal SOCs that may potentially occur within the vicinity of the proposed station, including the Virginia least trillium and the rare skipper, which also have the potential to occur onsite based on the wooded upland and riverine wetland habitat types in the Project vicinity. The Virginia least trillium and the rare skipper are Federal SOCs and are not state-listed. Personal communication with the VDCR indicated that these species are taken into consideration based on Global Rank.

Based on localized species occurrence data from the VDCR and VDGIF, no federally- or state-listed species or SOCs have been documented within the vicinity of Skiffes Creek Switching Station. However, given the wooded upland and riverine wetland habitat types in the Project vicinity, these federally- and state-listed species and SOCs have the potential to occur onsite. The VDCR EOReps dataset identified an isolated occurrence of the Mountain Camellia (*Stewartia ovata*) within Dominion Virginia Power's exiting right-of-way approximately 0.1 mile west of the Kingsmill Substation between MPs C35.9 and C36.2 in James City County. This species is not federally- or state-listed; however, it is ranked G4, meaning it is common and apparently secure globally, though it may be rare in parts of its range, especially at the periphery. Because the mountain camellia was documented in James City County, this species also has the potential to occur onsite.

Species-specific surveys may be required prior to construction to determine the potential, if any, of the proposed Project to affect the above referenced species. If such species are identified, Dominion Virginia Power would work with the VDCR to minimize any impacts to these species and their habitat.

Based on the CCB's 2011 survey, the Skiffes Creek Switching Station does not intersect any primary or secondary management zones as identified in The Bald Eagle Protection Guidelines for Virginia (2000). Construction of the Skiffes Creek Switching Station is anticipated to have no effect on the bald eagle. A copy of correspondence with the VDGIF regarding the Skiffes Creek Switching Station is provided in Attachment 2.F.2.

G. Erosion and Sediment Control

Dominion Virginia Power is required to submit annual erosion and sediment control specifications and an anticipated list of transmission line projects to VDCR for review and approval. Dominion Virginia Power's submittal for 2013 will likewise follow VDCR guidelines, and this project will be included in the submittal. These specifications are given to the Dominion Virginia Power's contractors and require erosion and sediment control measures to be in place before construction of the line begins and specify the requirements for rehabilitation of the right-of-way. A copy of the approval letter from the VDCR for the year 2012 is provided as Attachment 2.G to this Supplement.

H. Archaeological, Historic, Scenic, Cultural or Architectural Resources

On behalf of Dominion Virginia Power, Cultural Resources, Inc. ("CRI") conducted a Stage One Pre-Application analysis in accordance with the Virginia Department of Historical Resources ("VDHR") *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia (2008)* ("Guidelines"). Copies of CRI's cultural resources assessments are provided as Appendix G to NRG's Environmental Routing Study, which also summarizes CRI's findings as they pertain to the Project study area. CRI's reports discuss cultural resources within the VDHR tiered study area in greater detail, including the sites discussed below. Archeological sites are discussed first, followed by a presentation of the historic and architectural sites. Correspondence from VDHR dated January 9, 2012 is provided as Attachment 2.H.1. Consistent with the VDHR Guidelines, CRI's review considered National Historic Landmark ("NHL") properties located within a 1.5-mile radius of the centerline; National Register of Historic Places ("NRHP")-listed properties, NHLs, battlefields, and historic landscapes within a 1.0-mile radius of the centerline, NRHP-eligible and -listed properties, NHLs, battlefields, and historic landscapes within a 0.5-mile radius of the centerline; and architectural resources and archeological sites located within the right-of-way for each project component. Correspondence from the National Park Service ("NPS") dated April 17, 2012 is provided as Attachment 2.H.2.

Once a route is approved by the Commission, the VDHR may request a full archaeological and architectural survey be conducted pursuant to Section II of the VDHR *Guidelines*. Dominion Virginia Power will consult with the VDHR to determine those resources that will be assessed and develop strategies to avoid, minimize, or mitigate direct and indirect impacts on such resources. Additionally, Dominion Virginia Power will consult with the NPS to evaluate impacts on the Captain John Smith Chesapeake National Historic Trial ("NHT") and visual impacts on Civil War battlefields.

500 kV Proposed Route (Surry-Skiffes Creek)

Four previously recorded archaeological sites are located wholly or partially within the right-of-way for the Proposed Route. Two sites (44JC0649 and 44JC0650) are unevaluated. The VDHR

determined two sites (44JC0662 and 44JC0663) not eligible for listing in the NRHP. Site 44JC0662 was reported in 1991 as a late-eighteenth to late-nineteenth century domestic site identified within and adjacent to Dominion Virginia Power's existing transmission line corridor. Phase II evaluation of site 44JC0662 began in 1991, but was not completed. This excavation resulted in the identification of cellar features, post holes and post molds, and grave shafts. The VDHR considered the site eligible at that time. In 1994, a single transect of shovel tests was excavated across the site that resulted in the identification of a single piece of bottle glass. Based on the archaeological inventory in 1994, the site was recommended not eligible for listing in the NRHP, and the State Historic Preservation Office ("SHPO") concurred with this recommendation. However, CRI indicates that site 44JC0662 may retain archaeological potential and warrants further assessment to determine the integrity of archaeological deposits. If any of the James River Crossing Variations were incorporated into the Proposed Route, the same four archaeological sites (44JC0649, 44JC0650, 44JC0662, and 44JC0663) would be located within the right-of-way of the resulting route.

500 kV Alternate Route (Chickahominy-Skiffes Creek)

Ten archaeological sites occur within the right-of-way of the Chickahominy Alternative. Eight of the 10 sites have not been evaluated for listing in the NRHP (44CC0350, 44JC0195, 44JC1175, 44WB-0133-0001, 44WB0133-0002, 44YO0220, 44YO0524, and 44YO0757). Two unevaluated sites (44JC0195 and 44YO0757) have never been field verified through archaeological survey. Of the two remaining sites, the VDHR determined one site (44WB0066) eligible and one site (44JC1044) potentially eligible for listing in the NRHP.

230 kV Skiffes Creek-Whealton Line

Thirteen previously identified archaeological sites are located wholly or partially within the existing right-of-way of the 230 kV Skiffes Creek-Whealton line. One site, a cemetery (44JC0048), has been determined eligible for listing in the NRHP by the VDHR.

The DHR has determined three sites (44NN0060, 44YO0592 and 44YO1059) to be potentially eligible for listing in the NRHP and two sites (44JC0662 and 44JC0663) not eligible for listing in the NRHP. Site 44JC0662 is addressed in the previous discussion of the 500 kV Proposed Route. The remaining seven sites (44YO0092, 44YO0180, 44YO0181, 44YO0183, 44YO0233, 44YO0237 and 44YO0240) are unevaluated.

Skiffes Creek Switching Station

Site 44JO0662, which is addressed in the discussion of the 500 kV Proposed Route, is located within the parcel on which the proposed Skiffes Creek Switching Station will be constructed.

Historic and Architectural Sites

Twenty-nine historic and architectural sites considered within the tiered study area are located within 1.5 miles of all Project components. Four of the 29 sites were each assigned an architectural resource identification number by the VDHR and contain archaeological sites listed in the NRHP: Bryan Manor Plantation (44YO0007/099-0065); Bruton Parish Poorhouse (44YO0060/099-0070); Burwell's Mill Complex Archaeological District (Whittaker's Mill) (099-5275); and Oakland Farm Multiple Resource Area (Queen Hith Plantation) (121-0041). The Bryan Manor Plantation is an archaeological site; however, gravestones located in the cemetery within the site boundary represent the above-ground component. When last surveyed in 2007, the above-ground components of the Burwell's Mill Complex

Archaeological District (Whittaker's Mill) (099-5275) consisted of Civil War earthworks, the colonial road, and some structures at the mill site. The Bruton Parish Poorhouse and Oakland Farm Multiple Resource Area (Queen Hith Plantation) are archaeological sites that do not contain architectural structures. The Capitol Landing/Queen Mary's Port (137-0056), also assigned only an architectural resource identification number, was originally recorded as archaeological site and does not contain above-ground structures. The Bruton Poorhouse, Capitol Landing/Queen Mary's Port, and Oakland Farm Multiple Resource Area (Queen Hith Plantation) are not considered as architectural resources in this analysis. These archaeological sites are not located within the rights-of-way for the Proposed and Alternate Routes and were not considered in CRI's archaeological assessment. The locations of 26 historic and architectural sites are listed by nearest MP in Table H-1.

The Captain John Smith Chesapeake NHT, managed by the NPS, was established in 2006 as the first national water trail (NPS, 2011). The trail traces approximately 3,000 miles of John Smith's voyages on the Chesapeake Bay and nine of its major tributaries, including the Chickahominy and James Rivers, which are both crossed by Project components. This NHT is not reported as a site in the DHR database; however, the VDHR treats it as a National Register-eligible resource.

500 kV Proposed Route (Surry-Skiffes Creek)

Two architectural resources considered as part of the Stage One Pre-application process are located within 1.5 miles of the Proposed Route, including the Battle of Yorktown (099-5283) and Carter's Grove (047-0001). The Battle of Yorktown is within 1.0 mile, and Carter's Grove is within 0.5 mile, 1.0 mile, and 1.5 miles of the Proposed Route. Hog Island WMA (090-0121) is within 0.5 mile of the Proposed Route. The boundary of the Hog Island WMA architectural resource as reported in the VDHR files is not coterminous with the property boundary of the Hog Island WMA. The Proposed Route crosses the Captain John Smith Chesapeake NHT, and one unevaluated architectural resource, Sherry House (047-0113) is adjacent to or crossed by the right-of-way of the Proposed Route. The Spray King Car Wash (047-5059), a site determined to be ineligible, is located within the right-of-way. The Battle of Williamsburg is located within 1.5 miles of the Proposed Route. The American Battlefield Protection Program ("ABPP") of the NPS reports that portions of the Yorktown battlefield landscape have been altered and that many landscape features are intact. The VDHR considers the Battle of Yorktown as unevaluated for its NRHP-eligibility.

The results of CRI's field reconnaissance suggest that the Proposed Route and James River Crossing Variations 1 through 3 would result in minimal visual impact to the Battle of Yorktown. Only a small portion of the battlefield falls within the 1.5 miles of the Proposed Route and the three James River Crossing Variations and is located south of Route 60 adjacent to Skiffes Creek near the western boundary of the battlefield resource in this area. This portion of the battlefield is not a core engagement area, but rather a portion of the larger battlefield study area as defined by the ABPP. The portion of the battlefield adjacent to Skiffes Creek is wooded and low-lying and a residential subdivision is located within the battlefield boundary immediately to the east.

TABLE H-1

Surry-Skiffes Creek 500 kV Transmission Project
Skiffes Creek-Whealton 230 kV Transmission Line Project
Skiffes Creek 500-230-115 kV Switching Station
Historic and Architectural Resources within the Study Area

Transmission Line Section/ Site Number	Site Name	Nearest Milepost[a]
500 kV PROPOSED ROUTE (SURRY-SKIFFES CREEK)		
N/A	Captain John Smith Chesapeake NHT	S1.5[b]
090-0121	Hog Island Wildlife Management Area	S1.5[b]
099-5283	Battle of Yorktown (Civil War)	S5.4
047-0001	Carter's Grove	S6.3
047-0113	Sherry House	S6.8[b]
099-5282	Battle of Williamsburg (Civil War)	S7.4
500 kV PROPOSED ROUTE WITH JAMES RIVER CROSSING VARIATION 1		
N/A	Captain John Smith Chesapeake NHT	S1.5[b]
090-0121	Hog Island Wildlife Refuge	S1.5[b]
099-5283	Battle of Yorktown (Civil War)	JV1-4.0
047-0001	Carter's Grove	S6.3
047-0113	Sherry House	S6.8[b]
099-5282	Battle of Williamsburg (Civil War)	S7.4
500 kV PROPOSED ROUTE WITH JAMES RIVER CROSSING VARIATION 2		
N/A	Captain John Smith Chesapeake NHT	S1.5[b]
090-0121	Hog Island Wildlife Refuge	S1.5[b]
047-0001	Carter's Grove	JV2-3.9
099-5283	Battle of Yorktown (Civil War)	S6.9
047-0113	Sherry House	S6-.8[b]
099-5282	Battle of Williamsburg (Civil War)	S7.4
500 kV PROPOSED ROUTE WITH JAMES RIVER CROSSING VARIATION 3		
N/A	Captain John Smith Chesapeake NHT	S1.5[b]
090-0121	Hog Island Wildlife Refuge	S1.5[b]
047-0001	Carter's Grove	JV3-3.8
099-5283	Battle of Yorktown (Civil War)	S6.9
047-0113	Sherry House	S6.8[b]
099-5282	Battle of Williamsburg (Civil War)	S7.4
500 kV ALTERNATE ROUTE (CHICKAHOMINY-SKIFFES CREEK)		
018-5004	Saint Mary's Church Battlefield (Samaria Church)	C0.0 – C4.3[b]
018-0066	Moss Side	C10.9
018-5101	Old Main Road Rural Historic District	C11.0 – C12.2, C15.2 – C15.7[b]
018-0018	Poplar Springs	C11.3
018-0063	Piney Grove	C11.4
018-0037	Eagle's Nest (Eagle Lodge/Margots/Claybancke)	C18.0
137-0013	Sir Christopher Wren Building (William & Mary College, Main Building)	C30.9
137-0058	Wythe House	C31.1
137-0007	Bruton Parish Church	C31.1
137-0032	Peyton Randolph House (Peachy House)	C31.2
137-0050	Williamsburg Historic District	C31.2
137-0033	James Semple House (Randolph-Semple House)	C31.6
047-0002	Colonial National Historical Park/Colonial Parkway	C31.9[b]
099-5282	Battle of Williamsburg (Civil War)	C32.2 – C36.5[b]

TABLE H-1 (cont'd)

Surry-Skiffes Creek 500 kV Transmission Project
Skiffes Creek-Whealton 230 kV Transmission Line Project
Skiffes Creek 500-230-115 kV Switching Station
Historic and Architectural Resources within the Study Area

Transmission Line Section/ Site Number	Site Name	Nearest Milepost[a]
099-0040	Confederate Peninsular Defenses Fort 9 (Redoubt #9)	C33.1
099-0065	Bryan Manor Plantation Site	C33.2
099-5275	Burwell's Mill Complex Archaeological District (Whittaker's Mill)	C34.6
047-0001	Carter's Grove	C36.9
230 kV SKIFFES CREEK-WHEALTON LINE		
047-0001	Carter's Grove	W1.0
121-0016	Lee Hall	W2.3
099-5283	Battle of Yorktown (Civil War)	W2.4 – W12.5 [b]
121-5068	Village of Lee Hall Historic District	W2.8
099-5282	Battle of Williamsburg (Civil War)	W3.2 – W3.5 [b]
121-5031	Simon Read/Reid Curtis House (Boxwood Inn), 10 Elmhurst St	W3.4
121-0014	Lee Hall Railroad Station	W3.4
121-0050	Lee's Mill Earthworks (Battlefield Park)	W5.1[b]
121-0060	Battle of Dam #1 (Lee's Mill Battlefield/Newport News Park)	W6.6
114-5297	Big Bethel Battlefield (Civil War)	W19.4

[a] A set of mileposted topographic and aerial photo-based route maps can be found in Appendices I and J of the Environmental Routing Study prepared by NRG. The Surry Alternative and each of the three James River Crossing Variations have been mileposted independently. The milepost provided in the table for resources within proximity to the Surry Alternative and James River Crossing Variations represents the milepost of the closest route to the resource.

[b] Resource located either all or in part within the right-of-way.

