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 I of VI

COMMONWEALTH OF VIRGINIA

BEFORE THE

STATE CORPORATION COMMISSION

APPLICATION OF

VIRGINIA ELECTRIC AND POWER COMPANY

FOR APPROVAL AND CERTIFICATION
OF ELECTRIC FACILITIES

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COMMONWEALTH OF VIRGINIA
BEFORE THE
STATE CORPORATION COMMISSION

Application of	)	
	)	
Virginia Electric and Power Company	)	**Case No. PUE-2012-00029**
	)	
For approval and certification of electric transmission facilities under Va. Code § 56-46.1 and the Utility Facilities Act, Va. Code § 56-265.1 *et seq.*	)	

APPLICATION OF VIRGINIA ELECTRIC AND POWER COMPANY FOR APPROVAL AND CERTIFICATION OF ELECTRIC FACILITIES FOR THE SURRY-SKIFFES CREEK 500 KV TRANSMISSION LINE, SKIFFES CREEK-WHEALTON 230 KV TRANSMISSION LINE AND SKIFFES CREEK 500 kV-230 kV-115 KV SWITCHING STATION

Virginia Electric and Power Company ("Dominion Virginia Power" or the "Company") respectfully shows as follows:

1. Dominion Virginia Power is a public service corporation organized under the laws of the Commonwealth of Virginia furnishing electric service to the public within its Virginia service territory. The Company also furnishes electric service to the public in portions of North Carolina. Dominion Virginia Power's electric system, consisting of facilities for generation, transmission and distribution of electric energy, as well as associated facilities, is interconnected with the electric systems of neighboring utilities, and is a part of the interconnected network of electric systems serving the continental United States. By reason of its operation in two states and its interconnections with other utilities, the Company is engaged in interstate commerce.

2. In order to perform its legal duty to furnish adequate and reliable electric service, Dominion Virginia Power must, from time to time, construct new transmission

facilities in its system. The electric facilities proposed in this application are necessary so that Dominion Virginia Power can continue to provide reliable electric service to its customers, consistent with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards for transmission facilities and the Company's planning criteria.

3. Accordingly, the Company 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 in-service date for the proposed Project is May of 2015, with the estimated construction time of 18 months. A period of 12 months will be needed for engineering, material procurement, right-of-way acquisition, and construction permitting.

4. The Project is necessary to assure that Dominion Virginia Power can continue to provide reliable electric service to its customers in the load area 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") 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 criteria 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.

5. The need for the proposed transmission facilities is being driven by continued load growth in the North Hampton Roads Load Area over the past ten years. Over the 10-year period from 2002 to 2011, peak electrical demand for the North Hampton Roads Load Area grew from 1767 MW to 1969 MW, an increase of 11.4%. In addition, load projections (based on the 2012 PJM Load Forecast) indicate load will grow an additional 351 MW between 2012 and 2021.

6. 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 Virginia State Corporation Commission ("Commission") on September 1, 2011, identified multiple generation units located in the area as projected to retire between 2014 and 2022. On November 7, 2011, the Company filed notices with PJM Interconnection, LLC ("PJM"), the regional transmission organization of which the Company is a member, to retire generating units at Chesapeake

and Yorktown Power Stations. 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.

7. 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. These reliability violations, if not relieved, will impact service reliability to the citizens of the Commonwealth of Virginia, including those in the

North Hampton Roads Load Area. The Supreme Court of Virginia has affirmed the Commission's determination of need for new transmission facilities based on violations of NERC Reliability Standards identified through the PJM RTEPP. *Piedmont Envtl. Council* v. *Virginia Elec. and Power Co.*, 278 Va. 553, 684 S.E. 2d 805 (2009). 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. The necessity for the Project is described in more detail in Section I of the Appendix attached to this application.

8. 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 ("Proposed Route"). Approximately 1.5 miles of this Proposed Route for the 500 kV line will cross Company-owned property for the Surry Power Plant before making a 3.5-mile overhead crossing of the James River. The remainder of the Proposed Route will require approximately 0.7 mile of new right-of-way and approximately 1.7 miles of an existing right-of-way varying in width from 80 feet to 130 feet and containing a portion of the Company's existing 115 kV Lanexa-Yorktown Line #34, the width of which will need to be expanded to 150 feet. The Company is also presenting three variations to the 500 kV Proposed Route reflecting alternative crossings of the James River ("James River Crossing Variations 1, 2 and 3") for consideration by the Commission. The 500 kV Proposed Route utilizing the James River Crossing Variations 1, 2 and 3 are 8.0 miles, 7.2 miles, and 7.5 miles in length, respectively.

9. The Company is also presenting 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. This Alternate Route for the 500 kV line would require work at the Company's existing Chickahominy Substation instead of the existing Surry Switching Station as required for the Proposed Route.

10. 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.

11. The Company proposes to construct the new 500 kV Line #582 using 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 proposed new 250 kV Line #2138 will be constructed using a combination of weathering steel monopoles and several steel H-frame structures supporting 2-636 ACSR bundled conductors, with a transfer capability of 1047 MVA, and two fiber optic shield wires.

12. The estimated total cost of the proposed Project using the Proposed Route for the 500 kV line is $150.6 million (2011 dollars) ($56.3 million for the 500 kV line + $46.4 for the 230 kV line + $47.9 million for the Skiffes Creek Switching Station and other substation work).[1] The estimated total cost of the proposed Project using the Alternate Route

[1] The estimated cost for the 500 kV Proposed Route (Surry-Skiffes Creek) using the James River Crossing Variation 1 is approximately $61.1 million, for an estimated total cost of the Project of $155.4 million;

for the 500 kV line is $213.2 million (2011 dollars) ($115.5 million for the 500 kV line + $46.4 for the 230 kV line + $51.3 million for the Skiffes Creek Switching Station and other substation work).

13. The approximate size of the structures, the materials to be used for the transmission line, and the right-of-way clearing methods, corridor usage and maintenance procedures are described in Section II of the Appendix. All of the proposed facilities will meet or exceed the standards of the National Electrical Safety Code in effect at the time of construction.

14. The proposed facilities will afford the best means of meeting the continuing need for reliable service while reasonably minimizing adverse impact on the scenic, environmental and historic assets of the area. The Proposed and Alternate Routes for the 500 kV line, as well as the three James River Crossing Variations and the proposed route for the 230 kV Skiffes Creek-Whealton Line, are described in Section III of the Appendix. In addition, 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") to provide a detailed analysis of the Project area and perform a routing analysis comparing the alternative routes for the proposed 500 kV line. NRG's Environmental Routing Study is included as part of the application materials.

15. Based on consultations with the Virginia Department of Environmental Quality ("DEQ"), the Company has developed a supplement ("DEQ Supplement") containing information designed to facilitate review and analysis of the proposed facilities by the DEQ and other relevant agencies. The DEQ Supplement is attached to this application.

Variation 2 is approximately $58.7 million, for an estimated Project cost of $153.0 million; and Variation 3 is approximately $60.2 million, for an estimated Project cost of $154.5 million.

16. Dominion Virginia Power's experience, the advice of consultants and a review of published studies by experts in the field have disclosed no causal link to harmful health or safety effects from electric and magnetic fields generated by the Company's existing or proposed facilities. For further discussion of this topic, see Section IV of the Appendix.

17. A list of federal, state and local agencies and officials that reasonably may be expected to have an interest in the proposed construction, and to which a copy of the application will be sent, is set forth in Section V of the Appendix.

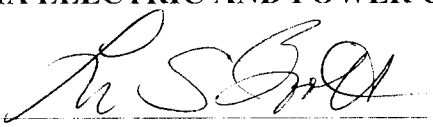
18. In addition to the information provided in the Appendix, NRG's Environmental Routing Study and the DEQ Supplement, this application is supported by the prepared direct testimony of Company Witnesses Scot C. Hathaway, Peter Nedwick, James Cox, Anthony J. Spears, Elizabeth P. Harper, and Douglas J. Lake filed with this application.

WHEREFORE, Dominion Virginia Power respectfully requests that the Commission expeditiously:

(a) direct that notice of this application be given pursuant to § 56-46.1 of the Code of Virginia; and

(b) approve pursuant to § 56-46.1 of the Code of Virginia the proposed transmission facilities and grant a certificate of public convenience and necessity for those transmission facilities under the Utility Facilities Act.

VIRGINIA ELECTRIC AND POWER COMPANY

By: 

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June 11, 2012

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Application No. 257

Appendix

Containing Information in Response to
"Guidelines of Minimum Requirements for Transmission Line Application"

Case No. PUE-2012-00029

Filed June 11, 2012

TABLE OF CONTENTS

I. NECESSITY FOR THE PROPOSED PROJECT

A. Detail the engineering justifications for the proposed project (for example, provide narrative to support why the project is necessary to upgrade or replace an existing facility, to significantly increase system reliability, to connect a new generating station to the Company's system, etc.). Detail the later plans for the proposed project, if appropriate.

Response: In order to comply with mandatory North American Electric Reliability Corporation ("NERC") Reliability Standards by increasing transmission capacity, Virginia Electric and Power Company ("Dominion Virginia Power" or the "Company") 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").

Attachment I.A.1 contains a one-line diagram of the existing transmission facilities, and Attachment I.A.2 contains a one-line diagram of the proposed Project. Attachment I.E.1 contains a map of the Company's existing transmission system in this area, and Attachments I.E.2 and 3 contain maps of the transmission system with the proposed 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 ("Proposed Route"). Approximately 1.5 miles of this Proposed Route for the 500 kV line will cross Company-owned property for the Surry Power Plant before making a 3.5-mile overhead crossing of the James River. The remainder of the Proposed Route will require approximately 0.7 mile of new right-of-way and approximately 1.7 miles of an existing right-of-way varying in width from 80 feet to 130 feet and containing a portion of the Company's existing 115 kV Lanexa-Yorktown Line #34, the width of which will need to be expanded to 150 feet. The Company is also presenting three variations to the 500 kV Proposed Route reflecting alternative crossings of the James River ("James River Crossing Variations 1, 2 and 3") for consideration by the Virginia State Corporation Commission ("Commission"). The 500 kV Proposed Route utilizing the James River Crossing Variations 1, 2 and 3 are 8.0 miles, 7.2 miles, and 7.5 miles in length, respectively.

The Company is also presenting 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. This Alternate Route for the 500 kV line would require work at the Company's existing Chickahominy Substation instead of the existing Surry Switching Station as required for the Proposed Route.

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 Section V.A of this Appendix.

The new 500 kV line, utilizing the Proposed Route (Surry-Skiffes Creek), the Proposed Route with the James River Crossing Variation 1, 2 or 3, or the Alternate Route (Chickahominy-Skiffes Creek), will be a combination of 500 kV single circuit galvanized steel lattice structures 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. These facilities are described in detail in Sections I.D, II.A.3 and II.B of this Appendix. 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 Section II.C of this Appendix.

The estimated total cost of the proposed Project using the Proposed Route for the 500 kV line is $150.6 million (2011 dollars) ($56.3 million for the 500 kV line + $46.4 for the 230 kV line + $47.9 million for the Skiffes Creek Switching Station and other substation work).[2] The estimated total cost of the proposed Project using the Alternate Route for the 500 kV line is $213.2 million (2011 dollars) ($115.5 million for the 500 kV line + $46.4 for the 230 kV line + $51.3 million for the Skiffes Creek Switching Station and other substation work).

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

[2] The estimated cost for the 500 kV Proposed Route (Surry-Skiffes Creek) using the James River Crossing Variation 1 is approximately $61.1 million, for an estimated total cost of the Project of $155.4 million; Variation 2 is approximately $58.7 million, for an estimated Project cost of $153.0 million; and Variation 3 is approximately $60.2 million, for an estimated Project cost of $154.5 million.

The Project is necessary to assure that Dominion Virginia Power can continue to provide reliable electric service to its customers in the load area 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") 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 criteria 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. As explained in Section I.B, the need for the proposed transmission facilities is being driven by continued load growth in the North Hampton Roads Load Area over the past ten years. Over the 10-year period from 2002 to 2011, peak electrical demand for the North Hampton Roads Load Area grew from 1767 MW to 1969 MW, an increase of 11.4%. In addition, load projections (based on the 2012 PJM Load Forecast) indicate load will grow an additional 351 MW between 2012 and 2021.

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 Attachment I.A.3. On November 7, 2011, the Company filed notices with PJM Interconnection, LLC ("PJM"), the regional transmission organization ("RTO") of which the Company is a member, to retire generating units at Chesapeake and Yorktown Power Stations. See 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.

The mandatory NERC Reliability Standards constitute minimal criteria with which all public utilities must comply as components of the interstate electric transmission system. Moreover, the Energy Policy Act of 2005 mandates that electric utilities must follow these NERC Reliability Standards, and utilities could be fined up to $1 million a day per violation if found to be in noncompliance. NERC has been designated by the Federal Energy Regulatory Commission ("FERC") as the Electric Reliability Organization for the United States.

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 RTO 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.

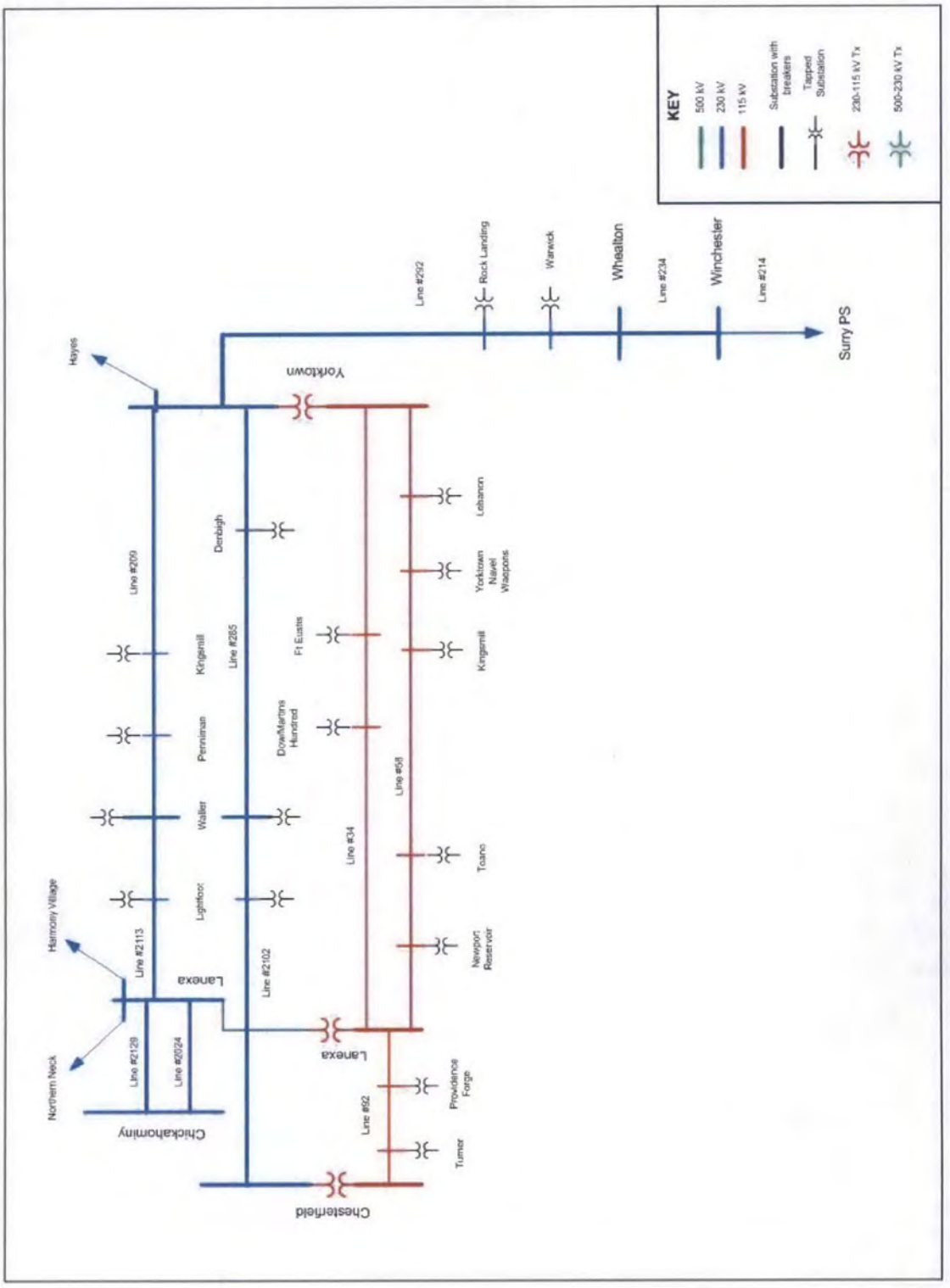
Dominion Virginia Power's transmission system is responsible for providing transmission service to the Company's retail customers and also to Appalachian Power Company (APCo), Old Dominion Electric Cooperative (ODEC), Northern Virginia Electric Cooperative (NOVEC), Central Virginia Electric Cooperative (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.

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

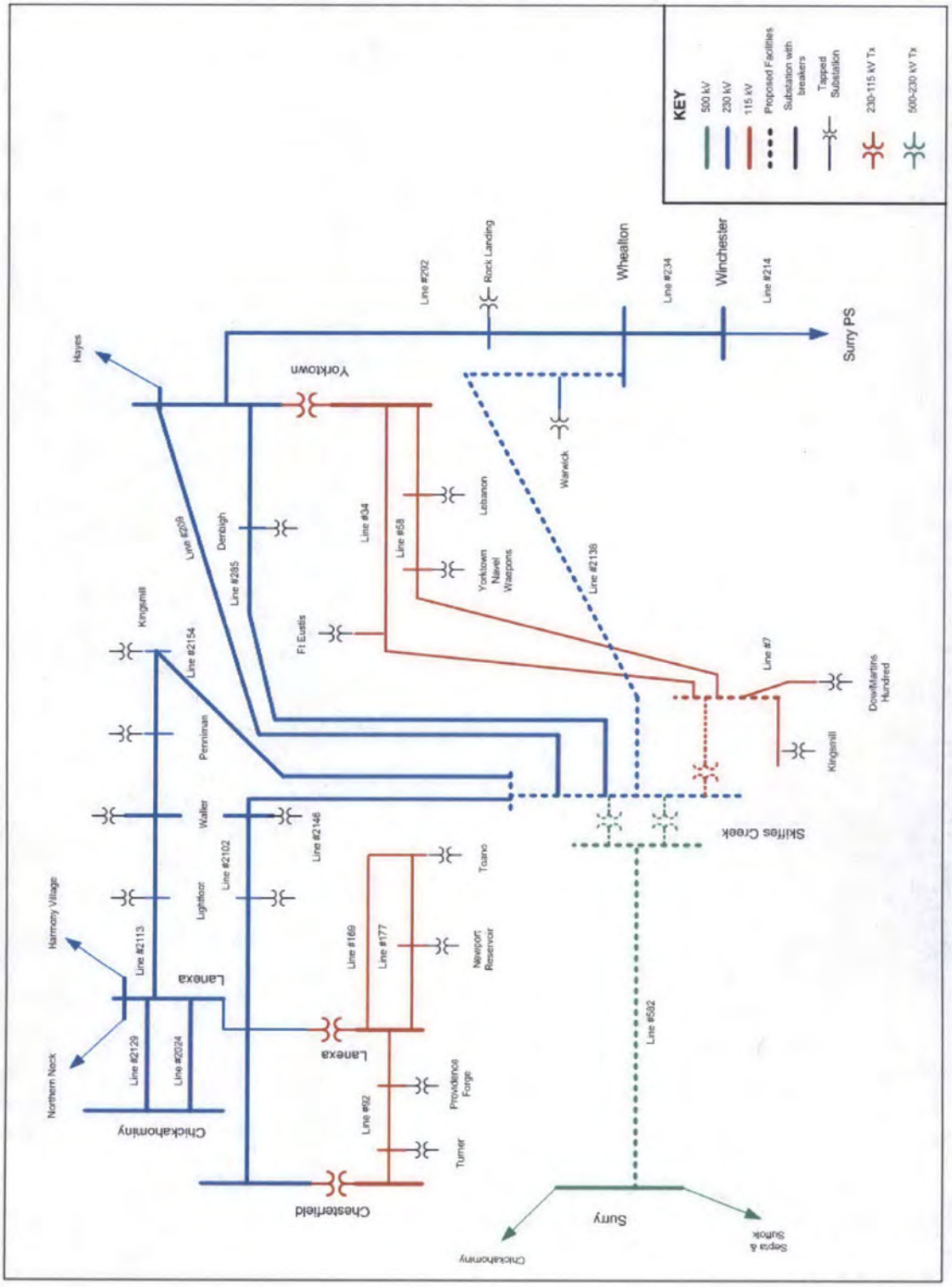
involved in the development and the reliability assessment of the power flow models used in the RTEPP analysis. The active participation of the Transmission Owners in the development and assessment phases of this process is critical to ensure a comprehensive and accurate RTEP. These reliability violations, if not relieved, will impact service reliability to the citizens of the Commonwealth of Virginia, including those in the North Hampton Roads Load Area. The Supreme Court of Virginia has affirmed the Commission's determination of need for new transmission facilities based on violations of NERC Reliability Standards identified through the PJM RTEPP. *Piedmont Envtl. Council* v. *Virginia Elec. and Power Co.*, 278 Va. 553, 684 S.E. 2d 805 (2009).

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.

Attachment I.A.1 Existing System



Attachment I.A.2 Proposed System



3.1.3 PLANNED CHANGES TO EXISTING GENERATION

Efficiency, output, and environmental characteristics of plants are reviewed as part of the Company's normal course of business. Many of the uprates and derates discussed in this section occur during routine maintenance cycles or are associated with standard refurbishment. However, several plant ratings have been and will continue to be adjusted to conform with PJM market rules and environmental standards.

The Company continues to evaluate opportunities for existing unit uprates as a cost-effective means of increasing generating capacity and improving system reliability. Between 2009 and 2011 the Company's investment in its existing generation fleet has yielded net capacity uprates of 172 MW.

The EPA has proposed and finalized a significant number of new regulations that are expected to affect certain units in the Company's current fleet of generation resources. These regulations, as shown in Figure 3.1.3.1, are designed to regulate the air, water, and solid waste constituents.

Figure 3.1.3.1 EPA REGULATIONS

Constituent[1]		Key Regulation[2]	Expected Rule[3]
Air	Hg/HAPS	Utility HAPS (MACT) (HG/Air Toxics Rule)	11/2011
	SO_2	CSAPR	FINAL
		SO_2 NAAQS	FINAL
	NO_x	Ozone Standard Revision	8/2011
		CSAPR	FINAL
		CSAPR II	12/2012
	CO_2	GHG Tailoring Rule	FINAL
		EGU NSPS	5/2012
		Federal Cap & Trade	NA
Solid Waste	Ash	CCB	12/2012
Water	316(b)	316(b) Impingement	7/2012
		316(b) Entrainment	
	Effluent	Effluent Discharges	1/2014

Notes: 1) *Constituent: Hg=Mercury; HAPS=Hazardous Air Pollutants; S02=Sulfur Dioxide; NOx=Nitrogen Oxide; CO2=Carbon Dioxide; GHG=Greenhouse Gas; Water 316(b)=Clean Water Act § 316(b) Cooling Water Intake Structures*
2) Key Regulation: MACT=Maximum Achievable Control Technology; CSAPR and CSAPR I/=Cross-State Air Pollution Rule; S02 NAAQS=Sulfur Dioxide National Ambient Air Quality Standards; EGU NSPS=Electric Generating Units New Source Performance Standard; CC8=Coal Combustion 8yproducts
3) Expected Rule: NA=Not Available

Compliance with existing and future environmental regulations is an important part of the Company's planning process and a key corporate focus. On May 7, 2008, the Company commissioned a new pollution control system which included a scrubber at Chesterfield Unit 6. An additional scrubber at Chesterfield Unit 5 was completed on June 30, 2011. It is anticipated by the end of 2011, Chesterfield Units 3 and 4 will also be connected to the Chesterfield Unit 5 scrubber. Both scrubbers are anticipated to provide a 95% reduction in sulfur dioxide ("SOz") emissions and an 80% reduction in mercury ("Hg") emissions.

Based on the draft and final form of environmental regulations along with current market

conditions, the 2011 Plan includes the following impacts to the existing generating resources in terms of retrofitting, repowering and retiring, which may be revised when the regulations are finalized:

Retrofit
Possum Point Unit 5 (779 MW) and Yorktown Unit 3 (804 MW) are in the Plan to be retrofitted with a SNCR unit by 2015.

Repower
Coal-fired Yorktown Unit 2 (156 MW) is in the Plan to be repowered by natural gas and oil by 2015.

On June 27, 2011, the Company filed an application with the SCC for approval to convert three of its Virginia coal-fired power stations, Altavista, Hopewell, and Southampton, to biomass fuel (Case No. PUE-2011-00073). The three power stations are all similar and went into operation in 1992. Conversion of these stations is expected to result in overall reductions of S02, nitrogen oxide ("NOx") , Hg and particulate emissions. The proposed conversions are projected to increase the capacity factors of these units, provide economical base load energy and provide environmental and energy benefits to the Commonwealth of Virginia over the next 25 years. If the proposed conversions are approved by the Virginia Department of Environmental Quality ("VDEQ") and the SCC, the power stations could begin burning biomass by the end of 2013.

Additional efforts to reduce emissions from the Company's existing generation fleet include plans to repower its coal-fired Bremo Power Station by natural gas subject to regulatory approval. The station is the Company's oldest coal-fired power station in Virginia. The two coal units currently in use at the station were put into service in 1950 and 1958. Bremo Units 3 and 4 with respective summer capacities of 71 MWand 156 MW are planned to repower in 2014. This conversion is expected to reduce the Company's emissions of S02, NO_x and carbon dioxide ("C02"), while maintaining the Bremo site and providing capacity.

Appendix 31 provides a listing of uprates and derates to the Company's existing generation.

3.1.4 POTENTIAL GENERATION RETIREMENTS

In order to comply with environmental regulations, a number of factors are driving the Company's decisions to either retrofit aging coal- and oil-fired generating units with newer technology or retire those particular units from service. Figure 3.1.3.1 summarizes these environmental regulations.

As part 'Of the 2011 IRP process, the Company analyzed a number of options for several of the older coal- and oil-fired units that may not be compliant with impending environmental rules that begin to take effect in 2015, if they include requirements as detailed in their current draft forms. This analysis included a review of the costs to retrofit the units with new environmental control equipment, repower the units by natural gas or convert the units to burn biomass as a fuel source, or retire the units from service. The analysis incorporated assumptions regarding fuel prices, energy prices, costs associated with retrofits and repowering, pending environmental regulations, cost of existing equipment, fuel availability and operating costs. This analysis sought to balance these competing costs and environmental regulations with the goal of maintaining system reliability. It should be noted that this analysis is based on the Company's current assumptions for these drivers.
Based on requirements of draft and final form of environmental regulations along with current

market conditions, the 2011 Plan includes the following potential retirement options for existing generating resources.

Chesapeake Energy Center Units 1 (111 MW) and 2 (111 MW) and Yorktown Unit 1 (159 MW) are in the Plan to be retired by 2015. Chesapeake Energy Center Units 3 (156 MW) and 4 (217 MW) are in the Plan to be retired by 2016. Yorktown Units 2 (156 MW) and 3 (804 MW) are in the Plan to be retired by 2022. Appendix 3J lists the retirements included in the Plan.
In addition to retirements in the Plan, the coal unit at North Branch Power Station, located in Bayard, West Virginia, is currently in cold reserve status. As a result of a mitigation agreement between the National Park Service and the Company, the terms of which are a condition to the Prevention of Significant Deterioration permit for the Warren County Power Station, the unit will be retired from service once the Warren County Power Station begins its commercial operation.

The Company is also evaluating future blackstart resources based on the generation retirements that are anticipated over the next several years. Potential retirements include some generation facilities that are currently designated as blackstart units. Blackstart generators are generating units that are able to start without an outside electrical supply or are able to remain operating at reduced levels when automatically disconnected from the grid. The North American Electric Reliability Corporation ("NERC") Reliability Standard EOP-005 requires the Transmission Operator ("TOP") to have a plan that allows for restoring its system following a complete shutdown (i.e., blackout). As the TOP, PJM assigns this analysis to the Company in its role as the Transmission Owner, but also performs an internal study to verify all requirements are met.

Currently, the Company's tentative plan is to request approximately 250 MW of additional blackstart generation in increments of at least 50 MW per year for five years between 2013 and the end of 2018. The Company will employ PJM's Black Start Replacement Process to solicit additional blackstart generation to ensure a resilient and robust ability to meet blackstart and restoration requirements. This replacement process is described in Section 10 of PJM Manual 14D - Generator Operational Requirements. In accordance with the PJM process, once the Company officially notifies PJM of the intent to retire blackstart capacity, PJM will work with the Company to determine future blackstart capacity needs and PJM will post a Request for Proposals ("RFP") for blackstart service. The initial RFP is expected to occur within the first quarter of 2012 and subsequent RFPs may be issued at a later date. PJM and the Company will work together to select the preferred replacement blackstart units.

Page 106 Virginia 2011 IRP

Based on draft and final form of environmental regulations along with current market conditions, the 2011 Plan includes the following impacts to the existing generating resources in terms of retrofitting, repowering and retiring, which may be revised when the regulations are finalized:

1. Retrofit
   - 1,583 MW of heavy oil-fired generation with new SNCR controls by 2015
2. Repower
   - 153 MW of small coal-fired generation repowered from coal to biomass by the end of 2013
   - 383 MW of small coal-fired generation repowered from coal to natural gas and oil by 2015
3. Retire
   - 754 MW of small coal-fired generation retired by 2016
   - 960 MW of heavy oil-fired and natural gas-fired units retired by 2022

Page 113 Virginia 2011 IRP

POTENTIAL GENERATION RETIREMENTS:

The Company currently anticipates that the units listed in Figure 7.2.5 will be considered for retirement by the end of 2016.

Figure 7.2.5 POTENTIAL GENERATION RETIREMENTS

Unit Name	MW Summer	Year Effective
Chesapeake 1	111	2015
Chesapeake 2	111	2015
Chesapeake 3	156	2016
Chesapeake 4	217	2016
Lowmoor GT1	12	2015
Lowmoor GT2	12	2015
Lowmoor GT3	12	2015
Lowmoor GT4	12	2015
Mount Storm GT1	11	2015
Northern Neck GT1	12	2016
Northern Neck GT2	11	2016
Northern Neck GT3	12	2016
Northern Neck GT4	12	2016
Possum Point CT1	12	2014
Possum Point CT2	12	2014
Possum Point CT3	12	2014
Possum Point CT4	12	2014
Possum Point CT5	12	2014
Possum Point CT6	12	2014
Yorktown 1	159	2015

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Attachment I.A.4 Retirement Letters Filed with PJM

C.D. Holley
Vice President - Fossil & Hydro System Operations
Dominion Generation

An operating segment of
Dominion Resources, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard, Glen Allen, VA 23060

Web Address: www.dom.com

November 7, 2011

Mr. David Schweizer, P.E.
Manager, Power System Coordination
PJM Interconnection
Valley Forge Corporate Center
955 Jefferson Avenue
Norristown, PA 19403-2497

Dear Mr. Schweizer,

Dominion Virginia Power is requesting deactivation (retirement) of its Chesapeake Units 1, 2, 3 and 4 located in Chesapeake, Virginia. Chesapeake Energy Center Unit 1 and Unit 2 will be deactivated effective December 31, 2014. Chesapeake Energy Center Unit 3 and Unit 4 will be deactivated effective December 31, 2015. Units 1, 2, 3, and 4 have been committed into the RPM capacity market through May 31, 2015.

Dominion has performed extensive analysis of options to enable the Chesapeake Coal Fired units to comply with the expected requirements of EPA's Cross State Air Pollution Rule, the National Ambient Air Quality Standards (NAAQS) for Ozone and SO_2, the Mercury/Air Toxics Rule (Utility MACT) and section 316b of the Clean Water Act. Installation of equipment and upgrades to comply with the above would require a capital investment of approximately $1 billion between 2011 and 2022 at Chesapeake Energy Center. If the environmental regulations are implemented as expected and the energy and capacity markets remain as currently projected, Dominion does not plan to invest for continued operation of these units beyond the dates above.

Over the course of time between this notification and the planned deactivation dates, the expected requirements or implementation dates for the environmental regulations may change. There could also be a significant change in the energy and capacity markets. We continually monitor both the regulations and the market and will inform you if the changes warrant a revision to our planned deactivations.

Please call Jeff Currier at 804-273-4269 or Sidney Bragg at 804-273-2164 if you require any additional information.

Sincerely,

Doug Holley
Vice President – F&H System Operations

Over the course of time between this notification and the planned deactivation dates, the expected requirements or implementation dates for the environmental regulations may change. There could also be a significant change in the energy and capacity markets. We continually monitor both the regulations and the market and will inform you if the changes warrant a revision to our planned deactivations.

Please call Jeff Currier at 804-273-4269 or Sidney Bragg at 804-273-2164 if you require any additional information.

Sincerely,

Doug Holley
Vice President – F&H System Operations

I. NECESSITY FOR THE PROPOSED PROJECT

B. Describe the present system and detail how the proposed project will effectively satisfy present and future demand requirements. Provide pertinent load growth data (at least five years of historical and ten years of projected loads where applicable). Provide all assumptions inherent within the projected data and why existing right-of-way cannot adequately serve the needs of the Company if that is the case. Indicate when the existing system is projected to be inadequate. If the existing system is, or will at some future time be inadequate in a contingency situation, describe this critical contingency. Detail what might cause such situation. Where appropriate, provide historical incidence of similar situations which would be avoided by the proposed construction.

Response: Attachments I.E.1 through I.E.3 show the portion of the Company's transmission system in the area of the proposed Project.

The study 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.

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.

The table in 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 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 1767 MW to 1969 MW, an increase of 11.4%. The projected loads in 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.

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.

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 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, 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 (Attachment I.B.3). In summer 2016 this same contingency condition results in thermal overload of Line #2113 above 94% of its emergency rating (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 (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 (Attachments I.B.10 and 19). Also a depressed voltage condition would occur for this contingency condition. 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 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 Attachment I.B.23.

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,[3] both of which are generation deficient. The North Hampton Roads Load Area is projected in 2016 to have a peak load of 2183 MW and available generation capacity of 1285 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.[4]

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 3991 MW and available local generation capacity of 1701 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 3200 MW of their bulk power requirements, and under critical system conditions this increases to over 4000 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 4200 MW and 5000 MW, respectively.

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

[3] 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.

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

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.

Attachment I.B.1 Historical Loads (MW)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Northern Neck	387	399	392	357	439	445	483	457	431	471	501
Yorktown	1293	1,368	1,343	1,329	1,503	1,486	1,505	1,490	1,413	1,484	1,468
North Hampton Roads	**1,680**	**1,767**	**1,735**	**1,686**	**1,942**	**1,931**	**1,988**	**1,947**	**1,844**	**1,955**	**1,969**
Percent Growth	--	5.2%	(1.8%)	(2.8%)	**15.2%**	**(0.6%)**	**3.0%**	**(2.1%)**	**(5.3%)**	**6.0%**	**0.7%**
System Peak	**19,471**	**19,077**	**16,502**	**16,731**	**18,897**	**19,375**	**19,688**	**19,051**	**18,137**	**19,140**	**20,061**
Percent Growth	--	(2.0%)	(13.5%)	1.4%	14.4%	2.5%	1.6%	(3.2%)	(4.8%)	5.5%	4.8%
Date	8/09/2001	7/29/2002	8/29/2003	8/4/2004	7/27/2005	8/3/2006	8/8/2007	6/10/2008	8/10/2009	7/24/2010	7/22/2011

Attachment I.B.2 Projected Loads (MW) (2011 Load Forecast)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Northern Neck	499	524	540	554	568	579	592	606	620	634
Yorktown	1601	1663	1702	1734	1766	1786	1815	1842	1872	1,898
North Hampton Roads	**2,100**	**2,187**	**2,242**	**2,288**	**2,334**	**2,365**	**2,407**	**2,448**	**2,492**	**2,532**
Percent Growth	--	**4.1%**	**2.5%**	**2.1%**	**2.0%**	**1.3%**	**1.8%**	**1.7%**	**1.8%**	**1.6%**
System Peak	**20,937**	**21,963**	**22,670**	**23,272**	**23,810**	**24,176**	**24,660**	**25,129**	**25,628**	**26,069**
Percent Growth		4.9%	3.2%	2.7%	2.3%	1.5%	2.0%	1.9%	2.0%	2.0%

Attachment I.B.2 Projected Loads (MW) (2012 Load Forecast)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Northern Neck	480	490	505	539	565	575	585	596	607	616
Yorktown	1477	1531	1568	1600	1618	1633	1647	1664	1681	1692
North Hampton Roads	**1,957**	**2,021**	**2,073**	**2,139**	**2,183**	**2,208**	**2,232**	**2,260**	**2,288**	**2,308**
Percent Growth	--	**3.2%**	**2.6%**	**3.2%**	**2.1%**	**1.1%**	**1.1%**	**1.3%**	**1.2%**	**1.0%**
System Peak	**19,508**	**20,139**	**20,883**	**21,568**	**22,055**	**22,386**	**22,708**	**23,083**	**23,450**	**23,747**
Percent Growth		3.2%	3.7%	3.2%	2.3%	1.5%	1.4%	1.7%	1.6%	1.3%

Attachment I.B.3 – Summer 2015 Outage of Line #2102 (Chickahominy – Lightfoot - Waller)

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E MON, MAY 07 2012 7:40
2015 SUMMER BASE CASE (ERAG/MMWG16S10) REV. 03/20/2012
GEN RET YORK & CHESAPKE
OUTPUT FOR AREA 345 [DVP]
SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED: NONE)
LOADINGS ABOVE 92.5 % OF RATING SET B (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER BRANCHES):

X--------- FROM BUS ----------X				X---------- TO BUS ----------X						
BUS#	X-- NAME	--X BASKV	AREA	BUS#	X-- NAME	--X BASKV	AREA	CKT	LOADING	RATING	PERCENT
314289	6DARBYTN	230.00	345	315067	1DARBY 1	13.800*	345	1	85.9	90.0	95.4
314289	6DARBYTN	230.00	345	315068	1DARBY 2	13.800*	345	1	85.9	90.0	95.4
314289	6DARBYTN	230.00	345	315069	1DARBY 3	13.800*	345	1	85.9	90.0	95.4
314289	6DARBYTN	230.00	345	315070	1DARBY 4	13.800*	345	1	85.9	90.0	95.4
314391	6LIGH209	230.00*	345	314415	6WALR209	230.00	345	1	438.7	470.0	93.3
314465	6ELIZ R	230.00*	345	315110	1ELIZAR3	13.800	345	1	122.9	130.0	94.5
314682	3BUGGS I	115.00	345	315150	1BUGGS 1	13.800*	345	1	70.0	74.6	93.9
314682	3BUGGS I	115.00	345	315151	1BUGGS 2	13.800*	345	1	69.9	70.0	99.8
314901	8BATH CO	500.00*	345	3WNDTR	BATH 3W1	WND 1	345	1	1008.6	1080.0	93.4
314901	8BATH CO	500.00*	345	3WNDTR	BATH 3W3	WND 1	345	1	1008.9	1080.0	93.4
314901	8BATH CO	500.00*	345	3WNDTR	BATH 3W5	WND 1	345	1	1008.5	1080.0	93.4
315201	1BATH 1A	20.500*	345	3WNDTR	BATH 3W1	WND 2	345	1	508.3	540.0	94.1
315202	1BATH 2B	20.500*	345	3WNDTR	BATH 3W1	WND 3	345	1	508.3	540.0	94.1
315203	1BATH 3C	20.500*	345	3WNDTR	BATH 3W3	WND 2	345	1	508.3	540.0	94.1
315204	1BATH 4D	20.500*	345	3WNDTR	BATH 3W3	WND 3	345	1	508.3	540.0	94.1
315205	1BATH 5E	20.500*	345	3WNDTR	BATH 3W5	WND 2	345	1	508.3	540.0	94.1
315206	1BATH 6F	20.500*	345	3WNDTR	BATH 3W5	WND 3	345	1	508.3	540.0	94.1

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E MON, MAY 07 2012 7:41
2015 SUMMER BASE CASE (ERAG/MMWG16S10) REV. 03/20/2012
GEN RET YORK & CHESAPKE

BUSES WITH VOLTAGE GREATER THAN 1.0800:

BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)	BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)

* NONE *

BUSES WITH VOLTAGE LESS THAN 0.9000:

BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)	BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)

* NONE *

Attachment I.B.4 – Summer 2015 Outage of James River Tower Line (Line #214 & #263)

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012   7:47
 2015 SUMMER BASE CASE (ERAG/MMWG16S10) REV. 03/20/2012
 GEN RET YORK & CHESAPKE
                        OUTPUT FOR AREA 345 [DVP         ]
 SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED:
NONE)
 LOADINGS ABOVE  99.5 % OF RATING SET C (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER
BRANCHES):

 X--------- FROM BUS ----------X X---------- TO BUS ----------X
   BUS# X-- NAME --X BASKV  AREA   BUS# X-- NAME --X BASKV  AREA CKT LOADING  RATING PERCENT
 314386 6KINGS M    230.00*  345 314423 6YORKTWN    230.00   345  1    490.5   437.0   112.2
 314391 6LIGH209    230.00   345 314415 6WALR209    230.00*  345  1    615.3   541.0   113.7
 314682 3BUGGS I    115.00   345 315151 1BUGGS 2    13.800*  345  1     69.9    70.0    99.8

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012   7:48
 2015 SUMMER BASE CASE (ERAG/MMWG16S10) REV. 03/20/2012
 GEN RET YORK & CHESAPKE

 BUSES WITH VOLTAGE GREATER THAN 1.0800:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                          * NONE *


 BUSES WITH VOLTAGE LESS THAN 0.9200:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)
 314398 6NP NEWS    230.00  345 0.9199 211.58    314399 6PEMBROK    230.00  345 0.9183 211.20
 314407 6SHELBNK    230.00  345 0.9167 210.84
```

Attachment I.B.5 – Summer 2015 Outage of Chickahominy – Lanexa ROW (Line #92, #2102, #2024 & #2124)

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012   8:16
 2015 SUMMER BASE CASE (ERAG/MMWG16S10) REV. 03/20/2012
 GEN RET YORK & CHESAPKE
                        OUTPUT FOR AREA 345 [DVP         ]
 SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED:
NONE)
 LOADINGS ABOVE  99.5 % OF RATING SET C (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER
BRANCHES):

 X--------- FROM BUS ----------X X---------- TO BUS -----------X
   BUS# X-- NAME --X BASKV  AREA   BUS# X-- NAME --X BASKV  AREA CKT LOADING  RATING PERCENT
 313818 6BENCHRCH   230.00   345 314398 6NP NEWS    230.00*  345  1    806.1   672.0   120.0
 313818 6BENCHRCH   230.00*  345 314522 6CHCKTUK    230.00   345  1    832.9   672.0   123.9
 314398 6NP NEWS    230.00   345 314399 6PEMBROK    230.00*  345  1    679.7   549.0   123.8
 314399 6PEMBROK    230.00   345 314407 6SHELBNK    230.00*  345  1    679.6   549.0   123.8
 314421 6WINCHST    230.00   345 314540 6POOLSVL    230.00*  345  1    727.4   650.0   111.9
 314682 3BUGGS I    115.00   345 315151 1BUGGS 2    13.800*  345  1     69.9    70.0    99.8

------------------------------------------------------------------------------


     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012   8:16
 2015 SUMMER BASE CASE (ERAG/MMWG16S10) REV. 03/20/2012
 GEN RET YORK & CHESAPKE

 BUSES WITH VOLTAGE GREATER THAN 1.0800:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                          * NONE *


 BUSES WITH VOLTAGE LESS THAN 0.9100:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                          * NONE *

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Attachment I.B.6 – Summer 2015 Outage of Line #2102 (Chickahominy – Lightfoot - Waller) With Yorktown #2 Off-Line (Critical System Condition)

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012   8:34
 2015 SUMMER BASE CASE (ERAG/MMWG16S10) REV. 03/20/2012
 GEN RET YORK & CHESAPKE NO YORK 2
                        OUTPUT FOR AREA 345 [DVP         ]
 SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED:
NONE)
 LOADINGS ABOVE  93.5 % OF RATING SET B (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER
BRANCHES):

 X--------- FROM BUS ----------X X---------- TO BUS ----------X
   BUS# X-- NAME --X BASKV  AREA   BUS# X-- NAME --X BASKV  AREA CKT LOADING  RATING PERCENT
 314289 6DARBYTN    230.00   345 315067 1DARBY 1    13.800*  345  1    86.5    90.0    96.2
 314289 6DARBYTN    230.00   345 315068 1DARBY 2    13.800*  345  1    86.5    90.0    96.2
 314289 6DARBYTN    230.00   345 315069 1DARBY 3    13.800*  345  1    86.5    90.0    96.2
 314289 6DARBYTN    230.00   345 315070 1DARBY 4    13.800*  345  1    86.5    90.0    96.2
 314386 6KINGS M    230.00*  345 314423 6YORKTWN    230.00   345  1   363.4   380.0    95.6
 314391 6LIGH209    230.00*  345 314415 6WALR209    230.00   345  1   478.7   470.0   101.8
 314465 6ELIZ R     230.00*  345 315110 1ELIZAR3    13.800   345  1   122.9   130.0    94.6
 314543 6GRAVELA    230.00*  345 315120 1GRAVEL4    13.800   345  1    85.6    90.0    95.1
 314682 3BUGGS I    115.00   345 315150 1BUGGS 1    13.800*  345  1    70.0    74.6    93.9
 314682 3BUGGS I    115.00   345 315151 1BUGGS 2    13.800*  345  1    69.9    70.0    99.8
 315201 1BATH 1A    20.500*  345 3WNDTR BATH 3W1     WND 2   345  1   508.4   540.0    94.1
 315202 1BATH 2B    20.500*  345 3WNDTR BATH 3W1     WND 3   345  1   508.4   540.0    94.1
 315203 1BATH 3C    20.500*  345 3WNDTR BATH 3W3     WND 2   345  1   508.4   540.0    94.1
 315204 1BATH 4D    20.500*  345 3WNDTR BATH 3W3     WND 3   345  1   508.4   540.0    94.1
 315205 1BATH 5E    20.500*  345 3WNDTR BATH 3W5     WND 2   345  1   508.4   540.0    94.1
 315206 1BATH 6F    20.500*  345 3WNDTR BATH 3W5     WND 3   345  1   508.4   540.0    94.1



     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012   8:34
 2015 SUMMER BASE CASE (ERAG/MMWG16S10) REV. 03/20/2012
 GEN RET YORK & CHESAPKE NO YORK 2

 BUSES WITH VOLTAGE GREATER THAN 1.0800:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                        * NONE *


 BUSES WITH VOLTAGE LESS THAN 0.9300:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                        * NONE *
```

Attachment I.B.7 – Summer 2015 Outage of Breaker 285T2102 (Waller) With Yorktown #2 Off-Line (Critical System Condition)

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E MON, MAY 07 2012 8:40
2015 SUMMER BASE CASE (ERAG/MMWG16S10) REV. 03/20/2012
GEN RET YORK & CHESAPKE NO YORK 2
OUTPUT FOR AREA 345 [DVP]
SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED: NONE)
LOADINGS ABOVE 93.5 % OF RATING SET B (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER BRANCHES):

X--------- FROM BUS ----------X				X---------- TO BUS ----------X						
BUS#	X-- NAME	--X BASKV	AREA	BUS#	X-- NAME	--X BASKV	AREA	CKT	LOADING	RATING	PERCENT
314289	6DARBYTN	230.00	345	315067	1DARBY 1	13.800*	345	1	86.3	90.0	95.9
314289	6DARBYTN	230.00	345	315068	1DARBY 2	13.800*	345	1	86.3	90.0	95.9
314289	6DARBYTN	230.00	345	315069	1DARBY 3	13.800*	345	1	86.3	90.0	95.9
314289	6DARBYTN	230.00	345	315070	1DARBY 4	13.800*	345	1	86.3	90.0	95.9
314391	6LIGH209	230.00*	345	314415	6WALR209	230.00	345	1	441.2	470.0	93.9
314465	6ELIZ R	230.00*	345	315110	1ELIZAR3	13.800	345	1	122.9	130.0	94.6
314543	6GRAVELA	230.00*	345	315120	1GRAVEL4	13.800	345	1	85.6	90.0	95.1
314682	3BUGGS I	115.00	345	315150	1BUGGS 1	13.800*	345	1	70.0	74.6	93.9
314682	3BUGGS I	115.00	345	315151	1BUGGS 2	13.800*	345	1	69.9	70.0	99.8
315201	1BATH 1A	20.500*	345	3WNDTR	BATH 3W1	WND 2	345	1	508.3	540.0	94.1
315202	1BATH 2B	20.500*	345	3WNDTR	BATH 3W1	WND 3	345	1	508.3	540.0	94.1
315203	1BATH 3C	20.500*	345	3WNDTR	BATH 3W3	WND 2	345	1	508.3	540.0	94.1
315204	1BATH 4D	20.500*	345	3WNDTR	BATH 3W3	WND 3	345	1	508.3	540.0	94.1
315205	1BATH 5E	20.500*	345	3WNDTR	BATH 3W5	WND 2	345	1	508.3	540.0	94.1
315206	1BATH 6F	20.500*	345	3WNDTR	BATH 3W5	WND 3	345	1	508.3	540.0	94.1

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E MON, MAY 07 2012 8:40
2015 SUMMER BASE CASE (ERAG/MMWG16S10) REV. 03/20/2012
GEN RET YORK & CHESAPKE NO YORK 2

BUSES WITH VOLTAGE GREATER THAN 1.0800:

BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)	BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)

* NONE *

BUSES WITH VOLTAGE LESS THAN 0.9400:

BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)	BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)

* NONE *

Attachment I.B.8 – Summer 2015 Outage of Line #263 (Chuckatuck-Benns Church – Newport News) With Yorktown #2 Off-Line (Critical System Condition)

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012   8:42
 2015 SUMMER BASE CASE (ERAG/MMWG16S10) REV. 03/20/2012
 GEN RET YORK & CHESAPKE NO YORK 2
                       OUTPUT FOR AREA 345 [DVP         ]
 SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED:
NONE)
 LOADINGS ABOVE  93.5 % OF RATING SET B (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER
BRANCHES):

 X--------- FROM BUS ----------X X---------- TO BUS -----------X
   BUS# X-- NAME --X BASKV  AREA   BUS# X-- NAME --X BASKV  AREA CKT LOADING  RATING PERCENT
 314289 6DARBYTN    230.00   345 315067 1DARBY 1    13.800*  345  1     87.6    90.0    97.4
 314289 6DARBYTN    230.00   345 315068 1DARBY 2    13.800*  345  1     87.6    90.0    97.4
 314289 6DARBYTN    230.00   345 315069 1DARBY 3    13.800*  345  1     87.6    90.0    97.4
 314289 6DARBYTN    230.00   345 315070 1DARBY 4    13.800*  345  1     87.6    90.0    97.4
 314421 6WINCHST    230.00*  345 314540 6POOLSVL    230.00   345  1    563.9   559.0   100.9
 314465 6ELIZ R     230.00*  345 315110 1ELIZAR3    13.800   345  1    122.9   130.0    94.5
 314543 6GRAVELA    230.00*  345 315120 1GRAVEL4    13.800   345  1     85.6    90.0    95.1
 314682 3BUGGS I    115.00   345 315150 1BUGGS 1    13.800*  345  1     70.0    74.6    93.9
 314682 3BUGGS I    115.00   345 315151 1BUGGS 2    13.800*  345  1     69.9    70.0    99.8
 315201 1BATH 1A    20.500*  345 3WNDTR BATH 3W1     WND 2   345  1    508.5   540.0    94.2
 315202 1BATH 2B    20.500*  345 3WNDTR BATH 3W1     WND 3   345  1    508.5   540.0    94.2
 315203 1BATH 3C    20.500*  345 3WNDTR BATH 3W3     WND 2   345  1    508.5   540.0    94.2
 315204 1BATH 4D    20.500*  345 3WNDTR BATH 3W3     WND 3   345  1    508.5   540.0    94.2
 315205 1BATH 5E    20.500*  345 3WNDTR BATH 3W5     WND 2   345  1    508.5   540.0    94.2
 315206 1BATH 6F    20.500*  345 3WNDTR BATH 3W5     WND 3   345  1    508.5   540.0    94.2

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012   8:43
 2015 SUMMER BASE CASE (ERAG/MMWG16S10) REV. 03/20/2012
 GEN RET YORK & CHESAPKE NO YORK 2

 BUSES WITH VOLTAGE GREATER THAN 1.0800:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                          * NONE *


 BUSES WITH VOLTAGE LESS THAN 0.9400:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                          * NONE *
```

Attachment I.B.9 – Summer 2015 Outage of Line #214 (Surry - Poolesville – Winchester) With Yorktown #2 Off-Line (Critical System Condition)

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012   9:42
 2015 SUMMER BASE CASE (ERAG/MMWG16S10) REV. 03/20/2012
 GEN RET YORK & CHESAPKE NO YORK 2
                       OUTPUT FOR AREA 345 [DVP         ]
 SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED:
NONE)
 LOADINGS ABOVE  93.5 % OF RATING SET B (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER
BRANCHES):

 X--------- FROM BUS ----------X X---------- TO BUS ----------X
   BUS# X-- NAME --X BASKV  AREA   BUS# X-- NAME --X BASKV  AREA CKT LOADING  RATING PERCENT
 313818 6BENCHRCH   230.00   345 314398 6NP NEWS    230.00*  345  1    559.3   584.0    95.8
 313818 6BENCHRCH   230.00*  345 314522 6CHCKTUK    230.00   345  1    584.7   584.0   100.1
 314289 6DARBYTN    230.00   345 315067 1DARBY 1    13.800*  345  1     87.6    90.0    97.4
 314289 6DARBYTN    230.00   345 315068 1DARBY 2    13.800*  345  1     87.6    90.0    97.4
 314289 6DARBYTN    230.00   345 315069 1DARBY 3    13.800*  345  1     87.6    90.0    97.4
 314289 6DARBYTN    230.00   345 315070 1DARBY 4    13.800*  345  1     87.6    90.0    97.4
 314465 6ELIZ R     230.00*  345 315110 1ELIZAR3    13.800   345  1    122.9   130.0    94.6
 314543 6GRAVELA    230.00*  345 315120 1GRAVEL4    13.800   345  1     85.6    90.0    95.1
 314682 3BUGGS I    115.00   345 315150 1BUGGS 1    13.800*  345  1     70.0    74.6    93.9
 314682 3BUGGS I    115.00   345 315151 1BUGGS 2    13.800*  345  1     69.9    70.0    99.8
 315201 1BATH 1A    20.500*  345 3WNDTR BATH 3W1     WND 2   345  1    508.5   540.0    94.2
 315202 1BATH 2B    20.500*  345 3WNDTR BATH 3W1     WND 3   345  1    508.5   540.0    94.2
 315203 1BATH 3C    20.500*  345 3WNDTR BATH 3W3     WND 2   345  1    508.5   540.0    94.2
 315204 1BATH 4D    20.500*  345 3WNDTR BATH 3W3     WND 3   345  1    508.5   540.0    94.2
 315205 1BATH 5E    20.500*  345 3WNDTR BATH 3W5     WND 2   345  1    508.5   540.0    94.2
 315206 1BATH 6F    20.500*  345 3WNDTR BATH 3W5     WND 3   345  1    508.5   540.0    94.2

     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012   9:42
 2015 SUMMER BASE CASE (ERAG/MMWG16S10) REV. 03/20/2012
 GEN RET YORK & CHESAPKE NO YORK 2

 BUSES WITH VOLTAGE GREATER THAN 1.0800:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                          * NONE *


 BUSES WITH VOLTAGE LESS THAN 0.9400:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                          * NONE *

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Attachment I.B.10 – Summer 2015 Outage of James River Tower Line (Line #214 & #263) With Yorktown #2 Off-Line (Critical System Condition)

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012   9:48
 2015 SUMMER BASE CASE (ERAG/MMWG16S10) REV. 03/20/2012
 GEN RET YORK & CHESAPKE NO YORK 2
                      OUTPUT FOR AREA 345 [DVP         ]
 SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED:
NONE)
 LOADINGS ABOVE  99.5 % OF RATING SET C (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER
BRANCHES):

 X--------- FROM BUS ----------X X---------- TO BUS ----------X
   BUS# X-- NAME --X BASKV  AREA   BUS# X-- NAME --X BASKV  AREA CKT LOADING  RATING PERCENT
 313812 6ROCKLANDING230.00   345 314416 6WARWICK    230.00*  345  1    549.2   541.0   101.5
 313812 6ROCKLANDING230.00*  345 314423 6YORKTWN    230.00   345  1    646.1   541.0   119.4
 314214 6CHCKAHM    230.00   345 314390 6LIGH285    230.00*  345  1   1173.1   830.0   141.3
 314296 6PENNIMAN   230.00   345 314386 6KINGS M    230.00*  345  1    885.8   541.0   163.7
 314296 6PENNIMAN   230.00*  345 314415 6WALR209    230.00   345  1    904.7   541.0   167.2
 314339 6SPRUNCE    230.00   345 315083 1SPRUNCA    13.800*  345  1     69.9    67.5   103.6
 314376 6DENBIGH    230.00*  345 314413 6WALR285    230.00   345  1    937.4   830.0   112.9
 314386 6KINGS M    230.00   345 314423 6YORKTWN    230.00*  345  1    855.3   437.0   195.7
 314388 6LANEXA     230.00   345 314391 6LIGH209    230.00*  345  1   1082.8   812.0   133.4
 314390 6LIGH285    230.00   345 314413 6WALR285    230.00*  345  1   1059.8   830.0   127.7
 314391 6LIGH209    230.00   345 314415 6WALR209    230.00*  345  1   1017.4   541.0   188.1
 314409 6TABB       230.00*  345 314423 6YORKTWN    230.00   345  1    863.1   830.0   104.0
 314682 3BUGGS I    115.00   345 315151 1BUGGS 2    13.800*  345  1     69.9    70.0    99.8

     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012   9:49
 2015 SUMMER BASE CASE (ERAG/MMWG16S10) REV. 03/20/2012
 GEN RET YORK & CHESAPKE NO YORK 2

 BUSES WITH VOLTAGE GREATER THAN 1.0800:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                        * NONE *


 BUSES WITH VOLTAGE LESS THAN 0.9200:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)
 313811 6ELKO L286  230.00  345 0.9164 210.77    313812 6ROCKLANDING230.00  345 0.5177 119.08
 313813 3OCRAN      115.00  345 0.8500 97.745    313828 3WHITEMARSH 115.00  345 0.6960 80.043
 314139 6OAKGROV    230.00  345 0.9035 207.80    314172 6DUNNSVL    230.00  345 0.8500 195.50
 314173 3GARNER     115.00  345 0.8875 102.07    314174 3HARMONY    115.00  345 0.8319 95.674
 314176 6HARMONY    230.00  345 0.7746 178.16    314177 3HAYES89    115.00  345 0.6553 75.357
 314178 3LANCAST    115.00  345 0.8555 98.384    314180 6HAYES      230.00  345 0.5570 128.12
 314182 6NORNECK    230.00  345 0.8611 198.05    314183 6SANDERS    230.00  345 0.8692 199.93
 314184 3SHACKLE    115.00  345 0.8537 98.175    314187 3WAN 176    115.00  345 0.8154 93.770
 314188 3WEST PT    115.00  345 0.8652 99.497    314189 6PAPERMILL  230.00  345 0.7979 183.52
 314190 6WESTMOR    230.00  345 0.8832 203.14    314191 3WHITE S    115.00  345 0.8451 97.190
 314214 6CHCKAHM    230.00  345 0.8934 205.48    314243 3PROV 92    115.00  345 0.9168 105.43
 314257 6WHITOAK    230.00  345 0.9139 210.21    314258 6ELKO       230.00  345 0.9115 209.65
 314296 6PENNIMAN   230.00  345 0.6375 146.62    314371 3AMOCO Y    115.00  345 0.5254 60.426
 314372 3BLOXOMC    115.00  345 0.5154 59.274    314373 3COLONY     115.00  345 0.5209 59.903
 314374 3COPELND    115.00  345 0.5373 61.793    314375 6CORRCTN    230.00  345 0.8062 185.42
 314376 6DENBIGH    230.00  345 0.5746 132.16    314377 3DOW 34     115.00  345 0.8928 102.67
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314378 3FTEUS34    115.00  345 0.5126 58.946    314379 3FTEUS58    115.00  345 0.5085 58.473
314381 3GRAFT34    115.00  345 0.5180 59.571    314382 3GRAFT58    115.00  345 0.5158 59.315
314384 3KINGS M    115.00  345 0.8611 99.030    314385 3HARMO_1    115.00  345 0.8325 95.738
314386 6KINGS M    230.00  345 0.6223 143.12    314387 3LANEXA     115.00  345 0.8929 102.68
314388 6LANEXA     230.00  345 0.8165 187.80    314389 3LEBAN58    115.00  345 0.5058 58.166
314390 6LIGH285    230.00  345 0.6709 154.30    314391 6LIGH209    230.00  345 0.7030 161.68
314392 3MAGRUDR    115.00  345 0.5333 61.324    314393 3MERCURY    115.00  345 0.5248 60.349
314394 3NASA       115.00  345 0.5369 61.744    314395 3HARMO_2    115.00  345 0.8324 95.721
314396 3NNEWS58    115.00  345 0.8805 101.26    314397 3NNEWS75    115.00  345 0.5373 61.793
314398 6NP NEWS    230.00  345 0.4934 113.48    314399 6PEMBROK    230.00  345 0.4941 113.65
314400 3LANCA_1    115.00  345 0.8559 98.434    314401 3PENINSL    115.00  345 0.5369 61.741
314402 6PENINSL    230.00  345 0.5061 116.41    314403 3SEAFD76    115.00  345 0.5275 60.666
314404 3SEAFD79    115.00  345 0.5268 60.585    314406 3SHELBNK    115.00  345 0.5329 61.282
314407 6SHELBNK    230.00  345 0.4952 113.89    314408 6CHCKA_1    230.00  345 0.8961 206.10
314409 6TABB       230.00  345 0.5193 119.43    314411 3TOANO58    115.00  345 0.8788 101.07
314412 3U CARBD    115.00  345 0.5369 61.745    314413 6WALR285    230.00  345 0.6453 148.42
314414 3WARWICK    115.00  345 0.5273 60.636    314415 6WALR209    230.00  345 0.6687 153.79
314416 6WARWICK    230.00  345 0.5147 118.39    314417 3WHEALTN    115.00  345 0.5388 61.958
314418 6WHEALTN    230.00  345 0.5054 116.23    314420 3PENIN_1    115.00  345 0.5371 61.772
314421 6WINCHST    230.00  345 0.5051 116.17    314422 3YORKTWN    115.00  345 0.5256 60.443
314423 6YORKTWN    230.00  345 0.5513 126.79    314424 3YNWS 58    115.00  345 0.5054 58.118
314425 3YORK PS    115.00  345 0.5256 60.444    314440 6LANEX_1    230.00  345 0.8182 188.18
314442 6NP NE_1    230.00  345 0.4944 113.71    314445 6WHEAL_1    230.00  345 0.5064 116.47
314450 6YORKT_1    230.00  345 0.5531 127.21    315091 1YORKTN2    18.000  345 0.5256  9.461
315092 1YORKTN3    25.000  345 0.5513 13.782
```

Attachment I.B.11 – Summer 2015 Outage of Chickahominy – Lanexa ROW (Line #92, #2102, #2024 & #2124) With Yorktown #2 Off-Line (Critical System Condition)

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012   9:55
 2015 SUMMER BASE CASE (ERAG/MMWG16S10) REV. 03/20/2012
 GEN RET YORK & CHESAPKE NO YORK 2
                       OUTPUT FOR AREA 345 [DVP         ]
 SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED:
NONE)
 LOADINGS ABOVE  99.5 % OF RATING SET C (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER
BRANCHES):

 X--------- FROM BUS ----------X X---------- TO BUS ----------X
   BUS# X-- NAME --X BASKV  AREA   BUS# X-- NAME --X BASKV  AREA CKT LOADING  RATING PERCENT
 313810 6DAHLGREN    230.00*  345 314131 6ARNOLDS     230.00   345  1    750.8   699.0   107.4
 313818 6BENCHRCH    230.00   345 314398 6NP NEWS     230.00*  345  1   1410.2   672.0   209.8
 313818 6BENCHRCH    230.00*  345 314522 6CHCKTUK     230.00   345  1   1439.4   672.0   214.2
 314131 6ARNOLDS     230.00*  345 314175 6COMORN      230.00   345  1    763.9   699.0   109.3
 314132 6BIRCHWD     230.00   345 314175 6COMORN      230.00*  345  1    770.1   699.0   110.2
 314398 6NP NEWS     230.00   345 314399 6PEMBROK     230.00*  345  1   1243.1   549.0   226.4
 314399 6PEMBROK     230.00   345 314407 6SHELBNK     230.00*  345  1   1242.9   549.0   226.4
 314416 6WARWICK     230.00*  345 314418 6WHEALTN     230.00   345  1    628.0   541.0   116.1
 314418 6WHEALTN     230.00*  345 314421 6WINCHST     230.00   345  1    987.2   671.0   147.1
 314421 6WINCHST     230.00*  345 314540 6POOLSVL     230.00   345  1   1174.9   650.0   180.8
 314522 6CHCKTUK     230.00*  345 314525 6KINGSFO     230.00   345  1    934.8   830.0   112.6
 314525 6KINGSFO     230.00*  345 314537 6SUFFOLK     230.00   345  1    968.3   830.0   116.7
 314538 6SURRY       230.00   345 314540 6POOLSVL     230.00*  345  1   1184.3   830.0   142.7
 314682 3BUGGS I     115.00   345 315151 1BUGGS 2     13.800*  345  1     69.9    70.0    99.8

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012   9:55
 2015 SUMMER BASE CASE (ERAG/MMWG16S10) REV. 03/20/2012
 GEN RET YORK & CHESAPKE NO YORK 2

 BUSES WITH VOLTAGE GREATER THAN 1.0800:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                        * NONE *


 BUSES WITH VOLTAGE LESS THAN 0.9100:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)
 313810 6DAHLGREN    230.00  345 0.7065 162.49    313812 6ROCKLANDING230.00  345 0.4537 104.36
 313813 3OCRAN       115.00  345 0.4167 47.923    313818 6BENCHRCH   230.00  345 0.7479 172.03
 313828 3WHITEMARSH 115.00  345 0.4424 50.872    314131 6ARNOLDS    230.00  345 0.7894 181.56
 314132 6BIRCHWD     230.00  345 0.8468 194.75    314139 6OAKGROV    230.00  345 0.6063 139.46
 314163 6FINES       230.00  345 0.8952 205.90    314172 6DUNNSVL    230.00  345 0.4701 108.12
 314173 3GARNER      115.00  345 0.4518 51.958    314174 3HARMONY    115.00  345 0.4171 47.970
 314175 6COMORN      230.00  345 0.7998 183.96    314176 6HARMONY    230.00  345 0.3990 91.768
 314177 3HAYES89     115.00  345 0.4520 51.981    314178 3LANCAST    115.00  345 0.4185 48.132
 314180 6HAYES       230.00  345 0.4412 101.48    314181 3NORNECK    115.00  345 0.5156 59.295
 314182 6NORNECK     230.00  345 0.4972 114.36    314183 6SANDERS    230.00  345 0.5163 118.76
 314184 3SHACKLE     115.00  345 0.4211 48.422    314187 3WAN 176    115.00  345 0.3921 45.087
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314188	3WEST PT	115.00	345	0.4214	48.459	314189	6PAPERMILL	230.00	345	0.4032	92.747
314190	6WESTMOR	230.00	345	0.5507	126.67	314191	3WHITE S	115.00	345	0.4160	47.835
314296	6PENNIMAN	230.00	345	0.4226	97.198	314371	3AMOCO Y	115.00	345	0.4441	51.076
314372	3BLOXOMC	115.00	345	0.4658	53.564	314373	3COLONY	115.00	345	0.4513	51.898
314374	3COPELND	115.00	345	0.4794	55.131	314375	6CORRCTN	230.00	345	0.4067	93.549
314376	6DENBIGH	230.00	345	0.4327	99.532	314377	3DOW 34	115.00	345	0.4265	49.052
314378	3FTEUS34	115.00	345	0.4313	49.597	314379	3FTEUS58	115.00	345	0.4271	49.120
314381	3GRAFT34	115.00	345	0.4367	50.217	314382	3GRAFT58	115.00	345	0.4344	49.959
314384	3KINGS M	115.00	345	0.3794	43.628	314385	3HARMO_1	115.00	345	0.4174	48.003
314386	6KINGS M	230.00	345	0.4254	97.846	314387	3LANEXA	115.00	345	0.4276	49.174
314388	6LANEXA	230.00	345	0.4116	94.661	314389	3LEBAN58	115.00	345	0.4245	48.817
314390	6LIGH285	230.00	345	0.4176	96.039	314391	6LIGH209	230.00	345	0.4149	95.426
314392	3MAGRUDR	115.00	345	0.4762	54.760	314393	3MERCURY	115.00	345	0.4752	54.643
314394	3NASA	115.00	345	0.4732	54.420	314395	3HARMO_2	115.00	345	0.4173	47.994
314396	3NNEWS58	115.00	345	0.4078	46.895	314397	3NNEWS75	115.00	345	0.4794	55.131
314398	6NP NEWS	230.00	345	0.5485	126.16	314399	6PEMBROK	230.00	345	0.5213	119.90
314400	3LANCA_1	115.00	345	0.4188	48.156	314401	3PENINSL	115.00	345	0.4732	54.417
314402	6PENINSL	230.00	345	0.4673	107.47	314403	3SEAFD76	115.00	345	0.4502	51.769
314404	3SEAFD79	115.00	345	0.4494	51.682	314406	3SHELBNK	115.00	345	0.4833	55.584
314407	6SHELBNK	230.00	345	0.4948	113.80	314409	6TABB	230.00	345	0.4566	105.01
314411	3TOANO58	115.00	345	0.4052	46.602	314412	3U CARBD	115.00	345	0.4733	54.432
314413	6WALR285	230.00	345	0.4185	96.262	314414	3WARWICK	115.00	345	0.4623	53.161
314415	6WALR209	230.00	345	0.4173	95.973	314416	6WARWICK	230.00	345	0.4559	104.87
314417	3WHEALTN	115.00	345	0.4808	55.297	314418	6WHEALTN	230.00	345	0.4671	107.44
314420	3PENIN_1	115.00	345	0.4734	54.444	314421	6WINCHST	230.00	345	0.4682	107.69
314422	3YORKTWN	115.00	345	0.4443	51.094	314423	6YORKTWN	230.00	345	0.4432	101.94
314424	3YNWS 58	115.00	345	0.4241	48.769	314425	3YORK PS	115.00	345	0.4440	51.065
314440	6LANEX_1	230.00	345	0.4124	94.852	314442	6NP NE_1	230.00	345	0.5497	126.42
314445	6WHEAL_1	230.00	345	0.4681	107.66	314450	6YORKT_1	230.00	345	0.4447	102.28
314484	6HARBORV226	230.00	345	0.9030	207.69	314497	6SEWLSPT	230.00	345	0.9085	208.96
314500	6NAVYS	230.00	345	0.9085	208.96	314501	6NAVYS1	230.00	345	0.9085	208.95
314505	6NAVYN	230.00	345	0.9086	208.97	314510	6NAVYN1	230.00	345	0.9083	208.91
314522	6CHCKTUK	230.00	345	0.7711	177.34	314523	6CRITTDN	230.00	345	0.8847	203.49
314525	6KINGSFO	230.00	345	0.8463	194.65	314533	6SMITFLD	230.00	345	0.8651	198.98
314538	6SURRY	230.00	345	0.8281	190.46	314540	6POOLSVL	230.00	345	0.7599	174.78
314543	6GRAVELA	230.00	345	0.8284	190.54	314544	6GRAVELB	230.00	345	0.8282	190.49
314828	6CHCKT_1	230.00	345	0.7734	177.88	315033	1BRCHWDA	18.000	345	0.8544	15.380
315034	1NNECKC1	13.200	345	0.5288	6.981	315035	1NNECKC2	13.200	345	0.5288	6.981
315091	1YORKTN2	18.000	345	0.4443	7.997	315092	1YORKTN3	25.000	345	0.4432	11.081
315111	1LKKINGA	13.800	345	0.9027	12.457	315112	1LKKINGB	13.800	345	0.9027	12.457
315116	1SURRY 1	22.000	345	0.8411	18.504	315117	1GRAVELC	13.800	345	0.8119	11.204
315119	1GRAVEL3	13.800	345	0.8688	11.989	315120	1GRAVEL4	13.800	345	0.8589	11.852
315121	1GRAVEL5	13.800	345	0.8603	11.873	315122	1GRAVEL6	13.800	345	0.8282	11.430

Attachment I.B.12 – Summer 2016 Outage of Line #2102 (Chickahominy – Lightfoot - Waller)

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E MON, MAY 07 2012 10:29
2016 SUMMER BASE CASE (ERAG/MMWG17S11) REV. 03/22/2012
CHESAPEKE AND YORKTOWN RET
OUTPUT FOR AREA 345 [DVP]
SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED: NONE)
LOADINGS ABOVE 93.5 % OF RATING SET B (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER BRANCHES):

X--- FROM BUS ---X				X--- TO BUS ---X						
BUS#	X-- NAME	--X BASKV	AREA	BUS#	X-- NAME	--X BASKV	AREA	CKT	LOADING	RATING	PERCENT
314074	6POSSUM	230.00*	345	315008	1POSSM6A	18.000	345	1	180.7	190.0	95.1
314074	6POSSUM	230.00*	345	315009	1POSSM6B	18.000	345	1	180.7	190.0	95.1
314289	6DARBYTN	230.00	345	315067	1DARBY 1	13.800*	345	1	86.1	90.0	95.6
314289	6DARBYTN	230.00	345	315068	1DARBY 2	13.800*	345	1	86.1	90.0	95.6
314289	6DARBYTN	230.00	345	315069	1DARBY 3	13.800*	345	1	86.1	90.0	95.6
314289	6DARBYTN	230.00	345	315070	1DARBY 4	13.800*	345	1	86.1	90.0	95.6
314391	6LIGH209	230.00*	345	314415	6WALR209	230.00	345	1	457.0	470.0	97.2
314465	6ELIZ R	230.00*	345	315110	1ELIZAR3	13.800	345	1	122.8	130.0	94.5
314543	6GRAVELA	230.00*	345	315119	1GRAVEL3	13.800	345	1	90.6	90.0	100.7
314543	6GRAVELA	230.00*	345	315120	1GRAVEL4	13.800	345	1	90.6	90.0	100.7
314682	3BUGGS I	115.00	345	315150	1BUGGS 1	13.800*	345	1	70.0	74.6	93.9
314682	3BUGGS I	115.00	345	315151	1BUGGS 2	13.800*	345	1	69.9	70.0	99.8
315201	1BATH 1A	20.500*	345	3WNDTR	BATH 3W1	WND 2	345	1	507.6	540.0	94.0
315202	1BATH 2B	20.500*	345	3WNDTR	BATH 3W1	WND 3	345	1	507.6	540.0	94.0
315203	1BATH 3C	20.500*	345	3WNDTR	BATH 3W3	WND 2	345	1	507.6	540.0	94.0
315204	1BATH 4D	20.500*	345	3WNDTR	BATH 3W3	WND 3	345	1	507.6	540.0	94.0
315205	1BATH 5E	20.500*	345	3WNDTR	BATH 3W5	WND 2	345	1	507.6	540.0	94.0
315206	1BATH 6F	20.500*	345	3WNDTR	BATH 3W5	WND 3	345	1	507.6	540.0	94.0

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E MON, MAY 07 2012 10:29
2016 SUMMER BASE CASE (ERAG/MMWG17S11) REV. 03/22/2012
CHESAPEKE AND YORKTOWN RET

BUSES WITH VOLTAGE GREATER THAN 1.0800:

BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)	BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)

* NONE *

BUSES WITH VOLTAGE LESS THAN 0.9300:

BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)	BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)

* NONE *

Attachment I.B.13 – Summer 2016 Outage of James River Tower Line (Line #214 & #263)

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012  10:32
 2016 SUMMER BASE CASE (ERAG/MMWG17S11) REV. 03/22/2012
 CHESAPEKE AND YORKTOWN RET
                      OUTPUT FOR AREA 345 [DVP         ]
 SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED:
NONE)
 LOADINGS ABOVE  99.5 % OF RATING SET C (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER
BRANCHES):

 X--------- FROM BUS ----------X X---------- TO BUS -----------X
   BUS# X-- NAME --X BASKV  AREA   BUS# X-- NAME --X BASKV  AREA CKT LOADING  RATING PERCENT
 314296 6PENNIMAN   230.00*  345 314415 6WALR209    230.00   345  1    550.0   541.0   101.7
 314386 6KINGS M    230.00*  345 314423 6YORKTWN    230.00   345  1    506.4   437.0   115.9
 314391 6LIGH209    230.00   345 314415 6WALR209    230.00*  345  1    633.8   541.0   117.2
 314543 6GRAVELA    230.00*  345 315119 1GRAVEL3    13.800   345  1     91.2    90.0   101.4
 314543 6GRAVELA    230.00*  345 315120 1GRAVEL4    13.800   345  1     91.2    90.0   101.4
 314682 3BUGGS I    115.00   345 315151 1BUGGS 2    13.800*  345  1     69.9    70.0    99.8

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012  10:33
 2016 SUMMER BASE CASE (ERAG/MMWG17S11) REV. 03/22/2012
 CHESAPEKE AND YORKTOWN RET

 BUSES WITH VOLTAGE GREATER THAN 1.0800:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                          * NONE *


 BUSES WITH VOLTAGE LESS THAN 0.9200:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)
 313812 6ROCKLANDING230.00  345 0.9102 209.35    314398 6NP NEWS    230.00  345 0.9027 207.62
 314399 6PEMBROK    230.00  345 0.9012 207.28    314402 6PENINSL    230.00  345 0.9032 207.74
 314407 6SHELBNK    230.00  345 0.8998 206.95    314409 6TABB       230.00  345 0.9090 209.07
 314416 6WARWICK    230.00  345 0.9091 209.10    314418 6WHEALTN    230.00  345 0.9061 208.39
 314421 6WINCHST    230.00  345 0.9059 208.35    314442 6NP NE_1    230.00  345 0.9045 208.04
 314445 6WHEAL_1    230.00  345 0.9079 208.82
```

Attachment I.B.14 – Summer 2016 Outage of Chickahominy – Lanexa ROW (Line #92, #2102, #2024 & #2124)

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012  10:41
 2016 SUMMER BASE CASE (ERAG/MMWG17S11) REV. 03/22/2012
 CHESAPEKE AND YORKTOWN RET
                      OUTPUT FOR AREA 345 [DVP         ]
 SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED:
NONE)
 LOADINGS ABOVE  99.5 % OF RATING SET C (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER
BRANCHES):

 X--------- FROM BUS ----------X X---------- TO BUS -----------X
   BUS# X-- NAME --X BASKV  AREA   BUS# X-- NAME --X BASKV  AREA CKT LOADING  RATING PERCENT
 313818 6BENCHRCH   230.00   345 314398 6NP NEWS    230.00*  345  1    809.4   672.0   120.4
 313818 6BENCHRCH   230.00*  345 314522 6CHCKTUK    230.00   345  1    835.7   672.0   124.4
 314398 6NP NEWS    230.00   345 314399 6PEMBROK    230.00*  345  1    682.8   549.0   124.4
 314399 6PEMBROK    230.00   345 314407 6SHELBNK    230.00*  345  1    682.8   549.0   124.4
 314421 6WINCHST    230.00   345 314540 6POOLSVL    230.00*  345  1    741.0   650.0   114.0
 314543 6GRAVELA    230.00   345 315119 1GRAVEL3    13.800*  345  1     91.6    90.0   101.8
 314543 6GRAVELA    230.00   345 315120 1GRAVEL4    13.800*  345  1     91.6    90.0   101.8
 314682 3BUGGS I    115.00   345 315151 1BUGGS 2    13.800*  345  1     69.9    70.0    99.8

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012  10:42
 2016 SUMMER BASE CASE (ERAG/MMWG17S11) REV. 03/22/2012
 CHESAPEKE AND YORKTOWN RET

 BUSES WITH VOLTAGE GREATER THAN 1.0800:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                          * NONE *


 BUSES WITH VOLTAGE LESS THAN 0.9100:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                          * NONE *
```

Attachment I.B.15 – Summer 2016 Outage of Line #2102 (Chickahominy – Lightfoot - Waller) With Yorktown #2 Off-Line (Critical System Condition)

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012  11:06
 2016 SUMMER BASE CASE (ERAG/MMWG17S11) REV. 03/22/2012
 CHESAPEKE AND YORKTOWN RET  NO YORK 2
                      OUTPUT FOR AREA 345 [DVP         ]
 SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED:
NONE)
 LOADINGS ABOVE  93.5 % OF RATING SET B (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER
BRANCHES):

 X--------- FROM BUS ----------X X---------- TO BUS ----------X
   BUS# X-- NAME --X BASKV  AREA   BUS# X-- NAME --X BASKV  AREA CKT LOADING  RATING PERCENT
 314074 6POSSUM     230.00*  345 315008 1POSSM6A    18.000   345  1    180.7   190.0    95.1
 314074 6POSSUM     230.00*  345 315009 1POSSM6B    18.000   345  1    180.7   190.0    95.1
 314289 6DARBYTN    230.00   345 315067 1DARBY 1    13.800*  345  1     86.8    90.0    96.5
 314289 6DARBYTN    230.00   345 315068 1DARBY 2    13.800*  345  1     86.8    90.0    96.5
 314289 6DARBYTN    230.00   345 315069 1DARBY 3    13.800*  345  1     86.8    90.0    96.5
 314289 6DARBYTN    230.00   345 315070 1DARBY 4    13.800*  345  1     86.8    90.0    96.5
 314386 6KINGS M    230.00*  345 314423 6YORKTWN    230.00   345  1    380.2   380.0   100.1
 314391 6LIGH209    230.00*  345 314415 6WALR209    230.00   345  1    497.2   470.0   105.8
 314465 6ELIZ R     230.00*  345 315110 1ELIZAR3    13.800   345  1    122.9   130.0    94.5
 314543 6GRAVELA    230.00*  345 315119 1GRAVEL3    13.800   345  1     90.5    90.0   100.6
 314543 6GRAVELA    230.00*  345 315120 1GRAVEL4    13.800   345  1     90.5    90.0   100.6
 314544 6GRAVELB    230.00*  345 315121 1GRAVEL5    13.800   345  1     85.6    90.0    95.1
 314682 3BUGGS I    115.00   345 315150 1BUGGS 1    13.800*  345  1     70.0    74.6    93.9
 314682 3BUGGS I    115.00   345 315151 1BUGGS 2    13.800*  345  1     69.9    70.0    99.8
 315201 1BATH 1A    20.500*  345 3WNDTR BATH 3W1     WND 2   345  1    507.6   540.0    94.0
 315202 1BATH 2B    20.500*  345 3WNDTR BATH 3W1     WND 3   345  1    507.6   540.0    94.0
 315203 1BATH 3C    20.500*  345 3WNDTR BATH 3W3     WND 2   345  1    507.6   540.0    94.0
 315204 1BATH 4D    20.500*  345 3WNDTR BATH 3W3     WND 3   345  1    507.6   540.0    94.0
 315205 1BATH 5E    20.500*  345 3WNDTR BATH 3W5     WND 2   345  1    507.6   540.0    94.0
 315206 1BATH 6F    20.500*  345 3WNDTR BATH 3W5     WND 3   345  1    507.6   540.0    94.0

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012  11:06
 2016 SUMMER BASE CASE (ERAG/MMWG17S11) REV. 03/22/2012
 CHESAPEKE AND YORKTOWN RET  NO YORK 2

 BUSES WITH VOLTAGE GREATER THAN 1.0800:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                          * NONE *


