



# **Dominion<sup>®</sup>**

**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-Wheaton 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 III of VI**



## **DOMINION VIRGINIA POWER**

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

### **Environmental Routing Study**

**P r e p a r e d   b y**



**J u n e   7 ,   2 0 1 2**



**DOMINION VIRGINIA POWER**  
**Surry-Skiffes Creek 500 kV Transmission Line**  
**Skiffes Creek-Whealton 230 kV Transmission Line**  
**Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

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**DOMINION VIRGINIA POWER**  
**Surry-Skiffes Creek 500 kV Transmission Line**  
**Skiffes Creek-Wheaton 230 kV Transmission Line**  
**Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

## **1.0 INTRODUCTION**

This report describes the environmental review and alternatives assessment conducted on behalf of Virginia Electric and Power Company (Dominion) by Natural Resource Group, LLC (NRG) for the proposed Surry-Skiffes Creek 500 kV Transmission Line, Skiffes Creek-Wheaton 230 kV Transmission Line, and Skiffes Creek 500 kV-230 kV-115 kV Switching Station in southeastern Virginia. In order to comply with mandatory North American Electric Reliability Corporation (NERC) Reliability Standards by increasing transmission capacity, Dominion proposes to construct (a) approximately 7.4 miles of new 500 kV electric transmission line in the Counties of Surry and James City from Dominion'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 Dominion; (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 Dominion's existing Wheaton Substation located in the City of Hampton; and (d) additional facilities at the existing Surry Switching Station and Wheaton Substation.

## **2.0 PROJECT DESCRIPTION**

The proposed project consists of two primary transmission line components, the Surry-Skiffes Creek 500 kV Transmission Line and the Skiffes Creek-Whealton 230 kV Transmission Line, as well as the proposed Skiffes Creek Switching Station (see Figure 2.0-1 in Appendix A). Two alternative routes were identified and assessed for the 500 kV transmission line. The 230 kV Skiffes Creek-Whealton Transmission Line would be constructed entirely within Dominion's existing right-of-way between the proposed Skiffes Creek Switching Station and the existing Whealton Substation; as a result, only the proposed route was assessed for this portion of the project. Each of the project components is described in more detail below.

A set of topographic and aerial photo-based route maps for the project are contained in Appendices I and J, respectively. The route maps have been mileposted to a tenth of a mile and are presented at 1:6,000 scale. A separate set of maps is provided for each of the three transmission line routes. The milepost (MP) designations for the Surry-Skiffes Creek 500 kV Transmission Line are preceded by an "S" (e.g., S1.0, S2.0, etc.), those for the three James River Crossing Variations are preceded by "JV1," "JV2," and "JV3," those for the Chickahominy-Skiffes Creek 500 kV Transmission Line are preceded by a "C," and the MPs for the Skiffes Creek-Whealton 230 kV Transmission Line are preceded by a "W." The environmental features discussed in the text are referenced by MP as appropriate.

### **2.1 THE CHICKAHOMINY-SKIFFES CREEK AND SURRY-SKIFFES CREEK 500 KV TRANSMISSION LINE ALTERNATIVES**

Several route alternatives were considered for this project. Ultimately two route alternatives were identified as feasible and evaluated for the 500 kV portion of the project. The first, the Chickahominy Alternative, would originate at the existing Chickahominy Substation (in Charles City County) and extend east/southeast to the new Skiffes Creek Switching Station in James City County. The second alternative, the Surry Alternative, would originate at Dominion's existing Surry Switching Station in Surry County and extend to the new Skiffes Creek Switching Station (see Figure 2.1-1 in Appendix A). Other alternatives that were considered included using the existing corridor from Chickahominy Substation to Lanexa, which was ultimately rejected after it was determined by Dominion to not be electrically feasible. Another routing option considered was potentially utilizing underground construction across the James River along the Surry Alternative, as discussed in Appendix Section I.C. of the State Corporation Commission (SCC) Application for this project.