Carter's Grove is a mid-eighteenth century dwelling listed in the NRHP and the Virginia Landmarks Register ("VLR"), and as a NHL. Additionally, Carter's Grove is protected under a historic preservation easement held by the VDHR. The plantation house is situated close the James River and is buffered from modern development to the east by mature tree stands. Route 60 intersects the northeastern corner of the property. An existing transmission line, residential development, and an industrial complex are within 0.5 mile of the property. A visual effects analysis for Carter's Grove included on-ground photography by CRI, photo simulations, and a GIS-based line of sight analysis for the Proposed Route and the James River Crossing Variations 1 through 3. The photo simulation and the line of site analysis for onshore and in-water portions of the alternatives were completed for the Proposed Route and the James River Crossing Variations 1 through 3 subsequent to CRI's field survey. The analysis of structures located in the James River was completed to assess site lines to each structure location from a point 6 feet off the ground from the front of the main house at Carter's Grove.

For the Proposed Route, these combined analyses suggest that five of the 15 structures in the river would be visible from the main house at distances between 2.4 and 3.3 miles. A line of sight analysis was also completed from a location between the main house of Carter's Grove and Route 60 (Pocahontas Trail) facing southeast to northeast to assess the view of the onshore portion of the Proposed Route. No structures on the Proposed Route are visible from the house due to the dense forest located between the house and the transmission line route. CRI's analysis verified that the natural terrain and the dense stands of mature trees create a visual barrier from the property to the onshore portions of the Proposed Route. CRI recommended that the onshore and in-water portions of the Proposed Route would have no or minimal visual impact on Carter's Grove, respectively.

If the James River Crossing Variation 1 were incorporated into the Proposed Route, the route would cross the Captain John Smith Chesapeake NHT, Hog Island WMA, and Sherry House. The

Proposed Route would partially cross the Spray King Car Wash (047-5059). Additionally, the Battle of Yorktown, Carter's Grove, and the Battle of Williamsburg would be located within the same distance buffers as for the Proposed Route. The GIS-based line of sight analysis and photo simulation from Carter's Grove to the James River Crossing Variation 1, verifies that three of the 16 structures in the river would be all or partially visible through breaks in the trees or over the top of trees. One structure would be wholly visible at a distance of about 2.0 miles; the top 246 feet of the second structure would be visible at about 1.7 miles; and only the top 40 feet of the third structure would be visible at 3.5 miles. CRI's analysis verified that the natural terrain and the dense stands of mature trees create a visual barrier from the property to the onshore portions of James River Crossing Variation 1 and does not represent a visual impact. CRI recommends that the in-water portion of the James River Crossing Variation 1 would have a moderate visual impact on Carter's Grove.

If the James River Crossing Variation 2 were incorporated into the Proposed Route, the route would cross the Captain John Smith Chesapeake NHT, Hog Island WMA, and Sherry House. The James River Crossing Variation 2 would partially cross the Spray King Car Wash (047-5059). Additionally, the Battle of Yorktown, Carter's Grove, and the Battle of Williamsburg would be located within the same distance buffers as for the Proposed Route. For the James River Crossing Variation 2, the line of sight analysis determined that six of the 14 structures in the river would be all or partially visible from Carter's Grove at distances between 1.7 and 3.0 miles. The photo simulation from Carter's Grove to the James River Crossing Variation 2 verifies that five full structures and the upper half of a sixth structure would be seen from this location. CRI recommends that the in-water portions of the James River Crossing Variation 2 would have a moderate visual impact on Carter's Grove.

If the James River Crossing Variation 3 were incorporated into the Proposed Route, the route the route would cross the Captain John Smith Chesapeake NHT, Hog Island WMA, and Sherry House. The James River Crossing Variation 2 would partially cross the Spray King Car Wash (047-5059). Additionally, the Battle of Yorktown, Carter's Grove, and the Battle of Williamsburg would be located within the same distance buffers as for the Proposed Route. For the James River Crossing Variation 3, the line of sight analysis verified only three of the 15 structures in the river would be all or partially visible. The nearest structure (27) at approximately 0.8 mile from Carter's Grove would be partially visible. Structures 25 and 26, which are the taller structures required to span the eastern shipping channel, would be visible at approximately 1.3 and 1.1 miles, respectively. The photo simulation from this location suggests that the height and closeness of structures represent a distinct new visual addition to the visual landscape surrounding Carter's Grove. CRI recommends that the James River Crossing Variation 3 would have a severe visual impact on Carter's Grove.

A line of sight analysis was also completed from a location between the main house of Carter's Grove and Route 60 (Pocahontas Trail) facing southeast to northeast to assess the view of the onshore portion of the route. No structures on the Proposed Route and the James River Crossing Variations 1 through 3 are visible from the house due to the dense forest located between the house and the transmission line route. Similarly, CRI's analysis verified that the natural terrain and the dense stands of mature trees create a visual barrier from the property to the onshore portions of the Proposed Route and the James River Crossing Variations 1 through 3. CRI recommends that Carter's Grove will not be impacted by the onshore portions of these four alternatives.

500 kV Alternate Route (Chickahominy-Skiffes Creek)

Eighteen architectural sites considered as part of the Stage One pre-application process are located within 1.5 miles of the Alternate Route. The Battle of Williamsburg (Civil War) (099-5282) and

the Old Main Road Rural Historic District (018-5101) are unevaluated. Moss Side (018-0066), Saint Mary's Church Battlefield (Samaria Church) (018-5004), and Confederate Peninsular Defenses Fort 9 (Redoubt #9) (099-0040) were determined eligible for listing in the NRHP by the VDHR. However, the Confederate Peninsular Defenses Fort 9 (Redoubt #9) was demolished by improvements to Interstate 64. The Colonial National Historical Park/Colonial Parkway (047-0002) is listed in the NRHP. Five sites are listed in the NRHP and VLR, including Poplar Springs (018-0018), Piney Grove (018-0063), Bryan Manor Plantation (099-0065), Burwell's Mill Complex and Archaeological District (Whittaker's Mill) (099-5275), Eagle's Nest (Eagle Lodge/Margots/Claybancke) (018-0037). An additional seven sites are listed in the NRHP and VLR, and are NHLs. These seven sites are located within 1.5 miles of the Alternate Route and each resource is briefly described below. Five of the 18 sites are located along the Chickahominy to Lightfoot Section, including Poplar Springs, Piney Grove, Moss Side, Eagle's Nest (Eagle Lodge/Margots/Claybancke), and Saint Mary's Church Battlefield (Samaria Church). The remaining 13 sites are located along the Lightfoot to Skiffes Creek Section.

Line of sight analyses were completed for four significant architectural resources, including Piney Grove (018-0063), Poplar Springs (018-0018), Eagle's Nest (01-0037), and Moss Side (018-0066). Piney Grove, Poplar Springs, and Eagle's Nest are listed in the NRHP and VLR, and Moss Side has been determined eligible for listing in the NRHP. Additionally, Saint Mary's Church Battlefield (018-5004), a site determined eligible for listing in the NRHP, was reviewed to determine the potential visual affect from the project based on the visual photo simulation study and CRI's report. A brief description of these analyses is addressed in the site descriptions below.

Four resources extend from the right-of-way to the 0.5-, 1.0-, and 1.5-mile buffers: the Battle of Williamsburg (099-5282); the Old Main Rural Historic District (018-5101); Saint Mary's Church Battlefield (018-5004); and Colonial National Historical Park/Colonial Parkway (047-002). The Battle of Williamsburg encompasses an estimated 10,370 acres. Colonial Williamsburg is located within the current battlefield boundary. Much of the battlefield has undergone modern development, including the construction of Interstate 64; the construction of modern residential neighborhoods, commercial, and industrial complexes; and the Newport News Golf Course. The Lightfoot Junction-Skiffes Creek Section of the Alternate Route right-of-way bisects the battlefield. CRI completed a visual effects assessment of the battlefield and recommended that the Alternate Route would minimally impact this resource.

The Old Main Road Rural Historic District is located in Charles City County along Route 615 and Route 623. The northern portion of the district is bound by the Chickahominy River. The Alternate Route crosses the Old Main Road Rural Historic District in areas of open fields and dense woods. Eighty-two previously recorded architectural resources are located within the district boundary. Three of the resources considered in the tiered study area are located within the Old Main Road Rural Historic District: Poplar Springs, Piney Grove, and Moss Side. The rural historic district was defined after CRI's completion of the visual assessment; however, photographs taken for Poplar Grove and Piney Springs suggest the Alternate Route would result in moderate impacts to some architectural resources. CRI recommended that the open design and relatively large spans between structures may minimize the overall visual impact on the district's landscape in certain areas.

Saint Mary's Church Battlefield (1864) is located in Charles City County. The battlefield landscape consists of open agricultural fields with tree lines as well as densely wooded areas. Architectural resources are scattered within the boundary of the battlefield; however, most are not associated with the battlefield. Routes 602, 603, and 609 cross portions of the battlefield resource. Additionally, the current Chickahominy Substation is located in the northwestern corner of the battlefield. CRI recommended that the open design and relatively large spans between structures may minimize the overall visual impact on the Saint Mary's Church Battlefield in certain areas.

As documented in the visual simulation study and CRI's field study, the area encompassed by the Saint Mary's Church Battlefield is currently a mixture of some rural agricultural areas, but mostly forested lands with interspersed houses, roads, existing transmission line rights-of-way, a landfill, and a sand and gravel mining area. Most of the transmission line in this area would be located either along existing transmission lines or located in forested areas. Distant views of the new structures would be along the same right-of-way as existing structures of the same height and appearance and would not be expected to significantly change the visual character of this area of the battlefield. Other areas are primarily forested and short, foreground views of the transmission line would be limited to along roadways.

The Colonial National Historical Park Colonial Parkway was constructed between 1930 and 1958 as a scenic roadway connecting Jamestown, Williamsburg, and Yorktown. Within most of the Lightfoot to Skiffes Creek Section of the Alternate Route the parkway is flanked by forested land. CRI's visual assessment indicated that the existing transmission line was not visible from the parkway except where the transmission line would cross the parkway. CRI recommended that Colonial Parkway would be minimally impacted by the Alternate Route.

Five architectural resources considered by the VDHR are located within the 0.5-mile buffer: Poplar Springs (018-0018); Piney Grove (018-0063); Moss Slide (018-0066); Confederate Peninsular Defenses Fort 9 (Redoubt #9) (099-0040); and Bryan Manor Plantation (099-0065). Poplar Springs also occurs in the 1.0-mile buffer. Poplar Springs, Piney Grove, and Moss Side are early-nineteenth century houses. Each house is surrounded by large trees and open fields.

Poplar Springs (c. 1809) is a one-and-a-half-story frame dwelling supported by a raised brick foundation, sitting on approximately 91 acres and accessed by a long straight gravel driveway. Photographs taken by CRI from public right-of-way at the end of the driveway in the direction of the Alternate Route indicate that the proposed Project would be visible from this resource. CRI reports that the Project could have a moderate visual effect on Poplar Springs.

Piney Grove (c. 1800) is a one-and-a-half-story frame dwelling constructed of logs in a hall and parlor plan, sitting on approximately 5.2 acres accessible from a long driveway. A variety of trees to the rear and north of the house provide vegetative screening. However, the view to the southeast observed by CRI lacks vegetative screening of the Alternate Route. Based on a review of aerial photographs and the field visit, CRI recommends that the Project may have a minimal visual effect.

Moss Side (c. 1850) is a wood-framed two-story dwelling. Several later outbuildings are located on the property and include a smoke/meat house (c. 1830), and a secondary dwelling and chicken coop (c. 1900). The house sits on a relatively level lot and is accessed from a long gravel driveway. Forested land largely surrounds the property; however, breaks in the forested areas may allow a line of sight of the Alternate Route from the house toward the northeast and southeast. Based on a review of aerial photographs and the field visit, CRI recommends that the Project may have a minimal visual effect.

Both Moss Side and Piney Grove are surrounded by dense woods with few openings as confirmed during CRI's field investigation. The line of site analysis suggests that only the top 23 feet of one structure would be visible from a distance of about 0.5 mile from Moss Side. All other structures that could reasonably be seen from Moss Site would be blocked by the tree cover surrounding the house. Similarly, the dense tree cover surrounding Piney Grove would block views of the structures that would be located near, and that could reasonably be expected to be seen from this historic property. Based on line of sight analysis, it was determined that the two structures that would be located directly west of the Poplar Springs main house would be entirely blocked from view by the dense forest documented during CRI's field investigation.

Eagle's Nest (Eagle Lodge/Margots/Claybancke) (018-0037), a site listed in the VLR and NRHP, is located within 1.0 mile of the Alternate Route. Eagles Nest is situated on a rise in the landscape that offers a view of the Chickahominy River and Eagle's Bottom Marsh. Large expanses of deciduous and evergreen trees are present to the north and northwest of the house. Photographs taken by CRI from the end of the driveway to the southeast toward the Alternate Route suggest that the route may be visible from Eagle's Nest. CRI recommends that the Project would result in minimal impact on this resource. For the line of sight analysis at Eagle's Nest, most of the structures that could potentially be seen from this location are located on the east side of the river as well as the two 195-foot-tall structures used to span the river. The analysis determined that the top 56 feet and 16 feet of the western and eastern structures used to span the river, respectively, would be visible from the front of the house. Additionally, the top 37 feet of the westernmost structure modeled would be visible. Fourteen structures would not be visible from Eagle's Nest due to a large-canopied tree located in the front yard that would block views from the front of the house towards the transmission line on the east side of the river.

The Confederate Peninsular Defenses Fort 9 (Redoubt #9) was demolished by road improvements to Interstate 64. No visual impact would result from the Alternate Route.

Bryan Manor Plantation archaeological site is a mid-eighteenth century plantation complex. The site was listed on the NRHP in 1978. When last surveyed, the above-ground components of the Bryan Manor site consisted of gravestones located in the cemetery. The site was inaccessible at the time of the CRI's fieldwork; therefore, the condition of the gravestones is unknown. The site, which is heavily wooded, is located on the southwestern side of Interstate 64. Modern development occurs to the northwest, west and southwest of the resource. CRI recommends the Project would have minimal impact on the Bryan Manor Plantation.

One site is located within 0.5- and 1.0-mile buffers: Burwell's Mill Complex and Archaeological District (Whittaker's Mill) includes five archaeological sites adjacent to King's Creek. The location of the site is largely forested with deciduous trees and some evergreens. The site consists of a mill dam, mill race, borrow pit, mill foundation, and two structure foundations. Domestic sites and brick kilns associated with the mill complex, Civil War earthworks, and a segment of the principal colonial road between Williamsburg and Yorktown are represented within the district. The site was listed on the NRHP in 2008. When last surveyed in 2007, the above-ground components of the Whittaker's Mill archaeological complex consisted of Civil War earthworks, the colonial road, and some structures at the mill site. The site is located approximately 2,300 feet to the northeast from the existing transmission line currently located in the Lightfoot Junction to Skiffes Creek Section of the Alternate Route. A forested area is located between the site and the Alternate Route to the southwest of the site. Burwell's Mill Complex and Archaeological District (Whittaker's Mill) has been impacted by encroaching commercial development to the southwest, west and northwest. The existing Lightfoot Junction to Skiffes Creek transmission corridor is visible southwest of the site. CRI recommends that the Project would minimally impact the site.

Carter's Grove (047-0001), which is also addressed in the discussion of the 500 kV Proposed Route, is a well preserved example of a two-story, seven-bay, mid-eighteenth century Georgian dwelling. Carter's Grove is located within 0.5, 1.0, and 1.5 miles of the Alternate Route. The site was listed in the NRHP in 1969 and as a NHL in 1970. The site is also protected under a historic preservation easement held by the VDHR. The plantation property is surrounded by modern development, but within the plantation property the house is situated close to the James River. Vegetation surrounding the plantation property includes areas of tree lines, dense forest, and open fields. The existing transmission line right-of-way corridor and associated structures, under current landscape, was visible from the end of the driveway used to access this resource. CRI recommends that the Carter's Grove would be minimally impacted by the Alternate Route.