 BUSES WITH VOLTAGE LESS THAN 0.9300:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                          * NONE *
```

Attachment I.B.16 – Summer 2016 Outage of Line #263 (Chuckatuck-Benns Church – Newport News) With Yorktown #2 Off-Line (Critical System Condition)

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012  11:10
 2016 SUMMER BASE CASE (ERAG/MMWG17S11) REV. 03/22/2012
 CHESAPEKE AND YORKTOWN RET  NO YORK 2
                      OUTPUT FOR AREA 345 [DVP         ]
 SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED:
NONE)
 LOADINGS ABOVE  93.5 % OF RATING SET B (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER
BRANCHES):

 X--------- FROM BUS ----------X X---------- TO BUS ----------X
   BUS# X-- NAME --X BASKV  AREA   BUS# X-- NAME --X BASKV  AREA CKT LOADING  RATING PERCENT
 314074 6POSSUM     230.00*  345 315008 1POSSM6A    18.000   345  1    180.7   190.0    95.1
 314074 6POSSUM     230.00*  345 315009 1POSSM6B    18.000   345  1    180.7   190.0    95.1
 314289 6DARBYTN    230.00   345 315067 1DARBY 1    13.800*  345  1     87.6    90.0    97.4
 314289 6DARBYTN    230.00   345 315068 1DARBY 2    13.800*  345  1     87.6    90.0    97.4
 314289 6DARBYTN    230.00   345 315069 1DARBY 3    13.800*  345  1     87.6    90.0    97.4
 314289 6DARBYTN    230.00   345 315070 1DARBY 4    13.800*  345  1     87.6    90.0    97.4
 314421 6WINCHST    230.00*  345 314540 6POOLSVL    230.00   345  1    551.6   559.0    98.7
 314465 6ELIZ R     230.00*  345 315110 1ELIZAR3    13.800   345  1    122.8   130.0    94.5
 314543 6GRAVELA    230.00*  345 315119 1GRAVEL3    13.800   345  1     90.5    90.0   100.5
 314543 6GRAVELA    230.00*  345 315120 1GRAVEL4    13.800   345  1     90.5    90.0   100.5
 314544 6GRAVELB    230.00*  345 315121 1GRAVEL5    13.800   345  1     85.6    90.0    95.1
 314682 3BUGGS I    115.00   345 315150 1BUGGS 1    13.800*  345  1     70.0    74.6    93.9
 314682 3BUGGS I    115.00   345 315151 1BUGGS 2    13.800*  345  1     69.9    70.0    99.8
 315201 1BATH 1A    20.500*  345 3WNDTR BATH 3W1     WND 2   345  1    507.8   540.0    94.0
 315202 1BATH 2B    20.500*  345 3WNDTR BATH 3W1     WND 3   345  1    507.8   540.0    94.0
 315203 1BATH 3C    20.500*  345 3WNDTR BATH 3W3     WND 2   345  1    507.8   540.0    94.0
 315204 1BATH 4D    20.500*  345 3WNDTR BATH 3W3     WND 3   345  1    507.8   540.0    94.0
 315205 1BATH 5E    20.500*  345 3WNDTR BATH 3W5     WND 2   345  1    507.8   540.0    94.0
 315206 1BATH 6F    20.500*  345 3WNDTR BATH 3W5     WND 3   345  1    507.8   540.0    94.0

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012  11:10
 2016 SUMMER BASE CASE (ERAG/MMWG17S11) REV. 03/22/2012
 CHESAPEKE AND YORKTOWN RET  NO YORK 2

 BUSES WITH VOLTAGE GREATER THAN 1.0800:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                          * NONE *


 BUSES WITH VOLTAGE LESS THAN 0.9300:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                          * NONE *
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Attachment I.B.17 – Summer 2016 Outage of Line #214 (Surry - Poolesville – Winchester) With Yorktown #2 Off-Line (Critical System Condition)

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E MON, MAY 07 2012 11:13
2016 SUMMER BASE CASE (ERAG/MMWG17S11) REV. 03/22/2012
CHESAPEKE AND YORKTOWN RET NO YORK 2
OUTPUT FOR AREA 345 [DVP]
SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED: NONE)
LOADINGS ABOVE 93.5 % OF RATING SET B (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER BRANCHES):

X--------- FROM BUS ----------X				X---------- TO BUS ----------X						
BUS#	X-- NAME	--X BASKV	AREA	BUS#	X-- NAME	--X BASKV	AREA	CKT	LOADING	RATING	PERCENT
313818	6BENCHRCH	230.00*	345	314522	6CHCKTUK	230.00	345	1	568.4	584.0	97.3
314074	6POSSUM	230.00*	345	315008	1POSSM6A	18.000	345	1	180.7	190.0	95.1
314074	6POSSUM	230.00*	345	315009	1POSSM6B	18.000	345	1	180.7	190.0	95.1
314289	6DARBYTN	230.00	345	315067	1DARBY 1	13.800*	345	1	87.6	90.0	97.4
314289	6DARBYTN	230.00	345	315068	1DARBY 2	13.800*	345	1	87.6	90.0	97.4
314289	6DARBYTN	230.00	345	315069	1DARBY 3	13.800*	345	1	87.6	90.0	97.4
314289	6DARBYTN	230.00	345	315070	1DARBY 4	13.800*	345	1	87.6	90.0	97.4
314465	6ELIZ R	230.00*	345	315110	1ELIZAR3	13.800	345	1	122.9	130.0	94.5
314543	6GRAVELA	230.00*	345	315119	1GRAVEL3	13.800	345	1	90.5	90.0	100.5
314543	6GRAVELA	230.00*	345	315120	1GRAVEL4	13.800	345	1	90.5	90.0	100.5
314544	6GRAVELB	230.00*	345	315121	1GRAVEL5	13.800	345	1	85.6	90.0	95.1
314682	3BUGGS I	115.00	345	315150	1BUGGS 1	13.800*	345	1	70.0	74.6	93.9
314682	3BUGGS I	115.00	345	315151	1BUGGS 2	13.800*	345	1	69.9	70.0	99.8
315201	1BATH 1A	20.500*	345	3WNDTR	BATH 3W1	WND 2	345	1	507.7	540.0	94.0
315202	1BATH 2B	20.500*	345	3WNDTR	BATH 3W1	WND 3	345	1	507.7	540.0	94.0
315203	1BATH 3C	20.500*	345	3WNDTR	BATH 3W3	WND 2	345	1	507.7	540.0	94.0
315204	1BATH 4D	20.500*	345	3WNDTR	BATH 3W3	WND 3	345	1	507.7	540.0	94.0
315205	1BATH 5E	20.500*	345	3WNDTR	BATH 3W5	WND 2	345	1	507.7	540.0	94.0
315206	1BATH 6F	20.500*	345	3WNDTR	BATH 3W5	WND 3	345	1	507.7	540.0	94.0

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E MON, MAY 07 2012 11:13
2016 SUMMER BASE CASE (ERAG/MMWG17S11) REV. 03/22/2012
CHESAPEKE AND YORKTOWN RET NO YORK 2

BUSES WITH VOLTAGE GREATER THAN 1.0800:

BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)	BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)

* NONE *

BUSES WITH VOLTAGE LESS THAN 0.9300:

BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)	BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)

* NONE *

Attachment I.B.18 – Summer 2016 Outage of Breaker 285T2102 (Waller) With Yorktown #2 Off-Line (Critical System Condition)

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E MON, MAY 07 2012 11:27
2016 SUMMER BASE CASE (ERAG/MMWG17S11) REV. 03/22/2012
CHESAPEKE AND YORKTOWN RET NO YORK 2
OUTPUT FOR AREA 345 [DVP]
SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED: NONE)
LOADINGS ABOVE 93.5 % OF RATING SET B (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER BRANCHES):

X--- FROM BUS ---X				X--- TO BUS ---X							
BUS#	X-- NAME	BASKV	AREA	BUS#	X-- NAME	BASKV	AREA	CKT	LOADING	RATING	PERCENT
314074	6POSSUM	230.00*	345	315008	1POSSM6A	18.000	345	1	180.7	190.0	95.1
314074	6POSSUM	230.00*	345	315009	1POSSM6B	18.000	345	1	180.7	190.0	95.1
314289	6DARBYTN	230.00	345	315067	1DARBY 1	13.800*	345	1	86.6	90.0	96.2
314289	6DARBYTN	230.00	345	315068	1DARBY 2	13.800*	345	1	86.6	90.0	96.2
314289	6DARBYTN	230.00	345	315069	1DARBY 3	13.800*	345	1	86.6	90.0	96.2
314289	6DARBYTN	230.00	345	315070	1DARBY 4	13.800*	345	1	86.6	90.0	96.2
314391	6LIGH209	230.00*	345	314415	6WALR209	230.00	345	1	459.0	470.0	97.7
314465	6ELIZ R	230.00*	345	315110	1ELIZAR3	13.800	345	1	122.9	130.0	94.5
314543	6GRAVELA	230.00*	345	315119	1GRAVEL3	13.800	345	1	90.5	90.0	100.5
314543	6GRAVELA	230.00*	345	315120	1GRAVEL4	13.800	345	1	90.5	90.0	100.5
314544	6GRAVELB	230.00*	345	315121	1GRAVEL5	13.800	345	1	85.6	90.0	95.1
314682	3BUGGS I	115.00	345	315150	1BUGGS 1	13.800*	345	1	70.0	74.6	93.9
314682	3BUGGS I	115.00	345	315151	1BUGGS 2	13.800*	345	1	69.9	70.0	99.8
315201	1BATH 1A	20.500*	345	3WNDTR	BATH 3W1	WND 2	345	1	507.6	540.0	94.0
315202	1BATH 2B	20.500*	345	3WNDTR	BATH 3W1	WND 3	345	1	507.6	540.0	94.0
315203	1BATH 3C	20.500*	345	3WNDTR	BATH 3W3	WND 2	345	1	507.6	540.0	94.0
315204	1BATH 4D	20.500*	345	3WNDTR	BATH 3W3	WND 3	345	1	507.6	540.0	94.0
315205	1BATH 5E	20.500*	345	3WNDTR	BATH 3W5	WND 2	345	1	507.6	540.0	94.0
315206	1BATH 6F	20.500*	345	3WNDTR	BATH 3W5	WND 3	345	1	507.6	540.0	94.0

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E MON, MAY 07 2012 11:27
2016 SUMMER BASE CASE (ERAG/MMWG17S11) REV. 03/22/2012
CHESAPEKE AND YORKTOWN RET NO YORK 2

BUSES WITH VOLTAGE GREATER THAN 1.0800:

BUS#	X-- NAME	BASKV	AREA	V(PU)	V(KV)	BUS#	X-- NAME	BASKV	AREA	V(PU)	V(KV)

* NONE *

BUSES WITH VOLTAGE LESS THAN 0.9300:

BUS#	X-- NAME	BASKV	AREA	V(PU)	V(KV)	BUS#	X-- NAME	BASKV	AREA	V(PU)	V(KV)

* NONE *

Attachment I.B.19 – Summer 2016 Outage of James River Tower Line (Line #214 & #263) With Yorktown #2 Off-Line (Critical System Condition)

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012  11:56
 2016 SUMMER BASE CASE (ERAG/MMWG17S11) REV. 03/22/2012
 CHESAPEKE AND YORKTOWN RET  NO YORK 2
                       OUTPUT FOR AREA 345 [DVP         ]
 SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED:
NONE)
 LOADINGS ABOVE  99.5 % OF RATING SET C (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER
BRANCHES):

 X--------- FROM BUS ----------X X---------- TO BUS ----------X
   BUS# X-- NAME --X BASKV  AREA   BUS# X-- NAME --X BASKV  AREA CKT LOADING  RATING PERCENT
 313812 6ROCKLANDING230.00   345 314416 6WARWICK    230.00*  345  1    555.1   541.0   102.6
 313812 6ROCKLANDING230.00*  345 314423 6YORKTWN    230.00   345  1    653.5   541.0   120.8
 314214 6CHCKAHM    230.00   345 314390 6LIGH285    230.00*  345  1   1189.7   830.0   143.3
 314296 6PENNIMAN   230.00   345 314386 6KINGS M    230.00*  345  1    898.5   541.0   166.1
 314296 6PENNIMAN   230.00*  345 314415 6WALR209    230.00   345  1    917.4   541.0   169.6
 314339 6SPRUNCE    230.00   345 315083 1SPRUNCA    13.800*  345  1     69.9    67.5   103.6
 314376 6DENBIGH    230.00*  345 314413 6WALR285    230.00   345  1    950.5   830.0   114.5
 314386 6KINGS M    230.00   345 314423 6YORKTWN    230.00*  345  1    868.0   437.0   198.6
 314388 6LANEXA     230.00   345 314391 6LIGH209    230.00*  345  1   1098.8   812.0   135.3
 314390 6LIGH285    230.00   345 314413 6WALR285    230.00*  345  1   1075.3   830.0   129.6
 314391 6LIGH209    230.00   345 314415 6WALR209    230.00*  345  1   1032.3   541.0   190.8
 314409 6TABB       230.00*  345 314423 6YORKTWN    230.00   345  1    873.2   830.0   105.2
 314543 6GRAVELA    230.00*  345 315119 1GRAVEL3    13.800   345  1     90.5    90.0   100.5
 314543 6GRAVELA    230.00*  345 315120 1GRAVEL4    13.800   345  1     90.5    90.0   100.5
 314682 3BUGGS I    115.00   345 315151 1BUGGS 2    13.800*  345  1     69.9    70.0    99.8

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      MON, MAY 07 2012  11:56
 2016 SUMMER BASE CASE (ERAG/MMWG17S11) REV. 03/22/2012
 CHESAPEKE AND YORKTOWN RET  NO YORK 2

 BUSES WITH VOLTAGE GREATER THAN 1.0800:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                        * NONE *


 BUSES WITH VOLTAGE LESS THAN 0.9200:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)
 313811 6ELKO L286  230.00  345 0.9128 209.94    313812 6ROCKLANDING230.00  345 0.4954 113.94
 313813 3OCRAN      115.00  345 0.8334 95.844    313828 3WHITEMARSH 115.00  345 0.6756 77.698
 314139 6OAKGROV    230.00  345 0.8942 205.68    314172 6DUNNSVL    230.00  345 0.8403 193.26
 314173 3GARNER     115.00  345 0.8726 100.35    314174 3HARMONY    115.00  345 0.8157 93.800
 314176 6HARMONY    230.00  345 0.7633 175.56    314177 3HAYES89    115.00  345 0.6336 72.863
 314178 3LANCAST    115.00  345 0.8390 96.485    314180 6HAYES      230.00  345 0.5362 123.32
 314181 3NORNECK    115.00  345 0.9194 105.74    314182 6NORNECK    230.00  345 0.8510 195.72
 314183 6SANDERS    230.00  345 0.8593 197.63    314184 3SHACKLE    115.00  345 0.8399 96.591
 314187 3WAN 176    115.00  345 0.7976 91.728    314188 3WEST PT    115.00  345 0.8528 98.075
 314189 6PAPERMILL  230.00  345 0.7884 181.34    314190 6WESTMOR    230.00  345 0.8735 200.91
 314191 3WHITE S    115.00  345 0.8286 95.291    314214 6CHCKAHM    230.00  345 0.8888 204.41
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314243	3PROV 92	115.00	345	0.9098	104.63	314257	6WHITOAK	230.00	345	0.9102	209.35
314258	6ELKO	230.00	345	0.9077	208.77	314296	6PENNIMAN	230.00	345	0.6214	142.93
314371	3AMOCO Y	115.00	345	0.5006	57.572	314372	3BLOXOMC	115.00	345	0.4887	56.204
314373	3COLONY	115.00	345	0.4947	56.891	314374	3COPELND	115.00	345	0.5112	58.787
314375	6CORRCTN	230.00	345	0.7972	183.36	314376	6DENBIGH	230.00	345	0.5554	127.74
314377	3DOW 34	115.00	345	0.8834	101.59	314378	3FTEUS34	115.00	345	0.4875	56.059
314379	3FTEUS58	115.00	345	0.4833	55.576	314381	3GRAFT34	115.00	345	0.4930	56.691
314382	3GRAFT58	115.00	345	0.4907	56.435	314384	3KINGS M	115.00	345	0.8506	97.818
314385	3HARMO_1	115.00	345	0.8162	93.863	314386	6KINGS M	230.00	345	0.6054	139.25
314387	3LANEXA	115.00	345	0.8835	101.60	314388	6LANEXA	230.00	345	0.8083	185.91
314389	3LEBAN58	115.00	345	0.4806	55.264	314390	6LIGH285	230.00	345	0.6572	151.16
314391	6LIGH209	230.00	345	0.6901	158.72	314392	3MAGRUDR	115.00	345	0.5071	58.318
314393	3MERCURY	115.00	345	0.4983	57.303	314394	3NASA	115.00	345	0.5110	58.765
314395	3HARMO_2	115.00	345	0.8161	93.846	314396	3NNEWS58	115.00	345	0.8706	100.12
314397	3NNEWS75	115.00	345	0.5112	58.787	314398	6NP NEWS	230.00	345	0.4701	108.11
314399	6PEMBROK	230.00	345	0.4709	108.31	314400	3LANCA_1	115.00	345	0.8394	96.534
314401	3PENINSL	115.00	345	0.5110	58.762	314402	6PENINSL	230.00	345	0.4835	111.22
314403	3SEAFD76	115.00	345	0.5024	57.775	314404	3SEAFD79	115.00	345	0.5017	57.694
314406	3SHELBNK	115.00	345	0.5066	58.260	314407	6SHELBNK	230.00	345	0.4721	108.58
314408	6CHCKA_1	230.00	345	0.8915	205.04	314409	6TABB	230.00	345	0.4971	114.34
314411	3TOANO58	115.00	345	0.8689	99.923	314412	3U CARBD	115.00	345	0.5110	58.765
314413	6WALR285	230.00	345	0.6303	144.98	314414	3WARWICK	115.00	345	0.5010	57.619
314415	6WALR209	230.00	345	0.6542	150.47	314416	6WARWICK	230.00	345	0.4923	113.22
314417	3WHEALTN	115.00	345	0.5127	58.956	314418	6WHEALTN	230.00	345	0.4825	110.97
314420	3PENIN_1	115.00	345	0.5112	58.791	314421	6WINCHST	230.00	345	0.4822	110.91
314422	3YORKTWN	115.00	345	0.5008	57.590	314423	6YORKTWN	230.00	345	0.5303	121.97
314424	3YNWS 58	115.00	345	0.4801	55.216	314425	3YORK PS	115.00	345	0.5009	57.600
314440	6LANEX_1	230.00	345	0.8099	186.29	314442	6NP NE_1	230.00	345	0.4710	108.33
314445	6WHEAL_1	230.00	345	0.4835	111.20	314450	6YORKT_1	230.00	345	0.5321	122.37
315091	1YORKTN2	18.000	345	0.5008	9.014	315092	1YORKTN3	25.000	345	0.5303	13.258

Attachment I.B.20 – Summer 2016 Outage of Chickahominy – Lanexa ROW (Line #92, #2102, #2024 & #2124) With Yorktown #2 Off-Line (Critical System Condition)

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E MON, MAY 07 2012 12:07
2016 SUMMER BASE CASE (ERAG/MMWG17S11) REV. 03/22/2012
CHESAPEKE AND YORKTOWN RET NO YORK 2
OUTPUT FOR AREA 345 [DVP]
SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED: NONE)
LOADINGS ABOVE 99.5 % OF RATING SET C (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER BRANCHES):

X--------- FROM BUS ----------X				X---------- TO BUS ----------X						
BUS#	X-- NAME	--X BASKV	AREA	BUS#	X-- NAME	--X BASKV	AREA	CKT	LOADING	RATING	PERCENT
313810	6DAHLGREN	230.00*	345	314131	6ARNOLDS	230.00	345	1	812.4	699.0	116.2
313810	6DAHLGREN	230.00	345	314139	6OAKGROV	230.00*	345	1	696.4	699.0	99.6
313818	6BENCHRCH	230.00	345	314398	6NP NEWS	230.00*	345	1	1392.5	672.0	207.2
313818	6BENCHRCH	230.00*	345	314522	6CHCKTUK	230.00	345	1	1485.3	672.0	221.0
314131	6ARNOLDS	230.00*	345	314175	6COMORN	230.00	345	1	840.7	699.0	120.3
314132	6BIRCHWD	230.00*	345	314163	6FINES	230.00	345	1	676.8	671.0	100.9
314132	6BIRCHWD	230.00	345	314175	6COMORN	230.00*	345	1	850.9	699.0	121.7
314137	6FREDBRG	230.00	345	314163	6FINES	230.00*	345	1	701.9	671.0	104.6
314398	6NP NEWS	230.00	345	314399	6PEMBROK	230.00*	345	1	1174.3	549.0	213.9
314399	6PEMBROK	230.00	345	314407	6SHELBNK	230.00*	345	1	1155.3	549.0	210.4
314416	6WARWICK	230.00*	345	314418	6WHEALTN	230.00	345	1	551.5	541.0	101.9
314418	6WHEALTN	230.00*	345	314421	6WINCHST	230.00	345	1	860.6	671.0	128.3
314421	6WINCHST	230.00*	345	314540	6POOLSVL	230.00	345	1	1135.2	650.0	174.7
314522	6CHCKTUK	230.00*	345	314525	6KINGSFO	230.00	345	1	1016.8	830.0	122.5
314525	6KINGSFO	230.00*	345	314537	6SUFFOLK	230.00	345	1	1062.6	830.0	128.0
314538	6SURRY	230.00	345	314540	6POOLSVL	230.00*	345	1	1248.9	830.0	150.5
314682	3BUGGS I	115.00	345	315151	1BUGGS 2	13.800*	345	1	69.8	70.0	99.6

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E MON, MAY 07 2012 12:07
2016 SUMMER BASE CASE (ERAG/MMWG17S11) REV. 03/22/2012
CHESAPEKE AND YORKTOWN RET NO YORK 2

BUSES WITH VOLTAGE GREATER THAN 1.0800:

BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)	BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)
* NONE *											

BUSES WITH VOLTAGE LESS THAN 0.9200:

BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)	BUS#	X-- NAME	--X BASKV	AREA	V(PU)	V(KV)
313803	3OAKRI44	115.00	345	0.8946	102.88	313810	6DAHLGREN	230.00	345	0.6635	152.61
313812	6ROCKLANDING	230.00	345	0.3836	88.231	313813	3OCRAN	115.00	345	0.3165	36.398
313818	6BENCHRCH	230.00	345	0.6996	160.90	313828	3WHITEMARSH	115.00	345	0.3505	40.302
314131	6ARNOLDS	230.00	345	0.7562	173.94	314132	6BIRCHWD	230.00	345	0.8209	188.80

314139	6OAKGROV	230.00	345	0.5530	127.19	314163	6FINES	230.00	345	0.8767	201.65
314172	6DUNNSVL	230.00	345	0.4008	92.185	314173	3GARNER	115.00	345	0.3562	40.960
314174	3HARMONY	115.00	345	0.3181	36.581	314175	6COMORN	230.00	345	0.7680	176.64
314176	6HARMONY	230.00	345	0.3146	72.358	314177	3HAYES89	115.00	345	0.3625	41.685
314178	3LANCAST	115.00	345	0.3182	36.592	314180	6HAYES	230.00	345	0.3667	84.352
314181	3NORNECK	115.00	345	0.4271	49.111	314182	6NORNECK	230.00	345	0.4325	99.468
314183	6SANDERS	230.00	345	0.4537	104.36	314184	3SHACKLE	115.00	345	0.3229	37.129
314187	3WAN 176	115.00	345	0.2894	33.285	314188	3WEST PT	115.00	345	0.3236	37.214
314189	6PAPERMILL	230.00	345	0.3215	73.944	314190	6WESTMOR	230.00	345	0.4917	113.08
314191	3WHITE S	115.00	345	0.3160	36.336	314206	3OAKRIDG	115.00	345	0.8982	103.29
314261	3OAKRI_1	115.00	345	0.8986	103.34	314295	6BIRDNECK	230.00	345	0.9001	207.02
314296	6PENNIMAN	230.00	345	0.3457	79.512	314320	3S27T67A	115.00	345	0.8855	101.83
314321	3S27T67B	115.00	345	0.8830	101.55	314371	3AMOCO Y	115.00	345	0.3630	41.742
314372	3BLOXOMC	115.00	345	0.3792	43.613	314373	3COLONY	115.00	345	0.3657	42.052
314374	3COPELND	115.00	345	0.3932	45.222	314375	6CORRCTN	230.00	345	0.3258	74.935
314376	6DENBIGH	230.00	345	0.3579	82.328	314377	3DOW 34	115.00	345	0.3301	37.959
314378	3FTEUS34	115.00	345	0.3492	40.152	314379	3FTEUS58	115.00	345	0.3447	39.642
314381	3GRAFT34	115.00	345	0.3548	40.804	314382	3GRAFT58	115.00	345	0.3525	40.543
314384	3KINGS M	115.00	345	0.2782	31.990	314385	3HARMO_1	115.00	345	0.3183	36.606
314386	6KINGS M	230.00	345	0.3490	80.261	314387	3LANEXA	115.00	345	0.3313	38.102
314388	6LANEXA	230.00	345	0.3317	76.295	314389	3LEBAN58	115.00	345	0.3419	39.316
314390	6LIGH285	230.00	345	0.3416	78.560	314391	6LIGH209	230.00	345	0.3365	77.403
314392	3MAGRUDR	115.00	345	0.3914	45.015	314393	3MERCURY	115.00	345	0.3892	44.756
314394	3NASA	115.00	345	0.3893	44.770	314395	3HARMO_2	115.00	345	0.3183	36.599
314396	3NNEWS58	115.00	345	0.3094	35.585	314397	3NNEWS75	115.00	345	0.3932	45.222
314398	6NP NEWS	230.00	345	0.4878	112.20	314399	6PEMBROK	230.00	345	0.4587	105.51
314400	3LANCA_1	115.00	345	0.3183	36.610	314401	3PENINSL	115.00	345	0.3893	44.768
314402	6PENINSL	230.00	345	0.3989	91.741	314403	3SEAFD76	115.00	345	0.3681	42.336
314404	3SEAFD79	115.00	345	0.3674	42.249	314406	3SHELBNK	115.00	345	0.3979	45.756
314407	6SHELBNK	230.00	345	0.4303	98.958	314409	6TABB	230.00	345	0.3861	88.801
314411	3TOANO58	115.00	345	0.3066	35.260	314412	3U CARBD	115.00	345	0.3894	44.780
314413	6WALR285	230.00	345	0.3427	78.812	314414	3WARWICK	115.00	345	0.3761	43.254
314415	6WALR209	230.00	345	0.3395	78.096	314416	6WARWICK	230.00	345	0.3863	88.858
314417	3WHEALTN	115.00	345	0.3947	45.395	314418	6WHEALTN	230.00	345	0.3997	91.935
314420	3PENIN_1	115.00	345	0.3895	44.790	314421	6WINCHST	230.00	345	0.4009	92.205
314422	3YORKTWN	115.00	345	0.3631	41.760	314423	6YORKTWN	230.00	345	0.3693	84.929
314424	3YNWS 58	115.00	345	0.3414	39.267	314425	3YORK PS	115.00	345	0.3631	41.755
314436	3ALEX CR	115.00	345	0.8750	100.62	314437	3AMPHB67	115.00	345	0.8818	101.41
314438	3STORE	115.00	345	0.8869	102.00	314439	3BAYSIDE	115.00	345	0.8823	101.46
314440	6LANEX_1	230.00	345	0.3324	76.449	314441	3BERKL51	115.00	345	0.8888	102.21
314442	6NP NE_1	230.00	345	0.4888	112.42	314443	3BOWERS	115.00	345	0.8765	100.80
314444	6BOWERS	230.00	345	0.8799	202.37	314445	6WHEAL_1	230.00	345	0.4005	92.121
314447	3BURTN67	115.00	345	0.8855	101.83	314448	3CHESAPK	115.00	345	0.8832	101.57
314449	6CHESAPK	230.00	345	0.8900	204.69	314450	6YORKT_1	230.00	345	0.3705	85.206
314451	3CHESPTX	115.00	345	0.8829	101.53	314452	3CHRHLND	115.00	345	0.8819	101.41
314453	6CHRHLND	230.00	345	0.8591	197.59	314456	3CMN GAS	115.00	345	0.8831	101.55
314457	3CRADOCK	115.00	345	0.8803	101.23	314458	3DAVIS67	115.00	345	0.8903	102.39
314459	3DAVIS27	115.00	345	0.8908	102.44	314460	6CHESPTX	230.00	345	0.8898	204.66
314461	3DEEPC46	115.00	345	0.8893	102.27	314462	3DEEPC87	115.00	345	0.8809	101.30
314463	3DOZIER	115.00	345	0.8774	100.90	314464	6DOZIER	230.00	345	0.8923	205.24
314465	6ELIZ R	230.00	345	0.8921	205.18	314466	6FENTRES	230.00	345	0.9195	211.48
314469	3GOSPORT	115.00	345	0.8889	102.22	314470	3GRASFLD	115.00	345	0.8750	100.63
314471	3GREAT B	115.00	345	0.8676	99.778	314472	6GRN RUN	230.00	345	0.8950	205.86
314473	3GRENWCH	115.00	345	0.8921	102.59	314474	6GRENWCH	230.00	345	0.8947	205.78
314475	6HARBORV	230.00	345	0.8633	198.56	314477	3HODGE F	115.00	345	0.8752	100.65
314478	3IND PRK	115.00	345	0.8843	101.69	314479	3LANDSTN	115.00	345	0.9023	103.77
314480	6HUNTSMN	230.00	345	0.8970	206.31	314481	6LANDSTN	230.00	345	0.9038	207.87
314482	3LONDONB	115.00	345	0.8957	103.01	314483	3LONGC27	115.00	345	0.8829	101.53
314484	6HARBORV226	230.00	345	0.8515	195.85	314485	6LK KING	230.00	345	0.8597	197.74
314486	6LYNHAVN	230.00	345	0.8978	206.50	314487	3MCLAUGH	115.00	345	0.8843	101.70
314488	3OAKWOOD	115.00	345	0.8809	101.31	314490	6VA BCH	230.00	345	0.8993	206.84

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314491 3PENDLTN    115.00  345 0.8932 102.72    314492 3P ANNE     115.00  345 0.9006 103.57
314493 3REEVES     115.00  345 0.8891 102.25    314494 6REEVES     230.00  345 0.8958 206.03
314495 6RURITAN    230.00  345 0.8965 206.20    314496 3SEWLSPT    115.00  345 0.8895 102.29
314497 6SEWLSPT    230.00  345 0.8568 197.06    314498 3SHEA       115.00  345 0.8717 100.24
314499 6SNORFLK    230.00  345 0.8968 206.27    314500 6NAVYS      230.00  345 0.8568 197.05
314501 6NAVYS1     230.00  345 0.8567 197.05    314502 6STUMPY     230.00  345 0.9016 207.37
314503 3TAUSSIG    115.00  345 0.8841 101.68    314504 6THALIA     230.00  345 0.8950 205.85
314505 6NAVYN      230.00  345 0.8568 197.06    314506 3THOLE S    115.00  345 0.8841 101.68
314507 3THOMPSN    115.00  345 0.8588 98.760    314508 6THRS279    230.00  345 0.9000 207.00
314510 6NAVYN1     230.00  345 0.8565 197.00    314511 3VA BCH     115.00  345 0.8934 102.74
314512 6W LAND     230.00  345 0.9040 207.92    314513 3YADKIN     115.00  345 0.8910 102.46
314514 6YADKIN     230.00  345 0.8898 204.65    314522 6CHCKTUK    230.00  345 0.7242 166.55
314523 6CRITTDN    230.00  345 0.8337 191.75    314525 6KINGSFO    230.00  345 0.8070 185.60
314528 3IVOR106    115.00  345 0.8978 103.25    314529 3KINGS F    115.00  345 0.8973 103.19
314530 3GRENW_1    115.00  345 0.8930 102.69    314531 3MYRTLE     115.00  345 0.8897 102.31
314532 3OAKRI23    115.00  345 0.8982 103.29    314533 6SMITFLD    230.00  345 0.8174 187.99
314535 3SUFFCAP    115.00  345 0.8971 103.17    314536 3SUFFOLK    115.00  345 0.8971 103.17
314537 6SUFFOLK    230.00  345 0.8801 202.43    314538 6SURRY      230.00  345 0.7823 179.93
314540 6POOLSVL    230.00  345 0.7092 163.12    314542 3WINDSOR    115.00  345 0.8879 102.11
314543 6GRAVELA    230.00  345 0.7825 179.99    314544 6GRAVELB    230.00  345 0.7826 179.99
314550 6HICKORY    230.00  345 0.9192 211.41    314630 3REEVE_1    115.00  345 0.8900 102.35
314631 3THOLE_1    115.00  345 0.8846 101.73    314638 6ELIZ CT    230.00  345 0.9163 210.74
314639 6TANGLEW    230.00  345 0.9146 210.35    314648 6SUNBURY    230.00  345 0.8961 206.11
314651 6WINFALL    230.00  345 0.9135 210.11    314652 3VA BC_1    115.00  345 0.8948 102.90
314653 6CHRHL_1    230.00  345 0.8608 197.99    314656 6GRENW_1    230.00  345 0.8974 206.40
314657 6LANDS_1    230.00  345 0.9065 208.50    314658 6LYNHA_1    230.00  345 0.8978 206.50
314659 6REEVE_1    230.00  345 0.8985 206.65    314660 6YADKI_1    230.00  345 0.8915 205.05
314661 3SUFFC_1    115.00  345 0.8975 103.22    314823 3SUFFO_1    115.00  345 0.8975 103.22
314828 6CHCKT_1    230.00  345 0.7264 167.06    315033 1BRCHWDA    18.000  345 0.8287 14.916
315091 1YORKTN2    18.000  345 0.3631  6.536    315092 1YORKTN3    25.000  345 0.3693  9.231
315098 1CHESPKA    13.800  345 0.8894 12.274    315099 1CHESPKB    13.800  345 0.8832 12.188
315111 1LKKINGA    13.800  345 0.8536 11.780    315112 1LKKINGB    13.800  345 0.8536 11.780
315116 1SURRY 1    22.000  345 0.7957 17.506    315117 1GRAVELC    13.800  345 0.7670 10.584
315119 1GRAVEL3    13.800  345 0.8104 11.184    315120 1GRAVEL4    13.800  345 0.8107 11.187
315121 1GRAVEL5    13.800  345 0.8125 11.212    315122 1GRAVEL6    13.800  345 0.8160 11.261
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Attachment I.B.21 – Summer 2021 Outage of James River Tower Line (Line #214 & #263) With Yorktown #2 Off-Line(Critical System Condition)

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E TUE, MAY 08 2012 8:05
2021 SUMMER BASE CASE (ERAG/MMWG22S11) REV. 03/29/2012
YORK & CHESPKE RETIRED
OUTPUT FOR AREA 345 [DVP]
SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED: NONE)
LOADINGS ABOVE 99.5 % OF RATING SET C (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER BRANCHES):

FROM BUS				TO BUS						
BUS#	X-- NAME --X	BASKV	AREA	BUS#	X-- NAME --X	BASKV	AREA	CKT	LOADING	RATING	PERCENT
313812	6ROCKLANDING	230.00*	345	314423	6YORKTWN	230.00	345	1	624.7	541.0	115.5
314214	6CHCKAHM	230.00	345	314390	6LIGH285	230.00*	345	1	1230.7	830.0	148.3
314214	6CHCKAHM	230.00	345	314903	8CHCKAHM	500.00*	345	1	953.1	944.6	100.9
314296	6PENNIMAN	230.00	345	314386	6KINGS M	230.00*	345	1	914.6	541.0	169.1
314296	6PENNIMAN	230.00*	345	314415	6WALR209	230.00	345	1	936.7	541.0	173.2
314339	6SPRUNCE	230.00	345	315083	1SPRUNCA	13.800*	345	1	69.4	67.5	102.9
314376	6DENBIGH	230.00*	345	314413	6WALR285	230.00	345	1	956.2	830.0	115.2
314386	6KINGS M	230.00	345	314423	6YORKTWN	230.00*	345	1	875.4	437.0	200.3
314388	6LANEXA	230.00	345	314391	6LIGH209	230.00*	345	1	1140.2	812.0	140.4
314390	6LIGH285	230.00	345	314413	6WALR285	230.00*	345	1	1096.6	830.0	132.1
314391	6LIGH209	230.00	345	314415	6WALR209	230.00*	345	1	1061.2	541.0	196.2
314409	6TABB	230.00*	345	314423	6YORKTWN	230.00	345	1	831.8	830.0	100.2
314682	3BUGGS I	115.00	345	315151	1BUGGS 2	13.800*	345	1	69.9	70.0	99.7

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E TUE, MAY 08 2012 8:05
2021 SUMMER BASE CASE (ERAG/MMWG22S11) REV. 03/29/2012
YORK & CHESPKE RETIRED

BUSES WITH VOLTAGE GREATER THAN 1.0800:

BUS#	X-- NAME --X	BASKV	AREA	V(PU)	V(KV)	BUS#	X-- NAME --X	BASKV	AREA	V(PU)	V(KV)

* NONE *

BUSES WITH VOLTAGE LESS THAN 0.9200:

BUS#	X-- NAME --X	BASKV	AREA	V(PU)	V(KV)	BUS#	X-- NAME --X	BASKV	AREA	V(PU)	V(KV)
313810	6DAHLGREN	230.00	345	0.8976	206.45	313811	6ELKO L286	230.00	345	0.8783	202.00
313812	6ROCKLANDING	230.00	345	0.4095	94.189	313813	3OCRAN	115.00	345	0.6755	77.688
313828	3WHITEMARSH	115.00	345	0.5233	60.181	314139	6OAKGROV	230.00	345	0.8577	197.28
314172	6DUNNSVL	230.00	345	0.7956	182.98	314173	3GARNER	115.00	345	0.7284	83.763
314174	3HARMONY	115.00	345	0.6575	75.607	314176	6HARMONY	230.00	345	0.7169	164.90
314177	3HAYES89	115.00	345	0.4826	55.499	314178	3LANCAST	115.00	345	0.6819	78.415
314180	6HAYES	230.00	345	0.4505	103.60	314181	3NORNECK	115.00	345	0.7930	91.190
314182	6NORNECK	230.00	345	0.8067	185.54	314183	6SANDERS	230.00	345	0.8164	187.78
314184	3SHACKLE	115.00	345	0.6924	79.628	314187	3WAN 176	115.00	345	0.6289	72.329
314188	3WEST PT	115.00	345	0.7115	81.827	314189	6PAPERMILL	230.00	345	0.7455	171.46
314190	6WESTMOR	230.00	345	0.8332	191.63	314191	3WHITE S	115.00	345	0.6703	77.084
314214	6CHCKAHM	230.00	345	0.8526	196.10	314241	6OLDCHRC	230.00	345	0.8971	206.32

314243	3PROV 92	115.00	345	0.8007	92.075	314252	3TURNR92	115.00	345	0.8871	102.02
314253	6TURNER	230.00	345	0.9011	207.24	314257	6WHITOAK	230.00	345	0.8755	201.37
314258	6ELKO	230.00	345	0.8728	200.75	314271	6ALLIED	230.00	345	0.8957	206.01
314272	6ALPINE	230.00	345	0.8935	205.50	314281	6BURDET	230.00	345	0.8985	206.66
314294	6ENON	230.00	345	0.9033	207.76	314296	6PENNIMAN	230.00	345	0.5528	127.14
314308	6ICI	230.00	345	0.8905	204.80	314371	3AMOCO Y	115.00	345	0.3848	44.248
314372	3BLOXOMC	115.00	345	0.3564	40.990	314373	3COLONY	115.00	345	0.3672	42.223
314374	3COPELND	115.00	345	0.3790	43.587	314375	6CORRCTN	230.00	345	0.7538	173.38
314376	6DENBIGH	230.00	345	0.4758	109.43	314377	3DOW 34	115.00	345	0.7560	86.940
314378	3FTEUS34	115.00	345	0.3706	42.616	314379	3FTEUS58	115.00	345	0.3661	42.098
314381	3GRAFT34	115.00	345	0.3762	43.267	314382	3GRAFT58	115.00	345	0.3740	43.014
314384	3KINGS M	115.00	345	0.7136	82.066	314385	3HARMO_1	115.00	345	0.6579	75.658
314386	6KINGS M	230.00	345	0.5342	122.86	314387	3LANEXA	115.00	345	0.7565	86.995
314388	6LANEXA	230.00	345	0.7644	175.81	314389	3LEBAN58	115.00	345	0.3632	41.767
314390	6LIGH285	230.00	345	0.5942	136.66	314391	6LIGH209	230.00	345	0.6315	145.25
314392	3MAGRUDR	115.00	345	0.3764	43.281	314393	3MERCURY	115.00	345	0.3666	42.164
314394	3NASA	115.00	345	0.3807	43.784	314395	3HARMO_2	115.00	345	0.6578	75.644
314396	3NNEWS58	115.00	345	0.7395	85.040	314397	3NNEWS75	115.00	345	0.3790	43.587
314398	6NP NEWS	230.00	345	0.3804	87.503	314399	6PEMBROK	230.00	345	0.3818	87.824
314400	3LANCA_1	115.00	345	0.6822	78.455	314401	3PENINSL	115.00	345	0.3807	43.783
314402	6PENINSL	230.00	345	0.3973	91.374	314403	3SEAFD76	115.00	345	0.3826	43.999
314404	3SEAFD79	115.00	345	0.3819	43.922	314406	3SHELBNK	115.00	345	0.3757	43.203
314407	6SHELBNK	230.00	345	0.3836	88.227	314408	6CHCKA_1	230.00	345	0.8552	196.70
314409	6TABB	230.00	345	0.4111	94.545	314411	3TOANO58	115.00	345	0.7372	84.778
314412	3U CARBD	115.00	345	0.3807	43.783	314413	6WALR285	230.00	345	0.5635	129.60
314414	3WARWICK	115.00	345	0.3709	42.648	314415	6WALR209	230.00	345	0.5906	135.84
314416	6WARWICK	230.00	345	0.4064	93.471	314417	3WHEALTN	115.00	345	0.3806	43.767
314418	6WHEALTN	230.00	345	0.3969	91.291	314420	3PENIN_1	115.00	345	0.3809	43.804
314421	6WINCHST	230.00	345	0.3966	91.227	314422	3YORKTWN	115.00	345	0.3849	44.266
314423	6YORKTWN	230.00	345	0.4454	102.44	314424	3YNWS 58	115.00	345	0.3628	41.718
314425	3YORK PS	115.00	345	0.3857	44.360	314440	6LANEX_1	230.00	345	0.7660	176.17
314442	6NP NE_1	230.00	345	0.3812	87.680	314445	6WHEAL_1	230.00	345	0.3977	91.476
314450	6YORKT_1	230.00	345	0.4469	102.78	315091	1YORKTN2	18.000	345	0.3849	6.929
315092	1YORKTN3	25.000	345	0.4454	11.135						

Attachment I.B.22 – Summer 2021 Outage of Chickahominy – Lanexa ROW (Line #92, #2102, #2024 & #2124) With Yorktown #2 Off-Line (Critical System Condition)

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      TUE, MAY 08 2012   8:09
 2021 SUMMER BASE CASE (ERAG/MMWG22S11) REV. 03/29/2012
 YORK & CHESPKE RETIRED
                        OUTPUT FOR AREA 345 [DVP         ]
 SUBSYSTEM LOADING CHECK (INCLUDED: LINES; BREAKERS AND SWITCHES; TRANSFORMERS) (EXCLUDED:
NONE)
 LOADINGS ABOVE  99.5 % OF RATING SET C (MVA FOR TRANSFORMERS, CURRENT FOR NON-TRANSFORMER
BRANCHES):

 X--------- FROM BUS ----------X X---------- TO BUS ----------X
   BUS# X-- NAME --X BASKV  AREA    BUS# X-- NAME --X BASKV  AREA CKT LOADING  RATING PERCENT
 313810 6DAHLGREN   230.00*  345 314131 6ARNOLDS    230.00   345  1    760.5   699.0   108.8
 313818 6BENCHRCH   230.00   345 314398 6NP NEWS    230.00*  345  1   1205.7   672.0   179.4
 313818 6BENCHRCH   230.00*  345 314522 6CHCKTUK    230.00   345  1   1358.0   672.0   202.1
 314131 6ARNOLDS    230.00*  345 314175 6COMORN     230.00   345  1    807.9   699.0   115.6
 314132 6BIRCHWD    230.00*  345 314163 6FINES      230.00   345  1    886.1   671.0   132.1
 314132 6BIRCHWD    230.00   345 314175 6COMORN     230.00*  345  1    811.1   699.0   116.0
 314137 6FREDBRG    230.00   345 314163 6FINES      230.00*  345  1    929.0   671.0   138.4
 314287 6CHSTF B    230.00   345 314303 6HOPEWLL    230.00*  345  1    564.6   549.0   102.8
 314339 6SPRUNCE    230.00   345 315083 1SPRUNCA    13.800*  345  1     67.9    67.5   100.6
 314398 6NP NEWS    230.00   345 314399 6PEMBROK    230.00*  345  1    953.3   549.0   173.6
 314399 6PEMBROK    230.00   345 314407 6SHELBNK    230.00*  345  1    913.5   549.0   166.4
 314421 6WINCHST    230.00*  345 314540 6POOLSVL    230.00   345  1    937.9   650.0   144.3
 314522 6CHCKTUK    230.00*  345 314525 6KINGSFO    230.00   345  1   1260.9   830.0   151.9
 314525 6KINGSFO    230.00*  345 314537 6SUFFOLK    230.00   345  1   1326.2   830.0   159.8
 314538 6SURRY      230.00   345 314540 6POOLSVL    230.00*  345  1   1174.5   830.0   141.5

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     PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS®E      TUE, MAY 08 2012   8:10
 2021 SUMMER BASE CASE (ERAG/MMWG22S11) REV. 03/29/2012
 YORK & CHESPKE RETIRED

 BUSES WITH VOLTAGE GREATER THAN 1.0800:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)

                                        * NONE *


 BUSES WITH VOLTAGE LESS THAN 0.9100:

   BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)      BUS# X-- NAME --X BASKV AREA  V(PU)  V(KV)
 313801 6AYDLETTSW  230.00  345 0.6813 156.71    313803 3OAKRI44    115.00  345 0.6707 77.129
 313809 6MT RD2127  230.00  345 0.8787 202.10    313810 6DAHLGREN   230.00  345 0.5248 120.71
 313811 6ELKO L286  230.00  345 0.8807 202.56    313812 6ROCKLANDING230.00  345 0.1118 25.714
 313813 3OCRAN      115.00  345 0.0520  5.985    313818 6BENCHRCH   230.00  345 0.4713 108.39
 313823 3SHILOH     115.00  345 0.8434 96.989    313828 3WHITEMARSH 115.00  345 0.0695  7.992
 314131 6ARNOLDS    230.00  345 0.6345 145.94    314132 6BIRCHWD    230.00  345 0.7109 163.51
 314134 6CRANES     230.00  345 0.8652 198.99    314136 3FREDBRG    115.00  345 0.8747 100.59
 314137 6FREDBRG    230.00  345 0.8475 194.93    314138 6MINE RD    230.00  345 0.8584 197.43
 314139 6OAKGROV    230.00  345 0.3927 90.315    314142 6STAFORD    230.00  345 0.8979 206.51
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314145	6AQUI_HARB_B	230.00	345	0.9001	207.02	314149	3STJOHND	115.00	345	0.8926	102.65
314150	6STJOHN	230.00	345	0.9046	208.06	314151	3SLABTWN	115.00	345	0.8701	100.06
314152	3S JOHNS	115.00	345	0.8836	101.61	314153	3WOODPCK	115.00	345	0.8788	101.07
314154	3STJOHNS	115.00	345	0.8934	102.75	314163	6FINES	230.00	345	0.7783	179.00
314172	6DUNNSVL	230.00	345	0.2004	46.089	314173	3GARNER	115.00	345	0.1122	12.904
314174	3HARMONY	115.00	345	0.0471	5.418	314175	6COMORN	230.00	345	0.6484	149.13
314176	6HARMONY	230.00	345	0.0633	14.569	314177	3HAYES89	115.00	345	0.0777	8.930
314178	3LANCAST	115.00	345	0.0555	6.383	314180	6HAYES	230.00	345	0.0938	21.580
314181	3NORNECK	115.00	345	0.2037	23.426	314182	6NORNECK	230.00	345	0.2445	56.230
314183	6SANDERS	230.00	345	0.2714	62.415	314184	3SHACKLE	115.00	345	0.0534	6.141
314187	3WAN 176	115.00	345	0.0113	1.297	314188	3WEST PT	115.00	345	0.0549	6.314
314189	6PAPERMILL	230.00	345	0.0795	18.284	314190	6WESTMOR	230.00	345	0.3183	73.201
314191	3WHITE S	115.00	345	0.0499	5.735	314203	6MACKEYS	230.00	345	0.7420	170.65
314205	3HEARTS	115.00	345	0.8985	103.33	314206	3OAKRIDG	115.00	345	0.6734	77.438
314211	3ACCA	115.00	345	0.8685	99.883	314212	6FRRIVER	230.00	345	0.9031	207.72
314213	3CARVER	115.00	345	0.8645	99.417	314214	6CHCKAHM	230.00	345	0.8801	202.42
314215	6BEARISL	230.00	345	0.9031	207.71	314216	3DOSWELL	115.00	345	0.8989	103.37
314217	3ELMONT	115.00	345	0.8951	102.94	314218	6ELMONT	230.00	345	0.8883	204.30
314219	3GREENWD	115.00	345	0.8801	101.21	314220	3FRRIVER	115.00	345	0.9089	104.53
314221	3HANOVER	115.00	345	0.9027	103.81	314222	6HANOVER	230.00	345	0.8929	205.36
314223	3KINGS D	115.00	345	0.9036	103.91	314224	3LAKESD1	115.00	345	0.8769	100.84
314225	6CHARCTY	230.00	345	0.8689	199.85	314226	3LAKESD2	115.00	345	0.8781	100.98
314227	6LAKESD	230.00	345	0.8740	201.01	314228	6MESSER	230.00	345	0.8673	199.47
314229	6MT R221	230.00	345	0.8827	203.03	314233	6N POLE	230.00	345	0.8928	205.34
314234	3NRTHEST	115.00	345	0.8777	100.93	314236	6NRTHEST	230.00	345	0.8812	202.67
314237	3NRTHWST	115.00	345	0.8833	101.58	314238	6NRTHWST	230.00	345	0.8797	202.34
314239	6OILVILL	230.00	345	0.8892	204.52	314241	6OLDCHRC	230.00	345	0.8826	203.00
314242	6PEARSON	230.00	345	0.8854	203.65	314243	3PROV 92	115.00	345	0.8735	100.45
314245	6SOUTHWEST_1	230.00	345	0.8781	201.97	314246	3RF&P 60	115.00	345	0.8725	100.33
314247	3RIVER86	115.00	345	0.8765	100.80	314248	6RIVR222	230.00	345	0.8755	201.36
314249	3SHOCKOE	115.00	345	0.8599	98.886	314250	6ROCKVILLE	230.00	345	0.8854	203.65
314251	6S PUMP	230.00	345	0.8828	203.05	314252	3TURNR92	115.00	345	0.8717	100.25
314253	6TURNER	230.00	345	0.8818	202.82	314254	3TWELFTH	115.00	345	0.8697	100.01
314256	3WECO 7	115.00	345	0.8652	99.496	314257	6WHITOAK	230.00	345	0.8806	202.53
314258	6ELKO	230.00	345	0.8805	202.51	314259	3CAR56_1	115.00	345	0.8769	100.84
314260	6VARINIA	230.00	345	0.8835	203.20	314261	3OAKRI_1	115.00	345	0.6737	77.477
314262	3NEWBO_1	115.00	345	0.8411	96.727	314263	6TYLER1	230.00	345	0.8661	199.19
314265	3FIVEFORKSDP	115.00	345	0.9047	104.04	314266	6NORTHAMPTON	230.00	345	0.8557	196.81
314269	6PGDP	230.00	345	0.8028	184.65	314270	1GOSPORT	34.500	345	0.6948	23.972
314271	6ALLIED	230.00	345	0.8713	200.40	314272	6ALPINE	230.00	345	0.8716	200.47
314273	3BAKRS P	115.00	345	0.8389	96.474	314274	3BASIN	115.00	345	0.8733	100.43
314275	6BELMEAD	230.00	345	0.8854	203.65	314276	6BASIN	230.00	345	0.8845	203.43
314277	3BELLW72	115.00	345	0.8759	100.73	314278	6BERMUDA	230.00	345	0.8264	190.07
314279	3BBOVERI	115.00	345	0.8764	100.79	314280	3NEWBOHE	115.00	345	0.8406	96.664
314281	6BURDET	230.00	345	0.8710	200.32	314282	6CARSON	230.00	345	0.8798	202.34
314283	3CENTLIA	115.00	345	0.8759	100.73	314284	3CHSTFLD	115.00	345	0.8788	101.06
314285	6CHRL249	230.00	345	0.8757	201.42	314286	6CHSTF A	230.00	345	0.8687	199.81
314287	6CHSTF B	230.00	345	0.8653	199.03	314288	6COGTXPT	230.00	345	0.8768	201.65
314289	6DARBYTN	230.00	345	0.8837	203.26	314291	3DEFEN97	115.00	345	0.8390	96.485
314292	3DISPUTN	115.00	345	0.8321	95.689	314293	3DU PONT	115.00	345	0.8672	99.728
314294	6ENON	230.00	345	0.8705	200.21	314295	6BIRDNECK	230.00	345	0.6731	154.80
314296	6PENNIMAN	230.00	345	0.0853	19.617	314297	3F LEE97	115.00	345	0.8385	96.422
314298	3HARROWG	115.00	345	0.8634	99.292	314299	6HARROWG	230.00	345	0.8681	199.66
314300	3KEVLAR	115.00	345	0.8672	99.723	314301	6HARR205	230.00	345	0.8676	199.54
314302	3HARVELL	115.00	345	0.8511	97.876	314303	6HOPEWLL	230.00	345	0.8007	184.15
314304	6HGNT222	230.00	345	0.8755	201.36	314306	6HULL219	230.00	345	0.8790	202.17
314307	6HULL282	230.00	345	0.8964	206.17	314308	6ICI	230.00	345	0.8721	200.58
314309	6IRON208	230.00	345	0.8707	200.25	314311	6IRON282	230.00	345	0.8938	205.58
314312	3JARRATT	115.00	345	0.8675	99.761	314313	3KINGSLN	115.00	345	0.8772	100.88
314314	3LOCKS	115.00	345	0.8570	98.556	314316	6LOCKS	230.00	345	0.8705	200.22
314317	3MANCHST	115.00	345	0.8745	100.57	314318	3MARLBRO	115.00	345	0.8691	99.948

314319	3MAURY24	115.00	345	0.8744	100.55	314320	3S27T67A	115.00	345	0.6258	71.972
314321	3S27T67B	115.00	345	0.6221	71.543	314322	6MDLTHAN	230.00	345	0.9025	207.58
314323	3NC GAS	115.00	345	0.8762	100.76	314324	3PIPELIN	115.00	345	0.8715	100.22
314325	3PURDYSW	115.00	345	0.8686	99.894	314327	3PLAZA	115.00	345	0.8774	100.90
314328	6PLAZA	230.00	345	0.8736	200.92	314329	3POE	115.00	345	0.8411	96.725
314331	6POE	230.00	345	0.8705	200.21	314332	3PORTR24	115.00	345	0.8745	100.57
314334	3REAMS D	115.00	345	0.8462	97.311	314336	3REYMT72	115.00	345	0.8774	100.90
314337	3 69T148	115.00	345	0.8467	97.373	314338	6SOUWEST	230.00	345	0.8755	201.36
314339	6SPRUNCE	230.00	345	0.8896	204.61	314340	3SISISKY	115.00	345	0.8419	96.823
314341	3STRATFD	115.00	345	0.8716	100.24	314342	3TEMPLE	115.00	345	0.8445	97.118
314343	6TRABUE	230.00	345	0.8950	205.86	314344	3TYLER	115.00	345	0.8724	100.32
314346	6TYLER	230.00	345	0.8658	199.13	314347	3WAKEFLD	115.00	345	0.8229	94.631
314349	3WALTHAL	115.00	345	0.8660	99.595	314350	3WVLY DP	115.00	345	0.8275	95.167
314351	3WAVERLY	115.00	345	0.8267	95.070	314352	6WINTERP	230.00	345	0.8838	203.28
314368	3FREDB_1	115.00	345	0.8752	100.64	314371	3AMOCO Y	115.00	345	0.0809	9.304
314372	3BLOXOMC	115.00	345	0.0898	10.329	314373	3COLONY	115.00	345	0.0770	8.858
314374	3COPELND	115.00	345	0.1051	12.089	314375	6CORRCTN	230.00	345	0.0834	19.176
314376	6DENBIGH	230.00	345	0.0835	19.204	314377	3DOW 34	115.00	345	0.0641	7.369
314378	3FTEUS34	115.00	345	0.0660	7.591	314379	3FTEUS58	115.00	345	0.0612	7.041
314380	6FREDB_1	230.00	345	0.8501	195.51	314381	3GRAFT34	115.00	345	0.0718	8.258
314382	3GRAFT58	115.00	345	0.0696	8.001	314384	3KINGS M	115.00	345	0.0077	0.883
314385	3HARMO_1	115.00	345	0.0471	5.421	314386	6KINGS M	230.00	345	0.0867	19.944
314387	3LANEXA	115.00	345	0.0657	7.553	314388	6LANEXA	230.00	345	0.0887	20.402
314389	3LEBAN58	115.00	345	0.0582	6.696	314390	6LIGH285	230.00	345	0.0652	14.991
314391	6LIGH209	230.00	345	0.0831	19.104	314392	3MAGRUDR	115.00	345	0.1040	11.958
314393	3MERCURY	115.00	345	0.1006	11.564	314394	3NASA	115.00	345	0.1025	11.788
314395	3HARMO_2	115.00	345	0.0471	5.421	314396	3NNEWS58	115.00	345	0.0415	4.767
314397	3NNEWS75	115.00	345	0.1051	12.089	314398	6NP NEWS	230.00	345	0.2325	53.479
314399	6PEMBROK	230.00	345	0.2003	46.058	314400	3LANCA_1	115.00	345	0.0555	6.386
314401	3PENINSL	115.00	345	0.1025	11.787	314402	6PENINSL	230.00	345	0.1325	30.467
314403	3SEAFD76	115.00	345	0.0847	9.737	314404	3SEAFD79	115.00	345	0.0839	9.652
314405	3HANOV_1	115.00	345	0.9033	103.88	314406	3SHELBNK	115.00	345	0.1101	12.666
314407	6SHELBNK	230.00	345	0.1686	38.772	314408	6CHCKA_1	230.00	345	0.8828	203.03
314409	6TABB	230.00	345	0.1173	26.969	314410	6ELMON_1	230.00	345	0.8883	204.30
314411	3TOANO58	115.00	345	0.0383	4.410	314412	3U CARBD	115.00	345	0.1026	11.797
314413	6WALR285	230.00	345	0.0665	15.287	314414	3WARWICK	115.00	345	0.0871	10.016
314415	6WALR209	230.00	345	0.0826	19.006	314416	6WARWICK	230.00	345	0.1148	26.394
314417	3WHEALTN	115.00	345	0.1067	12.275	314418	6WHEALTN	230.00	345	0.1295	29.795
314419	6NRTHW_1	230.00	345	0.8824	202.95	314420	3PENIN_1	115.00	345	0.1025	11.793
314421	6WINCHST	230.00	345	0.1309	30.118	314422	3YORKTWN	115.00	345	0.0811	9.322
314423	6YORKTWN	230.00	345	0.0964	22.183	314424	3YNWS 58	115.00	345	0.0578	6.646
314425	3YORK PS	115.00	345	0.0813	9.353	314435	6SAPONY	230.00	345	0.8808	202.59
314436	3ALEX CR	115.00	345	0.6202	71.325	314437	3AMPHB67	115.00	345	0.6206	71.372
314438	3STORE	115.00	345	0.6299	72.444	314439	3BAYSIDE	115.00	345	0.6222	71.555
314440	6LANEX_1	230.00	345	0.0889	20.442	314441	3BERKL51	115.00	345	0.6351	73.041
314442	6NP NE_1	230.00	345	0.2330	53.586	314443	3BOWERS	115.00	345	0.6223	71.561
314444	6BOWERS	230.00	345	0.6665	153.29	314445	6WHEAL_1	230.00	345	0.1298	29.854
314447	3BURTN67	115.00	345	0.6258	71.972	314448	3CHESAPK	115.00	345	0.6336	72.863
314449	6CHESAPK	230.00	345	0.6756	155.40	314450	6YORKT_1	230.00	345	0.0968	22.253
314451	3CHESPTX	115.00	345	0.6341	72.925	314452	3CHRHLND	115.00	345	0.6265	72.043
314453	6CHRHLND	230.00	345	0.6340	145.82	314454	3POE_1	115.00	345	0.8417	96.790
314455	6CARSO_1	230.00	345	0.8824	202.96	314456	3CMN GAS	115.00	345	0.6334	72.835
314457	3CRADOCK	115.00	345	0.6266	72.060	314458	3DAVIS67	115.00	345	0.6325	72.735
314459	3DAVIS27	115.00	345	0.6331	72.803	314460	6CHESPTX	230.00	345	0.6747	155.19
314461	3DEEPC46	115.00	345	0.6412	73.734	314462	3DEEPC87	115.00	345	0.6297	72.411
314463	3DOZIER	115.00	345	0.6250	71.872	314464	6DOZIER	230.00	345	0.6787	156.10
314465	6ELIZ R	230.00	345	0.6809	156.61	314466	6FENTRES	230.00	345	0.6929	159.37
314467	6MDLTH_1	230.00	345	0.9053	208.21	314468	3GREATBR	115.00	345	0.6682	76.843
314469	3GOSPORT	115.00	345	0.6362	73.161	314470	3GRASFLD	115.00	345	0.6224	71.570
314471	3GREAT B	115.00	345	0.6123	70.409	314472	6GRN RUN	230.00	345	0.6701	154.11
314473	3GRENWCH	115.00	345	0.6349	73.011	314474	6GRENWCH	230.00	345	0.6698	154.05

314475	6HARBORV	230.00	345	0.6512	149.77	314476	3HICKORY	115.00	345	0.6681	76.837
314477	3HODGE F	115.00	345	0.6194	71.236	314478	3IND PRK	115.00	345	0.6247	71.838
314479	3LANDSTN	115.00	345	0.6476	74.473	314480	6HUNTSMN	230.00	345	0.6791	156.20
314481	6LANDSTN	230.00	345	0.6781	155.96	314482	3LONDONB	115.00	345	0.6400	73.595
314483	3LONGC27	115.00	345	0.6238	71.739	314484	6HARBORV226	230.00	345	0.6260	143.98
314485	6LK KING	230.00	345	0.6346	145.97	314486	6LYNHAVN	230.00	345	0.6735	154.91
314487	3MCLAUGH	115.00	345	0.6271	72.112	314488	3OAKWOOD	115.00	345	0.6182	71.098
314490	6VA BCH	230.00	345	0.6720	154.56	314491	3PENDLTN	115.00	345	0.6373	73.286
314492	3P ANNE	115.00	345	0.6456	74.238	314493	3REEVES	115.00	345	0.6336	72.859
314494	6REEVES	230.00	345	0.6697	154.04	314495	6RURITAN	230.00	345	0.6717	154.50
314496	3SEWLSPT	115.00	345	0.6283	72.256	314497	6SEWLSPT	230.00	345	0.6297	144.84
314498	3SHEA	115.00	345	0.6149	70.713	314499	6SNORFLK	230.00	345	0.6725	154.68
314500	6NAVYS	230.00	345	0.6297	144.82	314501	6NAVYS1	230.00	345	0.6296	144.81
314502	6STUMPY	230.00	345	0.6775	155.81	314503	3TAUSSIG	115.00	345	0.6217	71.493
314504	6THALIA	230.00	345	0.6701	154.12	314505	6NAVYN	230.00	345	0.6297	144.83
314506	3THOLE S	115.00	345	0.6225	71.584	314507	3THOMPSN	115.00	345	0.5991	68.891
314508	6THRS279	230.00	345	0.6784	156.04	314510	6NAVYN1	230.00	345	0.6294	144.75
314511	3VA BCH	115.00	345	0.6393	73.521	314512	6W LAND	230.00	345	0.6782	155.98
314513	3YADKIN	115.00	345	0.6432	73.972	314514	6YADKIN	230.00	345	0.6817	156.79
314516	3BRUNS_1	115.00	345	0.8949	102.92	314522	6CHCKTUK	230.00	345	0.4987	114.70
314523	6CRITTDN	230.00	345	0.6077	139.77	314524	3FRNKLN	115.00	345	0.7666	88.157
314525	6KINGSFO	230.00	345	0.5967	137.25	314526	3HANDSOM	115.00	345	0.7837	90.131
314527	3HOLLAND	115.00	345	0.7179	82.560	314528	3IVOR106	115.00	345	0.6724	77.324
314529	3KINGS F	115.00	345	0.6722	77.307	314530	3GRENW_1	115.00	345	0.6355	73.086
314531	3MYRTLE	115.00	345	0.6641	76.373	314532	3OAKRI23	115.00	345	0.6734	77.438
314533	6SMITFLD	230.00	345	0.5991	137.80	314534	3S HAMPT	115.00	345	0.7780	89.466
314535	3SUFFCAP	115.00	345	0.6740	77.512	314536	3SUFFOLK	115.00	345	0.6740	77.512
314537	6SUFFOLK	230.00	345	0.6833	157.16	314538	6SURRY	230.00	345	0.5616	129.18
314539	3UNCAMP	115.00	345	0.7554	86.868	314540	6POOLSVL	230.00	345	0.4803	110.46
314541	3WATKINS	115.00	345	0.7758	89.222	314542	3WINDSOR	115.00	345	0.6617	76.098
314543	6GRAVELA	230.00	345	0.5618	129.22	314544	6GRAVELB	230.00	345	0.5619	129.23
314545	3TOT5	115.00	345	0.8735	100.45	314546	3 96T105	115.00	345	0.8403	96.636
314547	3TOT3	115.00	345	0.8730	100.39	314548	3TARRTP	115.00	345	0.8731	100.41
314549	3TOT1	115.00	345	0.8735	100.46	314550	6HICKORY	230.00	345	0.6895	158.58
314551	3AHOSKIE	115.00	345	0.7924	91.122	314552	3ALBMARL	115.00	345	0.8345	95.969
314553	3ANCONDA	115.00	345	0.8726	100.35	314554	3BTLEBRO	115.00	345	0.9079	104.41
314555	3TDP	115.00	345	0.8511	97.873	314556	3BENSON	115.00	345	0.9039	103.94
314557	3BETHELC	115.00	345	0.8403	96.633	314558	3BOYKINS	115.00	345	0.7975	91.715
314559	3CAROLNA	115.00	345	0.8774	100.90	314560	3CNETO	115.00	345	0.8412	96.737
314561	6CAROLNA	230.00	345	0.8685	199.76	314562	3CLUBHSE	115.00	345	0.8708	100.14
314563	6CLUBHSE	230.00	345	0.8837	203.24	314564	6EDGECOM	230.00	345	0.9010	207.24
314565	3CLBHS71	115.00	345	0.8708	100.14	314566	3CRESWEL	115.00	345	0.7288	83.813
314567	3DUNBR	115.00	345	0.8999	103.49	314568	3EARLEYS	115.00	345	0.7960	91.540
314569	6EARLEYS	230.00	345	0.7950	182.85	314570	3METCATP	115.00	345	0.8705	100.11
314571	3EATON F	115.00	345	0.8940	102.81	314572	3EMPORIA	115.00	345	0.8707	100.13
314573	3EVERETS	115.00	345	0.8402	96.624	314574	6EVERETS	230.00	345	0.8508	195.67
314575	6NUCO TP	230.00	345	0.7601	174.83	314576	3FIVE PT	115.00	345	0.7854	90.324
314577	3COX DP	115.00	345	0.8910	102.46	314578	3HORNRTN	115.00	345	0.8775	100.91
314579	6HORNRTN	230.00	345	0.8799	202.37	314580	3MAPLETN	115.00	345	0.7886	90.692
314581	3JACKSON	115.00	345	0.8343	95.941	314582	3KELFORD	115.00	345	0.7824	89.976
314583	6LAKEVEW	230.00	345	0.8728	200.74	314584	3LITTLTN	115.00	345	0.8933	102.73
314585	3L GASTN	115.00	345	0.8858	101.86	314586	3MACKEYS	115.00	345	0.7379	84.855
314587	3MARGTSV	115.00	345	0.8239	94.747	314588	3METCALF	115.00	345	0.8687	99.898
314589	3MURPHYS	115.00	345	0.7885	90.676	314590	6NUCOR	230.00	345	0.7597	174.74
314591	6NASH	230.00	345	0.9045	208.03	314592	3PANTEGO	115.00	345	0.7695	88.494
314593	3PARMELE	115.00	345	0.8304	95.492	314594	6PLYMOTH	230.00	345	0.7583	174.41
314595	3PL HILL	115.00	345	0.8731	100.41	314596	3POPLR C	115.00	345	0.8026	92.294
314597	3RIDERS	115.00	345	0.7280	83.718	314598	3ROAN DP	115.00	345	0.8787	101.05
314599	6ROA VAL	230.00	345	0.8624	198.35	314600	3PLHITP	115.00	345	0.8732	100.42
314601	3ROBRSNV	115.00	345	0.8316	95.632	314602	3SAMS HD	115.00	345	0.7798	89.681
314603	3SCOT NK	115.00	345	0.7792	89.610	314604	3SEABORD	115.00	345	0.8374	96.304

314605	6ROSEMRY	230.00	345	0.8811	202.65	314606	3TAR TX4	115.00	345	0.8516	97.939
314607	3TAR RVR	115.00	345	0.8730	100.40	314608	3TARBORO	115.00	345	0.8741	100.52
314609	6TARBORO	230.00	345	0.8800	202.41	314610	6TOTDP4	230.00	345	0.8826	202.99
314611	6THELMA	230.00	345	0.8746	201.15	314612	3TREGO	115.00	345	0.8712	100.19
314613	3TRWBRDG	115.00	345	0.7784	89.511	314614	3TROWBR2	115.00	345	0.7805	89.758
314615	3TREGOTP	115.00	345	0.8716	100.24	314616	6TRWBRDG	230.00	345	0.7612	175.09
314617	3TUNIS	115.00	345	0.7915	91.027	314618	3VOA TAP	115.00	345	0.8201	94.316
314619	3BRINKDP	115.00	345	0.8702	100.08	314620	6CASHIE	230.00	345	0.7747	178.18
314621	3WEYERH	115.00	345	0.7793	89.625	314622	3WHARTON	115.00	345	0.8204	94.344
314623	3WITAKRS	115.00	345	0.8980	103.27	314624	3WILSNDP	115.00	345	0.8328	95.772
314625	3AULANDR	115.00	345	0.7986	91.841	314626	3WOODLND	115.00	345	0.8114	93.317
314627	1ROSEMRY	13.800	345	0.8790	12.130	314628	3HALF DP	115.00	345	0.8811	101.32
314629	3MARTNCO	115.00	345	0.8305	95.508	314630	3REEVE_1	115.00	345	0.6342	72.933
314631	3THOLE_1	115.00	345	0.6228	71.618	314632	6AYDLETOLD	230.00	345	0.6827	157.03
314633	6POINTHB	230.00	345	0.6727	154.73	314634	3COLNGTN	115.00	345	0.7206	82.869
314635	3COLNGTP	115.00	345	0.6847	78.742	314636	3COLING2	115.00	345	0.6880	79.117
314637	6EDENTON	230.00	345	0.7197	165.53	314638	6ELIZ CT	230.00	345	0.6832	157.13
314639	6TANGLEW	230.00	345	0.6858	157.73	314640	6KITY H1	230.00	345	0.6687	153.81
314641	3KITTY H	115.00	345	0.7030	80.844	314642	3NAGS HD	115.00	345	0.6658	76.572
314643	3O INLET	115.00	345	0.6547	75.287	314644	6KITY H2	230.00	345	0.6687	153.81
314645	6SLIGO	230.00	345	0.6830	157.09	314646	1KITTY 4	34.500	345	0.7030	24.253
314647	6SHAWBRO	230.00	345	0.6826	156.99	314648	6SUNBURY	230.00	345	0.6859	157.76
314650	1KITTY 5	34.500	345	0.7042	24.296	314651	6WINFALL	230.00	345	0.6940	159.62
314652	3VA BC_1	115.00	345	0.6403	73.633	314653	6CHRHL_1	230.00	345	0.6353	146.11
314654	6FENTR_1	230.00	345	0.6950	159.85	314655	6FENTR_2	230.00	345	0.6950	159.85
314656	6GRENW_1	230.00	345	0.6718	154.52	314657	6LANDS_1	230.00	345	0.6801	156.43
314658	6LYNHA_1	230.00	345	0.6756	155.38	314659	6REEVE_1	230.00	345	0.6718	154.51
314660	6YADKI_1	230.00	345	0.6831	157.10	314661	3SUFFC_1	115.00	345	0.6744	77.552
314662	6S HERTFORD	230.00	345	0.7133	164.05	314675	3BRODNAX	115.00	345	0.8985	103.32
314676	3BRUNSWK	115.00	345	0.8945	102.87	314693	3FRMAN D	115.00	345	0.8795	101.14
314704	3LAWRENC	115.00	345	0.8891	102.25	314720	3 52T190	115.00	345	0.6658	76.572
314721	3SO HILL	115.00	345	0.9033	103.88	314783	1WEYRHBI	13.800	345	0.7422	10.243
314784	1WEYRHSB	13.800	345	0.7422	10.243	314785	2DANLTWN	69.000	345	0.8576	59.171
314786	2GASBURG	69.000	345	0.8930	61.615	314787	2BRUNSW2	69.000	345	0.8861	61.143
314823	3SUFFO_1	115.00	345	0.6744	77.552	314824	3UNCAM_1	115.00	345	0.7559	86.927
314826	3WATKI_1	115.00	345	0.7762	89.267	314827	3WATKI_2	115.00	345	0.7762	89.267
314828	6CHCKT_1	230.00	345	0.5002	115.05	314829	3COLIN_1	115.00	345	0.6883	79.155
314830	3COLNG_1	115.00	345	0.7210	82.911	314831	3MACKE_1	115.00	345	0.7384	84.913
314833	6SHAWB_1	230.00	345	0.6840	157.31	314834	3BTLEB_1	115.00	345	0.9085	104.48
314835	3CAROL_1	115.00	345	0.8778	100.95	314850	3CLBHS_1	115.00	345	0.8712	100.19
314862	3EARLE_1	115.00	345	0.7965	91.601	314863	3EMPOR_1	115.00	345	0.8711	100.18
314864	3EVERE_1	115.00	345	0.8408	96.689	314865	3TARBO_1	115.00	345	0.8745	100.57
314866	3TUNIS_1	115.00	345	0.7919	91.072	314867	3WHART_1	115.00	345	0.8208	94.390
314872	2BRUNSWICKDP	69.000	345	0.8712	60.111	314902	8CARSON	500.00	345	0.8928	446.39
314903	8CHCKAHM	500.00	345	0.8961	448.03	314909	8FENTRES	500.00	345	0.7368	368.39
314915	8FIVEFRK	500.00	345	0.8710	435.49	314923	8SEPTA	500.00	345	0.8205	410.24
314924	8SURRY	500.00	345	0.8233	411.67	314927	8YADKIN	500.00	345	0.7483	374.15
314928	8SULFOLK	500.00	345	0.7667	383.35	315033	1BRCHWDA	18.000	345	0.7215	12.988
315058	1CHESTF3	14.400	345	0.8861	12.759	315059	1CHESTF4	22.000	345	0.9024	19.853
315060	1CHESTF5	22.000	345	0.8818	19.400	315061	1CHESTG7	13.800	345	0.9094	12.550
315062	1CHESTS7	13.800	345	0.9063	12.507	315065	1CHESTF6	24.000	345	0.8896	21.349
315073	1STONECA	13.200	345	0.8445	11.148	315074	1HOPCGN1	13.800	345	0.8136	11.228
315075	1HOPCGN2	13.800	345	0.8136	11.228	315076	1HOPPOLC	13.800	345	0.8315	11.475
315077	1HOPHCF1	13.800	345	0.8249	11.384	315078	1HOPHCF2	13.800	345	0.8249	11.384
315079	1HOPHCF3	13.800	345	0.8249	11.384	315080	1HOPHCF4	13.800	345	0.8319	11.481
315084	1SPRUNCB	13.800	345	0.8477	11.698	315086	1SPRUNCD	13.800	345	0.8500	11.730
315091	1YORKTN2	18.000	345	0.0811	1.459	315092	1YORKTN3	25.000	345	0.0964	2.411
315108	1ELIZAR1	13.800	345	0.7229	9.976	315109	1ELIZAR2	13.800	345	0.7079	9.769
315110	1ELIZAR3	13.800	345	0.7110	9.811	315111	1LKKINGA	13.800	345	0.6402	8.834
315112	1LKKINGB	13.800	345	0.6402	8.834	315115	1SHAMPT1	13.800	345	0.7995	11.033