#### **2.1.1 The Chickahominy Alternative**

The Chickahominy Alternative consists of two sections and is 37.89 miles long. The first section, the Chickahominy to Lightfoot Junction Section, is 24.93 miles long, with 0.78 miles adjacent to Dominion's existing 500 kV transmission Line #567 corridor and 24.15 miles located on existing but undeveloped easement owned by Dominion. The remaining approximately 12.96 miles is located on Dominion's existing 230/115 kV transmission line corridor that extends between the Lightfoot Junction and the Skiffes Creek Switching Station. The Lightfoot Junction does not represent a facility, but rather denotes the point of convergence between the undeveloped existing right-of-way portion of the route and an existing, developed Dominion right-of-way. Each section is described below.



#### **2.1.1.1 Chickahominy to Lightfoot Junction Section**

The Chickahominy to Lightfoot Junction Section of the Chickahominy Alternative would utilize an easement obtained by Dominion in the early 1970s that has not yet been cleared of vegetation or developed. The easement was purchased for a potential 500 kV line between the Chickahominy Substation and the site of the proposed Skiffes Creek Switching Station. This alternative would begin at the existing Chickahominy Substation and would extend for a distance of 24.93 miles through Charles City and James City Counties before intersecting with Dominion's existing transmission line corridor at Lightfoot Junction. The existing easement varies between 150 and 250 feet in width.

Starting at the Chickahominy Substation, it extends south for a distance of 0.78 mile adjacent to Dominion's existing Line #567. The route then turns southeast for approximately 2.39 miles across pasture and forested land, crossing Barnetts Road (State Route (SR) 609) and Samaria Lane. After crossing Samaria Lane the route pivots to the southeast and continues for approximately 5.37 miles, crossing Adkins Road, Courthouse Road (SR 155), and Sturgeons Point Road. This portion of the route predominantly consists of undeveloped forested land with some open pasture and a few agricultural tracts. After crossing Sturgeon Point Road the route again turns southeast and continues for approximately 2.30 miles across undeveloped forested land, crosses The Glebe Lane, and continues in a southeasterly direction for approximately 1.49 miles across a mixture of farms and undeveloped forested lands.

From here, the route turns further to the southeast for 8.39 miles, crossing Barrows Creek, Wilcox Neck Road, the Chickahominy River, Blackstump Creek, and Jolly Pond Road (SR 611). This portion of the route predominantly consists of undeveloped forested land consisting of a state Wildlife Management Area (WMA) with some parcels of farm and pasture lands. The Chickahominy River is about 1,850 feet wide at the crossing location. After crossing Jolly Pond Road (SR 611), this alternative route continues to the east for approximately 0.44 mile across undeveloped forested land. From this point the route turns to the northeast for approximately 3.77 miles across undeveloped forested land, crosses Jolly Pond Road (SR 611) for a second time, and intersects with Dominion's existing transmission corridor near the Colonial Heritage Golf Club and residential development.

#### **2.1.1.2 Lightfoot Junction to Skiffes Creek Section**

The Lightfoot Junction to Skiffes Creek Section of the Chickahominy Alternative is approximately 12.96 miles long. This portion of the route is located in the vicinity of the City of Williamsburg, Virginia and traverses residential and commercial areas. The route initially proceeds 3.39 miles to the southeast from Lightfoot Junction, crossing Highway 199, Old Towne Road (SR 658), and Waltz Farm Drive. The route then turns to the southeast for 5.47 miles and crosses U.S. Route 60, Route 132, and the Colonial Parkway before reaching Interstate 64. The route then pivots slightly to the southeast and proceeds adjacent to Interstate 64 for approximately 1.98 miles.

Before crossing Interstate 64 and reaching the existing Kingsmill Substation, the route splits into two subsections, one to the north and one to the south, with each subsection following an existing transmission right-of-way. To the north, the existing right-of-way is 150 feet wide and currently contains 230/115 kV wood pole structures (Lines #209 and #58). The existing

structures would be removed and replaced with steel single pole structures carrying a single circuit 500 kV line, which would be placed within the center of the right-of-way. To the south, the existing right-of-way is 100 feet wide and contains double circuit, steel pole structures with 230 and 115 kV lines (Lines #285 and #34). The 115 kV line would be replaced with the second 230 kV line relocated from the northern side of the right-of-way. The route of the new double circuit 230 kV line would also require relocation into the Kingsmill Substation, which would require approximately 4.0 acres of new 100-foot-wide right-of-way (see Figure C26 in Appendix J).