James Semple House (Randolph-Semple House) (137-0033) (c. 1770) is a two-story frame dwelling. The house was listed on the NRHP and as a NHL in 1970. Additionally, the James Semple House is a contributing resource to the Williamsburg Historic District (137-0050). This house is located within 1.0 mile of the Lightfoot to Skiffes Creek Section of the Alternate Route. Between the architectural resource and the transmission line are areas of residential development as well as green space. The existing transmission line and associated structures, under current landscape conditions, were not visible from this resource. CRI recommends that the James Semple House would not be visually impacted by the Alternate Route.

Williamsburg Historic District (137-0050) encompasses several structures included in this analysis: Bruton Parish Church (137-0007), the James Semple House (137-0033); Peyton Randolph House (137-0032); and the George Wythe House (137-0058). Many properties within the district are operated as a living-history tourist attraction. The district was listed in the NRHP in 1966 and as a NHL in 1960. The district is bounded on the north and east by Route 62. Beyond this boundary are areas of modern development and a buffer of trees which extends from the existing transmission line corridor approximately 2,000 feet to the southwest. At its closest point, the historic district is approximately 4,000 feet southwest of the existing transmission line. In addition to viewshed photographs taken from individually NRHP-listed architectural resources within the Williamsburg Historic District, CRI selected six additional locations to assess the viewshed. The existing transmission corridor was not visible from the vantage points assessed. CRI recommends that there would be no visual impact from the Alternate Route on the Williamsburg Historic District.

Bruton Parish Church (137-0007) is a brick structure that features a cruciform plan and dates to 1711. The church was listed in the NRHP and as a NHL in 1970. Bruton Parish Church is considered a contributing resource to the Williamsburg Historic District (137-0050). The church is located among residential, commercial and modern industrial development. The church is located approximately 6,200 feet to the southwest of the existing transmission line right-of-way corridor. The Bruton Parish Church is surrounded by portions of the Williamsburg Historic District as well as other residential, commercial and modern industrial development. CRI recommends that there would be no visual impact on the Williamsburg Historic District from the Alternate Route.

Sir Christopher Wren Building (William & Mary College, Main Building) (137-0013) (c. 1695) is a four-story brick structure. One of the original buildings at the College of William and Mary, the house was listed in the NRHP in 1966 and as a NHL in 1960. This building is also associated with the Revolutionary War Route and Transportation Survey 1781-1782 (VDHR 000-8900-0097) and the unevaluated College of William and Mary Historic District (137-0061). At its closest point, the Wren Building is approximately 7,500 feet from the existing transmission line corridor and associated structures. Historic and modern development and a densely forested area separate the building from the existing transmission line. Under current landscape conditions, CRI reported that the existing transmission line was not visible from this resource. CRI recommends that the Christopher Wren Building would not be visually impacted by the Alternate Route.

Peyton Randolph House (Peachy House) (137-0032) (c. 1715) is a two-story frame dwelling with interior end corbelled chimneys. The house was listed in the NRHP and as a NHL in 1970. The resource is also a contributing resource to the Williamsburg Historic District (137-0050) and is associated with the Revolutionary War Route and Transportation Survey 1781-1782 (VDHR 000-8900-0097). The property is approximately 6,000 feet to the southwest of the existing transmission line. Located between the house and the existing transmission line is a portion of the Williamsburg Historic District, modern commercial development and forested land. The existing transmission line was not visible from this resource. CRI recommends that the Peyton Randolph House would not be visually impacted by the Alternate Route.

Wythe House (137-0058) (c. 1755) is a two-story brick dwelling. The house was listed in the NRHP and as a NHL in 1970. The house is located in the western portion of the Williamsburg Historic District (137-0050) and is a contributing resource to the district. The property is approximately 6,200 feet southwest of the existing transmission line. Between the house and the existing transmission line corridor are areas of Historic residences and a forested area. CRI recommends that the George Wythe House would not be visually impacted by the Alternate Route.

230 kV Skiffes Creek-Whealton Line

Eleven architectural sites considered as part of the Stage I pre-application process are located within 1.5 miles of the existing transmission right-of-way, in which the 230 kV Skiffes Creek-Whealton line will be constructed. Three architectural sites are located within the existing right-of-way of the Skiffes Creek to Whealton Section: Battle of Yorktown (099-5283); Battle of Williamsburg (099-5282); and Lee's Mill Earthworks (Battlefield Park) (121-0050). The Battle of Yorktown is considered eligible. The ABPP recommended a portion of the Battle of Williamsburg as eligible. Lee's Mill Earthworks is listed in the VLR and NRHP. Both the Battle of Williamsburg and the Battle of Yorktown are within 0.5, 1.0, and 1.5 miles of the existing right-of-way for the 230 kV Skiffes Creek-Whealton line. Lee's Mill Earthworks is also located within the 0.5-mile buffer.

Two of the 11 sites, Big Bethel Battlefield (114-5297) and Fort Eustis Historic District (121-0105), were removed from consideration in the analysis of the proposed Skiffes Creek-Whealton line. Big Bethel Battlefield was the first land battle of the Civil War in Virginia. The ABPP recommended the Big Bethel Battlefield as not eligible as an individual resource because the historic terrain of the landscape has been extensively altered; however, opportunities exist to assess the area for commemorative purposes. The VDHR has determined the Big Bethel Battlefield to be ineligible for listing in the NRHP.

The Fort Eustis Historic District (121-0105) is not considered a historic district by the VDHR. The VDHR has assigned architectural resource numbers to several military bases as a way to track them. Although there have been individual structures documented at Fort Eustis, none of them occur within the tiered study area.

The Battle of Yorktown (099-5283) covers an area of approximately 63,960 acres. This Civil War battlefield is part of the Union offensive referred to as the Peninsular Campaign. The battlefield resource consists of three main areas: the core area; the existing NRHP boundary; and a large area considered potentially eligible for listing in the NRHP. Portions of the NRHP-listed and potentially eligible battlefield areas fall within the existing Skiffes Creek-Whealton right-of-way as well as within the VDHR *Guidelines* 1.0-mile buffer. The larger study area extends into the 1.5-mile buffer. The ABPP reports that only portions of the Yorktown Battlefield landscape have been altered and many landscape features are intact.

The landscape within the vicinity of the Skiffes Creek-Whealton line consists of modern residential and commercial development; the Interstate 64 corridor as well as other major transportation corridors; forested areas, reservoirs and other lakes and watercourses. The portion of the core battlefield area which is within the transmission line corridor and the 0.5-mile buffer has been bisected by Fort Eustis Boulevard/Route 105. Portions of the battlefield have been previously impacted by the construction of the existing transmission line, which is visible from a number of points within the resource. CRI recommends that the Yorktown Battlefield will be minimally impacted by the Skiffes Creek-Whealton line.

The Battle of Williamsburg (Civil War) (099-5282) is an area comprising an estimated 10,370 acres. The ABPP reports that the battlefield landscape has been fragmented, but may retain some features relating to the significance of the battlefield. CRI reports that the portion of the battlefield crossed by the proposed Skiffes Creek-Whealton line is not considered NRHP-eligible. Much of the area encompassed by the battlefield has been developed, including the construction of Interstate 64, a number of modern residential neighborhoods, commercial and industrial complexes, and the Newport News Golf Course. CRI recommends no further evaluation of this resource.

Lee's Mill Earthworks (Battlefield Park) (121-0050) is listed in the NRHP and the VLR. The earthworks are located on a 10-acre parcel in the City of Newport News to the southwest of Route 60/Warwick Road. Entrance into the site is within a modern residential development. The property currently is owned by the City of Newport News Virginia War Museum and open to the public. Lee's Mill Earthworks is approximately 4,750 feet southwest of the existing transmission line corridor. Modern industrial development, Warwick Boulevard (a four lane divided highway), forested land, and wetlands are situated between the resource and the existing transmission line. The park itself consists of dense wooded areas that provide a vegetative screen between the resource and the surrounding modern development. Under current landscape conditions, CRI recommends that Lee's Mill Earthworks will not be visually impacted by the proposed Skiffes Creek-Whealton line.

One additional historic and architectural site is located within 0.5 mile of the 230 kV Skiffes Creek-Whealton line existing right-of-way: Village of Lee Hall Historic District (121-5068). The Village of Lee Hall Historic District, which is considered potentially eligible, is a collection of post-1881 architectural resources located within the present-day city of Newport News. The district includes two land parcels that join near the intersection of Warwick Boulevard (Route 60) and Ripley Street. The northern section is crossed by several roads; the southern section encompasses the residences on the west side of Warwick Boulevard from Ripley Street southward. CRI took photographs throughout the district to determine whether the existing transmission line was visible. The transmission line wires were the only features visible during this assessment. CRI recommends that the Village of Lee Hall Historic District will be minimally impacted by the proposed Skiffes Creek-Whealton line.

Three additional architectural resources are located within the 1.0-mile buffer of the existing Skiffes Creek-Whealton line right-of-way: Lee Hall Railroad Station (121-0040); Simon Reid Curtis House (Boxwood Inn) (121-5031); and Battle of Dam #1 (Lee's Mill Battlefield/Newport News Park) (121-0060). Lee Hall Railroad Station was listed the NRHP in 2010 and is located within the 1.0-mile buffer of the existing transmission corridor. The station is also included in the NRHP-eligible Village of Lee Hall Historic District (121-5068) as a contributing resource. In 2009, the building was moved across the railroad tracks to its current location. The railroad station is approximately 4,000 feet northeast of the existing transmission line. Forested land, industrial and commercial lots, modern residential development, and a river are located between the railroad station and the exiting transmission line. CRI's visual assessment documented that the existing transmission line was not visible from this resource. CRI recommends that Lee Hall Railroad Station will not be visually impacted by the Skiffes Creek-Whealton line.

The Simon Reid Curtis House, also known as the Boxwood Inn (121-5031), is an 1896 two-and-a-half-story dwelling located within the 1.0-mile buffer. The house was listed on the NRHP in 2009 and is considered a contributing resource to the Village of Lee Hall Historic District (121-5068). The house is approximately 4,000 feet to the northeast of the existing transmission line. Commercial development, forested land, and a water course were documented between the house and the existing transmission line. CRI documented modern residential development to the south of the resource. The existing transmission line was visible from this resource. CRI recommends that the Simon Reid Curtis House will be minimally impacted by the proposed Skiffes Creek-Whealton line.

The Battle of Dam #1 (Lee's Mill Battlefield/Newport News Park) (121-0060) encompasses approximately 143 acres of land to the northeast of the current transmission line. The property is discontinuous with the two sections separated by the city reservoir. The park was listed in the NRHP in 1995. The mainly forested portion of the park on the southeast side of the reservoir is utilized as a municipal golf course (Newport News Golf Course), picnic area, and camp ground with paved entrance roads. An additional transmission line, which connects to the transmission line currently under study to the southeast, bisects the battlefield park in a northwest-southeast direction. The proposed Skiffes Creek-Whealton line will be located between approximately 4,000 to 5,000 feet to the southeast and southwest. West and southwest of the park, CRI documented modern redevelopment and the Interstate 64-Fort Eustis Boulevard interchange. Forested area is located to the northwest, and modern residential development is located to the south of the park. CRI recommends that the Battle of Dam #1 (Lee's Mill Battlefield/Newport News Park) will not be visually impacted by the proposed 230 kV line.

Two sites are located within the 1.0- and 1.5-mile buffer zones of the Skiffes Creek-Whealton line: Carter's Grove (047-001) and Lee Hall (121-0016). Carter's Grove is addressed in the discussion of the 500 kV Proposed Route and 500 kV Alternate Route. During CRI's assessment, the existing transmission line in the right-of-way that will contain the new 230 kV line was only visible from the end of the driveway leading to Carter's Grove. CRI recommends that this resource will be minimally impacted by the 230 kV Skiffes Creek-Whealton line.

Lee Hall (121-0016) (c. 1848) is a two-story masonry dwelling with interior brick chimneys. The house was listed in the NRHP in 1972. In 1999, the City of Newport News and the Commonwealth of Virginia Board of Historic Resources placed a preservation easement on the property in order to protect both the building's historic architectural features and its 12.29-acre setting. To the southwest of the resource, CRI documented a modern housing development, a forested area, and a river. To the southeast of the resource, CRI documented modern residential neighborhoods as well as commercial and industrial development. CRI reported that the existing transmission corridor was not visible from this resource and recommends that Lee Hall will not be visually impacted by the proposed Skiffes Creek-Whealton line.

Skiffes Creek Switching Station

No previously recorded historic or architectural resources occur within the parcel on which the proposed Skiffes Creek Switching Station will be constructed. However, Carter's Grove (047-0001), the Battle of Williamsburg (099-5282), and the Battle of Yorktown (099-5241) are located, wholly or in part, within the tiered study area. Carter's Grove is located within 0.5, 1.0, and 1.5 miles of the switching station. The Battle of Williamsburg (Civil War) is located within 1.0 and 1.5 miles of the switching station. The Battle of Yorktown (Civil War) is located within 1.5 miles of the switching station. Each of these resources is addressed in the preceding discussions of the 500 kV Proposed Route, including the James River Crossing Variations, Alternate Route and the new 230 kV line.

I. Chesapeake Bay Preservation Areas

Construction, installation, operation and maintenance of electric transmission lines are conditionally exempt from the Chesapeake Bay Preservation Act as stated in the exemption for public utilities, railroads, public roads and facilities in 9 VAC 10-20-150. The Company will meet those conditions.

J. Wildlife Resources

As noted in Section 2.F, the FWS, VDCR and VDGIF databases were searched in order to assess the potential presence of any state-threatened or endangered species in the vicinity of the Project. The

search determined there is the potential presence of 11 federal and state-endangered and threatened species in addition to three federal SOCs within the Project area. Dominion Virginia Power intends to perform the appropriate surveys to determine if these species are present and to coordinate with the appropriate regulatory agencies in order to avoid and minimize impacts on these resources to the extent practicable.

K. Recreation, Agricultural, and Forest Resources

500 kV Proposed Route (Surry-Skiffes Creek)

Land uses crossed by the Proposed Route are predominantly industrial with limited areas of residential and commercial lands. The portion of the James River where the proposed crossing will be located is within a segment that is currently designated by the Commonwealth of Virginia as scenic. The Proposed Route also crosses the Captain John Smith Chesapeake NHT at the proposed James River crossings. The James City County portion of the route would cross an approximately 0.51-mile section of forested area before converging with Dominion Virginia Power's existing transmission corridor. Approximately 20.13 acres of forested land would need to be cleared within the right-of-way.

If the James River Crossing Variation 1 were incorporated, the impacts of the Proposed Route would be substantially the same. The only differences would be that the James City County portion of the route would cross an approximately 0.46-mile section of forested area before converging with Dominion Virginia Power's existing transmission corridor, and approximately 20.09 acres of forested land would need to be cleared within the proposed right-of-way.

If James River Crossing Variation 2 were incorporated, the impacts of the Proposed Route would be substantially the same. The only difference would be that the James City County portion of the route would cross an approximately 0.62-mile section of forested area before converging with Dominion Virginia Power's existing transmission corridor, and approximately 19.90 acres of forested land would need to be cleared within the proposed right-of-way.

If James River Crossing Variation 3 were incorporated, the impacts of the Proposed Route would be substantially the same. The only difference would be that the James City County portion of the route would cross an approximately 0.62-mile section of forested area before converging with Dominion Virginia Power's existing transmission corridor, and approximately 20.10 acres of forested land would need to be cleared within the proposed right-of-way.