315116	1SURRY 1	22.000	345	0.5779	12.713	315119	1GRAVEL3	13.800	345	0.5886	8.123

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315120 1GRAVEL4    13.800  345 0.5888  8.125    315121 1GRAVEL5    13.800  345 0.5887  8.125
315122 1GRAVEL6    13.800  345 0.5911  8.157    315126 1ROARAP2    14.400  345 0.9075 13.068
315128 1ROARAP4    14.400  345 0.9079 13.073    315134 1ROAVALA    13.800  345 0.9061 12.504
315135 1ROAVALB    13.800  345 0.8946 12.346    315136 1ROSEMG1    13.800  345 0.8985 12.400
315137 1ROSEMS1    13.800  345 0.9092 12.546    315138 1ROSEMG2    13.800  345 0.9033 12.465
315139 1GASTONA    14.400  345 0.8917 12.840    315141 1GASTONB    14.400  345 0.8916 12.840
315146 1KITYHKA    13.800  345 0.7030  9.701    315147 1KITYHKB    13.800  345 0.7043  9.720
315184 1GI-102A    26.000  345 0.8874 23.074    315233 1SURRY 2    22.000  345 0.8099 17.817
315260 1GOSPRTA    13.800  345 0.7727 10.663    315261 1GOSPRTB    13.800  345 0.7619 10.514
315262 1GOSPRTC    13.800  345 0.7618 10.513    315292 1DOMTR78    13.800  345 0.7422 10.243
315293 1DOMTR9     13.800  345 0.7422 10.243    315294 1DOMTR10    13.800  345 0.7422 10.243

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Attachment I.B.23 – Summary of NERC Reliability Criteria Violations

	Contingency Event	Electrical Result	NERC Reliability Criteria Violation	Violations First Occur
1	Critical System Condition & Outage of Line #2102 (Chickahominy to Waller)	Overload of Line #2113	Category B	2015 Summer
2	Critical System Condition & Outage of Line #214 (Surry to Winchester)	Overload of Line #263	Category B	2015 Summer
3	Critical System Condition & Outage Of Line #263 (Chuckatuck to Newport News)	Overload of Line #214	Category B	2015 Summer
4	James River Crossing Tower Line #214 &#263	Overload of Line #209, #285, #288, #292, #2102, #2113; degraded voltage condition North Hampton Roads	Category C5	2015 Summer
5	Chickahominy – Lanexa ROW Line #92, #2024, #2102, #2129	Overload of Line #211, #228,#214, #263 & 2083; degraded voltage condition North Hampton Roads; loss of Generation at Chesterfield Surry and North Anna Power Stations	Category D	2015 Summer

I. NECESSITY FOR THE PROPOSED PROJECT

C. Describe the feasible alternatives, if any, for meeting the identified need without constructing the proposed project. Explain why these alternatives were rejected.

Response: 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.

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. See Attachment I.C.1 for a table comparing 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 Attachment I.C.2, and TEAC White Paper contained in Attachment I.C.3 to this Appendix, 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 Plan process, the Company considered, but rejected, feasible generation alternatives in favor of the proposed Project as explained below.

Transmission Alternatives to 500 kV Skiffes Line:

1) Construct a Surry-Skiffes Creek Double Circuit 230 kV Line.

This alternative would construct an approximately 7.4-mile long double circuit 230 kV tower line from Surry 230 kV Switching Substation 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.

2) Construct a Chickahominy-Skiffes Creek Double Circuit 230 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.

3) Construct 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.

4) Construct an Underground Surry-Skiffes Creek 500 kV Line or Double Circuit 230 kV Line.

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,[5] the estimated cost of the project, if this alternative were included, would be approximately $382.6 million for a hybrid line underground from

[5] 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.

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.

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.

PJM TEAC Evaluation of Transmission Alternatives:[6]

5) 500 kV Line: Chickahominy-Skiffes Creek vs Surry-Skiffes Creek

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.

6) Surry 230 Partial Alternative

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 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.

7) 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.

[6] 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.

Generation Alternatives to Proposed Project:

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.

Attachment I.C.1

COMPARISON OF TRANSMISSION OPTIONS TO SKIFFES CREEK

	Resolves NERC Reliability Deficiencies in 2015 and 2016	Resolves NERC Reliability Deficiencies in 2021	Total Project Cost
Surry 500 kV	Yes	Yes	$150.6 M
Chickahominy Alternative Route 500 KV	Yes	Yes	$213.2 M
Surry 230 kV I.C (1)	No	No	$131.6 M
Chickahominy 230 kV I.C (2)	Yes	No	$191 M
Lanexa ROW I.C (3)	No	No	$255.7 M
Surry 230kV UG I.C (4)	No	No	$382.6 M (Hybrid) $462.6 M (All UG)
Surry 500kV UG I.C (4)	N/A See I.C (4)	N/A See I.C (4)	N/A See I.C (4)
Surry 230 kV Partial I.C (6)	No	No	$165 M
Great Bridge & Surry 230 kV I.C (7)	No	No	$165 M plus

Issues Tracking

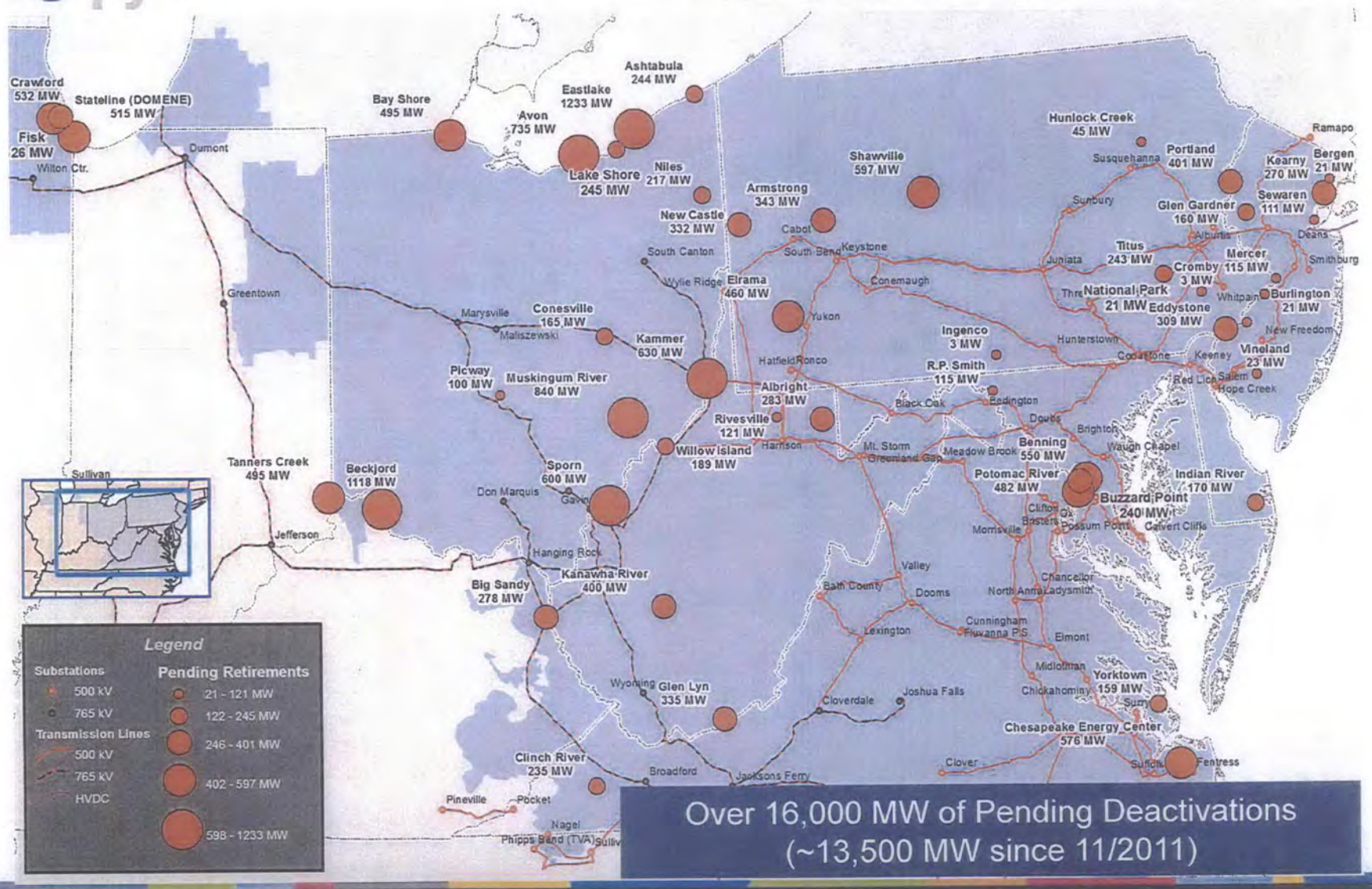
Issues Tracking

- Open Issues
  - None

- New Issues

Generation Deactivation Notification (Retirements) Update

All Pending Generator Deactivations



Over 16,000 MW of Pending Deactivations
(~13,500 MW since 11/2011)

Deactivation Status

Unit	Trans Zone	Requested Deactivation Date	PJM Reliability Status
Chesapeake 1 & 2, Yorktown 1	DOM	12/31/2014	Reliability Analysis complete. Impacts identified. Upgrades expected to be completed by June 2015.
Chesapeake 3 & 4	DOM	12/31/2015	Reliability Analysis complete. Impacts identified. Upgrades expected to be completed by June 2016.
Bergen 3; Burlington 8; National Park 1; Mercer 3; Sewaren 6	PSEG	6/1/2015	Reliability Analysis Complete. Impacts identified and expected to be resolved in three - four years. Working with affected TO to finalize upgrade schedule.
Armstrong 1 & 2; Ashtabula 5; Bayshore 2-4; Eastlake 1-5; Lake Shore 18; R Paul Smith 3 & 4;	AP	9/1/2012	Reliability analysis complete. Impacts identified and expected to be resolved by June 2016. Further refinement of the reliability analysis, required upgrades, and generator deactivation schedule continues.
Walter C Beckjord 1	DEOK	5/1/2012	Reliability Analysis complete - no impacts identified.
Walter C Beckjord 2-6	DEOK	4/1/2015	Reliability Analysis complete - impacts identified - upgrades scheduled to be completed by June 2014
Albright 1-3; Rivesville 5 & 6; Willow Island 1 & 2	APS	9/1/2012	Reliability Analysis complete - impacts identified - upgrades scheduled to be completed by May 2013
New Castle 3-5; New Castle Diesels A & B	ATSI	4/16/2015	Reliability Analysis complete - impacts identified - upgrades scheduled to be completed by June 2015

Deactivation Status

Unit	Trans Zone	Requested Deactivation Date	PJM Reliability Status
Portland 1 & 2; Glen Gardner CT 1-8	MetEd	1/7/2015	Reliability Analysis complete - impacts identified - upgrades scheduled to be completed by June 2016
Elrama 1-4	DUQ	6/1/2012	Reliability Analysis complete - impacts identified - upgrades scheduled to be completed by June 2014
Shawville 1-4; Titus 1-3	PenElec	4/16/2015	Reliability Analysis complete - impacts identified - upgrades scheduled to be completed by June 2016
Niles 1 & 2	ATSI	6/1/2012	Reliability Analysis complete - impacts identified - upgrades scheduled to be completed by June 2014
Fisk Street 19, Crawford 7 & 8	ComEd	12/31/2012	Reliability Analysis Complete. No impacts identified.
Conesville 3	AEP	12/31/2012	Reliability Analysis Underway
Big Sandy 1; Clinch River 3; Glen Lyn 5 & 6; Kammer 1-3; Kanawha River 1 & 2; Muskingum River 1-4; Pickway 5; Sporn 1-4; Tanner Creek 1-3	AEP	6/1/2015	Reliability Analysis Underway

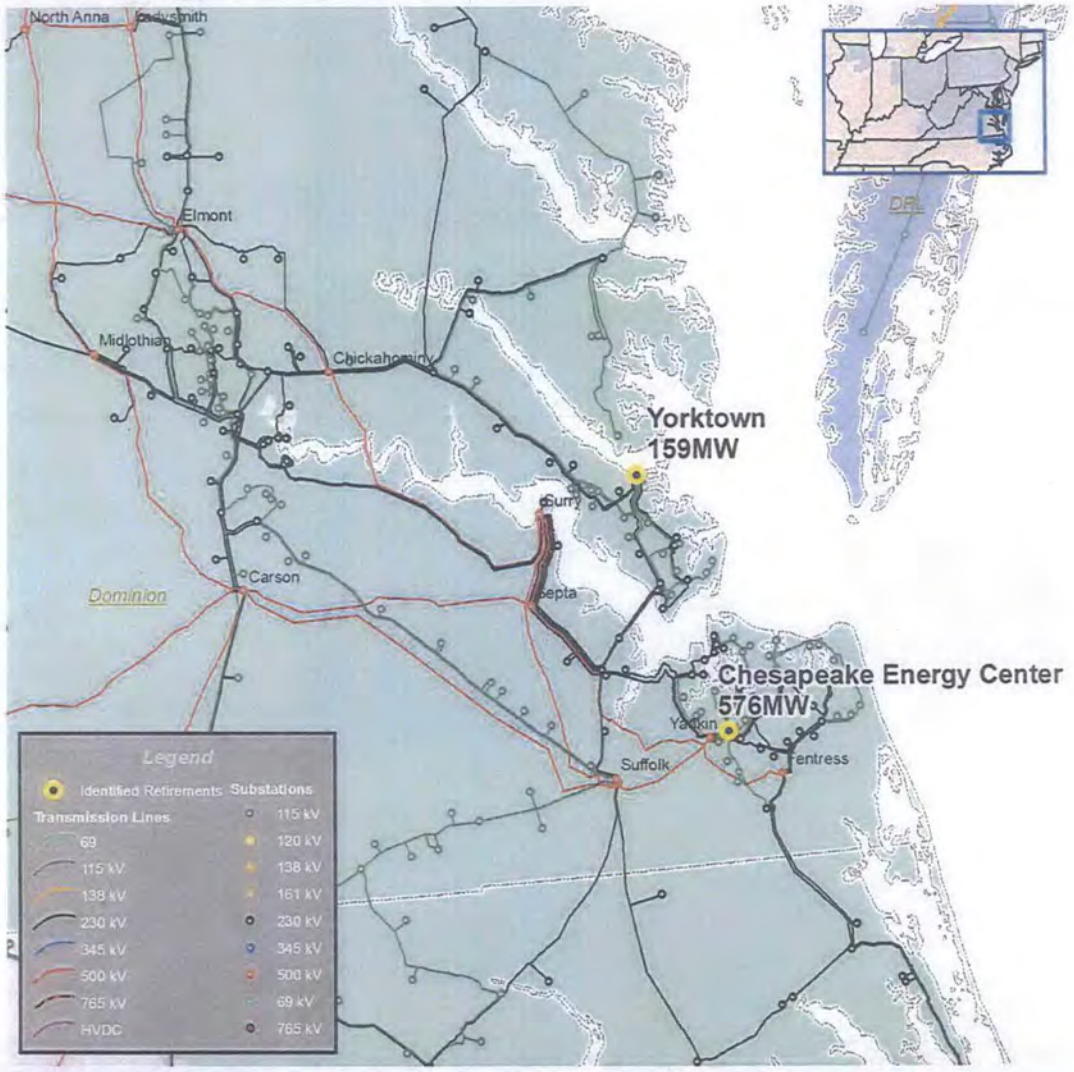
Deactivation Status

Unit	Trans Zone	Requested Deactivation Date	PJM Reliability Status
Avon Lake 7 & 9	ATSI	4/16/2015	Reliability Analysis Underway
Sewaren 1-4	PSEG	6/1/2015	Reliability Analysis Underway. PSEG also contemplating re-use of Capacity Rights for a new generation project
Cedar 1 & 2; Deepwater 1 & 6; Missouri Ave CT B, C & D	AE	5/31/2015	Reliability Analysis Underway

Chesapeake #1-4 & Yorktown #1 Deactivation

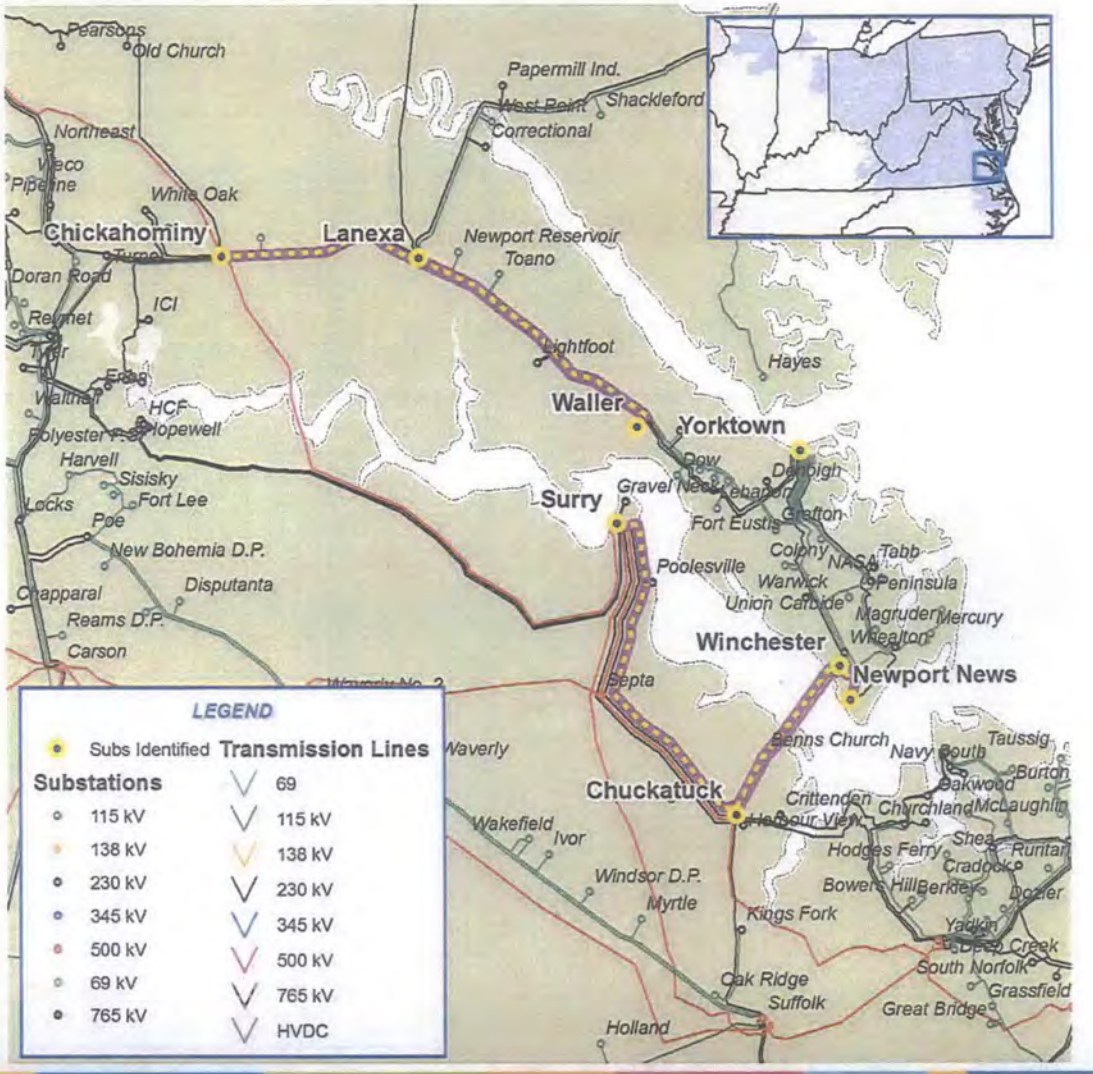
Chesapeake and Yorktown Deactivation Notifications

- Deactivation Notifications:
  - Chesapeake Units 1-2 & Yorktown 1
    - 381 MW
    - Requested Retirement Date: December 31, 2014
  - Chesapeake 3&4
    - 354 MW
    - Requested Retirement Date: December 31, 2015



Dominion Transmission Zone
James River Crossing Alternatives

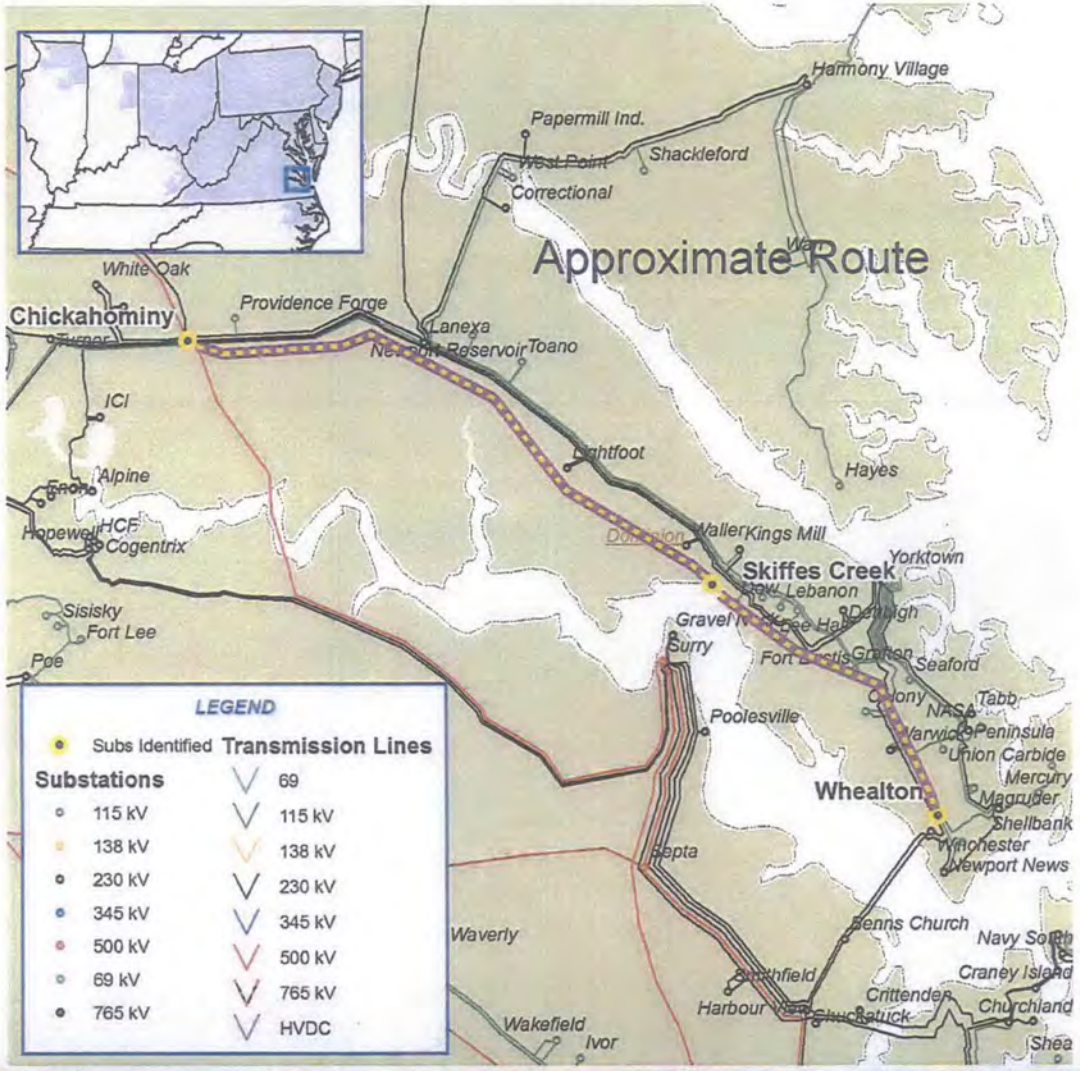
- Dominion Criteria – critical system conditions of Yorktown #3 outage
- N-1 Thermal Overloads (All conductor limits)
  - Chuckatuck – Newport News 230 kV is overloaded for the loss of Surry – Winchester 230 kV
  - Surry - Winchester 230 kV is overloaded for the loss of Chuckatuck – Newport News 230 kV
  - Lanexa – Waller 230 kV is overloaded for the loss of Chickahominy – Waller 230 kV
- James River Crossing Double Circuit Towerline overloads (All conductor limits)
  - Chickahominy – Waller 230 kV, Lanexa – Waller 230 kV, and Yorktown – Whealton 230 kV
- Also, voltage collapse for the James River Crossing Double Circuit Towerline outage
- Several solution alternatives evaluated



Chickahominy 500 kV Alternative

- Dominion Proposed Solution
- Chickahominy to Skiffes Creek 500 kV Line $116 M
  - (38 miles total, already Dominion owned)
- Chickahominy 500 kV Station 500 kV Breakers $4.6 M
- Skiffes Creek 500-230 kV Tx and Switching Station $42.4 M
- New Skiffes Creek - Whealton 230 kV Line $46.4 M
- Whealton 230 kV Breakers $2.1 M
- Yorktown 230 kV Work $0.2 M
- Lanexa 115 kV Work $0.13M
- Surry 230 kV Work $0.13 M
- Kings Mill, Peninmen, Toano, Waller, Warwick $ 0.03 M

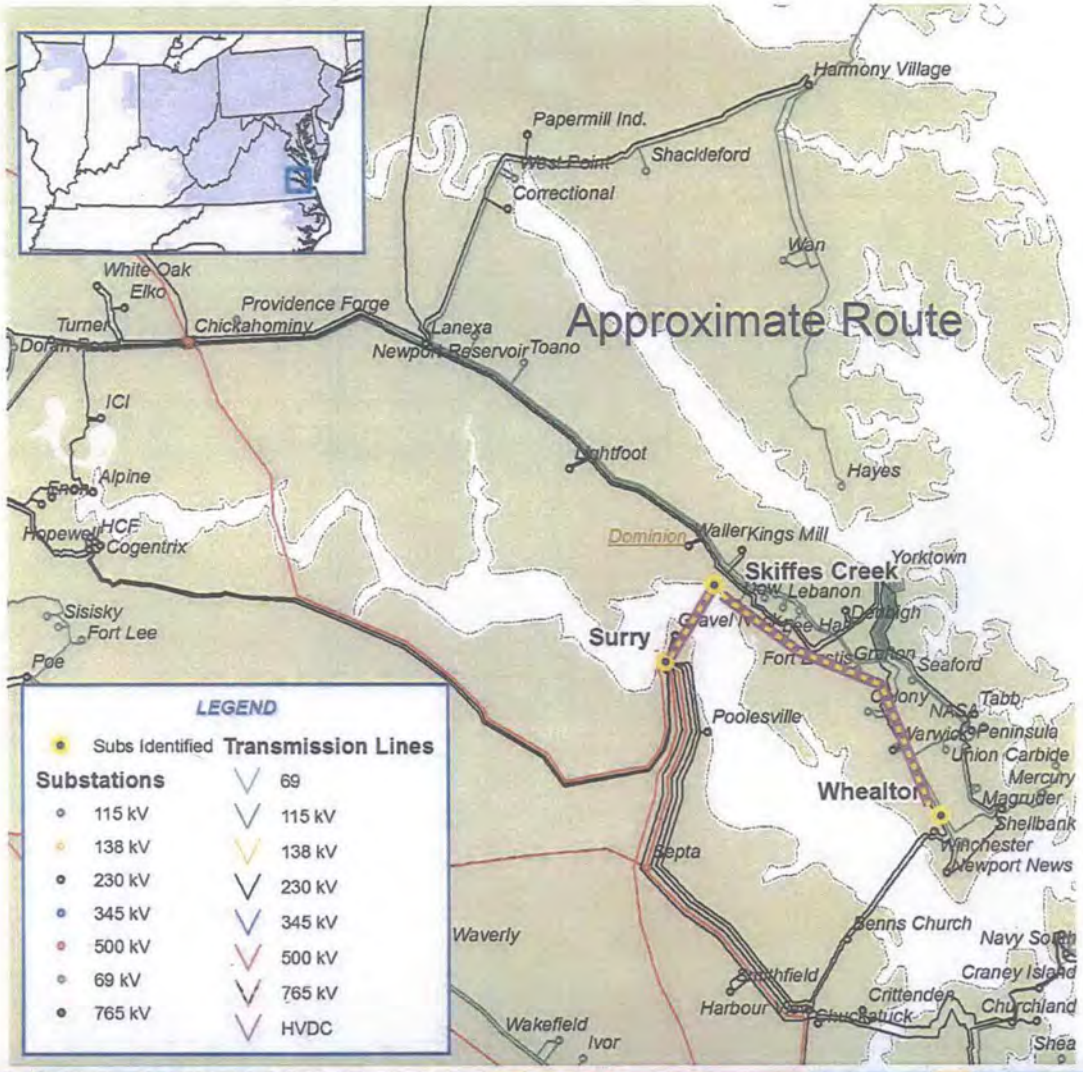
- Estimated project cost: $211.99 M



Surry 500 kV Alternative

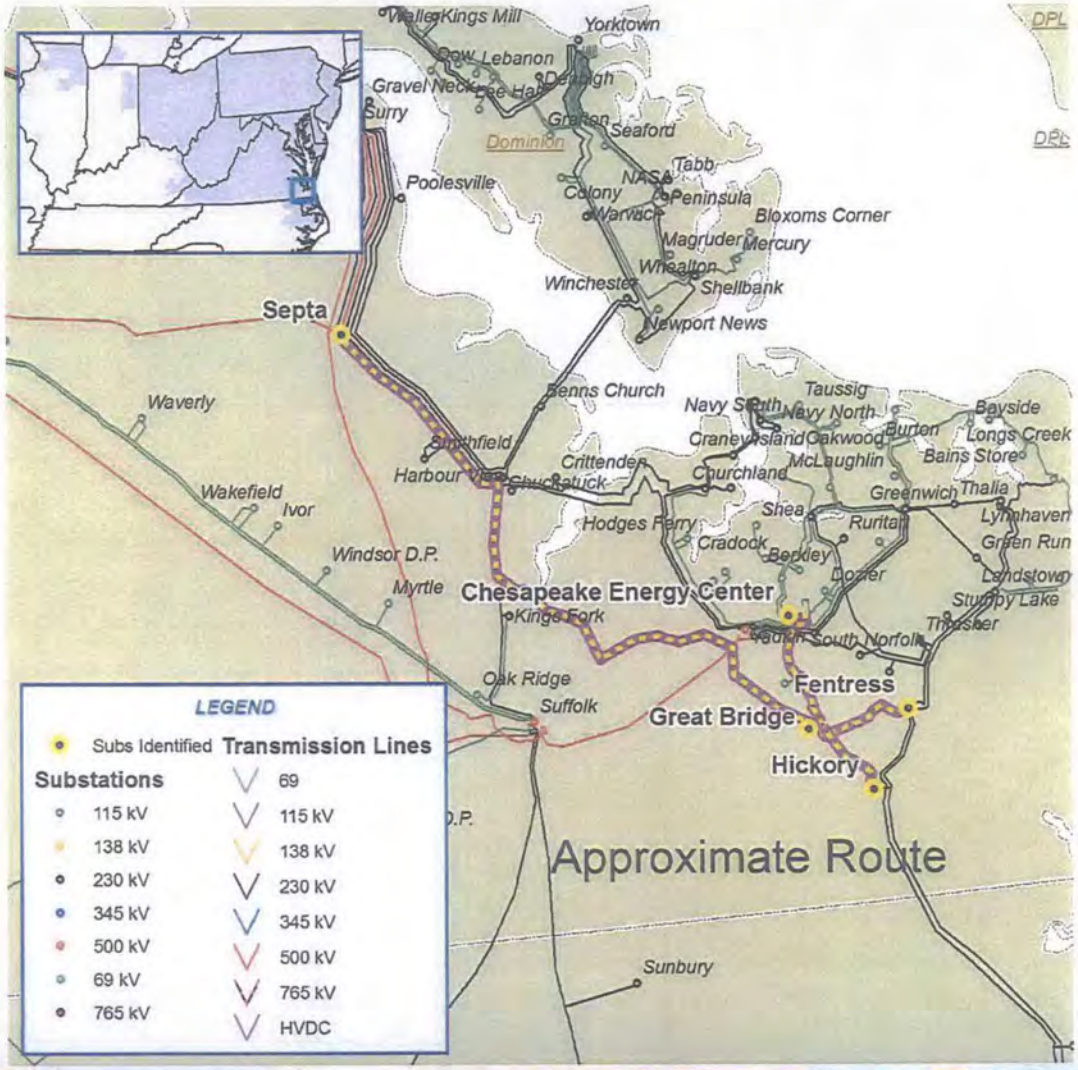
- Dominion Proposed Solution
- Surry to Skiffes Creek 500 kV Line $58.3 M
  - 7.7 miles total (3 miles already existing Dominion ROW)
- Surry 500 kV Station Work $1.5 M
- Skiffes Creek 500-230 kV Tx and Switching Station $42.4 M
- New Skiffes Creek - Whealton 230 kV Line $46.4 M
- Whealton 230 kV Breakers $2.1 M
- Yorktown 230 kV Work $0.2 M
- Lanexa 115 kV Work $0.13M
- Surry 230 kV Work $0.13 M
- Kings Mill, Peninmen, Toano, Waller, Warwick $ 0.03 M

- Estimated project cost: $151.19 M



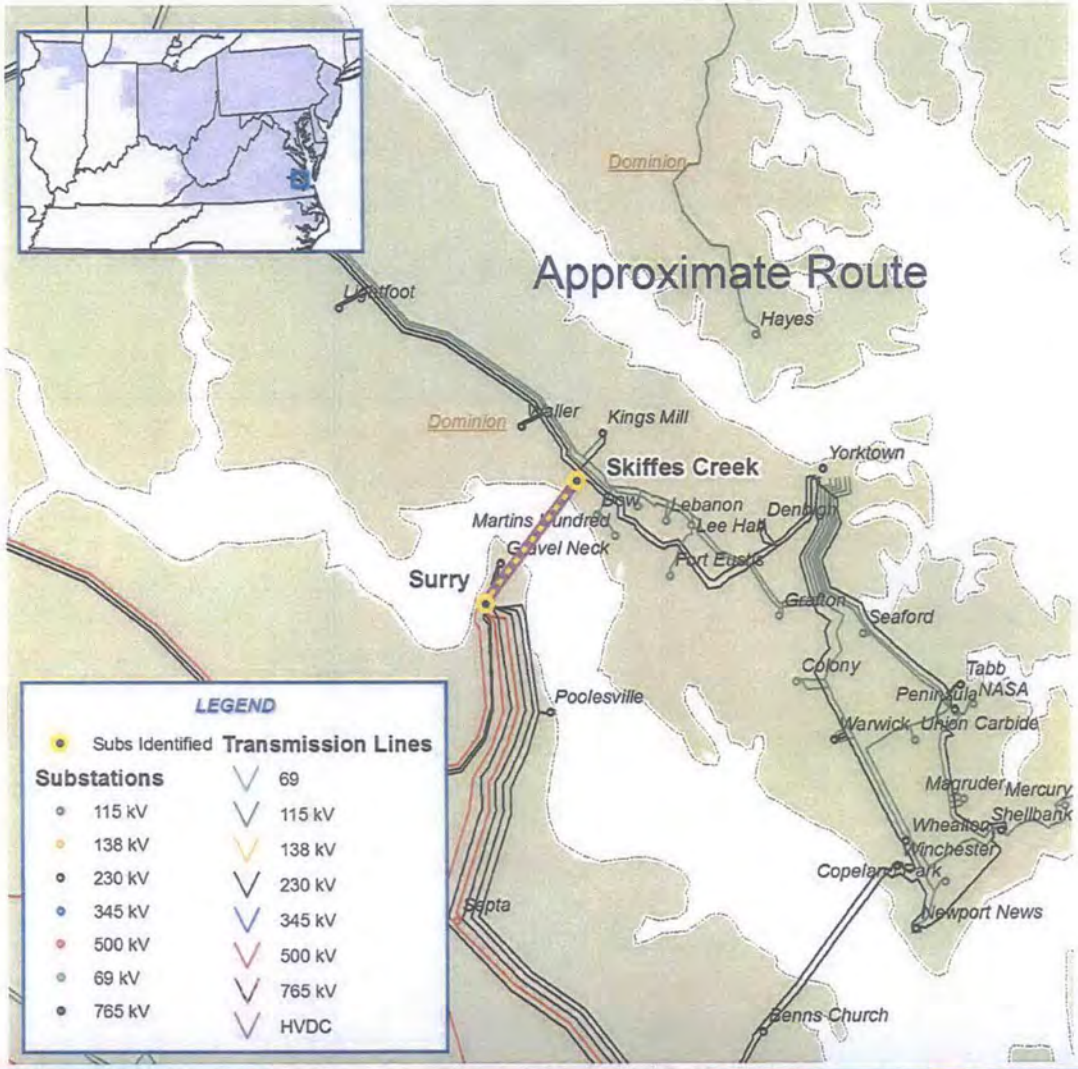
Great Bridge & Surry 230 kV Alternative

- LS Power / Northeast Transmission Development Proposed
- Build a new Great Bridge 500 kV substation (3 breaker ring bus) along existing Fentress-Septa 500 kV circuit.
- Build a new Great Bridge 115 kV substation at the intersection of the Fentress-Septa 500 kV circuit and the Hickory-Great Bridge 115 kV circuit.
- Install a new Great Bridge 500/115 kV transformer.
- Reconductor Great Bridge-Chesapeake 115 kV with high temperature conductor.
- Install a second Yorktown 230/115 kV transformer.
- New Surry-Skiffes Creek single circuit 230 kV line in series with a PAR at Surry.
- $99 M for Surry – Skiffes Creek 230 kV plus the cost of the Great Bridge and Yorktown area work



Surry 230 kV Partial Alternative

- 230 kV Alternative to the 500 kV portions of the Chickahominy 500 kV and Surry 500 kV proposals
- Construct a New Surry - Skiffes Creek single circuit 230 kV line $84 M
  - Total length approximately 7.33 miles
  - ~3 miles underground/underwater
- Construct a Phase Angle Regulator in series with Surry – Skiffes Creek 230 kV at Surry $15 M
- Estimated project cost: $99 M



Alternative Performance Comparison

- Great Bridge & Surry 230 kV Alternative
  - Does not address several key criteria violations

- Analytical focus on other three alternatives
  - Chickahominy 500 kV Alternative
  - Surry 500 kV Alternative
  - Surry 230 kV Partial Alternative

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Alternative Performance Comparison

- Chickahominy 500 kV Alternative, Surry 500 kV Alternative and Surry 230 kV Partial Alternative performance in the near term
  - All solved the applicable criteria violations
    - N-1-1
    - Generator Deliverability
    - Load Deliverability
    - Dominion Critical Condition criteria
  - Surry 230 kV Partial Alternative solution acceptable in near term but with small margin on thermal limits

- Sensitivity of at-risk generation (Yorktown #2)
  - Surry 230 kV Partial Alternative demonstrates a thermal overload of Lanexa – Waller 230 kV and the proposed Phase Angle Regulator
  - No performance issues for Chickahominy 500 kV and Surry 500 kV

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Alternative Cost Comparison

- Proposed Alternative to Dominion 500 kV scope of work
  - Surry 500 kV scope of work
    - Surry to Skiffes Creek 500 kV Line (7 miles overhead) $58.3 M
    - Surry 500 kV Station Work $1.5 M
    - Skiffes Creek 500-230 kV Tx and Switching Station $25 M
    - **Total Surry 500 kV alternative and associated work: $84.8 M as estimated by Dominion**
  - Surry 230 kV scope of work
    - New Surry to Skiffes Creek 230 kV Line (4 miles overhead / 3 miles underwater) $84 M
    - Install new 230 kV Phase Angle Regulator (PAR) in series with the new Surry to Skiffes Creek 230 kV $15 M
    - **Total Surry 230 kV alternative and associated work: $99 M as estimated by LS Power**

Proposed Solution Considerations

Chickahominy 500 kV

- ROW
  - Dominion Owned
- Siting process / timeline
- Estimated cost: $134.8

Surry 500 kV

- ROW
  - mostly Dominion Owned
- Siting process / timeline
- Estimated cost: $84.8 M

Surry 230 kV Partial

- ROW
  - Expansion limitations at Surry 230 kV
- Phase Angle Regulator
  - Siting
  - Added operational complexity of a PAR
- Siting process / timeline
- Estimated cost: $99 M

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Proposed Solution

- Recommended solution:
  - Surry 500 kV alternative

- Assign construction responsibility to Dominion

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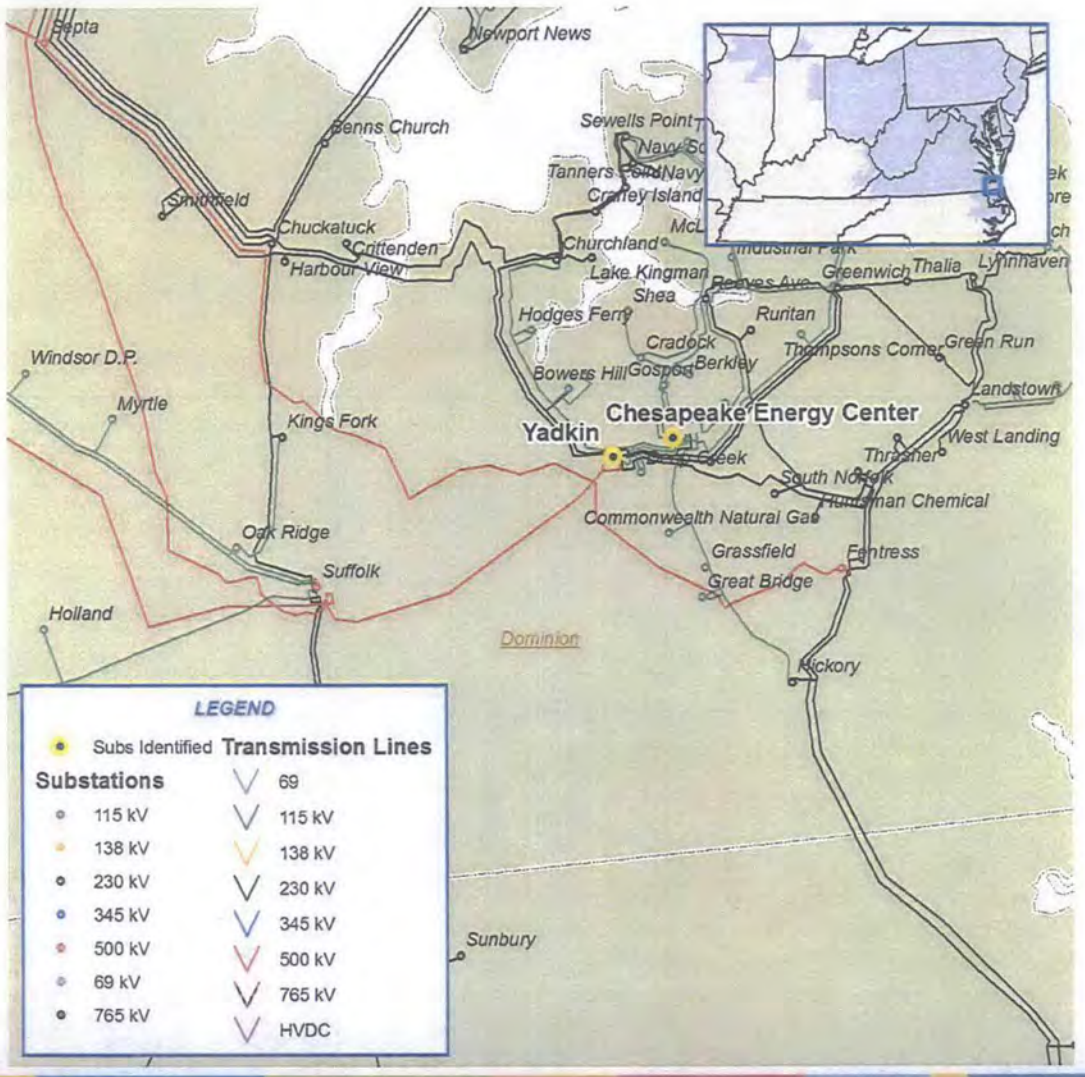
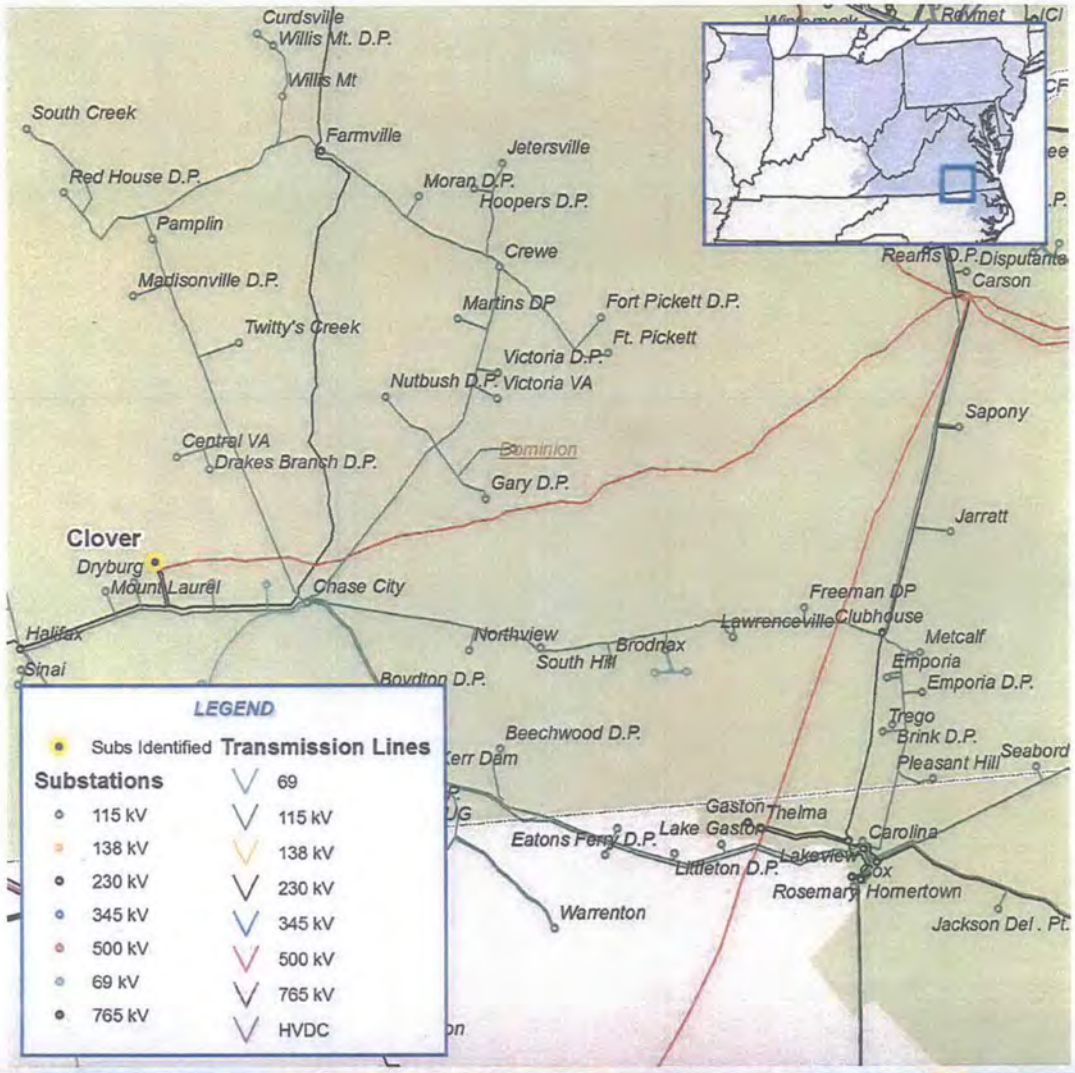
Additional Required Dominion Transmission Zone Upgrade

- Dominion Criteria – critical system condition of Surry #2 outage
  - Yadkin – Chesapeake 115 kV is over its emergency rating for the loss of the Chesapeake 230/115 kV TX
  - The Yadkin 230/115 kV transformer is over its emergency rating for the loss of Yadkin – Chesapeake – Greenwich 230 kV
  - The Chesapeake 230/115 kV transformer is over its emergency rating for the loss of the Yadkin – Chesapeake – Greenwich 115 kV circuit or the Yadkin 230/115 kV TX #1
  - Each Yadkin 500/230 kV Transformer is overloaded for the loss of the parallel transformer
- At Yadkin 500 kV, Install six 500 kV breakers and a third 500/230 kV TX at Yadkin
- Install a 2nd 230/115 kV TX at Yadkin
- Install a 2nd 230/115 kV TX at Chesapeake
- Uprate Yadkin – Chesapeake 115 kV
- Estimated Project Cost: $45 M
- Projected in-service date: 6/1/2016



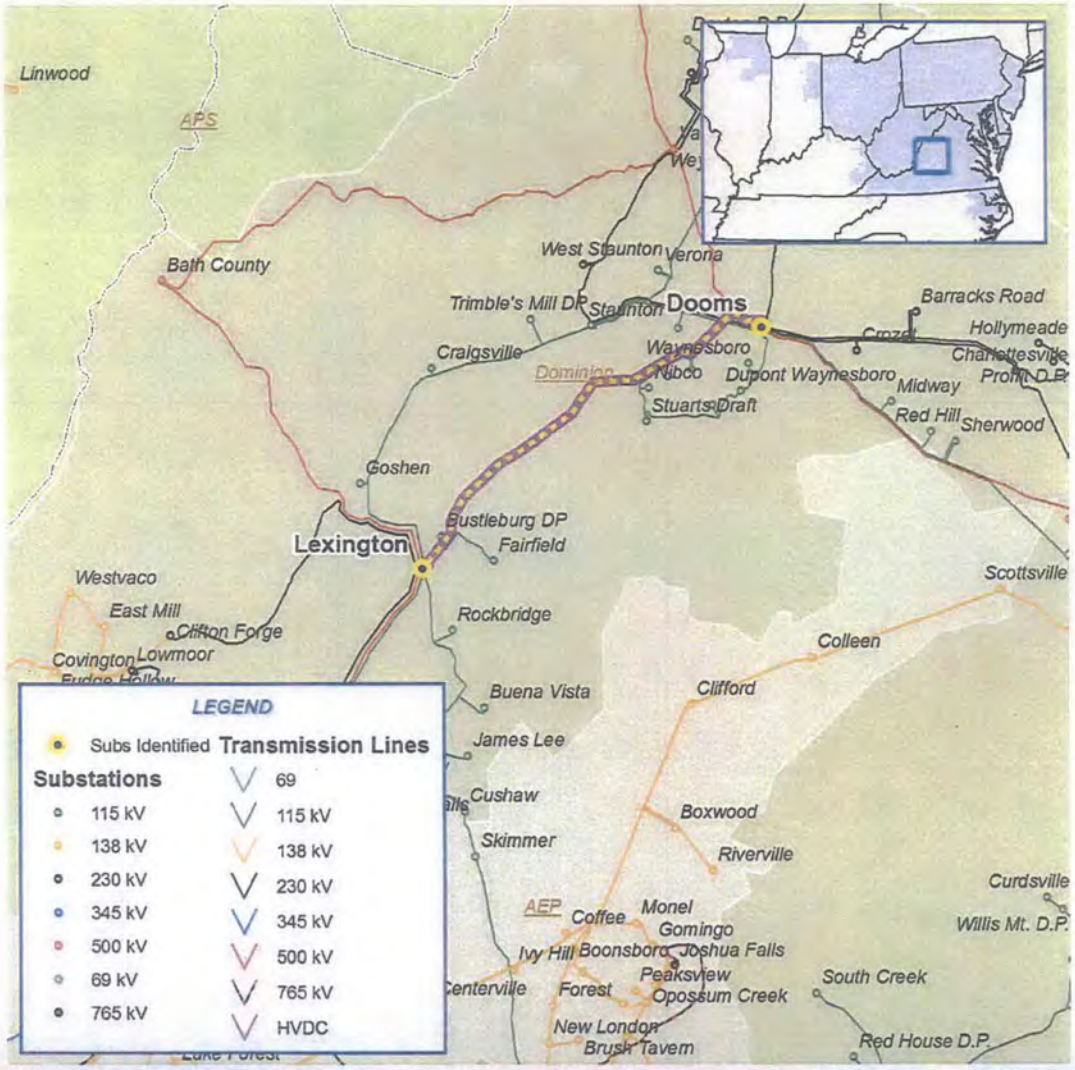
Additional Required Dominion Transmission Zone Upgrade

- Dominion Criteria – critical system conditions of Yorktown #3 or Surry #2 outage
- The loss of the Clover 500/230 TX #2 overloads Clover 500/230 kV TX #1
- Install a 3rd 500/230 kV TX at Clover
- Estimated Project Cost: $16 M
- Projected in-service date: 6/1/2016



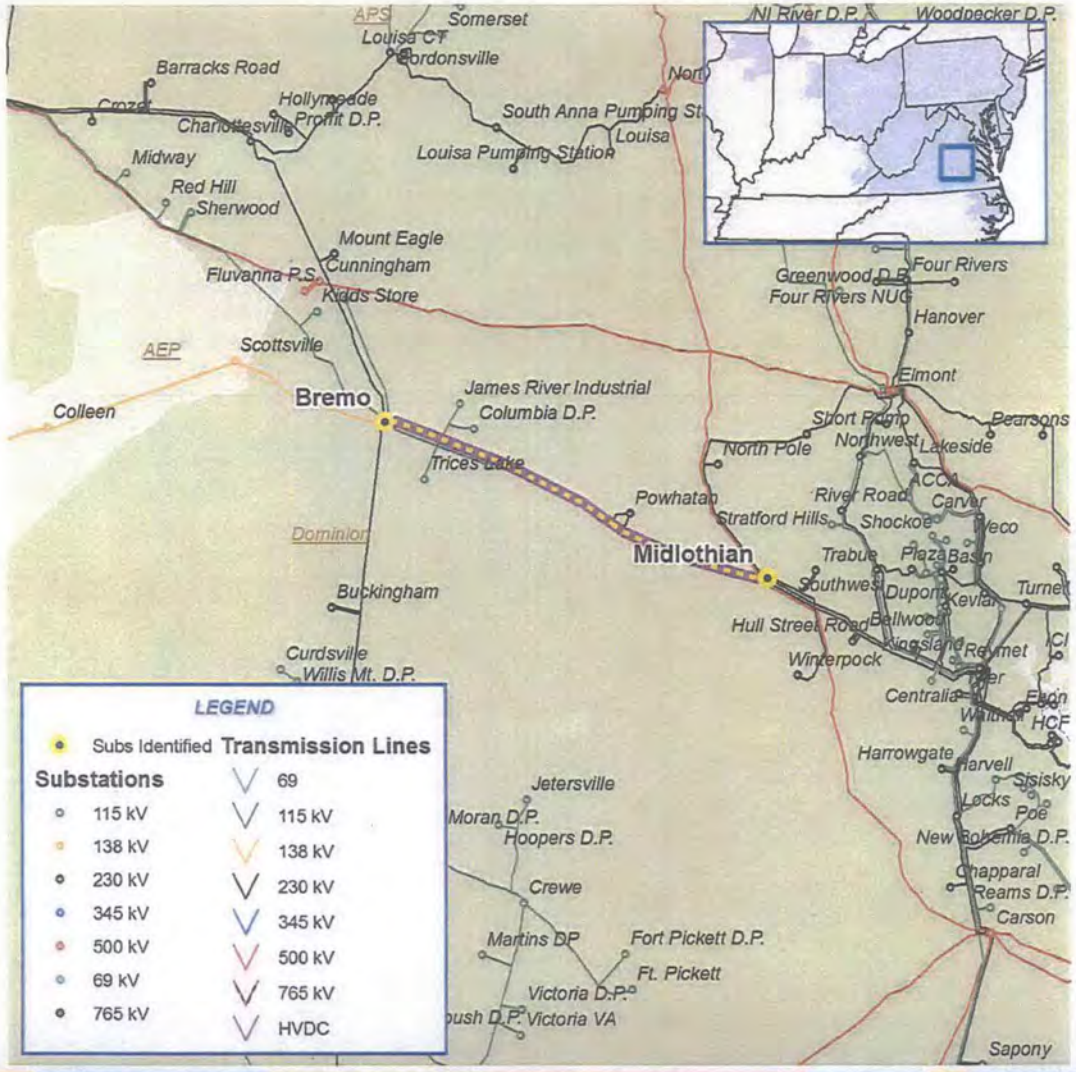
Additional Required Dominion Transmission Zone Upgrade

- Dominion Criteria – critical system conditions of Yorktown #3 or Surry #2 outage
- The loss of Bath – Valley 500 kV overloads Dooms – Lexington 500 kV
- Rebuild Lexington – Dooms 500 kV
  - 40 miles
- Estimated Project Cost: $120 M
- Projected in-service date: 6/1/2016



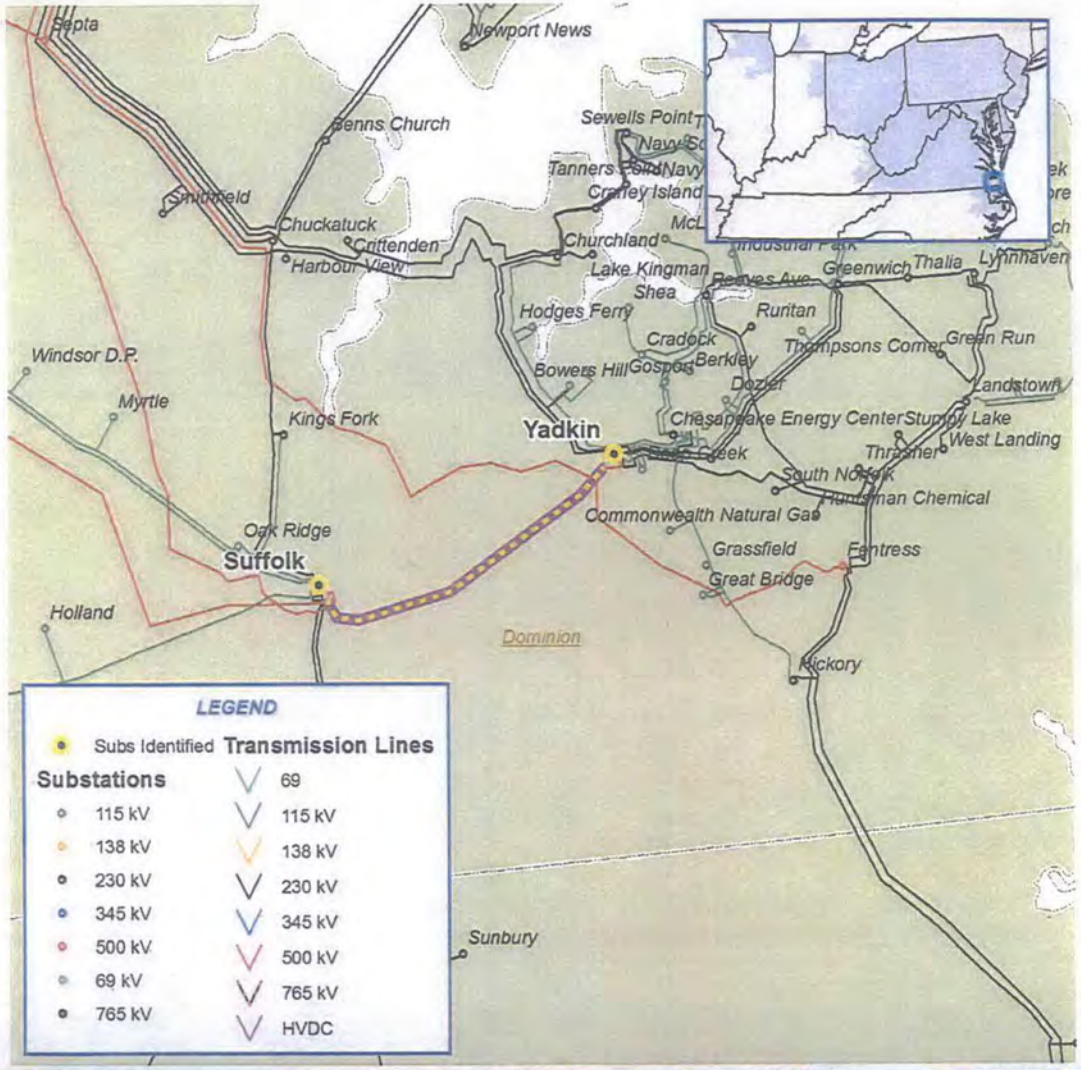
Additional Required Dominion Transmission Zone Upgrade

- Dominion Criteria – critical system conditions of Yorktown #3 or Surry #2 outage
- Bremo – Midlothian 230 kV is overloaded for the loss of Elmont – Cunningham 230 kV
- Uprate Bremo – Midlothian 230 kV to its maximum operating temperature
- Estimated Project Cost: $10 M
- Projected in-service date: 6/1/2016



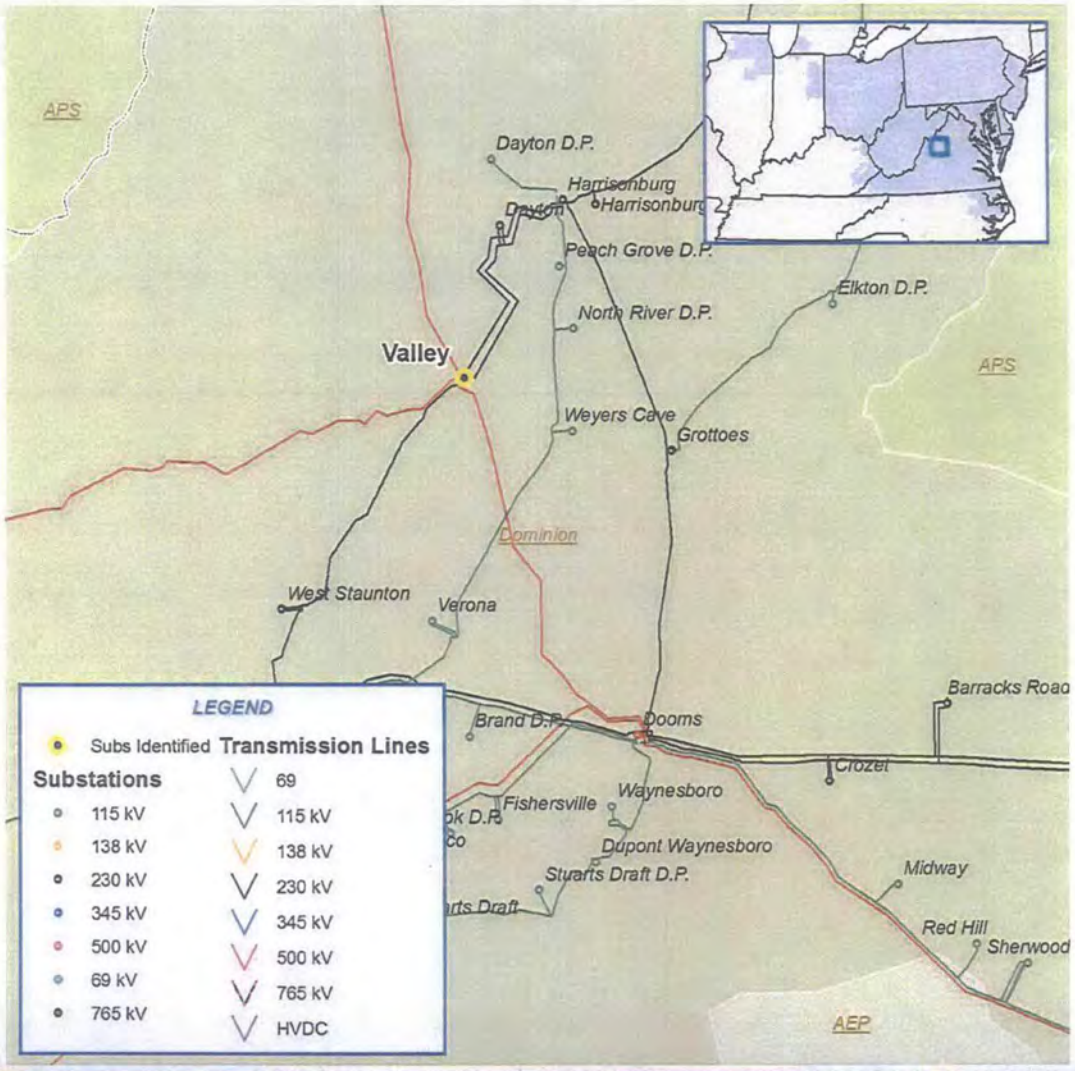
Additional Required Dominion Transmission Zone Upgrade

- N-1-1 Thermal Violation
- Huntsman – Thrasher 230 kV is over its emergency rating for the loss of the Suffolk – Yadkin 500 kV and Fentress – Septa 500 kV lines
- Build a Suffolk – Yadkin 230 kV line (14 miles)
  - Install two 230 kV breakers at both Suffolk and Yadkin Substation to interconnect
  - Primarily along existing towers
- Estimated Project Cost: $40 M
- Projected in-service date: 6/1/2016



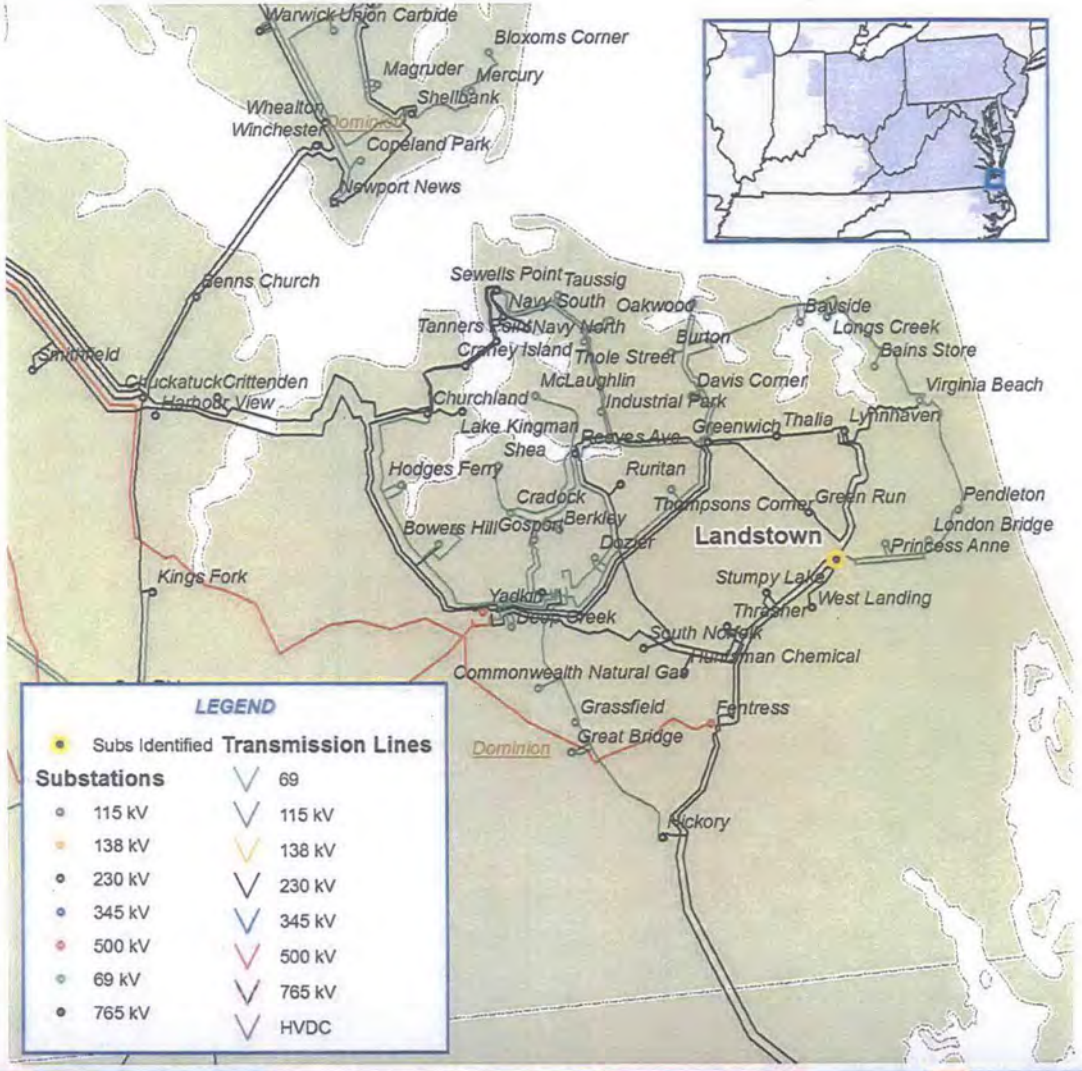
Additional Required Dominion Transmission Zone Upgrade

- N-1-1 Thermal Violation
- The Valley 500/230 kV TX is thermally overloaded for the loss of Dooms – Valley 500 kV and Dooms – Lexington 500 kV
- Add a second Valley 500/230 kV TX
- Estimated Project Cost: $16 M
- Projected in-service date: 6/1/2016



Additional Required Dominion Transmission Zone Upgrade

- N-1-1 Voltage Violation
- Voltage collapse in the VA Beach area for the loss of Suffolk – Yadkin 500 kV and Yadkin – Fentress 500 kV
- Install a 500 MVAR SVC at Landstown 230 kV
  - May need to split into two smaller SVCs
- Estimated Project Cost: $60 M
- Projected in-service date: 6/1/2016



- Approval of all of the upgrades in this presentation, except those noted as still under review will be sought from the PJM Board of Mangers at their May 17th meeting.

- Comments or questions should be directed to: RTEP@pjm.com

Transmission Expansion Advisory Committee (TEAC) Recommendations to the PJM Board

PJM Staff Whitepaper
May 2012

EXECUTIVE SUMMARY

Since November, PJM has received notification from several generation owners of their intent to deactivate a number of generators totaling over 13,000 MW of generation. Generation owners are required to notify PJM of their intent to deactivate generation per Article V of the PJM tariff. Baseline reliability criteria violations have been identified as a result of the generation deactivations. Transmission reinforcements to address the reliability criteria violations are being developed.

The baseline upgrades related to the generation deactivation studies completed as of this time are summarized below. The requested generation deactivations range from May 2012 through the end of 2015. If the transmission upgrades that are required to maintain reliability cannot be implemented by the requested deactivation date, generation may need to be retained through Reliability Must Run (RMR) agreements. Based on the expected in-service date of some of the transmission upgrades included in this report, RMR agreements are being pursued.

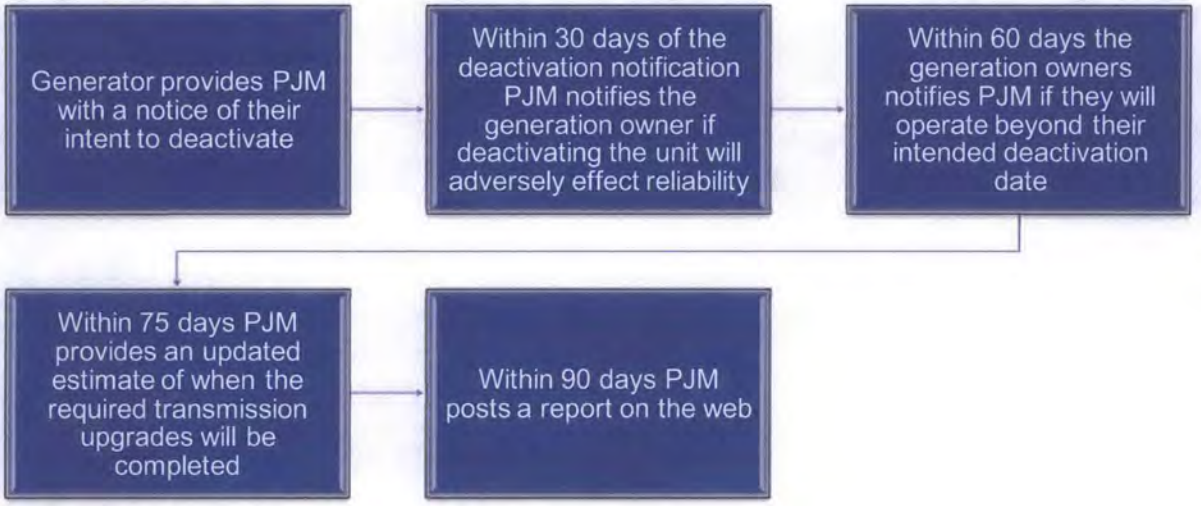
The total increase to the RTEP to include these baseline project changes is $1,881 million. With these changes, the RTEP will include over $23.410 billion of transmission additions and upgrades since the first plan was approved by the Board in 2000.

SUMMARY OF RESULTS

Generation Deactivation Process

As noted above, generation deactivation is covered under Article V of the PJM tariff. The flowchart below details the generation deactivation process. After a generation owner notifies PJM of their intent to deactivate a unit, PJM conducts a series of studies to determine if deactivating the generator will have an adverse impact on the reliability of the bulk electric system. This baseline analysis determines the compliance of the system with reliability criteria and standards. If reliability criteria violations are identified, transmission upgrades are developed to resolve the identified issues. If the transmission upgrades can be put in place prior to the intended deactivation date, the unit can retire as requested. If the transmission upgrades cannot be put in place prior to the requested deactivation date then an RMR agreement may be pursued. The generation owner is not under any obligation to pursue the RMR agreement and may retire the unit at any time. PJM cannot compel a generator to remain in-service. Transmission upgrades required to maintain a reliable system are identified and reviewed with the Sub-regional RTEP Committees and the

Transmission Expansion Advisory Committee (TEAC). The cost of transmission upgrades to mitigate criteria violations caused by generation deactivation is allocated to load.



The upgrades included in this report are needed due to the deactivation of multiple units from several different generation owners. The table below summarizes the generation deactivations driving the need for the upgrades included in this report.

Unit Name	Capacity (MW)	Owner	Official Owner Request Date
Chesapeake 1	111	Dominion	11/15/2011
Chesapeake 2	111	Dominion	11/15/2011
Yorktown 1	159	Dominion	11/15/2011
Chesapeake 3	147	Dominion	11/15/2011
Chesapeake 4	207	Dominion	11/15/2011
Bergen 3	21	PS Power	12/1/2011
Burlington 8	21	PS Power	12/1/2011
National Park 1	21	PS Power	12/1/2011
Mercer 3	115	PS Power	12/1/2011
Sewaren 6	111	PS Power	12/1/2011
Armstrong 1	172	FE Solutions	1/26/2012
Armstrong 2	171	FE Solutions	1/26/2012

Unit Name	Capacity (MW)	Owner	Official Owner Request Date
Ashtabula 5	244	FE Solutions	1/26/2012
Bay Shore 2	138	FE Solutions	1/26/2012
Bay Shore 3	142	FE Solutions	1/26/2012
Bay Shore 4	215	FE Solutions	1/26/2012
Eastlake 1	132	FE Solutions	1/26/2012
Eastlake 2	132	FE Solutions	1/26/2012
Eastlake 3	132	FE Solutions	1/26/2012
Eastlake 4	240	FE Solutions	1/26/2012
Eastlake 5	597	FE Solutions	1/26/2012
Lake Shore 18	245	FE Solutions	1/26/2012
R Paul Smith 3	28	FE Solutions	1/26/2012
R Paul Smith 4	87	FE Solutions	1/26/2012
Walter C Beckjord 1	94	Duke Energy	2/1/2012
Walter C Beckjord 2	94	Duke Energy	2/1/2012
Walter C Beckjord 3	128	Duke Energy	2/1/2012
Walter C Beckjord 4	150	Duke Energy	2/1/2012
Walter C Beckjord 5	238	Duke Energy	2/1/2012
Walter C Beckjord 6	414	Duke Energy	2/1/2012
Albright 1	73	FE Solutions	2/8/2012
Albright 2	73	FE Solutions	2/8/2012
Albright 3	137	FE Solutions	2/8/2012
Rivesville 5	35	FE Solutions	2/8/2012
Rivesville 6	86	FE Solutions	2/8/2012
Willow Island 1	51	FE Solutions	2/8/2012
Willow Island 2	138	FE Solutions	2/8/2012
New Castle 3	93	GenOn	2/29/2012
New Castle 4	92	GenOn	2/29/2012
New Castle 5	140	GenOn	2/29/2012
New Castle Diesels	5.5	GenOn	2/29/2012
Portland 1	158	GenOn	2/29/2012
Portland 2	243	GenOn	2/29/2012
Glen Gardner CTs	160	GenOn	2/29/2012
Shawville 1 - 4	597	GenOn	2/29/2012
Titus 1 - 3	243	GenOn	2/29/2012
Niles 1 & 2	217	GenOn	2/29/2012
Elrama 1 - 4	396	GenOn	2/29/2012
Fisk 19	326	Midwest Generation	3/8/2012
Crawford 7	213	Midwest Generation	3/8/2012
Crawford 8	319	Midwest Generation	3/8/2012

The baseline deactivation analysis, discussed herein, resulted in the need for transmission upgrades in several transmission zones. In total these analyses identified over 130 upgrades ranging from simple line terminal equipment upgrades, new substations and substation additions to reinforce underlying systems, rebuilding existing lines to higher capacity, and new transmission lines. A summary of the major baseline project additions that are $5 million or greater are detailed below. A complete listing of all of the projects is included as an attachment to this document.

Mid-Atlantic Region System Upgrades

- PEPCO Transmission Zone
  - Reconductor 230 kV line 23032 and 23034 with high temperature conductor - $16M

- PENELEC Transmission Zone
  - Construct a 115 kV ring bus at Claysburg Substation - $5.25M
  - Construct Farmers Valley 345/230 kV and 230/115 kV substation by looping the Homer City to Stolle Road 345 kV line into Farmers Valley – $29.5M
  - Relocate the Erie South 345 kV line bay - $13M
  - Convert the Lewis Run – Farmers Valley 115 kV line to 230 kV - $46.8M

- PPL Transmission Zone
  - Install a new North Lancaster 500/230 kV substation - $42M

- JCPL Transmission Zone
  - Construct a new Whippany to Montville 230 kV line - $37.5M

Western Region System Upgrades

- American Electric Power
  - Reconductor Kammer – West Bellaire 345 kV - $20M
  - Install a new 765/345 substation at Mountaineer and build a ¾ mile 345 kV line to Sporn - $65M
  - Terminate Transformer #2 at SW Lima in a new bay position - $5M
  - Add four 765 kV breakers at Kammer - $30M

- APS Transmission Zone
  - Loop the Homer City-Handsome Lake 345 kV line into the Armstrong substation and install a 345/138 kV transformer at Armstrong - $27.8M
  - Install a new Buckhannon – Weston 138 kV line - $17.5M
  - Convert Moshannon substation to a four breaker 230 kV ring - $6.5M

- ATSI Transmission Zone
  - Install a 345/138 kV transformer at the Inland Q-11 station - $7.2M

- Convert Eastlake units 1, 2, 3, 4 and 5 to synchronous condensers - $100M
- Convert Lakeshore 18 to synchronous condensers - $20M
- Re-conductor the Galion – GM Mansfield – Ontario - Cairns 138 kV line - $9.8M
- Install a 2nd 345/138 kV transformer at the Allen Junction station - $7.2M
- Install a 2nd 345/138 kV transformer at the Bay Shore station - $7.2M
- Create a new Northfield Area 345 kV switching station by looping in the Eastlake – Juniper 345 kV line and the Perry - Inland 345 kV line - $37.5M
- Build a new Mansfield - Northfield Area 345 kV line - $184.5M
- Create a new Harmon 345/138/69 kV substation by looping in the Star – South Canton 345 kV line - $46M
- Build a new Harmon – Brookside + Harmon - Longview 138 kV line - $9.2M
- Create a new Five Points Area 345/138 kV substation by looping in the Lemoyne – Midway 345 kV line - $30M
- Build a new 345-138kV Substation at Niles - $32M
- Build a new substation near the ATSI-AEP border and a new 138kV line from new substation to Longview - $17.7M
- Build new Allen Jct - Midway - Lemonye 345kV line - $86.3M
- Build a new Leroy Center 345/138 kV substation by looping in the Perry – Harding 345 kV line - $46M
- Build a new Toronto to Harmon 345 kV line - $218.3M
- Build a new Toronto 345/138 kV substation - $41.8M
- Build a new West Fremont – Groton – Hayes 138 kV line - $45M
- Reconductor the ATSI portion of South Canton – Harmon 345 kV line - $6M
- Add a new 150 MVAR SVC and 100 MVAR capacitor at New Castle - $31.7M

- Duquesne Transmission Zone
  - Install a third 345/138 kV transformer at Collier - $8M

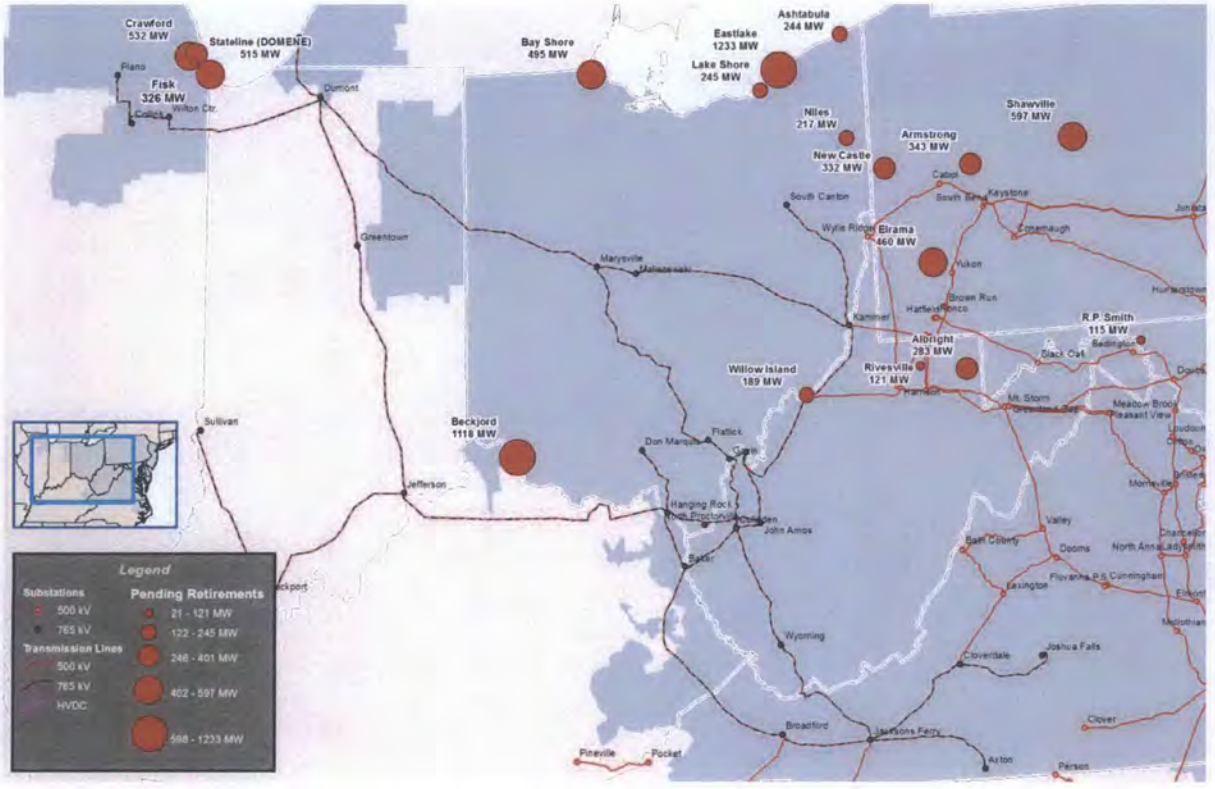
Southern Region System Upgrades

- Dominion Virginia Power Transmission Zone
  - Build new Surry to Skiffes Creek 500 kV line - $58.3M
  - Build new Skiffes Creek 500/230 substation - $42.4M
  - Build new Skiffes Creek – Whealton 230 kV line - $46.4M
  - Expand Yadkin 500/230 kV and 230/115 kV substation and Chesapeake 230/115 kV substation - $45M
  - Add a third 500/230 kV transformer at Yadkin - $16M
  - Add six 500 kV breakers at Yadkin - $8M
  - Install a third 500/230 kV transformer at Clover - $16M
  - Rebuild Lexington to Dooms 500 kV line - $120M

- Upgrade Bremo – Midlothian 230 kV line - $10M
- Build a new Suffolk to Yadkin 230 kV line - $40M
- Install a second Valley 500/230 kV transformer - $16M
- Build a 500 MVAR SVC at Landstown 230 kV - $60M

Western Region System Upgrades

The majority of the generator deactivations that PJM has received since November are for units in the western region of PJM. Generation owners including First Energy Solutions, Duke Energy, GenOn and Midwest Generation have notified PJM of their intent to deactivate units in the western region of PJM. As shown in the map below a number of these deactivations are clustered around Lake Erie in the American Transmission System Inc. (ATSI) transmission zone. Deactivation of the generation along Lake Erie will require significant transmission upgrades to resolve thermal and voltage violations in and around the City of Cleveland which has historically been constrained due to voltage limitations.



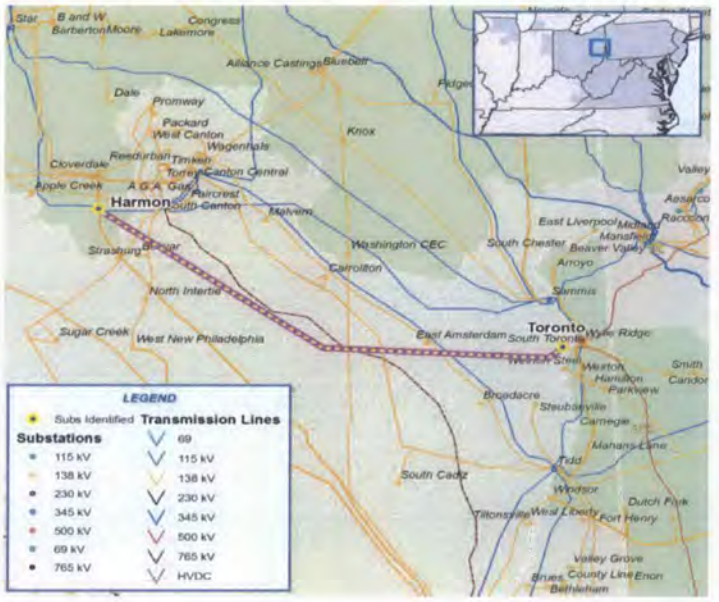
Several new 345 kV transmission lines, new 345/138 kV substations, and new reactive upgrades have been identified in addition to a large number of incremental upgrades to existing facilities. The map on the following page shows the new 345 kV lines and the new 345/138 kV stations.

As noted above, the ability to import power into the Cleveland area has historically been limited by voltage problems. Deactivation of the generation in and around Cleveland will exacerbate these voltage limitations. As a result, a significant number of upgrades have been identified to address voltage and voltage stability criteria. The Eastlake units 1 – 5 and the Lakeshore 18 unit were recommended to be converted to synchronous condensers. The estimated cost for this work is $20M for each machine. The expected reactive capability for the Eastlake units 1 – 3 is 124 MVAR/machine, Eastlake unit 4 is 268 MVAR, Eastlake unit 5 is 485 MVAR and 260 MVAR for the Lakeshore 18 machine. In addition a new 345/138 kV substation at Leroy Center was recommended. The new station will be established by looping the existing Perry to Harding 345 kV line through the station. The estimated cost for the new Leroy Center substation is $46M. A new Northfield area 345/138 kV substation was recommended to address voltage violations under load deliverability conditions. The new substation will be established by tapping the existing Eastlake to Juniper 345 kV line and the Perry to Inland 345 kV line. The estimated cost for that work is $37.5M. A new 345 kV line from Mansfield to Northfield was also recommended to reinforce the 345 kV feed into the Northfield area. The estimated cost for this new line is $184.5M. In addition, a new 345 kV line from Beaver Valley to Leroy Center and another new 345 kV line from Mansfield to Leroy Center are being considered to address ATSI voltage stability criteria violations. The estimated cost of the two new 345 kV lines is $393M. The Beaver Valley to Leroy Center and Mansfield to Leroy Center 345 kV lines were not recommended to the PJM Board at this time. Additional analysis using the ATSI voltage stability is in progress.

A new Five Points 345/138 kV substation was recommended to address NERC category C3 (N-1-1) voltage violations. The new station will be created by looping the existing Lemoyne to Midway 345 kV line through the station. The estimated cost for this work is $30M. A second Bayshore 345/138 kV transformer was also recommended to address NERC category C3 (N-1-1) voltage violations. The estimated cost for adding the second transformer at Bayshore is $7.2M. In addition to these upgrades to address voltage problems in and around the City of Cleveland, a 150 MVAR SVC and 100 MVAR capacitor were

recommended at New Castle station in western Pennsylvania to address voltage problems primarily related to the deactivation of the New Castle generation.

There are also a number of projects that are required to address thermal violations. A new Harmon 345/138/69 kV station was recommended to address several NERC category C (breaker failure) contingency overloads. The new Harmon station will be established by looping the South Canton to Star 345 kV line through the station. The estimated cost for this project is $46M. In addition, a new Toronto 345/138 kV substation was recommended to address a number of NERC category C3 (N-1-1) violations. The new substation will be established by looping the existing Sammis to Wylie Ridge 345 kV line through the station. The estimated cost for the new Toronto station is $41.8M. In addition, a new Toronto to Harmon 345 kV line was recommended to reinforce the 345 kV system in the area. The estimated cost for the new Toronto to Harmon 345 kV line is $218.3M.

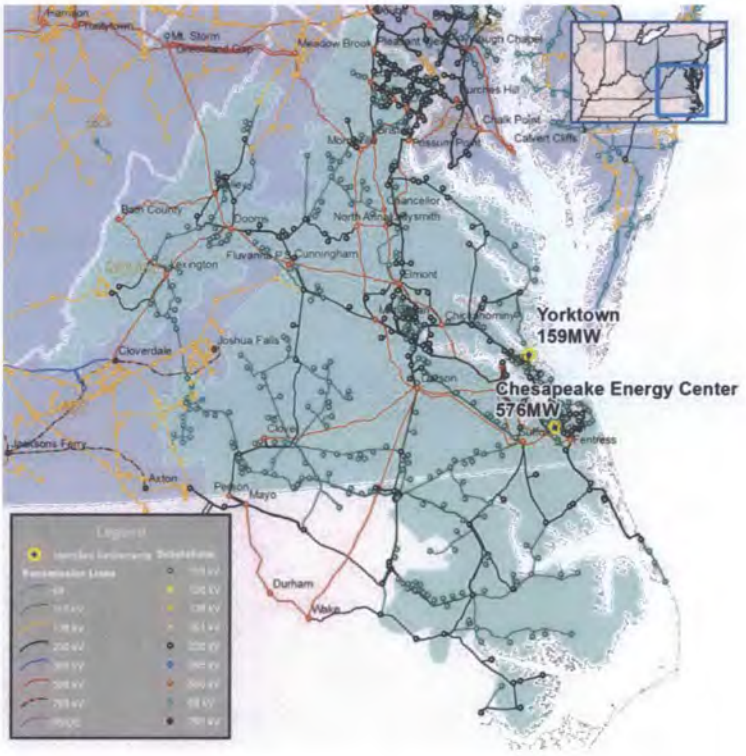


A new 345 kV line from Allen Junction to Midway to Lemoyne was recommended to address a NERC category C3 (N-1-1) thermal violation on Lemoyne to BG Tap 138 kV line. The violation is being driven by the loss of the Allen Junction to Lulu 345 kV tie line to Michigan and the Lemoyne to Five Points 345 kV line. Approximately 48 miles (roughly 3/4 of the line) will utilize an open tower position on an existing double circuit tower structures. The estimate cost for Allen Junction to Midway to Lemoyne line is $86.3M. A new 138 kV line between West Fremont and Hayes was recommended to address thermal violations on other 138 kV facilities for NERC category C5 (double circuit tower) contingency. Specifically the Ottowa to Lakeview 138 kV line and the Lakeview to Greenfield 138 kV line are both overloaded for a double circuit towerline contingency. The estimated cost of the new 138 kV line is $45M.

A new 345 kV source into the Sporn station was recommended to address an overload on the Mountain to Belmont 765 kV line for a NERC category C breaker failure contingency at Marysville that trips the Marysville – Sorenson 765 kV line and the Marysville – Flatlick 765 kV line. The recommended project is to add a new 765/345 kV transformer at Mountaineer and build a new 345 kV line from Mountaineer to Sporn. The Sporn station is approximately ¾ of a mile from Mountaineer. The estimated cost for this project is approximately $65M.

Southern Region System Upgrades

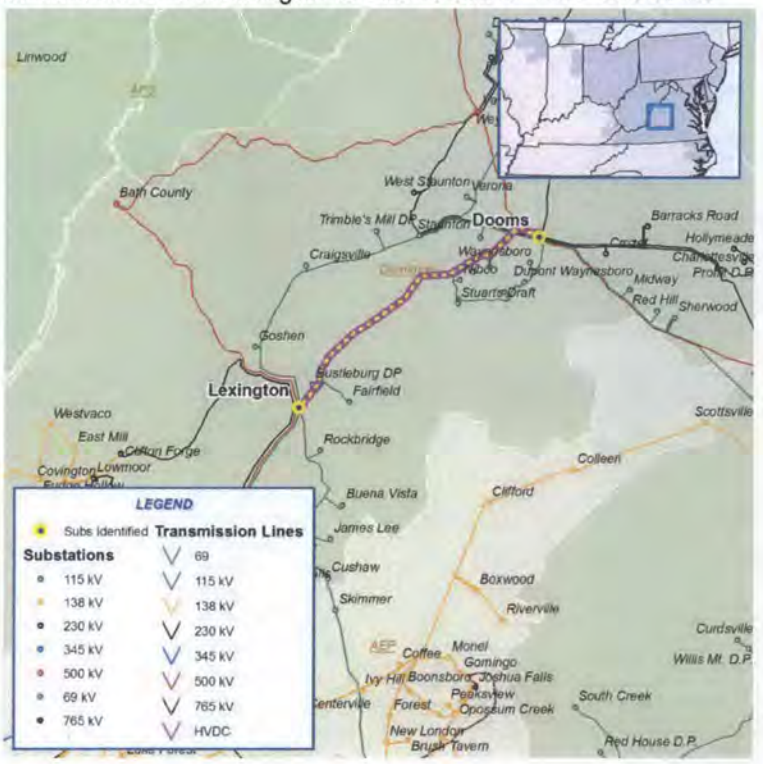
Several new upgrades have been identified in the Dominion transmission zone. A number of the more significant upgrades are summarized below. These upgrades are being driven primarily by the deactivation of the Yorktown 1 unit (159 MW) and the Chesapeake 1 – 4 units (576 MW total). The map below shows the relative location of these units within the Dominion transmission zone.



Thermal and voltage violations were identified on the 230 kV facilities noted on the diagram at the right which serve the northern Hampton Roads area of Virginia. Several alternatives were evaluated to address these issues including a new 500 kV line from Chickahominy to a new station called Skiffes Creek, a new 500 kV line from Surry crossing the James River to the new Skiffes Creek station, and a new 230 kV line from Surry to Skiffes Creek. Each of these alternatives also included a new 230 kV line from Skiffes Creek to Whealton with an estimated cost of $46.4 million. PJM staff is recommending the new 500 kV line from Surry to Skiffes Creek which has an estimated cost of $100.7 million including the new Skiffes Creek 500/230 kV substation. Each alternative resolved the reliability

criteria violations in 2015, however the 230 kV alternative was found to be less robust and would not be adequate under certain at-risk generation scenarios that were evaluated by PJM staff. In addition, the 230 kV alternative required a Phase Angle Regulator (PAR) to control the flow of power on the proposed Surry to Skiffes Creek 230 kV line which would add additional operational complexity. The 500 kV line from Chickohominy to Skiffes Creek was not chosen primarily due to it being the highest cost alternative.

A violation of Dominion planning criteria was identified on the Lexington to Dooms 500 kV line. One of the Dominion planning criteria establishes the critical system conditions by removing a single generator followed by the single contingency outage of any other line or generator. Under these conditions with either the Yorktown 3 unit or the Surry 2 unit off-line, the Lexington to Dooms 500 kV line overloads for the loss of the Bath to Valley 500 kV line. The recommended upgrade to address this violation is to rebuild the 40 mile Lexington to Dooms 500 kV line. The estimated cost for this work is $120 million. The line is being recommended to be rebuilt to address the thermal overload and to address the aging infrastructure issues that are similar to problems that are driving the need for the rebuild of the Mt Storm – Doubs 500 kV line.



Other significant upgrades in the Dominion transmission zone include a third 500/230 kV transformer at Yadkin (estimated cost $16 million) to address thermal overloads on the existing Yadkin 500/230 kV transformers for the loss of the other transformer, a third 500/230 kV transformer at Clover (estimated cost $16 million) to address overloads on the existing Clover 500/230 kV transformers, a new Suffolk to Yadkin 230 kV line (estimated cost $40 million) to address a NERC category C3 (N-1-1) overload, a second Valley 500/230 kV transformer to address overloads on the existing transformer to address NERC category C3(N-1-1) violations, and a new 500 MVAR Static VAR Compensator (SVC) on the 230 kV at Landstown to address NERC category C3 (N-1-1) voltage violations in the Southern Hampton Roads area.

Mid-Atlantic Region System Upgrades

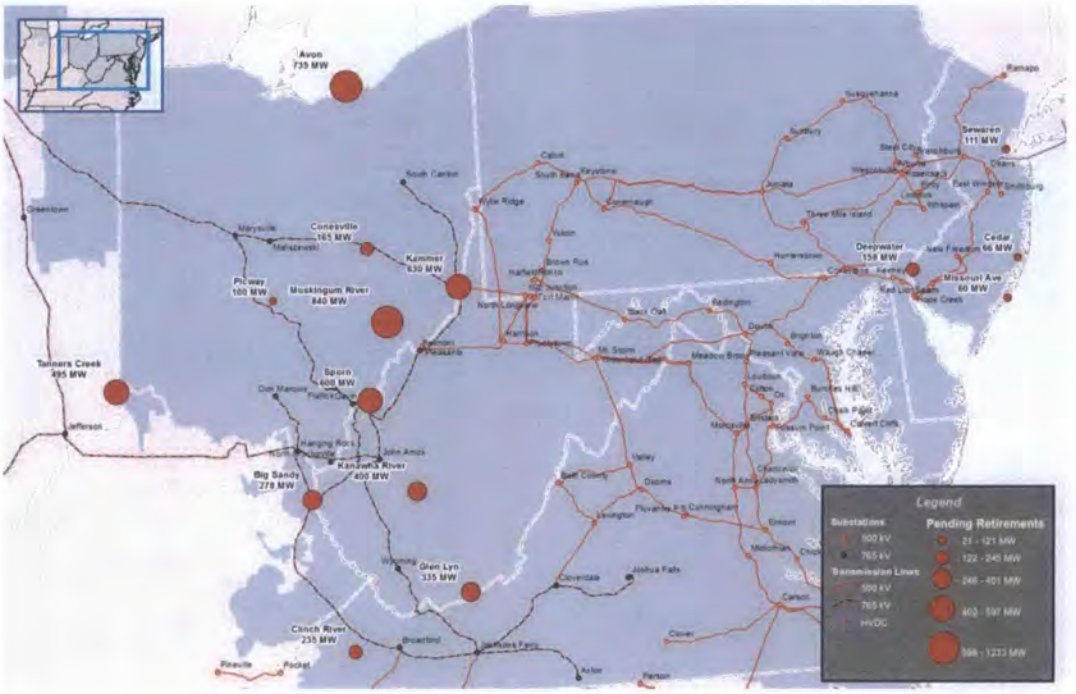
There are a number of upgrades in the Mid-Atlantic region. Many of these upgrades are being driven by the deactivation of the GenOn units at Portland, Shawville, Titus and Glen Gardner.

In the PPL transmission zone a new 500/230 kV substation is being recommended to address several overloads on 230 kV facilities in the South Akron and South Manheim areas. The estimated cost for the project is $42M. In the JCPL transmission zone a new 6.4 mile 230 kV line between Whippany and Montville is being recommended to address NERC Category C3 (N-1-1) violations due to the loss of the Montville to Roseland 230 kV line followed by the loss of the Kittatiny to Newton 230 kV line. The estimated cost for the project is $37.5M.

There are several upgrades in the Pennelec transmission zone to address both thermal and voltage violations. A new 345/230/115 kV substation was recommended at the existing Farmers Valley 115 kV substation. The 345 kV source will be from the Homer City to Stolle Road 345 kV line that passes near the station. This project is needed to address NERC category B (single contingency) voltage drop violations, generator deliverability violations and NERC category C3 (N-1-1) thermal violations. The estimated cost for this work is $29.5M. In addition to this upgrade, the existing 115 kV line from Farmers Valley to Lewis Run be converted to 230 kV. This upgrade is required to address generator deliverability violations. The estimated cost for this conversion work is $46.8M.

Next Steps

PJM staff continues to work on a number of generator deactivation studies for units shown on the map below including twenty two units in the AEP transmission zone, two Avon Lake units in the ATSI transmission zone, several units at Sewaren in the PSEG zone and several units in the Atlantic Electric transmission zone. Although upgrades will be required to address reliability violations for these deactivations, based on initial analysis the number and scope of upgrades required for these deactivations is expected to be less than those described in this report.



Review by the Transmission Expansion Advisory Committee (TEAC)

The results of all of the deactivation analyses were reviewed with the TEAC at the February 16th, March 15th, April 12th meetings. Final upgrades included in this report were reviewed with the TEAC at the April 27, 2012 meeting.

Board Approval

The PJM Board met on May 17th and approved the elements of the 2012 RTEP documented herein.

Appendix: Retirement Baseline Upgrades

Upgrade ID	Project Description	Transmission Owner	Cost Estimate
b1879	Perform a sag study on the Hansonville - Meadowview 138 kV line (Improve the emergency rating to 245 MVA)	AEP	$ 0.10
b1946	Perform a sag study on the Brues – West Bellaire 138 kV line	AEP	$ 0.03
b1947	A sag study of the Dequine - Meadowlake 345 kV line #1 line may improve the emergency rating to 1400 MVA	AEP	$ 0.01
b1948	Establish a new 765/345 interconnection at Sporn. Install a 765/345 kV transformer at Mountaineer and build ¾ mile of 345 kV to Sporn	AEP	$ 65.00
b1949	Perform a sag study on the Grant Tap – Deer Creek 138 kV line and replace bus and risers at Deer Creek station	AEP	$ 0.30
b1950	Perform a sag study on the Kammer – Ormet 138 kV line of the conductor section	AEP	$ 0.10
b1951	Perform a sag study of the Maddox- Convoy 345 kV line to improve the emergency rating to 1400 MVA	AEP	$ 0.03
b1952	Perform a sag study of the Maddox – T130 345 kV line to improve the emergency rating to 1400 MVA	AEP	$ 0.03
b1953	Perform a sag study of the Meadowlake - Olive 345 kV line to improve the emergency rating to 1400 MVA	AEP	$ 0.06
b1954	Perform a sag study on the Milan - Harper 138 kV line and replace bus and switches at Milan Switch station	AEP	$ 0.35
b1955	Perform a sag study of the R-049 - Tillman 138 kV line may improve the emergency rating to 245 MVA	AEP	$ 0.03
b1956	Perform a sag study of the Tillman - Dawkins 138 kV line may improve the emergency rating to 245 MVA	AEP	$ 0.03
b1957	Terminate Transformer #2 at SW Lima in a new bay position	AEP	$ 5.00
b1958	Perform a sag study on the Brookside - Howard 138 kV line and replace bus and risers at AEP Howard station	AEP	$ 0.50
b1960	Sag Study on 7.2 miles SE Canton-Canton Central 138kV ckt	AEP	$ 0.30
b1961	Sag study on the Southeast Canton – Sunnyside 138kV line	AEP	$ 0.25
b1962	Add four 765 kV breakers at Kammer	AEP	$ 30.00
b1963	Build approximately 1 mile of circuit comprising of 2-954 ACSR to get the rating of Waterford-Muskinum 345 kV higher	AEP	$ 3.50
b1970	Reconductor 13 miles of the Kammer – West Bellaire 345kV circuit	AEP	$ 20.00
b1971	Perform a sag study to improve the emergency rating on the Bridgville – Chandlersville 138 kV line	AEP	$ 0.05
b1972	Replace disconnect switch on the South Canton 765/345 kV transformer	AEP	$ 0.30
b1973	Perform a sag study to improve the emergency rating on the Carrollton – Sunnyside 138 kV line	AEP	$ 0.05
b1974	Perform a sag study to improve the emergency rating on the Bethel Church – West Dover 138 kV line	AEP	$ 0.03
b1975	Replace a switch at South Millersburg switch station	AEP	$ 0.20
b1837	Replace breaker risers and wave traps at Marlowe 138 kV and wave traps at Bedington 138 kV	APS	$ 0.60
b1840	Install a new Buckhannon - Weston 138 kV line	APS	$ 17.50

Upgrade ID	Project Description	Transmission Owner	Cost Estimate
b1902	Replace line trap at Stonewall on the Stephenson 138 kV line terminal	APS	$ 0.08
b1941	Loop the Homer City-Handsome Lake 345 kV line into the Armstrong substation and install a 345/138 kV transformer at Armstrong	APS	$ 27.80
b1942	Change the CT ratio at Millville to improve the Millville – Old Chapel 138 kV line ratings	APS	$ 0.05
b1964	Convert Moshannon substation to a 4 breaker 230 kV ring bus	APS	$ 6.50
b1965	Install a 44 MVAR 138 kV capacitor at Luxor substation	APS	$ 1.50
b1986	Upgrade the AP portion of the Elrama – Mitchell 138 kV line by replace breaker risers on the Mitchell 138 kV bus on the Elrama terminal	APS	$ 0.05
b1987	Reconductor the Osage-Collins Ferry 138 kV line with 795 ACSS. Upgrade terminal equipment at Osage and Collins Ferry	APS	$ 1.80
b1988	Raise structures between Lake Lynn and West Run to eliminate the clearance de-rates on the West Run – Lake Lynn 138 kV line	APS	$ 0.32
b1989	Raise structures between Collins Ferry and West Run to eliminate the clearance de-rates on the Collins Ferry - West Run 138 kV line	APS	$ 0.32
b1913	Convert Eastlake units 1, 2, 3, 4 and 5 to synchronous condensers	ATSI	$ 100.00
b1914	Convert Lakeshore 18 to a synchronous condenser	ATSI	$ 20.00
b1915	Install a 50 MVAR capacitor bank at the Maclean 138 kV station	ATSI	$ 3.00
b1916	Install a 345/138 kV transformer at the Inland Q-11 station	ATSI	$ 7.20
b1917	Install a 138 kV circuit breaker at the Inland Q-11 station	ATSI	$ 0.90
b1918	Upgrade terminal equipment on the Avon – Crestwood 138 kV line	ATSI	$ 0.30
b1919	Re-conductor the Galion – Leaside 138 kV line with 336 ACSS	ATSI	$ 4.90
b1920	Re-conductor the Galion – GM Mansfield – Ontario - Cairns 138 kV line with 477 ACSS	ATSI	$ 9.80
b1921	Install a 2nd 345/138 kV transformer at the Allen Junction station	ATSI	$ 7.20
b1922	Install a 2nd 345/138 kV transformer at the Bayshore station	ATSI	$ 7.20
b1923	Create a new Northfield Area 345 kV switching station by looping in the Eastlake – Juniper 345 kV line and the Perry - Inland 345 kV line	ATSI	$ 37.50
b1924	Build a new Mansfield - Northfield Area 345 kV line	ATSI	$ 184.50
b1925	Create a new Harmon 345/138/69 kV substation by looping in the Star – South Canton 345 kV line	ATSI	$ 46.00
b1926	Build a new Harmon – Brookside + Harmon - Longview 138 kV line	ATSI	$ 9.20
b1927	Create a new Five Points Area 345/138 kV substation by looping in the Lemoyne – Midway 345 kV line	ATSI	$ 30.00
b1928	Install a 50 MVAR capacitor at Hayes 138 kV	ATSI	$ 1.50
b1929	Install a 138/69 kV transformer at the Avery station	ATSI	$ 3.20
b1930	Increase design temperature limitation on the Avery – Hayes 138 kV line by raising the existing structures	ATSI	$ 0.13
b1931	Reconductor Cloverdale - Harmon #2 and #3 138 kV lines with 795 ACSS or greater conductor 6 miles total + Terminal upgrades	ATSI	$ 3.60
b1932	Change the transformer tap settings on the Maclean 138/69 kV transformers	ATSI	$ 0.05
b1933	Replace 336.4 ACSR SCCIR at Richland to upgrade the Richland – Naomi 138 kV line	ATSI	$ 0.04

Upgrade ID	Project Description	Transmission Owner	Cost Estimate
b1934	Build a new 345/138 kV Substation at Niles	ATSI	$ 32.00
b1934.1	Loop 1.2 miles of 345 kV into substation of the Highland – Shenango 345 kV line	ATSI	
b1934.2	New 345/138 kV transformer at Niles	ATSI	
b1935	ATSI-AEP 138 kV Substation on near territory border + 138 kV from new substation to Longview approx. 8 miles	ATSI	$ 17.70
b1936	Build new Allen Jct - Midway - Lemonye 345 kV line (48 miles of open tower position)	ATSI	$ 86.30
b1937	Build a new Leroy Center 345/138 kV substation by looping in the Perry – Harding 345 kV line	ATSI	$ 46.00
b1938	Place a portion of the 138 kV Leroy Center 345/138 kV project into service by summer 2015	ATSI	$ 3.30
b1939	Reconductor the Barberton – West Akron 138 kV line with 477 ACSS or greater (7.3 miles) + Terminal upgrades at Barberton	ATSI	$ 4.23
b1959	Build a new West Fremont-Groton-Hayes 138kV line	ATSI	$ 45.00
b1976	Reconductor ATSI portion of South Canton – Harmon 345 kV line	ATSI	$ 6.00
b1977	Build new Toronto 345/138 kV substation by looping in the Sammis – Wylie Ridge 345 kV line and tie in four 138 kV lines	ATSI	$ 41.80
b1977.1	Build a new Toronto-Harmon 345kV line	ATSI	$ 218.30
b1978	Reconductor Inland – Clinic Health Q-11 138 kV line	ATSI	$ 1.10
b1981	Replace relay on the Highland – G689 138 kV line	ATSI	$ 0.05
b1982	Reconductor the Hoytdale – Newcastle 138 kV lines #1 and #2 with 795 ACSS	ATSI	$ 4.80
b1983	Add 150 MVAR SVC and a 100 MVAR capacitor at New Castle	ATSI	$ 31.70
b1984	Install a 50 MVAR capacitor at the Boardman 138 kV bus	ATSI	$ 1.70
b1968	Establish operating procedure such that breaker 89, connecting Cheswick-Logans Ferry Z-53 to the No. 3 138 kV bus at Cheswick Substation is normally open	DL	$ -
b1969	Install a third 345-138 kV autotransformer at Collier Substation. Currently s0321 and will be converted to baseline.	DL	$ 8.00
b1985	Upgrade the Duquesne portion of the Elrama – Mitchell 138 kV line	DL	
b1905.1	Surry to Skiffes Creek 500 kV Line (7 miles overhead)	Dominion	$ 58.30
b1905.2	Surry 500 kV Station Work	Dominion	$ 1.50
b1905.3	Skiffes Creek 500-230 kV Tx and Switching Station	Dominion	$ 42.40
b1905.4	New Skiffes Creek - Whealton 230 kV line	Dominion	$ 46.40
b1905.5	Whealton 230 kV breakers	Dominion	$ 2.10
b1905.6	Yorktown 230 kV work	Dominion	$ 0.20
b1905.7	Lanexa 115 kV work	Dominion	$ 0.13
b1905.8	Surry 230 kV work	Dominion	$ 0.13
b1905.9	Kings Mill, Peninmen, Toano, Waller, Warwick	Dominion	$ 0.03
b1906.1	At Yadkin 500 kV, install six 500 kV breakers	Dominion	$ 9.00
b1906.2	Install a 2nd 230/115 kV TX at Yadkin	Dominion	$ 5.00
b1906.3	Install a 2nd 230/115 kV TX at Chesapeake	Dominion	$ 5.00
b1906.4	Uprate Yadkin – Chesapeake 115 kV	Dominion	$ 10.00
b1906.5	Install a third 500/230 kV TX at Yadkin	Dominion	$ 16.00
b1907	Install a 3rd 500/230 kV TX at Clover	Dominion	$ 16.00

Upgrade ID	Project Description	Transmission Owner	Cost Estimate
b1908	Rebuild Lexington – Dooms 500 kV	Dominion	$ 120.00
b1909	Uprate Bremo – Midlothian 230 kV to its maximum operating temperature	Dominion	$ 10.00
b1910	Build a Suffolk – Yadkin 230 kV line (14 miles) and install 4 breakers	Dominion	$ 40.00
b1911	Add a second Valley 500/230 kV TX	Dominion	$ 16.00
b1912	Install a 500 MVAR SVC at Landstown 230 kV	Dominion	$ 60.00
b2003	Construct a Whippany to Montville 230 kV line (6.4 miles)	JCPL	$ 37.50
b1999	Replace limiting wave trap, circuit breaker, substation conductor, relay and current transformer components at Northwood	ME	$ 0.90
b2000	Replace limiting wave trap on the Glendon - Hosensack line	ME	$ 0.05
b2001	Replace limiting circuit breaker and substation conductor transformer components at Portland 230kV	ME	$ 0.40
b2002	Northwood 230/115 kV Transformer upgrade	ME	$ 4.00
b1943	Construct a 115 kV ring bus at Claysburg Substation. Bedford North and Saxton lines will no longer share a common breaker	PENELEC	$ 5.25
b1944	Reconductor Eclipse substation 115 kV bus with 1033 kcmil conductor.	PENELEC	$ 0.15
b1945	Install second 230/115 kV autotransformer at Johnstown	PENELEC	$ 4.50
b1966	Replace the 1200 Amp Line trap at Lewistown on the Raystown-Lewistown 230 kV line and replace substation conductor at Lewistown	PENELEC	$ 0.15
b1967	Replace the Blairsville 138/115 kV transformer	PENELEC	$ 4.20
b1990	Install a 25 MVAR 115 kV Capacitor at Grandview	PENELEC	$ 0.90
b1991	Construct Farmers Valley 345/230 kV and 230/115 kV substation. Loop the Homer City-Stolle Road 345 kV line into Farmers Valley	PENELEC	$ 29.50
b1992	Reconductor Cambria Slope-Summit 115kV with 795 ACSS Conductor	PENELEC	$ 4.80
b1993	Relocate the Erie South 345 kV line terminal	PENELEC	$ 13.00
b1994	Convert Lewis Run-Farmers Valley to 230 kV using 1033.5 ACSR conductor. Project to be completed in conjunction with new Farmers Valley 345/230 kV transformation	PENELEC	$ 46.80
b1995	Change CT Ratio at Claysburg	PENELEC	$ 0.00
b1996.1	Replace 600 Amp Disconnect Switches on Ridgeway-Whetstone 115 kV line with 1200 Amp Disconnects	PENELEC	$ 0.50
b1996.2	Reconductor Ridgway and Whetstone 115 kV Bus.	PENELEC	$ 0.20
b1996.3	Replace Wave Trap at Ridgway.	PENELEC	
b1996.4	Change CT Ratio at Ridgway	PENELEC	
b1997	Replace 600 Amp Disconnect Switches on Dubois-Harvey Run-Whetstone 115 kV line with 1200 Amp Disconnects	PENELEC	$ 0.20
b1998	Install a 75 MVAR 115 kV Capacitor at Shawville	PENELEC	$ 1.50
b2008	Reconductor feeder 23032 and 23034 to high temp. conductor (10 miles)	PEPCO	$ 16.00
b2004	Replace the CTs and switch in South Akron Bay 4 to increase the rating	PPL	$ 0.53
b2005	Replace the CTs and switch in SAKR Bay 3 to increase the rating of the Millwood-South Akron 230 kV Line and of the rating in Bay 3	PPL	$ 0.53
b2006	Install North Lancaster 500/230 kV substation	PPL	$ 42.00
b2007	Install a 90 MVAR capacitor bank at the Frackville 230 kV Substation	PPL	$ 3.00

Appendix: Baseline Cost Allocation

Upgrade ID	Description	Cost Estimate	Transmission Owner	Required IS Date
b1840	Install a new Buckhannon - Weston 138 kV line	$ 17.50	APS	6/1/2016
b1906.2	Install a 2nd 230/115 kV TX at Yadkin	$ 5.00	Dominion	6/1/2015
b1906.3	Install a 2nd 230/115 kV TX at Chesapeake	$ 5.00	Dominion	6/1/2015
b1906.4	Uprate Yadkin – Chesapeake 115 kV	$ 10.00	Dominion	6/1/2015
b1906.5	Install a third 500/230 kV TX at Yadkin	$ 16.00	Dominion	6/1/2016
b1910	Build a Suffolk – Yadkin 230 kV line (14 miles) and install 4 breakers	$ 40.00	Dominion	6/1/2016
b1913	Convert Eastlake units 1, 2, 3, 4 and 5 to synchronous condensers	$ 100.00	ATSI	6/1/2015
b1914	Convert Lakeshore 18 to a synchronous condenser	$ 20.00	ATSI	6/1/2015
b1915	Install a 50 MVAR capacitor bank at the Maclean 138 kV station	$ 3.00	ATSI	6/1/2013
b1916	Install a 345/138 kV transformer at the Inland Q-11 station	$ 7.20	ATSI	6/1/2013
b1917	Install a 138 kV circuit breaker at the Inland Q-11 station	$ 0.90	ATSI	6/1/2013
b1918	Upgrade terminal equipment on the Avon – Crestwood 138 kV line	$ 0.30	ATSI	6/1/2013
b1919	Re-conductor the Galion – Leaside 138 kV line with 336 ACSS	$ 4.90	ATSI	6/1/2014
b1921	Install a 2nd 345/138 kV transformer at the Allen Junction station	$ 7.20	ATSI	6/1/2014
b1922	Install a 2nd 345/138 kV transformer at the Bayshore station	$ 7.20	ATSI	6/1/2014
b1923	Create a new Northfield Area 345 kV switching station by looping in	$ 37.50	ATSI	6/1/2015
b1924	Build a new Mansfield - Northfield Area 345 kV line	$ 184.50	ATSI	6/1/2015
b1925	Create a new Harmon 345/138/69 kV substation by looping in the Star	$ 46.00	ATSI	6/1/2015
b1926	Build a new Harmon – Brookside + Harmon - Longview 138 kV line	$ 9.20	ATSI	6/1/2015
b1927	Create a new Five Points Area 345/138 kV substation by looping in	$ 30.00	ATSI	6/1/2015
b1928	Install a 50 MVAR capacitor at Hayes 138 kV	$ 1.50	ATSI	6/1/2015
b1929	Install a 138/69 kV transformer at the Avery station	$ 3.20	ATSI	6/1/2015
b1930	Increase design temperature limitation on the Avery – Hayes 138 kV	$ 0.13	ATSI	6/1/2015
b1931	Reconductor Cloverdale - Harmon #2 and #3 138 kV lines with 795	$ 3.60	ATSI	6/1/2015
b1932	Change the transformer tap settings on the Maclean 138/69 kV	$ 0.05	ATSI	6/1/2015
b1933	Replace 336.4 ACSR SCCIR at Richland to upgrade the Richland –	$ 0.04	ATSI	6/1/2015
b1934	Build a new 345/138 kV Substation at Niles	$ 32.00	ATSI	6/1/2015
b1934.1	Loop 1.2 miles of 345 kV into substation of the Highland – Shenango		ATSI	6/1/2015
b1934.2	New 345/138 kV transformer at Niles		ATSI	6/1/2015
b1936	Build new Allen Jct - Midway - Lemonye 345 kV line (48 miles of open	$ 86.30	ATSI	6/1/2016
b1937	Build a new Leroy Center 345/138 kV substation by looping in the	$ 46.00	ATSI	6/1/2016
b1938	Place a portion of the 138 kV Leroy Center 345/138 kV project into	$ 3.30	ATSI	6/1/2015
b1939	Reconductor the Barberton – West Akron 138 kV line with 477 ACSS	$ 4.23	ATSI	6/1/2016
b1942	Change the CT ratio at Millville to improve the Millville – Old Chapel 138	$ 0.05	APS	6/1/2015
b1943	Construct a 115 kV ring bus at Claysburg Substation. Bedford North	$ 5.25	PENELEC	6/1/2015
b1944	Reconductor Eclipse substation 115 kV bus with 1033 kcmil	$ 0.15	PENELEC	6/1/2013
b1945	Install second 230/115 kV autotransformer at Johnstown	$ 4.50	PENELEC	6/1/2015
b1946	Perform a sag study on the Brues – West Bellaire 138 kV line	$ 0.03	AEP	12/1/2014