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

### **2.1.2 The Surry Alternative**

The Surry Alternative is 7.42 miles long. It extends in a northeasterly direction from Dominion's Surry Power Station in Surry County, crosses the James River, and terminates at the proposed Skiffes Creek Switching Station in James City County. The route originates at the Surry Switching Station and continues east for a distance of 1.38 miles paralleling an unnamed service road and a canal associated with the Surry Power Station. The route then pivots to the southeast for 0.23 mile, to a point just offshore in the James River, and then turns to the northeast for 3.48 miles and crosses the James River. After coming onshore in James City County, the route continues for 0.38 mile crossing a thin strip of beach, forested land, and a tidal stream channel feeding Wood Creek. The route then turns to the north for 0.30 mile crossing Utility Street and then reaches the Dow Chemical Substation. From the substation location to the proposed Skiffes Creek Switching Station, the route would utilize an existing Dominion right-of-way that currently contains a 115 kV line (a portion of Line #34). This existing right-of-way is 80 to 130 feet wide and would require expansion to a 150-foot width. It crosses through lightly developed and cleared forested land, and residential areas. The route then continues for 1.45 miles to the north, crossing U.S. Route 60. The route next pivots to the northwest for 0.19 mile to its terminus at the proposed Skiffes Creek Switching Station.

#### **2.1.2.1 The James River Crossing Variations**

Dominion also examined three route variations for crossing the James River along the Surry Alternative. These variations have been designated as the James River Crossing Variations 1, 2, and 3 (see Figure 2.1-1 in Appendix A). As will be discussed in more detail below in Section 4.2.6, these variations were developed to avoid potential impacts from the proposed crossing of the James River by the Surry Alternative to the airspace associated with Felker Army Airfield at Fort Eustis (Felker Airfield) (James River Crossing Variations 1 and 3) and/or to take advantage of a routing opportunity presented by a pipeline corridor that crosses the James River to the north of the Surry Alternative and continues east across James City County (James River Crossing Variations 2 and 3). The collocation of the proposed transmission corridor with this pipeline corridor also would avoid the bifurcation of a large tract currently owned by BASF on the eastern side of the James River. The location of each of these route variations is presented below.

#### **2.1.2.2 James River Crossing Variation 1**

The terrestrial portion of the James River Crossing Variation 1 is substantially the same as that of the Surry Alternative. There only is a minor deviation in James City County because the route comes onshore in James City County at a slightly different location. After leaving the shoreline in Surry County, the river crossing continues southeast for a distance of 0.1 mile. The river crossing then turns to the northeast across the James River for a distance of 0.55 mile. From this point, the river crossing pivots to the north for 1.02 miles adjacent to the shoreline of the Hog Island WMA. The river crossing then turns east for 2.46 miles, reaching the shoreline of the river in James City County. The total length of the Surry Alternative with the James River Crossing Variation 1 is 7.95 miles.

#### **2.1.2.3 James River Crossing Variation 2**

The terrestrial portion of the James River Crossing Variation 2 in Surry County is the same as that of the Surry Alternative. After leaving the shoreline in Surry County, the river crossing continues southeast for a distance of 0.1 mile. The river crossing then turns to the northeast to parallel the southern edge of an existing pipeline corridor that contains three pipelines and crosses the James River for 3.72 miles. Upon coming onshore in James City County, the river crossing continues to follow the southernmost pipeline, which is owned by Colonial Pipeline Company, and extends for 0.80 mile crossing a thin strip of beach and forested land until it intersects with Dominion's existing right-of-way that currently contains a 115 kV line (a portion of Line #34). From this point, the route would be the same as that of the Surry Alternative, continuing for 0.85 miles to the north, crossing U.S. Route 60, and then pivoting to the northwest for 0.19 mile to its terminus at the proposed Skiffes Creek Switching Station. The total length of the Surry Alternative with the James River Crossing Variation 2 is 7.17 miles.

#### **2.1.2.4 James River Crossing Variation 3**

The terrestrial portion of the James River Crossing Variation 3 in Surry County is the same as that of the Surry Alternative. After leaving the shoreline in Surry County, the river crossing continues southeast for a distance of 0.1 mile. The river crossing then pivots to the northeast to follow the pipeline corridor across the James River for a distance of 0.55 miles. From this point, the river crossing pivots to the north for 0.64 miles adjacent to the shoreline of the Hog Island WMA. The river crossing then turns northeast for 2.39 miles, crossing the James River, and then pivoting to the southeast for 0.45 mile to reach the shoreline of James City County. The river crossing then continues for 0.05 miles crossing a thin strand of beach, the corridor containing two Columbia Gas Transmission Pipelines and a wooded area, and then intersects the existing Colonial Pipeline Company Corridor. From this point, the James River Crossing Variation 3 follows the same route as the James River Crossing Variation 2. The total length of the Surry Alternative with the James River Crossing Variation 3 is 7.50 miles.