500 kV Alternate Route (Chickahominy-Skiffes Creek)

Land uses crossed by the Alternate Route between Chickahominy Substation and Lightfoot Junction are predominantly rural agricultural and forested lands. Limited areas of mixed use and special public interest lands associated with recreation resources discussed below are also crossed. James City County has developed Agricultural Forestal Districts ("AFDs"), and Charles City County is working to establish acreage limits for such districts, but to date no AFDs have been designated in Charles City County. Portions of two James City County AFDs are crossed by the Proposed Route. Approximately 420.45 acres of forested land would be to be cleared along this portion of the Alternate Route.

Land uses crossed by the Alternate Route between Lightfoot Junction and the Skiffes Creek Switching Station are predominately residential and commercial with limited areas of industrial, agricultural, historic and special public interest lands. This portion of the Alternate Route would be constructed almost entirely within the existing transmission line right-of-way, with approximately 4 acres

of new right-of-way to be acquired around Kingsmill Substation, and no additional right-of-way would be needed, therefore minimal impacts on agricultural or forest resources are anticipated.

There are 10 recreational resources crossed by the Alternate Route. Between the Chickahominy Substation and Lightfoot Junction, the route crosses the Plantation Loop of the Virginia Birding and Wildlife Coastal Trail ("Coastal Trail"), Chickahominy WMA, Captain John Smith Chesapeake NHT, and Freedom Park. Access to the Coastal Trail, Chickahominy WMA, and the Captain John Smith Chesapeake NHT should not be affected by the construction or implementation of this Alternate Route. Within Freedom Park there is a well-established mountain bike trail that would be crossed approximately six times by the Alternate Route. During Project construction access to and use of the trail would be temporarily impacted.

Between Lightfoot Junction and Skiffes Creek Switching Station, the Alternate Route crosses Lower Peninsula Loop of the Coastal Trail, Warhill Sports Complex, Waller Mill Park, Colonial National Historical Park Colonial Parkway, Williamsburg Country Club, and Kingsmill Resort and Golf Club. While operation of the Project would have no direct impacts on any of the recreation areas listed above, some temporary impacts may occur in these recreational areas during construction. Temporary affects include short-term facilities closure or limitations on access to parts of the facilities that contain portions of Dominion Virginia Power's existing right-of-way. Replacement of the existing structures could have a minor visual affect on these areas, especially those in locations where the existing structures would be replaced with taller structures. This would include the following recreation areas along the Alternate Route: Warhill Sports Complex, Waller Mill Park, Colonial National Historical Park Colonial Parkway, and Williamsburg Country Club. The Kingsmill Resort and Golf Club property is located in the area where the route of the transmission line splits into two rights-of-way between Interstate 60 and Tadich Drive. The southerly right-of-way crosses the Kingsmill Resort and Golf Club property. The golf course itself is not crossed, and no direct impacts on this golf course are expected. In addition, the existing structures along this portion of the Alternate Route that cross the property would not be replaced.

230 kV Skiffes Creek-Whealton Line

The 230 kV portion of the proposed Project is expected to have minimal impact on recreational, agricultural and forest resources, as no additional right-of-way is required. However, an additional portion of Dominion Virginia Power's existing right-of-way within Harwoods Mill Park and the York County Sports Complex between MPs W10.99 and W11.92 will need to be cleared.

Land uses crossed by the 230 kV Skiffes Creek-Whealton line are predominantly developed residential, commercial and industrial lands. Limited areas of forested lands occur within and surrounding various parks along the route.

There are five recreational resources crossed by the 230 kV Skiffes Creek-Whealton line: Lower Peninsula Loop of the Coastal Trail, Harwoods Mill Park, York County Sports Complex, Newport News Park, and Kiln Creek Golf Club Resort. The majority of facilities associated with the York County Sports Complex are north of the existing right-of-way, and the clearing will take place on the south side. There are a few multipurpose trails that extend across the existing right-of-way and around two ponded areas within the undeveloped right-of-way that will need to be cleared. Operation of the Project should have no direct impacts on these recreation areas since the trails already cross cleared right-of-way. Some temporary impacts may occur during construction. Replacement of the existing structures could have a minor visual affect on these recreation areas, especially in those locations where the existing structures will be replaced with taller structures. This will include the following recreations areas: Harwoods Mill Park, York County Sports Complex, Kiln Creek Golf Club Resort, and portions of Newport News Park. Since power lines and structures are already located in these areas, the long-term affect is expected to be

minimal. While some of the structures within the segment of the right-of-way that crosses Newport News Park will be replaced with taller structures, others will be left in place and restrung with new conductors. Therefore, the Project will have some incremental visual impacts on the park in those areas where the existing structures will be replaced with taller structures.

Skiffes Creek Switching Station

The proposed Skiffes Creek Switching Station is expected to have minimal impact on recreational, agricultural and forest resources as no new land purchases or easements would be required for construction or operation of the proposed facility, and there are no recreational resources located within 0.25 mile of the switching station. The switching station site consists of undeveloped forested land.

The Company's tree clearing methods utilize the Virginia Department of Forestry's Best Management Practices ("BMPs") for Water Quality. Specific sections of the BMPs that are pertinent to transmission line clearing operations include:

- Stream Crossing Design and Construction (culvert installation and removal);
- Equipment Maintenance and Litter;
- Harvest Closure (rehabilitation of the right-of-way after construction); and
- Revegetation of Disturbed Area.

The Company will utilize the above BMPs on the Project. Further discussion of the right-of-way clearing, rehabilitation, and maintenance can be found in Section 2.5 of the Environmental Routing Study prepared by NRG.

March 7, 2012 correspondence from the VDCR concerning the Project is provided as Attachment 2.K.1. January 19, 2012 correspondence from the NPS concerning the Project is provided as Attachment 2.K.2. March 22, 2012 correspondence from the USFWS concerning the Project is provided as Attachment 2.K.3.

L. Use of Pesticides and Herbicides

Dominion Virginia Power typically maintains transmission right-of-way by means of selective, low volume applications of U.S. Environmental Protection Agency ("EPA")-approved, non-restricted use herbicides. The goal of this method is to exclude tall growing brush species from right-of-way by establishing early successional plant communities of native grasses, forbs, and low growing woody vegetation. "Selective" application means the Company sprays only the undesirable plant species (as opposed to broadcast applications). "Low volume" application means the Company uses only the volume of herbicide necessary to remove the selected plant species. These herbicides are routinely applied by hand. DEQ has made previous requests that only herbicides approved for aquatic use by the EPA or the FWS be used in or around any surface water; Dominion Virginia Power intends to comply with this request.

M. Geology and Mineral Resources

The 500 kV Proposed and Alternate Routes, James River Crossing Variation, 230 kV Skiffes Creek-Whealton line, and Skiffes Creek Switching Station all fall within the Coastal Plain geologic province. This province is characterized by its terraced landscape, which extends from the province boundary near the City of Richmond east to the Atlantic Ocean. Quaternary and late Tertiary sand, silt, clay and gravel deposits cover the majority of the province. The western portion of the province, known as the upland sub-province, has an elevation range of 60 to 250 feet. The sub-province's physiography is

classified by wide upland regions with minor slopes and areas with stream erosion and steeper slopes. The eastern portion of the province, known as the lowland sub-province, has an elevation range of 0 to 60 feet. This sub-province's physiography is classified by flat lowland regions with little relief (Virginia Division of Mineral Resources 1933 and William and Mary Department of Geology, 2011).

Mineral resource areas were identified through review of publically available datasets, USGS topographic quadrangles, and recent (2011) digital aerial photographs.

500 kV Proposed Route (Surry-Skiffes Creek)

There are no mineral resources located within 0.5 mile of the Proposed Route. Therefore, the Company does not anticipate negative impacts on mineral resources of the Commonwealth from this route. There also are no mineral resources located within 0.5 mile of the James River Crossing Variations.

500 kV Alternate Route (Chickahominy-Skiffes Creek)

Along the Alternate Route there is one sand pit located approximately 0.35 mile north of the corridor near MP C2.3 in Charles City County east of Barnetts Road and north of Samaria Lane. This land is owned by USA Waste of Virginia and appears to be part of a large landfill. This resource is not crossed by the Alternate Route, and the Company does not anticipate negative impacts on mineral resources of the Commonwealth as a result of this route.

230 kV Skiffes Creek-Whealton Line

There is one clay pit and one gravel pit located within 0.5 mile of the proposed Skiffes Creek-Whealton line. The clay pit is located approximately 0.23 mile southwest of the corridor at MP W2.3 in the Green Mount Industrial Park west of Skiffes Creek. The gravel pit is located approximately 0.31 mile northeast of the corridor just east of the Skiffes Creek crossing near MP W2.7. Neither of these resources is crossed by the 230 kV Skiffes Creek-Whealton line, and the Company does not anticipate negative impacts on mineral resources of the Commonwealth as a result of this route.

Skiffes Creek Switching Station

There are no mineral resources located within 0.5 mile of the Skiffes Creek Switching Station; therefore, the Company does not anticipate negative impacts on mineral resources of the Commonwealth from the switching station.

N. Transportation Infrastructure

500 kV Proposed Route (Surry-Skiffes Creek)

The 500 kV Proposed Route originates at the Surry Power Station in Surry County, Virginia, crosses the James River, and terminates at the site of the proposed Skiffes Creek Switching Station in James City County, Virginia.

The 500 kV Proposed Route crosses the James River for a distance of approximately 3.53 miles. The James River Crossing Variation 1 crosses the James River for a distance of approximately 4.10 miles. The James River Crossing Variation 2 crosses the James River for a distance of approximately 3.81 miles. The James River Crossing Variation 3 crosses the James River for a distance of approximately 4.12 miles. Shipping channels and federal navigation channels within the Project area were identified using NOAA's Office of the Coast Guard Survey chart number 12248 and the COE Tribell Shoal Channel after Dredging Survey of July 2011. Mapping indicates the presence of two navigation channels in the James River at

the crossings of the 500 kV Proposed Route and James River Crossing Variations. The Tribell Shoal Federal Navigation Channel is located along the eastern portion of the river, and a second unnamed navigation channel is located along the western portion of the river. The Tribell Shoal Channel is used primarily by container vessels bound for the Richmond Deepwater Terminal. The channel is approximately 5 miles long, 300 feet wide, and approximately 26 feet deep. Activities within and over the federal navigation channel are regulated by the COE and USCG. The 500 kV Proposed Route and the James River Crossing Variations 1, 2, and 3 span the Tribell Shoal Channel for approximately 890, 680, 750, and 800 feet, respectively. The western channel is utilized primarily by tug and barge traffic and has a water depth of 15-19 feet. While this channel is not a Federal channel, the USCG regulates navigational clearances through its Bridge Division. The 500 kV Proposed Route and the James River Crossing Variations 1, 2, and 3 span the western channel for approximately 940, 920, 1000, and 940 feet, respectively.

Additional buffers and restricted areas associated with the navigational channels and dredge spoil area within the crossing area of the James River were determined through consultation between Dominion Virginia Power and the COE (Norfolk District). In order to provide adequate navigational buffers, structures at the crossing locations must be located at least 250 feet from the toe of the Tribell Shoal Channel and the dredge spoil area, and at least 100 feet from the toe of the western channel. Dominion Virginia Power would maintain the required minimum buffers from each of these restricted areas.

Additional clearance is needed for 500 kV lines crossing navigational channels. COE Code 33 CFR 322.5-Special policies (i)-Power transmission lines, addresses this clearance. In addition to the required minimum clearance of 145 feet at mean high water ("MHW") as designated by the USCG, the lines would have to have an additional 35 feet of clearance. The USCG Bridge Division is the advising agency for determining final required minimum clearances.

After coming onshore in James City County, the 500 kV Proposed Route and the 500 kV Proposed Route with the James River Crossing Variation 1 cross three roads: Utility Street, BASF Drive, and Route 60. After coming onshore in James City County, the 500 kV Proposed Route with the James River Crossing Variation 2 and 3 cross one road: U.S. Route 60. Temporary closures of roads could be required during construction. No long-term impacts to roads are anticipated by either the 500 kV Proposed Route or the 500 kV Proposed Route with the James River Crossing Variations. The Company will maintain proper clearances between all road surfaces and the conductors and will comply with Virginia Department of Transportation ("VDOT") requirements for access to the rights-of-way from public roads as well as the aerial crossings of the roads. At the appropriate time, Dominion Virginia Power will obtain the necessary VDOT permits as required.

On January 10, 2012 and again on November 8, 2012, the Company and NRG met with representatives from Langley Air Force Base and Felker Airfield at Fort Eustis to introduce the Project and coordinate on airspace matters associated with DOD facilities near the Project area. The representatives from Langley Air Force Base requested that Dominion Virginia Power evaluate the Project's impact on the TERPS surfaces associated with Langley Air Force Base and Felker Airfield. The 500 kV Proposed Route is located approximately 3.1 miles north of the Felker Airfield at Fort Eustis. While the height of the structures along the alignment of the proposed 500kV route will not penetrate the DOD Airport Imaginary Surfaces, two of the structures along the 500 kV Proposed Route located in the James River will penetrate the TERPS obstacle clearance surface associated with airport's runway. In the event that the DOD or the FAA determines that penetration of the TERPS surface is an unacceptable airspace obstruction, then two modified alignments of the 500 kV Proposed Route to the north have been developed, the James River Crossing Variations 1 and 3, to avoid penetrating the TERPS surface. The Company will continue to consult with the DOD regarding these airspace issues.

500 kV Alternate Route (Chickahominy-Skiffes Creek)

The Alternate Route crosses approximately 35 roads, including 27 crossings of Virginia state routes, highways, and a Virginia Scenic and National Scenic Parkway. The Alternate Route also crosses the CSX railroad in two separate locations. Temporary closures of roads could be required during construction. No long-term impacts to roads are anticipated by the Alternate Route. The Company will maintain proper clearances between all road surfaces and the conductors and will comply with VDOT requirements for access to the right-of-ways from public roads as well as the aerial crossings of the roads. At the appropriate time, the Company will obtain the necessary VDOT permits as required. Similarly, the Company will meet railroad specifications for facilities over their tracks and will obtain the appropriate approval from CSX.

230 kV Skiffes Creek-Whealton Line

The Skiffes Creek-Whealton 230 kV Transmission Line crosses approximately 42 roads, including 10 crossings of Virginia state routes, highways, and interstates. The majority of road crossings along the Skiffes Creek-Whealton 230 kV Transmission Line are smaller roads through existing subdivisions. The alternative also crosses a portion of a CSX railroad. Temporary closures of roads could be required during construction. No long-term impacts to roads are anticipated by the Skiffes Creek-Whealton 230 kV Transmission Line. The Company will maintain proper clearances between all road surfaces and the conductors and will comply with VDOT requirements for access to the right-of-ways from public roads as well as the aerial crossings of the roads. At the appropriate time, the Company will obtain the necessary VDOT permits as required. Similarly, the Company will meet railroad specifications for facilities over their tracks and will obtain the appropriate approval from CSX.

The Company and NRG met with representatives of Newport News/Williamsburg International Airport ("International Airport") on January 11, 2012, to discuss the Project and evaluate the existing conditions at the International Airport. Dominion Virginia Power evaluated the Part 77 civil airport imaginary surfaces for the existing facilities and determined that the heights of the proposed structures would not exceed the most restrictive obstacle clearance surface for the existing runways at the International Airport. The International Airport concurred with this analysis.

Skiffes Creek Switching Station

The Skiffes Creek Switching Station will be constructed on a 51-acre parcel in James City County. The parcel is located in a forested area within Dominion Virginia Power's existing right-of-way. The parcel is bounded to the west by forested land, to the south by Dominion Virginia Power's right-of-way, to the north by a CSX railroad and State Route 143 north of the railroad, and to the east by more forested land.

The Virginia Department of Transportation provided a letter dated March 1, 2012 (included as Attachment 2.N) which describes future transportation projects in the vicinity of the Dominion Virginia Power Project. The Project does not interfere with the described VDOT projects.