b1947	A sag study of the Dequine - Meadowlake 345 kV line #1 line may improve the emergency rating to 1400 MVA	$ 0.01	AEP	12/1/2013
b1949	Perform a sag study on the Grant Tap – Deer Creek 138 kV line and replace bus and risers at Deer Creek station	$ 0.30	AEP	12/1/2014

Upgrade ID	Description	Cost Estimate	Transmission Owner	Required IS Date
b1950	Perform a sag study on the Kammer – Ormet 138 kV line of the conductor section	$ 0.10	AEP	12/1/2012
b1951	Perform a sag study of the Maddox- Convoy 345 kV line to improve the emergency rating to 1400 MVA	$ 0.03	AEP	12/1/2013
b1952	Perform a sag study of the Maddox – T130 345 kV line to improve the emergency rating to 1400 MVA	$ 0.03	AEP	12/1/2013
b1953	Perform a sag study of the Meadowlake - Olive 345 kV line to improve the emergency rating to 1400 MVA	$ 0.06	AEP	12/1/2013
b1954	Perform a sag study on the Milan - Harper 138 kV line and replace bus and switches at Milan Switch station	$ 0.35	AEP	12/1/2014
b1955	Perform a sag study of the R-049 - Tillman 138 kV line may improve the emergency rating to 245 MVA	$ 0.25	AEP	12/1/2014
b1956	Perform a sag study of the Tillman - Dawkins 138 kV line may improve the emergency rating to 245 MVA	$ 0.25	AEP	12/1/2013
b1958	Perform a sag study on the Brookside - Howard 138 kV line and replace bus and risers at AEP Howard station	$ 0.50	AEP	12/1/2014
b1960	Sag Study on 7.2 miles SE Canton-Canton Central 138kV ckt	$ 0.30	AEP	12/1/2012
b1961	Sag study on the Southeast Canton – Sunnyside 138kV line	$ 0.25	AEP	12/1/2012
b1963	Build approximately 1 mile of circuit comprising of 2-954 ACSR to get the rating of Waterford-Muskinum 345 kV higher	$ 3.50	AEP	12/1/2013
b1965	Install a 44 MVAR 138 kV capacitor at Luxor substation	$ 1.50	APS	6/1/2014
b1966	Replace the 1200 Amp Line trap at Lewistown on the Raystown-	$ 0.15	PENELEC	12/1/2013
b1967	Replace the Blairsville 138/115 kV transformer	$ 4.20	PENELEC	6/1/2014
b1968	Establish operating procedure such that breaker 89, connecting	$ -	DL	6/1/2012
b1971	Perform a sag study to improve the emergency rating on the Bridgville – Chandlersville 138 kV line	$ 0.05	AEP	12/1/2014
b1972	Replace disconnect switch on the South Canton 765/345 kV transformer	$ 0.30	AEP	12/1/2014
b1973	Perform a sag study to improve the emergency rating on the Carrollton – Sunnyside 138 kV line	$ 0.05	AEP	12/1/2014
b1974	Perform a sag study to improve the emergency rating on the Bethel Church – West Dover 138 kV line	$ 0.03	AEP	12/1/2014
b1975	Replace a switch at South Millersburg switch station	$ 0.20	AEP	12/1/2014
b1978	Reconductor Inland – Clinic Health Q-11 138 kV line	$ 1.10	ATSI	6/1/2015
b1981	Replace relay on the Highland – G689 138 kV line	$ 0.05	ATSI	12/31/2012
b1982	Reconductor the Hoytdale – Newcastle 138 kV lines #1 and #2 with	$ 4.80	ATSI	6/1/2015
b1983	Add 150 MVAR SVC and a 100 MVAR capacitor at New Castle	$ 31.70	ATSI	6/1/2015
b1984	Install a 50 MVAR capacitor at the Boardman 138 kV bus	$ 1.70	ATSI	6/1/2015
b1985	Upgrade the Duquesne portion of the Elrama – Mitchell 138 kV line	TBD	DL	4/16/2015
b1986	Upgrade the AP portion of the Elrama – Mitchell 138 kV line by replace	$ 0.05	APS	6/1/2015
b1987	Reconductor the Osage-Collins Ferry 138 kV line with 795 ACSS.	$ 1.80	APS	6/1/2015
b1988	Raise structures between Lake Lynn and West Run to eliminate the	$ 0.32	APS	6/1/2015
b1989	Raise structures between Collins Ferry and West Run to eliminate the	$ 0.32	APS	6/1/2015

Upgrade ID	Description	Cost Estimate	Transmission Owner	Required IS Date
b1990	Install a 25 MVAR 115 kV Capacitor at Grandview	$ 0.90	PENELEC	6/1/2015
b1991	Construct Farmers Valley 345/230 kV and 230/115 kV substation.	$ 29.50	PENELEC	6/1/2015
b1992	Reconductor Cambria Slope-Summit 115kV with 795 ACSS Conductor	$ 4.80	PENELEC	6/1/2015
b1995	Change CT Ratio at Claysburg	$ 0.00	PENELEC	6/1/2015
b1996.1	Replace 600 Amp Disconnect Switches on Ridgeway-Whetstone 115	$ 0.50	PENELEC	6/1/2015
b1996.2	Reconductor Ridgway and Whetstone 115 kV Bus.	$ 0.20	PENELEC	6/1/2015
b1996.3	Replace Wave Trap at Ridgway.		PENELEC	6/1/2015
b1996.4	Change CT Ratio at Ridgway		PENELEC	6/1/2015
b1997	Replace 600 Amp Disconnect Switches on Dubois-Harvey Run-	$ 0.20	PENELEC	6/1/2015
b1998	Install a 75 MVAR 115 kV Capacitor at Shawville	$ 1.50	PENELEC	6/1/2015
b1999	Replace limiting wave trap, circuit breaker, substation conductor,	$ 0.90	ME	6/1/2015
b2000	Replace limiting wave trap on the Glendon - Hosensack line	$ 0.05	ME	6/1/2015
b2001	Replace limiting circuit breaker and substation conductor transformer	$ 0.40	ME	6/1/2015
b2002	Northwood 230/115 kV Transformer upgrade	$ 4.00	ME	6/1/2015
b2003	Construct a Whippany to Montville 230 kV line (6.4 miles)	$ 37.50	JCPL	6/1/2015
b2004	Replace the CTs and switch in South Akron Bay 4 to increase the	$ 0.53	PPL	6/1/2014
b2005	Replace the CTs and switch in SAKR Bay 3 to increase the rating of	$ 0.53	PPL	6/1/2014
b2007	Install a 90 MVAR capacitor bank at the Frackville 230 kV Substation	$ 3.00	PPL	6/1/2015

Upgrade ID	Description	Multi-Zone Cost Allocation	Required IS Date
b1905.1	Surry to Skiffes Creek 500 kV Line (7 miles overhead)	AEC - 1.83%, AEP - 15.12%, APS - 5.53%, ATSI - 8.65%, BGE - 4.46%, ComEd - 14.64%, ConEd - 0.55%, Dayton - 2.21%, DL - 1.85%, DPL - 2.61%, Dominion - 12.38%, ECP - 0.19%, JCPL - 4.07%, ME - 1.92%, Neptune - 0.41%, PECO - 5.54%, PENELEC - 1.93%, PEPCO - 4.33%, PPL - 4.77%, PSEG - 6.74%, RE - 0.27%,	6/1/2015
b1905.2	Surry 500 kV Station Work	AEC - 1.83%, AEP - 15.12%, APS - 5.53%, ATSI - 8.65%, BGE - 4.46%, ComEd - 14.64%, ConEd - 0.55%, Dayton - 2.21%, DL - 1.85%, DPL - 2.61%, Dominion - 12.38%, ECP - 0.19%, JCPL - 4.07%, ME - 1.92%, Neptune - 0.41%, PECO - 5.54%, PENELEC - 1.93%, PEPCO - 4.33%, PPL - 4.77%, PSEG - 6.74%, RE - 0.27%,	6/1/2015
b1905.3	Skiffes Creek 500-230 kV Tx and Switching Station	Dominion - 99.84%, PEPCO - 0.16%,	6/1/2015
b1905.4	New Skiffes Creek - Whealton 230 kV line	Dominion - 99.84%, PEPCO - 0.16%,	6/1/2016
b1905.5	Whealton 230 kV breakers	Dominion - 99.84%, PEPCO - 0.16%,	6/1/2016
b1905.6	Yorktown 230 kV work	Dominion - 99.84%, PEPCO - 0.16%,	6/1/2016
b1905.7	Lanexa 115 kV work	Dominion - 99.84%, PEPCO - 0.16%,	6/1/2016
b1905.8	Surry 230 kV work	Dominion - 99.84%, PEPCO - 0.16%,	6/1/2016
b1905.9	Kings Mill, Peninmen, Toano, Waller, Warwick	Dominion - 99.84%, PEPCO - 0.16%,	6/1/2016
b1906.1	At Yadkin 500 kV, install six 500 kV breakers	AEC - 1.83%, AEP - 15.12%, APS - 5.53%, ATSI - 8.65%, BGE - 4.46%, ComEd - 14.64%, ConEd - 0.55%, Dayton - 2.21%, DL - 1.85%, DPL - 2.61%, Dominion - 12.38%, ECP - 0.19%, JCPL - 4.07%, ME - 1.92%, Neptune - 0.41%, PECO - 5.54%, PENELEC - 1.93%, PEPCO - 4.33%, PPL - 4.77%, PSEG - 6.74%, RE - 0.27%,	6/1/2016
b1907	Install a 3rd 500/230 kV TX at Clover	APS - 5.83%, BGE - 4.74%, Dominion - 81.79%, PEPCO - 7.64%,	6/1/2016

Upgrade ID	Description	Multi-Zone Cost Allocation	Required IS Date
b1908	Rebuild Lexington – Dooms 500 kV	AEC - 1.83%, AEP - 15.12%, APS - 5.53%, ATSI - 8.65%, BGE - 4.46%, ComEd - 14.64%, ConEd - 0.55%, Dayton - 2.21%, DL - 1.85%, DPL - 2.61%, Dominion - 12.38%, ECP - 0.19%, JCPL - 4.07%, ME - 1.92%, Neptune - 0.41%, PECO - 5.54%, PENELEC - 1.93%, PEPCO - 4.33%, PPL - 4.77%, PSEG - 6.74%, RE - 0.27%,	6/1/2016
b1909	Uprate Bremo – Midlothian 230 kV to its maximum operating temperature	APS - 6.31%, BGE - 3.81%, Dominion - 81.9%, PEPCO - 7.98%,	6/1/2016
b1911	Add a second Valley 500/230 kV TX	APS - 14.85%, BGE - 3.1%, Dominion - 74.12%, PEPCO - 7.93%,	6/1/2016
b1912	Install a 500 MVAR SVC at Landstown 230 kV	DEOK - 0.46%, Dominion - 99.54%,	6/1/2016
b1920	Re-conductor the Galion – GM Mansfield – Ontario - Cairns 138 kV line with 477 ACSS	ATSI - 94.47%, DL - 2.9%, PENELEC - 2.63%,	6/1/2014
b1935	ATSI-AEP 138 kV Substation on near territory border + 138 kV from new substation to Longview approx. 8 miles	ATSI - 94.9%, DL - 2.97%, PENELEC - 2.13%,	
b1941	Loop the Homer City-Handsome Lake 345 kV line into the Armstrong substation and install a 345/138 kV transformer at Armstrong	APS - 67.86%, PENELEC - 32.14%,	6/1/2014
b1948	Establish a new 765/345 interconnection at Sporn. Install a 765/345 kV transformer at Mountaineer and build ¾ mile of 345 kV to Sporn	ATSI - 61.08%, DL - 21.87%, Dominion - 13.97%, PENELEC - 3.08%,	6/1/2015
b1957	Terminate Transformer #2 at SW Lima in a new bay position	AEP - 69.41%, ATSI - 23.11%, ECP - 0.17%, HTP - 0.19%, PENELEC - 2.42%, PSEG - 4.52%, RE - 0.18%,	12/1/2014
b1959	Build a new West Fremont-Groton-Hayes 138kV line	APS - 4.24%, ATSI - 87.76%, DL - 4.27%, PENELEC - 3.73%,	6/1/2018

Upgrade ID	Description	Multi-Zone Cost Allocation	Required IS Date
b1962	Add four 765 kV breakers at Kammer	AEC - 1.83%, AEP - 15.12%, APS - 5.53%, ATSI - 8.65%, BGE - 4.46%, ComEd - 14.64%, ConEd - 0.55%, Dayton - 2.21%, DL - 1.85%, DPL - 2.61%, Dominion - 12.38%, ECP - 0.19%, JCPL - 4.07%, ME - 1.92%, Neptune - 0.41%, PECO - 5.54%, PENELEC - 1.93%, PEPCO - 4.33%, PPL - 4.77%, PSEG - 6.74%, RE - 0.27%,	6/1/2015
b1964	Convert Moshannon substation to a 4 breaker 230 kV ring bus	APS - 41.06%, DPL - 6.68%, JCPL - 5.48%, ME - 10.7%, Neptune - 0.53%, PECO - 15.53%, PPL - 20.02%,	6/1/2014
b1969	Install a third 345-138 kV autotransformer at Collier Substation. Currently s0321 and will be converted to baseline.	APS - 18.69%, DL - 81.31%,	6/1/2013
b1970	Reconductor 13 miles of the Kammer – West Bellaire 345kV circuit	APS - 33.51%, ATSI - 32.21%, DL - 18.64%, Dominion - 6.01%, ECP - 0.1%, HTP - 0.11%, JCPL - 1.68%, Neptune - 0.18%, PENELEC - 4.58%, PSEG - 2.87%, RE - 0.11%,	6/1/2014
b1976	Reconductor ATSI portion of South Canton – Harmon 345 kV line	ATSI - 88.77%, ECP - 0.12%, HTP - 0.14%, JCPL - 1.24%, Neptune - 0.13%, PENELEC - 6.54%, PSEG - 2.94%, RE - 0.12%,	6/1/2015
b1977	Build new Toronto 345/138 kV substation by looping in the Sammis – Wylie Ridge 345 kV line and tie in four 138 kV lines	APS - 7%, ATSI - 88.14%, DL - 0.81%, PENELEC - 4.05%,	6/1/2017
b1977.1	Build a new Toronto-Harmon 345kV line	APS - 7%, ATSI - 88.14%, DL - 0.81%, PENELEC - 4.05%,	6/1/2017
b1993	Relocate the Erie South 345 kV line terminal	APS - 10.09%, ECP - 0.45%, HTP - 0.49%, JCPL - 5.14%, Neptune - 0.54%, PENELEC - 70.71%, PSEG - 12.1%, RE - 0.48%,	6/1/2015
b1994	Convert Lewis Run-Farmers Valley to 230 kV using 1033.5 ACSR conductor. Project to be completed in conjunction with new Farmers Valley 345/230 kV transformation	APS - 33.2%, ECP - 0.44%, HTP - 0.44%, JCPL - 8.64%, ME - 5.52%, Neptune - 0.86%, PENELEC - 36.81%, PSEG - 13.55%, RE - 0.54%,	6/1/2015
b2006	Install North Lancaster 500/230 kV substation	AEC - 1.1%, ECP - 0.37%, HTP - 0.37%, JCPL - 9.61%, ME - 19.42%, Neptune - 0.75%, PECO - 6.01%, PPL - 50.57%, PSEG - 11.35%, RE - 0.45%,	6/1/2017
b2008	Reconductor feeder 23032 and 23034 to high temp. conductor (10 miles)	BGE - 33.05%, DPL - 1.38%, PECO - 1.35%, PEPCO - 64.22%,	6/1/2015

I. NECESSITY FOR THE PROPOSED PROJECT

D. Describe any lines or facilities which will be removed, replaced, or taken out of service upon completion of the proposed project.

Response: See Section II.A.3 for right-of-way cross sections depicting the facility changes described below.

500 kV Proposed Route (Surry-Skiffes Creek):

Line #582 is proposed to be built between Surry Switching Station and Skiffes Creek Switching Station along the Proposed Route. See 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 structures to support new Line #582 with 115 kV underbuild to support existing Line #34 with new conductor and shield wire. See Attachments II.A.3.E and F. Continuing, 0.51 mile of double circuit galvanized structures will be removed and replaced with double circuit 500 kV structures to support new Line #582 with 115 kV underbuild to carry existing Line #34 along with new conductor and shield wire. See 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.

500 kV Alternate Route (Chickahominy-Skiffes Creek):

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 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 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 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 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 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.

230 kV Skiffes Creek-Whealton Line:

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 structures 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 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 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 structures 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 Attachments II.A.3.s through x.

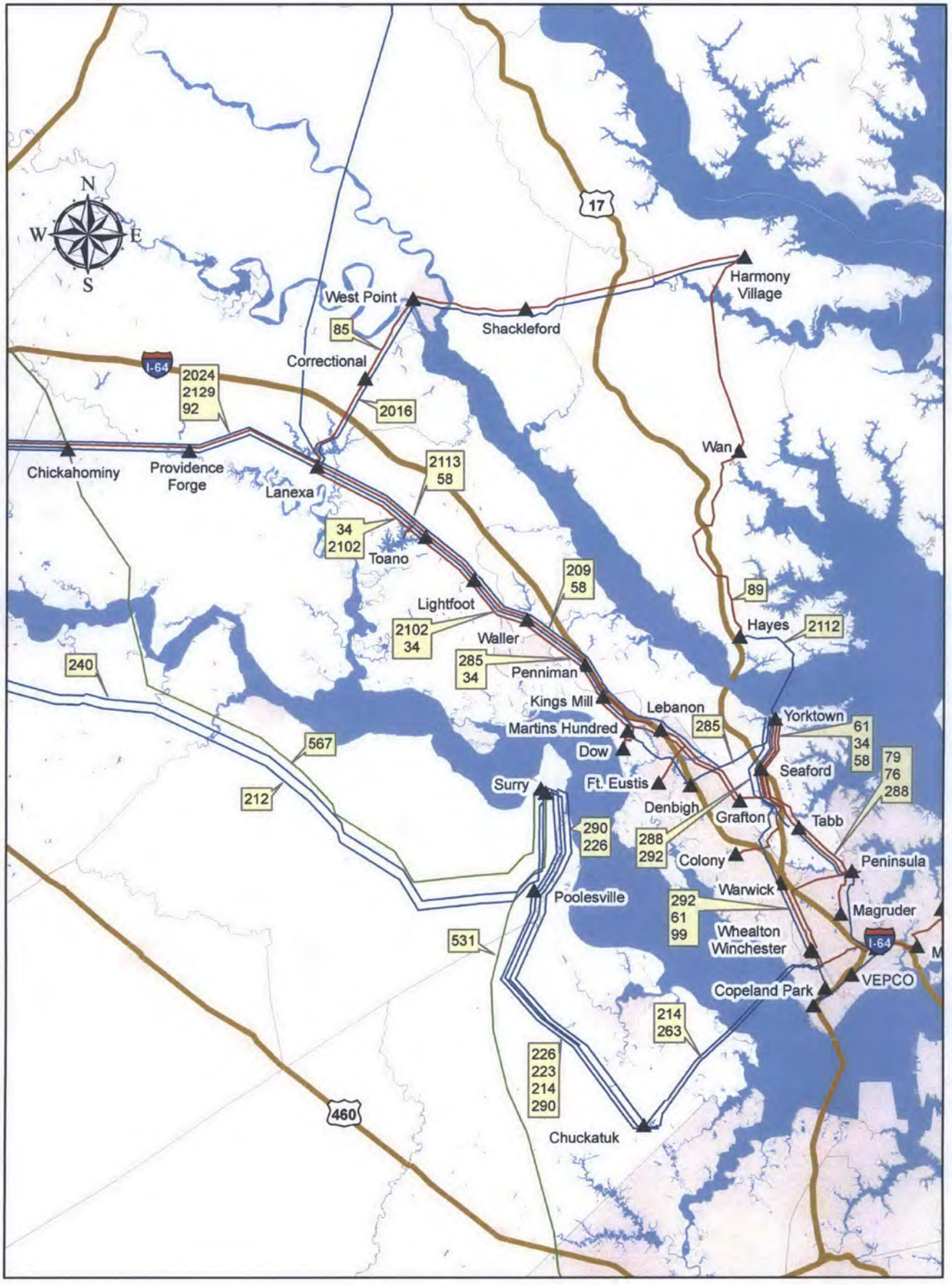
Between Harwoods Mill Junction and Union Carbide Tap are portions of Yorktown-Whealton Line #61 and Yorktown-Whealton Line #292. Approximately 6.12 miles of double circuit weathering steel lattice structures will be replaced with double circuit weathering steel monopoles and several single circuit weathering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

I. NECESSITY FOR THE PROPOSED PROJECT

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

Response: See Attachments I.E.1 (map of the existing transmission system in the area), I.E.2 (map of the transmission system in the area with the proposed Project using the 500 kV Proposed Route), and I.E.3 (map of the transmission system in the area with the proposed Project using the 500 kV Alternate Route).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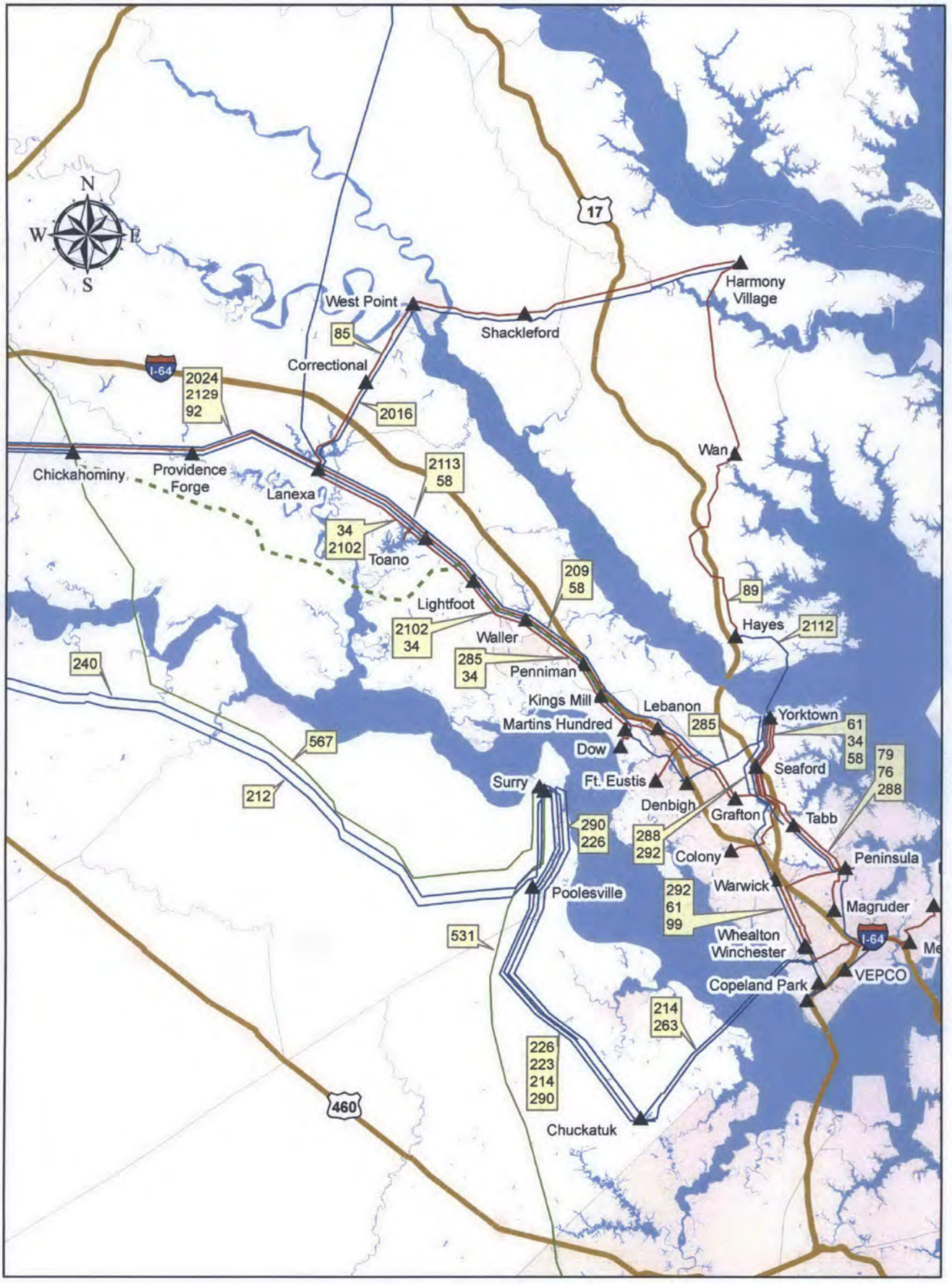
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I. NECESSITY FOR THE PROPOSED PROJECT

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

Response: 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.

I. NECESSITY FOR THE PROPOSED PROJECT

G. Provide the estimated cost of the project.

Response: The estimated total cost of the proposed Project using the 500 kV Proposed Route (Surry-Skiffes Creek) is $150.6 million (2011 dollars), comprised of the following components:

500 kV Line	$56.3 million[7]	
230 kV Line	$46.4 million	
Total Transmission Line	$102.7 million	
Skiffes Creek Switching Station	$43.8 million	
Surry Switching Station	$ 1.7 million	
Whealton Substation	$ 2.0 million	
Lanexa and Yorktown Substations	$ 0.4 million	
Total Switching Station/Substation	$47.9 million	
TOTAL PROJECT		$150.6 million

The estimated total cost of the proposed Project using the 500 kV Alternate Route (Chickahominy-Skiffes Creek) is $213.2 million (2011 dollars), comprised of the following components:

500 kV Line	$115.5 million	
230 kV Line	$ 46.4 million	
Total Transmission Line	$161.9 million	
Skiffes Creek Switching Station	$43.8 million	
Chickahominy Substation	$5.0 million	
Whealton Substation	$2.0 million	
Other Substations	$0.5 million[8]	
Total Switching Station/Substation		$51.3 million
TOTAL PROJECT		$213.2 million

[7] The estimated cost for the 500 kV Proposed Route (Surry-Skiffes Creek) using the James River Crossing Variation 1 is approximately $61.1 million, for an estimated total cost of the Project of $155.4 million; James River Crossing Variation 2 is approximately $58.7 million, for an estimated total cost of the Project of $153.0 million; and James River Crossing Variation 3 is approximately $60.2 million, for an estimated total cost of the Project of $154.5 million

[8] Substations include Kingsmill, Toano, Penniman, Waller, Warwick, Lanexa, and Yorktown.

I. NECESSITY FOR THE PROPOSED PROJECT

H. In addition to all other information required by these guidelines, applications for approval to construct facilities and transmission lines inter-connecting a Non Utility Generator (NUG) and a utility shall include the following information.

1. The full name of the NUG as it appears in its contract with the utility and the dates of the initial contract and any amendments;

2. A description of the arrangements for financing the facilities, including information on the allocation of costs between the utility and the NUG;

3. a. For Qualifying Facilities (QFs) certificated by Federal Energy Regulatory Commission (FERC) order, provide the QF or docket number, the dates of all certification or recertification orders, and the citation to FERC Reports, if available;

b. For self-certificated QFs, provide a copy of the notice filed with the FERC;

4. In addition to the information required in 3a or 3b, provide the project number and project name used by the FERC in licensing hydroelectric projects, also provide the dates of all orders and citations to FERC Reports, if available; and

5. If the name provided in 1 above differs from the name provided in 3 above, give a full explanation.

Response: Not applicable.

I. NECESSITY FOR THE PROPOSED PROJECT

I. Describe the new and existing generating sources, distribution circuits or load centers planned to be served by all new substations, switching stations and other ground facilities associated with the proposed project.

Response: There are no new or existing generation sources planned to be served by the proposed Project. For a description of the load centers to be served by the Project, see Sections I.A and I.B.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (ROW)

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

Response: The 500 kV Proposed Route (Surry-Skiffes Creek) is approximately 7.4 miles long. The 500 kV Proposed Route (Surry-Skiffes Creek) utilizing the James River Crossing Variation 1 is 8.0 miles long, utilizing the James River Crossing Variation 2 is 7.2 miles long, and utilizing the James River Crossing Variation 3 is 7.5 miles long.

The 500 kV Alternate Route (Chickahominy-Skiffes Creek) is approximately 37.9 miles long.

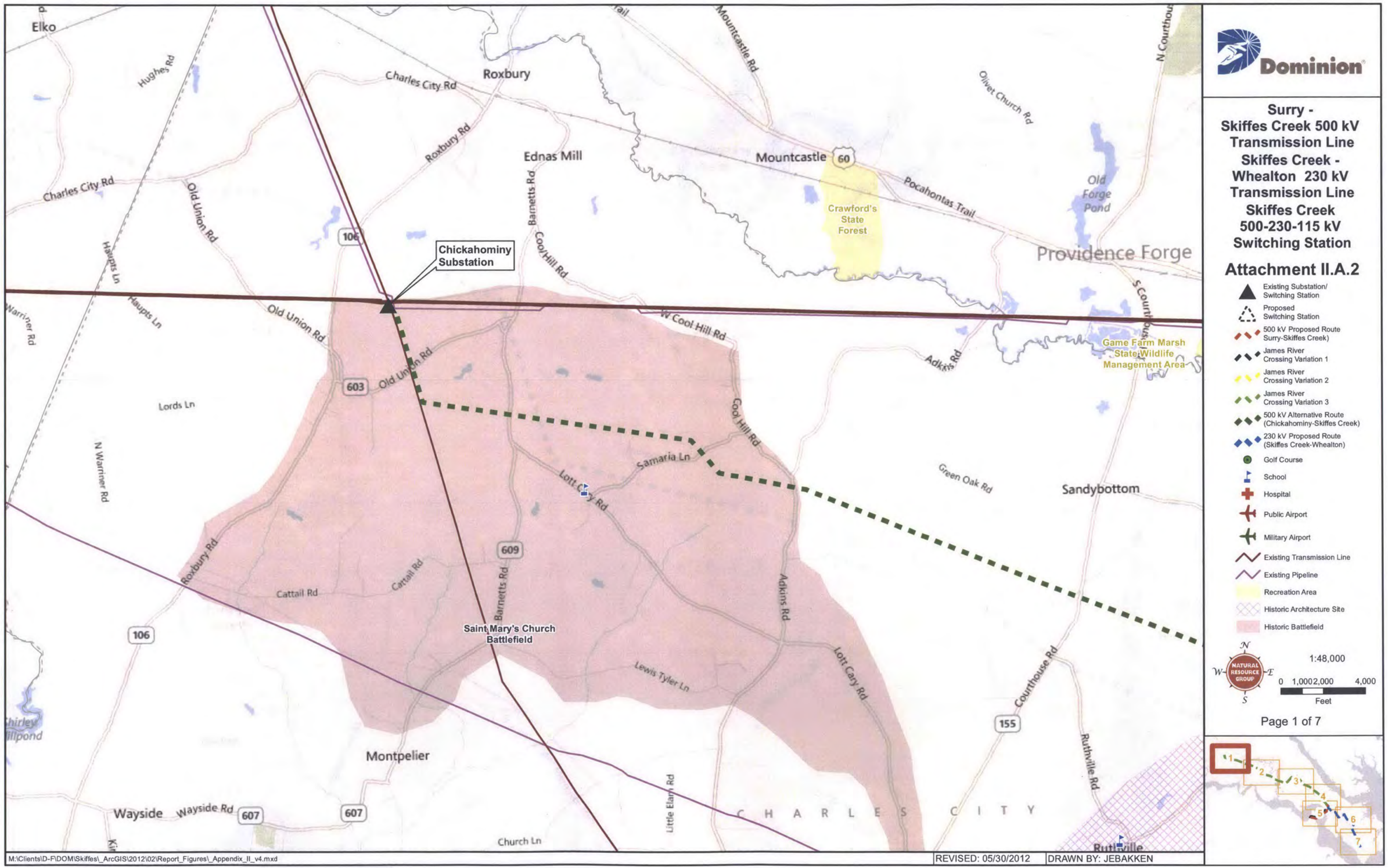
The proposed 230 kV Skiffes Creek-Whealton Line #2138 is approximately 20.2 miles long.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (ROW)

2. Provide a map of suitable scale showing the route of the proposed line and its relation to: the facilities of other public utilities which could influence the route selection, highways, streets, parks and recreational areas, scenic and historic areas, schools, convalescent centers, hospitals, airports and other notable structures close to the proposed project. Indicate the existing facilities which the line is proposed to follow, such as existing ROW, railroad tracks, etc.;

Response: See Attachment II.A.2.



Dominion

Surry - Skiffes Creek 500 kV Transmission Line
Skiffes Creek - Whealton 230 kV Transmission Line
Skiffes Creek 500-230-115 kV Switching Station

Attachment II.A.2

- Existing Substation/ Switching Station
- Proposed Switching Station
- 500 kV Proposed Route Surry-Skiffes Creek)
- James River Crossing Variation 1
- James River Crossing Variation 2
- James River Crossing Variation 3
- 500 kV Alternative Route (Chickahominy-Skiffes Creek)
- 230 kV Proposed Route (Skiffes Creek-Whealton)
- Golf Course
- School
- Hospital
- Public Airport
- Military Airport
- Existing Transmission Line
- Existing Pipeline
- Recreation Area
- Historic Architecture Site
- Historic Battlefield

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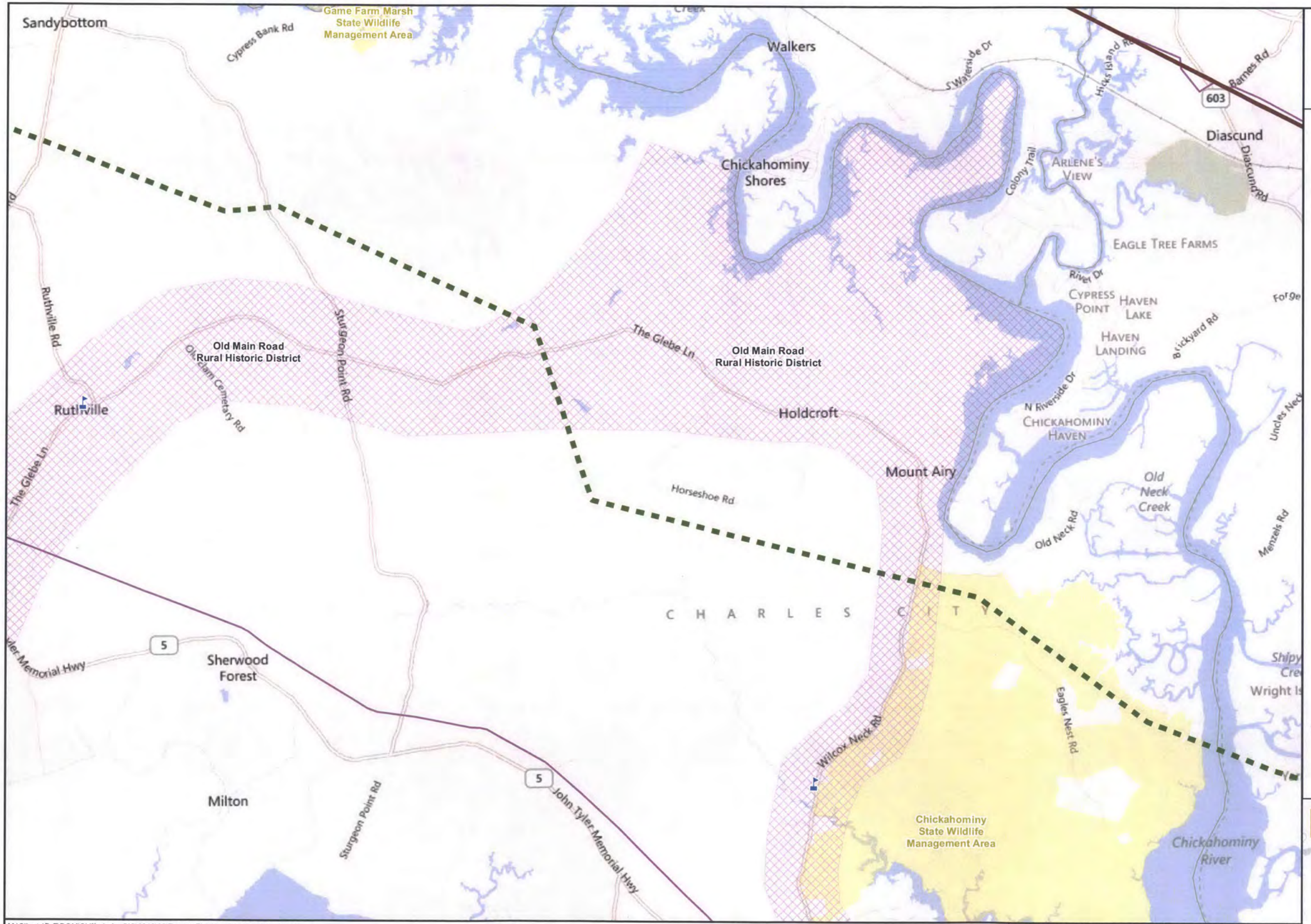

Dominion

Surry - Skiffes Creek 500 kV Transmission Line
Skiffes Creek - Whealton 230 kV Transmission Line
Skiffes Creek 500-230-115 kV Switching Station

Attachment II.A.2

- Existing Substation/ Switching Station
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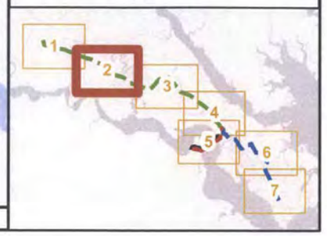

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Dominion

Surry - Skiffes Creek 500 kV Transmission Line
Skiffes Creek - Whealton 230 kV Transmission Line
Skiffes Creek 500-230-115 kV Switching Station

Attachment II.A.2

- Existing Substation/ Switching Station
- Proposed Switching Station
- 500 kV Proposed Route Surry-Skiffes Creek)
- James River Crossing Variation 1
- James River Crossing Variation 2
- James River Crossing Variation 3
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Dominion

Surry - Skiffes Creek 500 kV Transmission Line
Skiffes Creek - Whealton 230 kV Transmission Line
Skiffes Creek 500-230-115 kV Switching Station

Attachment II.A.2

- Existing Substation/ Switching Station
- Proposed Switching Station
- 500 kV Proposed Route Surry-Skiffes Creek)
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- James River Crossing Variation 3
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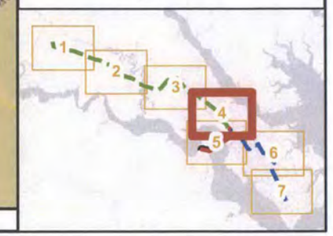

Dominion

Surry - Skiffes Creek 500 kV Transmission Line
Skiffes Creek - Whealton 230 kV Transmission Line
Skiffes Creek 500-230-115 kV Switching Station

Attachment II.A.2

- Existing Substation/ Switching Station
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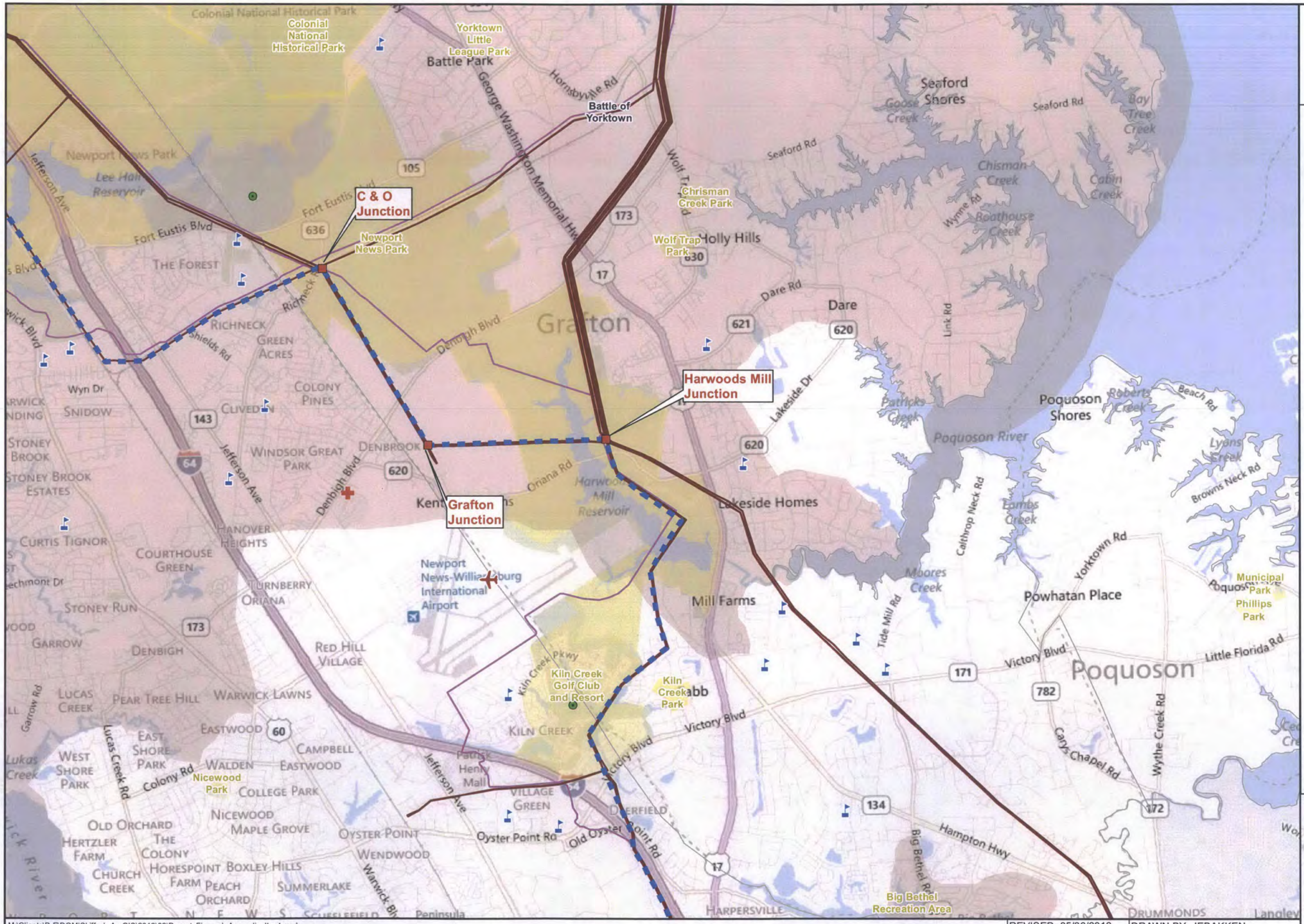

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Dominion

Surry - Skiffes Creek 500 kV Transmission Line
Skiffes Creek - Whealton 230 kV Transmission Line
Skiffes Creek 500-230-115 kV Switching Station

Attachment II.A.2

- Existing Substation/ Switching Station
- Proposed Switching Station
- 500 kV Proposed Route Surry-Skiffes Creek)
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- James River Crossing Variation 2
- James River Crossing Variation 3
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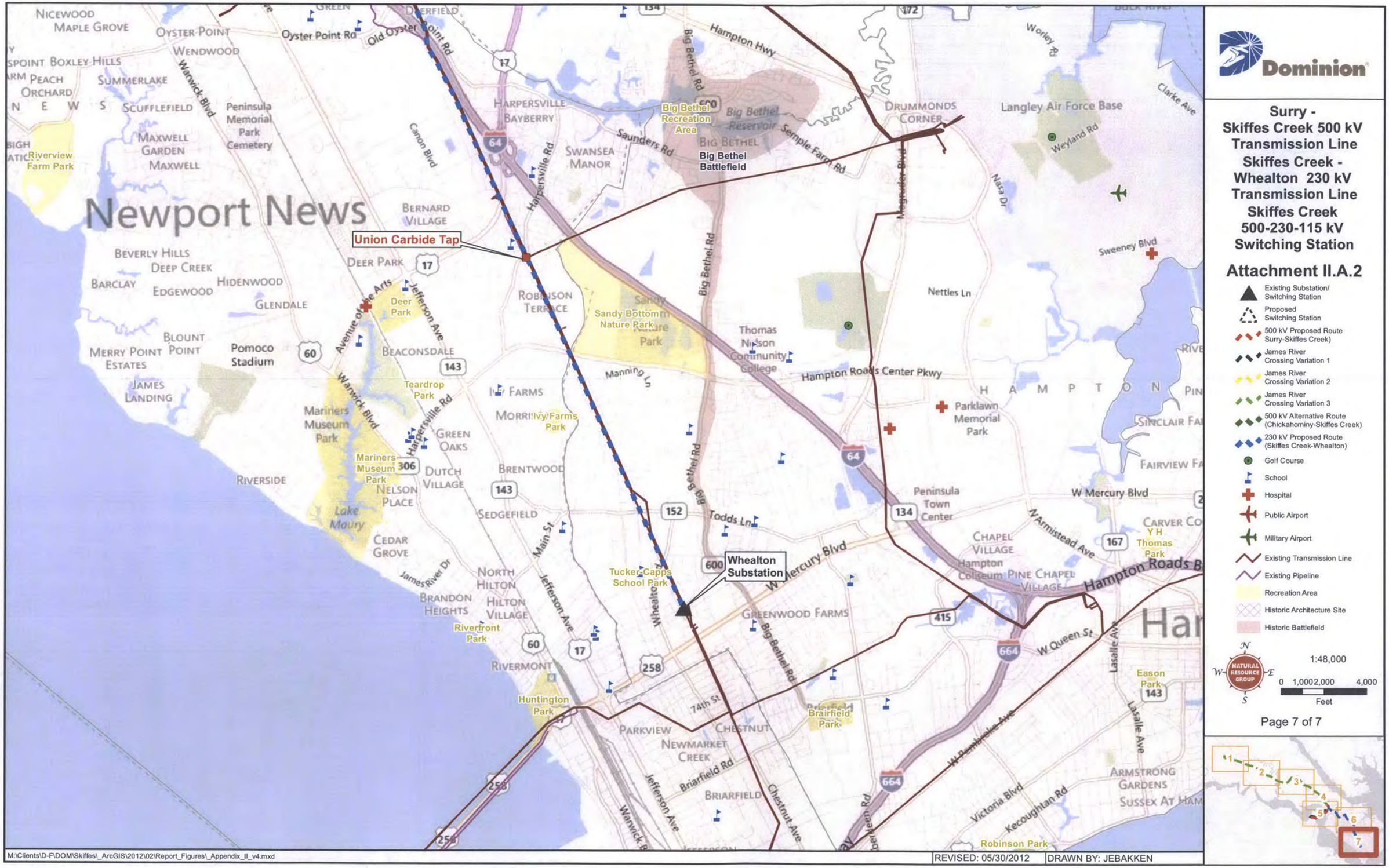

Dominion

Surry - Skiffes Creek 500 kV Transmission Line
Skiffes Creek - Whealton 230 kV Transmission Line
Skiffes Creek 500-230-115 kV Switching Station

Attachment II.A.2

- Existing Substation/ Switching Station
- Proposed Switching Station
- 500 kV Proposed Route Surry-Skiffes Creek)
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II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (ROW)

3. Provide a drawing(s) of the ROW cross section showing typical transmission line structure placements referenced to the edge of the right-of-way. This drawing should include:

a. ROW width for each cross section drawing;

b. Lateral distance between the conductors and edge of ROW; and

c. Existing utility facilities on the ROW.

Response: See Attachments II.A.3.A-J for the 500 kV Proposed Route (Surry-Skiffes Creek).

See Attachments II.A.3.V1-1 thru V1-4 for the 500 kV James River Crossing Variation 1.

See Attachments II.A.3.V2-1 thru V2-4 for the 500 kV James River Crossing Variation 2.

See Attachments II.A.3.V3-1 thru V3-4 for the 500 kV James River Crossing Variation 3.

See Attachments II.A.3.AA-PP for the 500 kV Alternate Route (Chickahominy-Skiffes Creek).

See Attachments II.A.3.a-ll for the proposed 230 kV Skiffes Creek-Whealton line.

For maps of the Project showing mileposts and locational references corresponding to the above-referenced attachments, see Appendix H and Appendix I of the Environmental Routing Study prepared by Natural Resource Group, LLC ("NRG") included as part of the application materials. The following provides a guide to the location references and abbreviated terms used in the above-referenced attachments and maps:

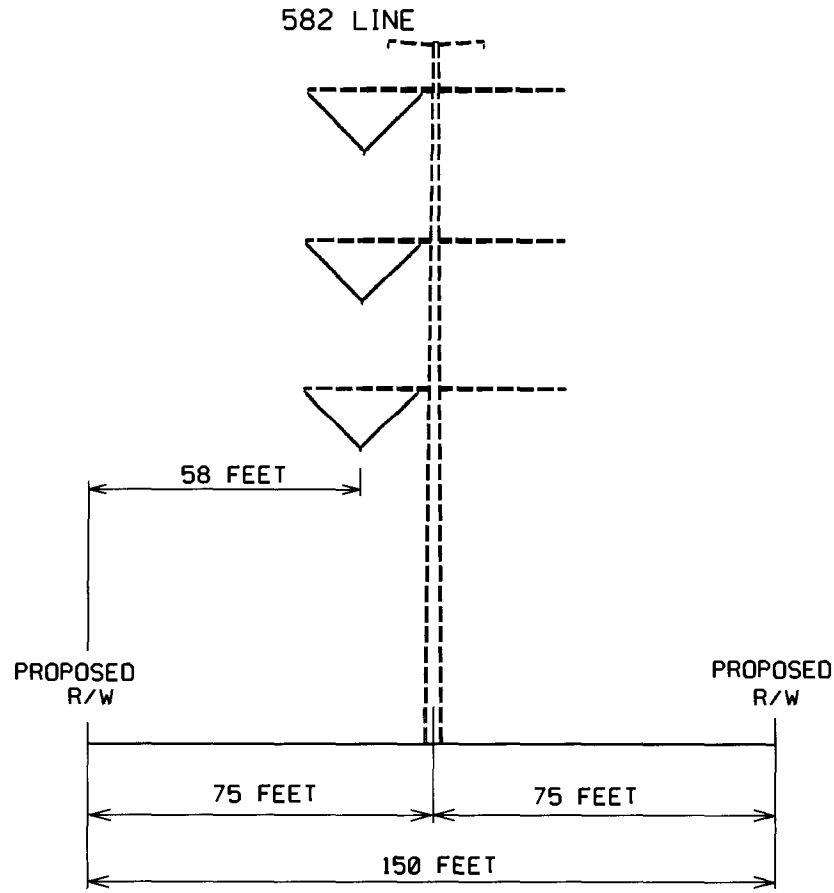
Abbreviated terms:

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 0.0
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

(S) MP 0.00 to 1.60



PROPOSED CONFIGURATION

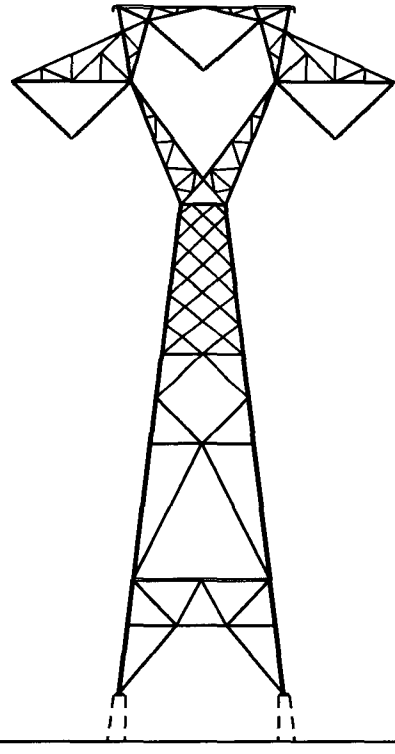
TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	GALVANIZED POLE
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	155 FEET
WIDTH AT CROSSARM:	60 FEET
WIDTH AT BASE:	7 FEET
AVERAGE SPAN LENGTH:	655 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	150 FEET
APPROXIMATE LENGTH:	1.60 MILES

$DGNSPEC$

(S) MP 1.60 to 2.72, 3.20 to 3.90 & 4.40 to 5.07

582 LINE



JAMES RIVER CROSSING

PROPOSED CONFIGURATION

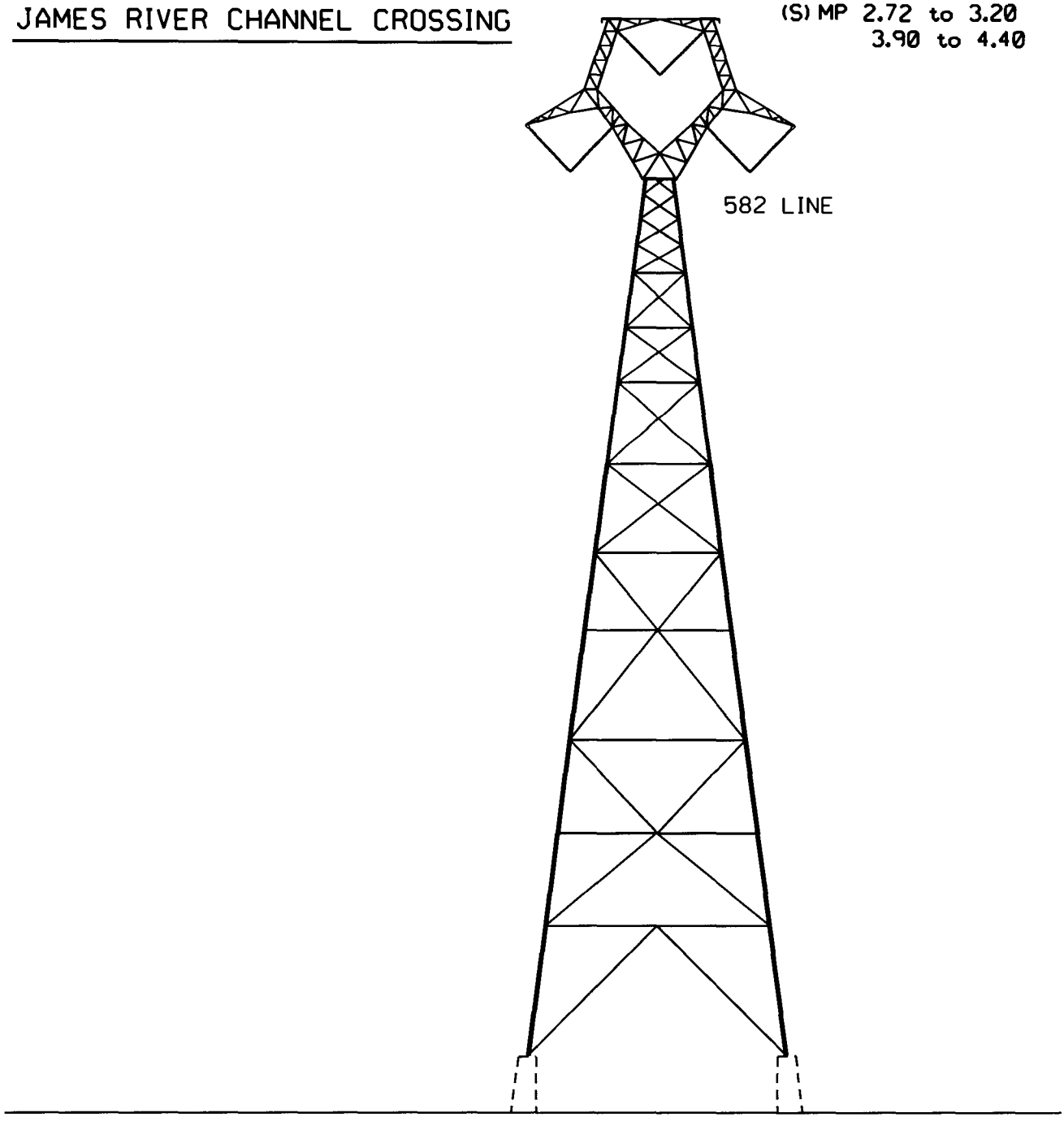
TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	160 FEET (INCLUDES FOUNDATION)
WIDTH AT CROSSARM:	84 FEET
WIDTH AT BASE:	38 FEET
AVERAGE SPAN LENGTH:	1400 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	BY PERMIT
APPROXIMATE LENGTH:	2.49 MILES

$DGNSPEC$

JAMES RIVER CHANNEL CROSSING

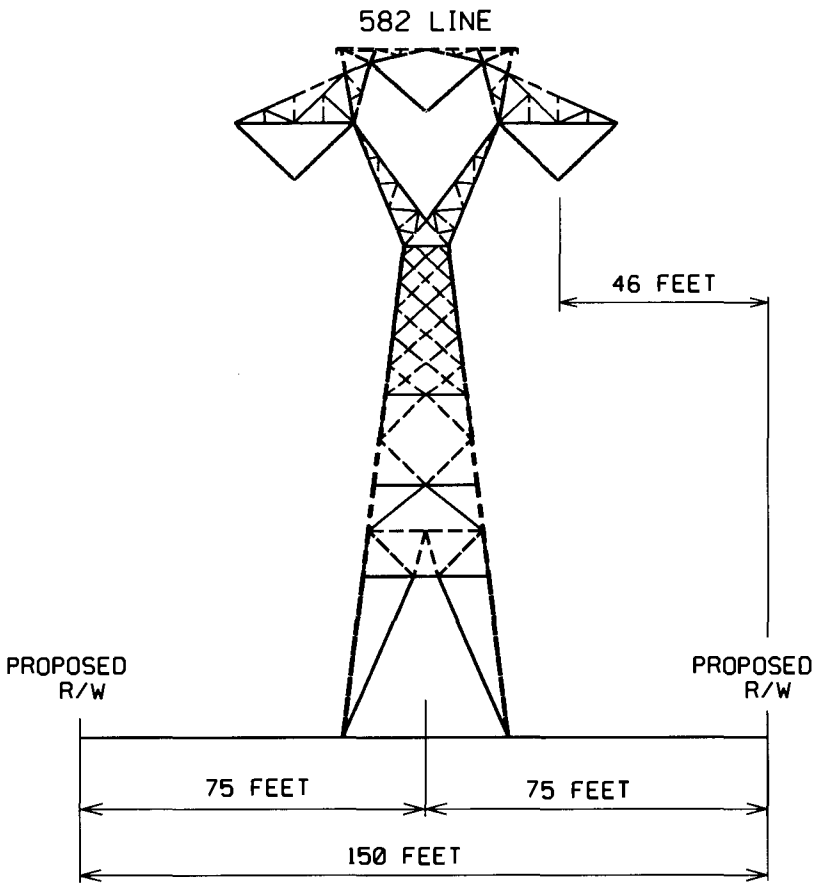
(S) MP 2.72 to 3.20
3.90 to 4.40



TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	295 FEET (INCLUDES FOUNDATION)
AVERAGE SPAN LENGTH:	1400 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	BY PERMIT
APPROXIMATE LENGTH:	0.98 MILES

$DGNSPEC$

(S) MP 5.07 to 5.73



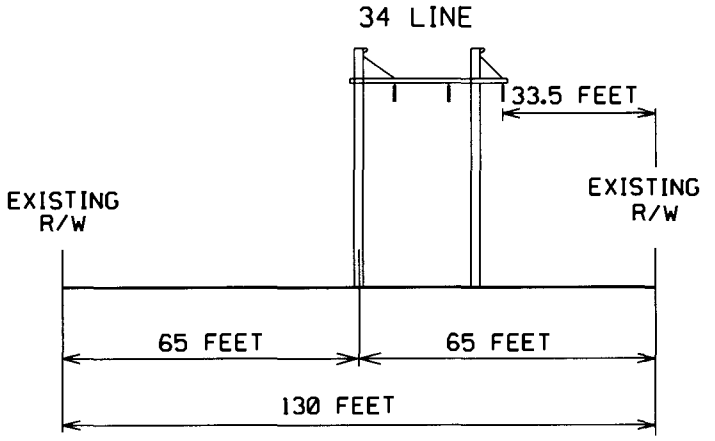
PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	150 FEET
WIDTH AT CROSSARM:	84 FEET
WIDTH AT BASE:	36 FEET
AVERAGE SPAN LENGTH:	1000 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	150 FEET
APPROXIMATE LENGTH:	0.66 MILES

$DGNSPEC$

(S) MP 5.73 to 6.70



EXISTING CONFIGURATION

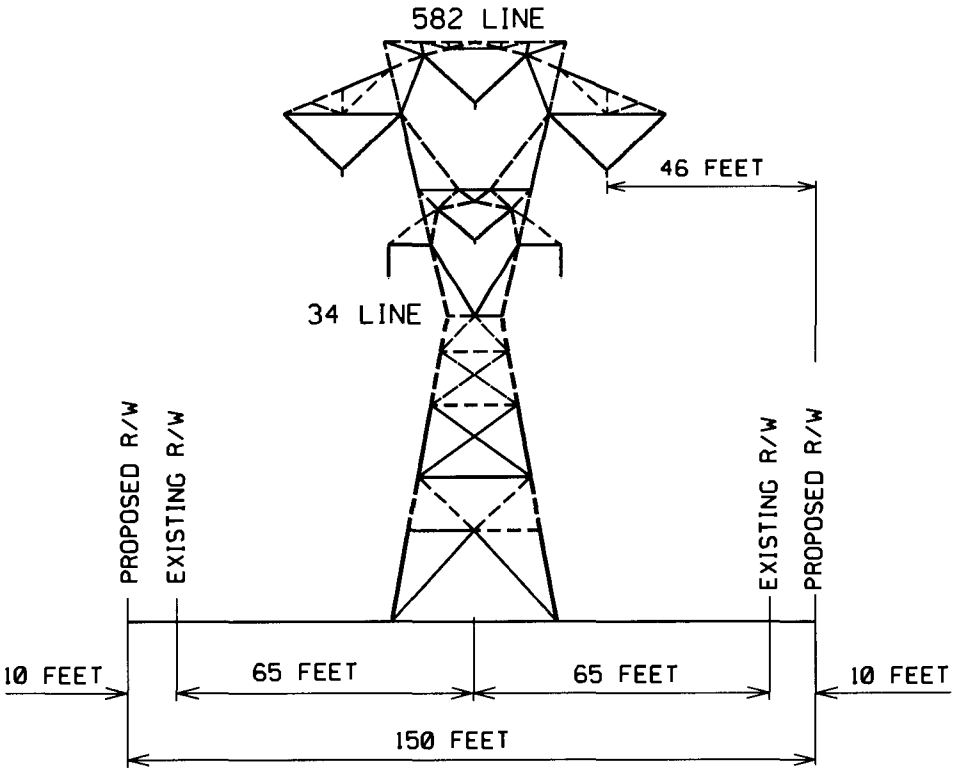
TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	WOOD H-FRAME
FOUNDATION :	DIRECT BURIED
APPROXIMATE HEIGHT:	52 FEET
WIDTH AT CROSSARM:	34 FEET
WIDTH AT BASE:	26 FEET
AVERAGE SPAN LENGTH:	550 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	130 FEET
APPROXIMATE LENGTH:	0.97 MILES

$DGNSPEC$

SCC Exhibits.dgn 4/15/2012 12:18:24 PM

(S) MP 5.73 to 6.70



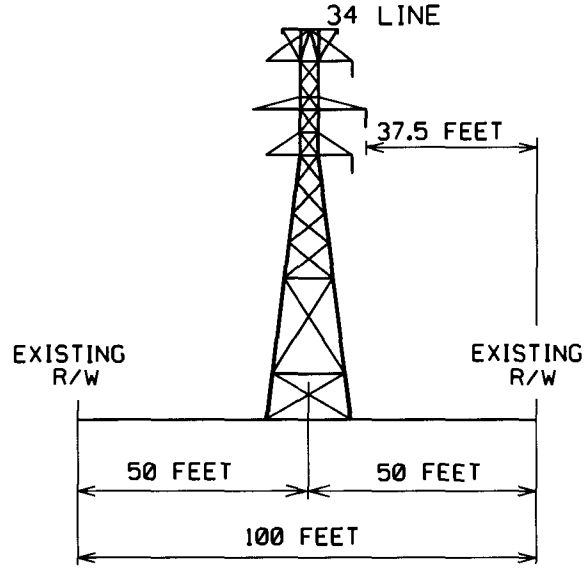
PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	128 FEET
WIDTH AT CROSSARM:	84 FEET
WIDTH AT BASE:	36 FEET
AVERAGE SPAN LENGTH:	1000 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	150 FEET
APPROXIMATE LENGTH:	0.97 MILES

$DGNSPEC$

(S) MP 6.70 to 6.82
7.08 to 7.21



EXISTING CONFIGURATION

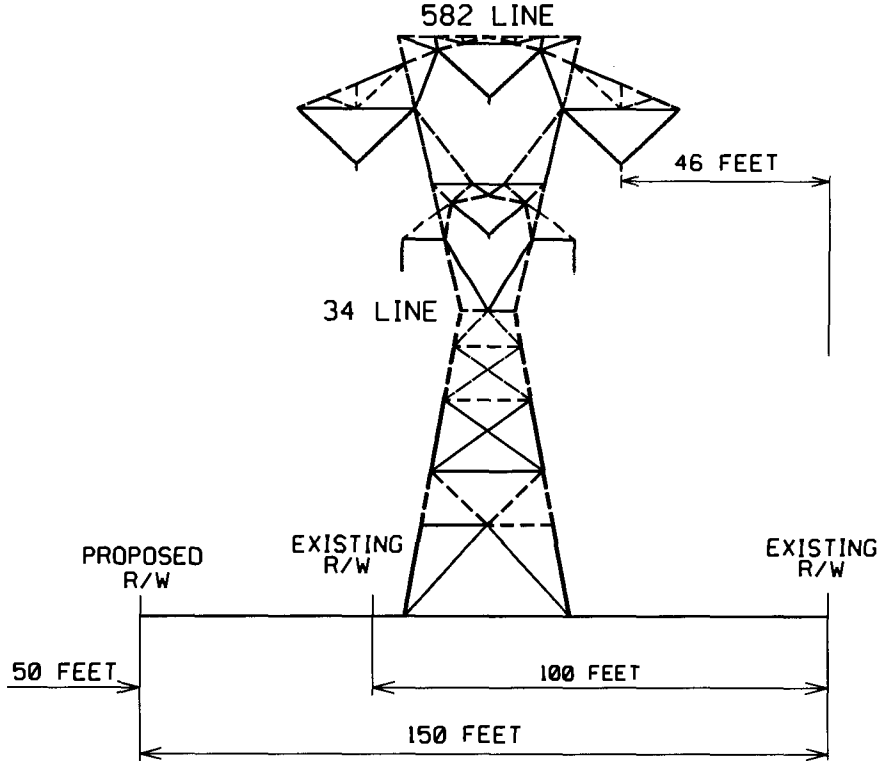
TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	EXISTING
APPROXIMATE HEIGHT:	85 FEET
WIDTH AT CROSSARM:	25.5 FEET
WIDTH AT BASE:	19.5 FEET
AVERAGE SPAN LENGTH:	690 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	100 FEET
APPROXIMATE LENGTH:	0.25 MILES

$DGNSPEC$

SCC Exhibits.dgn 4/15/2012 12:19:42 PM

(S) MP 6.70 to 6.82
7.08 to 7.21



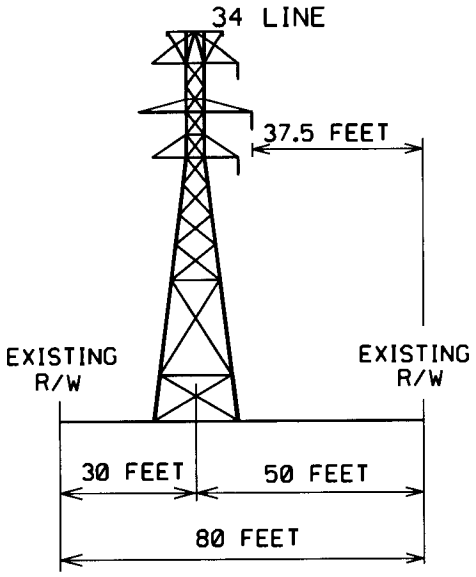
PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	128 FEET
WIDTH AT CROSSARM:	84 FEET
WIDTH AT BASE:	36 FEET
AVERAGE SPAN LENGTH:	1000 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	150 FEET
APPROXIMATE LENGTH:	0.25 MILES

$DGNSPEC$

(S) MP 6.82 to 7.08



EXISTING CONFIGURATION

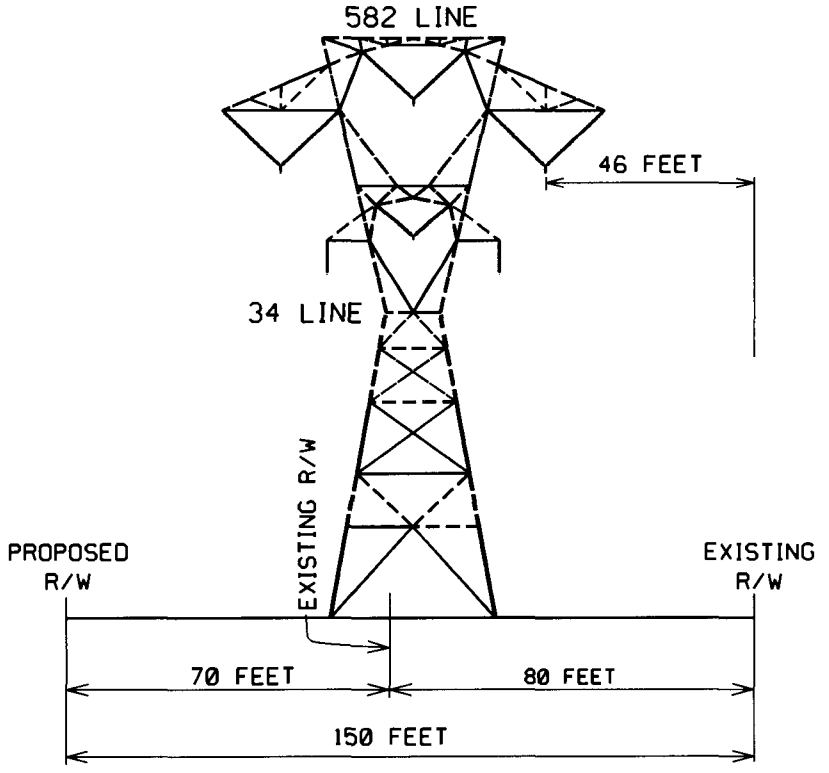
TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	EXISTING
APPROXIMATE HEIGHT:	85 FEET
WIDTH AT CROSSARM:	25.5 FEET
WIDTH AT BASE:	19.5 FEET
AVERAGE SPAN LENGTH:	690 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	80 FEET
APPROXIMATE LENGTH:	0.26 MILES

$DGNSPEC$

SCC Exhibits.dgn 4/15/2012 12:21:21 PM

(S) MP 6.82 to 7.08



PROPOSED CONFIGURATION

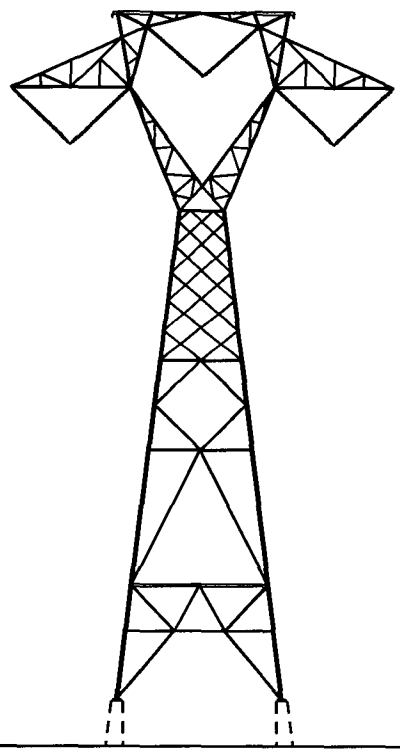
TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	128 FEET
WIDTH AT CROSSARM:	84 FEET
WIDTH AT BASE:	36 FEET
AVERAGE SPAN LENGTH:	1000 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	150 FEET
APPROXIMATE LENGTH:	0.26 MILES

$DGNSPEC$

(JV1) MP 0.00 to 1.65, 2.14 to 2.95 and 3.35 to 4.00

582 LINE



JAMES RIVER CROSSING

PROPOSED VARIATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

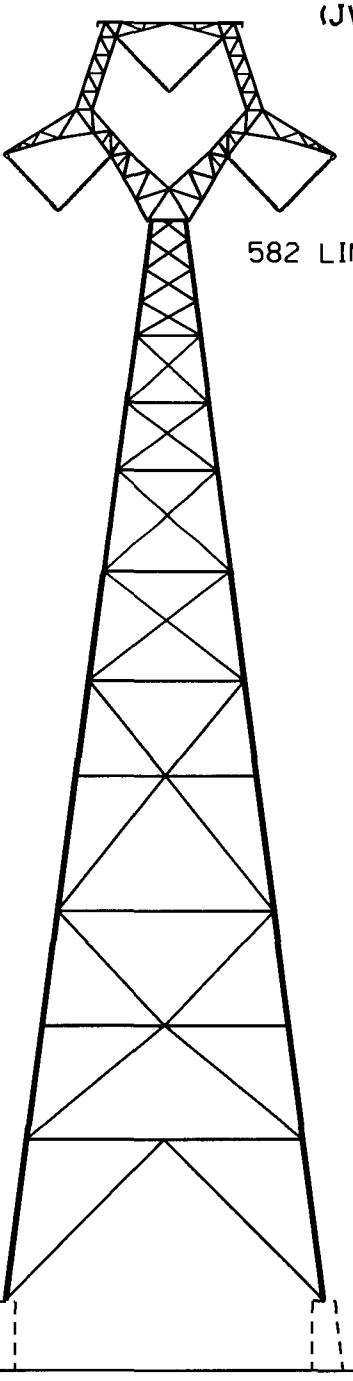
TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	160 FEET (INCLUDES FOUNDATION)
WIDTH AT CROSSARM:	84 FEET
WIDTH AT BASE:	38 FEET
AVERAGE SPAN LENGTH:	1000 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	BY PERMIT
APPROXIMATE LENGTH:	3.11 MILES

$DGNSPEC$

JAMES RIVER CHANNEL CROSSING

VARIATION

(JV1) MP 1.65 to 2.14



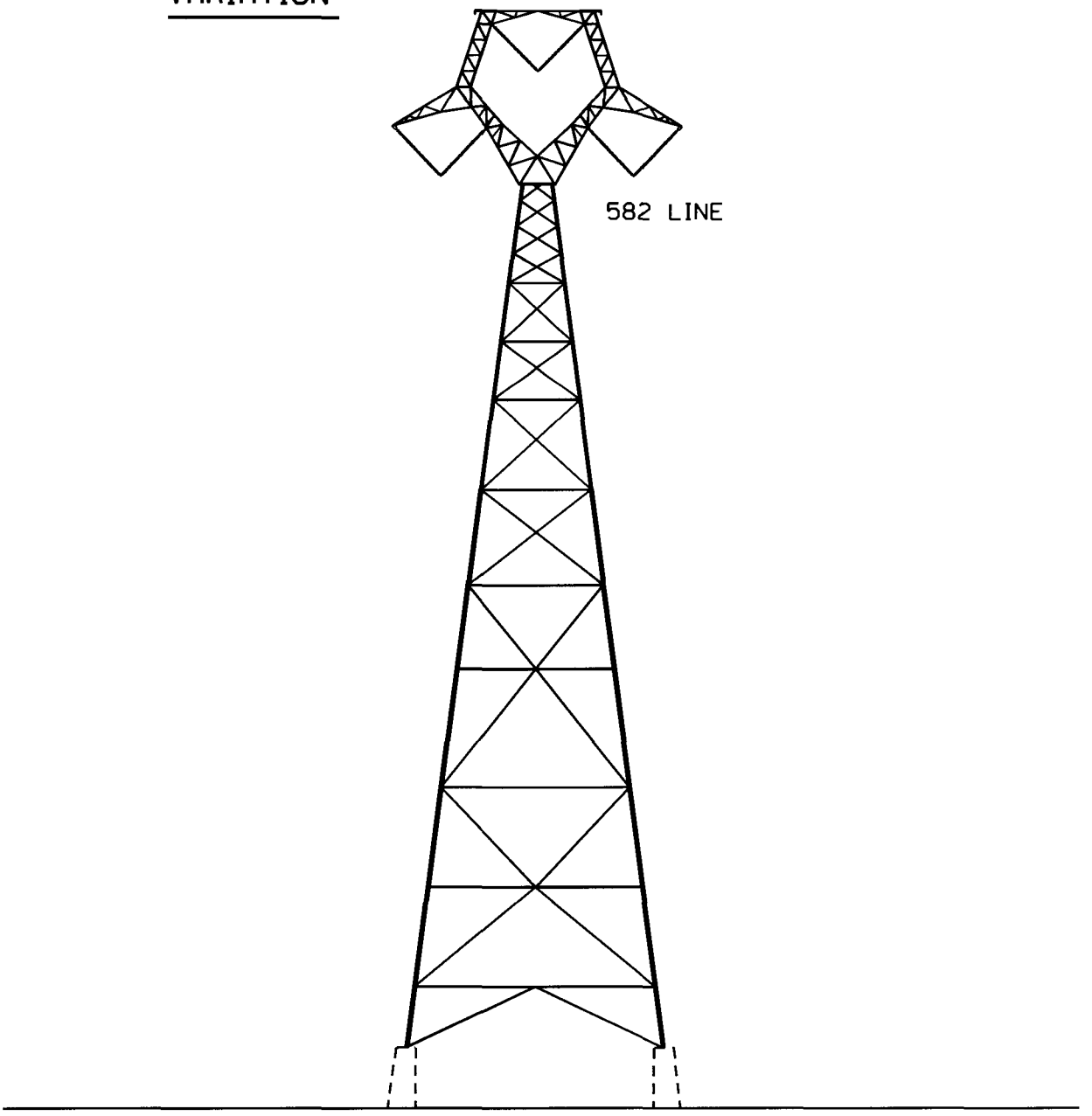
TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	295 FEET (INCLUDES FOUNDATION)
AVERAGE SPAN LENGTH:	1575 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	BY PERMIT
APPROXIMATE LENGTH:	0.49 MILES

$DGNSPEC$

JAMES RIVER CHANNEL CROSSING

(JV1) MP 2.95 to 3.35

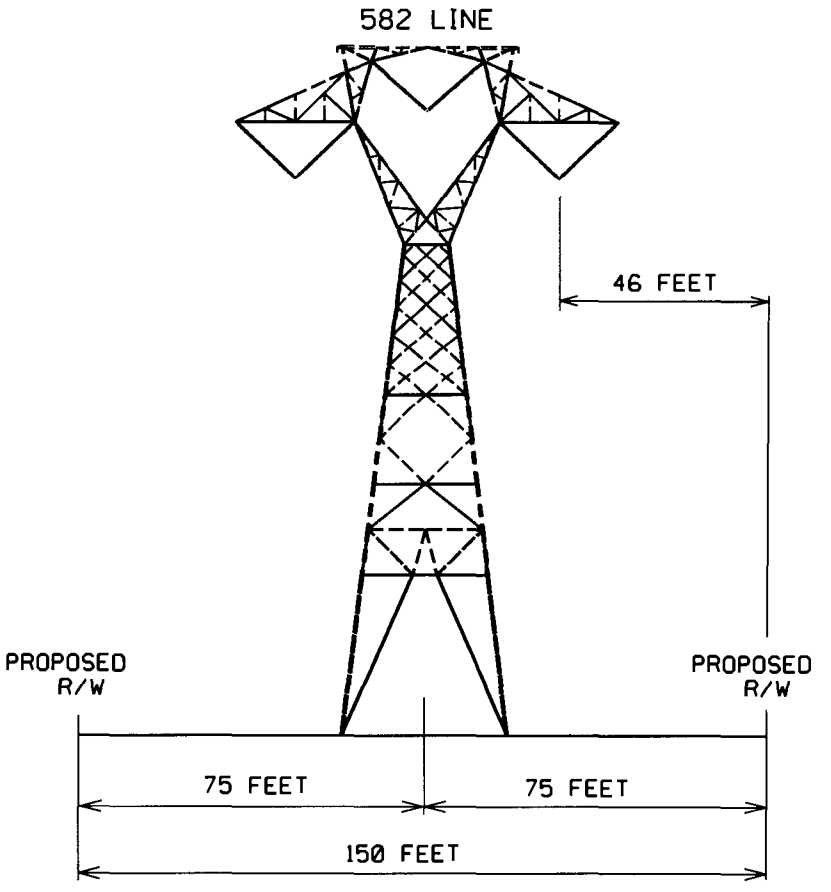
VARIATION



TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	275 FEET (INCLUDES FOUNDATION)
AVERAGE SPAN LENGTH:	1575 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	BY PERMIT
APPROXIMATE LENGTH:	0.40 MILES

$DGNSPEC$

(JV1) MP 4.00 to 4.04



PROPOSED VARIATION

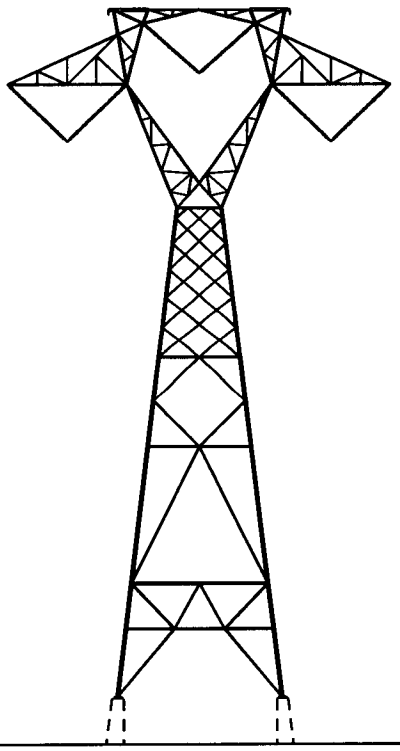
TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	150 FEET
WIDTH AT CROSSARM:	84 FEET
WIDTH AT BASE:	36 FEET
AVERAGE SPAN LENGTH:	1000 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	150 FEET
APPROXIMATE LENGTH:	0.04 MILES

$DGNSPEC$

(JV2) MP 0 to 1.17, 1.66 to 2.55 & 3.00 to 3.72

582 LINE



JAMES RIVER CROSSING

PROPOSED CONFIGURATION

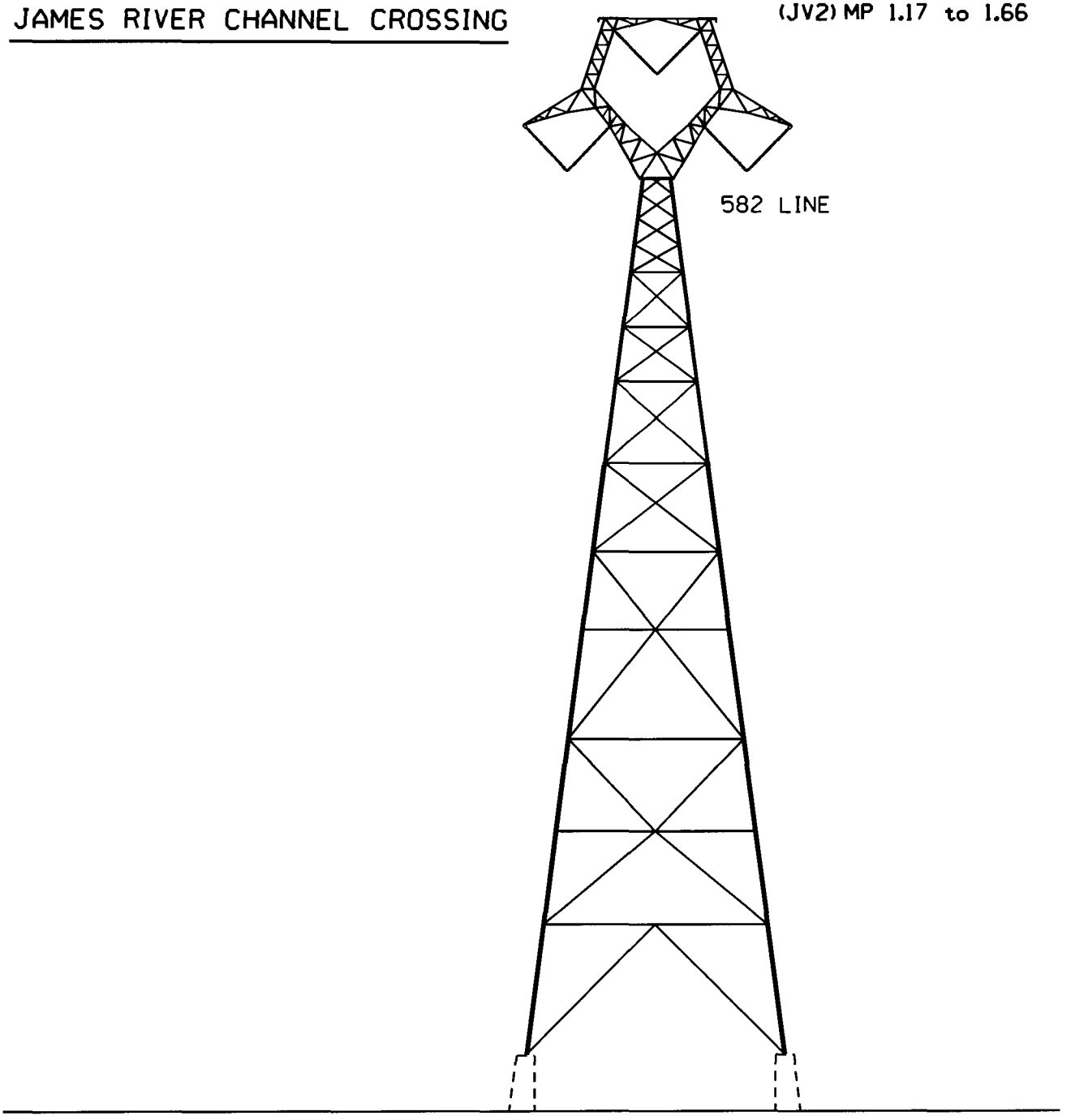
TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	160 FEET (INCLUDES FOUNDATION)
WIDTH AT CROSSARM:	84 FEET
WIDTH AT BASE:	38 FEET
AVERAGE SPAN LENGTH:	1400 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	BY PERMIT
APPROXIMATE LENGTH:	2.78 MILES

$DGNSPEC$

JAMES RIVER CHANNEL CROSSING

(JV2) MP 1.17 to 1.66

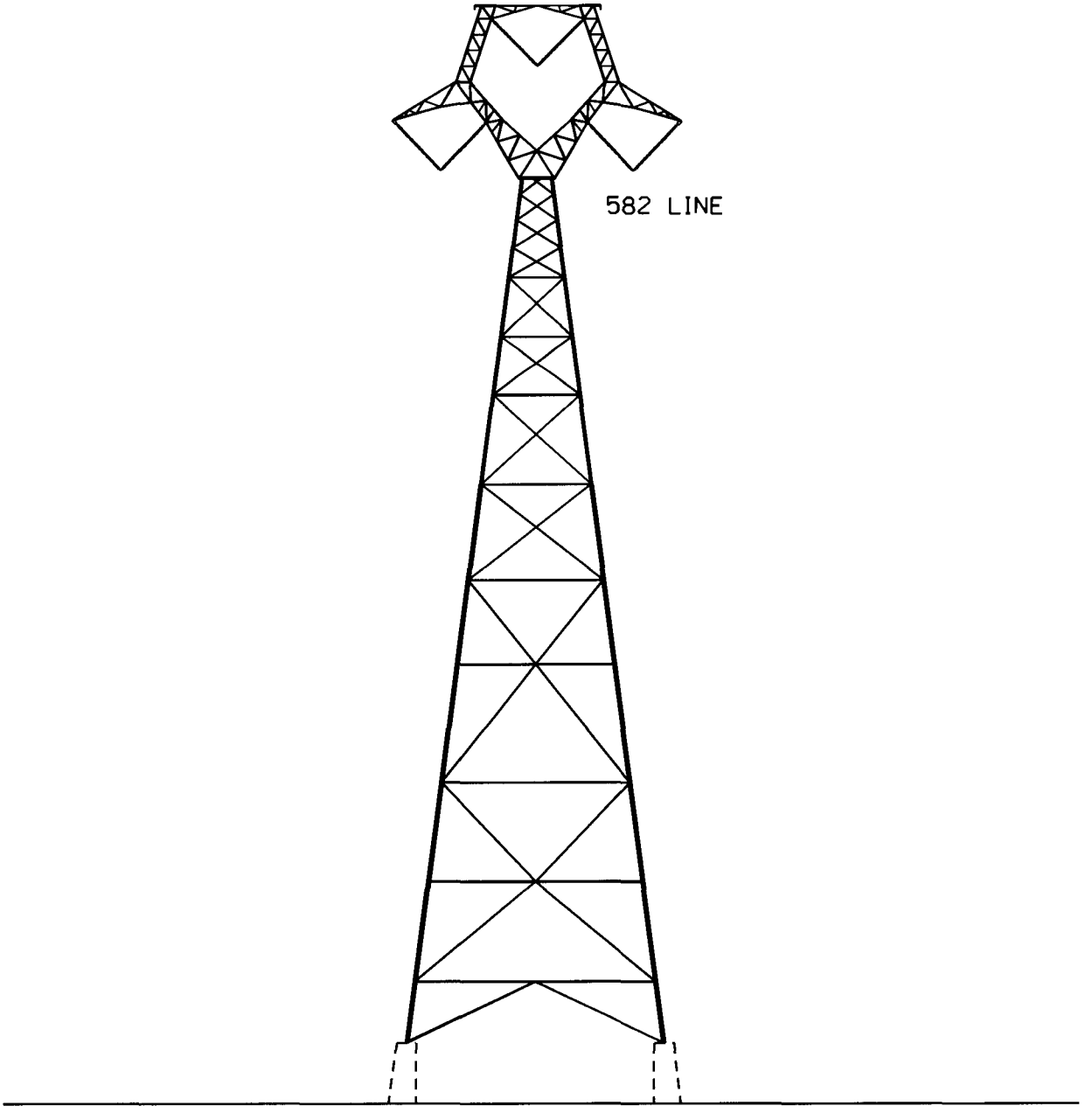


TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	295 FEET (INCLUDES FOUNDATION)
AVERAGE SPAN LENGTH:	1400 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	BY PERMIT
APPROXIMATE LENGTH:	0.49 MILES

$DGNSPEC$

JAMES RIVER CHANNEL CROSSING

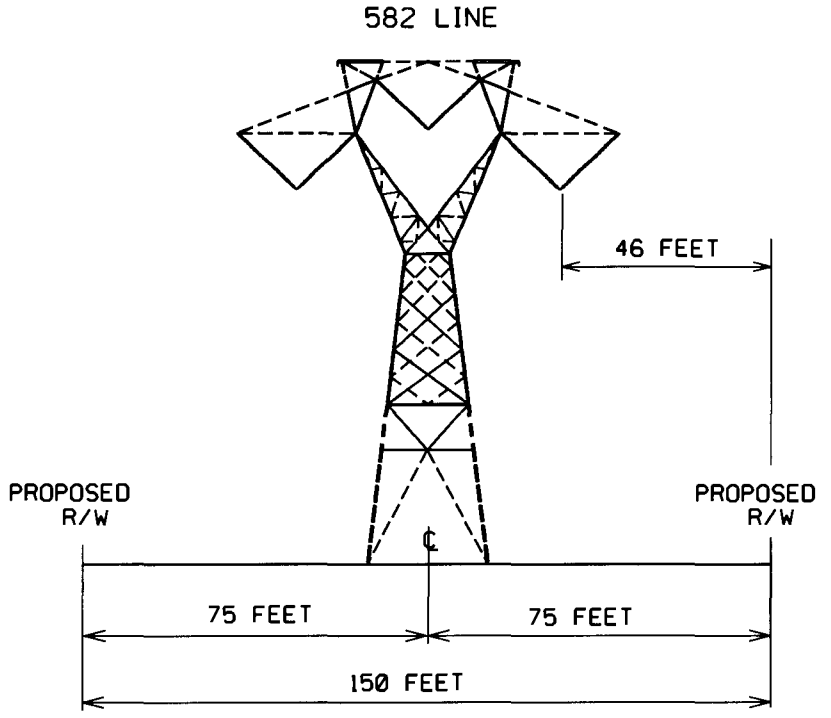
(JV2) MP 2.55 to 3.00



TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	275 FEET (INCLUDES FOUNDATION)
AVERAGE SPAN LENGTH:	1400 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	BY PERMIT
APPROXIMATE LENGTH:	0.45 MILES

$DGNSPEC$

(JV2) MP 3.72 to 4.52



PROPOSED CONFIGURATION

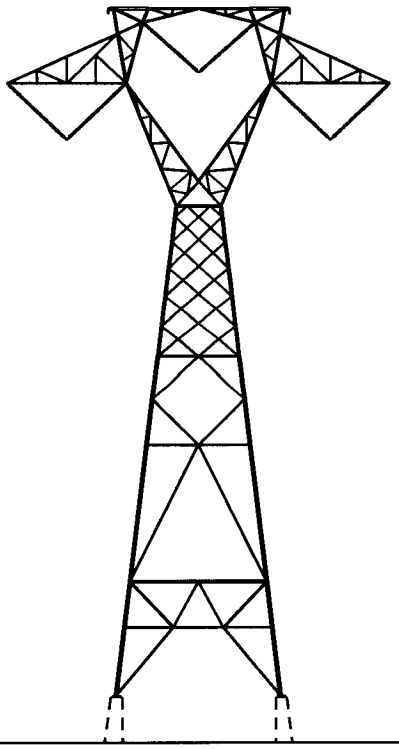
TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	111 FEET
WIDTH AT CROSSARM:	84 FEET
WIDTH AT BASE:	27 FEET
AVERAGE SPAN LENGTH:	835 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	150 FEET
APPROXIMATE LENGTH:	0.80 MILES

$DGNSPEC$

(JV3) MP 0 to 1.47, 1.96 to 2.90 & 3.35 to 4.05

582 LINE



JAMES RIVER CROSSING

PROPOSED CONFIGURATION

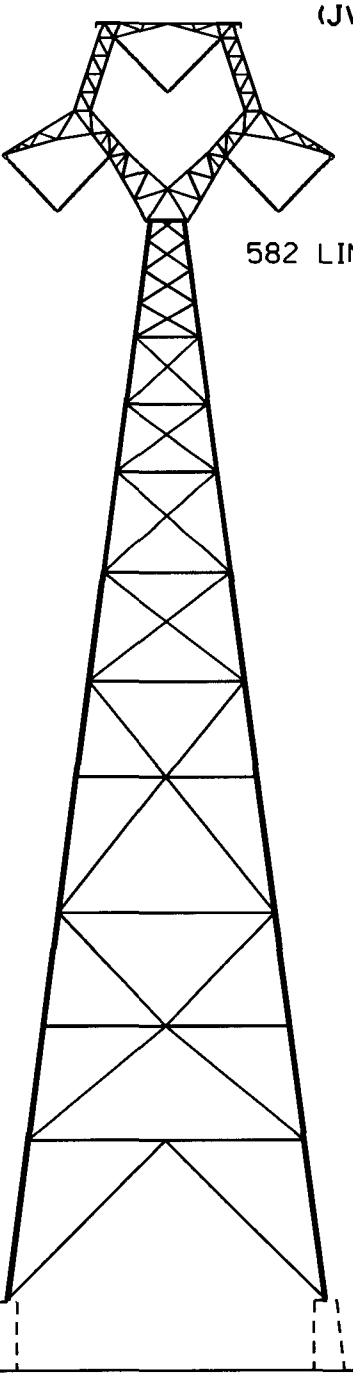
TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	160 FEET (INCLUDES FOUNDATION)
WIDTH AT CROSSARM:	84 FEET
WIDTH AT BASE:	38 FEET
AVERAGE SPAN LENGTH:	1190 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	BY PERMIT
APPROXIMATE LENGTH:	3.11 MILES

$DGNSPEC$

JAMES RIVER CHANNEL CROSSING

(JV3) MP 1.46 to 1.96

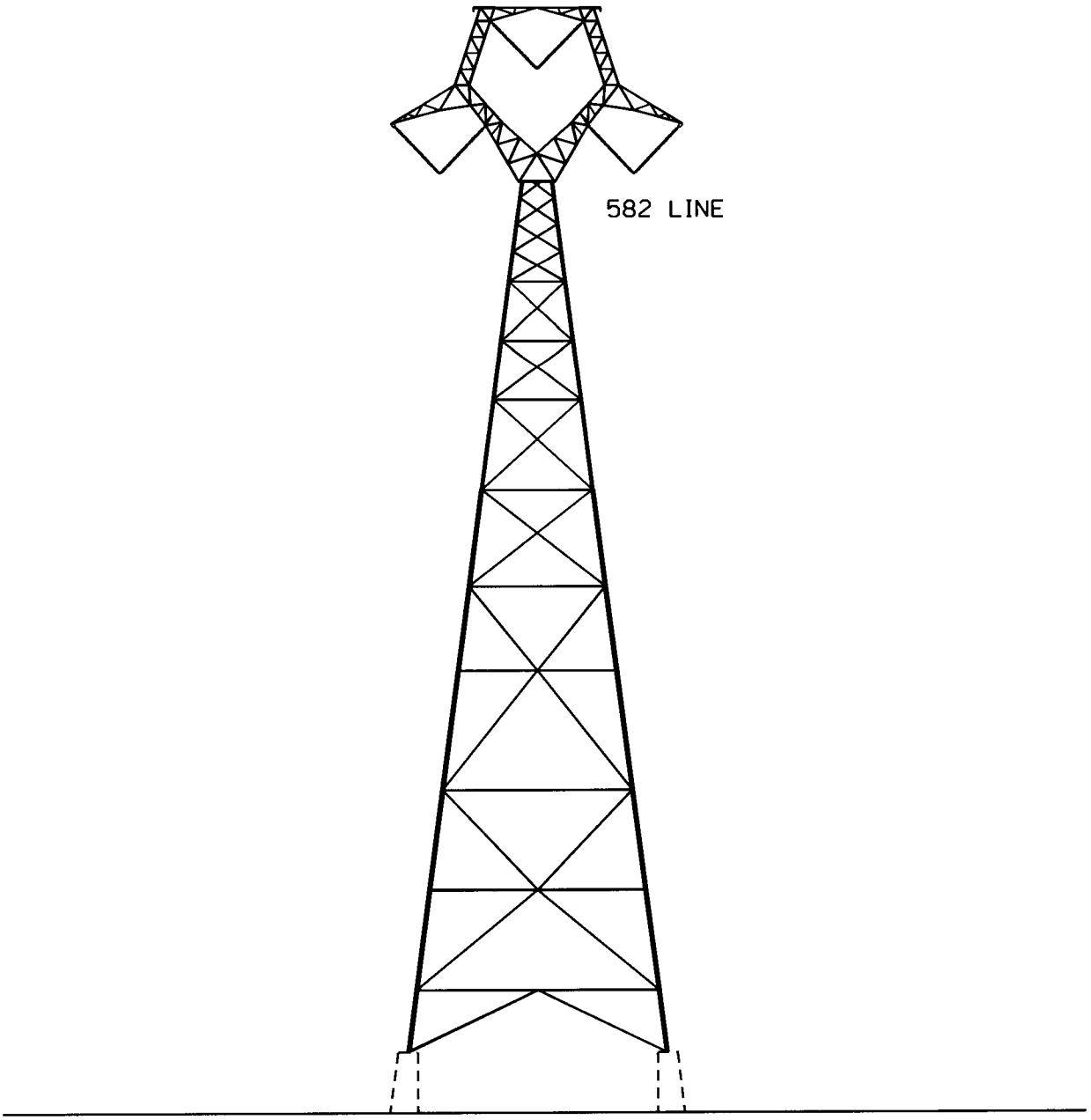


TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	295 FEET (INCLUDES FOUNDATION)
AVERAGE SPAN LENGTH:	1675 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	BY PERMIT
APPROXIMATE LENGTH:	0.50 MILES

$DGNSPEC$

JAMES RIVER CHANNEL CROSSING

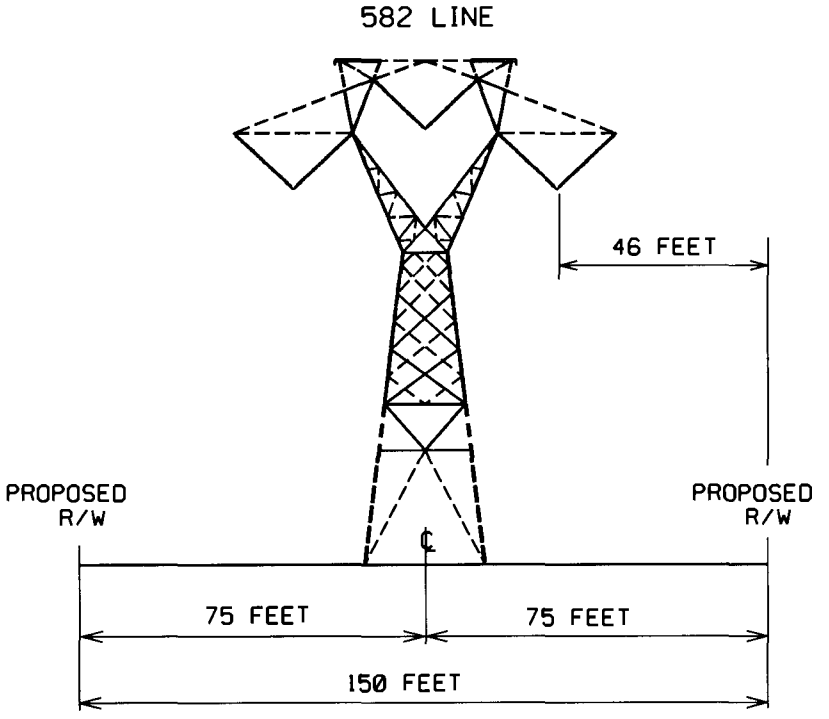
(JV3) MP 2.90 to 3.35



TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	275 FEET (INCLUDES FOUNDATION)
AVERAGE SPAN LENGTH:	1675 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	BY PERMIT
APPROXIMATE LENGTH:	0.45 MILES

$DGNSPEC$

(JV3) MP 4.05 to 4.85



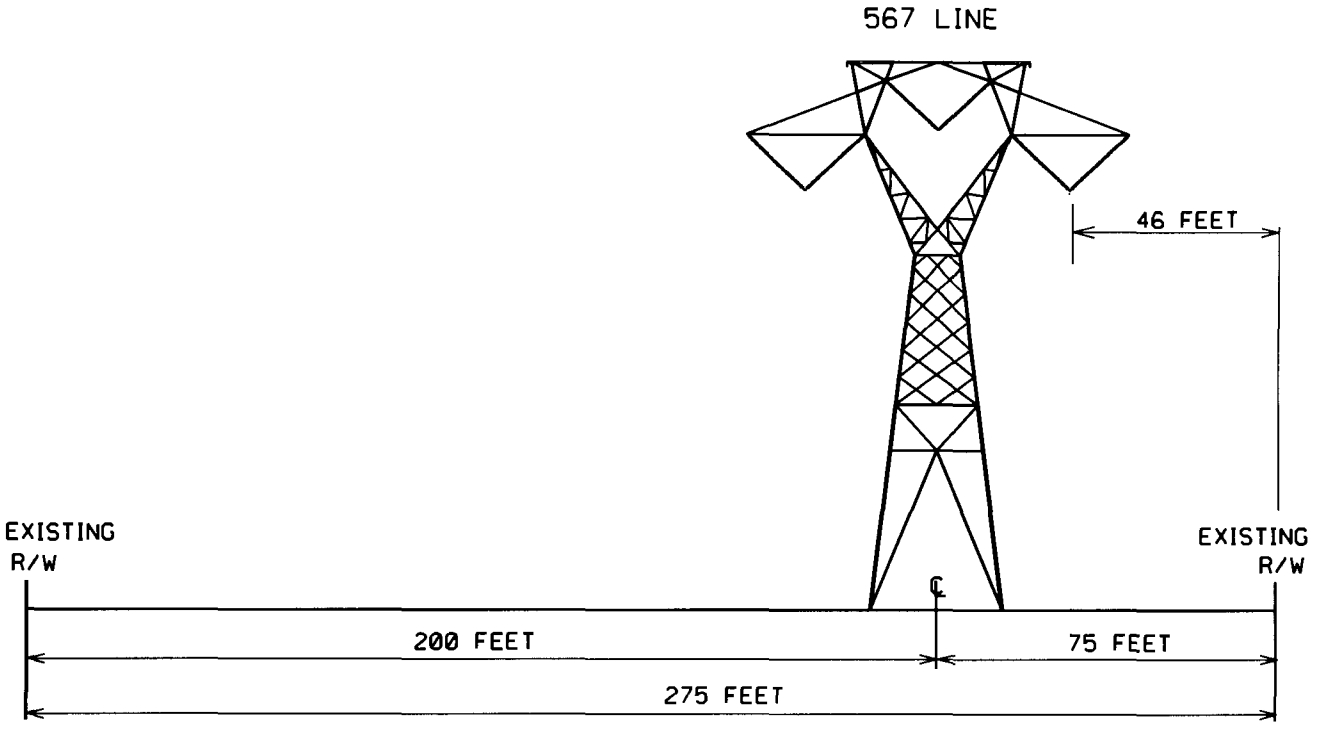
PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	111 FEET
WIDTH AT CROSSARM:	84 FEET
WIDTH AT BASE:	27 FEET
AVERAGE SPAN LENGTH:	835 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	150 FEET
APPROXIMATE LENGTH:	0.80 MILES

$DGNSPEC$

(C) MP (-0.07) - 0.79



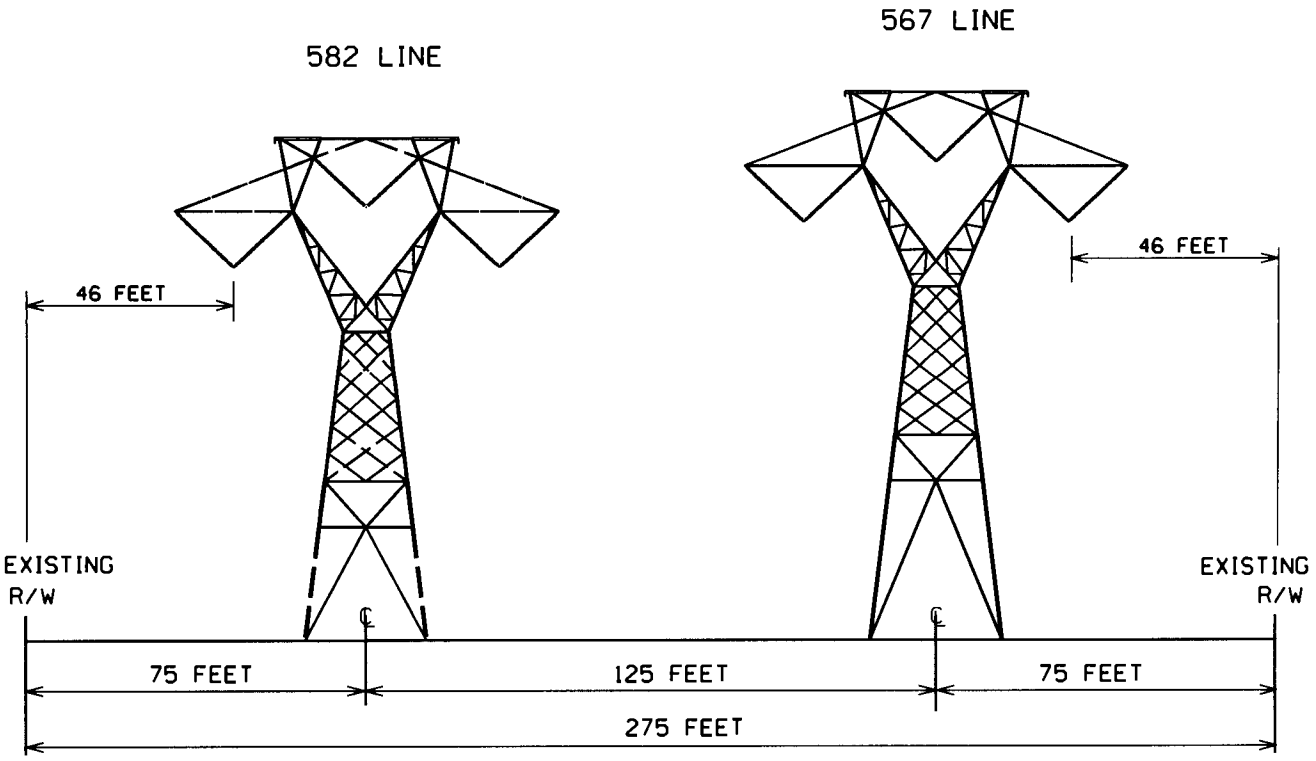
EXISTING CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE :	WEATHERING TOWER
FOUNDATION :	EXISTING
APPROX. AVERAGE HEIGHT :	121 FEET
WIDTH AT CROSSARM :	84 FEET
WIDTH AT BASE :	30 FEET
AVERAGE SPAN LENGTH :	950 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	275 FEET
APPROXIMATE LENGTH:	0.86 MILES

$DGNSPEC$

(C) MP (-0.07) - 0.79

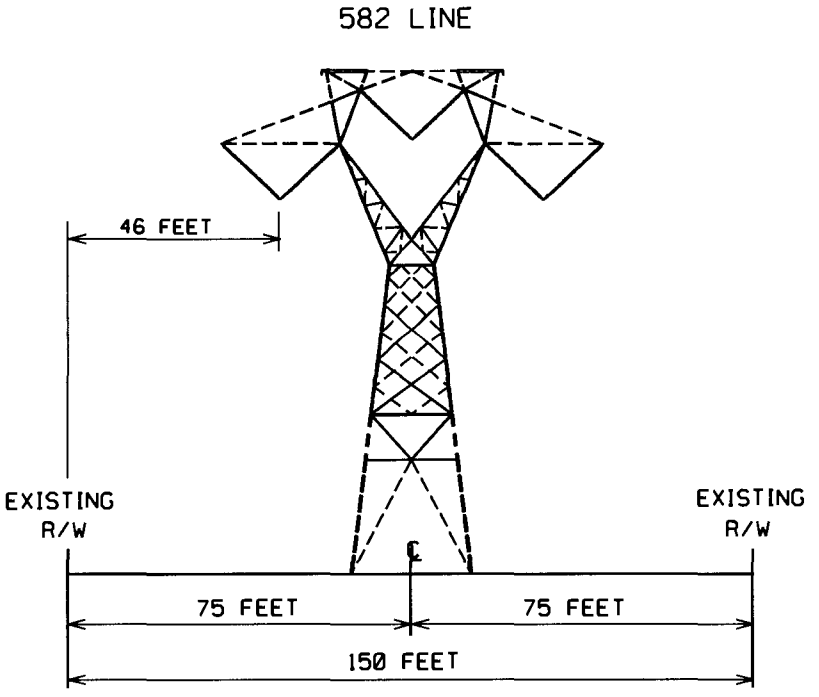


PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	GALVANIZED TOWER	WEATHERING TOWER
FOUNDATION :	PILES/CONCRETE	EXISTING
APPROXIMATE HEIGHT:	111 FEET	121 FEET
WIDTH AT CROSSARM:	84 FEET	84 FEET
WIDTH AT BASE:	27 FEET	30 FEET
AVERAGE SPAN LENGTH:	950 FEET	950 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	275 FEET	275 FEET
APPROXIMATE LENGTH:	0.86 MILES	0.86 MILES

(C) MP 0.79 - 21.15



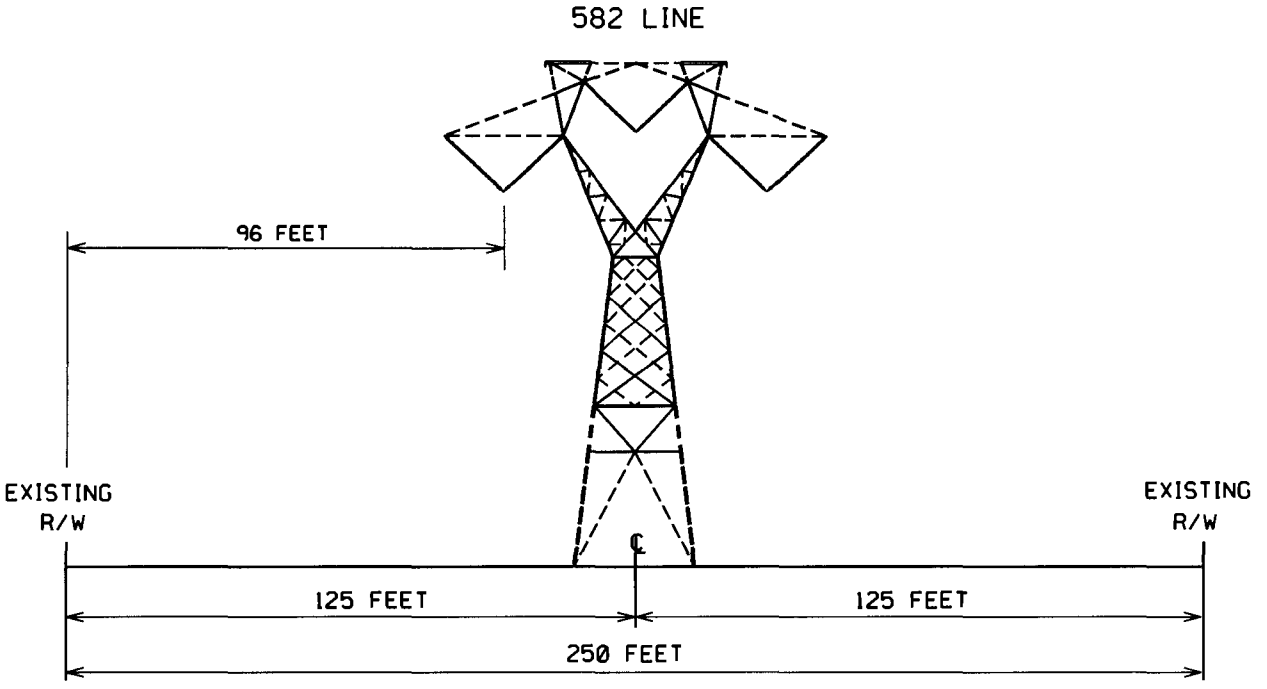
PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE :	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROX. AVERAGE HEIGHT :	111 FEET
WIDTH AT CROSSARM :	84 FEET
WIDTH AT BASE :	27 FEET
AVERAGE SPAN LENGTH :	1000 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	150 FEET
APPROXIMATE LENGTH:	18.27 MILES

$DGNSPEC$

(C) MP 0.79 - 21.15



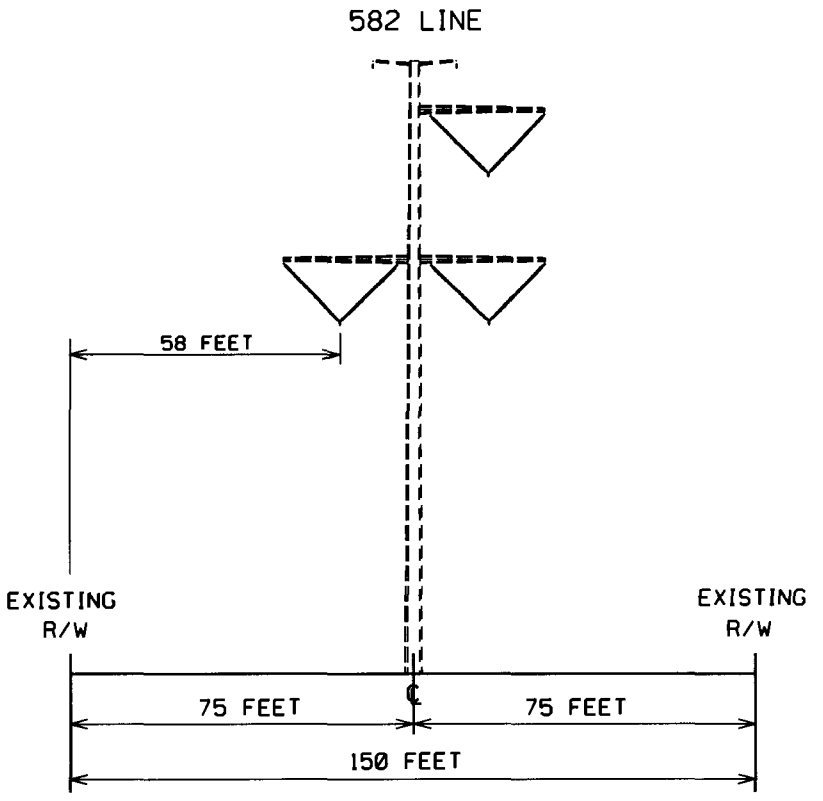
PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE :	GALVANIZED TOWER
FOUNDATION :	PILES/CONCRETE
APPROX. AVERAGE HEIGHT :	111 FEET
WIDTH AT CROSSARM :	84 FEET
WIDTH AT BASE :	27 FEET
AVERAGE SPAN LENGTH :	1000 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	250 FEET
APPROXIMATE LENGTH:	2.09 MILES

$DGNSPEC$

(C) MP 21.15 - 24.94



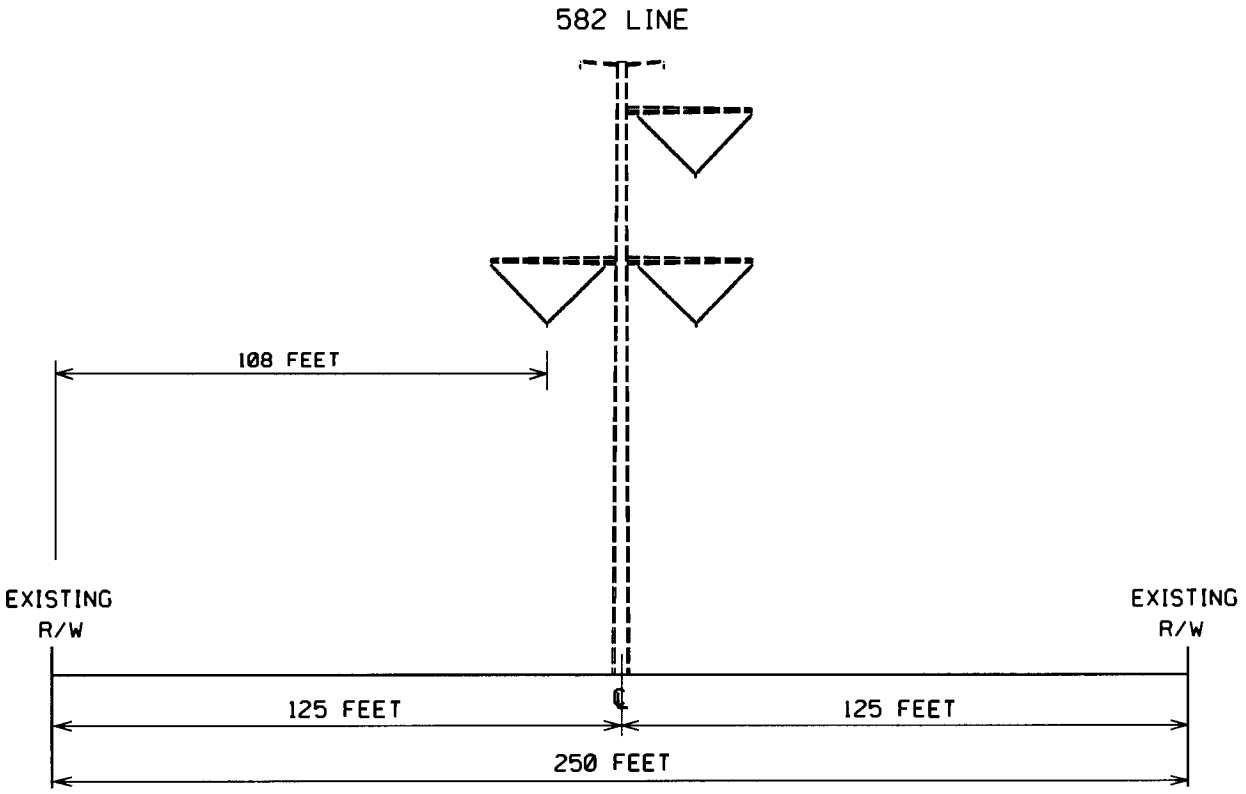
PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE :	GALVANIZED POLE
FOUNDATION :	PILES/CONCRETE
APPROX. AVERAGE HEIGHT :	135 FEET
WIDTH AT CROSSARM :	60 FEET
WIDTH AT BASE :	7 FEET
AVERAGE SPAN LENGTH :	900 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	150 FEET
APPROXIMATE LENGTH:	3.25 MILES

$DGNSPEC$

(C) MP 21.15 - 24.94



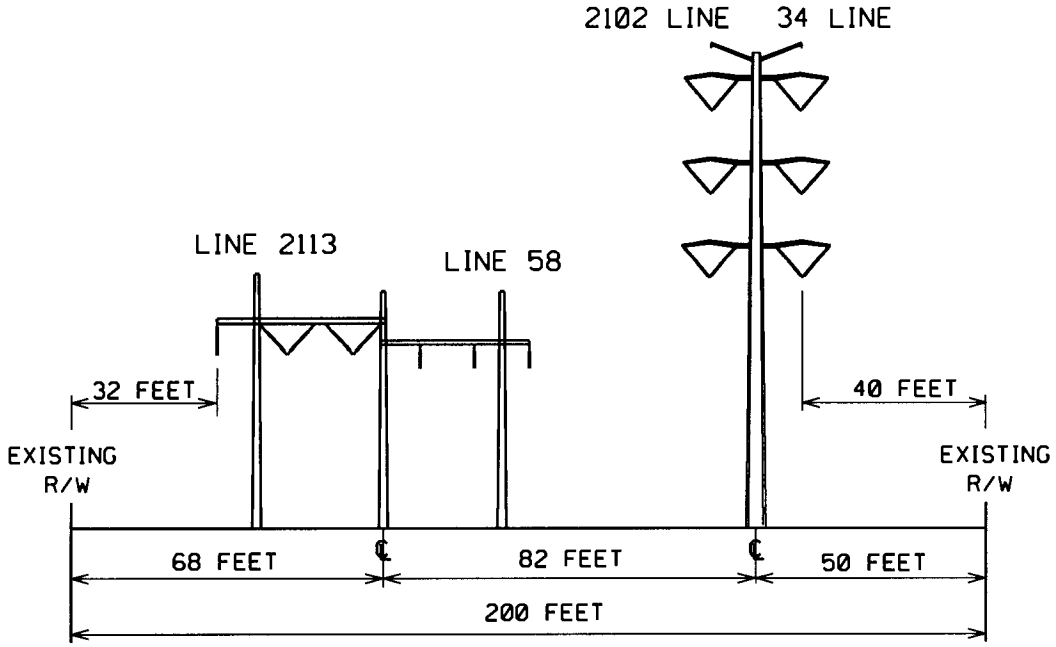
PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE :	GALVANIZED POLE
FOUNDATION :	PILES/CONCRETE
APPROX. AVERAGE HEIGHT :	135 FEET
WIDTH AT CROSSARM :	60 FEET
WIDTH AT BASE :	7 FEET
AVERAGE SPAN LENGTH :	900 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	250 FEET
APPROXIMATE LENGTH:	0.54 MILES

$DGNSPEC$

(C) MP 24.94 - 29.95



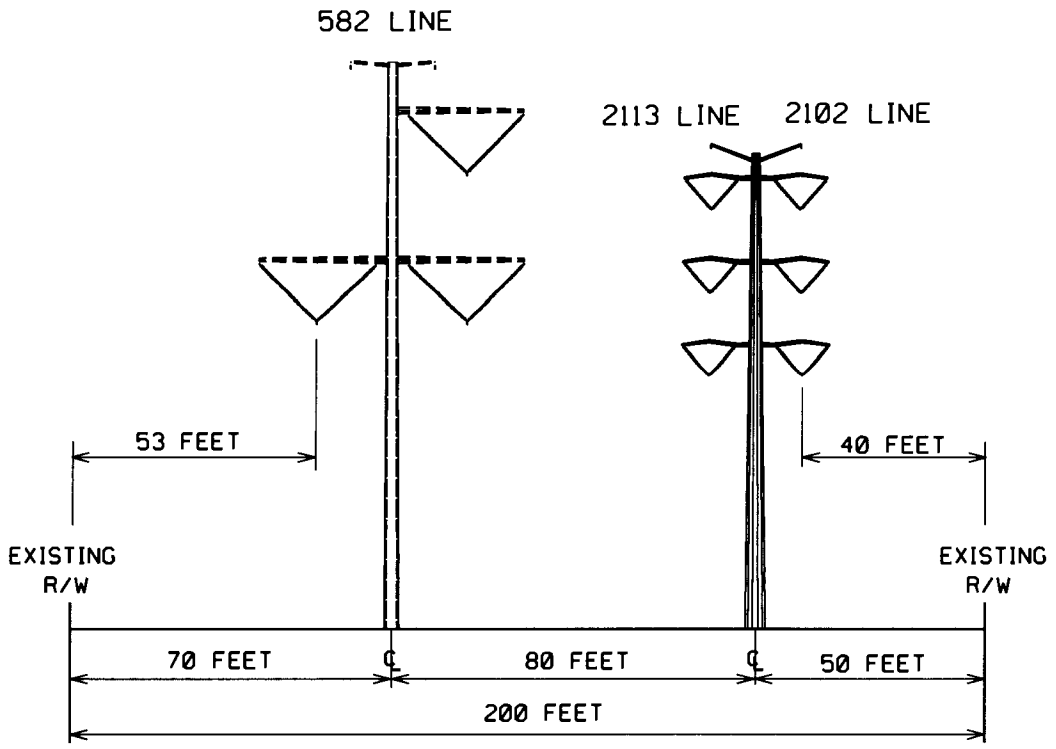
EXISTING CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	3 POLE WOOD	PAINTED POLE
FOUNDATION :	DIRECT BURIED	EXISTING
APPROXIMATE HEIGHT:	56.5 FEET	105 FEET
WIDTH AT CROSSARM:	68 FEET	32 FEET
WIDTH AT BASE:	53 FEET	5 FEET
AVERAGE SPAN LENGTH:	575 FEET	725 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	200 FEET	200 FEET
APPROXIMATE LENGTH:	5.01 MILES	5.01 MILES

$DGNSPEC$

(C) MP 24.94 - 29.95



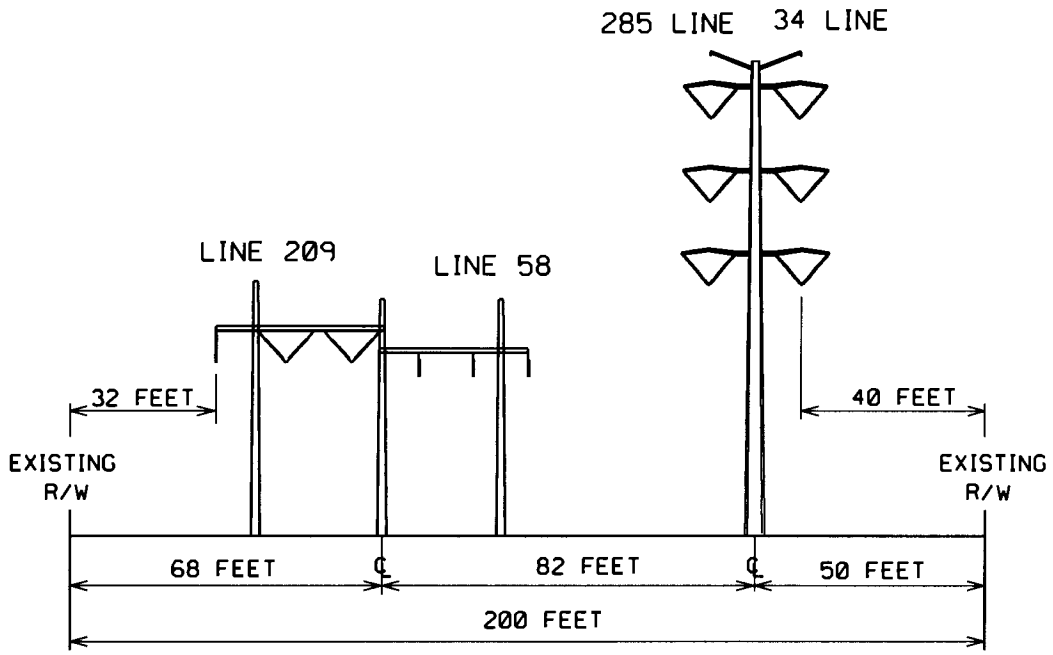
PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	GALVANIZED POLE	PAINTED POLE
FOUNDATION :	PILES/CONCRETE	EXISTING
APPROXIMATE HEIGHT:	125 FEET	105 FEET
WIDTH AT CROSSARM:	60 FEET	32 FEET
WIDTH AT BASE:	7 FEET	5 FEET
AVERAGE SPAN LENGTH:	800 FEET	725 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	200 FEET	200 FEET
APPROXIMATE LENGTH:	5.01 MILES	5.01 MILES

$DGNSPEC$

(C) MP 29.95 - 35.17



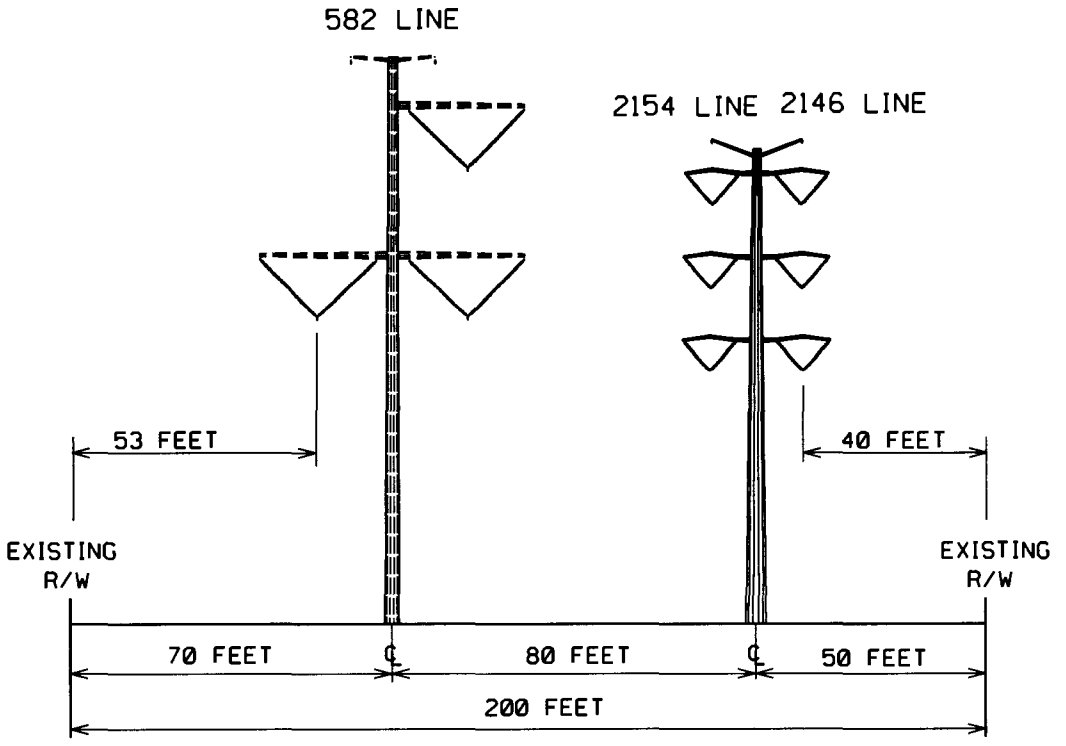
EXISTING CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	3 POLE WOOD	PAINTED POLE
FOUNDATION :	DIRECT BURIED	EXISTING
APPROXIMATE HEIGHT:	56.5 FEET	105 FEET
WIDTH AT CROSSARM:	68 FEET	32 FEET
WIDTH AT BASE:	53 FEET	5 FEET
AVERAGE SPAN LENGTH:	575 FEET	725 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	200 FEET	200 FEET
APPROXIMATE LENGTH:	5.22 MILES	5.22 MILES

$DGNSPEC$

(C)MP 29.95 - 35.17



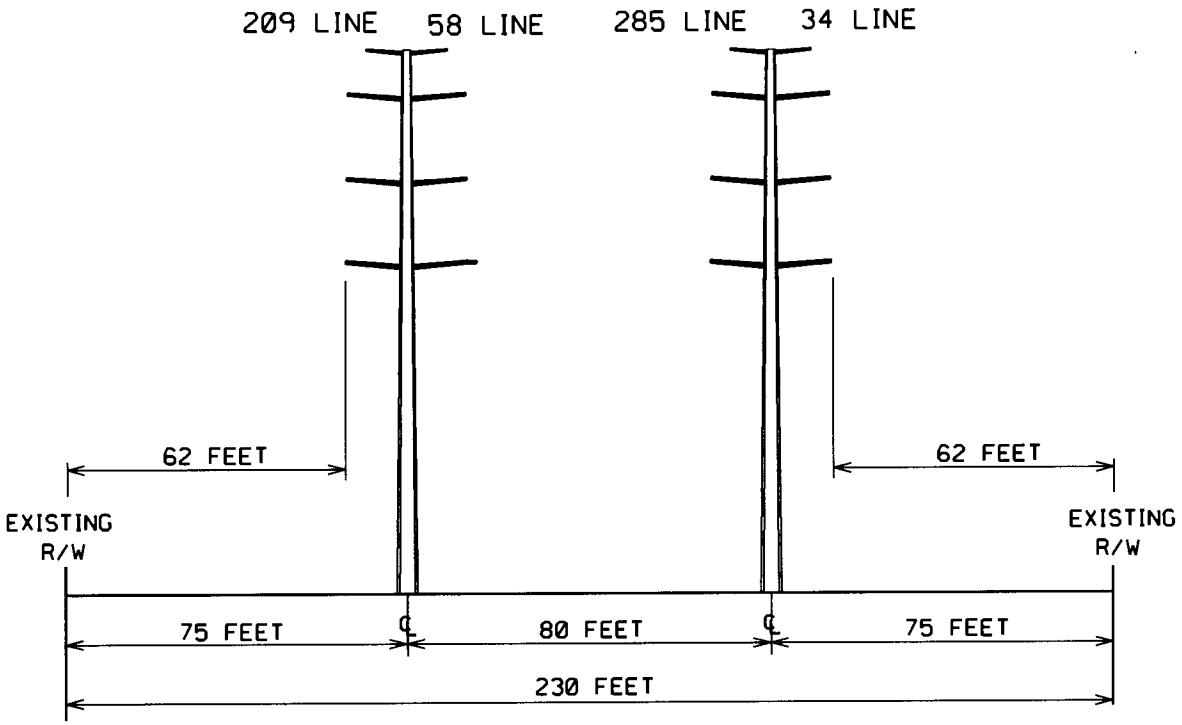
PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	GALVANIZED POLE	PAINTED POLE
FOUNDATION :	PILES/CONCRETE	EXISTING
APPROXIMATE HEIGHT:	125 FEET	105 FEET
WIDTH AT CROSSARM:	60 FEET	32 FEET
WIDTH AT BASE:	7 FEET	5 FEET
AVERAGE SPAN LENGTH:	800 FEET	725 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	200 FEET	200 FEET
APPRDXIMATE LENGTH:	5.22 MILES	5.22 MILES

$DGNSPEC$

(C) MP 35.17 - 35.78



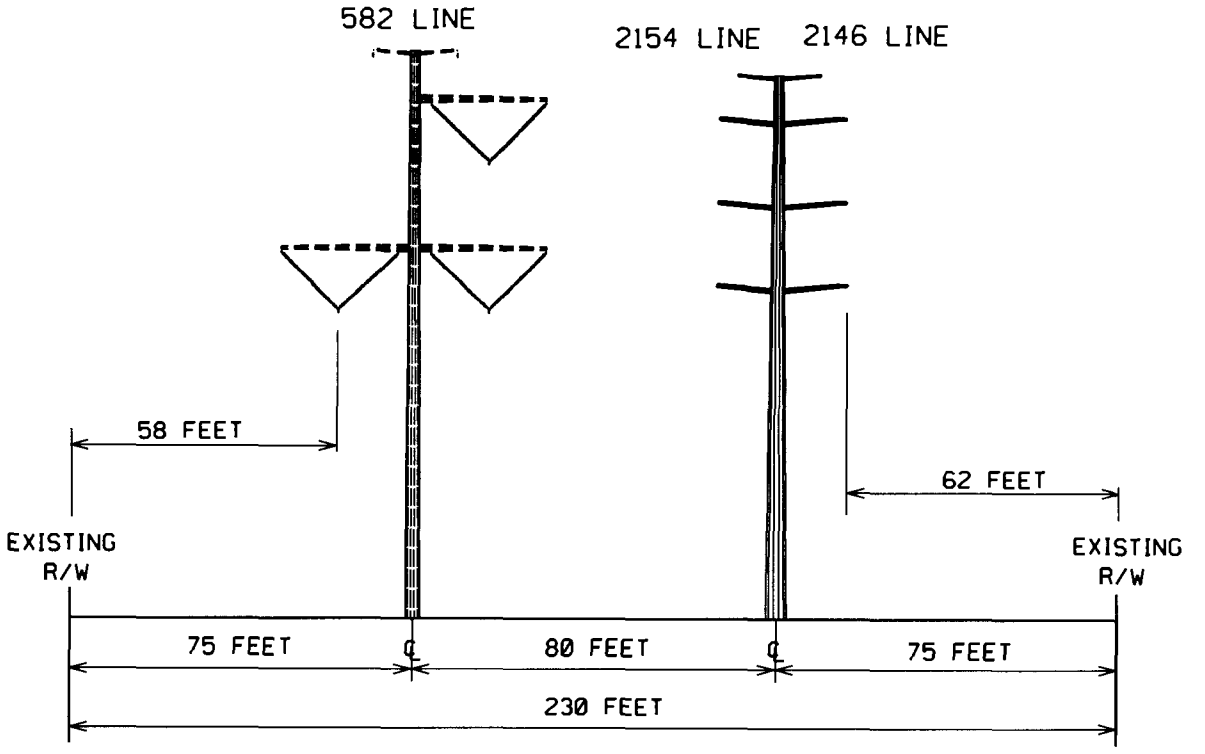
EXISTING CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	GALVANIZED POLE	GALVANIZED POLE
FOUNDATION :	EXISTING	EXISTING
APPROXIMATE HEIGHT:	120 FEET	120 FEET
WIDTH AT CROSSARM:	27 FEET	27 FEET
WIDTH AT BASE:	5 FEET	5 FEET
AVERAGE SPAN LENGTH:	770 FEET	770 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	230 FEET	230 FEET
APPROXIMATE LENGTH:	0.61 MILES	0.61 MILES

$DGNSPEC$

(C) MP 35.17 - 35.78



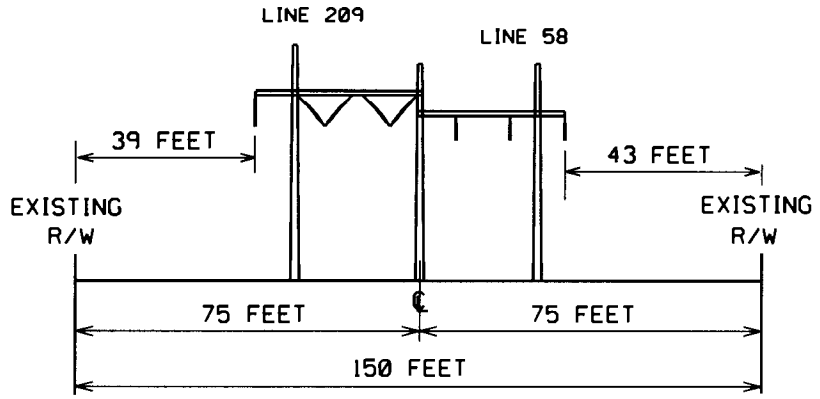
PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	GALVANIZED POLE	GALVANIZED POLE
FOUNDATION :	PILES/CONCRETE	EXISTING
APPROXIMATE HEIGHT:	125 FEET	120 FEET
WIDTH AT CROSSARM:	60 FEET	27 FEET
WIDTH AT BASE:	7 FEET	5 FEET
AVERAGE SPAN LENGTH:	770 FEET	770 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	230 FEET	230 FEET
APPROXIMATE LENGTH:	0.61 MILES	0.61 MILES

$DGNSPEC$

(C) MP 35.78 - 37.89



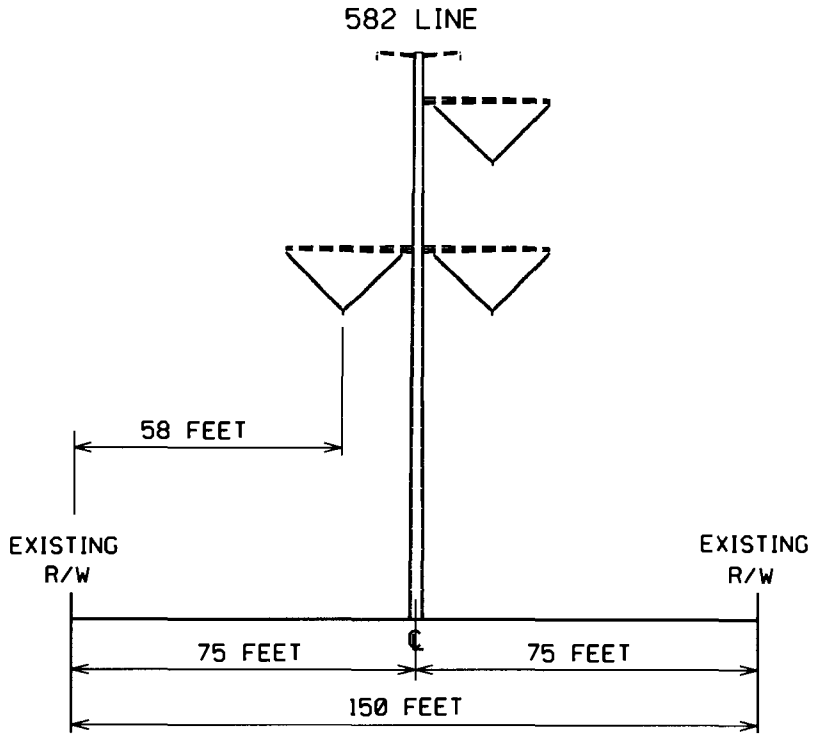
EXISTING CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE :	3-POLE WOOD
FOUNDATION :	DIRECT BURIED
APPROX. AVERAGE HEIGHT :	52 FEET
WIDTH AT CROSSARM :	68 FEET
WIDTH AT BASE :	53 FEET
AVERAGE SPAN LENGTH :	489 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	150 FEET
APPROXIMATE LENGTH:	2.11 MILES

$DGNSPEC$

(C) MP 35.78 - 37.89



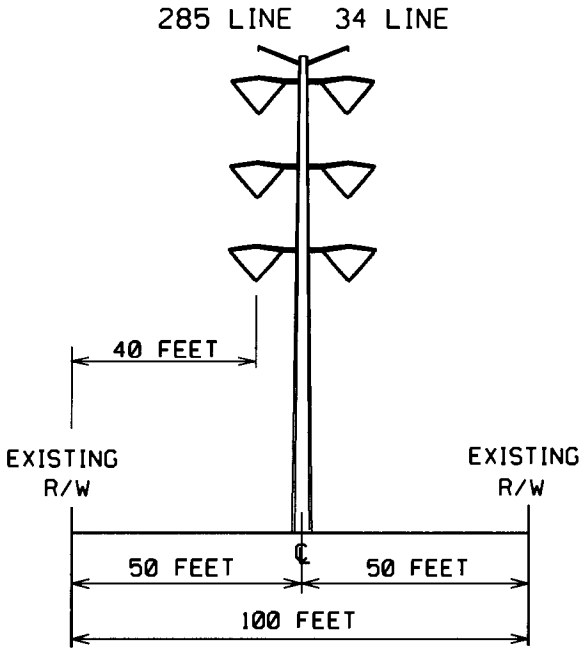
PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE :	GALVANIZED POLE
FOUNDATION :	PILES/CONCRETE
APPROX. AVERAGE HEIGHT :	125 FEET
WIDTH AT CROSSARM :	60 FEET
WIDTH AT BASE :	7 FEET
AVERAGE SPAN LENGTH :	800 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	150 FEET
APPROXIMATE LENGTH:	2.11 MILES

$DGNSPEC$

(K) MP 0.00 - 2.04



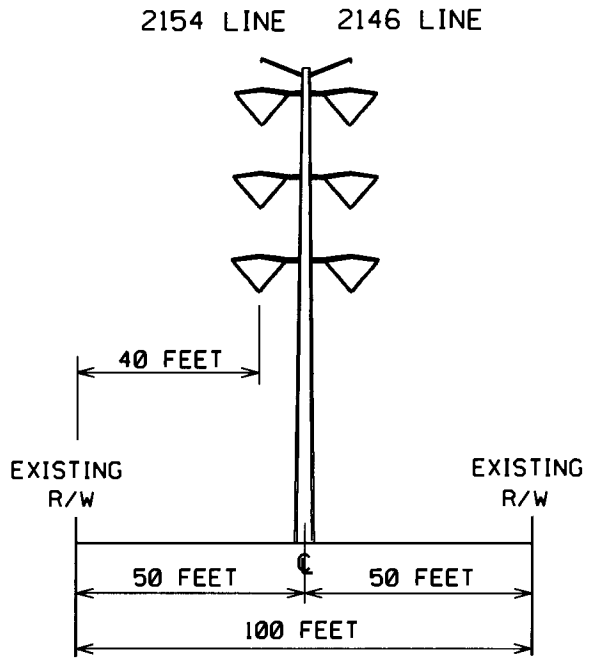
EXISTING CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE :	PAINTED POLE
FOUNDATION :	EXISTING
APPROX. AVERAGE HEIGHT :	105 FEET
WIDTH AT CROSSARM :	32 FEET
WIDTH AT BASE :	5 FEET
AVERAGE SPAN LENGTH :	740 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	100 FEET
APPROXIMATE LENGTH:	2.04 MILES

$DGNSPEC$

(K) MP 0.00 - 2.04



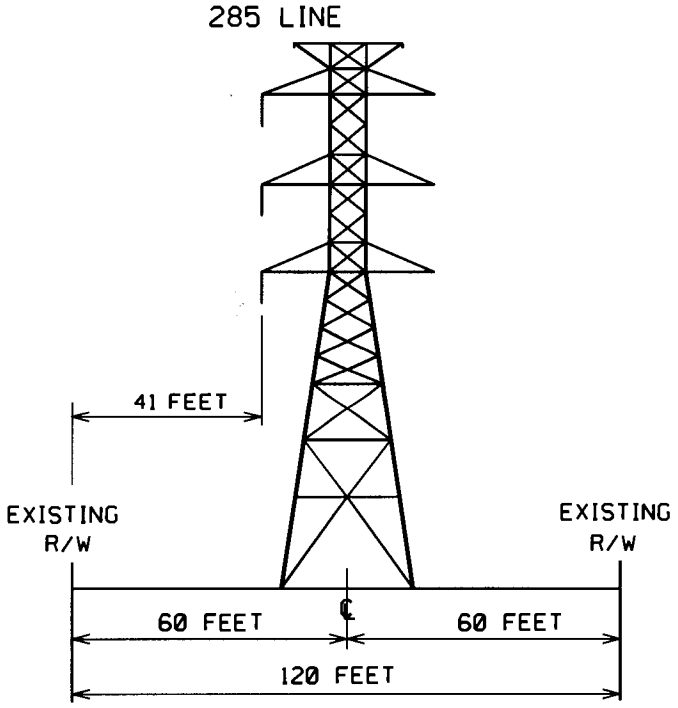
PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE :	PAINTED POLE
FOUNDATION :	EXISTING
APPROX. AVERAGE HEIGHT :	105 FEET
WIDTH AT CROSSARM :	32 FEET
WIDTH AT BASE :	5 FEET
AVERAGE SPAN LENGTH :	740 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	100 FEET
APPROXIMATE LENGTH:	2.04 MILES

$DGNSPEC$

(W) MP 0 - 1.18



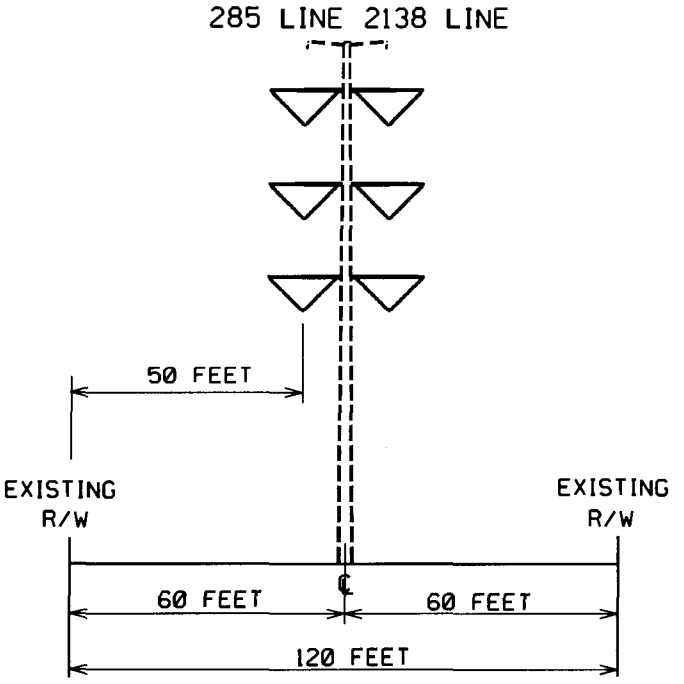
EXISTING CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE :	WEATHERING TOWER
FOUNDATION :	EXISTING
APPROX. AVERAGE HEIGHT :	120 FEET
WIDTH AT CROSSARM :	39 FEET
WIDTH AT BASE :	30 FEET
AVERAGE SPAN LENGTH :	824 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	120 FEET
APPROXIMATE LENGTH:	1.18 MILES

$DGNSPEC$

(W) MP 0 - 1.18



PROPOSED CONFIGURATION

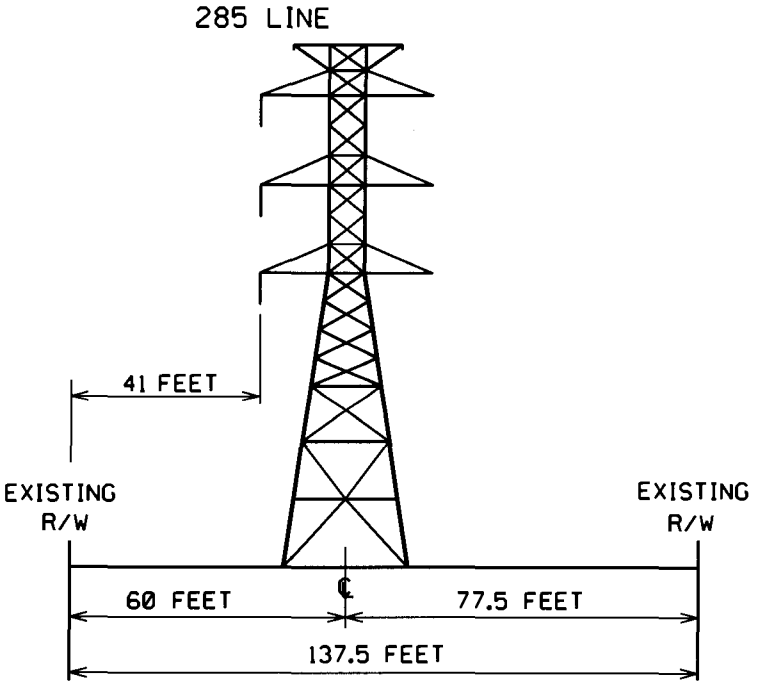
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE :	WEATHERING POLE
FOUNDATION :	PILES/CONCRETE
APPROX. AVERAGE HEIGHT :	115 FEET
WIDTH AT CROSSARM :	35 FEET
WIDTH AT BASE :	5 FEET
AVERAGE SPAN LENGTH :	850 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	120 FEET
APPROXIMATE LENGTH:	1.18 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/18/2012 1:58:03 PM

(W) MP 1.18 - 2.00



EXISTING CONFIGURATION

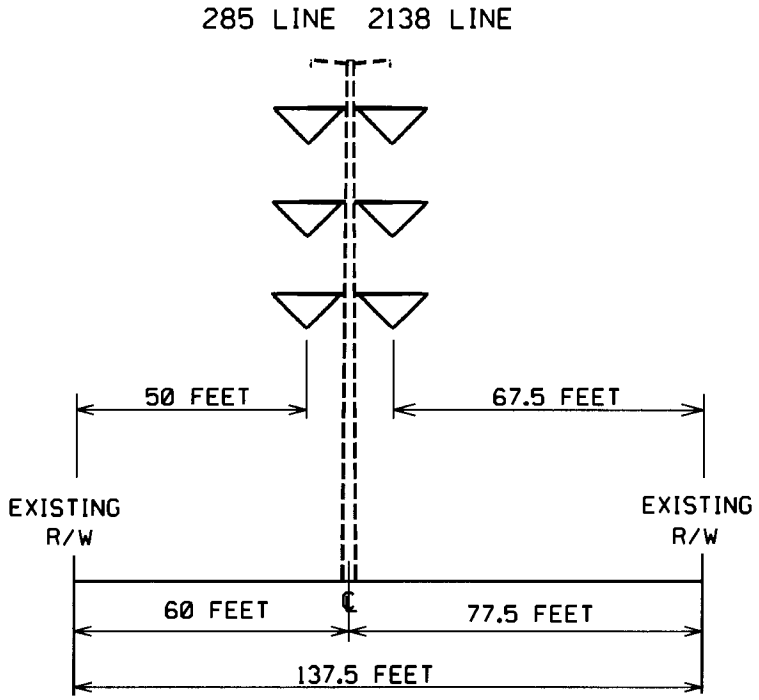
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE :	WEATHERING TOWER
FOUNDATION :	EXISTING
APPROX. AVERAGE HEIGHT :	115 FEET
WIDTH AT CROSSARM :	39 FEET
WIDTH AT BASE :	28 FEET
AVERAGE SPAN LENGTH :	857 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	137.5 FEET
APPROXIMATE LENGTH:	0.82 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/18/2012 1:58:27 PM

(W) MP 1.18 - 2.00



PROPOSED CONFIGURATION

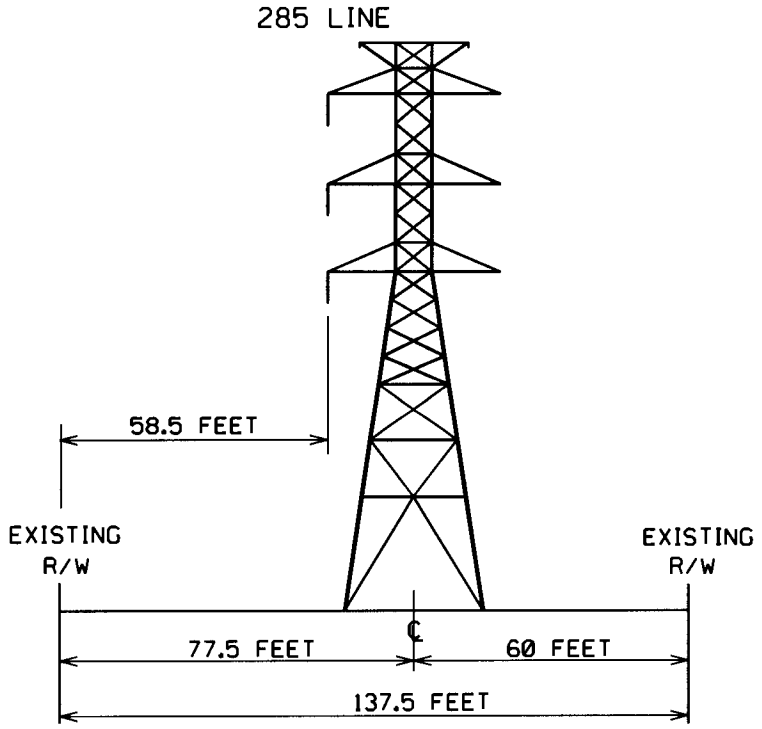
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE :	WEATHERING POLE
FOUNDATION :	PILES/CONCRETE
APPROX. AVERAGE HEIGHT :	115 FEET
WIDTH AT CROSSARM :	35 FEET
WIDTH AT BASE :	5 FEET
AVERAGE SPAN LENGTH :	850 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	137.5 FEET
APPROXIMATE LENGTH:	0.82 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/18/2012 1:59:00 PM

(W) MP 2.00 - 2.60



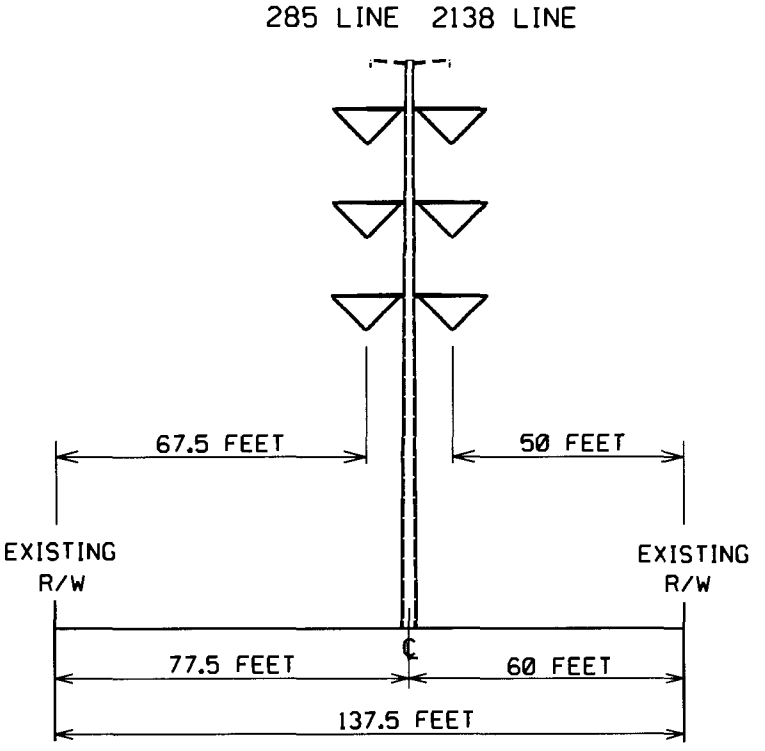
EXISTING CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE :	WEATHERING TOWER
FOUNDATION :	EXISTING
APPROX. AVERAGE HEIGHT :	125 FEET
WIDTH AT CROSSARM :	39 FEET
WIDTH AT BASE :	31 FEET
AVERAGE SPAN LENGTH :	1030 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	137.5 FEET
APPROXIMATE LENGTH:	0.60 MILES

$DGNSPEC$

(W) MP 2.00 - 2.60



PROPOSED CONFIGURATION

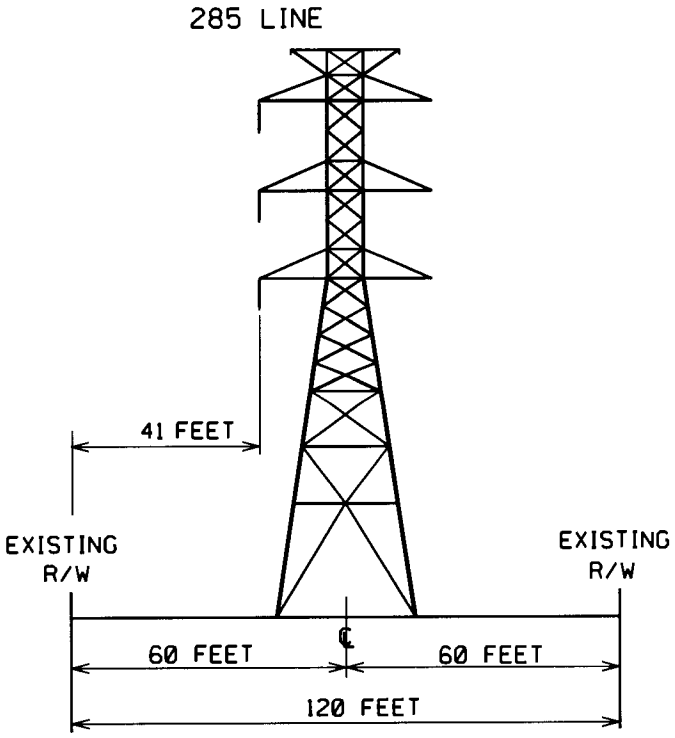
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE :	WEATHERING POLE
FOUNDATION :	PILES/CONCRETE
APPROX. AVERAGE HEIGHT :	125 FEET
WIDTH AT CROSSARM :	35 FEET
WIDTH AT BASE :	5 FEET
AVERAGE SPAN LENGTH :	1000 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	137.5 FEET
APPROXIMATE LENGTH:	0.60 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/18/2012 1:59:58 PM

(W) MP 2.60 - 2.95



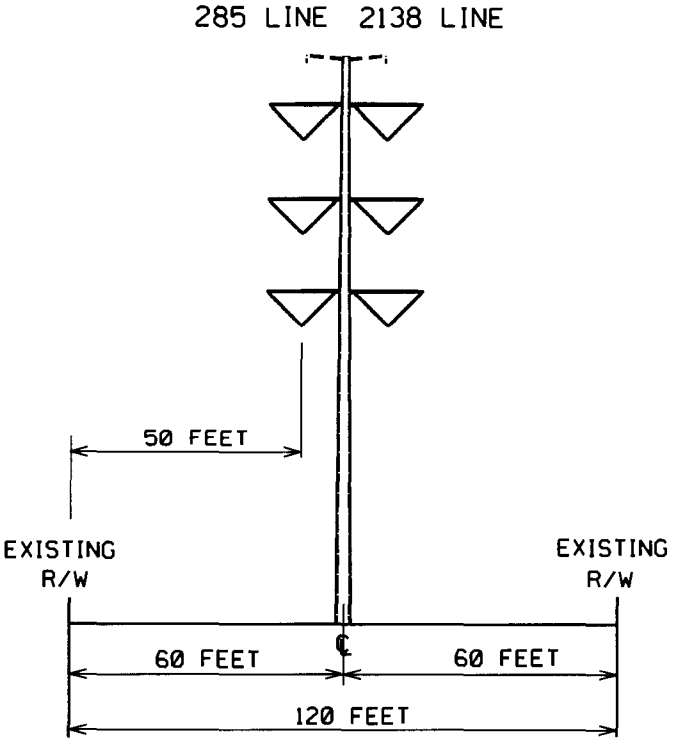
EXISTING CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE :	WEATHERING TOWER
FOUNDATION :	EXISTING
APPROX. AVERAGE HEIGHT :	125 FEET
WIDTH AT CROSSARM :	39 FEET
WIDTH AT BASE :	31 FEET
AVERAGE SPAN LENGTH :	982 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	120 FEET
APPROXIMATE LENGTH:	0.35 MILES

$DGNSPEC$

(W) MP 2.60 - 2.95



PROPOSED CONFIGURATION

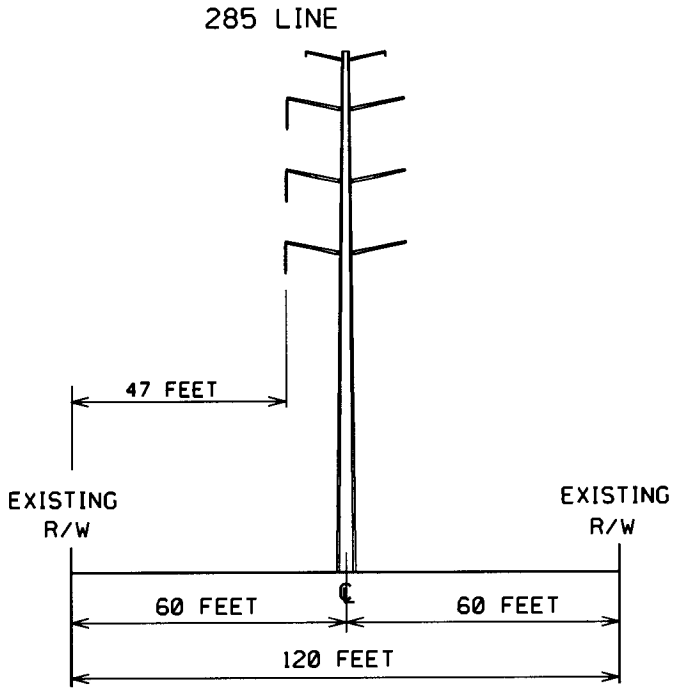
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE :	WEATHERING POLE
FOUNDATION :	PILES/CONCRETE
APPROX. AVERAGE HEIGHT :	125 FEET
WIDTH AT CROSSARM :	35 FEET
WIDTH AT BASE :	5 FEET
AVERAGE SPAN LENGTH :	1000 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	120 FEET
APPROXIMATE LENGTH:	0.35 MILES

$UGNSPEL$

SCC Exhibits.dgn 2/18/2012 2:00:55 PM

(W) MP 2.95 - 6.60



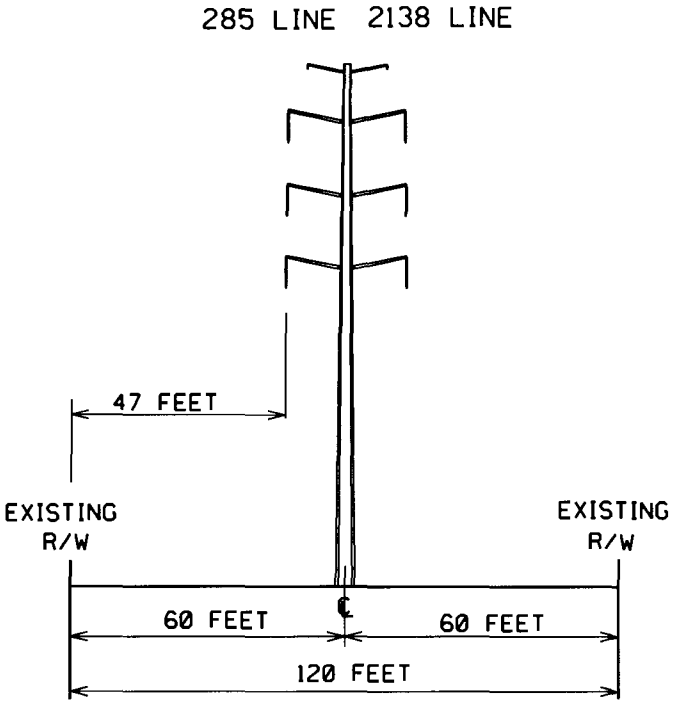
EXISTING CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE :	PAINTED POLE
FOUNDATION :	EXISTING
APPROX. AVERAGE HEIGHT :	115 FEET
WIDTH AT CROSSARM :	27 FEET
WIDTH AT BASE :	5 FEET
AVERAGE SPAN LENGTH :	1015 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	120 FEET
APPROXIMATE LENGTH:	3.65 MILES

$DGNSPEC$

(W) MP 2.95 - 6.60



PROPOSED CONFIGURATION

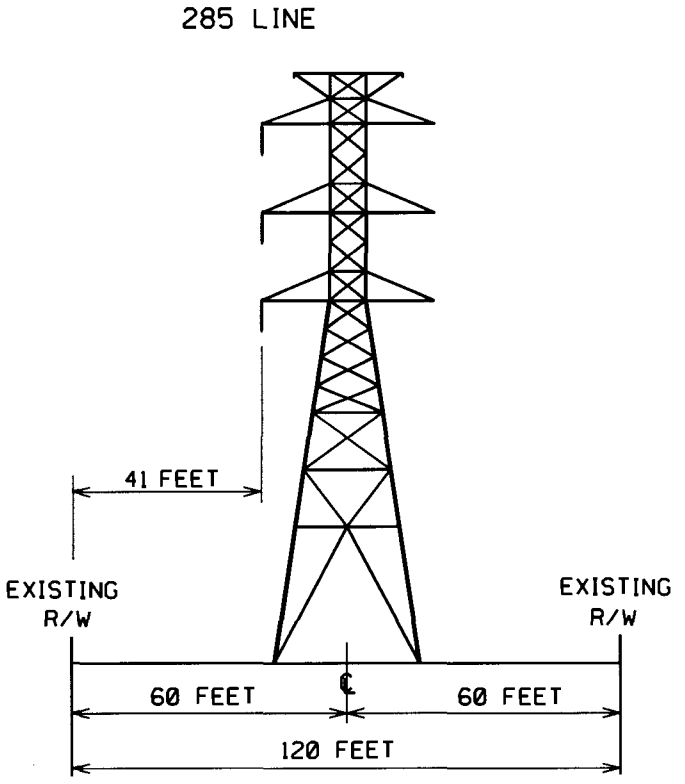
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE :	PAINTED POLE
FOUNDATION :	EXISTING
APPROX. AVERAGE HEIGHT :	115 FEET
WIDTH AT CROSSARM :	27 FEET
WIDTH AT BASE :	5 FEET
AVERAGE SPAN LENGTH :	1015 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	120 FEET
APPROXIMATE LENGTH:	3.65 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/18/2012 2:01:46 PM

(W) MP 6.60 - 7.55



EXISTING CONFIGURATION

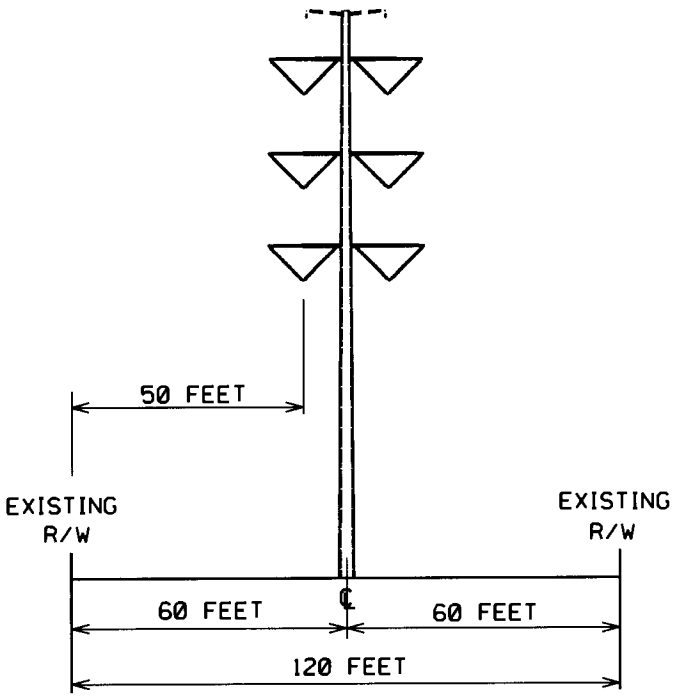
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE :	WEATHERING TOWER
FOUNDATION :	EXISTING
APPROX. AVERAGE HEIGHT :	130 FEET
WIDTH AT CROSSARM :	39 FEET
WIDTH AT BASE :	33 FEET
AVERAGE SPAN LENGTH :	1006 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	120 FEET
APPROXIMATE LENGTH:	0.95 MILES

$DGNSPEC$

(W) MP 6.60 - 7.55

285 LINE 2138 LINE



PROPOSED CONFIGURATION

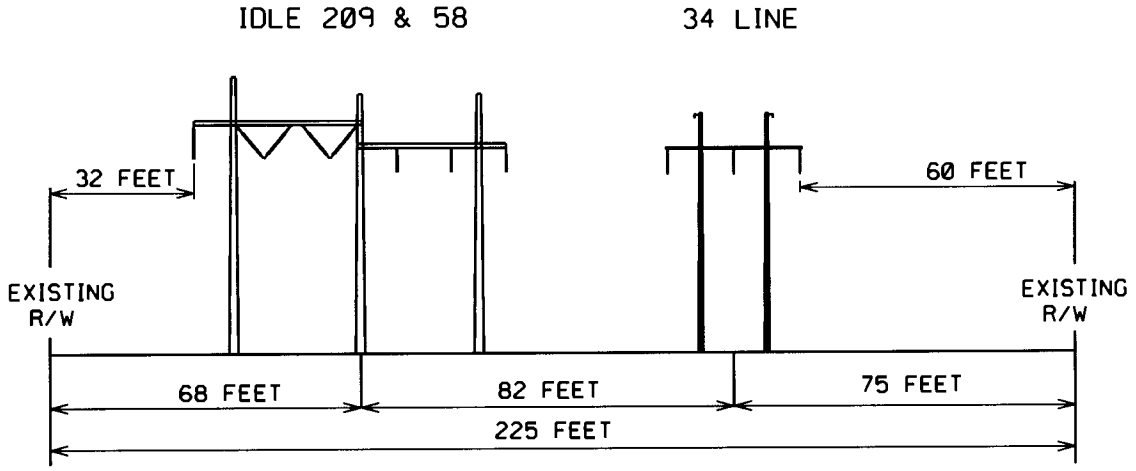
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE :	WEATHERING POLE
FOUNDATION :	PILES/CONCRETE
APPROX. AVERAGE HEIGHT :	125 FEET
WIDTH AT CROSSARM :	35 FEET
WIDTH AT BASE :	5 FEET
AVERAGE SPAN LENGTH :	1000 FEET
CONDUCTOR TYPE :	ALUMINUM
RIGHT-OF-WAY WIDTH :	120 FEET
APPROXIMATE LENGTH:	0.95 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/18/2012 2:02:40 PM

(W) MP 7.55 - 8.36



EXISTING CONFIGURATION

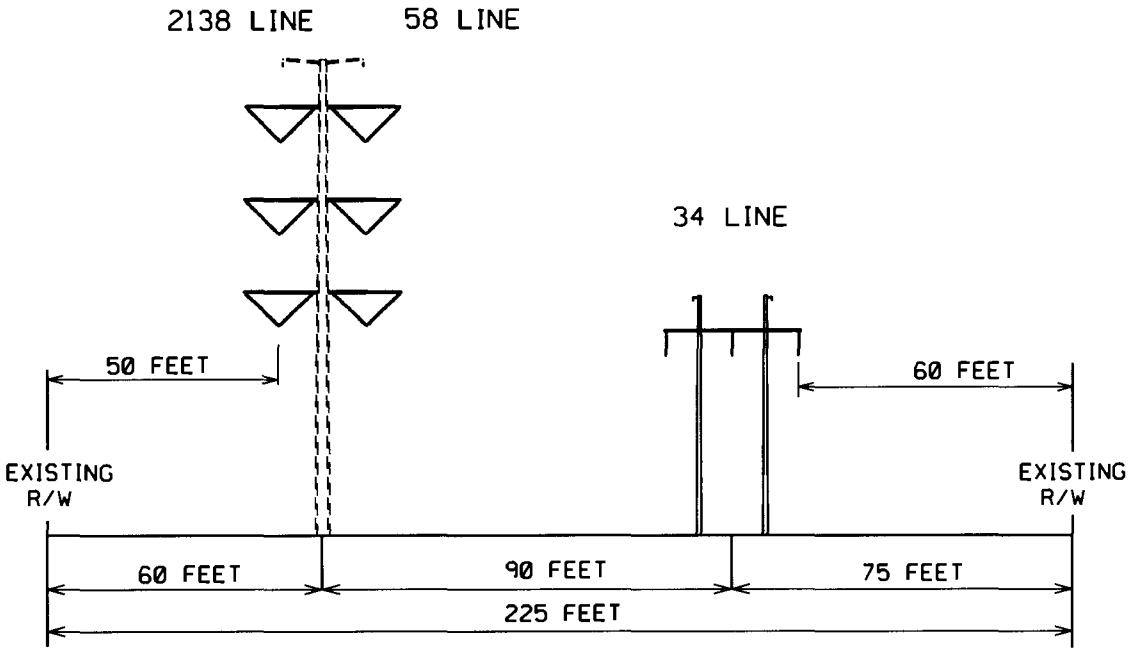
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	3 POLE WOOD	H FRAME WOOD
FOUNDATION :	DIRECT BURIED	DIRECT BURIED
APPROXIMATE HEIGHT:	61 FEET	52 FEET
WIDTH AT CROSSARM:	68 FEET	30 FEET
WIDTH AT BASE:	53 FEET	14 FEET
AVERAGE SPAN LENGTH:	568 FEET	535 FEET
CONDUCTOR TYPE:	ALUMINUM	COPPER
RIGHT OF WAY WIDTH:	225 FEET	225 FEET
APPROXIMATE LENGTH:	0.81 MILES	0.81 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/18/2012 2:03:12 PM

(W) MP 7.55 - 8.36



PROPOSED CONFIGURATION

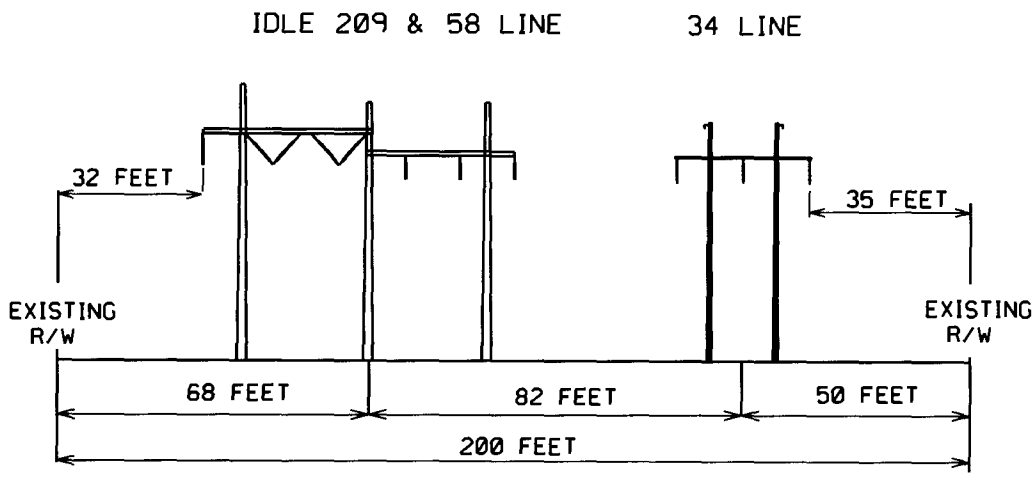
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	WEATHERING POLE	H FRAME WOOD
FOUNDATION :	PILES/CONCRETE	DIRECT BURIED
APPROXIMATE HEIGHT:	105 FEET	52 FEET
WIDTH AT CROSSARM:	35 FEET	30 FEET
WIDTH AT BASE:	5 FEET	14 FEET
AVERAGE SPAN LENGTH:	600 FEET	535 FEET
CONDUCTOR TYPE:	ALUMINUM	COPPER
RIGHT OF WAY WIDTH:	225 FEET	225 FEET
APPROXIMATE LENGTH:	0.81 MILES	0.81 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/18/2012 2:03:38 PM

(W) MP 8.36 - 8.92



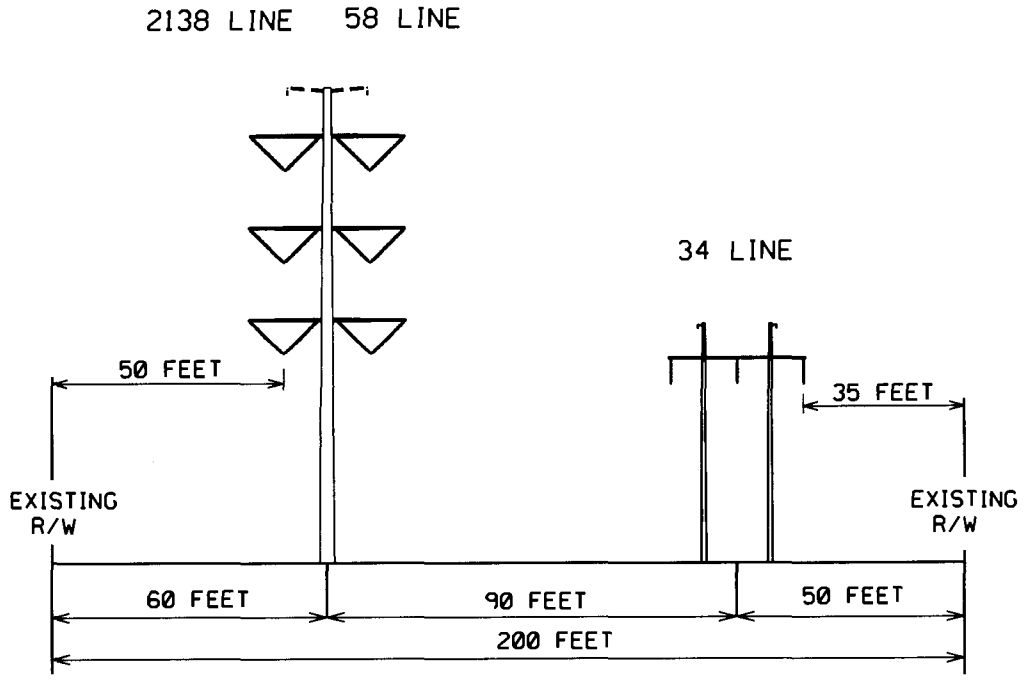
EXISTING CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	3 POLE WOOD	H FRAME WOOD
FOUNDATION :	DIRECT BURIED	DIRECT BURIED
APPROXIMATE HEIGHT:	61 FEET	52 FEET
WIDTH AT CROSSARM:	68 FEET	30 FEET
WIDTH AT BASE:	53 FEET	14 FEET
AVERAGE SPAN LENGTH:	589 FEET	505 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	200 FEET	200 FEET
APPROXIMATE LENGTH:	0.56 MILES	0.56 MILES

$DGNSPEC$

(W) MP 8.36 - 8.92



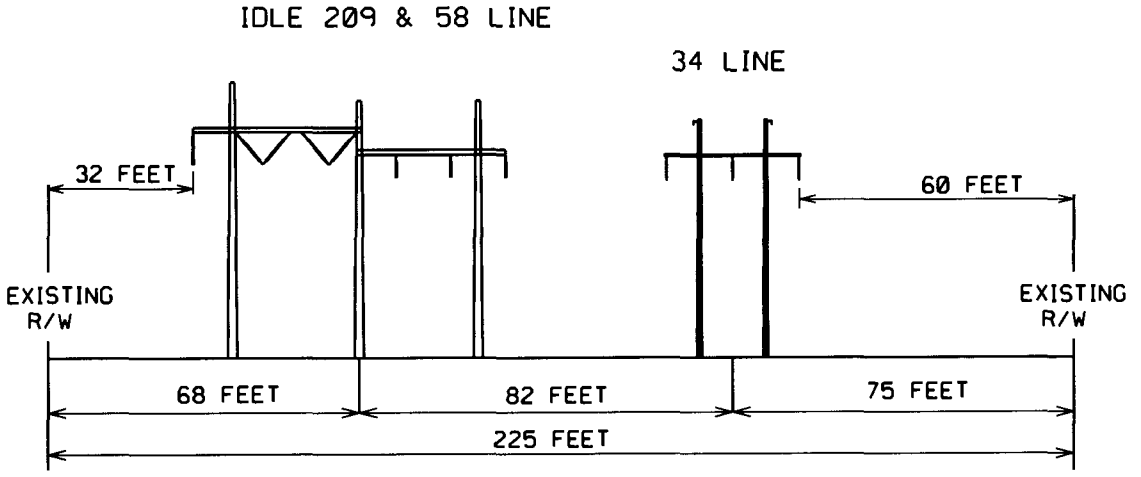
PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	WEATHERING POLE	H FRAME WOOD
FOUNDATION :	PILES CONCRETE	DIRECT BURIED
APPROXIMATE HEIGHT:	105 FEET	52 FEET
WIDTH AT CROSSARM:	35 FEET	30 FEET
WIDTH AT BASE:	5 FEET	14 FEET
AVERAGE SPAN LENGTH:	625 FEET	505 FEET
CONDUCTOR TYPE:	ALUMINUM	COPPER
RIGHT OF WAY WIDTH:	200 FEET	200 FEET
APPROXIMATE LENGTH:	0.56 MILES	0.56 MILES

$DGNSPEC$

(W) MP 8.92 - 9.24



EXISTING CONFIGURATION

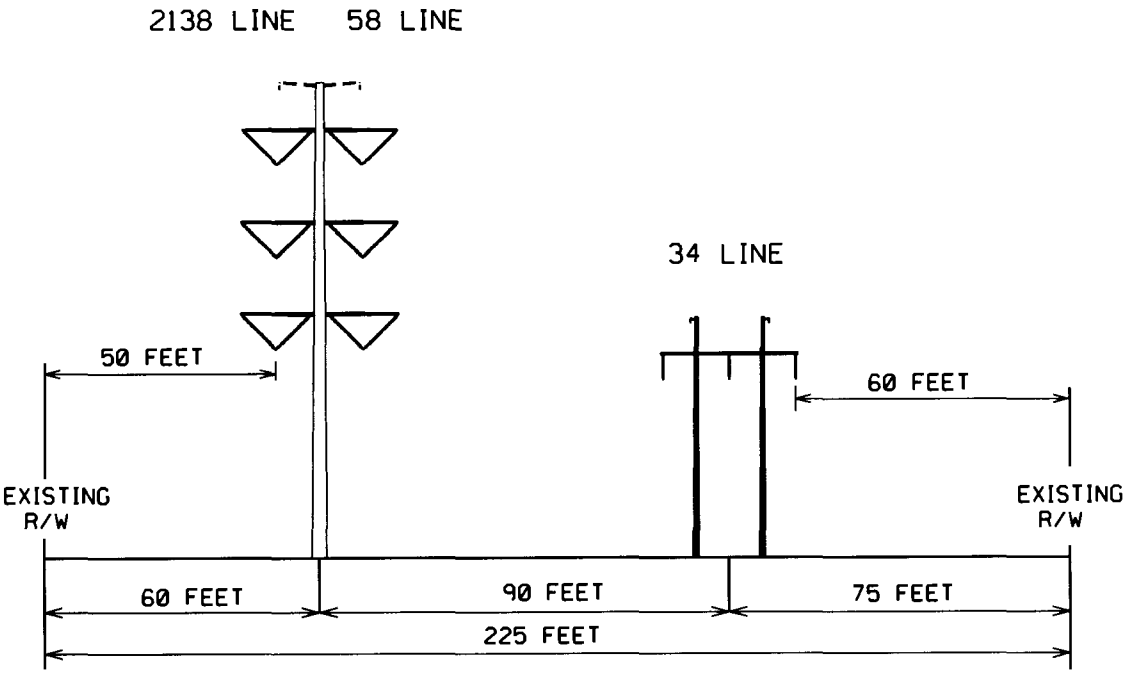
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	3 POLE WOOD	H FRAME WOOD
FOUNDATION :	DIRECT BURIED	DIRECT BURIED
APPROXIMATE HEIGHT:	61 FEET	52 FEET
WIDTH AT CROSSARM:	68 FEET	30 FEET
WIDTH AT BASE:	53 FEET	14 FEET
AVERAGE SPAN LENGTH:	519 FEET	792 FEET
CONDUCTOR TYPE:	ALUMINUM	COPPER
RIGHT OF WAY WIDTH:	225 FEET	225 FEET
APPROXIMATE LENGTH:	0.32 MILES	0.32 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/18/2012 2:05:17 PM

(W) MP 8.92 - 9.24



PROPOSED CONFIGURATION

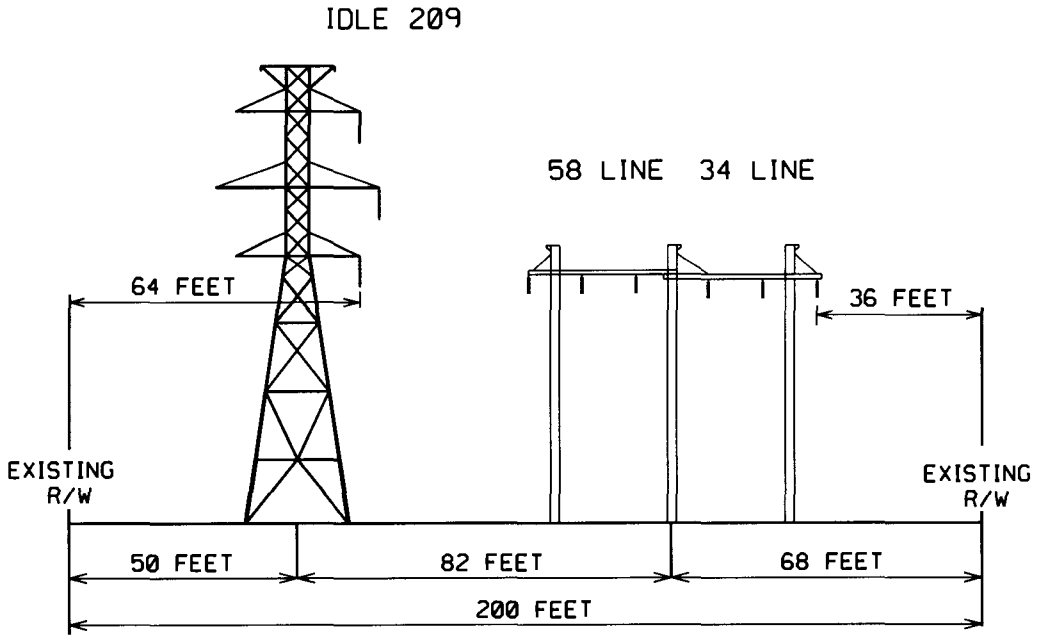
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	WEATHERING POLE	H FRAME WOOD
FOUNDATION :	PILES/CONCRETE	DIRECT BURIED
APPROXIMATE HEIGHT:	105 FEET	52 FEET
WIDTH AT CROSSARM:	35 FEET	30 FEET
WIDTH AT BASE:	5 FEET	14 FEET
AVERAGE SPAN LENGTH:	625 FEET	792 FEET
CONDUCTOR TYPE:	ALUMINUM	COPPER
RIGHT OF WAY WIDTH:	225 FEET	225 FEET
APPROXIMATE LENGTH:	0.32 MILES	0.32 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/21/2012 11:25:19 AM

(W) MP 9.24 - 9.49



EXISTING CONFIGURATION

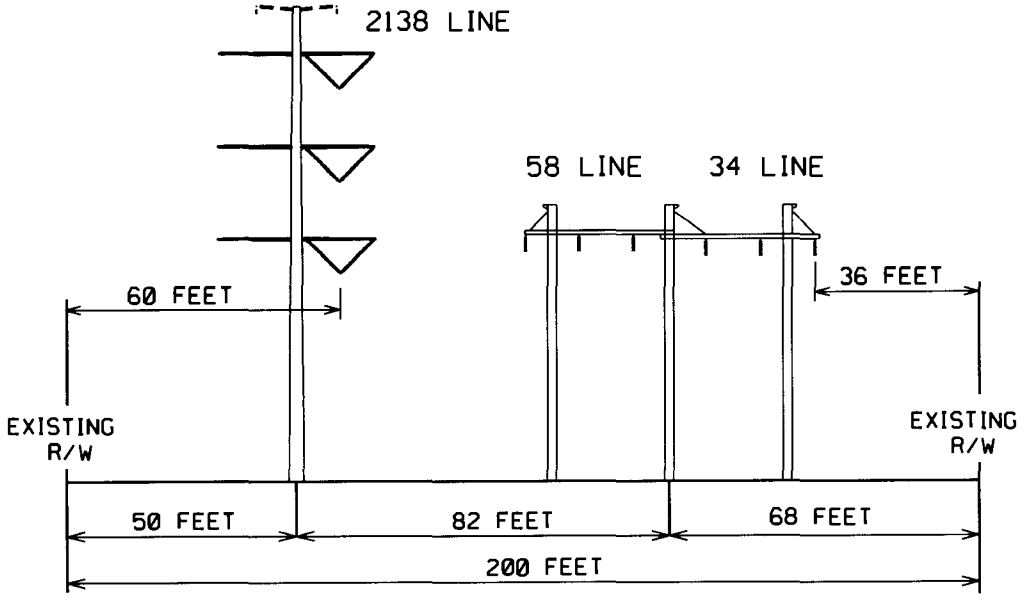
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	WEATHERING TOWER	3 POLE WOOD
FOUNDATION :	EXISTING	DIRECT BURIED
APPROXIMATE HEIGHT:	100 FEET	61 FEET
WIDTH AT CROSSARM:	36 FEET	65 FEET
WIDTH AT BASE:	24 FEET	52 FEET
AVERAGE SPAN LENGTH:	653 FEET	572 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM COPPER
RIGHT OF WAY WIDTH:	200 FEET	200 FEET
APPROXIMATE LENGTH:	0.25 MILES	0.25 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/18/2012 2:06:35 PM

(W) MP 9.24 - 9.49



PROPOSED CONFIGURATION

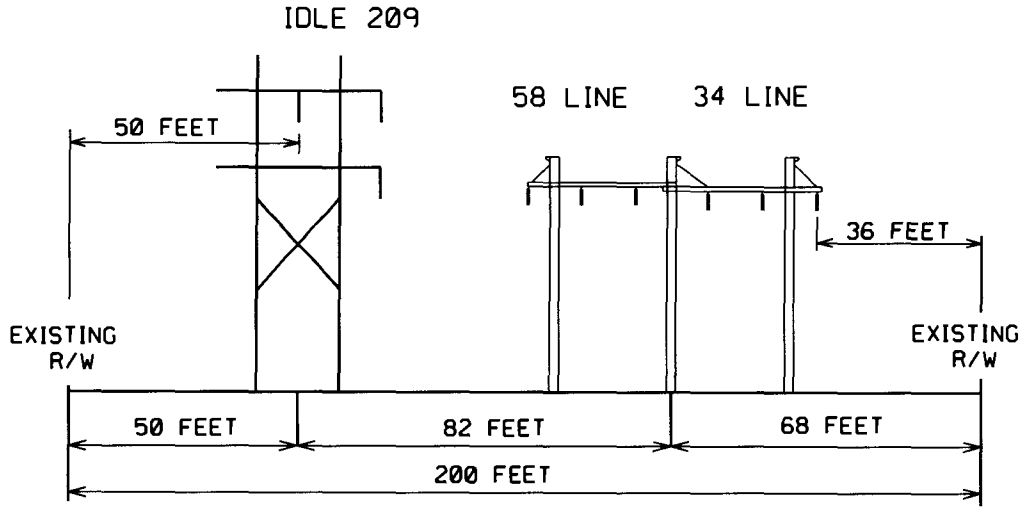
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	WEATHERING POLE	3 POLE WOOD
FOUNDATION :	PILES/CONCRETE	DIRECT BURIED
APPROXIMATE HEIGHT:	105 FEET	61 FEET
WIDTH AT CROSSARM:	35 FEET	65 FEET
WIDTH AT BASE:	5 FEET	52 FEET
AVERAGE SPAN LENGTH:	625 FEET	572 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM COPPER
RIGHT OF WAY WIDTH:	200 FEET	200 FEET
APPROXIMATE LENGTH:	0.25 MILES	0.25 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/18/2012 2:07:02 PM

(W) MP 9.49 - 10.00



EXISTING CONFIGURATION

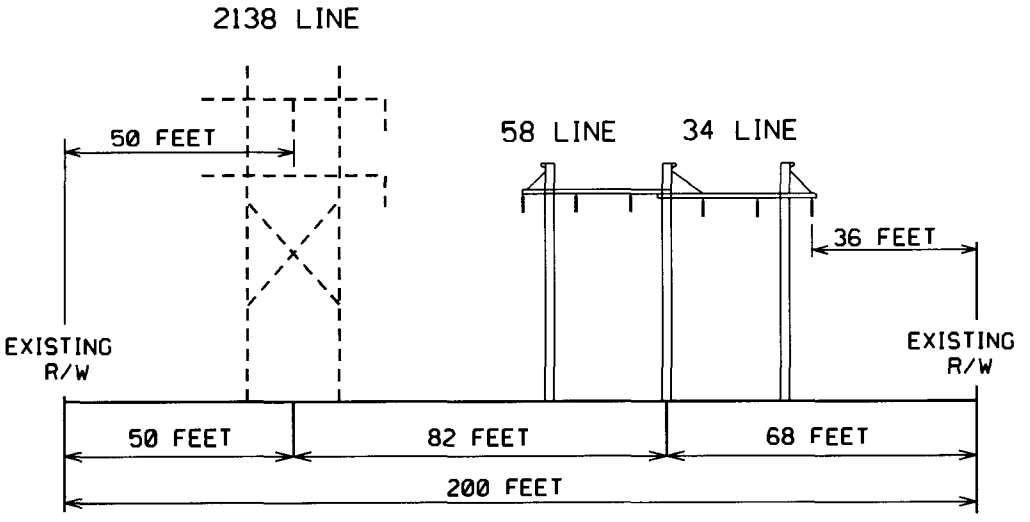
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	H FRAME	3 POLE WOOD
FOUNDATION :	DIRECT BURIED	DIRECT BURIED
APPROXIMATE HEIGHT:	75 FEET	52 FEET
WIDTH AT CROSSARM:	38 FEET	65 FEET
WIDTH AT BASE:	18 FEET	52 FEET
AVERAGE SPAN LENGTH:	547 FEET	581 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM COPPER
RIGHT OF WAY WIDTH:	200 FEET	200 FEET
APPROXIMATE LENGTH:	0.51 MILES	0.51 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/18/2012 2:07:26 PM

(W) MP 9.49 - 10.00



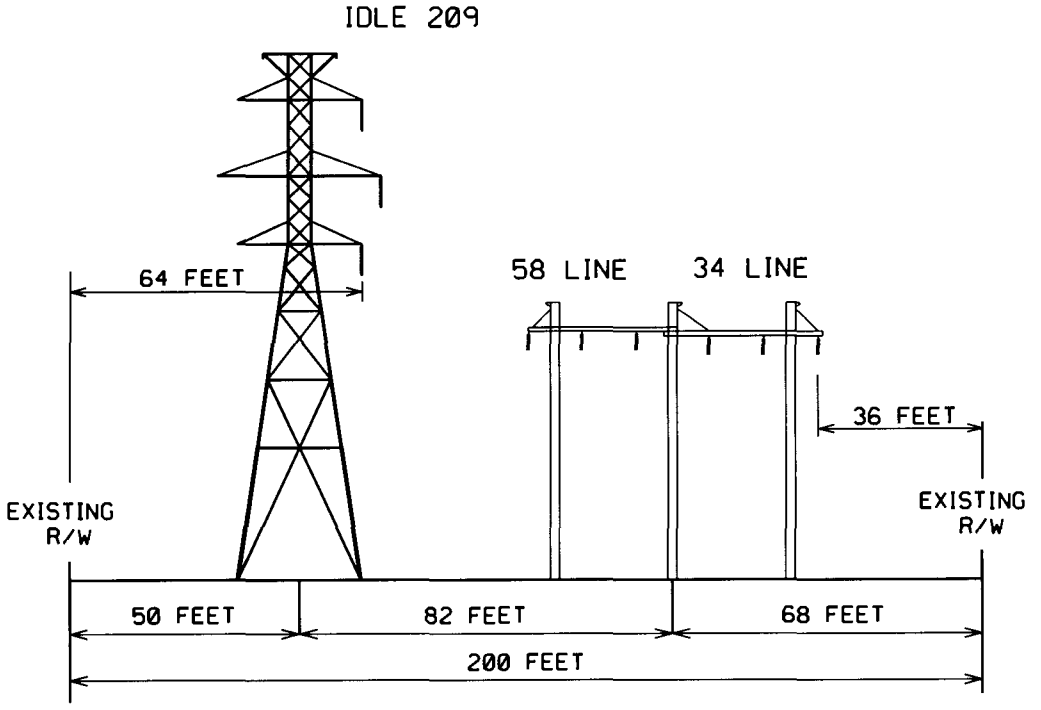
PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	WEATHERING H-FRAME	3 POLE WOOD
FOUNDATION :	PILES/CONCRETE	DIRECT BURIED
APPROXIMATE HEIGHT:	75 FEET	52 FEET
WIDTH AT CROSSARM:	40 FEET	65 FEET
WIDTH AT BASE:	20 FEET	52 FEET
AVERAGE SPAN LENGTH:	550 FEET	581 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM COPPER
RIGHT OF WAY WIDTH:	200 FEET	200 FEET
APPROXIMATE LENGTH:	0.51 MILES	0.51 MILES

$DGNSPEC$

(W) MP 10.00 - 10.70



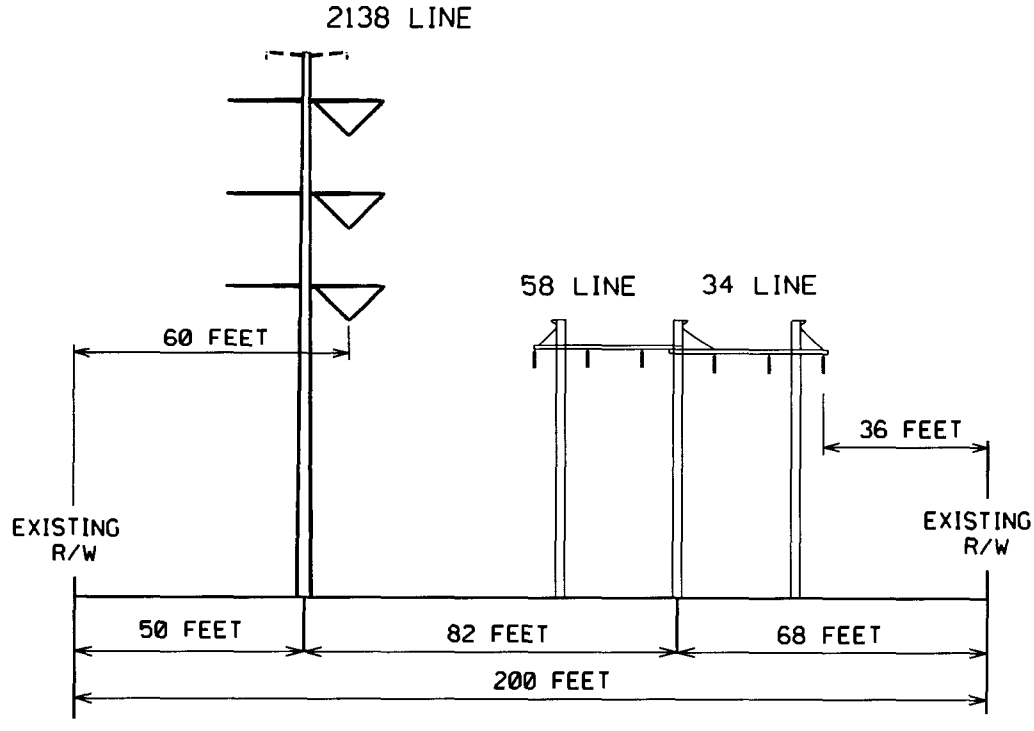
EXISTING CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	WEATHERING TOWER	3 POLE WOOD
FOUNDATION :	EXISTING	DIRECT BURIED
APPROXIMATE HEIGHT:	115 FEET	61 FEET
WIDTH AT CROSSARM:	36 FEET	65 FEET
WIDTH AT BASE:	27 FEET	52 FEET
AVERAGE SPAN LENGTH:	906 FEET	596 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM COPPER
RIGHT OF WAY WIDTH:	200 FEET	200 FEET
APPROXIMATE LENGTH:	0.70 MILES	0.70 MILES

$DGNSPEC$

(W) MP 10.00 - 10.70



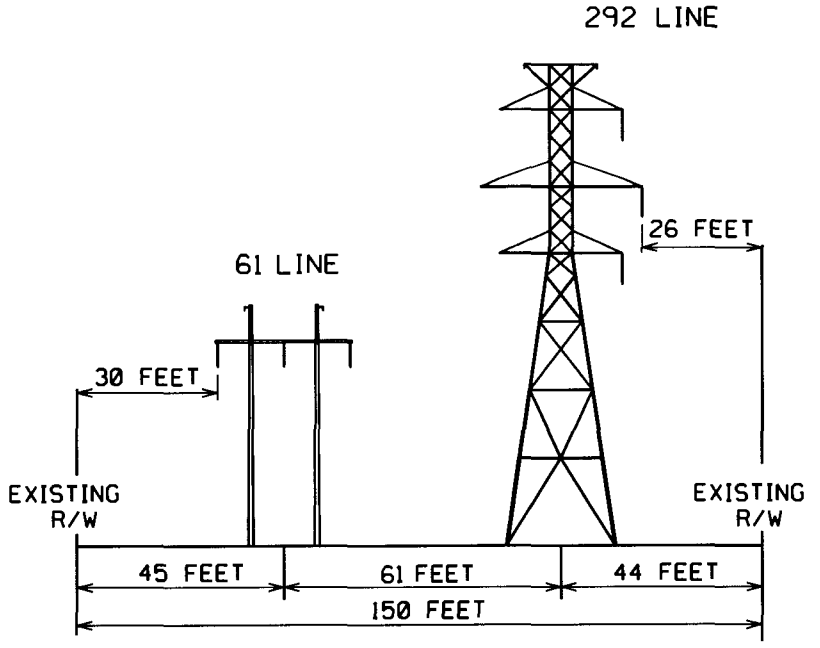
PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	WEATHERING POLE	3 POLE WOOD
FOUNDATION :	PILES/CONCRETE	DIRECT BURIED
APPROXIMATE HEIGHT:	120 FEET	61 FEET
WIDTH AT CROSSARM:	35 FEET	65 FEET
WIDTH AT BASE:	5 FEET	52 FEET
AVERAGE SPAN LENGTH:	900 FEET	596 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
		COPPER
RIGHT OF WAY WIDTH:	200 FEET	200 FEET
APPROXIMATE LENGTH:	0.70 MILES	0.70 MILES

$DGNSPEC$

(W) MP 10.70 - 10.99



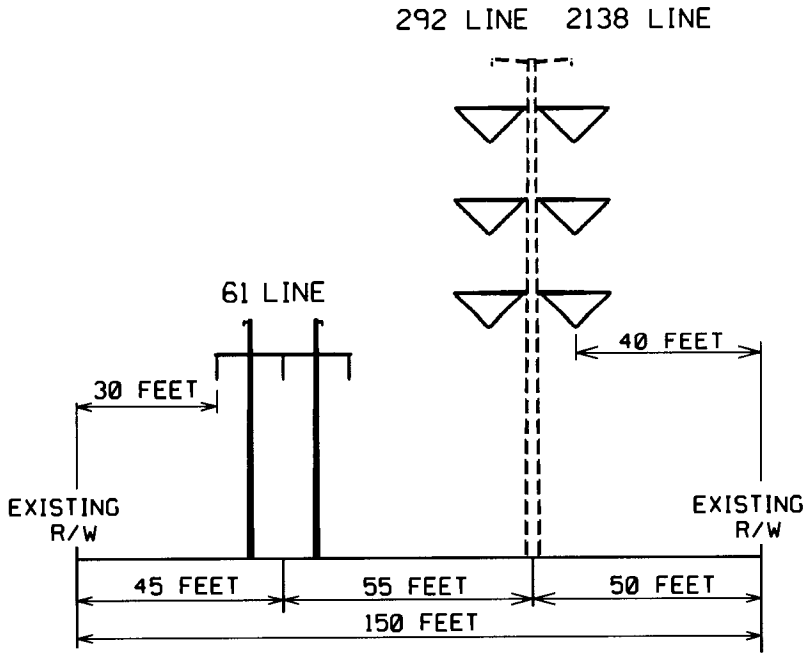
EXISTING CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	H FRAME WOOD	STEEL TOWER
FOUNDATION :	DIRECT BURIED	EXISTING
APPROXIMATE HEIGHT:	52 FEET	106 FEET
WIDTH AT CROSSARM:	30 FEET	36 FEET
WIDTH AT BASE:	14 FEET	25 FEET
AVERAGE SPAN LENGTH:	533 FEET	515 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	150 FEET	150 FEET
APPROXIMATE LENGTH:	0.29 MILES	0.29 MILES

$DGNSPEC$

(W) MP 10.70 - 10.99



PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	H FRAME WOOD	WEATHERING POLE
FOUNDATION :	DIRECT BURIED	PILES/CONCRETE
APPROXIMATE HEIGHT:	52 FEET	110 FEET
WIDTH AT CROSSARM:	30 FEET	35 FEET
WIDTH AT BASE:	14 FEET	5 FEET
AVERAGE SPAN LENGTH:	533 FEET	515 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	150 FEET	150 FEET
APPROXIMATE LENGTH:	0.29 MILES	0.29 MILES

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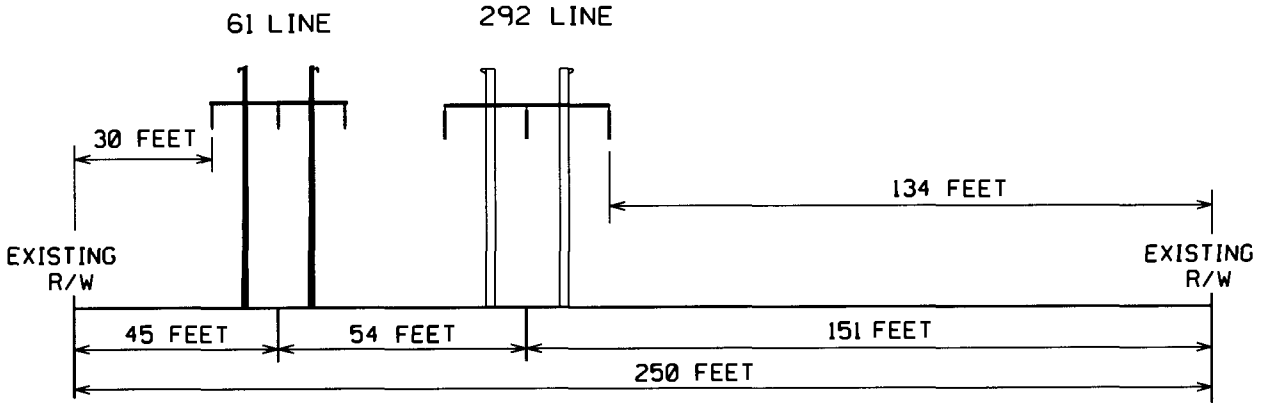
(W) MP 10.99 - 11.92



EXISTING CONFIGURATION

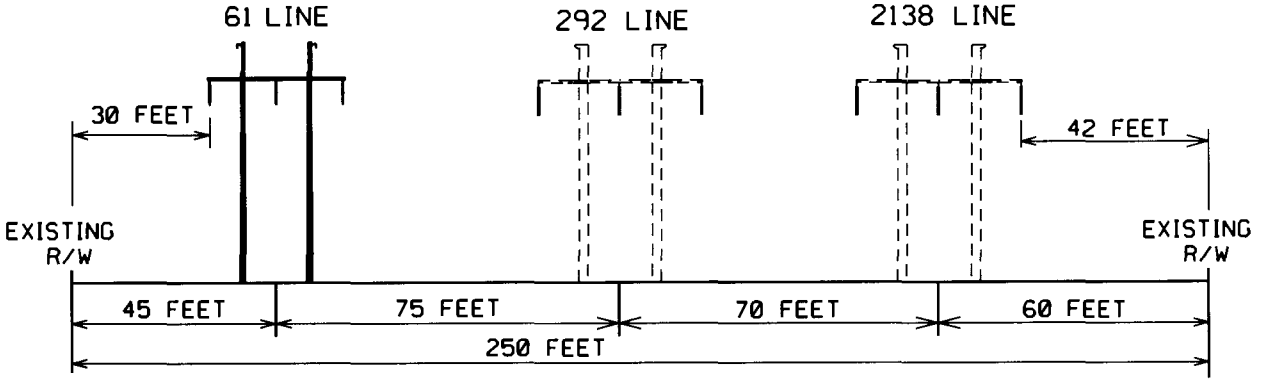
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	H FRAME WOOD	H FRAME WOOD
FOUNDATION :	DIRECT BURIED	DIRECT BURIED
APPROXIMATE HEIGHT:	52 FEET	52 FEET
WIDTH AT CROSSARM:	30 FEET	36 FEET
WIDTH AT BASE:	14 FEET	18 FEET
AVERAGE SPAN LENGTH:	690 FEET	500 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	250 FEET	250 FEET
APPROXIMATE LENGTH:	0.93 MILES	0.93 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/21/2012 8:56:24 AM

(W) MP 10.99 - 11.92



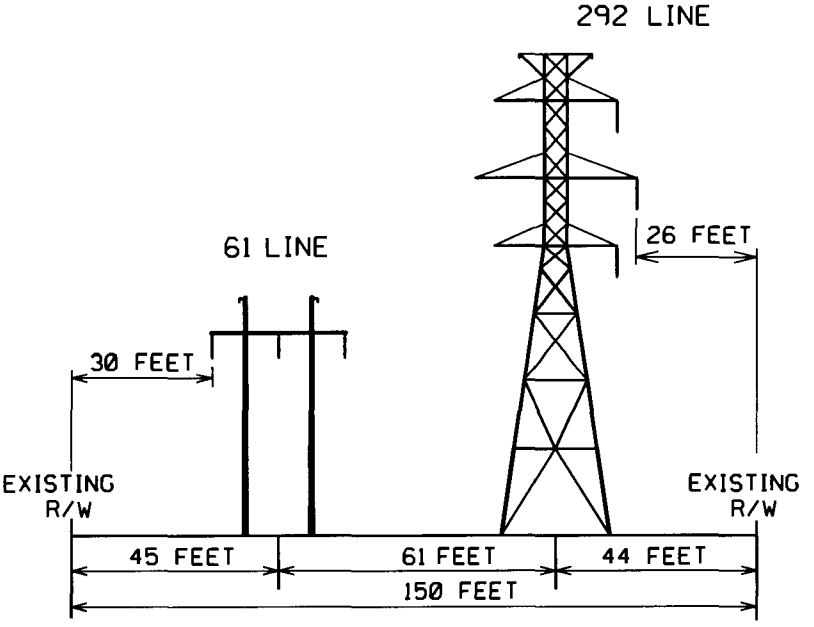
PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	H FRAME	H FRAME	H FRAME
FOUNDATION :	DIRECT BURIED	DIRECT BURIED	DIRECT BURIED
APPROXIMATE HEIGHT:	52 FEET	52 FEET	52 FEET
WIDTH AT CROSSARM:	30 FEET	38 FEET	38 FEET
WIDTH AT BASE:	14 FEET	19 FEET	19 FEET
AVERAGE SPAN LENGTH:	690 FEET	500 FEET	500 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	250 FEET	250 FEET	250 FEET
APPROXIMATE LENGTH:	0.93 MILES	0.93 MILES	0.93 MILES

$DGNSPEC$

(W) MP 11.92 - 16.82



EXISTING CONFIGURATION

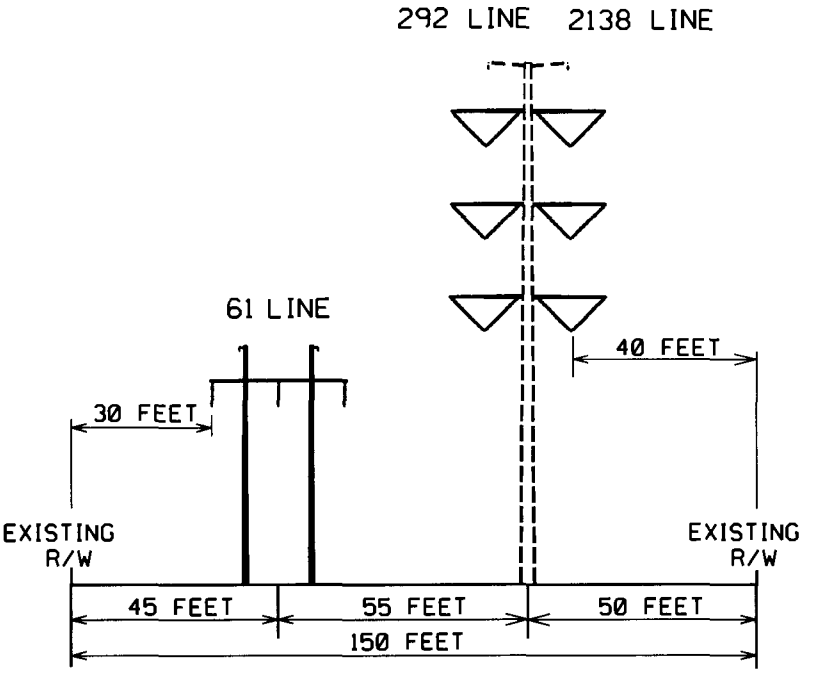
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	H FRAME WOOD	WEATHERING TOWER
FOUNDATION :	DIRECT BURIED	EXISTING
APPROXIMATE HEIGHT:	52 FEET	106 FEET
WIDTH AT CROSSARM:	30 FEET	36 FEET
WIDTH AT BASE:	14 FEET	25 FEET
AVERAGE SPAN LENGTH:	614 FEET	762 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	150 FEET	150 FEET
APPROXIMATE LENGTH:	4.90 MILES	4.90 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/18/2012 2:11:12 PM

(W) MP 11.92 - 16.82



PROPOSED CONFIGURATION

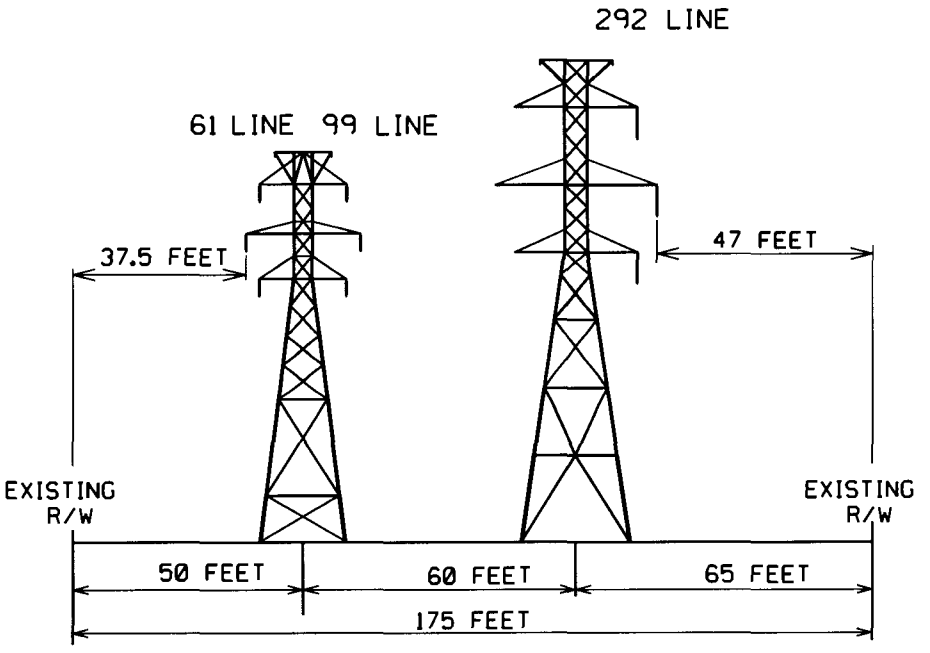
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	H FRAME	WEATHERING POLE
FOUNDATION :	DIRECT BURIED	PILES/CONCRETE
APPROXIMATE HEIGHT:	52 FEET	115 FEET
WIDTH AT CROSSARM:	30 FEET	35 FEET
WIDTH AT BASE:	14 FEET	5 FEET
AVERAGE SPAN LENGTH:	614 FEET	800 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	150 FEET	150 FEET
APPROXIMATE LENGTH:	4.90 MILES	4.90 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/18/2012 2:11:41 PM

(W) MP 16.82 - 19.10



EXISTING CONFIGURATION

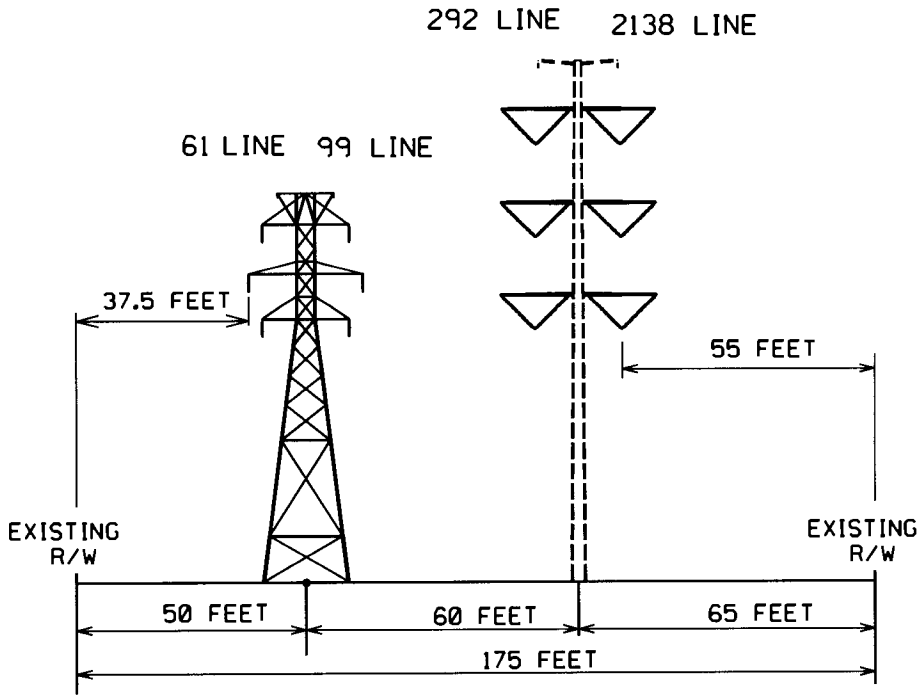
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	GALVANIZED TOWER	WEATHERING TOWER
FOUNDATION :	EXISTING	EXISTING
APPROXIMATE HEIGHT:	85 FEET	106 FEET
WIDTH AT CROSSARM:	26 FEET	36 FEET
WIDTH AT BASE:	20 FEET	25 FEET
AVERAGE SPAN LENGTH:	633 FEET	800 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	175 FEET	175 FEET
APPROXIMATE LENGTH:	2.28 MILES	2.28 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/18/2012 2:12:16 PM

(W) MP 16.82 - 19.10



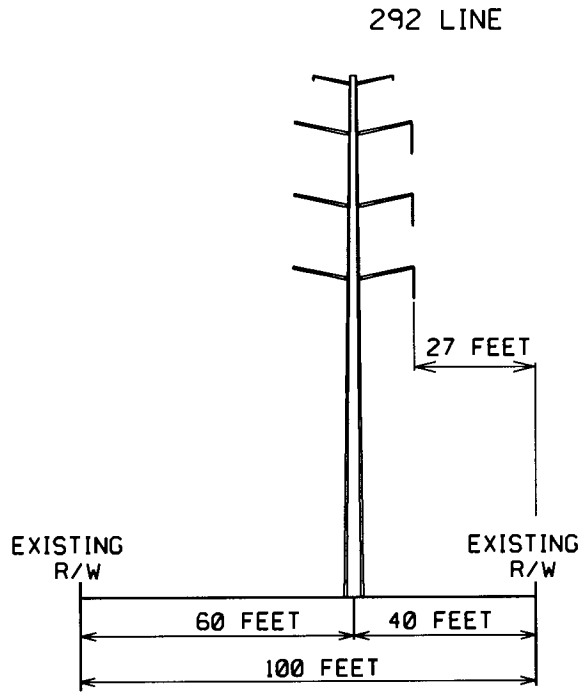
PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	GALVANIZED TOWER	WEATHERING POLE
FOUNDATION :	EXISTING	PILES/CONCRETE
APPROXIMATE HEIGHT:	85 FEET	115 FEET
WIDTH AT CROSSARM:	26 FEET	35 FEET
WIDTH AT BASE:	20 FEET	5 FEET
AVERAGE SPAN LENGTH:	633 FEET	800 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	175 FEET	175 FEET
APPROXIMATE LENGTH:	2.28 MILES	2.28 MILES

$DGNSPEC$

(W) MP 19.10 - 19.48



EXISTING CONFIGURATION

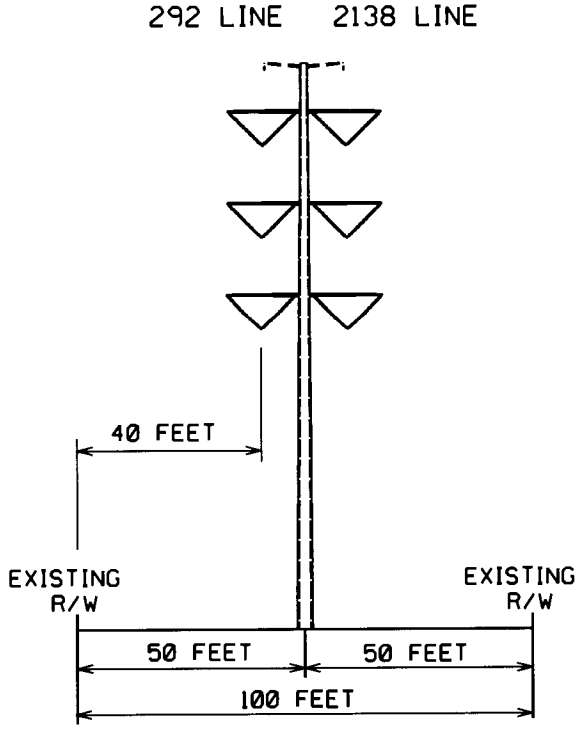
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	PAINTED POLE
FOUNDATION :	EXISTING
APPROXIMATE HEIGHT:	115 FEET
WIDTH AT CROSSARM:	26 FEET
WIDTH AT BASE:	5 FEET
AVERAGE SPAN LENGTH:	850 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	100 FEET
APPROXIMATE LENGTH OF LINE :	0.38 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/18/2012 2:13:14 PM

(W) MP 19.10 - 19.48



PROPOSED CONFIGURATION

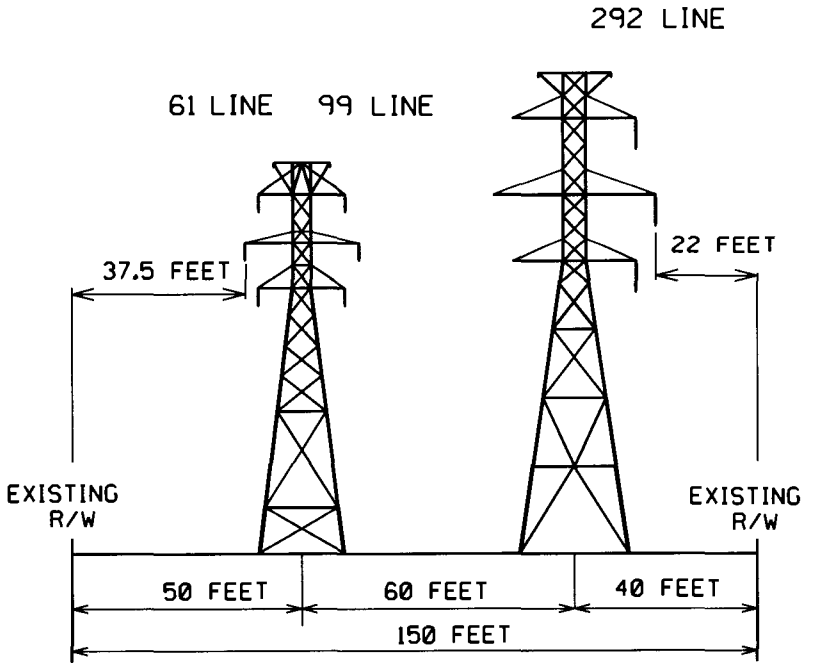
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	WEATHERING POLE
FOUNDATION :	PILES/CONCRETE
APPROXIMATE HEIGHT:	125 FEET
WIDTH AT CROSSARM:	35 FEET
WIDTH AT BASE:	5 FEET
AVERAGE SPAN LENGTH:	850 FEET
CONDUCTOR TYPE:	ALUMINUM
RIGHT OF WAY WIDTH:	100 FEET
APPROXIMATE LENGTH OF LINE :	0.38 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/18/2012 2:13:40 PM

(W) MP 19.48 - 19.85



EXISTING CONFIGURATION

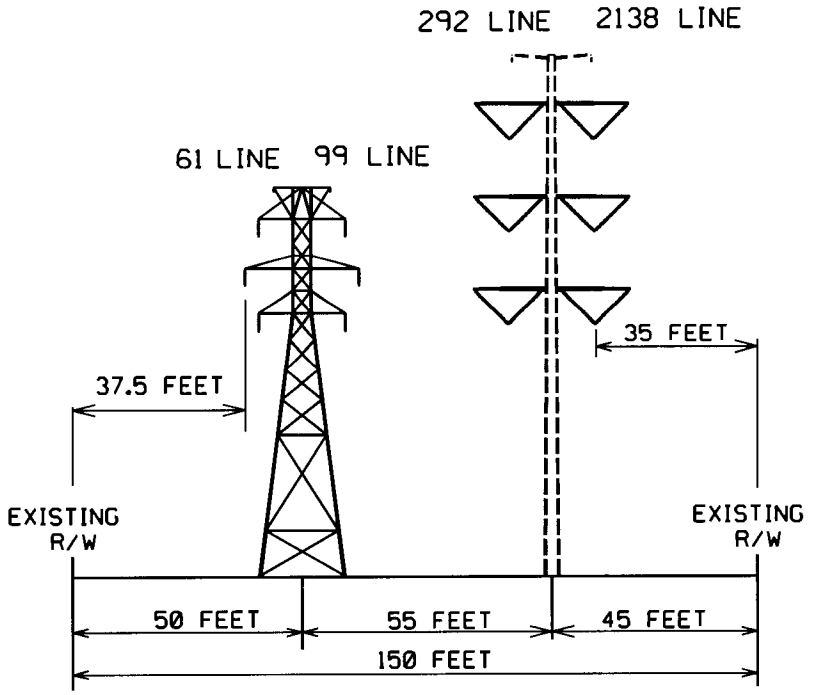
TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	GALVANIZED TOWER	WEATHERING TOWER
FOUNDATION :	EXISTING	EXISTING
APPROXIMATE HEIGHT:	85 FEET	106 FEET
WIDTH AT CROSSARM:	26 FEET	36 FEET
WIDTH AT BASE:	20 FEET	25 FEET
AVERAGE SPAN LENGTH:	664 FEET	800 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	150 FEET	150 FEET