## **2.2 SKIFFES CREEK SWITCHING STATION**

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

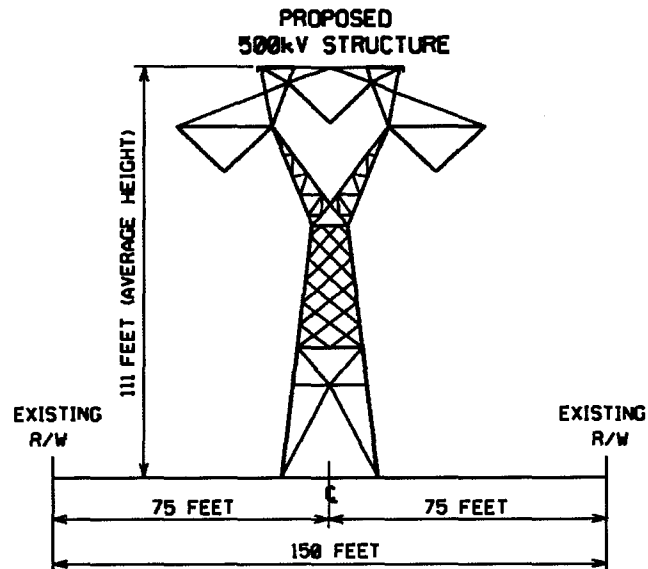
## **2.3 SKIFFES CREEK-WHEALTON 230 KV TRANSMISSION LINE**

The proposed Skiffes Creek-Whealton 230 kV Transmission Line will generally consist of replacing approximately 20.2 miles of existing single circuit 230 kV lines on existing Dominion right-of-way with new, double circuit 230 kV transmission line between the proposed Skiffes Creek Switching Station and the Whealton Substation. This new transmission line will be constructed within Dominion's existing right-of-way and will cross parts of James City County, York County, the City of Newport News, and the City of Hampton. From the proposed Skiffes Creek Switching Station, the line will proceed in a southeasterly direction for 3.69 miles, crossing U.S. Route 60 twice, Skiffes Creek, and the CSX Railroad. This portion of the route crosses a combination of undeveloped forest, commercial lands, and residential lands. The remainder of the route crosses primarily residential and commercial properties within the City of Newport News and the City of Hampton. After crossing the railroad, the route turns to the southeast to parallel the CSX Railroad corridor for a distance of 1.86 miles. The route then pivots to the east for 1.94 miles, crossing Interstate 64 to parallel another CSX Railroad corridor up to Richneck Road (SR 636). The route then turns in a southeasterly direction for a distance of 7.27 miles to travel around the eastern perimeter of the Newport News/Williamsburg International Airport, crossing Denbigh Boulevard, the Harwoods Mill Reservoir, Kiln Creek Parkway, Victory Boulevard, and Interstate 64. The route then continues in a southeasterly direction for 5.45 miles through commercial and residential areas crossing J. Clyde Morris Boulevard, Hampton Roads Center Parkway, and Todds Lane (SR 152), before ending at the Whealton Substation.

## **2.4 STRUCTURES**

Dominion will use several different structure types for the proposed 500 kV and 230 kV transmission lines. All 500 kV structures will be constructed of galvanized steel, while all 230 kV structures will be constructed of weathering steel. Along the Chickahominy Alternative, the 500 kV structures would consist of both lattice and single steel pole structures. From the Chickahominy Substation (MP C0.0) to Jolly Pond Road (MP C20.7), lattice structures with an average height of 111 feet would be used (see Figure 2.4-1). For the crossing of the Chickahominy River, two steel pole galvanized H-frame towers would be used to span the river (see Figure 2.4-2). Each tower would be bolted to concrete footings that would each be 20 feet by 20 feet, extending above ground or water level by 10 feet. From ground level, the towers would be approximately 195 feet tall.