ATTACHMENTS

-----Original Message-----
From: Steffey, Randy L NAO [mailto:Randy.L.Steffey@usace.army.mil]
Sent: Monday, March 05, 2012 9:24 AM
To: Christine Conrad; Dave Ramsey
Cc: Liz Harper (VirginiaPower - 6); Rhodes, Lynette R NAO
Subject: NAO-2012-00080 (PreApp for 500kV Aerial Transmission Line Crossing) (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Christine & Dave:

This email is follow-up to our January 18, 2012 meeting concerning Dominion's consideration of possibly constructing an aerial transmission line from Surry Nuclear Station across the James River to Skiffes Creek as an alternative route to other land based alignments/alternatives.

We coordinated the idea with our Operations Branch. Their comments can be found in the attachment (FW: Potential 500kV Aerial Transmission Line across the James River (NAO-2012-00080)). In summary, they recommended that all support structures maintain a minimum 250 ft offset distance from both the Tribell Federal Channel and their adjacent Overboard Disposal area. Regarding head clearance they are deferring to the Coast Guard on their requirements at this time. Finally, pdf drawings (Tribell Shoal Channel ADS 072011.pdf) are all that they can make available to the public. These drawings which are to scale provide the location of the channel, disposal area, under-river utility pipes, and oyster ground lease areas. They wanted to stress that these comments are only preliminary and that until an actual design in full detail is presented for review they cannot give a final decision on how the project would impact Operations.

In addition to Operations comments we feel that you should also be giving consideration to the following, but not limited to:

1. Historic Resources - VDHR DSS search returned a number of archeological and architectural resource hits in the vicinity of the project. Since the final alignment is unknown it is difficult to assess archeological impacts; however architectural impacts due to view shed appear eminent. We encourage that you begin coordinating with VDHR regarding such a proposal.

2. T&E Species - Similar to Historic Resources, a number of species hits were returned during a database search. One species not on the reports at this time, but should be considered is the Atlantic Sturgeon.

Dominion has indicated that they are evaluating the alternative on potential impacts to navigation, airspace, cultural resources & endangered species, scenic river status, land use, and oyster leases. In addition, we would also encourage coordination with the local Harbor Pilots that traverse the waterway on a regular basis so they have an opportunity to consider, review, and comment.

As indicated at the January meeting it is up to Dominion to explore all viable alternatives and select what they feel is their preferred alternative. Until we receive a complete permit application we cannot fully assess the likelihood of approval/denial on any proposed alternative, and it is likely that additional comments and/or concerns for consideration would be made.

Hope this information helps! We thank you for the opportunity of bringing us into the process early.

Randy Steffey
Environmental Scientist
Southern Virginia Regulatory Section
Ph: 757-201-7579 Fax: 757-201-7678
randy.l.steffey@usace.army.mil

The Norfolk District is committed to providing the highest level of support to the public. In order for us to better

serve you, we would appreciate you completing our Customer Satisfaction Survey located at http://pcr2.nwp.usace.army.mil/survey.html. We value your comments and appreciate your taking the time to complete the survey.

Classification: UNCLASSIFIED
Caveats: NONE

Environmental Database Review

Environmental regulated sites in the study area have been identified using publically available databases obtained from the U.S. Environmental Protection Agency (EPA) and the Virginia Department of Environmental Quality (VDEQ). The database provides "information about facilities, sites, or places subject to environmental regulation or of environmental interest". These include sites that use and/or store hazardous materials, waste producing facilities operating under permits from the EPA or other regulatory authorities, Superfund sites, the storage of petroleum, petroleum release sites and solid waste sites. The identification of a site in the databases does not necessarily mean that the site has contaminated soil or groundwater.

A summary of the information from the EPA and VDEQ database within a 0.5 mile buffer of the Surry Alternative, the Chickahominy Alternative, and the Skiffes Creek–Whealton Transmission Line and the 51-acre parcel on which the proposed Skiffes Creek Switching Station will be located is provided in Table 1 below. These data are also presented in Figure 2.E.1.

TABLE 1
Environmental Regulated Facilities and Hazardous Waste/Petroleum Release Sites within 0.5 Mile of the Proposed, Alternative, and Existing Transmission Line Routes

Database	Chickahominy Alternative [a/]		Surry Alternative	Skiffes Creek-Whealton Transmission Line	Skiffes Creek Switching Station
	Chickahominy to Lightfoot Junction Section	Lightfoot Junction to Skiffes Creek Section			
Water	0	2	3	13	0
Waste	0	14	8	59	0
Toxics	0	1	4	8	0
Land	0	14	8	60	0
Air	1	5	9	21	0
Leaking Petroleum Storage Tank	6	22	9	54	0
Petroleum Facilities	5	19	5	67	0
Solid Waste Facilities	2	0	1	1	0
Total	**14**	77	47	283	0

Water (Facilities that discharge storm or process water to surface water)
Waste (Facilities that handle or generate hazardous wastes)
Toxics (Facilities that release toxic substances to the environment)
Land (Site cleanup under RCRA, Superfund or Brownfield programs)
Air (Facilities with a release of pollutants to the air)
Petroleum Releases (Typically associated with storage tank releases)
Petroleum Facilities (Regulated petroleum storage)
Solid Waste Facilities (Former and existing landfills)

[a/] The Chickahominy Alternative would consist of two sections. The first section, the Chickahominy to Lightfoot Junction Section, predominantly would be constructed existing but undeveloped easement owned by Dominion. The remaining section would be located on Dominion's existing 230/115 kV transmission line corridor that extends between the Lightfoot Junction and the proposed Skiffes Creek Switching Station.

Following are summaries of the sites that were further assessed as having the potential to impact the project area.

Superfund Site Review

One Superfund site, the Naval Weapons Station (NWS) – Yorktown Superfund site is located approximately 600 feet east of the intersection of the Lightfoot Junction to Skiffes Creek Section of the Chickahominy Alternative, the Surry Alternative, and the Skiffes Creek-Whealton Transmission Line. The NWS – Yorktown Superfund site is an active Navy installation with operational history extending back to 1918. Over the years, many activities conducted at NWS – Yorktown generated and released hazardous wastes into the environment. These wastes include battery acid, solvents, paint, oil, and grease. As of December 1st, 1978, the Navy identified 30 potential sites within the Superfund boundary that needed investigation and/or remediation. Based on a review of a map included in an Agency for Toxic Substances and Disease Registry (ATSDR) report dated May 25th, 2006 no Superfund "Operable Units" appear to be in close proximity to the proposed or existing transmission line routes. Based on a review of the area topography and surface water drainage, the proposed and existing routes would likely be in an upgradient groundwater flow direction and not affected by existing soil and groundwater contamination at the NWS – Yorktown Superfund Site. No further evaluation is recommended with regard to the NWS – Yorktown Superfund site.

Petroleum Release Site Review

To further evaluate the potential impact to the proposed and alternative routes, NRG assessed the leaking petroleum storage tank sites that are located within 1,000 feet of the route centerlines. Twenty-six petroleum release sites were identified within 1,000 feet of the proposed routes. One of the sites is located adjacent to the Chickahominy to Lightfoot Junction Section of the Chickahominy Alternative, five sites are located adjacent to the existing Lightfoot Junction to Skiffes Creek Section of the Chickahominy Alternative, seventeen sites are located adjacent to the Skiffes Creek-Whealton Transmission Line, and three sites are located adjacent to the Surry Alternative. Following are summaries of the referenced petroleum release sites.

Surry Alternative: Petroleum Release Site Summary

1. The Mann Industries (8961 Pocahontas Trail, Williamsburg) petroleum release is located approximately 645 feet north of the Surry Alternative. This petroleum release was reported on June 29th, 1992 and is currently listed as closed by the VDEQ. The estimated groundwater flow direction at this site is west and the estimated depth to ground water is approximately 10 feet. Given the estimated groundwater flow direction and distance from the petroleum release, no further evaluation is recommended.

2. The Kemp Residence (70 Jan Rae Circle, Williamsburg) petroleum release is located approximately 520-feet west of the Surry Alternative. This petroleum release was reported to the VDEQ on February 2nd, 2010 and it is currently listed as closed by the VDEQ. The estimated groundwater flow direction is north and the estimated depth to groundwater is 10 feet.

Given the estimated groundwater flow direction and the distance from the petroleum release, no further evaluation is recommended.

3. The Williamsburg Can Plant (8935 Pocahontas Trail, Williamsburg) petroleum release is located approximately 730 feet west of the Surry Alternative Route. This petroleum release was reported to the VDEQ on November 14th, 1991 and is currently listed as closed by the VDEQ. The estimated groundwater flow direction is west/southwest and the estimated depth to groundwater is 20 feet. Given the estimated groundwater flow direction and distance from the petroleum release, no further evaluation is recommended.

Chickahominy to Lightfoot Junction Section: Petroleum Release Site Summary

1. The Binns Hall ARSR (8000 Cypress Bank Road, Charles City) petroleum release was reported to the VDEQ on February 4th, 1998 and is currently listed by the VDEQ as closed. Closed status indicates that no further evaluation or remediation is required. The closed status does not mean that no soil or groundwater contamination exists at the site. This site is located approximately 660 feet west of the Chickahominy to Lightfoot Junction Section of the Chickahominy Alternative. The estimated groundwater flow direction based on a review of area topography and surface water elevations is south/southeast and the depth to groundwater is approximately 30 feet. Given the distance and depth to groundwater, no further evaluation is recommended.

Lightfoot Junction to Skiffes Creek Section (Existing Route): Petroleum Release Site Summary

1. The Lightfoot Junction to Skiffes Creek Section of the Chickahominy Alternative is located approximately 350-feet north of the Shackleford Property (1155 Duncan Drive, Williamsburg) petroleum release. This petroleum release was reported on December 22nd, 2010 to the VDEQ and is currently listed as closed by the VDEQ. The estimated groundwater flow direction is north/northeast and the approximate depth to groundwater is 15 feet. Given that this is a residential site which typically does not have large petroleum releases, and the distance, no further evaluation is recommended.

2. The 7-Eleven Store 1003-20129 (8776 Pocahontas Trail, James City County) petroleum release was reported on November 12th, 1997 to the VDEQ and is currently listed as closed by the VDEQ. The Lightfoot to Skiffes Creek Section is located approximately 740- feet north of this site. The estimated groundwater flow direction is south/southeast and the approximate depth to groundwater is 20 feet. Given the estimated groundwater flow direction, no further evaluation is recommended.

3. The Williamsburg Motor Court – Former (2200 Richmond Road, Williamsburg) petroleum release was reported to the VDEQ on December 13th, 2004 and is currently listed as closed by the VDEQ. The site is located approximately 460-feet south of the existing transmission line. The estimated groundwater flow direction is south/southeast and the approximate depth to

groundwater is 15 feet. Given the estimated groundwater flow direction away from the transmission line and distance, no further evaluation is recommended.

4. The Bondurant Mary and Thomas Property (238 Thomas Nelson Lane, Williamsburg) petroleum release was reported on September 9th, 2008 to the VDEQ and is currently listed as closed by the VDEQ. This site is located approximately 760-feet south of the existing route. The estimated groundwater flow direction is south/southeast and the approximate depth to groundwater is 15 feet. Given the estimated groundwater flow direction and distance, no further evaluation is recommended.

5. The VDOT Handy Ice Store (6333 Centreville Road, Williamsburg) petroleum release was reported on March 3rd, 1994 to the VDEQ and is currently listed as closed by the VDEQ. The site is located approximately 130-feet west of the existing transmission line right-of-way. The estimated groundwater flow direction is north/northeast and the approximate depth to groundwater is 40 feet. Given the groundwater flow direction away from the project area, no further evaluation is recommended.

Skiffes Creek-Whealton Transmission Line: Petroleum Release Site Summary

1. The Pepsi Bottling Group, LLC – Newport News (17200 Warwick Boulevard, Newport News) petroleum release was reported on December 22nd, 2009 to the VDEQ and is currently listed as closed by the VDEQ. The Skiffes Creek-Whealton Transmission Line is located approximately 460-feet north of this site. The estimated groundwater flow direction is south/southwest and the estimated depth to groundwater is approximately 30 feet. Given the groundwater flow direction, distance and depth to groundwater, no further evaluation is recommended.

2. The Ed Martin Property (611 Industrial Park Drive) petroleum release was reported to the VDEQ on September 10th, 1992 and is currently listed as closed by the VDEQ. Skiffes Creek-Whealton Transmission Line is approximately 845 feet south of this site. The estimated groundwater flow direction is north/northwest and the approximate depth to groundwater is 15 feet. Given the groundwater flow direction and distance to the site, no further evaluation is recommended.

3. The White Tire Property (705 Industrial Park Road) petroleum release was reported to the VDEQ on August 14th, 2006 and is currently listed as closed by the VDEQ. The Skiffes Creek-Whealton Transmission Line is located approximately 820-feet south of the site. The estimated groundwater flow direction is north/northwest and the estimated depth to groundwater is 15 feet. Given the groundwater flow direction and distance to the site, no further evaluation is recommended.

4. The Custom Concrete – Newport News (700 Shields Road, Newport News) petroleum release is located approximately 150-feet south of the Skiffes Creek-Whealton Transmission Line. This site was reported on May 19th, 1999 to the VDEQ and is currently listed as closed by the VDEQ. The estimated groundwater flow direction is north/northwest and the depth to

groundwater is approximately 15 feet. Given the close proximity of this site, if groundwater is encountered, the potential for encountering petroleum contamination exists. If footings or drilled piers are expected to reach a depth of 15 feet and impact groundwater, a contaminated soil contingency plan should be developed to appropriately manage petroleum-impacted soil.

5. The Peninsula Dispose-all, Incorporated (701 Shields Road) petroleum release was reported on November 22nd, 1989 to the VDEQ and is currently listed as closed by the VDEQ. The site is located approximately 160-feet south of the Skiffes Creek-Whealton Transmission Line. The estimated groundwater flow direction is south/southeast and the estimated depth to groundwater is approximately 15 feet. Given the close proximity of this site, if groundwater is encountered, the potential for encountering petroleum contamination exists. If footings or drilled piers are expected to reach a depth of 15 feet and impact groundwater, a contaminated soil contingency plan should be developed to appropriately manage potential petroleum-impacted soil.

6. The CS Polymer (11900 Canon Boulevard, Newport News) petroleum release is located approximately 80-feet southwest of the Skiffes Creek-Whealton Transmission Line. This site was reported on April 29th, 1992 to the VDEQ and is currently listed as closed by the VDEQ. The estimated groundwater flow direction at this site is south/southeast and the estimated depth to ground water is approximately 15 feet. Given the close proximity of this site, the potential for encountering petroleum contamination exists. If footings or drilled piers are expected to reach a depth of 15 feet and impact groundwater, a contaminated soil contingency plan should be developed to appropriately manage potential petroleum-impacted soil.

7. The Guarry Property (769 Old Oyster Point Road, Newport News) petroleum release is located approximately 920-feet east of the proposed Skiffes Creek-Whealton Transmission Line. This petroleum release was reported to the VDEQ on November 23rd, 2005 and is currently listed as closed by the VDEQ. The estimated groundwater flow direction is east/southeast and the estimated depth to groundwater is 20 feet. Given the estimated groundwater flow direction and distance, no further evaluation is recommended.

8. The Value City – Newport Square (838 J. Clyde Morris Boulevard, Newport News) petroleum release is located approximately 760-feet east of the Skiffes Creek-Whealton Transmission Line. This site was reported to the VDEQ on April 6th, 1995 and is currently listed as closed by the VDEQ. The estimated groundwater flow direction is south/southeast and the estimated depth to groundwater is 20 feet. Given the estimated groundwater flow direction and distance from the petroleum release, no further evaluation is recommended.