APPROXIMATE LENGTH OF LINE :	0.37 MILES	0.37 MILES

$DGNSPEC$

SCC Exhibits.dgn 2/18/2012 2:15:03 PM

(W) MP 19.48 - 19.85



PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD SKIFFES CREEK

TYPE OF STRUCTURE:	GALVANIZED TOWER	WEATHERING POLE
FOUNDATION :	EXISTING	PILES/CONCRETE
APPROXIMATE HEIGHT:	85 FEET	115 FEET
WIDTH AT CROSSARM:	26 FEET	35 FEET
WIDTH AT BASE:	20 FEET	5 FEET
AVERAGE SPAN LENGTH:	664 FEET	800 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	150 FEET	150 FEET
APPROXIMATE LENGTH OF LINE :	0.37 MILES	0.37 MILES

$DGNSPEC$

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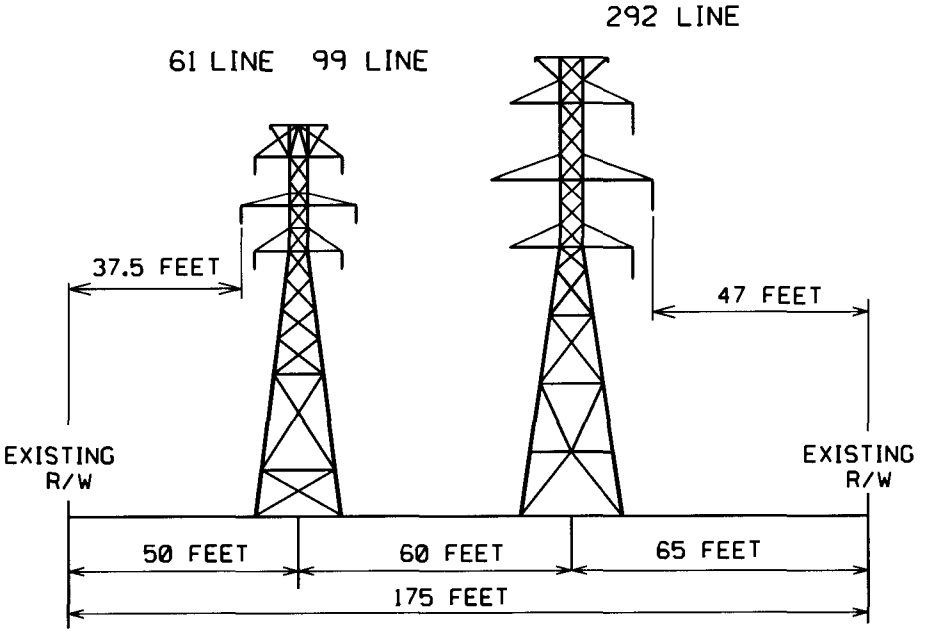
(W) MP 19.85 - 20.22



EXISTING CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	GALVANIZED TOWER	WEATHERING TOWER
FOUNDATION :	EXISTING	EXISTING
APPROXIMATE HEIGHT:	85 FEET	101 FEET
WIDTH AT CROSSARM:	26 FEET	36 FEET
WIDTH AT BASE:	20 FEET	22 FEET
AVERAGE SPAN LENGTH:	285 FEET	750 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	175 FEET	175 FEET
APPROXIMATE LENGTH OF LINE :	0.37 MILES	0.37 MILES

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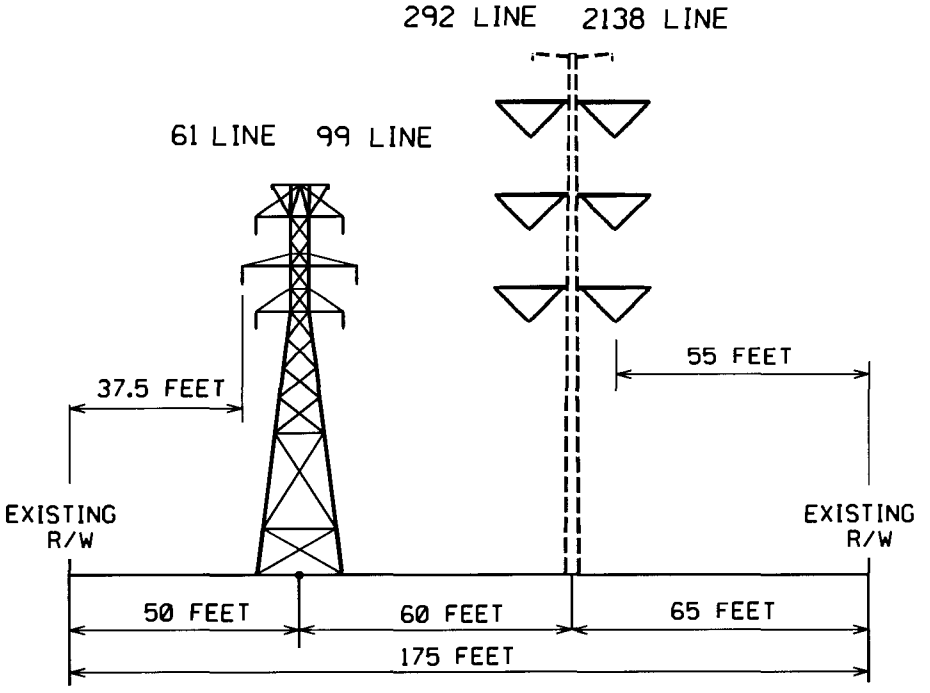

PROPOSED CONFIGURATION

TYPICAL RIGHT OF WAY LOOKING TOWARD WHEALTON

TYPE OF STRUCTURE:	GALVANIZED TOWER	WEATHERING POLE
FOUNDATION :	EXISTING	PILES/CONCRETE
APPROXIMATE HEIGHT:	85 FEET	110 FEET
WIDTH AT CROSSARM:	26 FEET	35 FEET
WIDTH AT BASE:	20 FEET	5 FEET
AVERAGE SPAN LENGTH:	285 FEET	800 FEET
CONDUCTOR TYPE:	ALUMINUM	ALUMINUM
RIGHT OF WAY WIDTH:	175 FEET	175 FEET
APPROXIMATE LENGTH OF LINE :	0.37 MILES	0.37 MILES

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II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (ROW)

4. Detail what portions of the ROW are subject to existing easements and over what portions easements will be needed;

Response: **500 kV Proposed Route (Surry-Skiffes Creek):**

The Proposed Route for the 500 kV line begins on Company-owned property for the Surry Power Station for approximately 1.5 miles before turning northeast to cross the James River for 3.5 miles. The Proposed Route's crossing of the James River will require a permit from the Virginia Marine Resources Commission ("VMRC") and royalties will be paid to the VMRC for the length of the Project over State bottomlands. Easements or encroachment agreements will be required for structure locations within the privately leased oyster grounds crossed by the Project in the James River.

Easements 150 feet wide will be required for the proposed line as it comes onshore in James City County and continues 0.7 mile to the Dow Chemical Substation. For approximately 1.7 miles from that substation location to the proposed Skiffes Creek Switching Station, an existing 115 kV line occupies right-of-way that varies from 80 feet to 130 feet wide. Additional easements will be required to expand the width of this existing right-of-way to 150 feet to accommodate the addition of the proposed 500 kV line. A double circuit 500 kV structure will be used for this portion of the Proposed Route to carry both the proposed 500 kV line and the existing 115 kV line. See Section I.D.

The Proposed Route utilizing James River Crossing Variation 1 is substantially the same on land as the Proposed Route but would require a longer distance in the James River and therefore more easements or encroachments for structure locations within the privately leased oyster grounds would be required.

The Proposed Route utilizing James River Crossing Variation 2 parallels the southern edge of an existing pipeline corridor both across the James River and as it enters James City County. Because the oyster beds were disturbed during the pipeline construction, it appears that this alternative would require no easements or encroachments within any oyster grounds. Coming onshore, approximately 0.8 mile of new easement 150 feet wide would be required before intersecting with Dominion Virginia Power's existing right-of-way. Additional easements will be required to expand the width of this existing right-of-way to 150 feet to accommodate the addition of the proposed 500 kV line.

The Proposed Route utilizing James River Crossing Variation 3 is substantially the same on land as Variation 2, but would require a longer distance in the James River, and its location would require easements or encroachment agreements for structure locations within the privately leased oyster grounds.

500 kV Alternate Route (Chickahominy-Skiffes Creek):

The Alternate Route for the 500 kV line from the existing Chickahominy Substation to the proposed Skiffes Creek Switching Station will require only minimal additional right-of-way. If the proposed transmission lines occupy this corridor, it would be constructed within unimproved and improved right-of-way for which easements were purchased many years ago. From the existing Chickahominy Substation to Lightfoot Junction, the existing unimproved right-of-way ranges from 150 feet to 250 feet wide.[9] From Lightfoot Junction to the proposed Skiffes Creek Switching Station, the existing 115 kV lines on the occupied transmission corridor will be removed and one of the existing 230 kV lines relocated to an existing structure, thus allowing the existing facilities in the northern side of the right-of-way to be replaced by the proposed 500 kV line. A rearrangement of the existing lines into the Kingsmill Substation will require the acquisition of approximately 4.0 acres in additional easement adjacent to that the substation.

230 kV Skiffes Creek-Whealton Line:

No additional easements are required for the proposed 230 kV Skiffes Creek-Whealton line.

[9] This right-of-way is unimproved, though in the early 1990s the Company cleared a strip on each edge of the existing right-of-way and installed orange carbonite stakes marking the electric transmission right-of-way. The stakes identified that it is an electric transmission line right-of-way belonging to Virginia Electric and Power Company.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (ROW)

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

Response: **500 kV Proposed Routes (Surry-Skiffes Creek):**

The Environmental Routing Study for the Project indicates that there are approximately 20.1 acres of forest land within the proposed right-of-way and right-of-way expansion that would be cleared. Most of the acreage that will require clearing is within an industrial zoned area in James City County.

The clearing requirements for the Proposed Routes utilizing either of James River Crossing Variations 1 or 3 are similar. The Proposed Route utilizing James River Crossing Variation 2 would require approximately 19.9 acres of forest to be cleared. The forested wetlands that would require clearing are minimal, ranging from approximately 0.6 to 0.7 acres for the Proposed Route and its Variations.

500 kV Alternate Route (Chickahominy-Skiffes Creek):

Along the 500 kV Alternate Route, there are approximately 420.5 acres of forest land within the unimproved right-of-way. Of that, approximately 106.9 acres are forested wetlands. The majority of this forested area is used for timber production; however, portions of this forested area are within the Chickahominy Wildlife Management Area ("Chickahominy WMA") and the James City County Freedom Park.

In addition, approximately 4.0 acres of new easement around the Kingsmill Substation would require clearing for rearrangement of the existing 230 kV transmission lines into the substation.

230 kV Skiffes Creek-Whealton Line:

No tree clearing is anticipated within the existing right-of-way where the proposed 230 kV Skiffes Creek-Whealton 230 kV line will be located, except for approximately 7.0 acres near the Newport News/Williamsburg International Airport where the Company owns the additional 100-foot wide right-of-way parallel to the currently occupied right-of-way.

In addition to any right-of-way clearing required for the Project to allow for construction activities and transmission line operation consistent with NERC compliance requirements, trees located outside the planned right-of-way that are tall enough to potentially impact the transmission facilities, commonly referred to

as danger trees, will need to be removed. Trees will be cut approximately at ground level and windrowed along the edge of the right-of-way, except in those areas adjacent to homes or development, where logs will be removed and debris disposed of by chipping or removal. Clearing will be accomplished by hand within 100 feet of streams, and within this buffer the Company attempts to preserve small plant material to reduce impacts to water quality. If windrows are used, they will be placed outside of wetlands. Erosion control devices will be used on an ongoing basis during the clearing activities. Any vehicles required for clearing in those areas delineated as wetlands will be placed on wetland mats.

Site rehabilitation during the Project is a continuous operation. Erosion control will be maintained and temporary stabilization for all soil disturbing activities will be used until the right-of-way has been restored. Inspectors will be in the field weekly or after every storm event to inspect the erosion control devices and maintain the appropriate reports both for the erosion and sediment control regulations and for the Virginia Stormwater Protection Permit. Upon completion of the Project, the Company will restore the right-of-way utilizing site procedures outlined in the Company's General Erosion and Sedimentation Control Specifications for the Construction and Maintenance of Electric Transmission Lines that is submitted yearly for approval by the Virginia Department of Conservation and Recreation. Time of year and weather conditions may affect when permanent stabilization takes place.

Periodic maintenance to control woody growth consists of hand cutting, machine mowing, and herbicide application. This right-of way-maintenance program will be on a regular cycle to prevent interruptions to electric service and provide access to the right-of-way in order to patrol and make emergency repairs. Any herbicide application will be selective and use low volume applications of U.S. Environmental Protection Agency ("EPA")-approved non-restricted use herbicides.

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (ROW)

6. Indicate the permitted uses of the ROW;

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

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

Typical permitted uses, with conditions, of the rights-of-way include:

1) Agriculture
2) Nurseries
3) Bicycle trails
4) Parking lots
5) Other utility facilities
6) Drainfields
7) Recreational areas
8) Roadways
9) Fences with gates

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (ROW)

7. Describe the Company's route selection procedures. Detail alternative route considered. Describe the Company's efforts in considering these alternatives. Detail why the proposed route was selected and other alternatives were rejected.

Response: 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.

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 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 the Environmental Routing Study.

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 Code of Virginia §§ 56-46.1 and 56-259, 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 ("Surry-Skiffes Creek") as the 500 kV Proposed Route and also identified the 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 another route from the Company's existing Chickahominy Substation to the proposed Skiffes Creek Switching Station ("Chickahominy-Skiffes Creek") for the Commission's consideration as the 500 kV Alternate Route. The following is a summary of the existing rights-of-way, the route selection process and comparison of the 500 kV routes, and descriptions of the Proposed (including the James River Crossing Variations) and Alternate Routes for the 500 kV line. A complete description of the route evaluation and selection process is provided in the Environmental Routing Study.

Existing Rights-of-Way Available for the 500 kV Line

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 ("Chickahominy to Lightfoot North and South Alternatives"). 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 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 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.

500 kV Route Selection Process

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, 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 Substation.

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 additional acres of 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. See Sections I.B and I.C for discussions of that issue. 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. The James City and Surry Counties' Staffs 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, which includes two Columbia Gas Transmission natural gas pipelines and one Colonial Pipeline Company 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.

Comparison of 500 kV Surry and Chickahominy Alternatives

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 WMA, 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 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. 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 route 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 its future redevelopment. The route enters the northern side of the BASF property and parallels the southern side of the Colonial Pipeline Company 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 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 and 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 feet 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 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 National Historic Trail. 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 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 National Historic Trail, 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 TERP non-approach to Felker Airfield, but places an angle structure in direct view from the front door 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 noted earlier. 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.

Description of the 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 7.4 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 U.S. Army Corps of Engineers. 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.

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

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.

Description of the 500 kV Proposed Route (Surry-Skiffes Creek Line) 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 0.2 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.

Description of the 500 kV Proposed Route (Surry-Skiffes Creek Line) 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 0.2 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.

Description of the 500 kV Alternate Route (Chickahominy-Skiffes Creek)

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.

Description of 230 kV Proposed Route (Skiffes Creek-Whealton)

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).

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (ROW)

8. Indicate how the construction of this transmission line complies with "Guidelines for the Protection of Natural, Historic, Scenic, and Recreational Values in the Design and Location of Rights-of-Way and Transmission Facilities" adopted by the Federal Power Commission in Order No. 414 issued November 27, 1970, and now applied by the Federal Energy Regulatory Commission. These guidelines may be found in Volume 44 of the Federal Power Commission Reports, page 1,491, or Volume 35 of the Federal Register, page 18,585 (December 8, 1970). Copies of the Guidelines may also be obtained from the Office of Public Information, Federal Energy Regulatory Commission, Washington, D.C. 20426. For reference purposes a copy of the guidelines is included.

Response: The FERC guidelines are a routing tool familiar to Dominion Virginia Power and are routinely used in routing its projects.

FERC Guideline #1 states that existing right-of-way should be given priority when adding additional facilities. In most cases, Dominion Virginia Power considers this guideline first and foremost when selecting the location for a new transmission line. The proposed Project utilizes existing transmission right-of-way for the entire length of the 230 kV Skiffes Creek-Whealton line, an existing transmission corridor for a portion of the Proposed Route for the 500 kV line, and existing right-of-way for almost the entire length of the Alternate Route for the 500 kV line.

Throughout the development of this Project the Company has been coordinating with local, state and federal agencies (Guideline #4 - where government land is involved the applicant should contact the agencies early in the planning process), and the Company follows FERC construction methods on a site specific basis for typical construction projects (Guidelines Nos. 8, 10, 11, 12, 13, 14, 15, 16, 18, 22 and 23.

The Company utilizes FERC guidelines in the clearing of right-of-way, constructing facilities and maintaining rights-of-way after construction. Moreover, secondary uses of the right-of-way that are consistent with the safe maintenance and operation of facilities are permitted (Guideline Nos. 46-50).

The station will be positioned on the property, and landscaping will be added as appropriate, so as to reasonably minimize environmental and visual impacts (Guideline Nos. 51-55 and 57).

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Right-of-way (ROW)

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

b. Provide three (3) copies of the Virginia Department of Transportation "General Highway Map" of each county and city through which the line will pass. On the maps show the proposed line and all previously approved and certificated facilities of the applicant. Also where the line will be located outside of the applicant's certificated service area; show the boundaries between the applicant and each affected electric utility. On each map showing the line outside of the applicant's certificated service area, have the appropriate individual of the affected electric utility sign if his/her company is not opposed to the proposed construction.

Response: a. The proposed transmission lines are located in the following Counties and Cities:

500 kV Proposed Route (Surry-Skiffes Creek):

Surry County – 3.5 miles (1.5 miles portion on land)

James City County – 4.0 miles (2.3 miles portion on land)

500 kV Proposed Route with James River Crossing Variation 1:

Surry County – 4.2 miles (1.5 miles portion on land)

James City County – 3.7 miles (2.3 miles portion on land)

500 kV Proposed Route with James River Crossing Variation 2:

Surry County – 3.7 miles (1.5 miles portion on land)

James City County – 3.5 miles (1.8 miles portion on land)

500 kV Proposed Route with James River Crossing Variation 3:

Surry County – 4.2 miles (1.5 miles portion on land)

James City County – 3.3 miles (1.9 miles portion on land)

500 kV Alternate Route (Chickahominy-Skiffes Creek):

Charles City County – 18.3 miles

James City County – 11.7 miles

City of Williamsburg – 1.6 miles

York County – 6.2 miles

230 kV Skiffes Creek-Whealton Line:

James City County –2.9 miles

York County – 6.4 miles

City of Newport News – 8.4 miles

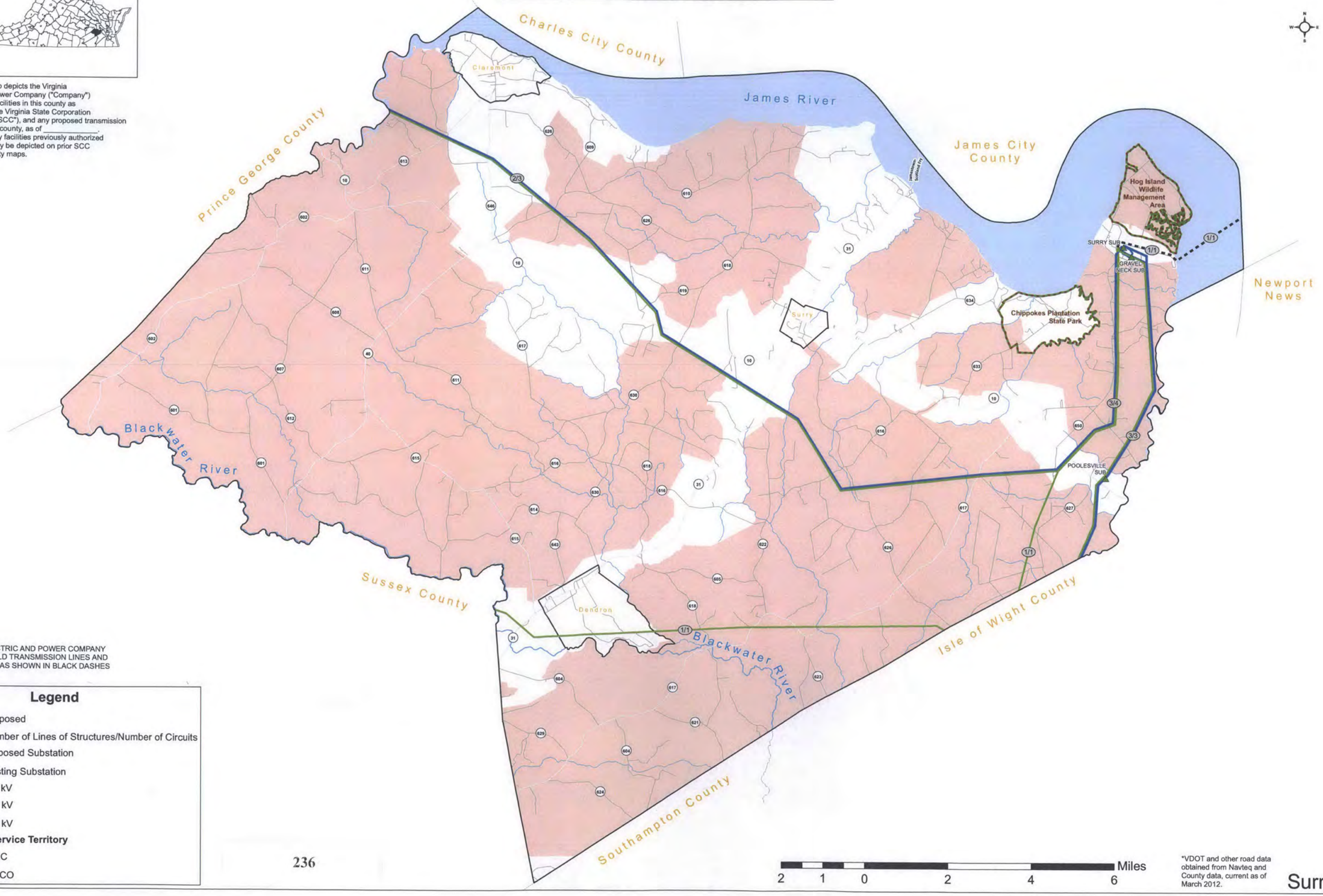
City of Hampton – 2.5 miles

The 500 kV Proposed Route, Proposed Routes with the James River Crossing Variations and Alternate Route, and the 230 kV Skiffes Creek-Whealton line, are located entirely within the Company's service territory.

b. Three copies each of a map of Surry County, a combined map of James City and York Counties, and a combined map of the Cities of Newport News and Hampton, depicting the proposed Project utilizing the Proposed Route for the 500 kV line and the 230 kV Skiffes Creek-Whealton line, are marked as required and have been submitted to the Commission's Division of Energy Regulation. These maps reflect the Virginia Department of Transportation and other road data obtained from Navteq and County data. Reduced copies of those maps are contained in Attachments II.A.9.b.1-3.

Surry County Road Map

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



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

Legend

- Proposed
- (1/1) Number of Lines of Structures/Number of Circuits
- △ Proposed Substation
- ▲ Existing Substation
- 115 kV
- 230 kV
- 500 kV

Provider Service Territory

- PGEC
- VEPCO

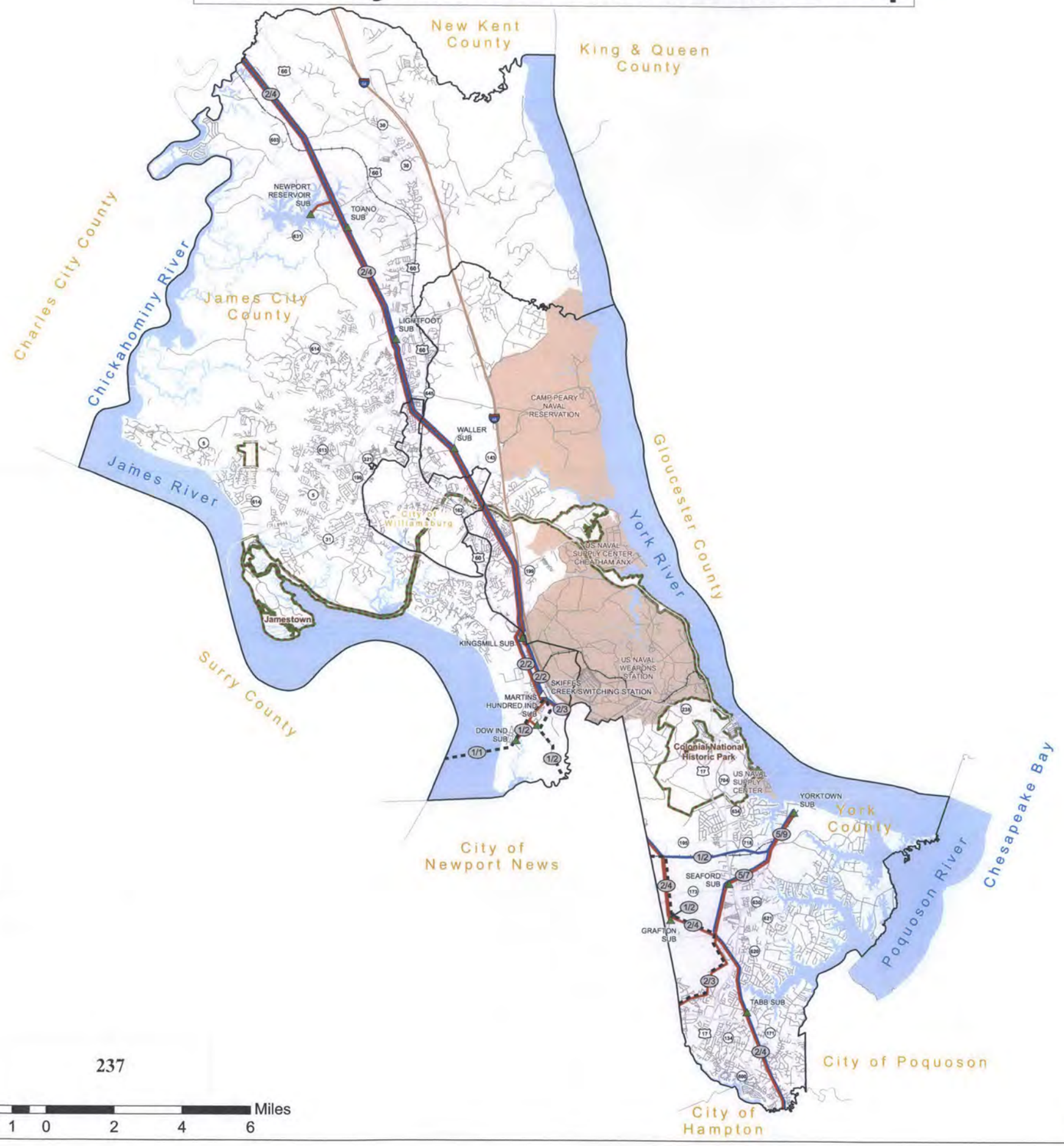
2 1 0 2 4 6 Miles

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

Surry

James City and York Counties Road Map

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



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

Legend

- Proposed
- Number of Lines of Structures/Number of Circuits
- Proposed Substation
- Existing Substation
- 115 kV
- 230 kV
- 500 kV
- Military Bases
- Colonial National Historic Park

Provider Service Territory

- VEPCO

237

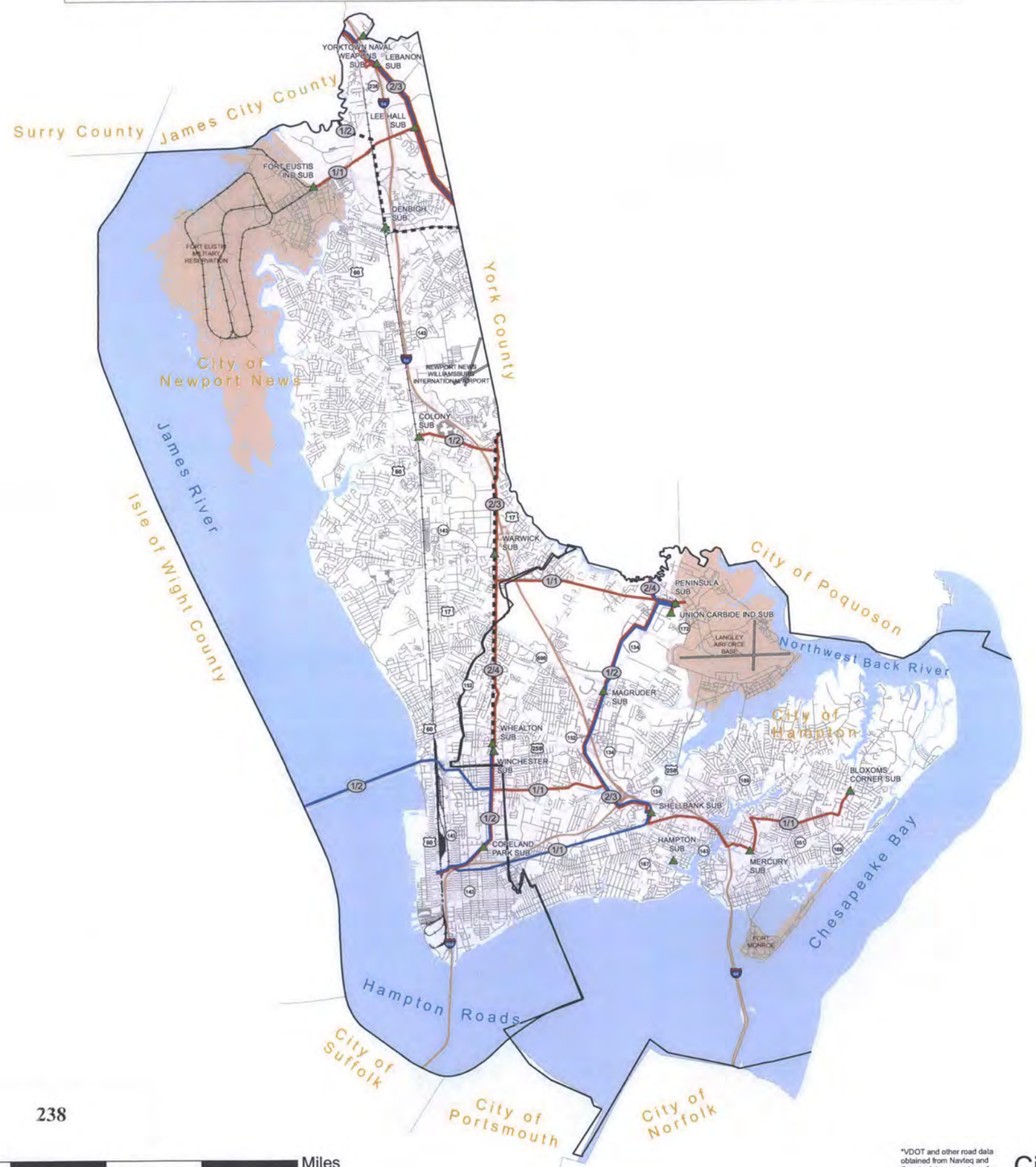
2 1 0 2 4 6 Miles

*VDOT and other road data obtained from Navteq and County data, current as of September 2009.

James City and York
City of Williamsburg

Cities of Newport News and Hampton Road Map

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



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

Legend

- Proposed
- Number of Lines of Structures/Number of Circuits
- Proposed Substation
- Existing Substation
- 115 kV
- 230 kV
- 500 kV
- MilitaryBases

Provider Service Territory

- VEPCO

2 1 0 2 4 6 Miles

*VDOT and other road data obtained from Navteq and County data, current as of September 2009.

Cities of Newport News and Hampton

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

1. Detail number of circuits and their design voltage and transfer capabilities;

Response: The Project proposes to install (a) one transmission circuit at a 500 kV operating voltage with a transfer capability of 4325 MVA using the 500 kV Proposed Route, 500 kV Proposed Route with one of the James River Crossing Variations or 500 kV Alternate Route and (b) one transmission circuit at a 230 kV operating voltage with a transfer capability of 1047 MVA for the proposed Skiffes Creek-Whealton line.

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

2. Detail number, size(s), type(s), and typical configurations of conductors;

Response: The proposed 500 kV transmission circuit for the Proposed Route, Proposed Route with one of the James River Crossing Variations or Alternate Route will have three triple-bundled 1351.5 ACSR 45/7 phase conductors arranged in modified delta configurations on steel pole structures and lattice structures with two fiber optic shield wires arranged horizontally at the top of the structures.

The proposed 230 kV transmission circuit for the Skiffes Creek-Whealton line will have three twin-bundled 636 ACSR 24/7 phase conductors arranged vertically on one side of double circuit steel pole structures with two fiber optic shield wires arranged horizontally at the top of the structures.

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

3. With regard to the proposed supporting structures over each portion of the ROW provide:

a. types of structures;

b. length of ROW with each type of structure;

c. material for typical structure (steel, oxidizing steel, etc.);

d. foundation material;

e. width at cross arms of typical structure;

f. width at base of typical structures;

g. typical span length;

h. approximate average heights of structures;

i. a schematic drawing of each typical structure; and

j. minimum conductor-to-ground clearance under maximum operating conditions;

Response: **500 kV Proposed Route (Surry-Skiffes Creek):**

(Attachment II.A.3.A)

a. Structure type — Monopole

b. ROW length — approximately 1.60 miles

c. Structure material — Galvanized Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 60 feet

f. Base width of typical structure — 7 feet

g. Average span length — 655 feet

h. Approximate average structure height — 155 feet

i. Typical structure — see Attachment II.A.3.A

j. Minimum clearance over ground — 31 feet

(Attachment II.A.3.B)

a. Structure type — Lattice Tower

b. ROW length — approximately 2.49 miles

c. Structure material — Galvanized Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 84 feet

f. Base width of typical structure — 38 feet

g. Average span length — 1400 feet

h. Approximate average structure height — 160 feet

i. Typical structure — see Attachment II.A.3.B

j. Minimum clearance over ground — 60 feet

(Attachment II.A.3.C)

a. Structure type — Lattice Tower

b. ROW length — approximately 0.98 mile

c. Structure material — Galvanized Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 75 feet

f. Base width of typical structure — 68 feet

g. Average span length — 1400 feet

h. Approximate average structure height — 295 feet

i. Typical structure — see Attachment II.A.3.C

j. Minimum clearance over ground — 180 feet

(Attachment II.A.3.D)

a. Structure type — Lattice Tower

b. ROW length — approximately 0.66 mile

c. Structure material — Galvanized Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 84 feet

f. Base width of typical structure — 36 feet

g. Average span length — 1000 feet

h. Approximate average structure height — 150 feet

i. Typical structure — see Attachment II.A.3.D

j. Minimum clearance over ground — 31 feet

(Attachment II.A.3.F)

a. Structure type — Lattice Tower
b. ROW length — approximately 0.97 mile
c. Structure material — Galvanized Steel
d. Foundation material — Concrete /Steel Pile
e. Cross arm width of typical structure — 84 feet
f. Base width of typical structure — 36 feet
g. Average span length — 1000 feet
h. Approximate average structure height — 128 feet
i. Typical structure — see Attachment II.A.3.F
j. Minimum clearance over ground — 20.1 feet

(Attachment II.A.3.H)

a. Structure type — Lattice Tower
b. ROW length — approximately 0.25 mile
c. Structure material — Galvanized Steel
d. Foundation material — Concrete /Steel Pile
e. Cross arm width of typical structure — 84 feet
f. Base width of typical structure — 36 feet
g. Average span length — 1000 feet
h. Approximate average structure height — 128 feet
i. Typical structure — see Attachment II.A.3.H
j. Minimum clearance over ground — 20.1 feet

(Attachment II.A.3.J)

a. Structure type — Lattice Tower
b. ROW length — approximately 0.26 mile
c. Structure material — Galvanized Steel
d. Foundation material — Concrete /Steel Pile
e. Cross arm width of typical structure — 84 feet
f. Base width of typical structure — 36 feet
g. Average span length — 1000 feet
h. Approximate average structure height — 128 feet

i. Typical structure — see Attachment II.A.3.J

j. Minimum clearance over ground — 20.1 feet

500 kV James River Crossing Variation 1:

(Attachment II.A.3.V1-1)

a. Structure type — Lattice Tower

b. ROW length — approximately 3.11 miles

c. Structure material — Galvanized Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 84 feet

f. Base width of typical structure — 38 feet

g. Average span length — 1000 feet

h. Approximate average structure height — 160 feet

i. Typical structure — see Attachment II.A.3.V1-1

j. Minimum clearance over ground — 60 feet

(Attachment II.A.3.V1-2)

a. Structure type — Lattice Tower

b. ROW length — approximately 0.49 miles

c. Structure material — Galvanized Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 75 feet

f. Base width of typical structure — 68 feet

g. Average span length — 1575 feet

h. Approximate average structure height — 295 feet

i. Typical structure — see Attachment II.A.3.V1-2

j. Minimum clearance over ground — 180 feet

(Attachment II.A.3.V1-3)

a. Structure type — Lattice Tower

b. ROW length — approximately 0.04 mile

c. Structure material — Galvanized Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 75 feet

f. Base width of typical structure — 65 feet

g. Average span length — 1575 feet

h. Approximate average structure height — 275 feet

i. Typical structure — see Attachment II.A.3.V1-3

j. Minimum clearance over ground — 180 feet

(Attachment II.A.3.V1-4)

a. Structure type — Lattice Tower

b. ROW length — approximately 0.04 mile

c. Structure material — Galvanized Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 84 feet

f. Base width of typical structure — 36 feet

g. Average span length — 1000 feet

h. Approximate average structure height — 150 feet

i. Typical structure — see Attachment II.A.3.V1-4

j. Minimum clearance over ground — 31 feet

500 kV James River Crossing Variation 2:

(Attachment II.A.3.V2-1)

a. Structure type — Lattice Tower

b. ROW length — approximately 2.78 miles

c. Structure material — Galvanized Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 84 feet

f. Base width of typical structure — 38 feet

g. Average span length — 1400 feet

h. Approximate average structure height — 160 feet

i. Typical structure — see Attachment II.A.3.V2-1

j. Minimum clearance over ground — 60 feet

(Attachment II.A.3.V2-2)

a. Structure type — Lattice Tower
b. ROW length — approximately 0.49 miles
c. Structure material — Galvanized Steel
d. Foundation material — Concrete /Steel Pile
e. Cross arm width of typical structure — 75 feet
f. Base width of typical structure — 68 feet
g. Average span length — 1400 feet
h. Approximate average structure height — 295 feet
i. Typical structure — see Attachment II.A.3.V2-2
j. Minimum clearance over ground — 180 feet

(Attachment II.A.3.V2-3)

a. Structure type — Lattice Tower
b. ROW length — approximately 0.45 mile
c. Structure material — Galvanized Steel
d. Foundation material — Concrete /Steel Pile
e. Cross arm width of typical structure — 75 feet
f. Base width of typical structure — 65 feet
g. Average span length — 1400 feet
h. Approximate average structure height — 275 feet
i. Typical structure — see Attachment II.A.3.V2-3
j. Minimum clearance over ground — 180 feet

(Attachment II.A.3.V2-4)

a. Structure type — Lattice Tower
b. ROW length — approximately 0.80 mile
c. Structure material — Galvanized Steel
d. Foundation material — Concrete /Steel Pile
e. Cross arm width of typical structure — 84 feet
f. Base width of typical structure — 27 feet
g. Average span length — 835 feet
h. Approximate average structure height — 111 feet

i. Typical structure — see Attachment II.A.3.V2-4

j. Minimum clearance over ground — 31 feet

500 kV James River Crossing Variation 3:

(Attachment II.A.3.V3-1)

a. Structure type — Lattice Tower

b. ROW length — approximately 3.11 miles

c. Structure material — Galvanized Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 84 feet

f. Base width of typical structure — 38 feet

g. Average span length — 1190 feet

h. Approximate average structure height — 160 feet

i. Typical structure — see Attachment II.A.3.V3-1

j. Minimum clearance over ground — 60 feet

(Attachment II.A.3.V3-2)

a. Structure type — Lattice Tower

b. ROW length — approximately 0.50 mile

c. Structure material — Galvanized Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 75 feet

f. Base width of typical structure — 68 feet

g. Average span length — 1675 feet

h. Approximate average structure height — 295 feet

i. Typical structure — see Attachment II.A.3.V3-2

j. Minimum clearance over ground — 180 feet

(Attachment II.A.3.V3-3)

a. Structure type — Lattice Tower

b. ROW length — approximately 0.45 mile

c. Structure material — Galvanized Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 75 feet

f. Base width of typical structure — 65 feet

g. Average span length — 1675 feet

h. Approximate average structure height — 275 feet

i. Typical structure — see Attachment II.A.3.V3-3

j. Minimum clearance over ground — 180 feet

(Attachment II.A.3.V3-4)

a. Structure type — Lattice Tower

b. ROW length — approximately 0.80 mile

c. Structure material — Galvanized Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 84 feet

f. Base width of typical structure — 27 feet

g. Average span length — 835 feet

h. Approximate average structure height — 111 feet

i. Typical structure — see Attachment II.A.3.V3-4

j. Minimum clearance over ground — 31 feet

500 kV Alternate Route (Chickahominy-Skiffes Creek):

(Attachment II.A.3.BB)

a. Structure type — Lattice Tower

b. ROW length — approximately 0.86 mile

c. Structure material — Galvanized Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 84 feet

f. Base width of typical structure — 27 feet

g. Average span length — 950 feet

h. Approximate average structure height — 111 feet

i. Typical structure — see Attachment II.A.3.BB

j. Minimum clearance over ground — 31 feet

(Attachment II.A.3.CC)

a. Structure type — Lattice Tower
b. ROW length — approximately 18.27 miles
c. Structure material — Galvanized Steel
d. Foundation material — Concrete /Steel Pile
e. Cross arm width of typical structure — 85 feet
f. Base width of typical structure — 27 feet
g. Average span length — 1000 feet
h. Approximate average structure height — 111 feet
i. Typical structure — see Attachment II.A.3.CC
j. Minimum clearance over ground — 31 feet

(Attachment II.A.3.DD)

a. Structure type — Lattice Tower
b. ROW length — approximately 2.09 miles
c. Structure material — Galvanized Steel
d. Foundation material — Concrete /Steel Pile
e. Cross arm width of typical structure — 84 feet
f. Base width of typical structure — 27 feet
g. Average span length — 1000 feet
h. Approximate average structure height — 120 feet
i. Typical structure — see Attachment II.A.3.DD
j. Minimum clearance over ground — 31 feet

(Attachment II.A.3.EE)

a. Structure type — Monopole
b. ROW length — approximately 3.25 miles
c. Structure material — Galvanized Steel
d. Foundation material — Concrete /Steel Pile
e. Cross arm width of typical structure — 60 feet
f. Base width of typical structure — 7 feet
g. Average span length — 900 feet
h. Approximate average structure height — 135 feet

i. Typical structure — see Attachment II.A.3.EE

j. Minimum clearance over ground — 31 feet

(Attachment II.A.3.FF)

a. Structure type — Monopole

b. ROW length — approximately 0.54 mile

c. Structure material — Galvanized Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 60 feet

f. Base width of typical structure — 7 feet

g. Average span length — 900 feet

h. Approximate average structure height — 135 feet

i. Typical structure — see Attachment II.A.3.FF

j. Minimum clearance over ground — 31 feet

(Attachment II.A.3.HH)

a. Structure type — Monopole

b. ROW length — approximately 5.01 miles

c. Structure material — Galvanized Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 60 feet

f. Base width of typical structure — 7 feet

g. Average span length — 800 feet

h. Approximate average structure height — 125 feet

i. Typical structure — see Attachment II.A.3.HH

j. Minimum clearance over ground — 31 feet

(Attachment II.A.3.JJ)

a. Structure type — Monopole

b. ROW length — approximately 5.22 miles

c. Structure material — Galvanized Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 60 feet

f. Base width of typical structure — 7 feet

g. Average span length — 800 feet

h. Approximate average structure height — 125 feet

i. Typical structure — see Attachment II.A.3.JJ

j. Minimum clearance over ground — 31 feet

(Attachment II.A.3.LL)

a. Structure type — Monopole

b. ROW length — approximately 0.61 mile

c. Structure material — Galvanized Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 60 feet

f. Base width of typical structure — 7 feet

g. Average span length — 770 feet

h. Approximate average structure height — 125 feet

i. Typical structure — see Attachment II.A.3.LL

j. Minimum clearance over ground — 31 feet

(Attachment II.A.3.NN)

a. Structure type — Monopole

b. ROW length — approximately 2.11 miles

c. Structure material — Galvanized Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 60 feet

f. Base width of typical structure — 7 feet

g. Average span length — 800 feet

h. Approximate average structure height — 125 feet

i. Typical structure — see Attachment II.A.3.NN

j. Minimum clearance over ground — 31 feet

(Attachment II.A.3.PP)

a. Structure type — Monopole

b. ROW length — approximately 2.04 miles

c. Structure material —Painted Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 32 feet

f. Base width of typical structure — 5 feet

g. Average span length — 740 feet

h. Approximate average structure height — 105 feet

i. Typical structure — see Attachment II.A.3.PP

j. Minimum clearance over ground — 22.5 feet

230 kV Skiffes Creek-Whealton Line:

(Attachment II.A.3.b)

a. Structure type — Monopole

b. ROW length — approximately 1.18 miles

c. Structure material — Weathering Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 35 feet

f. Base width of typical structure — 5 feet

g. Average span length — 850 feet

h. Approximate average structure height — 115 feet

i. Typical structure — see Attachment II.A.3.b

j. Minimum clearance over ground — 22.5 feet

(Attachment II.A.3.d)

a. Structure type — Monopole

b. ROW length — approximately 0.82 mile

c. Structure material — Weathering Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 35 feet

f. Base width of typical structure — 5 feet

g. Average span length — 850 feet

h. Approximate average structure height — 115 feet

i. Typical structure — see Attachment II.A.3.d

j. Minimum clearance over ground — 22.5 feet

(Attachment II.A.3.f)

a. Structure type — Monopole
b. ROW length — approximately 0.60 mile
c. Structure material — Weathering Steel
d. Foundation material — Concrete /Steel Pile
e. Cross arm width of typical structure — 35 feet
f. Base width of typical structure — 5 feet
g. Average span length — 1000 feet
h. Approximate average structure height — 125 feet
i. Typical structure — see Attachment II.A.3.f
j. Minimum clearance over ground — 22.5 feet

(Attachment II.A.3.h)

a. Structure type — Monopole
b. ROW length — approximately 0.35 mile
c. Structure material — Weathering Steel
d. Foundation material — Concrete /Steel Pile
e. Cross arm width of typical structure — 35 feet
f. Base width of typical structure — 5 feet
g. Average span length — 1000 feet
h. Approximate average structure height — 125 feet
i. Typical structure — see Attachment II.A.3.h
j. Minimum clearance over ground — 22.5 feet

(Attachment II.A.3.j)

a. Structure type — Monopole
b. ROW length — approximately 3.65 miles
c. Structure material — Painted Steel
d. Foundation material — Existing
e. Cross arm width of typical structure — 27 feet
f. Base width of typical structure — 5 feet
g. Average span length — 1015 feet

h. Approximate average structure height — 115 feet

i. Typical structure — see Attachment II.A.3.j

j. Minimum clearance over ground — 22.5 feet

(Attachment II.A.3.l)

a. Structure type — Monopole

b. ROW length — approximately 0.95 mile

c. Structure material — Weathering Steel

d. Foundation material — Concrete/Steel Pile

e. Cross arm width of typical structure — 35 feet

f. Base width of typical structure — 5 feet

g. Average span length — 1000 feet

h. Approximate average structure height — 125 feet

i. Typical structure — see Attachment II.A.3.l

j. Minimum clearance over ground — 22.5 feet

(Attachment II.A.3.n)

a. Structure type — Monopole

b. ROW length — approximately 0.81 mile

c. Structure material — Weathering Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 35 feet

f. Base width of typical structure — 5 feet

g. Average span length — 600 feet

h. Approximate average structure height — 105 feet

i. Typical structure — see Attachment II.A.3.n

j. Minimum clearance over ground — 22.5 feet

(Attachment II.A.3.p)

a. Structure type — Monopole

b. ROW length — approximately 0.56 mile

c. Structure material — Weathering Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 35 feet

f. Base width of typical structure — 5 feet

g. Average span length — 625 feet

h. Approximate average structure height — 105 feet

i. Typical structure — see Attachment II.A.3.p

j. Minimum clearance over ground — 22.5 feet

(Attachment II.A.3.r)

a. Structure type — Monopole

b. ROW length — approximately 0.32 mile

c. Structure material — Weathering Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 35 feet

f. Base width of typical structure — 5 feet

g. Average span length — 625 feet

h. Approximate average structure height — 105 feet

i. Typical structure — see Attachment II.A.3.r

j. Minimum clearance over ground — 22.5 feet

(Attachment II.A.3.t)

a. Structure type — Monopole

b. ROW length — approximately 0.25 mile

c. Structure material — Weathering Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 35 feet

f. Base width of typical structure — 5 feet

g. Average span length — 625 feet

h. Approximate average structure height — 105 feet

i. Typical structure — see Attachment II.A.3.t

j. Minimum clearance over ground — 22.5 feet

(Attachment II.A.3.v)

a. Structure type — H-frame
b. ROW length — approximately 0.51 mile
c. Structure material — Weathering Steel
d. Foundation material — Concrete /Steel Pile
e. Cross arm width of typical structure — 40 feet
f. Base width of typical structure — 20 feet
g. Average span length — 550 feet
h. Approximate average structure height — 75 feet
i. Typical structure — see Attachment II.A.3.v
j. Minimum clearance over ground — 22.5 feet

(Attachment II.A.3.x)

a. Structure type — Monopole
b. ROW length — approximately 0.70 mile
c. Structure material — Weathering Steel
d. Foundation material — Concrete /Steel Pile
e. Cross arm width of typical structure — 35 feet
f. Base width of typical structure — 5 feet
g. Average span length — 900 feet
h. Approximate average structure height — 120 feet
i. Typical structure — see Attachment II.A.3.x
j. Minimum clearance over ground — 22.5 feet

(Attachment II.A.3.z)

a. Structure type — Monopole
b. ROW length — approximately 0.29 mile
c. Structure material — Weathering Steel
d. Foundation material — Concrete /Steel Pile
e. Cross arm width of typical structure — 35 feet
f. Base width of typical structure — 5 feet
g. Average span length — 515 feet
h. Approximate average structure height — 110 feet

i. Typical structure — see Attachment II.A.3.z

j. Minimum clearance over ground — 22.5 feet

(Attachment II.A.3.bb)

a. Structure type — H-frame

b. ROW length — approximately 0.93 mile

c. Structure material — Weathering Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 38 feet

f. Base width of typical structure — 19 feet

g. Average span length — 500 feet

h. Approximate average structure height — 52 feet

i. Typical structure — see Attachment II.A.3.bb

j. Minimum clearance over ground — 22.5 feet

(Attachment II.A.3.dd)

a. Structure type — Monopole

b. ROW length — approximately 4.90 miles

c. Structure material — Weathering Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 35 feet

f. Base width of typical structure — 5 feet

g. Average span length — 800 feet

h. Approximate average structure height — 115 feet

i. Typical structure — see Attachment II.A.3.dd

j. Minimum clearance over ground — 22.5 feet

(Attachment II.A.3.ff)

a. Structure type — Monopole

b. ROW length — approximately 2.28 miles

c. Structure material — Weathering Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 35 feet

f. Base width of typical structure — 5 feet

g. Average span length — 800 feet

h. Approximate average structure height — 115 feet

i. Typical structure — see Attachment II.A.3.ff

j. Minimum clearance over ground — 22.5 feet

(Attachment II.A.3.hh)

a. Structure type — Monopole

b. ROW length — approximately 0.38 mile

c. Structure material — Weathering Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 35 feet

f. Base width of typical structure — 5 feet

g. Average span length — 850 feet

h. Approximate average structure height — 125 feet

i. Typical structure — see Attachment II.A.3.hh

j. Minimum clearance over ground — 22.5 feet

(Attachment II.A.3.jj)

a. Structure type — Monopole

b. ROW length — approximately 0.37 mile

c. Structure material — Weathering Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 35 feet

f. Base width of typical structure — 5 feet

g. Average span length — 800 feet

h. Approximate average structure height — 115 feet

i. Typical structure — see Attachment II.A.3.jj

j. Minimum clearance over ground — 22.5 feet

(Attachment II.A.3.ll)

a. Structure type — Monopole

b. ROW length — approximately 0.37 mile

c. Structure material — Weathering Steel

d. Foundation material — Concrete /Steel Pile

e. Cross arm width of typical structure — 35 feet

f. Base width of typical structure — 5 feet

g. Average span length — 800 feet

h. Approximate average structure height — 110 feet

i. Typical structure — see Attachment II.A.3.ll

j. Minimum clearance over ground — 22.5 feet

II. DESCRIPTION OF THE PROPOSED PROJECT

B. Line Design and Operational Features

4. Describe why the proposed structure type(s) was selected for this line.

Response: See the discussion provided in Section I.D.

500 kV Proposed Route (Surry-Skiffes Creek):

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 structure.

The Company plans to use single circuit galvanized lattice structures 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 structures 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 structures 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.[10] These lattice structures 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 structures 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.

[10] 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 Martins Hundred Substations while the existing facilities are removed and the proposed structures are installed.

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 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 structures 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 structures and steel/wood H-frames and will be visually compatible with existing parallel structures.

II. DESCRIPTION OF THE PROPOSED PROJECT

C. Describe and furnish plan drawings of all new substations, switching stations, and other ground facilities associated with the proposed project.

Response: The proposed Project requires construction of a new 500-230-115 kV switching station to be named Skiffes Creek Switching Station. 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 Whealton Substation, as described below. In addition, the Project using the 500 kV Proposed Route requires minimal work at Lanexa and Yorktown Substations primarily involving relay checks and upgrades. The Project using the 500 kV Alternate Route similarly requires minor work involving relay checks and upgrades at the Kingsmill, Toano, Penniman, Waller, Warwick, Lanexa, and Yorktown Substations.

Skiffes Creek Switching Station

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.

The detailed one-line diagram of the proposed arrangement for Skiffes Creek Switching Station is shown on Attachment II.C.1. The general arrangement of Skiffes Creek Switching Station is shown on Attachment II.C.2.

Surry Switching Station (as required for the 500 kV Proposed Route)

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.

A detailed one-line diagram of the proposed arrangement for Surry Switching Station is shown on Attachment II.C.3. The general arrangement of Surry Switching Station is shown on Attachment II.C.4.

Chickahominy Substation (as required for the 500 kV Alternate Route)

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.

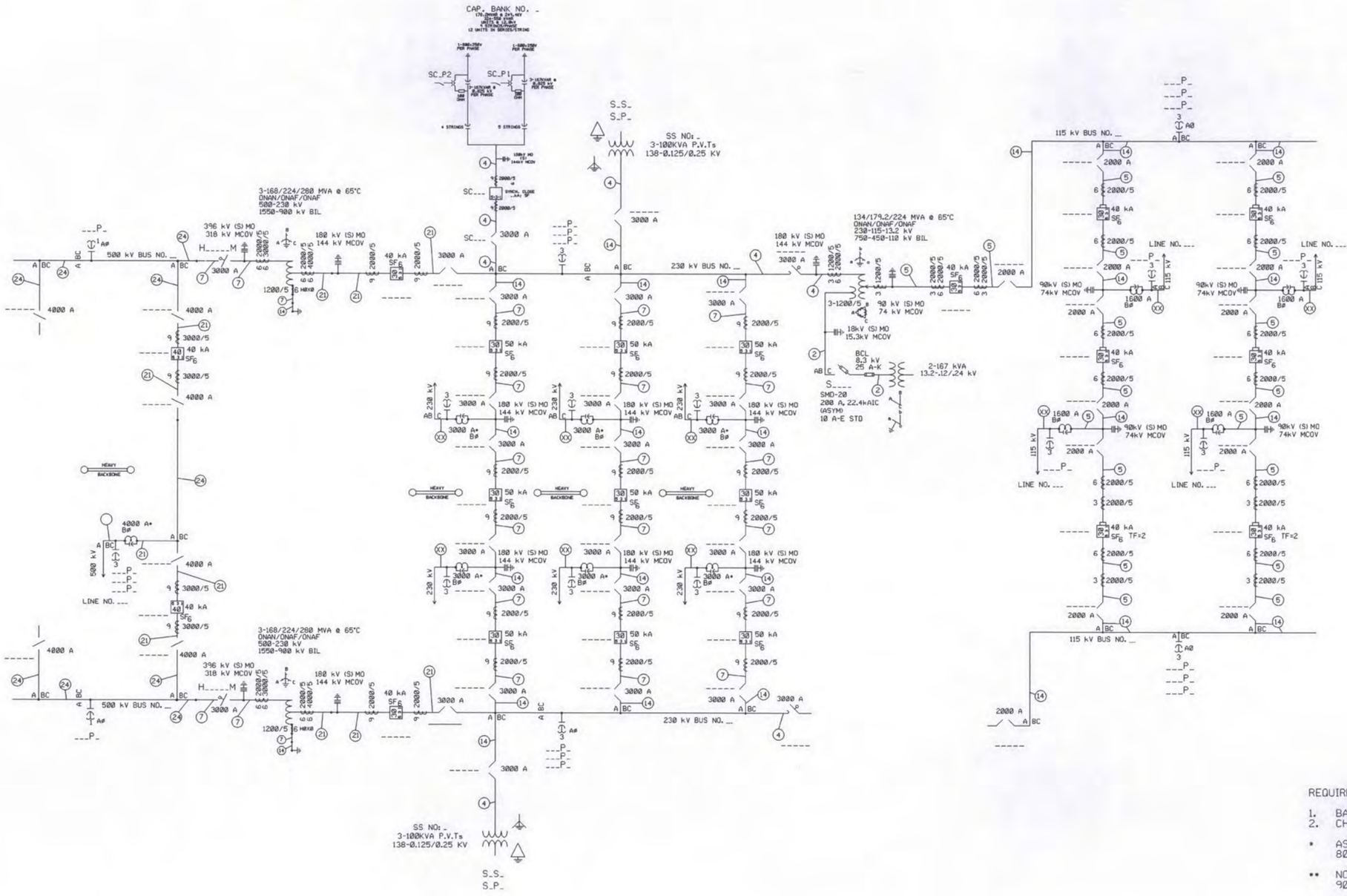
A detailed one-line diagram of the proposed arrangement for Chickahominy Substation is shown on Attachment II.C.5. The proposed arrangement of Chickahominy Substation is shown on Attachment II.C.6.

Whealton Substation

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.

A detailed one-line diagram of the proposed arrangement for Whealton Substation is shown on Attachment II.C.7. The proposed arrangement of Whealton Substation is shown on Attachment II.C.8.

NO	SUBSTATION CONDUCTOR SCHEDULE DESCRIPTION
2	4/0 AAC (OXLIP)
4	795 AAC (ARBUTUS)
5	2-795 AAC (ARBUTUS)
7	2-1590 AAC (COREOPSIS)
14	3½" ALUMINUM TUBING SCHEDULE 40
15	5" ALUMINUM TUBING SCHEDULE 40
21	3-1590 kCMIL AL (COREOPSIS)
24	5" ALUMINUM TUBING SCHEDULE 80



REQUIRED:

1. BATTERY 135 VDC, 300 AH
2. CHARGER 135 VDC, 50 A

* ASYMMETRICAL MOMENTARY RATING
8000A BACK-TO-BACK SWITCHING RATING

** NOTE WAVE TRAP FREQUENCY
90 - 200kHz OR 115 - 300 kHz

500 kV Control Enclosure Size	24'x50'
230 kV Control Enclosure Size	24'x70'

Rev	Approval	AMY	AJS
	Dates	09/15/11	
	Project No.	962245	
	DM No.		
	Description	J/S 500kV, 230kV & 115kV Sw. Station	

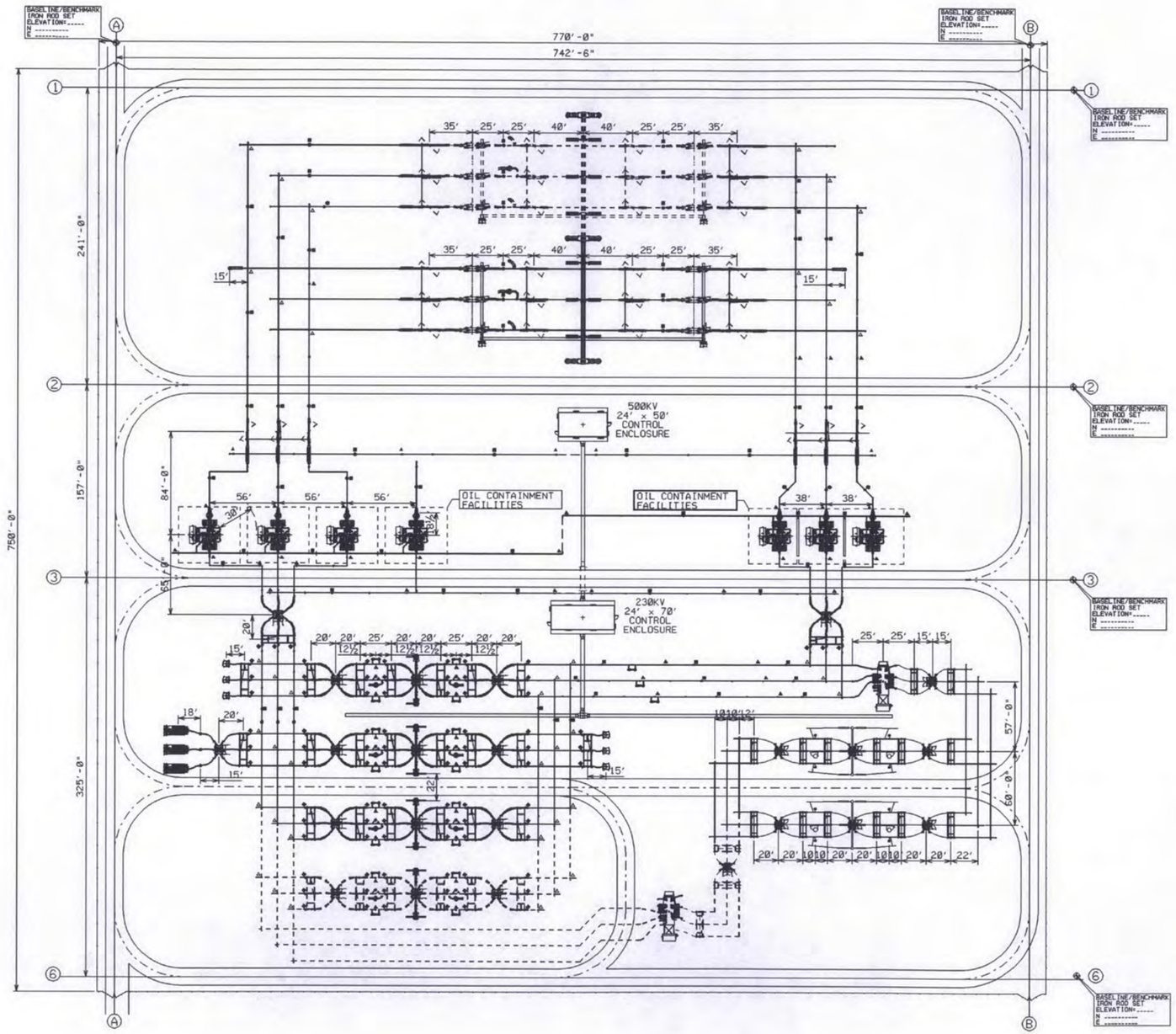
Revisions

Dominion

Construction One Line Diagram

Drawn By: AMY	Date 09/14/11	Substation	SKIFFES CREEK
Approval AJS	Date 09/14/11	Drawing No.	1265000Z.DGN

antho29



NOTES:

1. ALL ELECTRICAL EQUIPMENT, STRUCTURES, FENCE, GUYS, ETC. TO BE GROUNDED TO CONFORM TO DOMINION'S GROUNDING SPECIFICATIONS, DWGS. 45-M-000, 45-M-001, 45-M-002.
2. REFER TO ALUMINUM TUBING BUS DETAIL DWGS., 3½" AL. BUS, 45-M-004 AND 5" AL. BUS, 45-M-029, 45-M-055.
3. REFER TO ALUMINUM ANGLE BUS CONNECTION DETAILS, DWG 45-M-003.
4. REFER TO MISCELLANEOUS TYPICAL DETAILS, DWGS. 45-M-005, 45-M-006.
5. ▲ DENOTES TIGHT FIT BUS SUPPORT FITTING.
   △ DENOTES TIGHT FIT BUS SUPPORT FITTING (A FRAME)
   ■ DENOTES EXPANSION BUS SUPPORT FITTING,
   ◆ DENOTES EXPANSION TERMINAL FITTING.
   ● DENOTES EXPANSION COUPLING FITTING.

No.	Date	By	Description	Project Number
1	08/16/11	AMY	1/S 2-500kV CB's, 1-500/230kV T'X's, 1-230kV T'X, 7-115kV CB's	992245
Checked/Appr.	AJS	08/16/11		B/M

Revisions

Dominion

GENERAL ARRANGEMENT 500/230/115kV SWITCHING STA SKIFFES CREEK SUBSTATION

	Name	Date	Project No.	Sheet No.
Designed by:	AMY	08/16/11	992245	1 of 1
Approvals	AJS	08/16/11	Scale	
Approvals			1"=50'-0"	
		B/M No.	Revisions	
		0000		

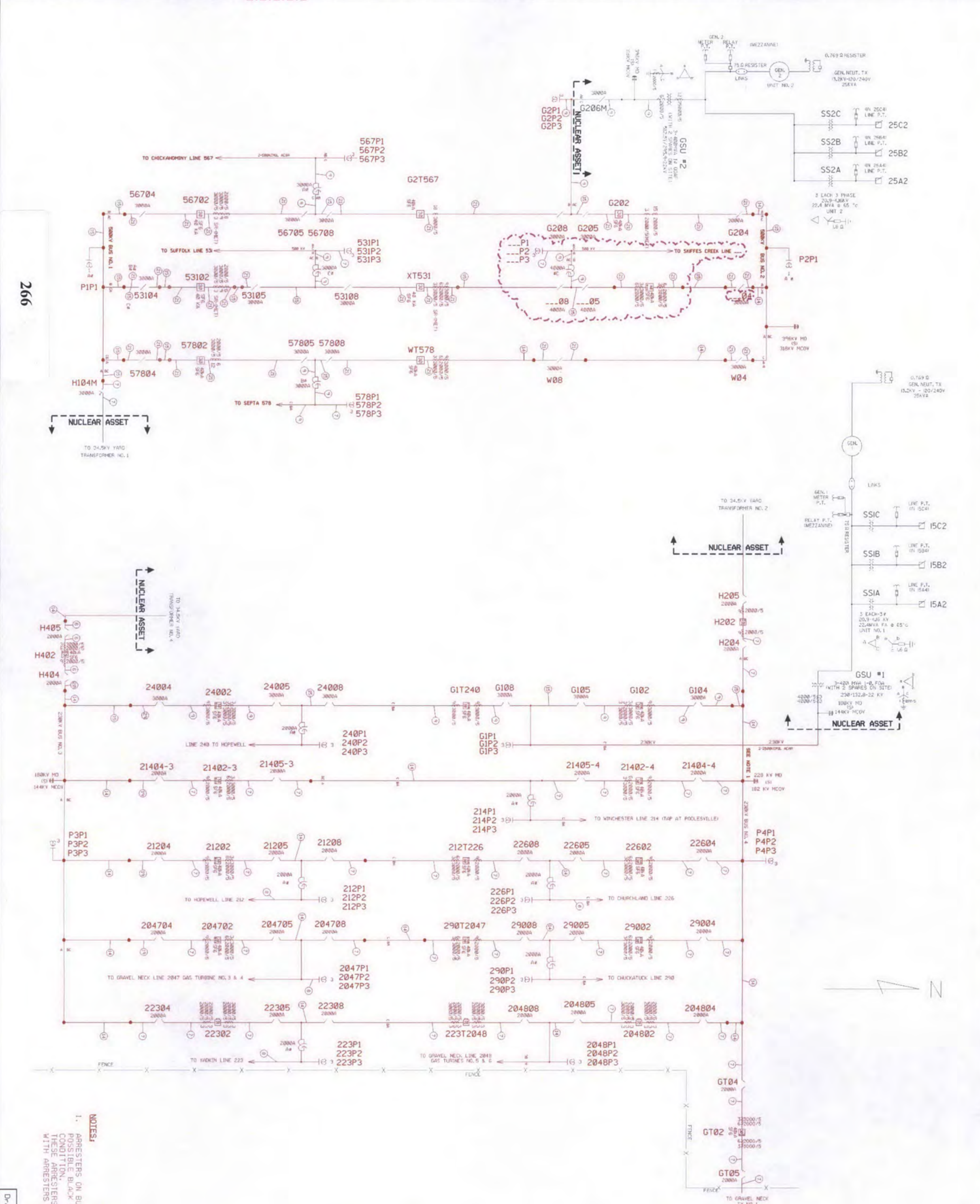
Cad File Name 1265000a.dgn
PLOTTED: 09-DEC-2011 09:42

Drawing No. 1265-000

antha29	Typical Drawing Information	Library Location	Cell Name	B/M Assembly	Pipe Stand Foundation Cells (Pier)	Pipe Stand Foundation Cells (Spread)	Foundation Cells for Other Typical Structures (Pier)	(Spread)	Steel Detail & Assembly

By: / Approval	AMY / TWV	RWB / JAB	MMO /	AJS /	MRH / DLP	TWV / DLP	MRH / DLP	DLP / DLP	DLP / DLP	MRH / DLP	DMJ / DLP	TWV / DLP	MRH / DLP	TWV / DLP	TWV /
Date:	01/07/10	9-8-11	10-11-11	02-29-12	5-19-05	6-29-05	2-15-06	10-28-05	6-29-06	2-10-06	6-29-06	12-06-06	12-28-07	12-04-08	12-18-08
Project No.	44096	942715	943639	99-2245	941795	244117	941795	941795	941795	941795	94-1795	941795	941795 & 942009	942009	942111
BM No.	5298	5912	6368		2764	2820	2883	2989	2989	2993	3260	3260	2993	NONE	4614
Description	R/P BUS #4 ARRESTERS	R/P CONDUCTORS AT SW 24004, 21404-03, 21204, 204704 & H404	R/P CB57802 CT's	NEW 500kV LINE ... TO SKIFFES CREEK	500 KV RELIABILITY PHASE 2	REPLACE 34.5 KV BREAKERS	R/P 531 LINE EQUIP 500KV REL. PHASE 3	R/P SW'S & CCVT'S - BUS#1 - PHASE 4	230KV REPLACE SWITCHES	R/P CB 56702 & 6 SW PHASE 5	REPLACE 230KV SWITCHES & TRAPS	REPLACE 230KV LINE TUNERS	UPDATED ONELINE NOTES FOR 500KV PHASE 3	UPDATED ONELINE WITH LATEST COMPLETION INFO	R/P SWITCHES 204804, 204805, 204808, 22304, 22305, 22308, 24004, 24005, & R/P 2048P1, P2, P3 CCVT's

Revisions



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NOTES:

1. ARRESTERS ON BUS #4 ARE RATED FOR POSSIBLE "BLACK START" GENERATION DELTA CONDITION.
THESE ARRESTERS SHALL BE REPLACED WITH ARRESTERS OF THE SAME RATINGS.

SUBSTATION CONDUCTOR SCHEDULE	
NO	DESCRIPTION
2	4/0 AAC (OXLIP)
4	795 AAC (ARBUTUS)
5	2-795 AAC (ARBUTUS)
6	1590 AAC (COREOPSIS)
7	2-1590 AAC (COREOPSIS)
8	2500 ACAR (84/7)
9	2-2500 ACAR (84/7)
14	3½" ALUMINUM TUBING SCHEDULE 40
15	5" ALUMINUM TUBING SCHEDULE 40
18	600 ALUMINUM 35 kV U.G. (2 DUCT)
19	2-1272 AAC Rope-Lay (259-37/7/0.0701)
20	1272 AAC Rope-Lay (259-37/7/0.0701)
21	3-1590 KCMIL AL (COREOPSIS)
29	3-1272 AAC Rope-Lay (259-37/7/0.0701)

Control Enclosure Size	
500KV	200KV
50'-8" x 29'-4"	70'-8" x 29'-4"

— NUCLEAR ASSET

— RED — ELECTRIC TRANSMISSION (E T) ASSET
(ON A COLOR PRINTER)

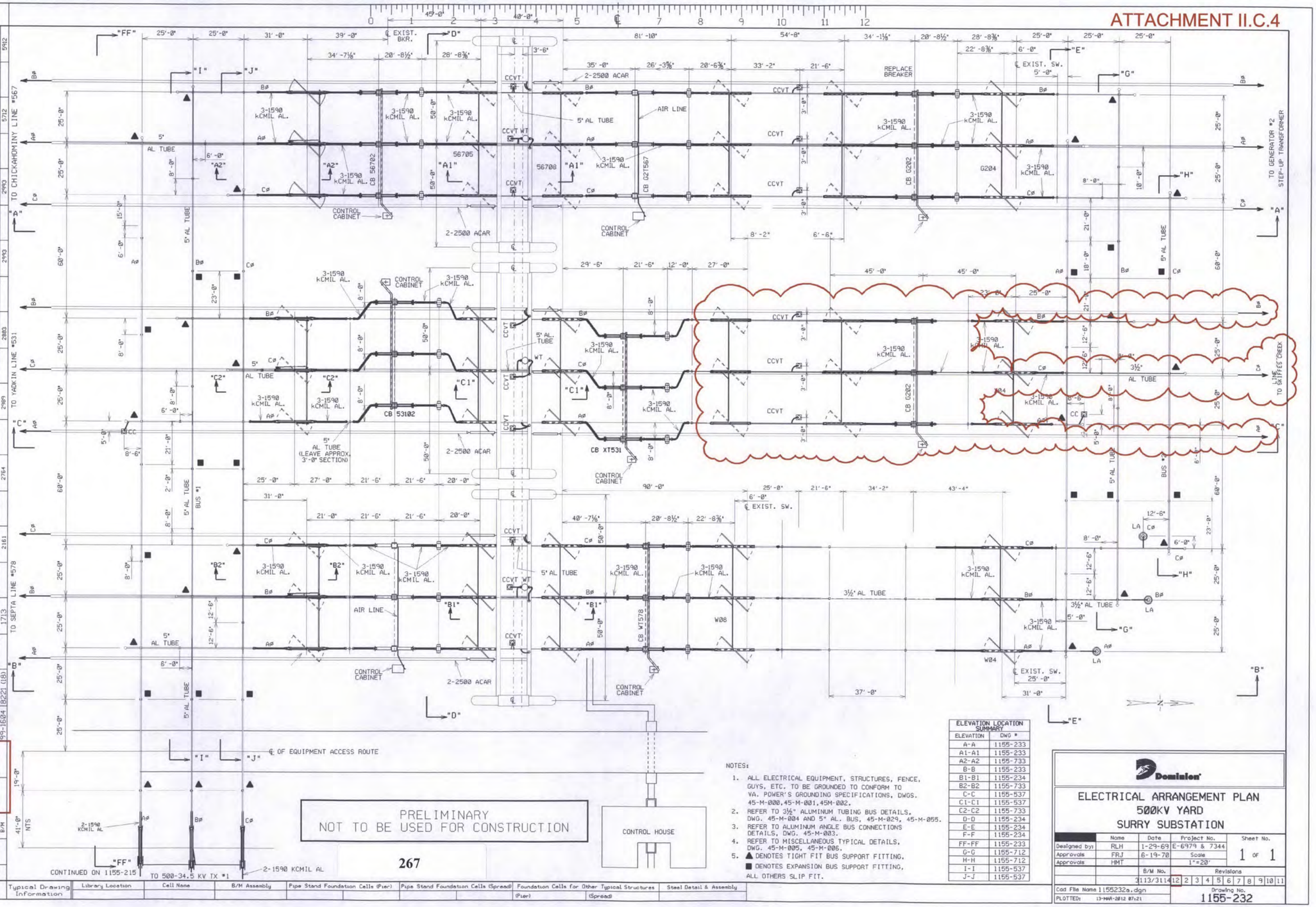
Dominion
Construction One Line Diagram

Drawn By:	Date	Substation	SURRY 500 & 230KV
Approval	Date	Drawing No.	11550OZ.DGN

01-MAR-2012 08:58

ATTACHMENT II.C.3

ATTACHMENT II.C.4



PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

ELEVATION LOCATION SUMMARY	
ELEVATION	DWG #
A-A	1155-233
A1-A1	1155-233
A2-A2	1155-733
B-B	1155-233
B1-B1	1155-234
B2-B2	1155-733
C-C	1155-537
C1-C1	1155-537
C2-C2	1155-733
D-D	1155-234
E-E	1155-234
F-F	1155-234
FF-FF	1155-233
G-G	1155-712
H-H	1155-712
I-I	1155-537
J-J	1155-537

NOTES:

1. ALL ELECTRICAL EQUIPMENT, STRUCTURES, FENCE, GUYS, ETC. TO BE GROUNDED TO CONFORM TO VA. POWER'S GROUNDING SPECIFICATIONS, DWGS. 45-M-000,45-M-001,45M-002.
2. REFER TO 3½" ALUMINUM TUBING BUS DETAILS, DWG. 45-M-004 AND 5" AL. BUS, 45-M-029, 45-M-055.
3. REFER TO ALUMINUM ANGLE BUS CONNECTIONS DETAILS, DWG. 45-M-003.
4. REFER TO MISCELLANEOUS TYPICAL DETAILS, DWG. 45-M-005, 45-M-006.
5. ▲ DENOTES TIGHT FIT BUS SUPPORT FITTING.
   ■ DENOTES EXPANSION BUS SUPPORT FITTING, ALL OTHERS SLIP FIT.

No.	Date	By	Description	Project Number
12	3/1/12	AJS	230 kV LINE	982245
2	5-12-94	WBH	NBL 5-13-94 REPLACE C.T. FOR CIR. BREAKER 57802	C00866323530 995-1604 8221 (18)
3	12-18-94	CDB3	R/P C.B. #57802 & #G21567	941700 1713
4	2-3-04	DLP	REPLACE VARIOUS SWITCHES, ARRESTERS, P.T.'s, C.C.V.T.'s, BREAKERS, C.T.'s, AND BUS SUPPORTS AS BUILT	94-1795 2161
5	5-4-05	DLP	R/P BKR WT578, AND ASSOC. DISC. SWITCHES, 2 SWITCHES, 3 CCVT's AND ONE WAVE TRAP.	94-1795 2764
6	11-9-05	DLP	R/P H104,53184M, 57884M,56704,P1P1, CONC. SUPP & TX. #1 MAN.	94-1795 2989
7	7-12-05	DLP	500 KV RELIABILITY PHASE 3	94-1795 2883
8	5-2-06	TWV	500 KV RELIABILITY PHASE B,C.T.'s, SW. 56702 & C.T.'s, SW. 56705, 56708, 56708, G204, W08, W04, ADA, & X04H	94-1795 2993