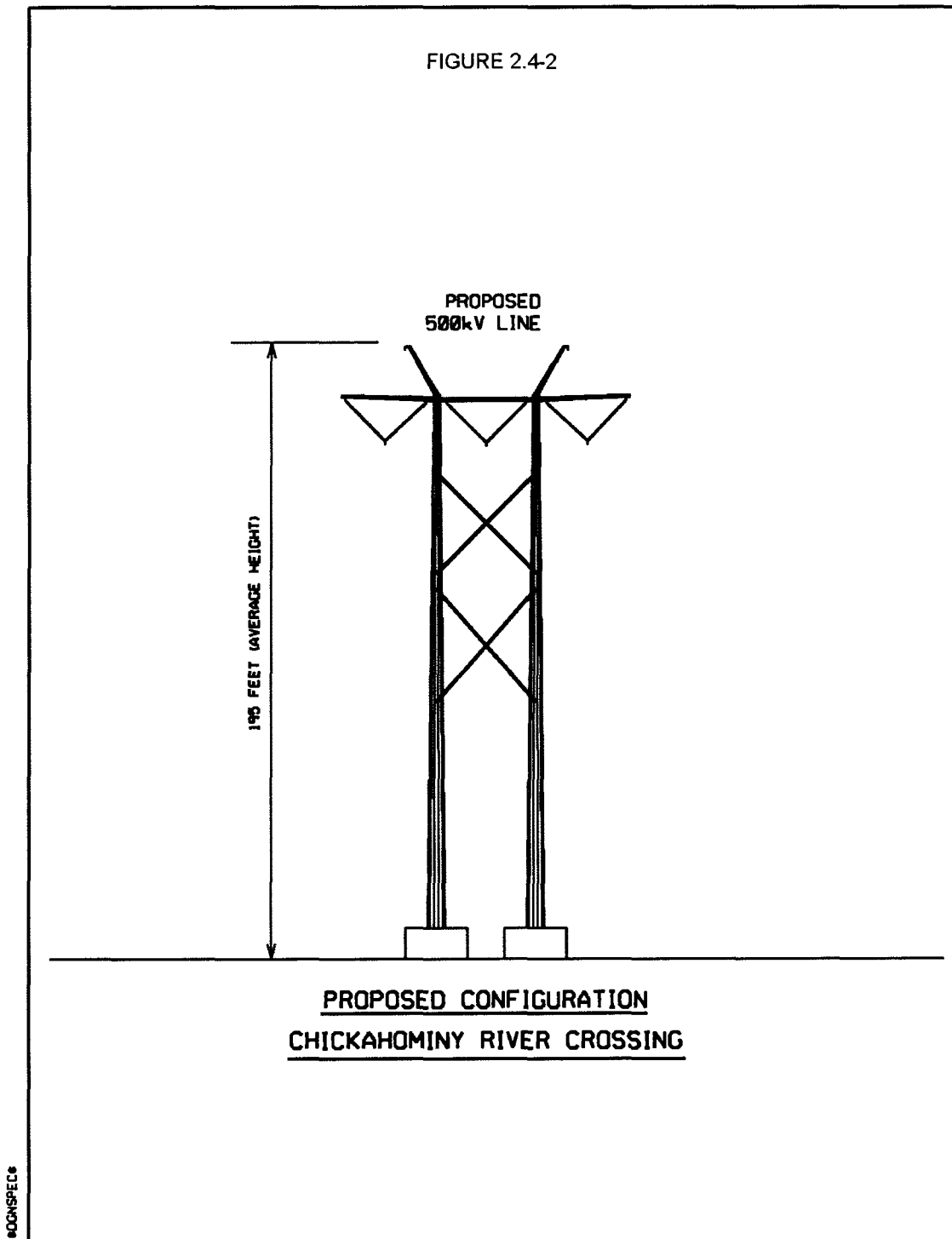
FIGURE 2.4-1



**PROPOSED CONFIGURATION**  
**BETWEEN CHICKAHOMINY SUB AND JOLLY POND ROAD**

#CONSPECS

FIGURE 2.4-2



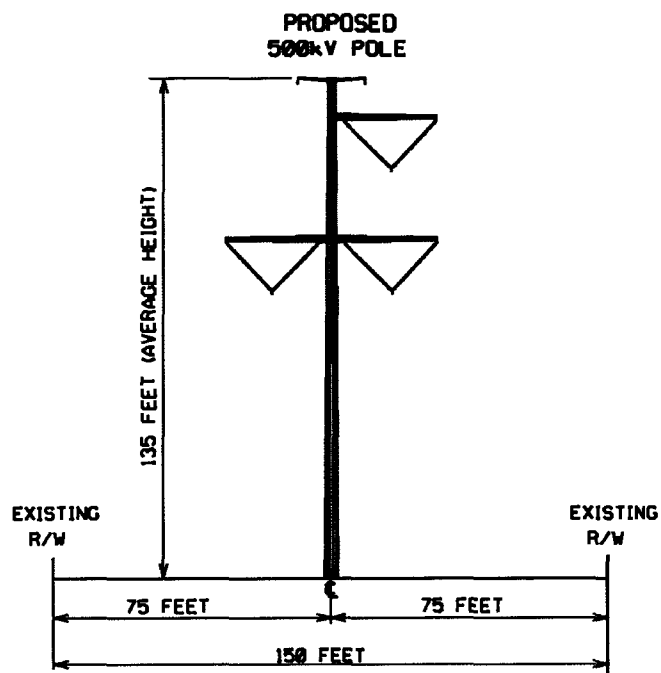
From Jolly Pond Road to Lightfoot Junction (MP C24.9) a single steel pole structure that averages about 135 feet in height would be used (see Figure 2.4-3). From Lightfoot Junction to the Skiffes Creek Switching Station (MP C37.9), the new structures would be constructed on existing transmission rights-of-way and would consist of galvanized single steel pole structures that average about 125 feet in height (see Figure 2.4-4).

Along the Surry Alternative and James River Crossing Variations, the 500 kV structures would be a combination of single steel pole structures and galvanized lattice structures, using several different designs that vary in height depending on the location along the route. From the Surry Switching Station (MP S0.0) to approximately MP S1.5, the tower design would consist of a single steel pole double circuit structure about 155 feet in height and configured for a single circuit (see Figure 2.4-5). Where the transmission line crosses the majority of the James River, (MPs S1.5 to S5.09), the transmission towers would consist of lattice structures ranging in height from approximately 160 feet to 175 feet tall (see Figure 2.4-6). At the two channel crossings in the river, taller galvanized lattice structures ranging in height from 275 feet to 295 feet would be used to span the two channels (see Figure 2.4-7). All structures used to cross the James River would be constructed on steel and concrete pilings. Across the river and onshore, from MP S5.09 to S5.77, lattice structures about 150 feet in height would be used (see Figure 2.4-8). Where the new 500 kV line would be built on the same right-of-way as an existing Dominion 115 kV transmission line (MP S5.7 to S7.42), the structure type would continue to be a similar design but would also carry the existing 115 kV circuit in an “under-built” configuration (see Figure 2.4-9).