9. There were two petroleum leaks reported at the Exxon S/S #2-7837 (834 J. Clyde Morris Boulevard, Newport News) site. These petroleum releases are located approximately 440-feet east of the Skiffes Creek – Whealton Transmission Line. The petroleum releases were reported to the VDEQ on June 13th, 1995 and are currently listed as closed by the VDEQ. The estimated groundwater flow direction at this site is south/southeast and the estimated depth to ground water is approximately 20 feet. Given the distance and the estimated groundwater flow direction, no further evaluation is recommended.

10. The Cox Communications Hampton Roads, LLC (750 Diligence Drive, Newport News) petroleum release is located approximately 630-feet west of the Skiffes Creek-Whealton Transmission Line. This petroleum release was reported to the VDEQ on December 30th, 2009 and is currently listed as closed by the VDEQ. The estimated groundwater flow direction is south/southeast and the estimated depth to groundwater is 20 feet. Given the estimated groundwater flow direction, distance and depth to groundwater, no further evaluation is recommended.

11. Two petroleum releases were reported at the Casey Honda BMW (777 J. Clyde Morris Boulevard, Newport News) site. These two petroleum releases are located approximately 490-feet west of the Skiffes Creek - Whealton Transmission Line. This site was reported to the VDEQ on January 18th, 2005 and is currently listed as closed by the VDEQ. The estimated groundwater flow direction is south/southeast and the estimated depth to groundwater is 20 feet. Given the estimated groundwater flow direction and distance from the petroleum releases, no further evaluation is recommended.

12. The Casey Honda Used Cars (783 J. Clyde Morris Boulevard, Newport News) petroleum release was reported to the VDEQ on February 11th, 2011 and is currently listed as closed by the VDEQ. This site is approximately 490-feet west of the Skiffes Creek-Whealton Transmission Line. The estimated groundwater flow direction is south/southeast and the estimated depth to groundwater is 20 feet. Given the estimated groundwater flow direction and distance from the petroleum release, no further evaluation is recommended.

13. The Sentry Food Mart #60 (780 J. Clyde Morris Boulevard, Newport News) petroleum release was reported to the VDEQ on February 8th, 1995 and is currently listed as closed by the VDEQ. The Skiffes Creek - Whealton Transmission Line is approximately 80-feet east of this site. The estimated groundwater flow direction is south/southeast and the approximate depth to groundwater is 20 feet. Given the close proximity of this site, if groundwater is encountered, the potential for encountering petroleum contamination exists. If footings or drilled piers are expected to reach a depth of 20 feet and impact groundwater, a contaminated soil contingency plan should be developed to appropriately manage petroleum-impacted soil.

14. The Branch Residence (11 Ridgecrest Drive, Hampton) petroleum release is located approximately 135-feet west of the proposed Skiffes Creek-Whealton Transmission Line. This petroleum release was reported to the VDEQ on March, 29th, 2001 and is currently listed as closed by the VDEQ. The estimated groundwater flow direction is south/southeast and the estimated depth to groundwater is 15 feet. Although a residential petroleum release is typically of a small scale, given the close proximity of this site, if groundwater is encountered, the potential for encountering fuel oil contamination exists. If footings or drilled piers are expected to reach a depth of 15 feet and impact groundwater, a contaminated soil contingency plan should be developed to appropriately manage potential fuel oil-impacted soil.

15. The Kaster Residence (908 Todds Lane, Hampton) petroleum release is located approximately 690-feet west of the Skiffes Creek-Whealton Transmission Line. This petroleum release was reported to the VDEQ on July 11th, 2011 and is currently listed as closed by the

VDEQ. The estimated groundwater flow direction is south/southeast and the estimated depth to groundwater is 20 feet. Although a residential petroleum release is typically of a small scale, given the groundwater flow direction, the potential for encountering fuel oil contamination exists. If footings or drilled piers are expected to reach a depth of 20 feet and impact groundwater downgradient of the petroleum release, a contaminated soil contingency plan should be developed to appropriately manage potential fuel oil-impacted soil.

Skiffes Creek Switching Station

There are no petroleum releases or any other contamination source within the parcel on which the Skiffes Creek Switching Station will be constructed.

Contaminated Sediment Review: James River

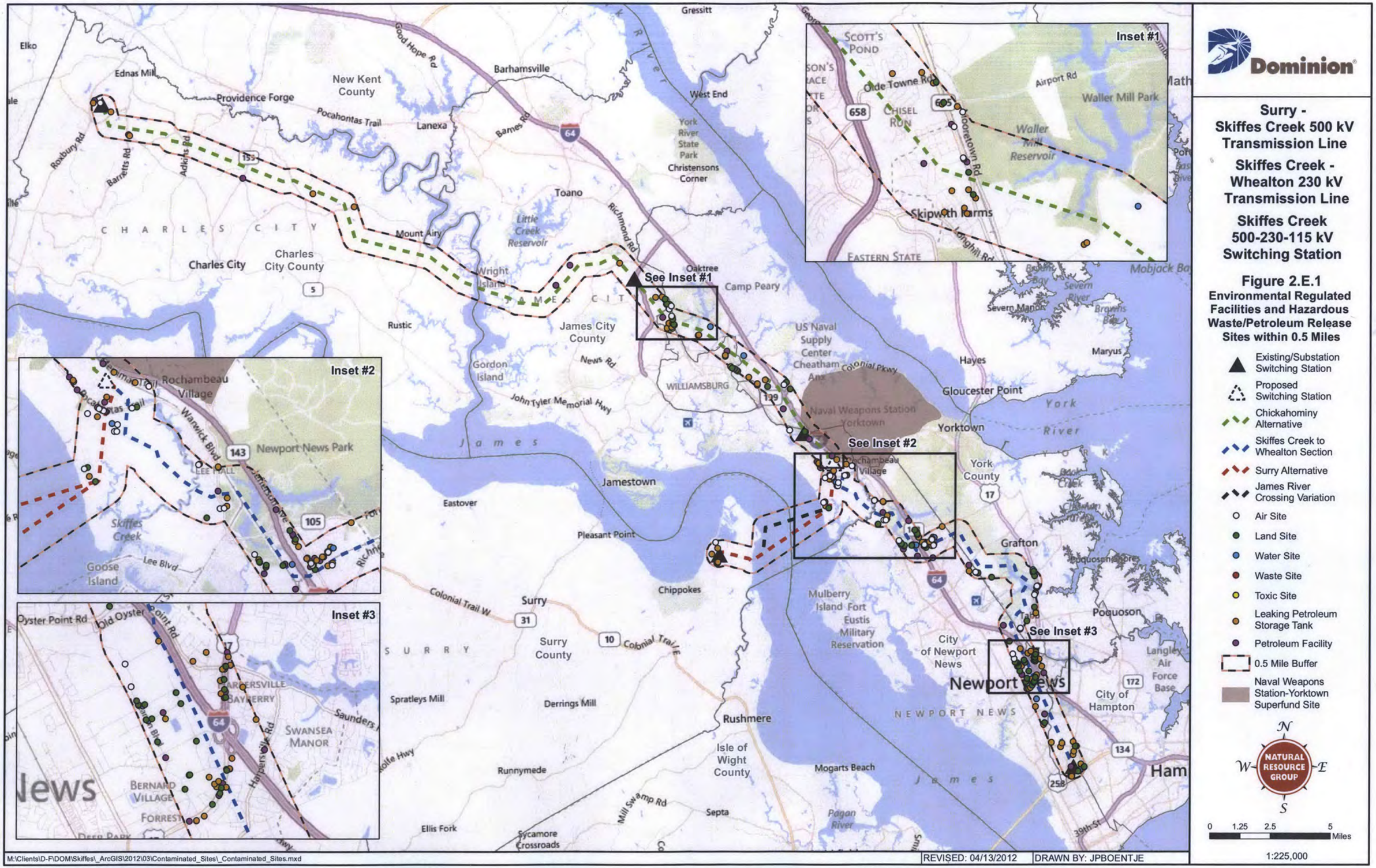
NRG completed a preliminary desktop evaluation to assess the presence of contaminated sediment in the James River near the proposed Surry Alternative James River crossing. A review of the Magnitude and Extent of Contaminated Sediment and Toxicity in Chesapeake Bay (Hartwell and Hameedi, 2007) indicates that sediment samples collected in the James River approximately two miles downstream of the proposed Surry Alternate crossing contained elevated concentrations of polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), DDT and metals.

NRG also reviewed the Chesapeake Bay Program's 2010 Chemical Contaminants map which illustrates impairments and percent contribution of contaminants to the Chesapeake Bay area. The James River is depicted as contributing PCBs to the Chesapeake Bay area.

NRG contacted the U.S. Army Corps of Engineers (COE) regarding sediment quality in the area of the Tribell Shoal Channel where annual channel dredging is being completed. Mr. Steve Powell (757-201-7788), the COE Tribell Shoal Channel dredging Operations Manager, indicated that he was aware that contaminated sediments exist in the project area and the COE is required to sample for contaminants every three years. The COE is currently trying to locate sediment quality data for the project area for our review.

NRG also contacted Mr. Steve Gibson (757-201-7652) with the COE Regulatory Section regarding any special permitting requirements. Mr. Gibson recommended that the Virginia Department of Environmental Quality (VDEQ) be contacted to assess potential sediment sampling requirements and that a Pre-Application Form be submitted to Mr. Randy Steffey (757-201-7579) with the COE.

Discussions with Mr. Tony Cario (804-527-5008) with the VDEQ water quality section indicated that Dominion should submit pre-application information to the Virginia Marine Resource Commission to obtain project permitting feedback prior to submitting a Joint Application. Mr. Cario commented that if only pile driving would be completed, there would likely not be a need to complete any pre-construction sediment sampling/testing. However, if dredging would be completed to provide pile-driving barge access, sediment testing may be required.



M:\Clients\D-F\DOM\Skiffes_ArcGIS\2012\03\Contaminated_Sites_Contaminated_Sites.mxd

REVISED: 04/13/2012

DRAWN BY: JPBOENTJE

Dominion

Surry - Skiffes Creek 500 kV Transmission Line

Skiffes Creek - Whealton 230 kV Transmission Line

Skiffes Creek 500-230-115 kV Switching Station

Figure 2.E.1

Environmental Regulated Facilities and Hazardous Waste/Petroleum Release Sites within 0.5 Miles

- Existing/Substation Switching Station
- Proposed Switching Station
- Chickahominy Alternative
- Skiffes Creek to Whealton Section
- Surry Alternative
- James River Crossing Variation
- Air Site
- Land Site
- Water Site
- Waste Site
- Toxic Site
- Leaking Petroleum Storage Tank
- Petroleum Facility
- 0.5 Mile Buffer
- Naval Weapons Station-Yorktown Superfund Site

N
W NATURAL RESOURCE GROUP E
S

0 1.25 2.5 5 Miles

1:225,000

BASF Contaminated Site Review

NRG performed a preliminary contaminated soil/groundwater review of the BASF Corporation site (8961 Pocahontas Trail, Williamsburg). This site is currently being investigated under supervision of the Virginia Department of Environmental Quality (VDEQ) as a hazardous waste site. The Compounds of Concern (COC) at the site include benzene, 1-dichloroethene, 4-dioxane, cis-1, 2-dichloroethene, perchloroethylene (tetrachloroethene), vinyl chloride, and zinc. The facility has been inactive since 1993.

Based on a review of the BASF 2011 Annual Compliance Groundwater Monitoring report, low concentrations of target analytes were detected in groundwater monitoring wells near the former BASF Wastewater Treatment Plant. Utilizing the VDEQ construction worker risk assessment worksheet, excavation workers are not expected to be exposed to site contaminants at concentrations that exceed Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs).

Given the industrial history of the site and potential to encounter higher COC soil/groundwater concentrations, NRG recommends that worker exposure monitoring be completed by an environmental/industrial hygiene technician during the construction activities near the former BASF wastewater treatment ponds. A construction contingency plan should also be developed to manage contaminated media (soil/groundwater) that may be encountered during the construction activities near the BASF site.

U.S. Fish and Wildlife Service, Virginia Field Office

Federally Endangered, Threatened, Proposed, and Candidate Species by County

CHARLES CITY COUNTY, VIRGINIA

Federally Endangered, Threatened, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
VASCULAR PLANTS		
Aeschynomene virginica	Sensitive joint-vetch	LT
Helonias bullata[2]	Swamp pink	LT
Isotria medeoloides[2]	Small whorled pogonia	LT

Other Federally Protected Species

BIRDS		
Haliaeetus leucocephalus[1]	Bald eagle	BGEPA

Species of Concern (No official Federal status)

VASCULAR PLANTS		
Juncus caesariensis	New Jersey rush	G2
Trillium pusillum var. virginianum	Virginia least trillium	G3T2

[1]Nesting occurs in this county; concentrated shoreline use has been documented on the James River.
[2]This species has been documented in an adjacent county and may occur in this county.

September 23, 2008
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

CITY OF HAMPTON, VIRGINIA

Federally Endangered, Threatened, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Charadrius melodus	Piping plover	LT
INVERTEBRATES		
Cicindela dorsalis dorsalis	Northeastern beach tiger beetle	LT

Other Federally Protected Species

BIRDS		
Haliaeetus leucocephalus	Bald eagle	BGEPA

Species of Concern (No official Federal status)

VASCULAR PLANTS		
Trillium pusillum var. virginianum	Virginia least trillium	G3T2

September 18, 2008
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

JAMES CITY COUNTY, VIRGINIA

Federally Endangered, Threatened, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
VASCULAR PLANTS		
Aeschynomene virginica	Sensitive joint-vetch	LT
Isotria medeoloides	Small whorled pogonia	LT

Other Federally Protected Species

BIRDS		
Haliaeetus leucocephalus[1]	Bald eagle	BGEPA

Species of Concern (No official Federal status)

INVERTEBRATES		
Problema bulenta	Rare skipper	G2G3
VASCULAR PLANTS		
Juncus caesariensis	New Jersey rush	G2
Nuphar sagittifolia	Narrow-leaved spatterdock	G2
Trillium pusillum var. virginianum	Virginia least trillium	G3T2

[1]Nesting occurs in this county; concentrated shoreline use has been documented on the James River.

September 25, 2008
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

NEW KENT COUNTY, VIRGINIA

Federally Endangered, Threatened, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
VASCULAR PLANTS		
Aeschynomene virginica	Sensitive joint-vetch	LT
Helonias bullata[1]	Swamp pink	LT
Isotria medeoloides	Small whorled pogonia	LT

Other Federally Protected Species

BIRDS		
Haliaeetus leucocephalus	Bald eagle	BGEPA

Species of Concern (No official Federal status)

INVERTEBRATES		
Problema bulenta	Rare skipper	G2G3
VASCULAR PLANTS		
Juncus caesariensis[1]	New Jersey rush	G2
Trillium pusillum var. virginianum	Virginia least trillium	G3T2

[1]This species has been documented in an adjacent county and may occur in this county.

September 24, 2008
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

CITY OF NEWPORT NEWS, VIRGINIA

Federally Endangered, Threatened, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
None documented		

Other Federally Protected Species

BIRDS		
Haliaeetus leucocephalus	Bald eagle	BGEPA

Species of Concern (No official Federal status)

None documented

September 24, 2008
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

YORK COUNTY, VIRGINIA

Federally Endangered, Threatened, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
VASCULAR PLANTS		
Isotria medeoloides[1]	Small whorled pogonia	LT

Other Federally Protected Species

BIRDS		
Haliaeetus leucocephalus	Bald eagle	BGEPA

Species of Concern (No official Federal status)

VASCULAR PLANTS		
Fimbristylis perpusilla	Harper's fimbristylis	G2
Juncus caesariensis[1]	New Jersey rush	G2
Trillium pusillum var. virginianum[1]	Virginia least trillium	G3T2

[1]This species has been documented in an adjacent county and may occur in this county.