9	9-18-07	DLP	REPLACE THREE EXIST. CONC. BUS SUPPORT STRUCTURES	94-1795 & 942089 2993
10	9-10-10	DLL	R/P 500KV BUS #2 BUS SUPPORTS, R/P 1 SET OF CCVT SUPPORTS.	94-2714 5712
11	1-3-11	DLL	R/P 500KV BUS #1 BUS SUPPORTS	94-2715 5912
12	3/1/12	AMY		

Revisions

Typical Drawing Information	Library Location	Cell Name	B/M Assembly	Pipe Stand Foundation Cells (Pier)	Pipe Stand Foundation Cells (Spread)	Foundation Cells for Other Typical Structures (Pier)	Foundation Cells for Other Typical Structures (Spread)	Steel Detail & Assembly

Dominion

ELECTRICAL ARRANGEMENT PLAN
500KV YARD
SURRY SUBSTATION

	Name	Date	Project No.	Sheet No.
Designed by:	RLH	1-29-69	E-6979 & 7344	1 OF 1
Approvals	FRJ	6-19-70	Scale	
Approvals	HMT		1"=20'	
		B/M No.	Revisions	
		3113/3114	12 2 3 4 5 6 7 8 9 10 11	

Cad File Name 1155232a.dgn
PLOTTED: 13-MAR-2012 07:21

Drawing No. 1155-232

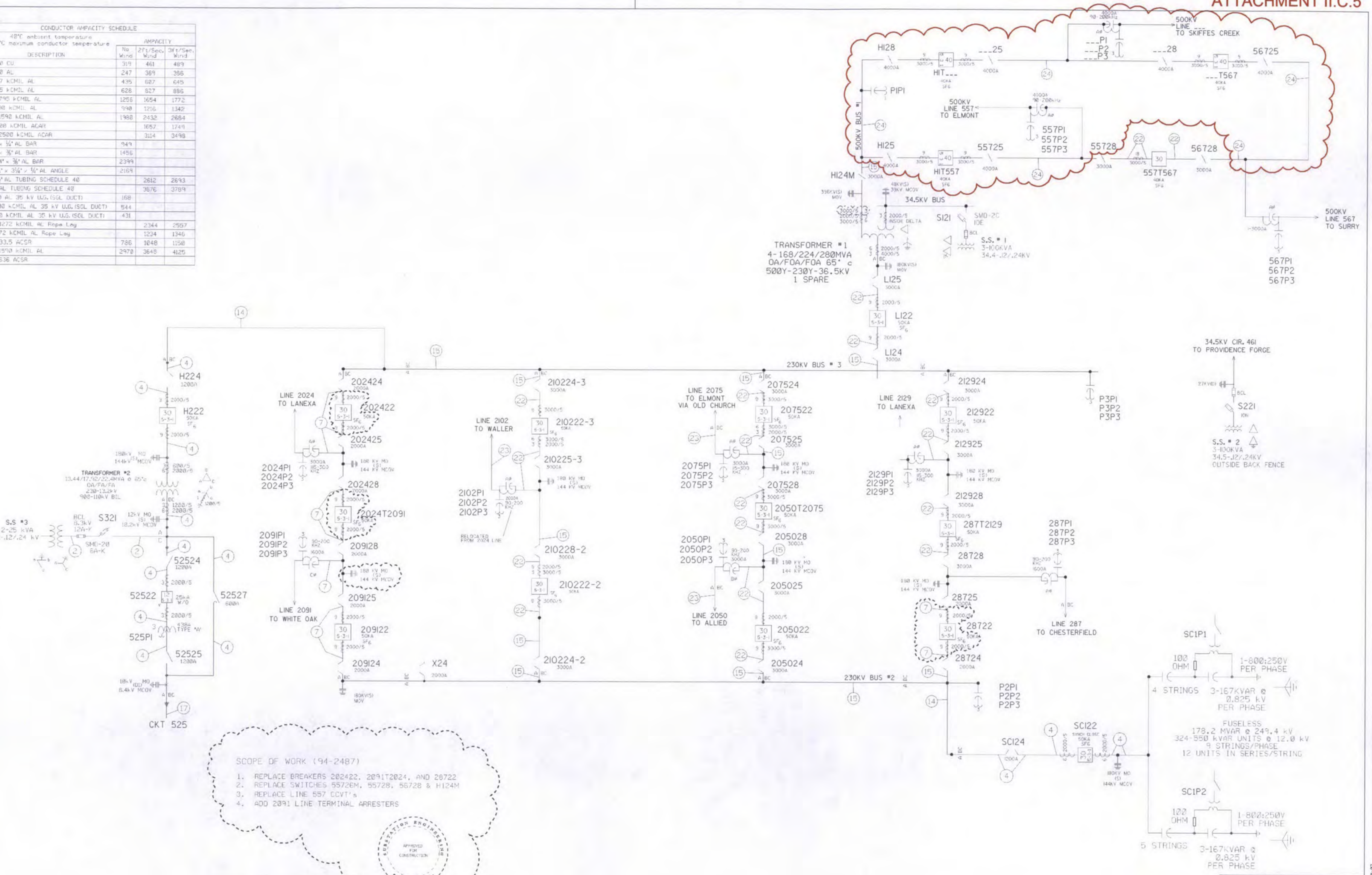
CONDUCTOR AMPACITY SCHEDULE

40°C ambient temperature
90°C maximum conductor temperature

NO	DESCRIPTION	AMPACITY No Wind	AMPACITY 2ft/Sec. Wind	AMPACITY 3ft/Sec. Wind
1	4/0 CU	319	461	489
2	4/0 AL	247	369	386
3	477 kCMIL AL	435	607	645
4	795 kCMIL AL	628	827	886
5	2-795 kCMIL AL	1256	1654	1772
6	1590 kCMIL AL	990	1216	1342
7	2-1590 kCMIL AL	1980	2432	2684
8	2500 kCMIL ACAR		1657	1749
9	2-2500 kCMIL ACAR		3114	3498
10	3" x ¼" AL BAR	949		
11	4" x ⅜" AL BAR	1456		
12	2-4" x ⅜" AL BAR	2399		
13	3¼" x 3¼" x ¼" AL ANGLE	2169		
14	3½" AL TUBING SCHEDULE 40		2612	2693
15	5" AL TUBING SCHEDULE 40		3676	3789
16	1/0 AL 35 kV U.G. (SGL DUCT)	168		
17	1000 kCMIL AL 35 kV U.G. (SGL DUCT)	544		
18	600 kCMIL AL 35 kV U.G. (SGL DUCT)	431		
19	2-1272 kCMIL AL Rope Lay		2344	2557
20	1272 kCMIL AL Rope Lay		1234	1346
21	1033.5 ACSR	786	1048	1150
22	3-1590 kCMIL AL	2970	3648	4125
23	2-636 ACSR			

Revisions

By	Approval	Date	Project No.	BM No.	Description
TWV		1-01-09	99-2062	5255	NEW 230 KV LINE TO LANEXA
TWV		11-30-09	99-1929	4171	2075 LINE TO ELMONT PHASE 2
TWV		7-27-09	99-1929	4816	PHASE 1 REPLACE CAP BANK #1
TWV		11-13-08	00-3318	4325	ADDED 525P1 TO REGULATORS
TWV		9-30-08	00-3318	4325	SCOPE CHANGE: 1/S 230 KV BKR NOT CIR. SW. AS PLANNED
TWV		7-8-08	00-3318	4325	NEW 230-13.2kV TX & 1 CKT
MRH	DLP	10-16-07	34899	3797	R/P CIR. SWITCHER (SC124) WITH CIR. BREAKER
MRH	DLP	11-6-06	94-1963	3274	ADD 567 LINE CCVT'S TO SCOPE.
DLP	DLP	11-6-06	94-1954	3321	RENAME 285 LINE EQUIP TO 2102
JEM	DLP	08/07/06	94-1963	3274	R/P C.B. 557T567
DMB	DMB	9/9/04	21712	2539	R/P CB#28522
DMB	DMB	2/17/03	941734	1906	R/P CB#285T287
AJS		10-13-11	99-2245		NEW 500kV LINE --- TO SKIFFES CREEK
BMC	TWV	04-26-11	94-2487	5853	REPLACE 4 BREAKERS, 4 SWITCHES, LINE 557 CCVT's
BMC	TWV	04-25-11	94-2924	6123	REPLACE BREAKERS 209122 & SC122



SCOPE OF WORK (94-2487)

1. REPLACE BREAKERS 202422, 2091T2024, AND 28722
2. REPLACE SWITCHES 55726M, 55728, 56728 & H124M
3. REPLACE LINE 557 CCVT's
4. ADD 2091 LINE TERMINAL ARRESTERS

SUBSTATION ENGINEERING APPROVED FOR CONSTRUCTION RICHMOND, VA.

Control Enclosure Size	20' x 70'

Dominion
CONSTRUCTION One Line Diagram

Drawn By:	Date	Substation	CHICKAHOMINY
Approval	Date	Drawing No.	0475000Z.DGN

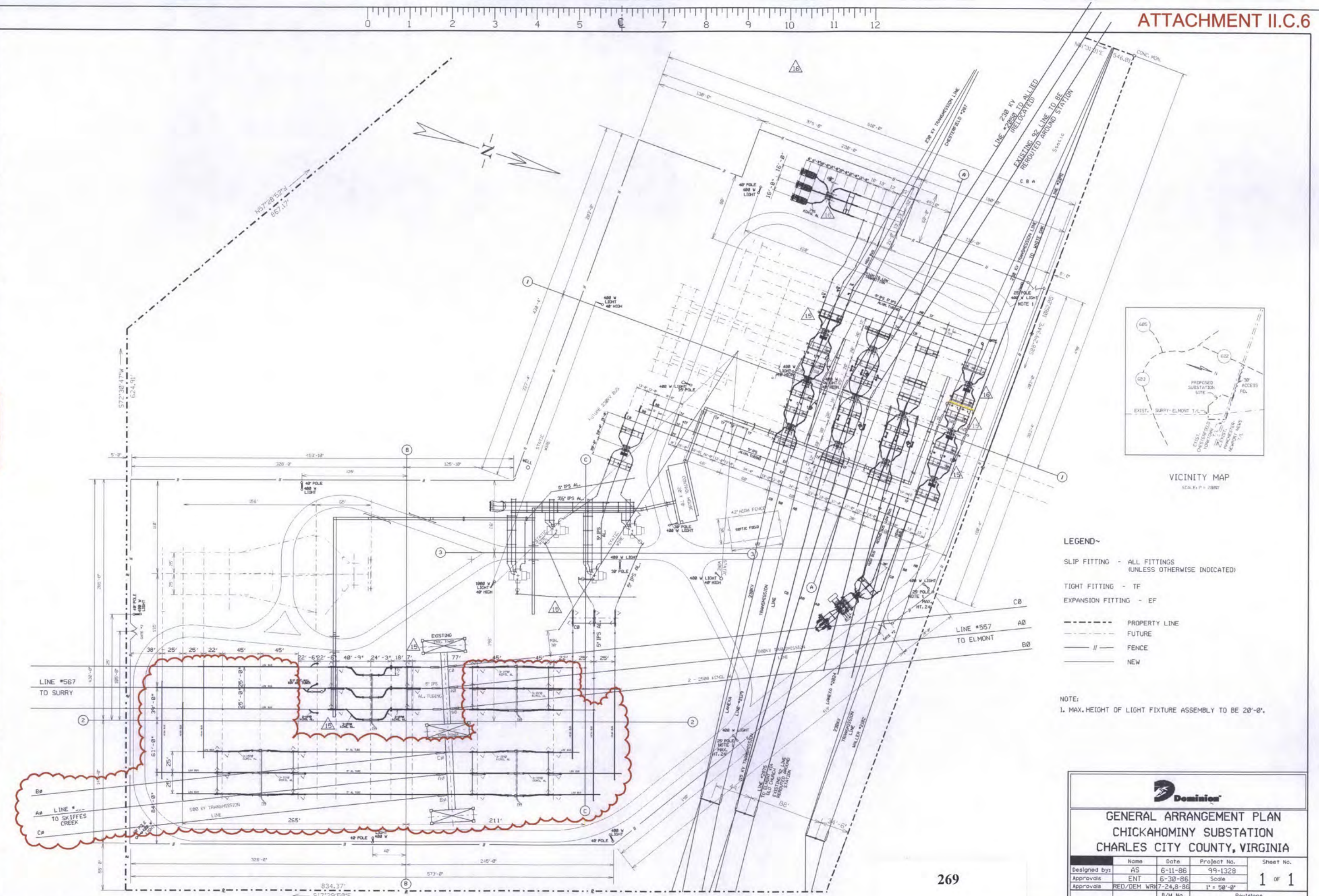
09-DEC-2011 08:07

antho29

ATTACHMENT II.C.6

No.	Date	Checked/Appr.	Description	Project Number	By	12	4-6-01	TWV	13	6-18-08	AMY	14	3/10/10	AMY	15	04-25-11	BMC	16	04-25-11	BMC
				B/M																
17	10/11/11	AJS	NEW 500kV LINE TO SKIFFES CREEK I/S 3-500 kV CB's	99-2245																
7	9/9/04	DMB	R/P CB#28522	99-1929		99129	4818	TWV	13	6-18-08	AMY	14	3/10/10	AMY	15	04-25-11	BMC	16	04-25-11	BMC
		DMB		2539																
8	08/30/06	DLP	R/P C.B. 557T567	94-1963																
	08/30/06	DLP		3274																
9	10-8-07	DLP	R/P CAP. BANK #1 CIR. SWITCHER W/ NEW BREAKER	34899																
	MRH			3797																
10	9-10-08	TWV	NEW 230-13.2kV TX. 7 1 CIR.	00-3318																
		TWV		4325																
11	11-20-08	TWV	UPDATED TRANSFORMER	00-3318																
				4325																

Revisions



VICINITY MAP

SCALE: 1" = 2000'

LEGEND~

SLIP FITTING - ALL FITTINGS (UNLESS OTHERWISE INDICATED)

TIGHT FITTING - TF

EXPANSION FITTING - EF

PROPERTY LINE

FUTURE

FENCE

NEW

NOTE:

1. MAX. HEIGHT OF LIGHT FIXTURE ASSEMBLY TO BE 20'-0".

Dominion

GENERAL ARRANGEMENT PLAN CHICKAHOMINY SUBSTATION CHARLES CITY COUNTY, VIRGINIA

	Name	Date	Project No.	Sheet No.
Designed by:	AS	6-11-86	99-1328	1 OF 1
Approvals	ENT	6-30-86	Scale	
Approvals	RED/DEM WRK	7-24,8-86	1" = 50'-0"	
		B/M No.	Revisions	
		6197	12 13 14 15 16 17 7 8 9 10 11	
Cad File Name			Drawing No.	
PLOTTED: 16-NOV-2011 13:37			475-053	

Typical Drawing Information	Library Location	Cell Name	B/M Assembly	Pipe Stand Foundation Cells (Pier)	Pipe Stand Foundation Cells (Spread)	Foundation Cells for Other Typical Structures (Pier)	(Spread)	Steel Detail & Assembly

an18a29

ATTACHMENT II.C.7

TO SKIFFES CREEK LINE ----

----P1
----P2
----P3

180kV MO (S) 144kV MCOV

3000A Aø 90-200KHZ

TO YORKTOWN LINE 292

292P1
292P2
292P3

180kV MO (S) 144kV MCOV

3000A Aø 90-200KHZ

STATION SERVICE NO. 1
2-167KVA
13.2-.12/.24KV

SMD-20 25K

BCL 8.3kV 40K

S141

18kV MO (S) 15.3kV MCOV

180kV MO (S) 144kV MCOV

90kV MO (S) 74kV MCOV

TRANSFORMER NO. 1
134.4/179.2/224MVA
230-116.03-13.2KV LTC
ONAN/ONAF/ONAF @ 65° C

TO PENINSULA LINE 99

TO YORKTOWN LINE 61

115KV BUS NO. 1

L144 2000A

L142

69/115Y-.115KV 600/1000:1

P1P1
P1P2
P1P3

T124-1 2000A

T124-2 2000A

T122 145 KV 40 KA SF6

----45 3000A

----T292

29245 3000A

H144 3000A

H142 SF6 1200A, 40kA

----48 3000A

234T---- SF6 40kA

23448 3000A

29248 3000A

H2T292 SF6 40kA

H248 3000A

23445 3000A

H2T234 SF6 40kA

H245 3000A

P3P1

H244M 3000A

S241 10A SM4

L242 145 KV SF6 40 KA

L244 2000A

P2P1
P2P2
P2P3

69/115Y-.115KV 600/1000:1

9944 2000A

9942 145 KV SF6 40 KA

9945 2000A

99P1 1200A Aø

6144 2000A

6142 145 KV SF6 40 KA

6145 2000A

61P1 1600A Aø

7545 2000A

7542 145 KV SF6 40 KA

7544 2000A

16545 2000A

165P1 1200A Aø

16542 145KV SF6 40 KA

16544 2000A

TRANSFORMER NO. 2
134.4/179.2/224MVA
230-115-13.2KV LTC
ONAN/ONAF/ONAF @ 65° C

18 KV (S) MO 15.3 KV MCOV

STATION SERVICE NO. 2
2-75KVA
13.2-.12/.24KV

180KV MO (S) 144KV MCOV

90KV MO (S) 74KV MCOV

115KV BUS NO. 2

TO NEWPORT NEWS LINE 75

TO SHELLBANK LINE 165

FUSELESS
118.8MVAR@249.4KV
(101MVAR@230KV)
216-550KVAR UNITS@12KV
6 STRINGS PER PHASE
12 CANS IN SERIES PER STRING

3-167KVAR @0.825KV PER PHASE

SC144 1200A

SC142 2000/5

SF6 40KA SYNCHRONOUS CLOSE SOC

500A 1.5mH

180KV MO (S) 144KV MCOV

100 OHM

SC1P1

1-800:250V PER PHASE

234P1
234P2
234P3

180kV MO (S) 144kV MCOV

TO WINCHESTER LINE 234 PILOT WIRE

Control Enclosure Size | 17' x 50'

270

By:	AJS	DMJ	DFP	BMC	JEM	AJS	DMB
Date:	11-03-11	05-11-09		09/03/09		03-10-10	
Project No.	99-2245	NONE		942234		94-2255	
BM No.		NONE		5136		5888	
Description	NEW 230kV LINE ---- TO SKIFFES CREEK	R/M Aø WAVE TRAP LINE 234		REPLACE TX #2		R/P TX#1, BRK 234T292, SW's 23445,23448,29248, 29245,T124-1 & H144M, I/S LA'S ON 234 & 292	

By:	JEM	KLG	DFP	JEM	JEM
Approval					
Date:	02/09/09	08-28-08			
Project No.	942113	99-2055	NONE		
BM No.	4735		4421		
Description	REPLACE CB 9942 AND 7542		LINE #61 UPRATE		

Revisions

Dominion

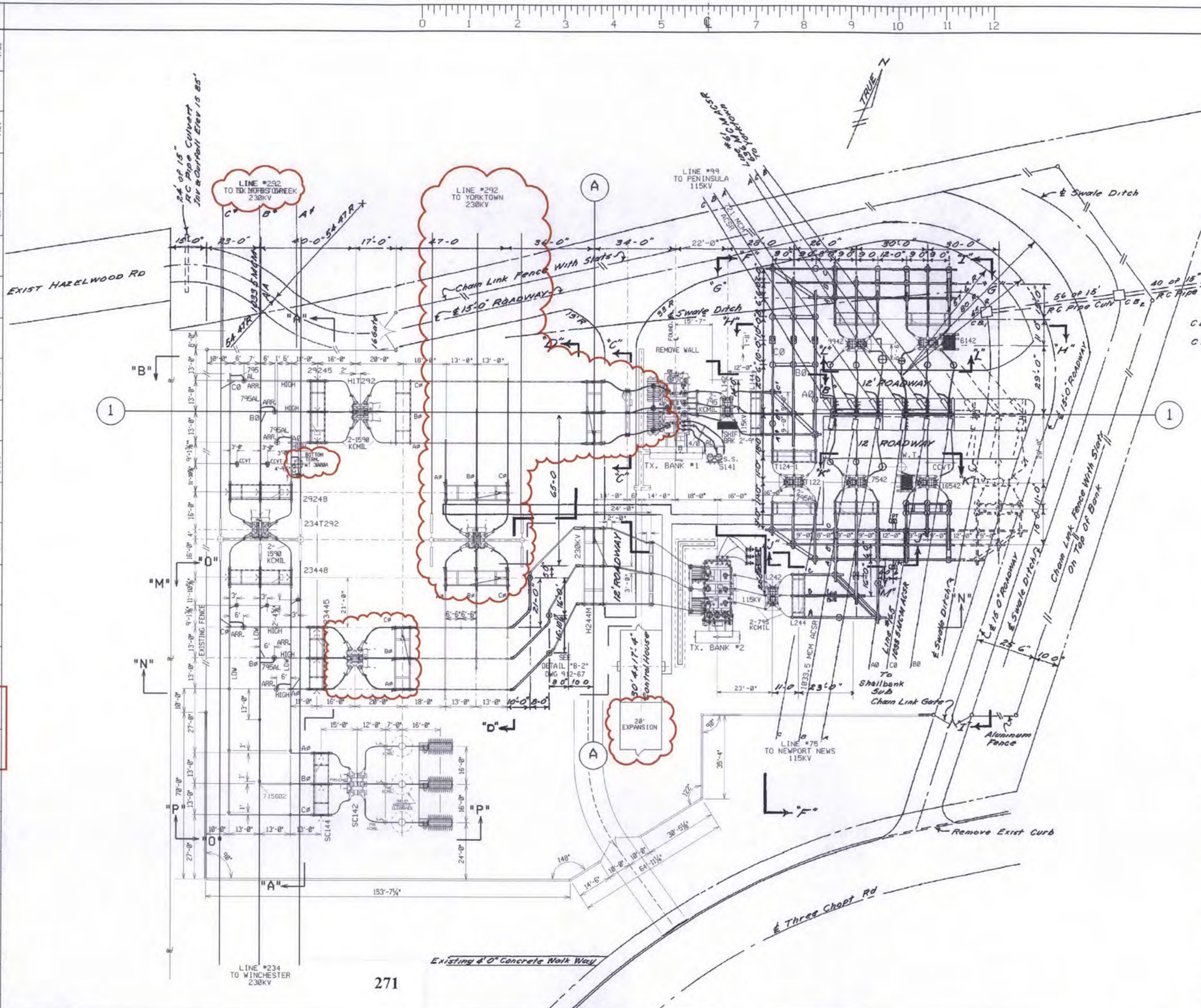
Construction One Line Diagram

Drawn By:	Date	Substation	WHEALTON
Approval	Date	Drawing No.	0912000Z.DGN

07-NOV-2011 15:45

antho29

ATTACHMENT II.C.8



ELEVATION LOCATIONS	
ELEVATION	DWG #
A-A	912-91
B-B	912-91
C-C	912-91
D-D	912-92
F-F	912-92
G-G	912-92
H-H	912-92
I-I	912-93
J-J	912-93
K-K	912-91
L-L	912-91
M-M	912-93
N-N	912-62
O-O	912-121
P-P	912-121

NOTES:

1. ALL ELECTRICAL EQUIPMENT, STRUCTURES, FENCE, GUYS, ETC. TO BE GROUNDED TO CONFORM TO DOMINION'S GROUNDING SPECIFICATIONS. DWGS. 45-M-000, 45-M-001, 45-M-002.
2. REFER TO ALUMINUM TUBING BUS DETAIL DWGS., 3½" AL. BUS. 45-M-004 AND 5" AL. BUS, 45-M-029, 45-M-055.
3. REFER TO ALUMINUM ANGLE BUS CONNECTION DETAILS, DWG 45-M-003.
4. REFER TO MISCELLANEOUS TYPICAL DETAILS, DWGS. 45-M-005, 45-M-006.
5. ▲ DENOTES TIGHT FIT BUS SUPPORT FITTING. ALL OTHERS SLIP FIT.
   △ DENOTES TIGHT FIT BUS SUPPORT FITTING (A FRAME).
   ■ DENOTES EXPANSION BUS SUPPORT FITTING.
   ◆ DENOTES EXPANSION TERMINAL FITTING.
   ● DENOTES EXPANSION COUPLING FITTING.

Revisions

No.	Date	By	Checked/Appr.	Description	Project Number	B/M
14	10-15-09	JEM		R/P TX #2	94-2234	5136
15	3-10-2011	LR		INSTALL: 1-230/115KV TRANSF, 1-QMB S.S. TX, 4-230KV SWITCHES, 2-230KV BREAKERS, 1-115KV BREAKERS, 1-115KV SWITCH	NW94225501 / 94-2255	5888
16	11/19/11	AJS	AMY 11/19/11	NEW 230 kV LINE TO SKIFFES CREEK	99-2245	
	7-27-98		07/23/98	R/P 115KV PTS ON BUS #1 F2; 94 3613; C01243713530; A18SUB/1886; A18SUB/1887		BM 9314
7	8-12-98	MRH	DLP	INSTALL 230KV CAP. BANK	99-1848	9288
8	12-5-03	MRH	DLP	R/P CB 16542, W.T. & CCVT	16925	2056
9	10-19-04	TWV	DLP	R/P W.T., CCVT's & LINE TUNER ON 292 LINE	16925	2493
10	03-10-08	DMJ	JEM	R/P CB's 6142 & L142	94-1905	3541
11	06-18-08	NE		165 LINE UPRATE R/P SWITCHES 16544 & 16546	99-2155	4237
12	02-02-09	BMC	KLG	LINE #61 UPRATE (RECONDUCTOR)	99-2065	4421
13	04-09-09	BMC	JEM	REPLACE CB 9942 AND 7542	94-2113	4735

antho29

Typical Drawing Information	Library Location	Cell Name	B/M Assembly	Pipe Stand Foundation Cells (Pier)	Pipe Stand Foundation Cells (Spread)	Foundation Cells for Other Typical Structures (Pier) (Spread)	Steel Detail & Assembly

Dominion

GENERAL ARRANGEMENT PLAN
WHEALTON SUBSTATION
HAMPTON, VIRGINIA

	Name	Date	Project No.	Sheet No.
Designed by:	MRH	8-6-98		1 OF 1
Approvals			Scale 1"=20'	
Approvals				
		B/M No.	Revisions: 14 15 16 6 7 8 9 10 11 12 13	
Cad File Name	0912090a.dgn/tif		Drawing No. 0912-090	
PLOTTED:	16-NOV-2011 13:29			

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

A. Describe the character of the area which will be traversed by this line, including, land use, wetlands, etc. Provide the number of dwellings within 500 feet of the line for each route considered.

Response: **500 kV Proposed Route (Surry-Skiffes Creek):**

Originating at the Company's Surry Switching Station in Surry County, the Proposed Route continues east for 1.4 miles on Company property adjacent to an unnamed service road that parallels a canal at 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, and then pivots northeast and crosses the James River for approximately 3.5 miles. The river is used for maritime shipping, recreation, seafood harvesting, and environmental habitat. There is a U.S. Army Corps of Engineer spoils area in the eastern side of the river. Where the Proposed Route comes onshore in James City County, it is within industrial zoned property, though the area crossed by the route has not yet been developed. An unused industrial chemical plant is directly to the north of the route, and a capped landfill area associated with the past use of that same industrial area is located to the south. The Proposed Route then turns north and joins an existing Dominion Virginia Power electric transmission line right-of-way varying in width from 80 feet to 130 feet that will require expansion to 150 feet wide, up to where it will cross U.S. Route 60. The existing right-of-way narrows at the Route 60 crossing. Additional right-of-way acquisition is proposed on the west side of the existing right-of-way, requiring the acquisition and removal of a single family dwelling. This and an adjacent parcel are zoned Rural Residential. A mobile home subdivision is on the eastern side of the right-of- way on property zoned Commercial. No additional right-of-way is proposed to the east, in order to avoid the removal of a number of mobile homes. The Proposed Route would then continue north on expanded and existing right-of-way, across property zoned predominantly Industrial, to the proposed Skiffes Creek Switching Station site that the Company has owned since the 1970s. To the east of the proposed line is a multi-unit apartment complex, and to the west of the proposed line is a large mobile home subdivision. There is an existing treed buffer that can remain undisturbed between those residential areas and the proposed 500 kV line.

There are 84 residences within 500 feet of the proposed right-of-way for the Proposed Route.

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

This route is similar to the Proposed Route for the overland portion. Leaving the shore on the Surry side of the river, the line turns north in the river to follow off

shore the eastern side of Hog Island before turning east to cross the river and enter James City County. After crossing the river and entering James City County, the route joins the alignment of the Proposed Route. The Proposed Route using the James River Crossing Variation 1 is approximately 8.0 miles long with a river crossing of approximately 4.1 miles.

There are 84 residences within 500 feet of the proposed right-of-way for the Proposed Route utilizing James River Crossing Variation 1.

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

This route is similar to the Proposed Route for the overland portion in Surry County. Leaving the shore on the Surry side of the river, the line turns northeast to follow the southern edge of an existing pipeline corridor that contains two Columbia Gas Transmission natural gas pipelines and a Colonial Pipeline Company refined petroleum products pipeline in the river. After crossing the river and entering James City County, the route continues south of and parallel to the Colonial pipeline and crosses several parcels that are zoned for industrial use, including one parcel that belongs to the Authority, as noted previously. The route then joins the alignment of the Proposed Route. The James River Crossing Variation 2 is approximately 7.2 miles long with 3.8 miles being within the James River.

There are 84 residences within 500 feet of the proposed right-of-way for the Proposed Route utilizing James River Crossing Variation 2.

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

This route is similar to the Proposed Route for the overland portion in Surry County. Leaving the shore on the Surry side of the river, the line turns north in the river adjacent to the shoreline of Hog Island WMA before turning northeast to cross the river, then turns southeast to cross the existing pipeline corridor in the river, and turns northeast again to enter James City County. After crossing the river and entering James City County, the route continues on shore in the same location described above for Variation 2, across the same industrial parcels. The James River Crossing Variation 3 is approximately 7.5 miles long with 4.1 miles being within the James River.

There are 84 residences within 500 feet of the proposed right-of-way for the Proposed Route utilizing James River Crossing Variation 3.

500 kV Alternate Route (Chickahominy-Skiffes Creek):

Beginning at the Chickahominy Substation in Charles City County, the Alternate Route for the 500 kV line is within existing right-of-way that crosses a combination of both open fields and forest lands, but forested land dominates in this rural area and is at various stages of growth for timber production. The Alternate Route also crosses an area south of the Waste Management of Virginia Landfill that appears to be where that landfill could be expanded. The right-of-way is along one side to reasonably minimize potential impacts to future expansion plans for the landfill. At most of the locations where the Alternate Route crosses a state maintained road, residential development has occurred. In the vicinity of The Glebe Lane, there are a number of homes in close proximity to this road crossing that hold historic significance, particularly for the local community. This area has more open fields so the line may be visible from those resources. Before leaving Charles City County, the line enters the Chickahominy WMA that is owned and managed by VDGIF. This area is managed primarily for upland wildlife, and hunting is allowed. A sighting range is available, as is a boat ramp on Morris Creek for fishing opportunities in Morris Creek and the Chickahominy River.

The terrain of Charles City County is relatively flat and interspersed with some areas of wetlands and small streams. Crossing the Chickahominy River, there are three river front properties on the Charles City side, one of which includes a permanent dwelling and two that appear to be used seasonally. The Chickahominy River is used for recreation (boating, sailing, water skiing, and fishing). Access to this location is by water only, with much of the western shore in Charles City County being under State ownership, and the eastern shore being flat with tidal marsh interspersed with small shallow inlets and streams. As the Alternate Route enters James City County, most of the property is held by one owner up to and slightly beyond Jolly Pond Road and remains undeveloped. The right-of-way crosses large tracts of property owned by James City County and includes an area that was previously a county landfill. The Alternate Route then enters Freedom Park and crosses an area used mainly for walking trails and mountain biking trails. The right-of-way parallels the back side of Lois S. Hornsby Middle School and J. Blain Blayton Elementary School. After crossing Jolly Pond Road again, it crosses an area identified as Colonial Heritage that is in various stages of residential development where some of the property is presently under County review for future development, and another portion of the property near Lightfoot Junction is either developed or under construction. At Lightfoot Junction, the Alternate Route then turns southeast and follows an existing transmission line corridor.

Residential development has occurred around the existing right-of-way and in the vicinity to Route 199. Warhill High School has been built on the north side, and a County sports complex has been built on the south side of the existing electric transmission line right-of-way. Commercial development and redevelopment is

occurring near Route 60 with retail shopping being the main component of that development. The Alternate Route then enters York County and crosses undeveloped areas owned by the City of Williamsburg around the Waller Mill Reservoir and Park, and the Colonial Williamsburg Foundation before entering the City of Williamsburg and becoming again mostly residential development that has grown around the existing transmission line right-of-way. The Alternate Route enters York County again, crosses the Colonial Parkway and remains predominantly within residential development, parallels Interstate 64, crosses on the north side of Williamsburg Golf Club, crosses the interchange of Interstate 64/U.S. Route 60 and Route 143, before entering James City County again and crossing Dominion Virginia Power's existing Kingsmill Substation. The existing right-of-way divides at this location, and the Alternate Route for the proposed 500 kV line would be located in the most northern right-of-way that parallels Interstate 64 and is located at the rear of a residential area. It then turns through a mobile home residential area, joins again with the other right-of-way, and enters the undeveloped parcel owned by Dominion Virginia Power for the proposed for the Skiffes Creek Switching Station.

There are 1,129 residences within 500 feet of the existing right-of-way. Of those, 91 are within 500 feet of the uncleared right-of-way, and the remainder are along the existing occupied right-of-way between Lightfoot Junction and the proposed Skiffes Creek Switching Station. Due to the planned and ongoing residential development near Lightfoot Junction, the number of homes will increase as this application is being considered.

230 kV Skiffes Creek-Whealton Line:

Beginning at the proposed Skiffes Creek Switching Station, the proposed 230 kV line would be placed on existing double circuit single pole structures or on double circuit single pole structures that would replace the existing structures. This existing right-of-way crosses an industrial area in James City County where Walmart and Sam's Club warehouses have been constructed on either side of the existing corridor. The route crosses over Skiffes Creek and enters the City of Newport News. The right-of-way crosses U.S. Route 60 and the Lee Hall Reservoir, paralleling railroad tracks before crossing Denbigh Substation, turning across Interstate 64, and paralleling CSX railroad tracks into York County. At the C&O Junction, the existing structure line will be replaced with a double circuit weathering steel pole the remainder of the way to the existing Whealton Substation. This area adjacent to the C&O Junction is an area where the Huntington Point Planned Development (residential) is proposed. The existing right-of-way then goes around the Newport New/Williamsburg International Airport, crossing the Harwoods Mill Reservoir, a sports complex near Oriana Road, the reservoir again, and enters an area that becomes increasingly residential in nature before re-entering the City of Newport News. Crossing Interstate 64, the right-of-way crosses the Oyster Point Commercial Development area and enters an area south of U.S. Route 17 that is residential. In the vicinity of the

Hampton Roads Center Parkway, the right-of-way enters the City of Hampton and continues within residential neighborhoods that have been constructed around the existing transmission corridor, until entering the existing Whealton Substation.

There are 2,007 residences within 500 feet of the existing right-of-way.

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

B. Advise of any public meetings the Company has had with neighborhood associations and officials of local, state or federal governments who would have an interest or responsibility with respect to affected area or areas.

Response: 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 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 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 Attachment III.B.3. Additionally, newspaper advertisements for the Open Houses ran in six local publications in mid-December and early January. See 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 about the new route being studied. Additional notifications of the Project, including considering the 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 Senator Donald McEachin, Delegate Joe Morrissey,
March 9, 2012	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 Attachment III.B.5. An advertisement for the Open House ran in five local newspapers on March 14, 2012 and March 21, 2012. See Attachment III.B.6. Follow-up letters and a revised map showing the Proposed Route were mailed to everyone previously notified along the Chickahominy Alternative (approximately 2,100 parcels) on March 16, 2012. See 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 the Virginia Department of Environmental Quality 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.

In addition to the foregoing communications with the impacted localities, and in accordance with Virginia Code § 15.2-2202, letters dated March 14, 2012 (provided as 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:

- Mt. 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

Additional information was provided to the public through numerous interviews with the local media and through an internet website dedicated to the Project:

http://www.dom.com/about/electric-transmission/skiffes/index.jsp

Dominion Virginia Power
P.O. Box 26666, Richmond, VA 23261-6666
Web Address: www.dom.com

Dominion®

September 19, 2011

RE: ***Right-of-Way surveys***

Dear Property Owner:

To ensure continued reliability and support regional economic growth, Dominion Virginia Power (Dominion) is in the early stages of developing plans for new electric transmission facilities.

Your property is crossed by, or adjacent to, an existing electric transmission corridor with lines that extend from James City County and continue to Newport News. Dominion engineering is looking into the potential of developing a project to reconfigure the lines in this existing corridor.

Over the next several weeks Dominion employees and contractors will be accessing some easements along local transmission rights-of-way to begin surveying and/or soil testing. If you have questions about this survey work, please send an e-mail to powerline@dom.com, or call us toll free at 1-888-757-6698.

Opportunities to learn more about proposed projects will eventually be available online and at our publicly advertised community meetings. Dominion will mail area residents updates as further details of potential regional electric transmission facilities are developed.

Sincerely,

Dominion Virginia Power

Dominion Virginia Power
P.O. Box 26666, Richmond, VA 23261-6666
Web Address: www.dom.com

Dominion®

September 19, 2011

RE: ***Right-of-Way surveys***

Dear Property Owner:

To ensure continued reliability and support regional economic growth, Dominion Virginia Power (Dominion) is in the early stages of developing plans for new electric transmission facilities.

Your property is crossed by, or adjacent to, an easement acquired by Dominion in the 1970's/1980's for purposes of building electric transmission infrastructure. Dominion engineering is looking into the potential of developing a project utilizing this existing easement.

Over the next several weeks Dominion employees and contractors will be accessing some easements along local transmission rights-of-way to begin surveying and/or soil testing. If you have questions about this survey work, please send an e-mail to powerline@dom.com, or call us toll free at 1-888-757-6698.

Opportunities to learn more about proposed projects will eventually be available online and at our publicly advertised community meetings. Dominion will mail area residents updates as further details of potential regional electric transmission facilities are developed.

Sincerely,

Dominion Virginia Power

Dominion Virginia Power

Mailing Address: P.O. Box 26666
Richmond, VA 23261

Web Address: www.dom.com

December 1, 2011

RE: ***Chickahominy-Skiffes Creek 500kV & Skiffes Creek – Whealton 230kV Lines***

Dear Property Owner:

Dominion is committed to providing reliable electricity to our customers. Regional electrical demand increases and announced retirement of power generation facilities has accelerated the need for new transmission lines to be built and operational by 2014.

Your property is crossed by, or adjacent to, an existing electric transmission corridor with lines that extend from James City County and continue to Newport News. Dominion recently conducted a preliminary feasibility study and has now assembled a project team to develop plans to reconfigure these existing lines in order to accommodate new transmission infrastructure. **Initial studies indicate no need to expand the width of the existing right-of-way corridor.** Please refer to the enclosed fact sheet for additional project details and a map.

In December we will invite you, your neighbors, and the general public to attend one of three Informational Open House meetings to be scheduled during the month of January. Details will be mailed to you once dates and locations are confirmed and advertisements for these events will appear in regional newspapers.

We plan to file an application with the Virginia State Corporation Commission (SCC) in February 2012 to seek authorization to construct and operate new transmission facilities. Please visit our website to learn more about the proposed *Chickahominy-Skiffes Creek 500kV* and *Skiffes Creek-Whealton 230kV* projects and updates as we proceed at www.dom.com, keyword: "Skiffes." If you have questions or comments regarding the projects, please send an email to our dedicated transmission team at: powerline@dom.com or phone one of our representatives at 1-888-291-0190 from 7 a.m. to 7 p.m., Monday – Friday.

Sincerely,

Dominion Virginia Power

Dominion Virginia Power

Mailing Address: P.O. Box 26666
Richmond, VA 23261

Web Address: www.dom.com

December 1, 2011

RE: ***Chickahominy-Skiffes Creek 500kV Line***

Dear Property Owner:

Dominion is committed to providing reliable electricity to our customers. Regional electrical demand increases coupled with the announced retirement of nearby power generation facilities have accelerated the need for new high-voltage electric transmission lines to be built and operational by 2014.

Your property is crossed by, or adjacent to, an easement acquired by Dominion in the 1970's/1980's for purposes of building electric transmission infrastructure. Dominion recently conducted a preliminary feasibility study and has now assembled a project team to develop plans to utilize this right-of-way corridor. The existing easement establishes the right, among other things, to clear vegetation for the safe and reliable operation of future transmission facilities. Please refer to the enclosed fact sheet for additional project details and a map.

In December we will invite you, your neighbors, and the general public to attend one of three Informational Open House meetings to be scheduled during the month of January. Details will be mailed to you once dates and locations are confirmed and advertisements for these events will appear in regional newspapers.

We plan to file an application with the Virginia State Corporation Commission (SCC) in February 2012 to seek authorization to construct and operate new transmission facilities. Please visit our website to learn more about the proposed *Chickahominy-Skiffes Creek 500kV* project and updates as we proceed at www.dom.com, keyword: "Skiffes." If you have questions or comments regarding the project, please send an email to our dedicated transmission team at: powerline@dom.com or phone one of our representatives at 1-888-291-0190 from 7 a.m. to 7 p.m., Monday – Friday.

Sincerely,

Dominion Virginia Power

Dominion plans to meet continued growth with new transmission lines utilizing existing right-of-way easements

BACKGROUND — Dominion is committed to providing reliable electricity to our customers. Electrical demand in the Hampton Roads area is projected to increase by more than 20 percent by summer 2020. This growth will place a strain on the electrical grid, and create the potential for overloads and violations of North American Electric Reliability Corporation (NERC) reliability standards. Recently announced plans for retirement of local generation facilities has accelerated the need for new transmission lines to be built and in service by 2014. Dominion is now looking into the potential of developing transmission lines utilizing previously acquired right-of-way easements, see map on reverse.

PROJECT OVERVIEW

Chickahominy-Skiffes Creek 500kV Line — 38 miles total: approximately 25 miles uncleared, 13 miles existing, cleared corridor

- *During the 1970s/1980s, Dominion acquired new right-of-way (150' to 250' wide easements) in Charles City and James City counties. Dominion recently conducted a preliminary feasibility study and has now assembled a project team to develop plans to utilize this right-of-way corridor to build a new 500,000 volt (500kV) line to connect to an existing transmission corridor just north of Lightfoot Substation*
- *From north of Lightfoot Substation continuing south the new 500kV line will be collocated with other transmission structures within an existing corridor*
- *Skiffes Creek Switching Station — As part of application to be filed with the Virginia SCC, Dominion will propose to build and operate the Skiffes Creek Switching Station on land already acquired near the I-64 corridor in southern James City County*

Skiffes Creek-Whealton 230kV Line — 18 miles: all existing, cleared corridor

- *From the proposed Skiffes Creek Switching Station south to the existing Whealton Substation, Dominion plans to reconfigure the existing transmission lines and towers in order to accommodate a new 230,000 volt (230kV) line*

PROJECT BENEFITS

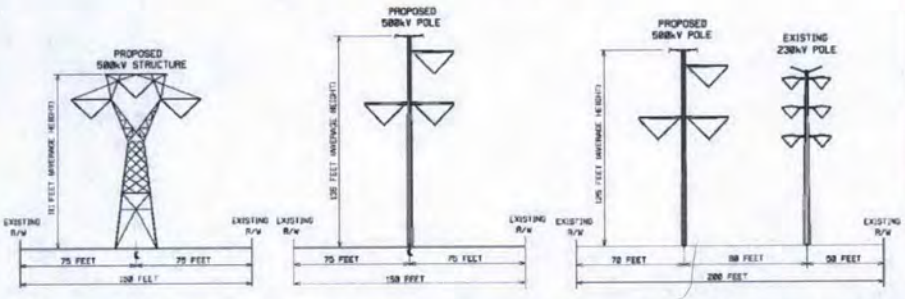
Dominion's new line projects will:

- Supply needed capacity by 2014 to serve the local area and our nation's critical military facilities
- Comply with mandatory NERC Reliability Standards,
- Take advantage of the existing corridor wherever possible, and
- Provide reliability improvements for fewer service interruptions and shorter durations when an outage does occur.

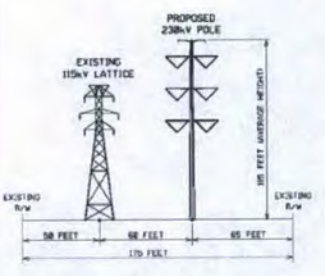
PROJECT TIMELINE

- **December 2012** — Community outreach and notification letters will be mailed to area residents
- **January 2012** — Multiple publicly advertised "Open House Meetings" will be held to solicit community input on proposed projects
- **February 2012** — File application with Virginia State Corporation Commission (SCC). Public will have multiple opportunities to engage in SCC application review process
- **Fall 2012** — Pending approval, initiate construction activities
- **November 2014** — Energize lines

Chickahominy-Skiffes Creek 500kV Proposed Structures

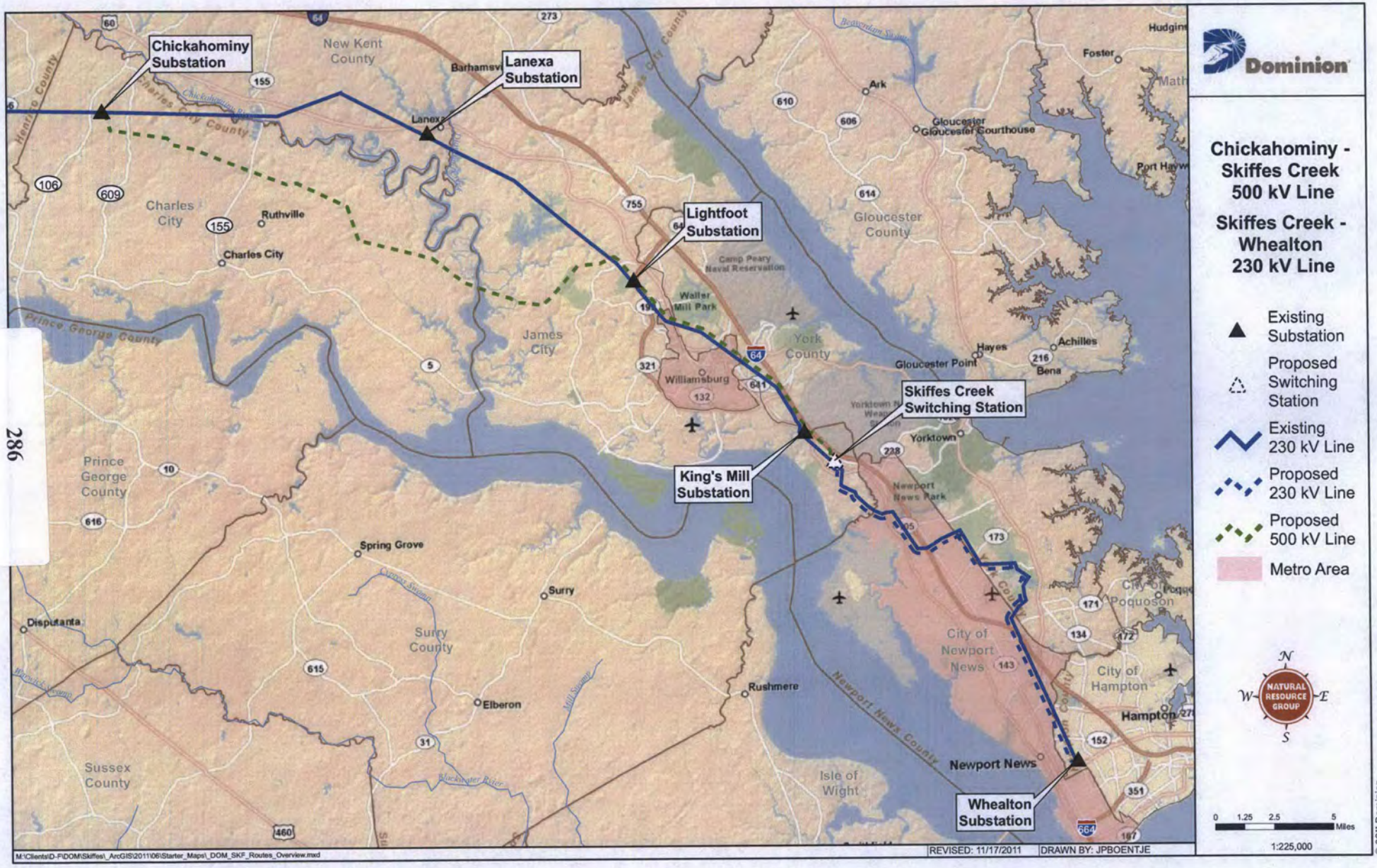


Skiffes Creek-Whealton 230kV Proposed Structure



The structure diagrams shown above are indicative of typical proposed structures but do not represent all potential configurations. Actual structure types and heights are subject to final engineering.

See reverse side for a map of the *Chickahominy-Skiffes Creek 500kV and Skiffes Creek-Whealton 230kV Rebuild Projects.*


Chickahominy Substation
Lanexa Substation
Lightfoot Substation
Skiffes Creek Switching Station
King's Mill Substation
Whealton Substation
New Kent County
Charles City County
James City County
York County
Gloucester County
Prince George County
Surry County
Sussex County
Isle of Wight
Newport News
City of Newport News
City of Hampton
Hampton
Poquoson
Williamsburg
Yorktown
Gloucester Courthouse
Charles City
Ruthville
Spring Grove
Surry
Disputanta
Elberon
Rushmere
Lanexa
Barhamsville
Foster
Ark
Hayes
Achilles
Gloucester Point
Bena
Camp Peary Naval Reservation
Waller Mill Park
Newport News Park
Dominion
Chickahominy - Skiffes Creek 500 kV Line
Skiffes Creek - Whealton 230 kV Line
Existing Substation
Proposed Switching Station
Existing 230 kV Line
Proposed 230 kV Line
Proposed 500 kV Line
Metro Area
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M:\Clients\D-P\DOM\Skiffes_ArcGIS\2011\06\Starter_Maps_DOM_SKF_Routes_Overview.mxd
REVISED: 11/17/2011
DRAWN BY: JPBOENTJE
© 2011 Dominion

Dominion Virginia Power
701 East Cary Street, Richmond, VA 23219
Mailing Address: P.O. Box 26666
Richmond, VA 23261
Web Address: www.dom.com

December 26, 2011

RE: ***Chickahominy-Skiffes Creek 500kV & Skiffes Creek – Whealton 230kV Lines***

Dear Property Owner:

Dominion is committed to providing reliable electricity to our customers. Electrical demand in the Hampton Roads area is projected to increase by more than 20 percent by summer 2020. Recently announced plans for retirement of local generation facilities have accelerated the need for new transmission lines to be built and in service by late 2014.

Your property is crossed by, or adjacent to, an existing electric transmission corridor with lines that extend from James City County to the City of Hampton. Dominion recently conducted a preliminary feasibility study and has now assembled a project team to develop plans to reconfigure these existing lines in order to accommodate new transmission infrastructure**. Initial studies indicate no need to expand the width of the existing right-of-way corridor.** Please refer to the enclosed fact sheet for additional project details and a map.

We welcome you, your neighbors, and the general public to attend one of the upcoming project Information Open House meetings scheduled in three locations in January.

MONDAY, JANUARY 9: 5 p.m.–7:30 p.m.

- **Warhill High School**
  4615 Opportunity Way
  Williamsburg, VA 23188

TUESDAY, JANUARY 10: 5 p.m.–7:30 p.m.

- **Charles City County Social Center**
  8320 Ruthville Road
  Ruthville, VA 23147

WEDNESDAY, JANUARY 11: 5 p.m.–7:30 p.m.

- **Woodside High School**
  13450 Woodside Lane
  Newport News, VA 23608

We plan to file an application with the Virginia State Corporation Commission (SCC) in February 2012 to seek authorization to construct and operate new transmission facilities. Please **visit our website to view detailed maps** and to learn more about the proposed *Chickahominy-Skiffes Creek 500kV* and *Skiffes Creek-Whealton 230kV* projects at www.dom.com, keyword: "Skiffes." If you have questions or comments regarding the project, please send an email to our dedicated transmission team at: powerline@dom.com or phone one of our representatives at 1-888-291-0190 from 7 a.m. to 7 p.m., Monday – Friday.

Sincerely,

Dominion Virginia Power

Dominion Virginia Power
701 East Cary Street, Richmond, VA 23219
Mailing Address: P.O. Box 26666
Richmond, VA 23261
Web Address: www.dom.com

December 26, 2011

RE: ***Chickahominy-Skiffes Creek 500kV Line***

Dear Property Owner:

Dominion is committed to providing reliable electricity to our customers. Electrical demand in the Hampton Roads area is projected to increase by more than 20 percent by summer 2020. Recently announced plans for retirement of local generation facilities have accelerated the need for new transmission lines to be built and in service by late 2014.

Your property is crossed by, or adjacent to, an easement acquired by Dominion in the 1970's/1980's for purposes of building electric transmission infrastructure. Dominion recently conducted a preliminary feasibility study and has now assembled a project team to develop plans to utilize this right-of-way corridor. The existing easement establishes the right, among other things, to clear vegetation for the safe and reliable operation of future transmission facilities. Please refer to the enclosed fact sheet for additional project details and a map.

We welcome you, your neighbors, and the general public to attend one of the upcoming Information Open House meetings scheduled in three locations in January.

MONDAY, JANUARY 9: 5 p.m.–7:30 p.m.

- **Warhill High School**
  4615 Opportunity Way
  Williamsburg, VA 23188

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WEDNESDAY, JANUARY 11: 5 p.m.–7:30 p.m.

- **Woodside High School**
  13450 Woodside Lane
  Newport News, VA 23608

We plan to file an application with the Virginia State Corporation Commission (SCC) in February 2012 to seek authorization to construct and operate new transmission facilities. Please **visit our website to view detailed maps** and to learn more about the proposed *Chickahominy-Skiffes Creek 500kV* project at www.dom.com, keyword: "Skiffes." If you have questions or comments regarding the project, please send an email to our dedicated transmission team at: powerline@dom.com or phone one of our representatives at 1-888-291-0190 from 7 a.m. to 7 p.m., Monday – Friday.

Sincerely,

Dominion Virginia Power

Dominion plans to meet continued growth with new transmission lines utilizing existing right-of-way easements

BACKGROUND — Dominion is committed to providing reliable electricity to our customers. Electrical demand in the Hampton Roads area is projected to increase by more than 20 percent by summer 2020. This growth will place a strain on the electrical grid, and create the potential for overloads and violations of North American Electric Reliability Corporation (NERC) reliability standards. Recently announced plans for retirement of local generation facilities has accelerated the need for new transmission lines to be built and in service in 2014. Dominion is now looking into the potential of developing transmission lines utilizing previously acquired right-of-way easements, see map on reverse.

PROJECT OVERVIEW

Chickahominy-Skiffes Creek 500kV Line — 38 miles total: approximately 25 miles uncleared, 13 miles existing, cleared corridor

- *During the 1970s/1980s, Dominion acquired new right-of-way (150' to 250' wide easements) in Charles City and James City counties. Dominion recently conducted a preliminary feasibility study and has now assembled a project team to develop plans to utilize this right-of-way corridor to build a new 500,000 volt (500kV) line to connect to an existing transmission corridor just north of Lightfoot Substation*
- *From north of Lightfoot Substation continuing south the new 500kV line will be collocated with other transmission structures within an existing corridor*
- *Skiffes Creek Switching Station — As part of application to be filed with the Virginia SCC, Dominion will propose to build and operate the Skiffes Creek Switching Station on land already acquired near the I-64 corridor in southern James City County*

Skiffes Creek-Whealton 230kV Line — 18 miles: all existing, cleared corridor

- *From the proposed Skiffes Creek Switching Station south to the existing Whealton Substation, Dominion plans to reconfigure the existing transmission lines and towers in order to accommodate a new 230,000 volt (230kV) line*

PROJECT BENEFITS

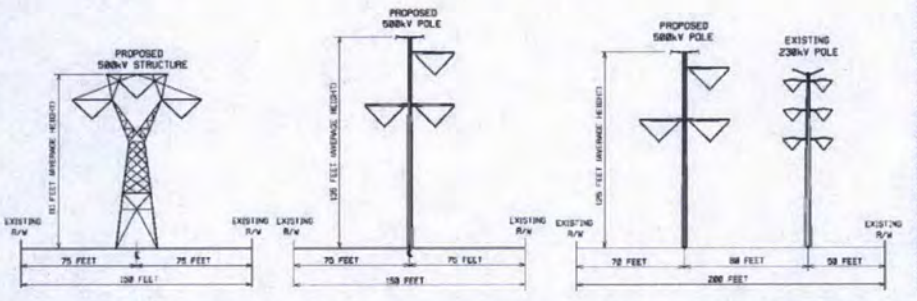
Dominion's new line projects will:

- **Supply needed capacity by 2014 to serve the local area and our nation's critical military facilities,**
- **Support local growth and economic development in central and eastern Virginia,**
- **Comply with mandatory NERC Reliability Standards, and**
- **Provide reliability improvements for fewer service interruptions and shorter durations when an outage does occur.**

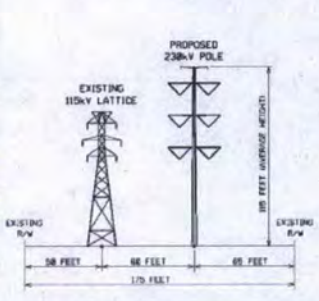
PROJECT TIMELINE

- **December 2012** — Community outreach and notification letters will be mailed to area residents
- **January 2012** — Multiple publicly advertised "Open House Meetings" will be held to solicit community input on proposed projects
- **February 2012** — File application with Virginia State Corporation Commission (SCC). Public will have multiple opportunities to engage in SCC application review process
- **Fall 2012** — Pending approval, initiate construction activities
- **November 2014** — Energize lines

Chickahominy-Skiffes Creek 500kV Proposed Structures

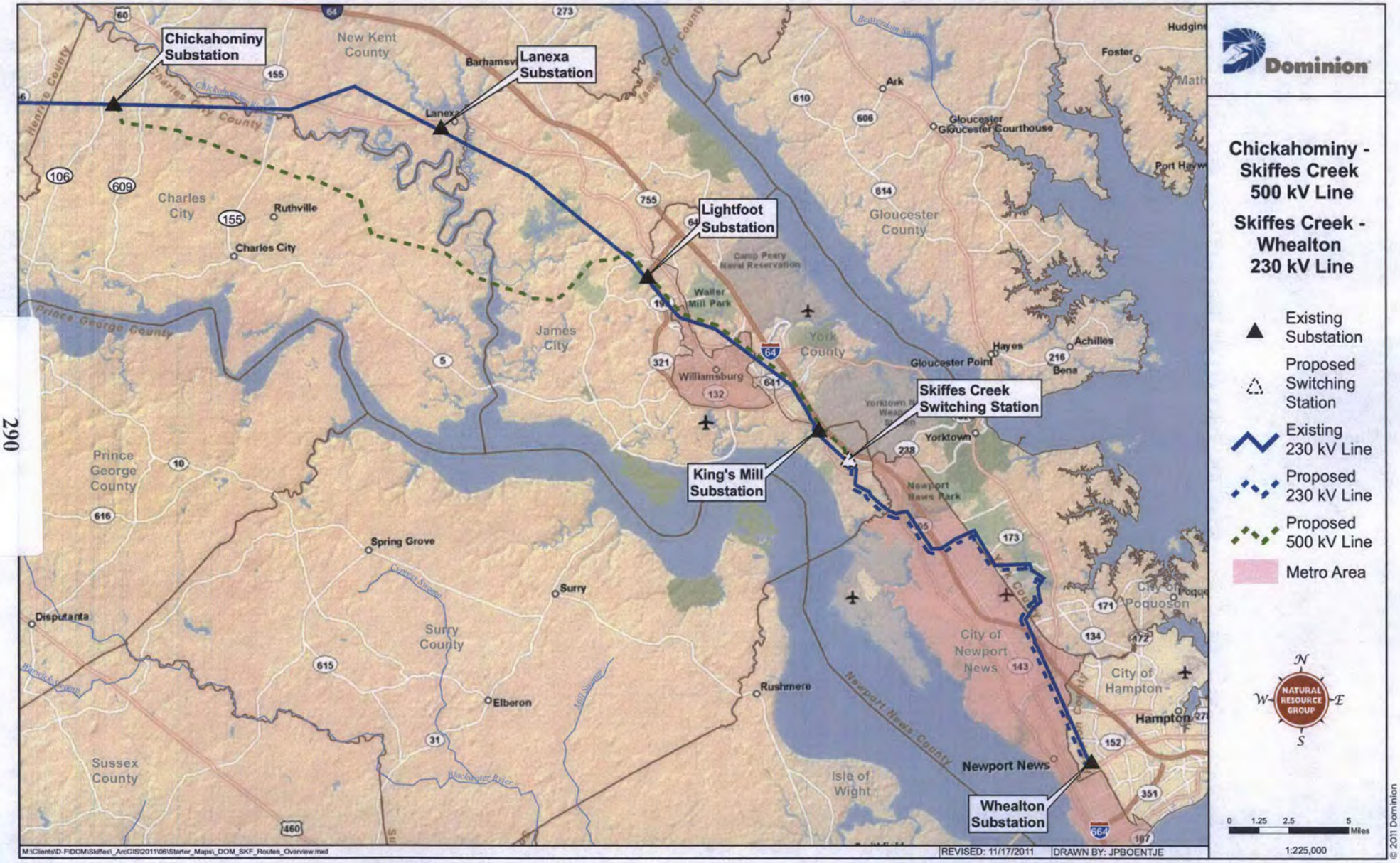


Skiffes Creek-Whealton 230kV Proposed Structure



The structure diagrams shown above are indicative of typical proposed structures but do not represent all potential configurations. Actual structure types and heights are subject to final engineering.

See reverse side for a map of the *Chickahominy-Skiffes Creek 500kV and Skiffes Creek-Whealton 230kV Projects.*


Chickahominy Substation
Lanexa Substation
Lightfoot Substation
Skiffes Creek Switching Station
King's Mill Substation
Whealton Substation
New Kent County
Charles City County
James City County
York County
Gloucester County
Prince George County
Surry County
Sussex County
Isle of Wight
Newport News
City of Newport News
City of Hampton
Hampton
Poquoson
Williamsburg
Yorktown
Gloucester Courthouse
Charles City
Ruthville
Spring Grove
Surry
Disputanta
Elberon
Rushmere
Lanexa
Barhamsville
Ark
Foster
Hayes
Achilles
Bena
Gloucester Point
Camp Peary Naval Reservation
Waller Mill Park
Newport News Park
Chickahominy - Skiffes Creek 500 kV Line
Skiffes Creek - Whealton 230 kV Line
Existing Substation
Proposed Switching Station
Existing 230 kV Line
Proposed 230 kV Line
Proposed 500 kV Line
Metro Area
NATURAL RESOURCE GROUP
N
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S
0 1.25 2.5 5 Miles
1:225,000
M:\Clients\D-F\DOM\Skiffes_ArcGIS\2011\06\Starter_Maps_DOM_SKF_Routes_Overview.mxd
REVISED: 11/17/2011
DRAWN BY: JPBOENTJE
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Dominion®

INFORMATIONAL OPEN HOUSE EVENTS

Dominion is committed to providing reliable electricity to our customers. Electrical demand in the Hampton Roads area is projected to increase by more than 20 percent by summer 2020. This growth will place a strain on the electrical grid, and create the potential for overloads and violations of North American Electric Reliability Corporation (NERC) reliability standards. Recently announced plans for retirement of local generation facilities have accelerated the need for new transmission lines to be built and in service by late 2014.

Dominion is now looking into the potential of developing transmission lines *utilizing previously acquired right-of-way easements*, see map below. We plan to file an application with the Virginia SCC in early 2012 and invite the public to learn more about the project by attending community meetings or visiting our website.

Visit one of our upcoming open house events anytime between 5:00 p.m. and 7:30 p.m. to learn more about our plans and view detailed potential route maps.

For additional project details, visit www.dom.com, keyword: SKIFFES

INFORMATIONAL OPEN HOUSE EVENTS

•

MONDAY, JANUARY 9
5 P.M. – 7:30 P.M.
Warhill High School
4615 Opportunity Way
Williamsburg, VA 23188

TUESDAY, JANUARY 10
5 P.M. – 7:30 P.M.
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8320 Ruthville Road
Ruthville, VA 23147

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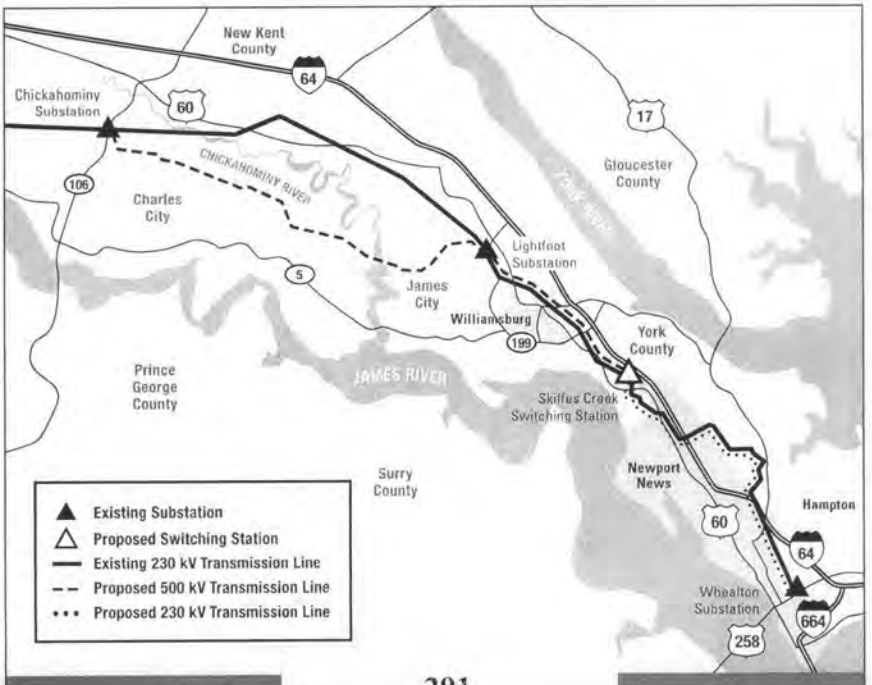


Dominion Virginia Power
701 East Cary Street, Richmond, VA 23219
Mailing Address: P.O. Box 26666
Richmond, VA 23261
Web Address: www.dom.com

March 13, 2012

RE: *Skiffes Creek 500kV*

Dear Property Owner:

Dominion is committed to providing reliable electricity to our customers. Electrical demand in the Hampton Roads area is projected to increase by more than 20 percent by summer 2020. Recently announced plans for retirement of local power generation facilities have accelerated the need for new transmission lines to be built and in service by summer 2015.

Your property is crossed by, or near to, a potential route for a new 500 kV line that extends from the Company's existing Surry Switching Station to the proposed Skiffes Creek Switching Station. We recently conducted a preliminary feasibility study in this area and Dominion is currently seeking public feedback on the *Surry-Skiffes Creek 500kV* transmission line route, to compare it to the previously announced *Chickahominy-Skiffes Creek 500kV* transmission line route that we continue to evaluate. Please visit the project website (www.dom.com, keyword "Skiffes") which provides detailed maps and additional information for both routes.

We welcome you, your neighbors, and the general public to attend an upcoming project Informational Open House meeting scheduled this month, please refer to the enclosed advertisement.

MONDAY, MARCH 26: 5 p.m.–7:30 p.m.

- **James River Elementary School**
  8901 Pocahontas Trail
  Williamsburg, VA 23185

The first route announced, the *Chickahominy-Skiffes Creek 500kV* (38-mile) route, would be built almost entirely within existing transmission right-of-way, consistent with federal guidelines and state requirements. In early December 2011, our continuing review of possible routes – evaluating historical, environmental, financial and other criteria -- indicated a route from Surry warranted further evaluation. In February of this year our project team determined the *Surry-Skiffes Creek 500kV* route is not only a viable electrical option but one with significant costs savings. This route is 7.7 miles long, requires an overhead transmission line across the James River, and will require approximately 4 miles of additional or expanded right-of-way.

Dominion will announce our recommendation for a proposed route and any alternate route(s) in April when we expect to file the SCC application for the project. Ultimately, the SCC will make the final determination of the route selection.

If you have questions or comments regarding the project, please send an email to our dedicated transmission team at: powerline@dom.com or phone one of our representatives at 1-888-291-0190 from 7 a.m. to 7 p.m., Monday – Friday.

Sincerely,

Dominion Virginia Power

Dominion

INFORMATIONAL OPEN HOUSE

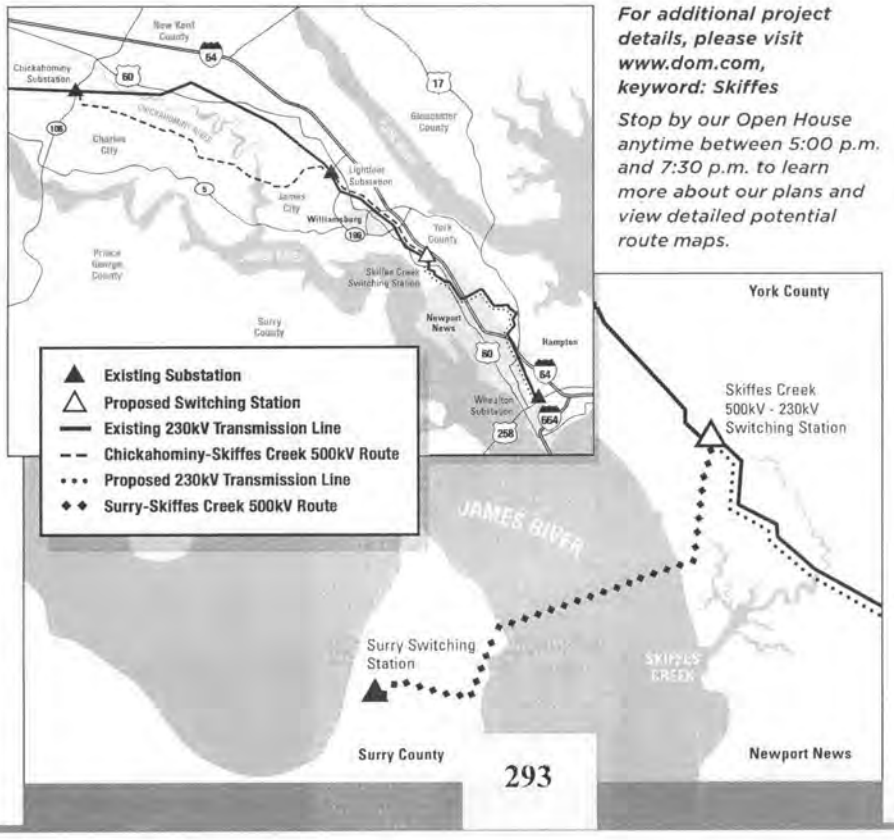
Dominion is currently seeking public feedback on a Surry-Skiffes Creek 500kV transmission line route, to compare it to the Chickahominy-Skiffes Creek 500kV transmission line route that we continue to evaluate. The 7.2-mile Surry-Skiffes Creek route would originate in Surry, cross the James River, and terminate in James City County. The scope of the Skiffes Creek-Whealton 230kV line utilizing existing right-of-way easements remains unchanged (see map below). For more information, visit www.dom.com, keyword "Skiffes," or attend our Open House, where you can talk directly with Dominion representatives.

Dominion is committed to providing reliable electricity to our customers. Electrical demand in the Hampton Roads area is projected to increase by more than 20 percent by summer 2020. This growth will challenge the existing electrical grid and create the potential for overloads and violations of North American Electric Reliability Corporation (NERC) reliability standards. Recently announced plans for retirement of local generation facilities have accelerated the need for new transmission lines to be built and in service by late 2014. Dominion has assessed preliminary environmental, cultural and historical information and calculated the costs of electrically viable alternatives.

OPEN HOUSE
MONDAY, MARCH 26

Stop by anytime between
5 P.M. – 7:30 P.M.

James River Elementary School
8901 Pocahontas Trail
Williamsburg, VA 23185



For additional project details, please visit www.dom.com, keyword: Skiffes

Stop by our Open House anytime between 5:00 p.m. and 7:30 p.m. to learn more about our plans and view detailed potential route maps.

Dominion Virginia Power
P.O. Box 26666
Richmond, VA 23261
Web Address: www.dom.com

March 16, 2012

RE: ***Skiffes Creek 500kV Line***

Dear Property Owner:

This letter is to provide you an update to the previously announced *Chickahominy – Skiffes Creek 500kV* line. Your property is crossed by, or adjacent to, an existing electric transmission corridor with lines that extend from James City County into the City of Williamsburg and back into southern James City County.

Please refer to the enclosed overview map. Dominion is currently investigating a *Surry-Skiffes Creek 500kV* transmission line route (red dashed line), to compare it to the *Chickahominy-Skiffes Creek 500kV* transmission line route (green dashed line) that we continue to evaluate. The project website has been revised (www.dom.com, keyword "Skiffes") and provides detailed maps and additional information for both routes.

The first route announced, the *Chickahominy-Skiffes Creek 500kV* (38-mile) route, would be built almost entirely within existing transmission right-of-way, consistent with federal guidelines and state requirements. In early December 2011, our continuing review of possible routes – evaluating historical, environmental, financial and other criteria -- indicated a route from Surry warranted further evaluation. In February of this year our project team determined the *Surry-Skiffes Creek 500kV* route is not only a viable electrical option but one with significant costs savings. This route is 7.7 miles long, requires an overhead transmission line across the James River, and will require approximately 4 miles of additional or expanded right-of-way.

Dominion will announce our recommendation for a proposed route and any alternate route(s) in April when we expect to file the SCC application for the project. Ultimately, the SCC will make the final determination of the route selection.

If you have questions or comments regarding the project, please send an email to our dedicated transmission team at: powerline@dom.com or phone one of our representatives at 1-888-291-0190 from 7 a.m. to 7 p.m., Monday – Friday.

Sincerely,

Dominion Virginia Power

Dominion Virginia Power
P.O. Box 26666
Richmond, VA 23261
Web Address: www.dom.com

Dominion

March 16, 2012

RE: ***Skiffes Creek 500kV Line***

Dear Property Owner:

This letter is to provide you an update to the previously announced *Chickahominy – Skiffes Creek 500kV* line. As we have previously stated, your property is crossed by, or adjacent to, an easement acquired by Dominion in the 1970's/1980's for purposes of building electric transmission infrastructure.

Please refer to the enclosed overview map. Dominion is currently investigating a *Surry-Skiffes Creek 500kV* transmission line route (red dashed line), to compare it to the *Chickahominy-Skiffes Creek 500kV* transmission line route (green dashed line) that we continue to evaluate. The project website has been revised (www.dom.com, keyword "Skiffes") and provides detailed maps and additional information for both routes.

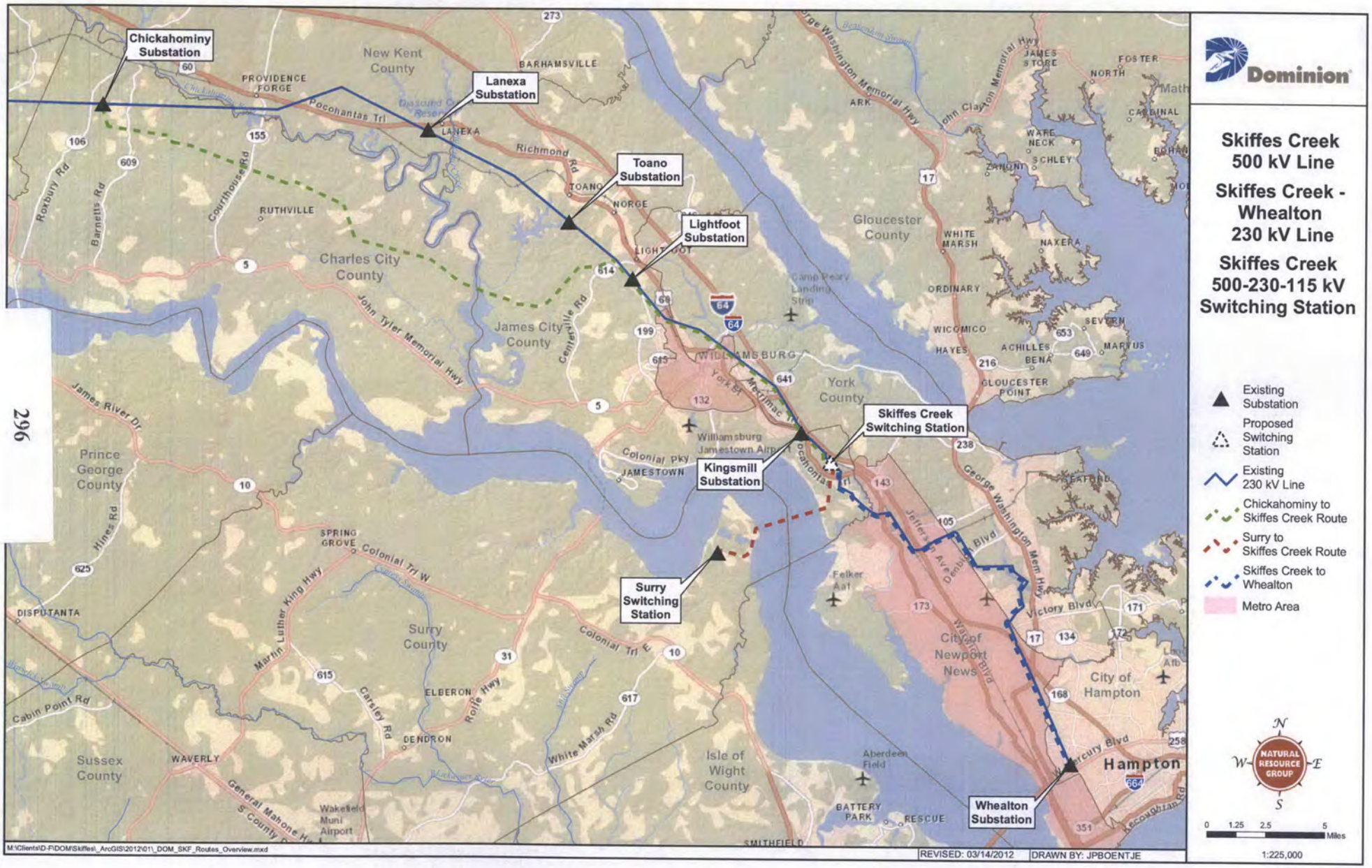
The first route announced, the *Chickahominy-Skiffes Creek 500kV* (38-mile) route, would be built almost entirely within existing transmission right-of-way, consistent with federal guidelines and state requirements. In early December 2011, our continuing review of possible routes – evaluating historical, environmental, financial and other criteria -- indicated a route from Surry warranted further evaluation. In February of this year our project team determined the *Surry-Skiffes Creek 500kV* route is not only a viable electrical option but one with significant costs savings. This route is 7.7 miles long, requires an overhead transmission line across the James River, and will require approximately 4 miles of additional or expanded right-of-way.

Dominion will announce our recommendation for a proposed route and any alternate route(s) in April when we expect to file the SCC application for the project. Ultimately, the SCC will make the final determination of the route selection.

If you have questions or comments regarding the project, please send an email to our dedicated transmission team at: powerline@dom.com or phone one of our representatives at 1-888-291-0190 from 7 a.m. to 7 p.m., Monday – Friday.

Sincerely,

Dominion Virginia Power


Chickahominy Substation
Lanexa Substation
Toano Substation
Lightfoot Substation
Skiffes Creek Switching Station
Kingsmill Substation
Surry Switching Station
Whealton Substation
New Kent County
Charles City County
James City County
York County
Gloucester County
Prince George County
Surry County
Sussex County
Isle of Wight County
City of Newport News
City of Hampton
Hampton
Williamsburg
Williamsburg Jamestown Airp
Felker Aaf
Aberdeen Field
Wakefield Muni Airport
PROVIDENCE FORGE
BARHAMSVILLE
LANEXA
TOANO
NORGE
LIGHTFOOT
RUTHVILLE
JAMESTOWN
SPRING GROVE
DISPUTANTA
ELBERON
DENDRON
WAVERLY
SMITHFIELD
BATTERY PARK
RESCUE
WHITE MARSH
ORDINARY
WICOMICO
HAYES
ACHILLES
BENA
GLOUCESTER POINT
NAXERA
SEVERN
MARYUS
WARE NECK
SCHLEY
ZAHONT
FOSTER
NORTH
CARDINAL
JAMES STORE
ARK
SEAFORD
Pocahontas Trl
Richmond Rd
Roxbury Rd
Barretts Rd
Courthouse Rd
John Tyler Memorial Hwy
Centerville Rd
James River Dr
Hines Rd
Colonial Pky
Colonial Trl W
Colonial Trl E
Marvin Luther King Hwy
Carsley Rd
Rolfe Hwy
Cabin Point Rd
White Marsh Rd
General Mahone Hwy
George Washington Memorial Hwy
John Clayton Memorial Hwy
Jefferson Ave
Denbigh Blvd
Victory Blvd
Mercury Blvd
Warwick Blvd
Camp Peary Landing Strip
Camp Peary
Afb
Skiffes Creek 500 kV Line
Skiffes Creek - Whealton 230 kV Line
Skiffes Creek 500-230-115 kV Switching Station
Existing Substation
Proposed Switching Station
Existing 230 kV Line
Chickahominy to Skiffes Creek Route
Surry to Skiffes Creek Route
Skiffes Creek to Whealton
Metro Area
NATURAL RESOURCE GROUP
0 1.25 2.5 5 Miles
1:225,000
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REVISED: 03/14/2012
DRAWN BY: JPBOENTJE

Dominion Virginia Power
701 East Cary Street, Richmond, VA 23219
Mailing Address: P.O. Box 26666
Richmond, VA 23261
Web Address: www.dom.com

March 14, 2012

Mr. Tyrone W. Franklin
Surry County Administrator
PO Box 65
Surry, VA 23883

Dominion Virginia Power's Proposed Skiffes Creek 500 kV line, Skiffes Creek-Whealton 230 kV Line and Skiffes Creek 500-230-115 kV Switching Station

Dear Mr. Franklin:

Dominion has contacted you previously concerning a new transmission line project to meet electrical demand in the Hampton Roads area. In addition, routing personnel with Dominion and Natural Resources Group, Inc. have been or will be in touch with members of your staff to obtain information about Surry County for the routing analysis required for this project.

Following is a brief description of the various parts of this project. We are currently investigating several alternative line routes for the 500 kV portion of the project; one is the *Chickahominy-Skiffes Creek 500 kV* line route and the other is the *Surry-Skiffes Creek 500 kV* line route. Dominion has not yet determined which of the alternatives for the 500 kV portion of the project would be proposed. Also enclosed you will find a map showing the routes being studied for this project.

Chickahominy-Skiffes Creek 500 kV
This is an approximately 38 mile route that begins in Charles City County at the Chickahominy Substation, crosses the Chickahominy River and continues through portions of James City County, York County and the City of Williamsburg to the proposed Skiffes Creek Switching Station. It includes approximately 24 miles of right-of-way that is 150 feet to 250 feet wide and was purchased in the 1970's but never used. A new 500 kV line would require that this right-of-way be cleared. The remainder of the 500 kV line to the proposed Skiffes Creek Switching Station would occupy an electric transmission line right-of-way that is being used today for electric transmission lines. Minimal additional right-of-way for this alternative route would be required for line rearrangement at the Kingsmill Substation.

Surry-Skiffes Creek 500 kV
This is an approximately 8 mile route that begins in Surry County at the Surry Power Station, crosses the James River and continues into James City County to the proposed Skiffes Creek Switching Station. This alternative route would be on new right-of-way once it left the Surry Power Station except for approximately 1.5 miles where this alternative route would follow existing transmission line right-of-way would require expansion.

Skiffes Creek-Whealton 230 kV Line
The proposed 230 kV line would be approximately 20 miles long and built within existing right of way from the proposed Skiffes Creek Switching Station to the existing Whealton Substation. It crosses portions of James City County, York County, and the Cities of Newport News and Hampton. No additional right-of-way will be required for this proposal.

Skiffes Creek Switching Station
The switching station is proposed in James City County on an approximately 51 acre parcel of land Dominion has owned since the 1970's. The site is wooded except where existing transmission lines cross it today.

Dominion will be filing an application in the beginning of April for a proposed 500 kV line to Skiffes Creek, for the proposed Skiffes Creek 500 kV Switching Station, and for a proposed 230 kV line that continues to our Whealton Substation. Pursuant to Virginia State Code §15.2-2202, Dominion respectfully invites the Surry County to share any interests related to our proposal. Should you wish for further consultation with Dominion about the project, please do not hesitate to contact me at (804)771-6145 or liz.harper@dom.com. When we file an application with the State Corporation Commission, we will provide a copy of that application to you.

Sincerely,

Liz Harper
Elizabeth Harper
Electric Transmission Lines, Siting and Permitting

enclosure

Please visit the project website at dom.com, entering the keyword "Skiffes".

Dominion Virginia Power
701 East Cary Street, Richmond, VA 23219
Mailing Address: P.O. Box 26666
Richmond, VA 23261
Web Address: www.dom.com

March 14, 2012

Mr. Robert C. Middaugh
James City County Administrator
PO Box 8784
Williamsburg, VA 23188

Dominion Virginia Power's Proposed Skiffes Creek 500 kV line, Skiffes Creek-Whealton 230 kV Line and Skiffes Creek 500-230-115 kV Switching Station

Dear Mr. Middaugh:

Dominion has contacted you previously concerning a new transmission line project to meet electrical demand in the Hampton Roads area. In addition, routing personnel with Dominion and Natural Resources Group, Inc. have been in touch with members of your staff to obtain information about James City County for the routing analysis required for this project.

Following is a brief description of the various parts of this project. We are currently investigating several alternative line routes for the 500 kV portion of the project; one is the *Chickahominy-Skiffes Creek 500 kV* line route and the other is the *Surry-Skiffes Creek 500 kV* line route. Dominion has not yet determined which of the alternatives for the 500 kV portion of the project would be proposed. Also enclosed you will find a map showing the routes being studied for this project.

Chickahominy-Skiffes Creek 500 kV
This is an approximately 38 mile route that begins in Charles City County at the Chickahominy Substation, crosses the Chickahominy River and continues through portions of James City County, York County and the City of Williamsburg to the proposed Skiffes Creek Switching Station. It includes approximately 24 miles of right-of-way that is 150 feet to 250 feet wide and was purchased in the 1970's but never used. A new 500 kV line would require that this right-of-way be cleared. The remainder of the 500 kV line to the proposed Skiffes Creek Switching Station would occupy an electric transmission line right-of-way that is being used today for electric transmission lines. Minimal additional right-of-way for this alternative route would be required for line rearrangement at the Kingsmill Substation.

Surry-Skiffes Creek 500 kV
This is an approximately 8 mile route that begins in Surry County at the Surry Power Station, crosses the James River and continues into James City County to the proposed Skiffes Creek Switching Station. This alternative route would be on new right-of-way once it left the Surry Power Station except for approximately 1.5 miles where this alternative route would follow existing transmission line right-of-way would require expansion.

Skiffes Creek-Whealton 230 kV Line
The proposed 230 kV line would be approximately 20 miles long and built within existing right of way from the proposed Skiffes Creek Switching Station to the existing Whealton Substation. It crosses portions of James City County, York County, and the Cities of Newport News and Hampton. No additional right-of-way will be required for this proposal.

Skiffes Creek Switching Station
The switching station is proposed in James City County on an approximately 51 acre parcel of land Dominion has owned since the 1970's. The site is wooded except where existing transmission lines cross it today.

Dominion will be filing an application in the beginning of April for a proposed 500 kV line to Skiffes Creek, for the proposed Skiffes Creek 500 kV Switching Station, and for a proposed 230 kV line that continues to our Whealton Substation. Pursuant to Virginia State Code §15.2-2202, Dominion respectfully invites James City County to share any interests related to our proposal. Should you wish for further consultation with Dominion about the project, please do not hesitate to contact me at (804)771-6145 or liz.harper@dom.com. When we file an application with the State Corporation Commission, we will provide a copy of that application to you.

Sincerely,

Elizabeth Harper
Electric Transmission Lines, Siting and Permitting

enclosure

Please visit the project website at dom.com, entering the keyword "Skiffes".

Dominion Virginia Power
701 East Cary Street, Richmond, VA 23219
Mailing Address: P.O. Box 26666
Richmond, VA 23261
Web Address: www.dom.com

March 14, 2012

Mr. Neil A. Morgan
Newport News City Manager
2400 Washington Avenue
Newport News, VA 23607

Dominion Virginia Power's Proposed Skiffes Creek 500 kV line, Skiffes Creek-Whealton 230 kV Line and Skiffes Creek 500-230-115 kV Switching Station

Dear Mr. Morgan:

Dominion has contacted you previously concerning a new transmission line project to meet electrical demand in the Hampton Roads area. In addition, routing personnel with Dominion and Natural Resources Group, Inc. have been in touch with members of your staff to obtain information about the City of Newport News for the routing analysis required for this project.

Following is a brief description of the various parts of this project. We are currently investigating several alternative line routes for the 500 kV portion of the project; one is the *Chickahominy-Skiffes Creek 500 kV* line route and the other is the *Surry-Skiffes Creek 500 kV* line route. Dominion has not yet determined which of the alternatives for the 500 kV portion of the project would be proposed. Also enclosed you will find a map showing the routes being studied for this project.

Chickahominy-Skiffes Creek 500 kV
This is an approximately 38 mile route that begins in Charles City County at the Chickahominy Substation, crosses the Chickahominy River and continues through portions of James City County, York County and the City of Williamsburg to the proposed Skiffes Creek Switching Station. It includes approximately 24 miles of right-of-way that is 150 feet to 250 feet wide and was purchased in the 1970's but never used. A new 500 kV line would require that this right-of-way be cleared. The remainder of the 500 kV line to the proposed Skiffes Creek Switching Station would occupy an electric transmission line right-of-way that is being used today for electric transmission lines. Minimal additional right-of-way for this alternative route would be required for line rearrangement at the Kingsmill Substation.

Surry-Skiffes Creek 500 kV
This is an approximately 8 mile route that begins in Surry County at the Surry Power Station, crosses the James River and continues into James City County to the proposed Skiffes Creek Switching Station. This alternative route would be on new right-of-way once it left the Surry Power Station except for approximately 1.5 miles where this alternative route would follow existing transmission line right-of-way would require expansion.

Skiffes Creek-Whealton 230 kV Line
The proposed 230 kV line would be approximately 20 miles long and built within existing right of way from the proposed Skiffes Creek Switching Station to the existing Whealton Substation. It crosses portions of James City County, York County, and the Cities of Newport News and Hampton. No additional right-of-way will be required for this proposal.

Skiffes Creek Switching Station
The switching station is proposed in James City County on an approximately 51 acre parcel of land Dominion has owned since the 1970's. The site is wooded except where existing transmission lines cross it today.

Dominion will be filing an application in the beginning of April for a proposed 500 kV line to Skiffes Creek, for the proposed Skiffes Creek 500 kV Switching Station, and for a proposed 230 kV line that continues to our Whealton Substation. Pursuant to Virginia State Code §15.2-2202, Dominion respectfully invites the City of Newport News to share any interests related to our proposal. Should you wish for further consultation with Dominion about the project, please do not hesitate to contact me at (804)771-6145 or liz.harper@dom.com. When we file an application with the State Corporation Commission, we will provide a copy of that application to you.

Sincerely,

Elizabeth Harper
Electric Transmission Lines, Siting and Permitting

enclosure

Please visit the project website at dom.com, entering the keyword "Skiffes".

Dominion Virginia Power
701 East Cary Street, Richmond, VA 23219
Mailing Address: P.O. Box 26666
Richmond, VA 23261
Web Address: www.dom.com

March 14, 2012

Mr. James O. McReynolds
York County Administrator
PO Box 532
Yorktown, VA 23690

Dominion Virginia Power's Proposed Skiffes Creek 500 kV line, Skiffes Creek-Whealton 230 kV Line and Skiffes Creek 500-230-115 kV Switching Station

Dear Mr. McReynolds:

Dominion has contacted you previously concerning a new transmission line project to meet electrical demand in the Hampton Roads area. In addition, routing personnel with Dominion and Natural Resources Group, Inc. have been in touch with members of your staff to obtain information about York County for the routing analysis required for this project.

Following is a brief description of the various parts of this project. We are currently investigating several alternative line routes for the 500 kV portion of the project; one is the *Chickahominy-Skiffes Creek 500 kV* line route and the other is the *Surry-Skiffes Creek 500 kV* line route. Dominion has not yet determined which of the alternatives for the 500 kV portion of the project would be proposed. Also enclosed you will find a map showing the routes being studied for this project.

Chickahominy-Skiffes Creek 500 kV
This is an approximately 38 mile route that begins in Charles City County at the Chickahominy Substation, crosses the Chickahominy River and continues through portions of James City County, York County and the City of Williamsburg to the proposed Skiffes Creek Switching Station. It includes approximately 24 miles of right-of-way that is 150 feet to 250 feet wide and was purchased in the 1970's but never used. A new 500 kV line would require that this right-of-way be cleared. The remainder of the 500 kV line to the proposed Skiffes Creek Switching Station would occupy an electric transmission line right-of-way that is being used today for electric transmission lines. Minimal additional right-of-way for this alternative route would be required for line rearrangement at the Kingsmill Substation.

Surry-Skiffes Creek 500 kV
This is an approximately 8 mile route that begins in Surry County at the Surry Power Station, crosses the James River and continues into James City County to the proposed Skiffes Creek Switching Station. This alternative route would be on new right-of-way once it left the Surry Power Station except for approximately 1.5 miles where this alternative route would follow existing transmission line right-of-way would require expansion.

Skiffes Creek-Whealton 230 kV Line
The proposed 230 kV line would be approximately 20 miles long and built within existing right of way from the proposed Skiffes Creek Switching Station to the existing Whealton Substation. It crosses portions of James City County, York County, and the Cities of Newport News and Hampton. No additional right-of-way will be required for this proposal.

Skiffes Creek Switching Station
The switching station is proposed in James City County on an approximately 51 acre parcel of land Dominion has owned since the 1970's. The site is wooded except where existing transmission lines cross it today.

Dominion will be filing an application in the beginning of April for a proposed 500 kV line to Skiffes Creek, for the proposed Skiffes Creek 500 kV Switching Station, and for a proposed 230 kV line that continues to our Whealton Substation. Pursuant to Virginia State Code §15.2-2202, Dominion respectfully invites York County to share any interests related to our proposal. Should you wish for further consultation with Dominion about the project, please do not hesitate to contact me at (804)771-6145 or liz.harper@dom.com. When we file an application with the State Corporation Commission, we will provide a copy of that application to you.

Sincerely,

Elizabeth Harper
Electric Transmission Lines, Siting and Permitting

enclosure

Please visit the project website at dom.com, entering the keyword "Skiffes".

Dominion Virginia Power
701 East Cary Street, Richmond, VA 23219
Mailing Address: P.O. Box 26666
Richmond, VA 23261
Web Address: www.dom.com

March 14, 2012

Ms. Mary Bunting
City Manager's Office
Hampton City Hall, 8th floor
22 Lincoln Street
Hampton, VA 23669

Dominion Virginia Power's Proposed Skiffes Creek 500 kV line, Skiffes Creek-Whealton 230 kV Line and Skiffes Creek 500-230-115 kV Switching Station

Dear Ms. Bunting:

Dominion has contacted you previously concerning a new transmission line project to meet electrical demand in the Hampton Roads area. In addition, routing personnel with Dominion and Natural Resources Group, Inc. have been in touch with members of your staff to obtain information about the City of Hampton for the routing analysis required for this project.

Following is a brief description of the various parts of this project. We are currently investigating several alternative line routes for the 500 kV portion of the project; one is the *Chickahominy-Skiffes Creek 500 kV* line route and the other is the *Surry-Skiffes Creek 500 kV* line route. Dominion has not yet determined which of the alternatives for the 500 kV portion of the project would be proposed. Also enclosed you will find a map showing the routes being studied for this project.

Chickahominy-Skiffes Creek 500 kV
This is an approximately 38 mile route that begins in Charles City County at the Chickahominy Substation, crosses the Chickahominy River and continues through portions of James City County, York County and the City of Williamsburg to the proposed Skiffes Creek Switching Station. It includes approximately 24 miles of right-of-way that is 150 feet to 250 feet wide and was purchased in the 1970's but never used. A new 500 kV line would require that this right-of-way be cleared. The remainder of the 500 kV line to the proposed Skiffes Creek Switching Station would occupy an electric transmission line right-of-way that is being used today for electric transmission lines. Minimal additional right-of-way for this alternative route would be required for line rearrangement at the Kingsmill Substation.

Surry-Skiffes Creek 500 kV
This is an approximately 8 mile route that begins in Surry County at the Surry Power Station, crosses the James River and continues into James City County to the proposed Skiffes Creek Switching Station. This alternative route would be on new right-of-way once it left the Surry Power Station except for approximately 1.5 miles where this alternative route would follow existing transmission line right-of-way would require expansion.

Skiffes Creek-Whealton 230 kV Line
The proposed 230 kV line would be approximately 20 miles long and built within existing right of way from the proposed Skiffes Creek Switching Station to the existing Whealton Substation. It crosses portions of James City County, York County, and the Cities of Newport News and Hampton. No additional right-of-way will be required for this proposal.

Skiffes Creek Switching Station
The switching station is proposed in James City County on an approximately 51 acre parcel of land Dominion has owned since the 1970's. The site is wooded except where existing transmission lines cross it today.

Dominion will be filing an application in the beginning of April for a proposed 500 kV line to Skiffes Creek, for the proposed Skiffes Creek 500 kV Switching Station, and for a proposed 230 kV line that continues to our Whealton Substation. Pursuant to Virginia State Code §15.2-2202, Dominion respectfully invites the City of Hampton to share any interests related to our proposal. Should you wish for further consultation with Dominion about the project, please do not hesitate to contact me at (804)771-6145 or liz.harper@dom.com. When we file an application with the State Corporation Commission, we will provide a copy of that application to you.

Sincerely,

Liz Harper
Elizabeth Harper
Electric Transmission Lines, Siting and Permitting

enclosure

Please visit the project website at dom.com, entering the keyword "Skiffes".

Dominion Virginia Power
701 East Cary Street, Richmond, VA 23219
Mailing Address: P.O. Box 26666
Richmond, VA 23261
Web Address: www.dom.com

March 14, 2012

Ms. Jacqueline M. Wallace
Interim County Administrator
Charles City County
PO Box 128
Charles City, VA 23030

Dominion Virginia Power's Proposed Skiffes Creek 500 kV line, Skiffes Creek-Whealton 230 kV Line and Skiffes Creek 500-230-115 kV Switching Station

Dear Ms. Wallace:

Dominion has contacted you previously concerning a new transmission line project to meet electrical demand in the Hampton Roads area. In addition, routing personnel with Dominion and Natural Resources Group, Inc. have been in touch with members of your staff to obtain information about Charles City County for the routing analysis required for this project.

Following is a brief description of the various parts of this project. We are currently investigating several alternative line routes for the 500 kV portion of the project; one is the *Chickahominy-Skiffes Creek 500 kV* line route and the other is the *Surry-Skiffes Creek 500 kV* line route. Dominion has not yet determined which of the alternatives for the 500 kV portion of the project would be proposed. Also enclosed you will find a map showing the routes being studied for this project.

Chickahominy-Skiffes Creek 500 kV
This is an approximately 38 mile route that begins in Charles City County at the Chickahominy Substation, crosses the Chickahominy River and continues through portions of James City County, York County and the City of Williamsburg to the proposed Skiffes Creek Switching Station. It includes approximately 24 miles of right-of-way that is 150 feet to 250 feet wide and was purchased in the 1970's but never used. A new 500 kV line would require that this right-of-way be cleared. The remainder of the 500 kV line to the proposed Skiffes Creek Switching Station would occupy an electric transmission line right-of-way that is being used today for electric transmission lines. Minimal additional right-of-way for this alternative route would be required for line rearrangement at the Kingsmill Substation.

Surry-Skiffes Creek 500 kV
This is an approximately 8 mile route that begins in Surry County at the Surry Power Station, crosses the James River and continues into James City County to the proposed Skiffes Creek Switching Station. This alternative route would be on new right-of-way once it left the Surry Power Station except for approximately 1.5 miles where this alternative route would follow existing transmission line right-of-way would require expansion.

Skiffes Creek-Whealton 230 kV Line
The proposed 230 kV line would be approximately 20 miles long and built within existing right of way from the proposed Skiffes Creek Switching Station to the existing Whealton Substation. It crosses portions of James City County, York County, and the Cities of Newport News and Hampton. No additional right-of-way will be required for this proposal.

Skiffes Creek Switching Station
The switching station is proposed in James City County on an approximately 51 acre parcel of land Dominion has owned since the 1970's. The site is wooded except where existing transmission lines cross it today.

Dominion will be filing an application in the beginning of April for a proposed 500 kV line to Skiffes Creek, for the proposed Skiffes Creek 500 kV Switching Station, and for a proposed 230 kV line that continues to our Whealton Substation. Pursuant to Virginia State Code §15.2-2202, Dominion respectfully invites the Charles City County to share any interests related to our proposal. Should you wish for further consultation with Dominion about the project, please do not hesitate to contact me at (804)771-6145 or liz.harper@dom.com. When we file an application with the State Corporation Commission, we will provide a copy of that application to you.

Sincerely,

Liz Harper

Elizabeth Harper
Electric Transmission Lines, Siting and Permitting

enclosure

Please visit the project website at dom.com, entering the keyword "Skiffes".

Dominion Virginia Power
701 East Cary Street, Richmond, VA 23219
Mailing Address: P.O. Box 26666
Richmond, VA 23261
Web Address: www.dom.com

March 14, 2012

Mr. Jackson C. Tuttle
City Manager
City of Williamsburg
401 Lafayette Street
Williamsburg, VA 23185

Dominion Virginia Power's Proposed Skiffes Creek 500 kV line, Skiffes Creek-Whealton 230 kV Line and Skiffes Creek 500-230-115 kV Switching Station

Dear Mr. Tuttle:

Dominion has contacted you previously concerning a new transmission line project to meet electrical demand in the Hampton Roads area. In addition, routing personnel with Dominion and Natural Resources Group, Inc. have been in touch with members of your staff to obtain information about the City of Williamsburg for the routing analysis required for this project.

Following is a brief description of the various parts of this project. We are currently investigating several alternative line routes for the 500 kV portion of the project; one is the *Chickahominy-Skiffes Creek 500 kV* line route and the other is the *Surry-Skiffes Creek 500 kV* line route. Dominion has not yet determined which of the alternatives for the 500 kV portion of the project would be proposed. Also enclosed you will find a map showing the routes being studied for this project.

Chickahominy-Skiffes Creek 500 kV
This is an approximately 38 mile route that begins in Charles City County at the Chickahominy Substation, crosses the Chickahominy River and continues through portions of James City County, York County and the City of Williamsburg to the proposed Skiffes Creek Switching Station. It includes approximately 24 miles of right-of-way that is 150 feet to 250 feet wide and was purchased in the 1970's but never used. A new 500 kV line would require that this right-of-way be cleared. The remainder of the 500 kV line to the proposed Skiffes Creek Switching Station would occupy an electric transmission line right-of-way that is being used today for electric transmission lines. Minimal additional right-of-way for this alternative route would be required for line rearrangement at the Kingsmill Substation.

Surry-Skiffes Creek 500 kV
This is an approximately 8 mile route that begins in Surry County at the Surry Power Station, crosses the James River and continues into James City County to the proposed Skiffes Creek Switching Station. This alternative route would be on new right-of-way once it left the Surry Power Station except for approximately 1.5 miles where this alternative route would follow existing transmission line right-of-way would require expansion.

Skiffes Creek-Whealton 230 kV Line
The proposed 230 kV line would be approximately 20 miles long and built within existing right of way from the proposed Skiffes Creek Switching Station to the existing Whealton Substation. It crosses portions of James City County, York County, and the Cities of Newport News and Hampton. No additional right-of-way will be required for this proposal.

Skiffes Creek Switching Station
The switching station is proposed in James City County on an approximately 51 acre parcel of land Dominion has owned since the 1970's. The site is wooded except where existing transmission lines cross it today.

Dominion will be filing an application in the beginning of April for a proposed 500 kV line to Skiffes Creek, for the proposed Skiffes Creek 500 kV Switching Station, and for a proposed 230 kV line that continues to our Whealton Substation. Pursuant to Virginia State Code §15.2-2202, Dominion respectfully invites the City of Williamsburg to share any interests related to our proposal. Should you wish for further consultation with Dominion about the project, please do not hesitate to contact me at (804)771-6145 or liz.harper@dom.com. When we file an application with the State Corporation Commission, we will provide a copy of that application to you.

Sincerely,

Elizabeth Harper
Electric Transmission Lines, Siting and Permitting

enclosure

Please visit the project website at dom.com, entering the keyword "Skiffes".

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

C. Detail the nature, location, and ownership of all buildings which would have to be demolished or relocated if the project is built as proposed.

Response:

500 kV Proposed Routes (Surry-Skiffes Creek):

From aerial photography, one (1) single family dwelling appears to be within the proposed expanded right-of-way for the 500 kV Surry-Skiffes Creek line. This property is owned by Spray King Car Wash, Inc. There are two other buildings on the parcel, at least one of which appears occupied, that would not be within the proposed right-of-way. The same information applies for the Proposed Route with any of the James River Crossing Variations 1, 2 and 3.

500 kV Alternate Route (Chickahominy-Skiffes Creek):

A number of buildings have been built within Dominion Virginia Power's existing right-of-way. These include a home that has been occupied for several years with a garage recently built, a mobile home, two homes in the last stages of construction and not yet occupied, and an automotive repair business. All owners have been notified that they were encroaching within the Company's right-of-way. As of the date of this filing, the mobile home has been moved and the two homes under construction are being moved. The owners of the home and garage and the automotive repair business are currently considering options to address their unauthorized encroachments.

230 kV Skiffes Creek-Whealton Line:

There are no residences within the existing right-of-way. Any property owners with encroaching sheds on the right-of-way will be notified to remove those encroachments.

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

D. What existing physical facilities will the line parallel, if any, such as existing transmission lines, railroad tracks, highways, pipelines, etc.? Describe the current use and physical appearance and characteristics of the existing right-of-way that would be paralleled. How long has the right-of-way been in use?

Response: **500 kV Proposed Routes (Surry-Skiffes Creek):**

The approximately 7.4-mile Proposed Route will originate and remain on the Company's Surry Power Station for approximately 1.5 miles as it parallels a station service road and canal. The last approximately 1.7 miles of the Proposed Route will be collocated with an existing right-of-way that is currently occupied by a portion of 115 kV Line #34 to the Dow Chemical Substation. This right-of-way ranges from 80 feet wide to 130 feet wide and it will need to be expanded to a width of 150 feet. This right-of-way was acquired between April 1957 and July 1971, but the majority of the easements were purchased in the late 1950s. This right-of-way originally paralleled a railroad spur track into the industrial area that has been removed and also parallels the existing entrance road into the industrial park (BASF Drive). The Proposed Route with the James River Crossing Variation 1 parallels the same physical facilities described above.

The Proposed Route with the James River Crossing Variations 2 or 3 parallels portions of an existing pipeline corridor that contains two Columbia Gas Transmission natural gas pipelines and one Colonial Pipeline Company refined petroleum products pipeline. After leaving Surry Power Station, Variation 2 parallels the southern edge of the Colonial pipeline across the river and into James City County until joining the existing right-of-way for the 115kV Line #34 up to the proposed Skiffes Creek Switching Station site. However, Columbia Gas Transmission and Colonial Pipeline Company have requested that the proposed overhead 500 kV line not share their 50-foot-wide right-of-way. They are concerned with maintaining clearances from their equipment to overhead electric lines during pipeline maintenance. Within the river, Dominion Virginia Power will maintain a substantial distance to the underwater pipelines to ensure that the construction of the overhead 500 kV structure foundations would not jeopardize the integrity of those pipeline facilities. Variation 3 does not parallel the pipelines in the river, but crosses them twice and parallels the southern side of the Colonial pipeline on land until joining the existing right-of-way for the 115 kV Line #34.

500 kV Alternate Route (Chickahominy-Skiffes Creek):

The approximately 37.9-mile Alternate Route parallels the existing 500 kV Line #567 within existing right-of-way for 0.8 mile south from the existing Chickahominy Substation. From the Chickahominy Substation to Lightfoot Junction, right-of-way of 150 feet to 250 feet wide was acquired in the 1970s for a future transmission use. From Lightfoot Junction to the proposed Skiffes Creek

Switching Station, the Alternate Route would be located on the north side of an existing and developed Company electric transmission line right-of-way for a length of approximately 13.0 miles. This right-of-way was acquired in 1940-41, and additional right-of-way was acquired in 1951-53 to widen that corridor. A gas pipeline, waterlines, and an electric distribution line are also located within this existing transmission line right-of-way.

230 kV Skiffes Creek-Whealton Line:

The 20.2-mile route for the proposed 230 kV line will occupy existing electric transmission line right-of-way for its entire length. Parts of this existing right-of way parallel a number of roads and railroad tracks. This right-of-way was acquired between October 1951 and June 1979 as lines were updated and added to this corridor. It appears the majority of the easements were purchased in the 1950s. There are various gas pipelines and waterlines within the existing transmission line right-of-way.

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

E. Has the Company investigated land use plans in the areas of the proposed route? How would the building of the proposed line effect future land use of the areas affected?

1. Has the Company determined from the governing bodies of each county, city and town in which the proposed facilities will be located whether those bodies have designated the important farmlands within their jurisdictions, as required by Virginia Code Section 3.1-18.5.3?

2. If so, and if any portion of the proposed facilities will be located on any such important farmland, please:

a. Include maps and other evidence showing the nature and extent of the impact on such farmlands.

b. Describe what alternatives exist to locating the proposed facilities on the affected farmlands, and why those alternatives are not suitable.

c. Describe the applicant's proposals to minimize the impact of the facilities on the affected farmland.

Response: As noted above in Section III.B., Dominion Virginia Power and NRG met with the local Planning Department staff from each of the counties and cities crossed by the Project components to investigate existing and proposed land use plans. In addition, NRG consulted the comprehensive plans for each of these counties and municipalities as well.

500 kV Proposed Route (Surry-Skiffes Creek):

The 500 kV Proposed Route passes through Surry and James City Counties. The route crosses land predominantly zoned as industrial. A portion of the industrially zoned lands includes the BASF property in James City County, which is currently for sale. The James City County Office of Economic Development is actively marketing the property and has received interest from a number of parties. A few development ideas have been brought forward for the property, but all are in very preliminary stages and no official development requests have been made. Some of the development ideas would require rezoning the industrial land and continued efforts of site remediation. James City County and the BASF property owner have expressed some concerns that the Proposed Route divides the BASF property in such a way that it may limit the potential locations and sizes of structures that could be developed on the property. The James River Crossing Variations 2 and 3 to the Proposed Route are offered for consideration partly in response to this particular concern, as both of these Variations would cross near

the northern boundary of the BASF property and, thereby, avoid dividing the property. However, they in turn could impact the use of another parcel owned by the Authority that is crossed by these Variations, as noted previously.

Based on the present comprehensive plans, the construction of the proposed Surry-Skiffes Creek 500 kV Transmission Line should have no significant impacts on future land use along the route. If the James River Crossing Variation 1 is incorporated into the Proposed Route, the resulting route should have no significant impacts on future land use based on the present comprehensive plans. If the Proposed Route with either the James River Crossing Variation 2 or 3 were chosen, the situation would be similar, based on the present comprehensive plans.

500 kV Alternate Route (Chickahominy-Skiffes Creek):

The 500 kV Alternate Route passes through Charles City County, James City County, the City of Williamsburg, and York County.

Charles City County has designated three development centers. The objective of these development centers is to promote areas of existing high public and private investment. These areas constitute zones for general development. Portions of the Alternate Route cross two of these development centers, the Roxbury Development Center and the Hideaway Development Area. There currently are no specific plans for commercial or residential development in the portions of these development centers crossed by the route. The Roxbury Development Center is located on both sides of Route 106 (between MPs C0.0 and C2.9) and is considered to be the industrial center of the county. The development center is located near major transportation routes and the county supports the future development of business parks, industrial parks, and commercial business in this area. The Hideaway Development Area is located along the Chickahominy River on either side of Route 615 and Route 623 (between MPs C14.8 and C15.1). This area currently consists primarily of single-family homes and tourism/recreational uses. This development is in close proximity to the Chickahominy River, permitting additional future recreational uses, including hunting, ecotourism, boating, and retreat centers.

There are four planned developments in the vicinity of the route. One these developments is situated in James City County, two are in the City of Williamsburg, and the fourth is located in York County. The route crosses a 373-acre parcel in James City County between MPs C23.8 and C24.4 that was purchased in 2004 by the U.S. Homes Corporation. This corporation is owned by Colonial Heritage LLC, which also owns the Colonial Heritage development located adjacent to this plot of land. No homes have been developed (based on 2011 aerial photography); however, it is expected that Colonial Heritage LLC may develop this land in the future. The route crosses a second parcel owned by Colonial Heritage LLC between MPs C24.4 and C24.8 that has been approved by James City County for mixed use development. Final approval was given on November 7, 2011 and construction has broken ground.

In the City of Williamsburg along the Alternate Route there are two planned development areas. The first is a lot located behind 3026 Richmond Road, which has been discussed as a possible commercial property development. To date, no plans have been submitted for this development. The lot abuts the northeast side of the existing corridor between MPs C28.3 and C28.5. The second development is known as the Alexander Commons Offices and is located at 919 Capitol Landing Road; it extends into the existing corridor near MP C31.1. The development consists of two new office buildings to be constructed behind the existing buildings. The project has been approved but to date has not moved forward.

In York County, the Alternate Route crosses a planned housing development named Powell Plantation located along Route 132 between MPs C29.9 and C30.6. This development, which was approved to consist of 313 homes, is currently on hold as there is no developer associated with the project. It is possible that a new developer will take on the project.

The Chickahominy to Lightfoot Junction section of the Alternate Route crosses land predominantly zoned as agricultural. While the construction of a new transmission line right-of-way would change the character of the landscape, it would not have a significant impact on current or future agricultural land use. The Lightfoot Junction to Skiffes Creek section of the Alternate Route would be constructed within Dominion Virginia Power's existing transmission line right-of-way. Since the new transmission line would be installed entirely within existing right-of-way and no new right-of-way would be acquired, the construction and operation of this section of the proposed facilities should not directly or indirectly affect land uses or zoning within the Project area.

The Alternate Route crosses 1.8 miles of planned developments including Colonial Heritage, Alexander Commons Offices, and Powell Plantation. The 3026 Richmond Road development discussed above borders, but is not crossed by, the existing right-of-way. The Colonial Heritage development (James City County), the Alexander Commons Office (City of Williamsburg), and the Powell Plantation (York County) planned developments would all be crossed by the new proposed 500 kV line if it is constructed using the Alternate Route. In all of these planned developments the proposed facilities would be installed entirely within the existing right-of-way and no new right-of-way would be needed. Consequently, there should be no impacts on the planning or development of these residential and office developments.

Skiffes Creek Switching Station:

There is no planned development in the vicinity of the Skiffes Creek Switching Station. The land in this area is zoned as rural residential. The facility would be constructed on an undeveloped parcel owned by Dominion Virginia Power. The parcel is located in a forested area and is crossed by an existing Dominion Virginia Power electric transmission 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.

230 kV Skiffes Creek-Whealton Line:

The Skiffes Creek-Whealton 230 kV transmission line passes through York County, James City County, the City of Newport News, and the City of Hampton. There is one planned development located in York County along the existing right-of-way for the new 230 kV line.

The proposed line crosses 1.5 miles of a planned development, Huntington Point. This development will be built in York County along the border of the City of Newport News south of the proposed Skiffes Creek Switching Station and just north of the Newport News/Williamsburg International Airport. The new transmission line in this area would consist of a second circuit of 230 kV. Within the planned development area, the proposed facilities would be installed entirely within Dominion Virginia Power's existing transmission corridor and no new right-of-way would be needed. Consequently, there would be no impacts on the planning or construction of the planned development.

The Route 60 East Relocation/Pocahontas Trail Project has land designated for the future relocation of Route 60 that is currently crossed by Dominion Virginia Power's existing right-of-way; however, this project has been suspended due to lack of funding.

The Skiffes Creek-Whealton 230 kV Transmission Line would require primarily removal and rebuilding of an existing single circuit 230 kV line in Dominion Virginia Power's existing right-of-way to install a double circuit 230 kV line. Since the new transmission line would be installed entirely within existing right-of-way and no new right-of-way would be acquired, the construction and operation of this section of the proposed facilities should not directly or indirectly affect land uses or zoning within the project area.

1. There are no important farmlands crossed by any components of the Project.

2. Not applicable.

    a. Not applicable.

    b. Not applicable.

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

F. Identify the following that lie within or adjacent to the proposed right-of-way:

1. **Any district, site, building, structure, or other object included in the National Register of Historic Places maintained by the U.S. Secretary of the Interior;**

2. **Any historic landmark, site, building, structure, district or object included in the Virginia Landmarks Register maintained by the Virginia Board of Historic Resources;**

3. **Any historic district designated by the governing body of any city or county;**

4. **Any state archaeological site or zone designated by the Director of the Virginia Department of Historic Resources, or his predecessor, and any site designated by a local archaeological commission, or similar body;**

5. **Any underwater historic property designated by the Virginia Department of Historic Resources, or predecessor agency or board;**

6. **Any National Natural Landmark designated by the U.S. Secretary of the Interior;**

7. **Any area or feature included in the Virginia Registry of Natural Areas maintained by the Virginia Department of Conservation and Recreation;**

8. **Any area accepted by the Director of the Virginia Department of Conservation and Recreation for the Virginia Natural Area Preserves System;**

9. **Any conservation easement qualifying under Sections 10.1-1009 to -1016 of the Code of Virginia, or prior provision of law;**

10. **Any state scenic river;**

11. **Any federal state, or local park, forest, game or wildlife preserve, recreational area, or similar facility; Features, sites, and the like listed in 1 through 10 above need not be identified again.**

Response: 1. **500 kV Proposed Route (Surry-Skiffes Creek):**

No historic properties listed in the National Register of Historic Places ("NRHP") are located within or adjacent to the proposed right-of-way of the Proposed Route. Carter's Grove (047-0001) is located within approximately 0.5 mile of the Proposed Route. This site is a mid-eighteenth century dwelling listed in the NRHP and the Virginia Landmarks Register ("VLR"), and as a National Historic Landmark. Additionally, Carter's Grove is protected under a historic preservation easement held by the Virginia Department of Historic Resources ("VDHR"). The area surrounding Carter's Grove has been developed over the years by both residential and industrial developments.

The Captain John Smith Chesapeake National Historic Trail is crossed by the Proposed Route at the James River. The route crosses the National Historic Trail at the *James River, Chickahominy River, Nansemond River, and Elizabeth River* preliminary trail management segment. One of 10 trail management sections, this trail segment has been designated as a high potential route segment associated with voyage stops, historic period American Indian villages, and a shoreline evocative of a seventeenth century landscape. This trail is not reported as a site in the VDHR database; however, the VDHR treats it as a NRHP-eligible resource.

If James River Crossing Variation 1, 2 or 3 were incorporated into the Proposed Route, Carter's Grove would be located within the 0.5 mile buffer of the route and the Captain John Smith Chesapeake National Historic Trail would be crossed by the route at the James River.

500 kV Alternate Route (Chickahominy-Skiffes):

One historic property listed in the NRHP is located within and adjacent to the right-of-way of the 500 kV Alternate Route. Colonial National Historical Park/Colonial Parkway (047-0002) was constructed between 1930 and 1958 as a scenic roadway connecting Jamestown, Williamsburg, and Yorktown. This 24-mile Colonial-style highway is crossed by the right-of-way for this route.

One property determined eligible for listing in the NRHP by the VDHR is located within and adjacent to the right-of-way of the Alternate Route. Saint Mary's Church Battlefield (018-5004) is associated with Grant's Overland Campaign of May and June 1864. The American Battlefield Protection Program ("ABPP") recommends that land use has undergone little change and represents a battlefield landscape.

The Battle of Williamsburg (Civil War) (099-5282), portions of which are considered eligible for listing in the NRHP by the VDHR, is located within and adjacent to the right-of-way of the Alternate Route. The ABPP

reports that the battlefield landscape has been fragmented, but may retain some features relating to the significance of the battlefield.

The Captain John Smith Chesapeake National Historic Trail, described above, is crossed by the Alternate Route at the Chickahominy River. This trail is not reported as a site in the VDHR database; however, the VDHR treats it as a NRHP-eligible resource.

Skiffes Creek Switching Station:

No district, site, building, structure, or other object included in the NRHP maintained by the U.S. Secretary of the Interior is located within or adjacent to the property on which the Skiffes Creek Switching Station will be constructed.

230 kV Skiffes Creek-Whealton Line:

One historic property is located within the right-of-way of the 230 kV Skiffes Creek-Whealton line. Lee's Mill Earthworks (Battlefield Park) (121-0050) is listed in the NRHP and the VLR. The site represents a Confederate fortification that withstood a Union attack in April 1862.

Two Civil War battlefields also are located within and adjacent to the right-of-way of the 230 kV Skiffes Creek-Whealton line. The Battle of Williamsburg (099-5282) is described above. The Battle of Yorktown (099-5283) is part of the Union offensive referred to as the Peninsular Campaign. The ABPP reports that only portions of the Yorktown battlefield landscape have been altered and many landscape features are intact. However, the portion of the Yorktown Battlefield crossed by the Skiffes Creek-Whealton line has been bisected by Fort Eustis Boulevard (Route 105) and has previously been impacted by the construction of the existing transmission line.

2. **500 kV Proposed Route (Surry-Skiffes Creek):**

No properties within or adjacent to the 500 kV Proposed Route are listed in the VLR. If any of the James River Crossing Variations were incorporated into the Proposed Route, no properties within or adjacent to the resulting routes would be listed in the VLR.

500 kV Alternate Route (Chickahominy-Skiffes Creek):

No properties within or adjacent to the right-of-way of the 500 kV Alternate Route are listed in the VLR.

Skiffes Creek Switching Station:

There are no properties listed in the VLR within or adjacent to the property on which the Skiffes Creek Switching Station will be located.

230 kV Skiffes Creek-Whealton Line:

One historic property is located within the right-of-way of the 230 kV Skiffes Creek-Whealton line. Lee's Mill Earthworks (Battlefield Park) (121-0050) is listed in the VLR and is described in Section III.F.1.

3. **500 kV Proposed Route (Surry-Skiffes Creek):**

No properties within or adjacent to the 500 kV Proposed Route are designated as a historic district. If any of the James River Crossing Variations were incorporated into the Proposed Route, no properties within or adjacent to the resulting routes would be designated as a historic district.

500 kV Alternate Route (Chickahominy-Skiffes Creek):

One property is located within and adjacent to the right-of-way of the 500 kV Alternate Route. The Old Main Road Rural Historic District (018-5108) is located in Charles City County along Route 615 and Route 623. Eighty-two previously recorded architectural resources are located within the district boundary. Four properties within this historic district are listed in the NRHP. The Old Main Rural Historic District is unevaluated.

Skiffes Creek Switching Station:

There are no historic districts within or adjacent to the property on which the Skiffes Creek Switching Station will be located.

230 kV Skiffes Creek-Whealton Line:

There are no historic districts within or adjacent to the right-of-way of the 230 kV Skiffes Creek-Whealton line.