September 24, 2008
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

CITY OF WILLIAMSBURG, VIRGINIA

Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
VASCULAR PLANTS		
Isotria medeoloides	Small whorled pogonia	LT

Species of Concern (No official Federal status)

VASCULAR PLANTS		
Juncus caesariensis[1]	New Jersey rush	G2
Trillium pusillum var. virginianum	Virginia least trillium	G3T2

[1]This species has been documented in an adjacent county and may occur in this county.

September 23, 2008
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

U.S. Fish and Wildlife Service

Natural Resources of Concern

This resource list is to be used for planning purposes only — it is not an official species-list.

Endangered Species Act species-list information for your project is available online and listed below for the following FWS Field Offices:

VIRGINIA ECOLOGICAL SERVICES FIELD OFFICE
6669 SHORT LANE
GLOUCESTER, VA 23061
(804) 693-6694
http://www.fws.gov/northeast/virginiafield/

Project Counties:

Surry, VA

Project Type:

Transmission Line

Endangered Species Act Species-list

There are a total of 1 species in your species-list

Species that may be affected by your project:

Flowering Plants			
Sensitive joint-vetch (*Aeschynomene virginica*)	Threatened	species info	Virginia Ecological Services Field Office

FWS National Wildlife Refuges

There are no refuges found within the vicinity of your project.

U.S. Fish and Wildlife Service

Natural Resources of Concern

FWS Migratory Birds

Not yet available through IPaC.

FWS Delineated Wetlands

Not yet available through IPaC.

Virginia Department of Conservation & Recreation

Natural Heritage Resources by County

Natural Heritage Resources by County

Your Search Criteria:
Charles City, Hampton (City), James City, New Kent, Newport News (City), Surry, Williamsburg (City), York
Federal Legal Status: All,
State Legal Status: All,
Search run: 02-23-2012

Click highlighted scientific names below to go to NatureServe report. Search Menu

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status	Last Year Observed
Charles City						
BIRDS						
Falco peregrinus	Peregrine Falcon	G4	S1B,S2N		LT	1998
Haliaeetus leucocephalus	Bald Eagle	G5	S2S3B,S3N		LT	2008
FISH						
Acipenser oxyrinchus	Atlantic Sturgeon	G3	S2	C		2007
LEPIDOPTERA (BUTTERFLIES & MOTHS)						
Problema bulenta	Rare Skipper	G2G3	S1	SOC		2008
VASCULAR PLANTS						
Aeschynomene virginica	Sensitive Joint-vetch	G2	S2	LT	LT	2001
Isoetes hyemalis	Winter Quillwort	G2G3	S1?	SOC		1992
Juncus caesariensis	New Jersey Rush	G2G3	S2	SOC	LT	2006
Nuphar sagittifolia	Narrow-leaved Spatterdock	G2	S1	SOC	LT	2003
Trillium pusillum var. virginianum	Virginia Least Trillium	G3T2	S2	SOC		1974
Hampton (City)						
AMPHIBIANS						
Ambystoma mabeei	Mabee's Salamander	G4	S1S2		LT	1985
BIRDS						
Charadrius melodus	Piping Plover	G3	S2B,S1N	LT	LT	1989
Gelochelidon nilotica	Gull-billed Tern	G5	S2B		LT	2010
Haliaeetus leucocephalus	Bald Eagle	G5	S2S3B,S3N		LT	2002

COLEOPTERA (BEETLES)						
Cicindela dorsalis dorsalis	Northeastern Beach Tiger Beetle	G4T2	S2	LT	LT	2006
REPTILES						
Crotalus horridus [Coastal Plain population]	Canebrake Rattlesnake	G4	S1		LE	2010
VASCULAR PLANTS						
Trillium pusillum var. virginianum	Virginia Least Trillium	G3T2	S2	SOC		1997

James City

AMPHIBIANS						
Ambystoma mabeei	Mabee's Salamander	G4	S1S2		LT	2007
BIRDS						
Haliaeetus leucocephalus	Bald Eagle	G5	S2S3B,S3N		LT	2007
FISH						
Acipenser oxyrinchus	Atlantic Sturgeon	G3	S2	C		2007
LEPIDOPTERA (BUTTERFLIES & MOTHS)						
Problema bulenta	Rare Skipper	G2G3	S1	SOC		2008
VASCULAR PLANTS						
Aeschynomene virginica	Sensitive Joint-vetch	G2	S2	LT	LT	2004
Isotria medeoloides	Small Whorled Pogonia	G2	S2	LT	LE	2010
Juncus caesariensis	New Jersey Rush	G2G3	S2	SOC	LT	1990
Nuphar sagittifolia	Narrow-leaved Spatterdock	G2	S1	SOC	LT	2003
Trillium pusillum var. virginianum	Virginia Least Trillium	G3T2	S2	SOC		2010

New Kent

BIRDS						
Haliaeetus leucocephalus	Bald Eagle	G5	S2S3B,S3N		LT	2002
LEPIDOPTERA (BUTTERFLIES & MOTHS)						
Problema bulenta	Rare Skipper	G2G3	S1	SOC		2008
VASCULAR PLANTS						

Aeschynomene virginica	Sensitive Joint-vetch	G2	S2	LT	LT	2008
Isoetes hyemalis	Winter Quillwort	G2G3	S1?	SOC		1992
Isotria medeoloides	Small Whorled Pogonia	G2	S2	LT	LE	1929
Nuphar sagittifolia	Narrow-leaved Spatterdock	G2	S1	SOC	LT	2003
Trillium pusillum var. virginianum	Virginia Least Trillium	G3T2	S2	SOC		1994

Newport News (City)

BIRDS						
Falco peregrinus	Peregrine Falcon	G4	S1B,S2N		LT	1998
Haliaeetus leucocephalus	Bald Eagle	G5	S2S3B,S3N		LT	2002
FISH						
Acipenser oxyrinchus	Atlantic Sturgeon	G3	S2	C		2007
REPTILES						
Crotalus horridus [Coastal Plain population]	Canebrake Rattlesnake	G4	S1		LE	2010

Surry

AMPHIBIANS						
Hyla gratiosa	Barking Treefrog	G5	S1		LT	mid-
BIRDS						
Haliaeetus leucocephalus	Bald Eagle	G5	S2S3B,S3N		LT	2002
FISH						
Acipenser oxyrinchus	Atlantic Sturgeon	G3	S2	C		2007
Enneacanthus chaetodon	Blackbanded Sunfish	G4	S1		LE	1985
LEPIDOPTERA (BUTTERFLIES & MOTHS)						
Problema bulenta	Rare Skipper	G2G3	S1	SOC		2007
MAMMALS						
Corynorhinus rafinesquii macrotis	Eastern Big-eared Bat	G3G4TNR	S2		LE	mid-
VASCULAR PLANTS						
Aeschynomene virginica	Sensitive Joint-vetch	G2	S2	LT	LT	1939
Desmodium ochroleucum	Creamflower Tick-trefoil	G1G2	SH	SOC		1941
Trillium pusillum var. virginianum	Virginia Least Trillium	G3T2	S2	SOC		1949

Williamsburg (City)

VASCULAR PLANTS						
Isotria medeoloides	Small Whorled Pogonia	G2	S2	LT	LE	1990

York

AMPHIBIANS						
Ambystoma mabeei	Mabee's Salamander	G4	S1S2		LT	2006
Ambystoma tigrinum	Tiger Salamander	G5	S1		LE	1993
Hyla gratiosa	Barking Treefrog	G5	S1		LT	1990
BIRDS						
Falco peregrinus	Peregrine Falcon	G4	S1B,S2N		LT	1994
Haliaeetus leucocephalus	Bald Eagle	G5	S2S3B,S3N		LT	2002
REPTILES						
Crotalus horridus [Coastal Plain population]	Canebrake Rattlesnake	G4	S1		LE	2008
VASCULAR PLANTS						
Fimbristylis perpusilla	Harper's Fimbristylis	G2	S1	SOC	LE	2008
Isotria medeoloides	Small Whorled Pogonia	G2	S2	LT	LE	1941
Trillium pusillum var. virginianum	Virginia Least Trillium	G3T2	S2	SOC		1983

Note: On-line queries provide basic information from DCR's databases at the time of the request. They are NOT to be substituted for a project review or for on-site surveys required for environmental assessments of specific project areas.

Need Additional Information? For more detailed information on locations of Natural Heritage Resources submit an information request.

Want to Contribute? If you have information on locations of natural heritage resources, please fill out and submit a rare species sighting form

Return to the Database Search page

Liz Harper (VirginiaPower - 6)

From: Ewing, Amy (DGIF) [Amy.Ewing@dgif.virginia.gov]
Sent: Thursday, February 23, 2012 4:06 PM
To: Liz Harper (VirginiaPower - 6)
Subject: ESSLog# 32638_500kV line to Skiffes Creek, line from Skiffes Creek to Whealton, Skiffes Creek switching station

We have reviewed the locations of the newly proposed 500kV Surry Point Alternate line, the proposed Skiffes Creek Switching Station, and the line from the new switching station to the Whealton Substation for the presence of resources under our jurisdiction.

According to our records, the following listed resources under our jurisdiction have been documented from the project sites:

- State Threatened bald eagle nests, bald eagle roost sites, and the James River Bald Eagle concentration zone
- James River Anadromous Fish Use Area, Skiffes Creek Anadromous Fish Use Area, Lawnes Creek Anadromous Fish Use Area, Warwick River Anadromous Fish Use Area
- Colonial waterbird colonies containing great blue herons
- State Endangered canebrake rattlesnakes
- State Threatened Mabee's salamanders
- State Endangered eastern tiger salamanders

Without better locational information and other details regarding the subject projects, we are unable to determine what, if any impacts upon the above-listed species and resources may result from the proposed work. We recommend that all environmental documents and applications address possible impacts upon the above listed species and resources. To assist in those efforts, we recommend coordination with our GIS Coordinator, Kendell Ryan, at Kendell.Ryan@dgif.virginia.gov or 804-367-0068. She may be able to provide you maps or shapefiles of the known resources from the project area.

To minimize the adverse impacts of linear utility project development on wildlife resources, we offer the following general recommendations: avoid and minimize impacts to undisturbed forest, wetlands, and streams to the fullest extent practicable; maintain naturally vegetated buffers of at least 100 feet in width around wetlands and on both sides of perennial and intermittent streams, where practicable; conduct significant tree removal and ground clearing activities outside of the primary songbird nesting season of March 15 through August 15; and, implement and maintain appropriate erosion and sediment controls throughout project construction and site restoration. We understand that adherence to these general recommendations may be infeasible in some situations. We are happy to work with the applicant to develop project-specific measures as necessary to minimize project impacts upon the Commonwealth's wildlife resources.

Thanks, Amy

Amy Ewing
Environmental Services Biologist
VA Dept. of Game and Inland Fisheries
4010 W. Broad Street
Richmond, VA 23230
804-367-2211
amy.ewing@dgif.virginia.gov

Douglas W. Domenech
Secretary of Natural Resources

David A. Johnson
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION
900 E. Main Street, 8th Floor, Pocahontas Building
Richmond, Virginia 23219-3558
Phone: (804) 225-3440 TOLL-FREE/TDD: 1-800-243-7229
FAX: 804-225-3447 WEBSITE: www.dcr.virginia.gov

January 30, 2012

Ms. Courtney Fisher
Senior Permit Specialist
Dominion Virginia Power Electric Transmission
701 East Cary Street – OJRP 12th Floor
Richmond, VA 23219

Subject: Dominion Virginia Power Electric Transmission
2012 General Erosion & Sediment Control Standards & Specifications Approval

Dear Ms. Fisher:

The Virginia Soil and Water Conservation Board (VSWCB) approved the 2012 General Erosion & Sediment Control Standards and Specifications (ESCSS) for Dominion Virginia Power Electric Transmission on December 7, 2011. The VSWCB approval was based on Department of Conservation and Recreation (DCR) staff review and recommendations. The VSWCB approval contained the following conditions and responses on variance requests:

1. A revised list of all proposed projects planned for construction from January 1, 2012 to December 31, 2012 must be submitted by February 27, 2012. The following information must be submitted for each project:

    - Project name (or number)
    - Project location (including nearest major intersection)
    - On-site project manager name and contact information
    - Project description
    - Acreage of disturbed area for project
    - Project start and finish dates

2. Project information unknown prior to February 27, 2012 must be provided to DCR two (2) weeks in advance of land disturbing activities by e-mail at the following address: LinearProjects@dcr.virginia.gov .

3. Notify DCR of the Responsible Land Disturber (RLD) at least two (2) weeks in advance of land disturbing activities by e-mail at the following address LinearProjects@dcr.virginia.gov . The information to be provided is name, contact information and certification number.

4. Install and maintain all erosion and sediment control practices in accordance with the 1992 Virginia Erosion and Sediment Control Handbook.

Please note that all land disturbing activities regulated by §10.1-563.D undertaken between January 1, 2012 through December 31, 2012 on private and publicly owned lands in Virginia must be conducted in accordance with the approved 2012 ESCSS. Individual project-specific erosion and sediment control plans must be prepared to ensure proper on site implementation of erosion and sediment control measures. However, these plans need not be submitted to DCR for approval as long as they comply with the approved 2012 ESCSS.

To ensure compliance with approved specifications and the Virginia Erosion and Sediment Control Law, DCR staff will conduct random site inspections, respond to complaints, and provide on site technical assistance with specific erosion and sediment control measures and plan implementation.

Please note that in 2011, the General Assembly revised §10.1-563.D of the Virginia Erosion and Sediment Control Law, authorizing the Board to charge a fee to electric, natural gas and telephone utility companies, interstate and intrastate natural gas pipeline companies, railroad companies and public service authorities for the costs associated with standards and specifications. The fee is intended to defray the costs to the state involved in the review and approval, project inspections, and compliance with the annual standards and specifications. If you are the appropriate billing contact for this fee, please find the enclosed invoice and follow the instructions on the invoice for remitting that fee. If our records show a different contact for billing, the invoice is being sent under separate cover to the appropriate person.

To ensure an efficient information exchange and response to inquiries, the Richmond Central Office is your primary point of contact. Central Office staff will coordinate with our regional staff as appropriate. Your point of contact is:

Larry Gavan
Department of Conservation and Recreation
Richmond Central Office
Phone: (804) 786-4508
Fax: (804) 786-1798
LinearProjects@dcr.virginia.gov

Thank you very much for your submission and continued efforts to conserve and protect Virginia's precious natural resources.

Sincerely,

John R. McCutcheon
Training and Certification Program Manager

Enclosure: Invoice for 2012 Annual Standards and Specifications

cc: Larry Gavan - DCR

COMMONWEALTH of VIRGINIA

Douglas W. Domenech
Secretary of Natural Resources

Department of Historic Resources
2801 Kensington Avenue, Richmond, Virginia 23221

Kathleen S. Kilpatrick
Director

Tel: (804) 367-2323
Fax: (804) 367-2391
TDD: (804) 367-2386
www.dhr.virginia.gov

January 9, 2012

Ms. Elizabeth Harper
Dominion Virginia Power
P.O. Box 26666
Richmond, VA 23261

Re: Chickahominy-Skiffes Creek 500kV Line, Skiffes Creek-Whealton 230 kV Line, and Skiffes Creek Switching Station
Charles City, James City, and York Counties, Cities of Williamsburg, Newport News, and Hampton, VA
DHR File No. 2011-2071

Dear Ms. Harper:

Thank you for initiating consultation with DHR on the project referenced above. Our comments are requested as part of the preparation of an application by Dominion Virginia Power to the State Corporation Commission (SCC). At this time, we have not been notified by any Federal agency of their involvement in this project or of the applicability of Section 106 of the National Historic Preservation Act. We reserve the right to provide additional comment through the DEQ-coordinated review of the completed SCC application or within the Federal Section 106 process, if applicable.