4. **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. If the James River Crossing Variation 1 were incorporated into the Proposed Route, these same four previously recorded archaeological sites would be located wholly or partially within the right-of-way of the resulting routes. Two sites (44JC0649 and 44JC0650) are unevaluated. The VDHR determined two sites (44JC0662 and 44JC0663) not eligible for listing in the NRHP; however, additional investigation may be warranted at site 44JOC0662 to

determine its National Register eligibility. These sites are characterized as an indeterminate historic site (44JC0649); indeterminate eighteenth century site (44JO0650); and historic trash pit/scatter (44JC0662 and 44JC0663).

One previously recorded archaeological site, 44JC0662, occurs within the parcel where the Skiffes Creek Switching Station will be constructed. 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, site 44JC0662 may retain archaeological potential.

If James River Crossing Variation 2 or 3 were incorporated into the Proposed Route, two previously recorded archaeological sites would be located wholly or partially within the right-of-way of the resulting routes, including 44JC0662 and 44JC0663.

500 kV Alternate Route (Chickahominy-Skiffes Creek):

Ten archaeological sites occur within the right-of-way of the 500 kV Alternate Route. 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. Site 44JO0195 is a nineteenth century dwelling that was reported based on Civil War mapping in 1983. Site 44YO0757 is a nineteenth century domestic site that was identified by an informant. The remaining six unevaluated sites include a brick scatter (44CC0350); a historic road trace (44JC1175); two late-eighteenth century military camps associated with the siege of Yorktown (44WB0133-0001 and 44WB0133-0001); Yorktown Battlefield, a single earthwork, and materials associated with the Moore House (44YO0220); and a historic dwelling of indeterminate age (44YO0524).

Of the two remaining sites, the VDHR determined one site (44WB0066) eligible and one site potentially eligible (44JC1044) for listing in the NRHP. Site 44WB0066 is an early-seventeenth century palisade. Site 44JC1044 is a multicomponent resource characterized as a Middle

Woodland camp and a mid-nineteenth to early-twentieth century farmstead.

Skiffes Creek Switching Station:

Site 44JO0662 is within the property boundary of the parcel where the proposed Skiffes Creek Switching Station will be constructed and is described above. Site 44JC0662 was initially identified as a large nineteenth century trash pit that was recommended as eligible in 1991 and is discussed above. A later field investigation in 1994 reported the identification of one (1) artifact within a much smaller area. After the 1994 investigation, the VDHR determined the site to be not eligible; however, additional investigation may be warranted at site 44JOC0662 to determine its National Register eligibility.

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 to Whealton line. One site, a cemetery (44JC0048), has been determined eligible for listing in the NRHP by the VDHR.

The VDHR has determined three sites (44NN0060, 44YO0592, and 44YO1059) potentially eligible for listing in the NRHP and one site (44JC0663) not eligible for listing in the NRHP. These four sites are reported as an indeterminate prehistoric site (44NN0060); a Civil War era camp (44YO0592); a multicomponent prehistoric camp and eighteenth century domestic site (44YO1059); and a mid-nineteenth to twentieth century trash scatter (44JC0063).

Site 44JC0662 was initially identified as a large nineteenth century trash pit that was recommended as eligible in 1991 and is discussed above. A later field investigation in 1994 reported the identification of one artifact within a much smaller area. After the 1994 investigation the VDHR determined the site to be not eligible; however, additional investigation may be warranted at site 44JOC0662 to determine its National Register eligibility. Site 44JO0662 is also within the property boundary of the proposed Skiffes Creek Switching Station.

The remaining seven sites are unevaluated (44YO0092, 44YO0180, 44YO0181, 44YO0183, 44YO0233, 44YO0237, and 44YO0240). These sites are reported as Civil War Earthworks (44YO0092 and 44YO0233); a prehistoric camp (44YO0180); a prehistoric camp and nineteenth century domestic site (44YO0181); an eighteenth century domestic site (44YO0183); an indeterminate Archaic and Woodland period site (44YO0237); and a historic road trace (44YO0592).

One unevaluated site (44JO0751) containing both prehistoric and historic components is located adjacent to the right-of-way. Additional information on the site is provided in the Cultural Resource Assessment for the Project, which is included in Appendix G of Environmental Routing Study.

5. **500 kV Proposed Route (Surry-Skiffes Creek):**

No underwater historic properties are located within or adjacent to the proposed right-of-way of the Proposed Route. A late-eighteenth century to early-nineteenth century shipwreck (44JC0840) is located approximately 425 feet south of the proposed right-of-way.

If James River Crossing Variation 1 were incorporated into the Proposed Route, no underwater historic properties would be located within or adjacent to the resulting routes' right-of-way. Site 44JC0840 is located approximately 2,400 feet south of the James River Crossing Variation 1.

If James River Crossing Variation 2 were incorporated into the Proposed Route, no underwater historic properties would be located within or adjacent to the resulting routes' right-of-way. Site 44JC0840 is located approximately 2,600 feet south of the James River Crossing Variation 2.

If James River Crossing Variation 3 were incorporated into the Proposed Route, no underwater historic properties would be located within or adjacent to the resulting routes' right-of-way. Site 44JC0840 is located approximately 4,600 feet south of the James River Crossing Variation 3.

500 kV Alternate Route (Chickahominy-Skiffes Creek):

No underwater historic properties are located within or adjacent to the right-of-way for the 500 kV Alternate Route.

Skiffes Creek Switching Station:

No underwater historic properties are located within or adjacent to the property on which the Skiffes Creek Switching Station would be constructed.

230 kV Skiffes Creek-Whealton Line:

No underwater historic properties are located within or adjacent to the 230 kV Skiffes Creek-Whealton right-of-way.

6. There are no National Natural Landmarks within or in the vicinity of any of the project components.

7. **500 kV Proposed Route (Surry-Skiffes Creek):**

The 500 kV Proposed Route would cross two areas or features included in the Virginia Registry of Natural Areas maintained by the Virginia Department of Conservation and Recreation ("VDCR"). If any of the James River Crossing Variations were adopted as a part of the Proposed Route, the resulting routes would cross these same features in the same locations.

Gravel Neck is a conservation site located in Surry County that supports at least one rare animal species. This location intersects the Proposed Route between MPs S0.8 and S1.4. The site appears to correspond to the location of a bald eagle (Haliaeetus leucocephalus) nest identified in the VDCR Element Occurrence Representations ("EOReps") dataset. According to the EOReps data, the nest was last observed in 1990. 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. Based on the CCB's 2011 survey, an eagle nest was not identified in the location of the Gravel Neck conservation site. VDCR's Natural Heritage Resources ("NHR") Program ranks this area as B5, which indicates that the area is "of general biodiversity significance." The Proposed Route intersects the Gravel Neck Conservation Site between MPs S0.8 and S1.3. If any of the James River Crossing Variations were adopted as part of the Proposed Route, the resulting routes would intersect the Gravel Neck Conservation Site in approximately the same location.

The Powerplant Outfall Habitat Zone is a conservation site located in Surry County that supports at least one rare animal species. The site also may correspond to the location of a bald eagle nest identified in the VDCR EOReps dataset. According to the EOReps data, the nest was last observed in 2002. Based on the CCB's "VAEagles" website's 2011 survey, an eagle nest was not identified in the location of the Gravel Neck conservation site. VDCR's NHR ranks this area as B5, which indicates that the area is "of general biodiversity significance." The Proposed Route and the Proposed Route with James River Crossing Variations 1, 2 and 3 intersect the Powerplant Outfall Habitat Zone between MPs S1.3 to S1.7, S1.3 to JV1-0.1, S1.3 to JV2-0.1, and S1.3 to JV3-0.1, respectively.

500 kV Alternate Route (Chickahominy-Skiffes Creek):

The 500 kV Alternate Route crosses six areas or features included in the Virginia Registry of Natural Areas maintained by the VDCR, three of which are identified as having listed species present.

Old Neck Creek is a Conservation Site located in Charles City County that supports rare plants, animals, and ecological communities. VDCR's NHR ranks this area as B2 - Very High priority conservation land. The Alternate Route crosses Old Neck Creek between MPs C16.6 and C18.0.

Yarmouth Creek is a Conservation Site located in Charles City County that, according to VDCR, supports many rare plants, animals, and ecological communities, and plays a critical role in ecosystem and species health and viability. VDCR's NHR ranks this area as B2 - Very High priority conservation land. The Alternate Route crosses Yarmouth Creek between MPs C18.4 and C20.2.

The Lightfoot Conservation Site is located in James City County and contains acidic upland hardwood forest located near the crest of a west-southwest facing slope at the headwaters of the Chickahominy River. VDCR's NHR ranks this location as B3 - High priority conservation area. The Alternate Route crosses the Lightfoot conservation site between MPs C23.6 and C24.8.

The Powhatan Creek Natural Area is a Conservation Site located in James City County and consists of gentle slopes, seeps, and slow-moving headwaters of Chisel Run with mixed hardwood and pine dominated uplands. VDCR's NHR ranks this area as B2 -Very High priority conservation land. The Lightfoot to Skiffes Creek section of the Alternate Route crosses the Powhatan Creek conservation area between MPs C25.9 and C26.8 and between MPs K0.1 and K0.8.

The VDCR data identified one General Location Area, which is identified as a "vascular plant" location with no further detail provided. The Alternate Route crosses the northernmost General Location Area where it overlaps the Grove Creek Conservation Site between MPs C35.9 and C36.2.

Grove Creek is a Conservation Site located in James City County that supports numerous rare plants and ecological communities. According to VDCR's NHR Program, the Grove Creek conservation site is an integral part of Virginia's Lower Peninsula ecosystem, and contributes significantly to long-term species and ecosystem health. VDCR's NHR ranks this area as a B1 - Outstanding priority conservation site. The Lightfoot Junction to Skiffes Creek section of the Alternate Route crosses the Grove Creek conservation site between MPs C35.9 and C36.1.

Skiffes Creek Switching Station:

The parcel on which the Skiffes Creek Switching Station will be constructed does not contain any areas or features included in the Virginia Registry of Natural Areas maintained by the VDCR.

230 kV Skiffes Creek-Whealton Line:

The 230 kV Skiffes Creek-Whealton line crosses five areas or features included in the Virginia Registry of Natural Areas maintained by the VDCR, one of which is identified as having state-listed species present.

Grafton Ponds is a Conservation Site located in the City of Newport News. It supports numerous rare plants, animals, and ecological communities. According to VDCR's NHR Program, this site is an integral part of Virginia's Lower Peninsula ecosystem, and it contributes significantly to long-term species and ecosystem health. VDCR's NHR ranks this area as B2 - Very High priority conservation lands. The 230 kV Skiffes Creek-Whealton line crosses the Grafton Ponds conservation site between MPs W6.6 and W8.5.

The Airport-TAAB is a Conservation Site consisting of a woody and marshy environment in York County that provides habitat for several rare species. VDCR's NHR considers this site B5 - General Interest conservation land. The 230 kV Skiffes Creek-Whealton line crosses the Airport-TAAB conservation site between MPs W12.0 and W13.0.

The VDCR data identified three General Location Areas, all of which were identified as "vascular plant" locations with no further detail provided. One General Location Area overlaps the Grafton Ponds Conservation Site. The 230 kV Skiffes Creek to Whealton line crosses this area between MPs W7.4 and W7.9 and crosses two overlapping General Location Areas between MPs W14.2 and W14.5.

8. **500 kV Proposed Route (Surry-Skiffes Creek):**

The 500 kV Proposed Route does not cross any areas accepted by the Director of the Virginia Department of Conservation and Recreation for the Virginia Natural Area Preserves System. If any of the James River Crossing Variations were incorporated into the Proposed Route, none of these areas would be crossed by the resulting routes.

500 kV Alternate Route (Chickahominy-Skiffes Creek):

The 500 kV Alternate Route does not cross any areas accepted by the Director of the Virginia Department of Conservation and Recreation for the Virginia Natural Area Preserves System.

Skiffes Creek Switching Station:

The parcel on which the Skiffes Creek Switching Station will be constructed does not cross any areas accepted by the Director of the Virginia Department of Conservation and Recreation for the Virginia Natural Area Preserves System.

230 kV Skiffes Creek-Whealton Line:

The 230 kV Skiffes Creek-Whealton line crosses one Virginia Natural Area Preserves System area. Grafton Ponds is a Conservation Site located in the City of Newport News and supports numerous rare plants, animals, and ecological communities. According to VDCR's NHR Program, this site is an integral part of Virginia's Lower Peninsula ecosystem, and it contributes significantly to long-term species and ecosystem health. VDCR's NHR ranks this area as B2 - Very High priority conservation lands. The proposed 230 kV Skiffes Creek-Whealton line crosses the Grafton Ponds conservation site between MPs W6.6 and W8.5.

9. **500 kV Proposed Route (Surry-Skiffes Creek):**

The 500 kV Proposed Route does not cross any conservation easements. If any of the James River Crossing Variations were incorporated into the Proposed Route, no conservation easements would be crossed by the resulting routes.

500 kV Alternate Route (Chickahominy-Skiffes Creek):

The 500 kV Alternate Route crosses four conservation easements totaling approximately 3.1 miles. Two of the conservation easements are managed by the Williamsburg Land Conservancy ("WLC"), and two are privately owned Agricultural and Forestal District ("AFD") easements. Within James City County, the Alternate Route crosses two AFD conservation districts under private ownership. The Yarmouth Island AFD is located on multiple privately owned parcels just east of the crossing of the Chickahominy River starting at MP C18.5. The Cranston's Pond AFD is located on multiple privately owned parcels west of Route 60 and north of Centerville Road. The Alternate Route crosses this AFD near MP C24.6. A 6.9 acre WLC conservation easement under private ownership is located between MPs C27.2 and C27.4. The easement is located in the northwest corner of the intersection of the Project corridor and Old Towne Road, approximately 1.0 mile south of the Lightfoot Substation. The Alternate Route crosses a 230-acre WLC conservation easement under private ownership located adjacent to Route 132 between MPs C30.4 and C30.7, and a 67.6-acre WLC conservation easement located adjacent to Route 132 between MPs C30.7 and C30.9. The Company's existing transmission right-of-way is sufficient for the proposed Project without any required expansion into the conservation easement areas.

Skiffes Creek Switching Station:

The property on which the Skiffes Creek Switching Station will be constructed does not cross any conservation easements.

230 kV Skiffes Creek-Whealton Line:

The 230 kV Skiffes Creek-Whealton line does not cross any conservation easements.

10. **500 kV Proposed Route (Surry-Skiffes Creek):**

The 500 kV Proposed Route crosses the James River, which has been designated as a state scenic river. If any of the James River Crossing Variations were incorporated into the Proposed Route, the resulting routes also would cross the James River.

500 kV Alternate Route (Chickahominy-Skiffes Creek):

The 500 kV Alternate Route crosses the Chickahominy River. The crossing location has not been designated as a state scenic river but has been identified as being worthy of future study.

Skiffes Creek Switching Station:

There are no state scenic rivers in the vicinity of the property on which the Skiffes Creek Switching Station will be constructed.

230 kV Skiffes Creek-Whealton Line:

There are no state scenic rivers crossed by the 230 kV Skiffes Creek-Whealton line.

11. **500 kV Proposed Route (Surry-Skiffes Creek):**

The 500 kV Proposed Route crosses the Captain John Smith Chesapeake National Historic Trail. If any of the James River Crossing Variations were incorporated into the Proposed Route, the resulting routes also would cross this trail as well.

500 kV Alternate Route (Chickahominy-Skiffes Creek):

The 500 kV Alternate Route crosses the Plantation Loop of the Virginia Birding and Wildlife Trail, the Chickahominy WMA, the Captain John Smith Chesapeake National Historic Trail, Freedom Park, Warhill Sports Complex, Lower Peninsula Loop of the Virginia Birding and Wildlife Coastal Trail, Waller Mill Park, Colonial National Historical Park Colonial Parkway, Williamsburg Country Club, and Kingsmill Resort and Golf Club. The route passes Bush Gardens, but does not cross the amusement park.

Skiffes Creek Switching Station:

The property on which the Skiffes Creek Switching Station will be located does not contain any federal state, or local park, forest, game or wildlife preserve, recreational area, or similar facility.

230 kV Skiffes Creek-Whealton Line:

The 230 kV Skiffes Creek-Whealton line crosses the Lower Peninsula Loop of the Virginia Birding and Wildlife Coastal Trail, Newport News Park, Harwood's Mill Park, York County Sports Complex, and Kiln Creek Golf Club and Resort. The route passes in the vicinity of but does not cross Kiln Creek Park, Sandy Bottom Nature Park, and Tucker-Capps Neighborhood Park.

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

G. List any airports where the proposed route would place a structure or conductor within the glide path of the airport. Advise of contacts and results of contacts made with appropriate officials regarding the effect on the airport's operations.

Response: There are 10 airports within 10 miles of Dominion Virginia Power's proposed facilities. One structure associated with the proposed facilities would penetrate the TERPS non-precision approach surface of only the Felker Army Airfield at Fort Eustis ("Felker Airfield").

Dominion Virginia Power met with airport officials from three airports in the vicinity of the Project area: Newport News/Williamsburg International Airport; Langley Air Force Base; and Felker Airfield at Fort Eustis. Dominion Virginia Power's proposed 230 kV Skiffes Creek-Whealton 230 kV line will be constructed within Dominion Virginia Power's existing 230 kV transmission right-of-way as it passes Newport News/Williamsburg International Airport and Langley Air Force Base. The proposed new structures would be the same reduced height (75 feet and 52 feet) as the existing structures that pass underneath the flight approach to both runways at the Newport News/Williamsburg International Airport. On January 11, 2012 at a meeting with Newport News/Williamsburg International Airport Assistant Airport Directors, Melissa Cheaney and Ted Kitchens, Dominion Virginia Power demonstrated with detailed elevation analyses that the new structures would not penetrate the approach surfaces to this airport. Dominion Virginia Power's proposed 230 kV Skiffes Creek to Whealton line will pass by the end of Langley's main runway at a distance of about 3.0 miles. Dominion Virginia Power met with officials from Langley Air Force Base (Ryan Baie, Community Planner and Jason Kretschmer, Airflow Manager) on January 10, 2012 to describe the location and proposed height of the new structures where they would pass underneath the flight approach to Langley's main runway. Through analysis of FAA Part 77 flight surfaces, Dominion Virginia Power demonstrated to Langley officials that the proposed structures would not interfere with or penetrate the Part 77 flight approaches to that airfield. Officials from Langley requested that Dominion Virginia Power also demonstrate that the facilities would not penetrate the TERPS surfaces at Langley Air Force Base and at Felker Airfield. Dominion Virginia Power completed these analyses and submitted them to Langley Air Force Base officials. Results show that the TERPS surfaces at Langley would not be affected.

On February 8, 2012, Dominion Virginia Power met with the Airfield Manager of the Felker Airfield, John Musser, at Fort Eustis. At the request of officials at Langley Air Force Base, Dominion Virginia Power investigated the height and location of the structures associated with the 500 kV Proposed Route, particularly where it crosses the James River. Dominion Virginia Power determined that its

proposed facilities would not penetrate the FAA Part 77 flight surfaces. However, it also determined that one structure that would be located within the James River crossing portion of the Proposed Route would penetrate the TERPS non-precision approach surface associated with flight approach to the Felker Airfield. Consequently, Dominion Virginia Power identified two variations to the Proposed Route, the James River Crossing Variations 1 and 3, located further north and upstream from the Proposed Route, and determined that both the Part 77 and the TERPS non-precision approach surfaces would not be penetrated.

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

H. Advise of any scenic byways that are in close proximity to or will be crossed by the proposed transmission line and describe what steps will be taken to mitigate any visual impacts on such byways. Describe typical mitigation techniques for other highway's crossings.

Response:

500 kV Proposed Route (Surry-Skiffes Creek):

No Virginia Scenic Byways are crossed by or in close proximity to the 500 kV Proposed Route. If any of the James River Crossing Variations were incorporated into the Proposed Route, the resulting routes also would not cross by or be in close proximity to any Virginia Scenic Byways.

500 kV Alternate Route (Chickahominy-Skiffes Creek):

The Lightfoot Junction to Skiffes Creek Section of the 500 kV Alternate Route crosses the Williamsburg Colonial Parkway, which is a parkway within the U.S. National Park Service system and has been designated a Virginia Scenic Byway and an American Byway. The Colonial Parkway is currently crossed by Dominion Virginia Power's existing transmission line right-of-way at the border of Williamsburg and York Counties. The parkway is flanked by forested land at the crossing location. The portion of the route that would be constructed on existing transmission line right-of-way between Lightfoot Junction and Skiffes Creek would involve removal and replacement of one set of structures with a new set of structures. Multiple transmission lines have been operating within these rights-of-way for many years and the proposed new facilities in this area will not substantially change the existing visual character of the current crossing of the Colonial Parkway.

Skiffes Creek Switching Station:

No Virginia Scenic Byways are crossed by or in close proximity to the proposed site of the Skiffes Creek Switching Station.

230 kV Skiffes Creek-Whealton Line:

No Virginia Scenic Byways are crossed by or in close proximity to the proposed 230 kV Skiffes Creek-Whealton line.

IV. HEALTH ASPECTS OF EMF

A. State the calculated maximum electric and magnetic field (EMF) levels that are expected to occur at the edge of the right-of-way. If the new transmission line is to be constructed on an existing electric transmission line right-of-way, provide the present EMF levels as well as the maximum levels calculated at the edge of right-of-way after the new line is operational.

Response: Public exposure to magnetic fields is best estimated by field levels from power lines calculated at annual average loading. For any day of the year, the EMF levels associated with average conditions provide the best estimate of potential exposure. Maximum (peak) values are less relevant as they may occur for only a few minutes or hours each year.

This section describes the levels of EMF associated with the existing transmission lines and the proposed 230 kV or 500 kV transmission lines. EMF levels are provided for both historical (2011) and future (2016) annual average and maximum (peak) loading conditions.

Historical average and Projected average loading

EMF levels were calculated for the existing and proposed lines at the ***historical average and projected average*** load condition and at an operating voltage of 120.75, 241.5 kV and 525 kV when supported on the existing and/or proposed structures – see Attachments below.

These field levels were calculated at mid-span where the conductors are closest to the ground and the conductors are at the historical average or projected average load operating temperature.

EMF levels at the edge of the right-of-way for the existing and/or proposed structures at historical average and projected average loading:

	Existing (E) or Proposed (P)	Left Edge Fields		Right Edge Fields	
		Electric (kV/m)	Magnetic (mG)	Electric (kV/m)	Magnetic (mG)
500 kV Proposed Route: Surry – Skiffes Creek					
Attach II.A.3.A	P	0.922	20.760	0.175	13.614
Attach II.A.3.B	P	2.100	9.708	2.100	13.173
Attach II.A.3.C	P	0.451	3.532	0.451	3.685
Attach II.A.3.D	P	2.968	16.300	2.968	20.386
Attach II.A.3.E	E	0.078	0.745	0.505	2.599
Attach II.A.3.F	P	2.573	13.362	2.547	16.763
Attach II.A.3.G	E	0.055	1.101	0.111	1.906

	Existing (E) or Proposed (P)	Left Edge Fields		Right Edge Fields	
		Electric (kV/m)	Magnetic (mG)	Electric (kV/m)	Magnetic (mG)
Attach II.A.3.H	P	2.573	13.362	2.547	16.763
Attach II.A.3.I	E	0.086	2.096	0.111	1.906
Attach II.A.3.J	P	2.573	13.362	2.547	16.763
500 kV Variation 1: Surry – Skiffes Creek					
Attach II.A.3.V1-1	P	2.100	9.708	2.100	13.173
Attach II.A.3.V1-2	P	0.451	3.532	0.451	3.685
Attach II.A.3.V1-3	P	0.451	3.532	0.451	3.685
Attach II.A.3.V1-4	P	2.968	16.300	2.968	20.386
500 kV Variation 2: Surry – Skiffes Creek					
Attach II.A.3.V2-1	P	2.100	9.708	2.100	13.173
Attach II.A.3.V2-2	P	0.451	3.532	0.451	3.685
Attach II.A.3.V2-3	P	0.451	3.532	0.451	3.685
Attach II.A.3.V2-4	P	2.968	16.300	2.968	20.386
500 kV Variation 3: Surry – Skiffes Creek					
Attach II.A.3.V3-1	P	2.100	9.708	2.100	13.173
Attach II.A.3.V3-2	P	0.451	3.532	0.451	3.685
Attach II.A.3.V3-3	P	0.451	3.532	0.451	3.685
Attach II.A.3.V3-4	P	2.968	16.300	2.968	20.386
500 kV Alternate Route: Chickahominy – Skiffes Creek					
Attach II.A.3.AA	E	0.162	2.193	2.715	7.785
Attach II.A.3.BB	P	3.014	23.085	2.775	10.075
Attach II.A.3.CC	P	2.968	20.758	2.968	16.599
Attach II.A.3.DD	P	0.741	8.903	0.741	6.270
Attach II.A.3.EE	P	1.925	18.778	1.645	10.587
Attach II.A.3.FF	P	0.526	10.631	0.677	5.386
Attach II.A.3.GG	E	1.266	3.917	0.188	7.319
Attach II.A.3.HH	P	2.269	18.717	0.520	8.629
Attach II.A.3.II	E	1.266	3.648	0.188	8.520
Attach II.A.3.JJ	P	2.269	18.604	0.520	3.783
Attach II.A.3.KK	E	0.045	3.360	0.050	4.616
Attach II.A.3.LL	P	1.953	17.053	0.131	2.972
Attach II.A.3.MM	E	0.943	0.602	0.420	1.503
Attach II.A.3.NN	P	1.925	18.777	1.645	10.586
Attach II.A.3.OO	E	0.440	13.902	0.198	7.714
Attach II.A.3.PP	P	0.425	12.711	0.423	5.135

	Existing (E) or Proposed (P)	Left Edge Fields		Right Edge Fields	
		Electric (kV/m)	Magnetic (mG)	Electric (kV/m)	Magnetic (mG)
230 kV Proposed Route: Skiffes Creek – Whealton					
Attach II.A.3.a	E	0.571	14.538	0.077	6.557
Attach II.A.3.b	P	0.220	8.840	0.221	1.434
Attach II.A.3.c	E	0.565	14.587	0.091	5.392
Attach II.A.3.d	P	0.220	8.840	0.051	0.801
Attach II.A.3.e	E	0.142	9.344	0.075	6.565
Attach II.A.3.f	P	0.052	5.399	0.227	1.450
Attach II.A.3.g	E	0.484	14.497	0.071	6.565
Attach II.A.3.h	P	0.226	8.752	0.227	1.450
Attach II.A.3.i	E	0.369	13.243	0.063	6.521
Attach II.A.3.j	P	0.405	12.256	0.406	3.431
Attach II.A.3.k	E	0.478	9.543	0.074	4.303
Attach II.A.3.l	P	0.227	4.455	0.227	3.461
Attach II.A.3.m	E	0.037	2.511	0.173	1.985
Attach II.A.3.n	P	0.194	16.188	0.152	6.680
Attach II.A.3.o	E	0.037	2.511	0.437	3.479
Attach II.A.3.p	P	0.196	16.185	0.409	6.128
Attach II.A.3.q	E	0.037	2.511	0.173	1.985
Attach II.A.3.r	P	0.196	16.177	0.152	6.678
Attach II.A.3.s	E	0.023	1.985	0.483	7.641
Attach II.A.3.t	P	0.106	11.073	0.410	7.203
Attach II.A.3.u	E	0.021	1.979	0.484	7.646
Attach II.A.3.v	P	0.730	4.654	0.452	5.752
Attach II.A.3.w	E	0.023	1.985	0.483	7.641
Attach II.A.3.x	P	0.120	11.022	0.411	7.163
Attach II.A.3.y	E	0.634	14.256	0.736	6.508
Attach II.A.3.z	P	0.522	13.939	0.445	14.996
Attach II.A.3.aa	E	0.650	15.719	0.088	1.192
Attach II.A.3.bb	P	0.654	17.584	1.413	12.364
Attach II.A.3.cc	E	0.632	4.538	0.736	2.798
Attach II.A.3.dd	P	0.523	7.264	0.463	10.692
Attach II.A.3.ee	E	0.098	6.908	0.170	3.433
Attach II.A.3.ff	P	0.112	9.665	0.133	9.191
Attach II.A.3.gg	E	0.072	1.349	0.846	3.561
Attach II.A.3.hh	P	0.456	5.264	0.456	10.667
Attach II.A.3.ii	E	0.098	6.908	0.906	5.141
Attach II.A.3.jj	P	0.113	9.781	0.632	14.362

	Existing (E) or Proposed (P)	Left Edge Fields		Right Edge Fields	
		Electric (kV/m)	Magnetic (mG)	Electric (kV/m)	Magnetic (mG)
Attach II.A.3.kk	E	0.098	6.908	0.170	3.433
Attach II.A.3.ll	P	0.112	9.665	0.133	9.191

Historical peak and Projected peak loading

EMF levels were calculated for the existing and/or proposed lines at the ***historical peak and projected peak*** load condition and at an operating voltage of 120.75, 241.5 kV and 525 kV when supported on the existing and/or proposed structures – see Attachments below

These field levels were calculated at mid-span where the conductors are closest to the ground and the conductors are at a historical peak or projected peak load operating temperature.

EMF levels at the edge of the right-of-way for the existing and/or proposed structures at a historical peak or projected peak loading:

	Existing (E) or Proposed (P)	Left Edge Fields		Right Edge Fields	
		Electric (kV/m)	Magnetic (mG)	Electric (kV/m)	Magnetic (mG)
500 kV Proposed Route: Surry – Skiffes Creek					
Attach II.A.3.A	P	0.918	57.615	0.176	37.753
Attach II.A.3.B	P	2.106	27.002	2.106	36.635
Attach II.A.3.C	P	0.452	9.806	0.452	10.237
Attach II.A.3.D	P	2.969	45.326	2.969	56.653
Attach II.A.3.E	E	0.078	0.922	0.505	3.218
Attach II.A.3.F	P	2.576	37.454	2.551	48.105
Attach II.A.3.G	E	0.055	1.363	0.111	2.360
Attach II.A.3.H	P	2.576	37.454	2.551	48.105
Attach II.A.3.I	E	0.086	2.956	0.111	2.360
Attach II.A.3.J	P	2.576	37.454	2.551	48.105
500 kV Variation 1: Surry – Skiffes Creek					
Attach II.A.3.V1-1	P	2.106	27.002	2.106	36.635
Attach II.A.3.V1-2	P	0.452	9.806	0.452	10.237
Attach II.A.3.V1-3	P	0.452	9.806	0.452	10.237
Attach II.A.3.V1-4	P	2.969	45.326	2.969	56.653

	Existing (E) or Proposed (P)	Left Edge Fields		Right Edge Fields	
		Electric (kV/m)	Magnetic (mG)	Electric (kV/m)	Magnetic (mG)
500 kV Variation 2: Surry – Skiffes Creek					
Attach II.A.3.V2-1	P	2.106	27.002	2.106	36.635
Attach II.A.3.V2-2	P	0.452	9.806	0.452	10.237
Attach II.A.3.V2-3	P	0.452	9.806	0.452	10.237
Attach II.A.3.V2-4	P	2.969	45.326	2.969	56.653
500 kV Variation 3: Surry – Skiffes Creek					
Attach II.A.3.V3-1	P	2.106	27.002	2.106	36.635
Attach II.A.3.V3-2	P	0.452	9.806	0.452	10.237
Attach II.A.3.V3-3	P	0.452	9.806	0.452	10.237
Attach II.A.3.V3-4	P	2.969	45.326	2.969	56.653
500 kV Alternate Route: Chickahominy – Skiffes Creek					
Attach II.A.3.AA	E	0.161	11.721	2.714	41.691
Attach II.A.3.BB	P	3.014	68.753	2.774	49.135
Attach II.A.3.CC	P	2.969	57.101	2.969	45.688
Attach II.A.3.DD	P	0.739	24.449	0.739	17.234
Attach II.A.3.EE	P	1.924	51.590	1.647	29.115
Attach II.A.3.FF	P	0.525	29.183	0.677	14.791
Attach II.A.3.GG	E	1.267	7.311	0.188	12.253
Attach II.A.3.HH	P	2.269	53.745	0.519	14.628
Attach II.A.3.II	E	1.266	7.994	0.189	26.634
Attach II.A.3.JJ	P	2.269	54.198	0.520	11.564
Attach II.A.3.KK	E	0.045	10.379	0.050	14.796
Attach II.A.3.LL	P	1.952	49.867	0.131	12.513
Attach II.A.3.MM	E	0.945	26.82	0.418	6.615
Attach II.A.3.NN	P	1.924	51.585	1.647	29.109
Attach II.A.3.OO	E	0.433	41.339	0.199	25.120
Attach II.A.3.PP	P	0.425	12.995	0.423	5.280
230 kV Proposed Route: Skiffes Creek – Whealton					
Attach II.A.3.a	E	0.209	40.495	0.210	18.145
Attach II.A.3.b	P	0.213	30.659	0.222	10.890
Attach II.A.3.c	E	0.557	40.614	0.094	14.917
Attach II.A.3.d	P	0.213	30.659	0.052	9.047
Attach II.A.3.e	E	0.138	25.919	0.078	18.164
Attach II.A.3.f	P	0.050	19.501	0.228	11.041
Attach II.A.3.g	E	0.474	40.389	0.076	18.164

	Existing (E) or Proposed (P)	Left Edge Fields		Right Edge Fields	
		Electric (kV/m)	Magnetic (mG)	Electric (kV/m)	Magnetic (mG)
Attach II.A.3.h	P	0.219	30.463	0.228	11.041
Attach II.A.3.i	E	0.359	36.866	0.067	18.049
Attach II.A.3.j	P	0.391	39.062	0.406	4.370
Attach II.A.3.k	E	0.473	29.859	0.076	13.424
Attach II.A.3.l	P	0.223	20.815	0.227	4.768
Attach II.A.3.m	E	0.037	4.249	0.173	3.524
Attach II.A.3.n	P	0.193	28.269	0.152	11.541
Attach II.A.3.o	E	0.037	4.249	0.437	6.233
Attach II.A.3.p	P	0.195	28.249	0.408	10.609
Attach II.A.3.q	E	0.037	4.249	0.173	3.524
Attach II.A.3.r	P	0.195	28.249	0.152	11.537
Attach II.A.3.s	E	0.023	3.484	0.483	14.261
Attach II.A.3.t	P	0.106	19.679	0.411	13.430
Attach II.A.3.u	E	0.021	3.472	0.484	14.268
Attach II.A.3.v	P	0.731	8.271	0.452	10.884
Attach II.A.3.w	E	0.023	3.484	0.483	14.261
Attach II.A.3.x	P	0.119	19.588	0.411	13.360
Attach II.A.3.y	E	0.637	25.843	0.735	17.903
Attach II.A.3.z	P	0.523	27.541	0.444	23.708
Attach II.A.3.aa	E	0.649	30.794	0.090	2.896
Attach II.A.3.bb	P	0.658	34.045	1.413	22.878
Attach II.A.3.cc	E	0.633	13.823	0.736	10.307
Attach II.A.3.dd	P	0.523	10.040	0.462	19.751
Attach II.A.3.ee	E	0.099	16.847	0.170	10.075
Attach II.A.3.ff	P	0.111	19.106	0.132	14.178
Attach II.A.3.gg	E	0.073	4.767	0.846	12.604
Attach II.A.3.hh	P	0.456	7.749	0.455	17.155
Attach II.A.3.ii	E	0.099	16.847	0.906	16.506
Attach II.A.3.jj	P	0.111	19.227	0.631	22.661
Attach II.A.3.kk	E	0.099	16.847	0.170	10.075
Attach II.A.3.ll	P	0.111	19.106	0.132	14.178

IV. HEALTH ASPECTS OF EMF

B. If Company is of the opinion that no significant health effects will result from the construction and operation of the line, describe in detail the reasons for that opinion and provide references or citations to supporting documentation.

Response: The foundation of the Company's opinion is the conclusions of expert panels formed by national and international scientific agencies; each of these panels has evaluated the scientific research related to health and power-frequency electric and magnetic fields (EMF) and provided conclusions that form the basis of guidance to governments and industries. The Company regularly monitors the recommendations of these expert panels to guide their approach to EMF.

Major reviews on this topic, in order of their most recent publication, include those published by the European Health Risk Assessment Network on Electromagnetic Fields Exposure (EFHRAN),[11] the International Commission on Non-Ionizing Radiation Protection (ICNIRP), the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR), the World Health Organization (WHO), and the International Committee on Electromagnetic Safety (ICES) (EFHRAN, 2010; ICNIRP, 2003, 2010; SCENIIR 2007, 2009; WHO, 2007; ICES, 2002).

Research on this topic varies widely in its approach. Some studies evaluate the effects of high EMF exposures not typically found in our day-to-day lives, while others evaluate the effects of common EMF exposures. The studies evaluate long-term effects (e.g., cancer, neurodegenerative diseases, and reproductive effects) and short-term biological responses. This research includes hundreds of epidemiology studies of people in their natural environment and laboratory studies of animals (*in vivo*) and isolated cells and tissues (*in vitro*). Standard scientific procedures are used by the expert panels to identify, review and summarize this large and diverse research area.

The general scientific consensus of the health agencies reviewing this research is that at levels associated with the operation of the proposed transmission line, or other common sources of EMF in our environment, the research does not support the conclusion that EMF causes any long-term, adverse health effects.

Thus, based on the conclusions of scientific reviews and the levels of EMF associated with the Project, the Company has determined that no adverse health effects will result from the operation of the proposed transmission lines.

[11] EFHRAN is funded by the European Commission's Executive Agency for Health and Consumers.

IV. HEALTH ASPECTS OF EMF

C. Describe any research studies the Company is aware of that meet the following criteria:

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

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

3. Have been subjected to peer review.

Response: The Virginia Department of Health's most recent review of studies on EMF was completed in 2000; many peer-reviewed research studies have become available since that time and were reviewed by the scientific organizations discussed above. The WHO recently conducted one of the most comprehensive and detailed reviews, which summarized peer-reviewed research published through early 2006 (WHO, 2007).

Research published in the peer-reviewed literature subsequent to the WHO report has been reviewed by several scientific organizations, all of which support the conclusions of the WHO (2007) report, including:

- The Health Council of the Netherlands (HCN) reviewed new research in 2007.
- SCENIHR, a committee of the European Commission, published their most recent assessment in 2009.
- The Swedish Radiation Protection Authority (SSI) updates their review annually; their most recent review evaluated research through 2007 (SSI, 2008).
- EFHRAN published the most recent review in February 2010.

These reviews can be consulted for commentary on recent studies. In addition, other recent peer-reviewed studies (e.g., Chung et al., 2010; Coble et al., 2009; Kheifets et al., 2010a, 2010b; Kroll et al., 2010; McNamee et al., 2010) provide evidence that clarifies previous findings.

- Chung et al. (2010) found no difference in lymphoma rates between cancer-prone mice exposed long-term to strong magnetic fields and an unexposed control group. Mice were exposed 21 hours per day for 40 weeks to magnetic fields up to 5,000 mG, which is hundreds to thousands of times greater than routine residential exposures. This study is consistent with previous *in vivo*

studies that found no evidence that magnetic fields promote the development of lymphoma or leukemia in laboratory animals.

- Coble et al. (2009) conducted a case-control study in the United States ("U.S.") of brain tumors (gliomas and meningiomas) in U.S. workers. This study was advanced because several different measures were used to assess individual exposure, and exposure duration was incorporated into lifetime magnetic-field exposure. No association was reported between any of the exposure metrics and brain tumors. This study's strengths are its large size and advanced exposure assessment.

- Kheifets et al. (2010a) conducted a pooled analysis of epidemiologic studies of childhood brain tumors and magnetic fields to explore the association in the larger pooled population. Ten case-control studies of childhood brain tumors were identified that met the inclusion criteria. No statistically significant associations with brain tumors were found in any of the three exposure levels, compared to average exposure less than 1 mG. A sub-group of five studies with information on calculated or measured magnetic fields greater than 3-4 mG reported a combined odds ratio that was elevated but not statistically significant.

- Kheifets et al (2010b) pooled data from studies of childhood leukemia and magnetic fields to update the previous meta-analyses on this topic published in 2000. The authors identified seven subsequent case-control studies of childhood leukemia that included measured or calculated magnetic field levels. Results showed an overall weak association with leukemia for the highest estimated long-term average exposure level (4 mG or higher) that was slightly elevated, but could not be distinguished from chance. This study confirms a positive association between average magnetic field levels greater than 3 mG and childhood leukemia, but the association could not be distinguished from chance due to small numbers.

- Kroll et al. (2010) re-evaluated a previous study in the United Kingdom that had reported childhood leukemia was associated with distance of a child's home at birth from a power line (Draper et al, 2005). Distance is considered a poor estimate of magnetic field exposure; therefore, Kroll et al. repeated the study using calculated magnetic field levels from nearby power lines. The results showed a weak, non-significant association between leukemia and the calculated magnetic fields from high-voltage power lines. As a result of small numbers and incomplete information, no strong conclusions can be drawn from this study.

- Recent research by McNamee et al. (2010a) examined how acute exposure of human subjects to 60-Hz magnetic fields affected human heart rate, heart rate variability and skin blood perfusion; no effects of exposure to an 18,000 mG magnetic field on these measures were reported. A similar study by these

investigators also reported no effects of these parameters at a lower magnetic field intensity of 2,000 mG (McNamee et al., 2010b).

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World Health Organization (WHO). Environmental Health Criteria 238: Extremely Low Frequency (ELF) Fields. WHO, Geneva, Switzerland, ISBN 978-92-4-157238-5, 2007.

http://www.who.int/peh-emf/publications/elf_ehc/en/index.html

V. NOTICE

A. Furnish a proposed route description to be used for public notice purposes. Provide a map of suitable scale showing the route of the proposed project.

Response: A map showing the 500 kV Proposed and Alternate Routes and the 230 kV Skiffes Creek-Whealton line is provided as Attachment V.A. Written descriptions of the routes for the Project are as follows:

500 kV Proposed Route (Surry-Skiffes Creek Line):

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, and then pivots northeast and crosses the James River for 3.5 miles. After coming onshore in James City County, the route continues for 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 0.3 mile crossing Utility Street and reaches the Dow Chemical Substation. From the substation location to the proposed Skiffes Creek Switching Station, the route would continue for 1.5 miles to the north, crossing U.S. Route 60. Then the route pivots to the northwest for 0.2 mile to its terminus at the proposed Skiffes Creek Switching Station. This last 1.7 miles would utilize an existing Dominion Virginia Power right-of-way that ranges from 80 to 130 feet in width. This existing right-of-way would need to be expanded to 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.

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

Dominion Virginia Power is in the process of consulting with the U.S. Department of Defense ("DOD") regarding the impacts to Felker Army 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 James River Crossing Variation 1. This Proposed Route using James River Crossing Variation 1 is 8.0 miles long with a James River crossing 4.1 miles long.

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, the route pivots northeast for 0.6 mile, pivots north for 1.0 mile offshore adjacent to the shoreline of 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.

500 kV Proposed Route (Surry-Skiffes Creek Line) with 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 0.2 mile to a point in the river, the route then pivots northeast 3.7 miles across the James River, paralleling the southern edge of an existing pipeline corridor that includes two natural gas pipelines and one refined petroleum products pipeline. Upon coming onshore in James City County, the route continues 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 right-of-way. From this point, the route would be the same as the Proposed Route, continuing 0.85 mile 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 and includes a James River crossing 3.8 miles long.

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

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, the 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 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 a thin strip of beach and the existing pipeline corridor, to a point just south of the Colonial 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 and includes a James River crossing 4.1 miles long.

500 kV Alternate Route (Chickahominy-Skiffes Creek):

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 24.9 miles to the 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 the Chickahominy Substation to the 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. Starting at the Chickahominy Substation on Chambers Road in Charles City County, the route parallels the existing 500 kV line 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 south southeast for 1.5 miles crossing The Glebe Lane (Route 615). Turning southeast, the route continues 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. Entering James City County, the Alternate Route within the unimproved right-of-way continues 6.4 miles, crossing Yarmouth Island, Jolly Pond Road (Route 611), 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. Crossing Jolly Pond Road a second time, the route continues through the Colonial Heritage residential development.

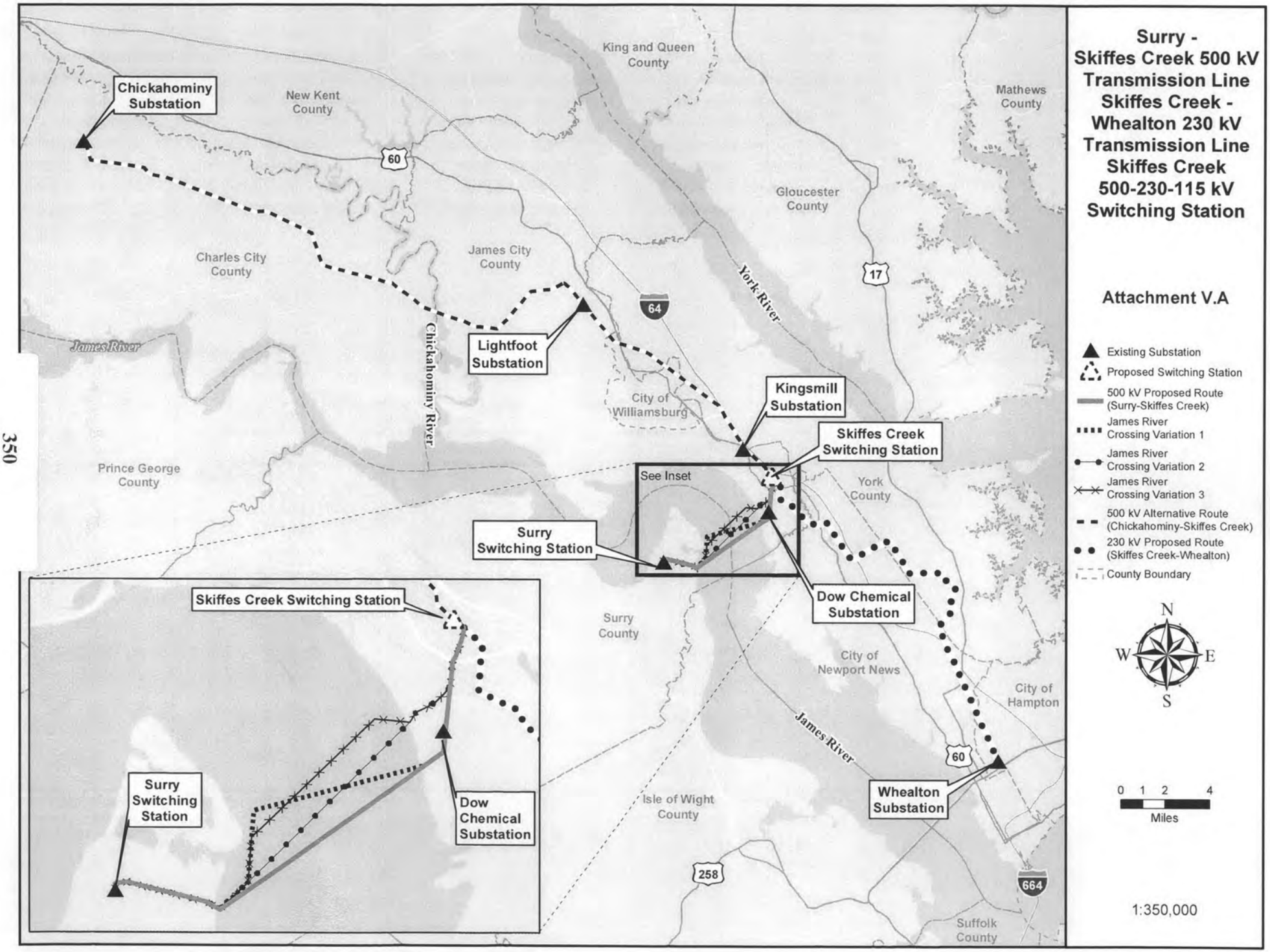
The Alternate Route then joins the improved and occupied right-of-way at the Lightfoot Junction and turns southeast approximately 13.0 miles to continue to the proposed Skiffes Creek Switching Station in James City County. In this occupied right-of-way, two existing 115 kV lines will be removed and an 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. The route initially proceeds 3.4 miles to the southeast from Lightfoot Junction, 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 5.5 miles and crosses Richmond Road (U.S. Route 60), Mooretown Road (Route 603), enters York County and crosses Waller Mill Road (Route 713) and Route 132 before entering the City of Williamsburg. It 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), Route 199 and continues behind the Williamsburg Country Club and an Interstate 64 interchange for U.S. Route 60

and Route 143. Before entering James City County for a second time and crossing Merrimac Trail (Route 143) and Pocahontas Trail (U.S. Route 60) to the existing Kingsmill Substation, the route splits into two separate 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. 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. 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 into 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 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.

230 kV Skiffes Creek-Whealton Line:

The proposed Skiffes Creek-Whealton 230 kV Transmission Line will consist of the installation 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, crosses Victory Boulevard, Lakeview 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 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 Drive 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). The proposed 230 kV line is approximately 20.2 miles long.


Surry - Skiffes Creek 500 kV Transmission Line
Skiffes Creek - Whealton 230 kV Transmission Line
Skiffes Creek 500-230-115 kV Switching Station
Attachment V.A
Chickahominy Substation
New Kent County
King and Queen County
Mathews County
Gloucester County
Charles City County
James City County
York River
James River
Chickahominy River
Lightfoot Substation
Kingsmill Substation
Skiffes Creek Switching Station
City of Williamsburg
Prince George County
See Inset
York County
Surry Switching Station
Dow Chemical Substation
Surry County
City of Newport News
City of Hampton
Isle of Wight County
Whealton Substation
Suffolk County
60
64
17
258
664
Existing Substation
Proposed Switching Station
500 kV Proposed Route (Surry-Skiffes Creek)
James River Crossing Variation 1
James River Crossing Variation 2
James River Crossing Variation 3
500 kV Alternative Route (Chickahominy-Skiffes Creek)
230 kV Proposed Route (Skiffes Creek-Whealton)
County Boundary
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Miles
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NOTICE

B. List of Company offices at which members of the public may inspect the application.

Response: The application is electronically available on the Project website at http://www.dom.com/about/electric-transmission/skiffes/index.jsp. In addition, the application is available at the following locations:

Dominion Virginia Power
701 East Cary Street
Richmond, VA 23219
Attention: Liz Harper OJRP 12

Surry County Planning Office
Surry County Government Center
45 School Street
Surry, VA 23883
Attention: Ms. Ronda Mack, Director of Planning

James City County Planning Office
101-A Mounts Bay Road
Williamsburg, VA 23185
Attention: Mr. Allen Murphy

City of Newport News Planning Office
City Hall, 2nd floor
2400 Washington Street
Newport News, VA 23607
Attention: Ms. Sheila McAllister, Director of Planning

City of Hampton Planning Office
City Hall, 5th floor
22 Lincoln Street
Hampton, VA 23669
Attention: Mr. Dave Stromberg

Charles City County Planning Office
10900 Court House Road
Charles City VA 23030
Attention: Ms. Allyson Finchum, Director of Planning

York County Planning Division
224 Ballard Street
Yorktown, VA 23690
Attention: Mr. Tim Cross, Principal Planner

City of Williamsburg Planning Office
Municipal Building
401 Lafayette Street
Williamsburg, VA 23185
Attention: Ms. Rhonda Rhodes, Zoning Administrator

V. NOTICE

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

Response:

Ellie Irons, Director (4 hard copies, 14 electronic copies)
Office of Environmental Impact Review
Virginia Department of Environmental Quality
629 East Main Street
Richmond, VA 23219

Rene Hypes
Virginia Natural Heritage Program
Virginia Department of Conservation and Recreation
217 Governor Street
Richmond VA 23219

Bert Parolari
Tidewater Regional Office
Virginia Department of Environmental Quality
5636 Southern Boulevard
Virginia Beach, VA 23462

Allison Dunaway
Piedmont Regional Office
Virginia Department of Environmental Quality
4949-A Cox Road
Glen Allen, VA 23060

Mr. James R. Cromwell
District Environmental Programs Manager
Virginia Department of Transportation
1401 East Broad Street
Richmond, VA 23219

Tony Watkinson
Chief of Habitat Management
Virginia Marine Resources Commission
2600 Washington Street, 3rd Floor
Newport New, VA 23140

Kathleen S. Kilpatrick, Director
Virginia Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221

Todd Groh
Virginia Department of Forestry
Fontaine Research Park
900 Natural Resources Drive, Suite 800
Charlottesville, VA 22903

R. N. Harrington, Manager
Airport Services Division
Virginia Department of Aviation
5702 Gulfstream Road
Richmond, VA 23250

Colonial National Historical Park
P.O. Box 210
Yorktown, VA 23690

Mr. G. Robert Lee
Executive Director
Virginia Outdoors Foundation
Capitol Place Building
1108 East Main Street, Suite 700
Richmond, Virginia 23219

Karen Mayne, Supervisor
Virginia Field Office
U.S. Fish and Wildlife Service
Ecological Services
6669 Short Lane
Gloucester, VA 23061

United States Army Corps of Engineers
Eastern District
Attn: Kim Prisco-Baggett
803 Front Street
Norfolk, VA 23510

John R. Musser, III
Chief, Aviation Division
Manager, Felker Army Airfield
Newport News, VA 23604

Colonial Williamsburg Foundation
P.O. Box 1776
Williamsburg, VA 23187-1776

Ms. Judy S. Lyttle, Chairman
Surry County Board of Supervisors
P.O. Box 65
Surry, VA 23883

Mr. Tyrone W. Franklin
Surry County Administrator
P.O. Box 65
Surry, VA 23883

Ms. Mary K. Jones, Chairman
James City County Board of Supervisors
P.O. Box 8784
Williamsburg, VA 23188

Mr. Robert C. Middaugh
James City County Administrator
P.O. Box 8784
Williamsburg, VA 23188

Mr. McKinley Price, Mayor
c/o Mabel V. Washington Jenkins
Newport News Clerk of City Council
2400 Washington Avenue, 9th floor
Newport News, VA 23607

Mr. Neil A. Morgan
Newport News City Manager
2400 Washington Avenue
Newport News, VA 23607

Mr. Thomas G. Shepperd, Jr., Chairman
York County Board of Supervisors
P.O. Box 532
Yorktown, VA 23690

Mr. James O. McReynolds
York County Administrator
P.O. Box 532
Yorktown, VA 23690

Ms. Molly Joseph Ward, Mayor
City of Hampton
Hampton City Hall, 8th floor
22 Lincoln Street
Hampton, VA 23669

Ms. Mary Bunting
City Manager's Office
Hampton City Hall, 8th floor
22 Lincoln Street
Hampton, VA 23669

Mr. Gilbert Smith Chairman
Charles City County Board of Supervisors
P.O. Box 128
Charles City, VA 23030

Ms. Jacqueline M. Wallace
Interim County Administrator
Charles City County
P.O. Box 128
Charles City, VA 23030

Mr. Clyde Haulman, Mayor
City of Williamsburg
401 Lafayette Street
Williamsburg, VA 23185

Mr. Jackson C. Tuttle
City Manager
City of Williamsburg
401 Lafayette Street
Williamsburg, VA 23185