The project, as presented, is the construction a new transmission line between the existing Chickahominy Substation and the proposed Skiffes Creek Switching Station and a reconfiguration of an existing transmission line between the proposed switching station and the existing Whealton Substation. As you are aware, these projects cross through areas that are significant to the history and prehistory of the Commonwealth. Our Archives show numerous recorded archaeological and historic architectural resources in the immediate vicinity of the proposed facilities, including several properties listed in the Virginia Landmarks Register (VLR) and National Register of Historic Places (NRHP).

From the information provided, we understand that the preferred alternative for the new Chickahominy-Skiffes Creek line runs within an undeveloped, but existing right-of-way. The construction of new lines within undeveloped rights-of-way has the strong potential to impact the setting of historic resources. We have received from the Charles City County Center for Local History and the owner of a VLR/NRHP-listed property on SR615 letters expressing their concern about the potential impacts of this portion of the project on historic resources. We echo this concern and suggest that Dominion consider the feasibility of

collocating the new Chickahominy-Skiffes Creek line with the existing line that connects the Chickahominy, Lanexa, and Lightfoot substations.

To meaningfully consider the impacts of this project on recorded historic resources and prior to finalizing your application to the SCC, we request that a pre-application analysis be prepared and submitted to DHR for review and comment in accordance with Section I of the DHR's *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia.* Once an alternative is approved by the SCC, we request that a full architectural and archaeological survey be conducted pursuant to Section II of the above-referenced guidance, the potential direct and indirect impacts to all VLR/NRHP-eligible resources be assessed, and moderate to severe impacts to VLR/NRHP-eligible resources be avoided, minimized, or mitigated by Dominion in consultation with DHR.

As always, we appreciate Dominion's consideration of historic resources in the planning of your projects. Please submit the requested additional materials when available. If you have any questions, please do not hesitate to contact me at roger.kirchen@dhr.virginia.gov.

Sincerely,

Roger W. Kirchen, Archaeologist
Office of Review and Compliance

Administrative Services
10 Courthouse Ave.
Petersburg, VA 23803
Tel: (804) 862-6416
Fax: (804) 862-6196

Capital Region Office
2801 Kensington Ave.
Richmond, VA 23221
Tel: (804) 367-2323
Fax: (804) 367-2391

Tidewater Region Office
14415 Old Courthouse Way
2nd Floor
Newport News, VA 23608
Tel: (757) 886-2807
Fax: (757) 886-2808

Western Region Office
962 Kime Lane
Salem, VA 24153
Tel: (540) 387-5428
Fax: (540) 387-5446

Northern Region Office
5357 Main Street
P.O. Box 519
Stephens City, VA 22655
Tel: (540) 868-7029
Fax: (540) 868-7033

United States Department of the Interior

NATIONAL PARK SERVICE
Colonial National Historical Park
Post Office Box 210
Yorktown, Virginia 23690

IN REPLY REFER TO:

H4217

April 17, 2012

Ms. Elizabeth Harper
Dominion Virginia Power
P.O. Box 26666
Richmond, Virginia 23261

Subject: Proposed 500 kV Line Project to Skiffes Creek, Skiffes Creek-Wheaton 230 kV Line, and Skiffes Creek 500-230-115 kV Switching Station

Dear Ms. Harper:

I reviewed the preliminary drawings provided in your letter to me dated February 3 for the proposed project. As this project falls within the viewshed of the Colonial Parkway and Jamestown Island, which are units of Colonial National Historical Park and are listed on the National Register of Historic Places, I will need to be consulted on this project to determine if it will adversely affect these nationally significant resources.

At present, I believe that the proposed overhead transmission line will be visible from the College Creek pull-off along the Parkway and from Black Point on Jamestown Island and therefore would be considered an adverse effect.

I look forward to hearing from you as the project moves forward.

Sincerely,

P. Daniel Smith
Superintendent

Douglas W. Domenech
Secretary of Natural Resources

David A. Johnson
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

203 Governor Street
Richmond, Virginia 23219-2010
(804) 786-1712

MEMORANDUM

DATE: March 7, 2012

TO: Liz Harper, Dominion Power

FROM: Roberta Rhur, Environmental Impact Review Coordinator

SUBJECT: DCR 12-009, SKIFFES CREEK –WHEALTON 230 KV LINE, CHARLES CITY CO

Division of Planning and Recreational Resources

The Department of Conservation and Recreation (DCR), Division of Planning and Recreational Resources (PRR), develops the *Virginia Outdoors Plan* and coordinates a broad range of recreational and environmental programs throughout Virginia. These include the Virginia Scenic Rivers program; Trails, Greenways, and Blueways; Virginia State Park Master Planning and State Park Design and Construction.

The proposed Surry Alternative has the potential to impact scenic and recreational sites. It is within the limits of the Scenic River designation for the Lower James Historic River, which was designated for its rich history, scenic and recreational attributes. It is also within the visual limits of the Hog Island State Wildlife Management Area, Carter's Grove, and Colonial National Historic Park. The proposed towers would have to be very high to accommodate commercial ships that use the river for transportation, thereby possible being visible from other significant historic and recreational sites, like Chippokes Plantation State Park, Jamestown Island and National Historic Park. The towers and wires will be visible from long distances along and from the river, which is a determent to the significant commercial, scenic and recreational assets the James River provides to the state and the region.

Although this alternative is shorter than the original proposal, the impacts to such scenic and historic resources are great. The original proposal is primarily along an existing corridor without crossing any scenic rivers or byways.

If you move forward with the Surry Alternative, we recommend that the crossing be an underwater one, which will be much less impactful for commercial shippers, boaters and other recreationalist.

Division of Stormwater Management

Stormwater Management:
Projects involving land-disturbing activities equal to or greater than 10,000 square feet, or equal to or greater than 2,500 square feet in all areas subject to the Chesapeake Bay Preservation Act, must comply with the Virginia Erosion and Sediment Control Law and all applicable regulations adopted in accordance

with that law. Projects involving land-disturbing activities equal to or greater than one acre, or equal to or greater than 2,500 square feet in all areas of the jurisdictions designated as subject to the Chesapeake Bay Preservation Area Designation and Management Regulations adopted pursuant to the Chesapeake Bay Preservation Act, must comply with the Virginia Stormwater Management Act and the Virginia Stormwater Management Program (VSMP) Permit Regulations adopted in accordance with the Act. If you have project specific questions please contact the Virginia Department of Conservation and Recreation Suffolk Regional Office.
http://www.dcr.virginia.gov/soil_&_water/swintro.shtml

Virginia Erosion and Sediment Control Law and Regulations:
http://www.dcr.virginia.gov/soil_&_water/documents/eslawrgs.pdf

Virginia Stormwater Management Act:
http://www.dcr.virginia.gov/soil_&_water/documents/vaswmlaw.pdf

Virginia Stormwater Management Program (VSMP) Permit Regulations:
http://www.dcr.virginia.gov/soil_&_water/documents/vaswmregs.pdf

Virginia Stormwater Program Permits
http://www.dcr.virginia.gov/soil_&_water/vsmp.shtml

The remaining DCR divisions have no comments regarding the scope of this project. Thank you for the opportunity to comment.

United States Department of the Interior

NATIONAL PARK SERVICE
Captain John Smith Chesapeake National Historic Trail
Chesapeake Bay Gateways and Watertrails Network
Star-Spangled Banner National Historic Trail
410 Severn Avenue, Suite 314
Annapolis, MD 21403

January 19, 2012
Stephenie Harrington
Dominion Virginia Power
701 East Cary Street
Richmond, Virginia 23219

Dear Ms. Harrington:

Thank you for copying our office in your January 6, 2012 letter to the Charles City County Center for Local History. I am writing to inform you of resources identified with the Captain John Smith Chesapeake National Historic Trail that may be impacted by the proposed Chickahominy-Skiffes Creek 500kV transmission line.

The Captain John Smith Chesapeake National Historic Trail was designated by Congress in 2006 and the National Park Service (NPS) finalized a *Comprehensive Management Plan* for the trail in February 2011. The trail commemorates the exploratory voyages of Captain Smith on the Chesapeake Bay and its tributaries in 1607-1609, tracing nearly 3000 miles along the bay and tributary rivers and creeks. In addition the trail also recognizes American Indian settlements and cultures of the seventeenth century, calls attention to the natural history of the Chesapeake Bay (both historic and contemporary), and provides new opportunities for education, recreation, and heritage tourism in the Chesapeake Bay region.

Primary trail resources identified in the *Comprehensive Management Plan* include landscapes evocative of the 17th century, archeological resources, and indigenous cultural landscapes. The long-term protection of these resources is crucial to achieving the purposes of the trail. The *Comprehensive Management Plan* called for more detailed, regionally specific "segment" plans to address the unique geography, resources, partners and opportunities associated with local segments. The first of these regional plans, *A Plan for the James River Segment,* was finalized in December 2011 and includes the area intersected by the proposed Chickahominy-Skiffes Creek line.

The proposed Chickahominy-Skiffes Creek 500kV transmission line and 150 ft buffer crosses the Chickahominy River in one of the five primary focus areas of the trail along the James River segment in the plan. The plan states this focus area is characterized by a nearly unspoiled river and marsh system. Further, the area of the proposed crossing is identified in the both the *Comprehensive Management Plan* and the James segment plan as: (1) a landscape evocative of the 17th century; (2) an indigenous cultural landscape; and (3) provides unique public access and recreational opportunities.

The Chickahominy River was and still is a significant resource to the Chickahominy Indians and demonstrates a long history of sustainable use. The trail represents an opportunity to present the Chickahominy tribes as an added value to Virginia's heritage tourism and the nation's natural and cultural history. The trail will serve as a low-impact, sustainable job creator and contributor to economic development for Charles City County residents and the Chickahominy tribal members. The river itself is considered a sacred traditional cultural property to the Chickahominy tribes, to be maintained as such without further destruction of its beauty, viewsheds, and cultural resources.

A full assessment of the potential impacts of the intersection of the proposed Chickahominy-Skiffes 500kV transmission line on trail-related resources cannot be accurately evaluated at this stage. However, the introduction of transmission lines in this particular landscape has the potential to adversely impact the resources the national historic trail is intended to commemorate, interpret and conserve.

We recommend Dominion Virginia Power consider alternative routes for the line or consider running the lines underground as is done in other sensitive resource locations in the Chesapeake region. We also request to be consulted further as the project proposal continues and as site-specific details that may impact trail-related resources become available.

Thank you very much for your consideration.

Sincerely,

John Maounis
Superintendent

United States Department of the Interior

FISH AND WILDLIFE SERVICE
300 Westgate Center Drive
Hadley, MA 01035-9589

In Reply Refer To:
FWS/Region 5/WSFR

MAR 2 2 2012

Robert W. Duncan, Executive Director
Department of Game and Inland Fisheries
P.O. Box 11104
Richmond, Virginia 23230

Dear Mr. Duncan:

I am writing in regards to the 500 kV transmission line proposed by Dominion Virginia Power to cross a portion of the Hog Island Wildlife Management Area (WMA) in Surrey County, Virginia. Hog Island WMA was purchased with a combination of Pittman-Robertson Wildlife Restoration and state hunting license dollars beginning in 1949 and 1950 under grant VA W-36-L from the U.S. Fish and Wildlife Service to the then Virginia Commission of Game and Inland Fisheries. Lands purchased with these revenues have significant restrictions and protections under Federal law. Indeed, it was Virginia Congressman A. Willis Robertson who wrote these restrictions into law in 1937.

Siting a transmission line on Hog Island WMA would violate 50 CFR Part 80 sections 80.11, 80.134, 80.135, and 80.136. If these Rules are violated, the Commonwealth of Virginia would no longer be eligible to participate in the Pittman-Robertson Wildlife Restoration program, under which you would otherwise receive $7,025,491 during fiscal year 2012.

Section 50 CFR 80.11 mandates that lands purchased with license revenues not be diverted to any purpose other than the administrative functions of the state fish and wildlife agency (agency). Section 80.134 stipulates that the agency must use real property acquired only for the purpose authorized in the grant. Section 80.135 requires any uses that interfere with the grant purpose be terminated and the land restored to its authorized purpose. Section 80.136 directs that if hunting license revenues were used in the purchase of property, any use of the property for unauthorized purposes would place the state in diversion, resulting in the loss of federal funding and forfeiture of program participation for the state.

There is no way under Federal law to accommodate the siting of this proposed transmission line on Hog Island WMA. If you have any questions, please do not hesitate to contact me at 413-253-8501.

Sincerely,

John F. Organ, Ph.D.
Chief, Division of Wildlife
and Sport Fish Restoration

COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION
1700 NORTH MAIN STREET
SUFFOLK, VIRGINIA 23434

Gregory A. Whirley
Commissioner

March 1, 2012

MEMORANDUM

TO: Elizabeth Harper

FROM: Eric L. Stringfield, Transportation Planning and Land Use Director

SUBJECT: Review of Environmental Impact Report

PROJECT: Proposed 500kV Line Project to Skiffes Creek-Whealton 230kV Line and Skiffes Creek 500-230-115kV Switching Station

LOCATION: Charles City County, James City County, City of Newport News

CC: Chip Ray & James Cromwell

This proposal was reviewed by the Hampton Roads Planning Office for impacts to existing and proposed transportation facilities in relationship to the three proposed alternatives that Dominion is considering for overhead electrical transmission lines in the Tidewater area. The Chickahominy Alternative, Surry Alternative, and the Whealton Substation projects proposed routes were reviewed. Listed below are the three alternatives and the known VDOT projects in the vicinity of the transmission line route.

Chickahominy Alternative

- UPC 97214 – James River ES Crossing Improvements-James City County
- UPC 98811 – Longhill Road Corridor Study – PE only – James City County
- UPC 98812 – Route 60/143 Connector Study – PE only – James City County
- UPC 100200 – Skiffes Creek Connector – Jams City County
- UPC 13496 & 14598 - Route 60 Relocation – James City County & City of Newport News
- UPC 60512 – Olde Towne Road curve improvements – James City County

Surry Alternative

- UPC 98812 – Route 60/143 Connector Study – PE only – James City County
- UPC 13496 & 14598 - Route 60 Relocation – James City County & City of Newport News
- UPC 87201 – Skiffes Creek Bridge/Rte 60 Relocation – James City County

Wheaton Substation

- UPC 4483 – Atkinson Boulevard new 4-lane roadway – City of Newport News

- UPC 57313 – Rte 64 Widening from 4-8 lanes –City of Newport News
- UPC 98570 – Fort Eustis Boulevard guardrail over Lee Hall Reservoir – City of Newport News
- UPC100856 - Oakland Industrial Park sidewalk – City of Newport News

There are several projects either recently completed, under construction or proposed in VDOT's Six Year Plan and the Hampton Roads 2034 Long Range Plan that improves traffic flow in this area. They include:

- Skiffes Creek Connector Study – James City County
- Route 60 Relocation Study – James City County
- Fort Eustis Bridge Replacement – City of Newport News
- I-64 Peninsula Widening (Jefferson Ave to Fort Eustis) – City of Newport News

The anticipated traffic impact from these proposed constructions does not adversely impact traffic operations in the area and impacts due to construction activities at these sites should be minimal. However, an official traffic analysis was not included with the letter to validate traffic impacts. In addition, any work performed within the VDOT right-of-way requires a land use permit. Please coordinate with the Land Development Permit Section for the appropriate forms to be completed to begin this process.

Please note that coordination with James City County, York County, Charles City County, the City of Hampton, and the City of Newport News is required to insure all current VDOT, county, and city standards are met. Otherwise, this office has no objections to the proposed construction activities.

If any additional information is required notify Darryll D Lewis, P.E at 757-925-1622 or darryll.lewis@vdot.virginia.gov

dl