For the majority of the proposed 230 kV Skiffes Creek to Whealton Section, the new transmission line structures that would replace existing structures would consist of a single steel pole double circuit 230 kV structure (see Figure 2.4-10). The structure would average about 115 feet tall and would be constructed of weathering steel that would turn a dark brown color after prolonged exposure to the weather. Two exceptions to this tower design along the Skiffes Creek to Whealton Section would occur from MPs W9.5 to W10.0 and from MPs W11.0 to W11.9. These two areas represent the portion of this transmission line section that currently crosses, and would be reconstructed within, the northern and eastern flight approaches to the two operating runways at Newport News/Williamsburg International Airport. Currently, Dominion's existing Line #2138 that crosses the northern flight approach to the airport is constructed on a double circuit 75-foot-tall structure with only a single circuit utilized. Dominion will replace the structures with a similar double circuit single pole design and height to meet Federal Aviation Administration (FAA) height restrictions within the flight approach area. On the east side of the airport between MPs W11.0 and 11.9, Dominion's existing transmission line right-of-way consists of two double pole H-frame structures that are each 52 feet tall. In this area, to accommodate the new 230 kV line, Dominion will construct a third 52-foot-tall double pole H-frame tower constructed of weathered steel on existing, but currently vacant, right-of-way (see Figure 2.4-11). An existing and proposed right-of-way cross section for this area can be found in Exhibit II.A.3.



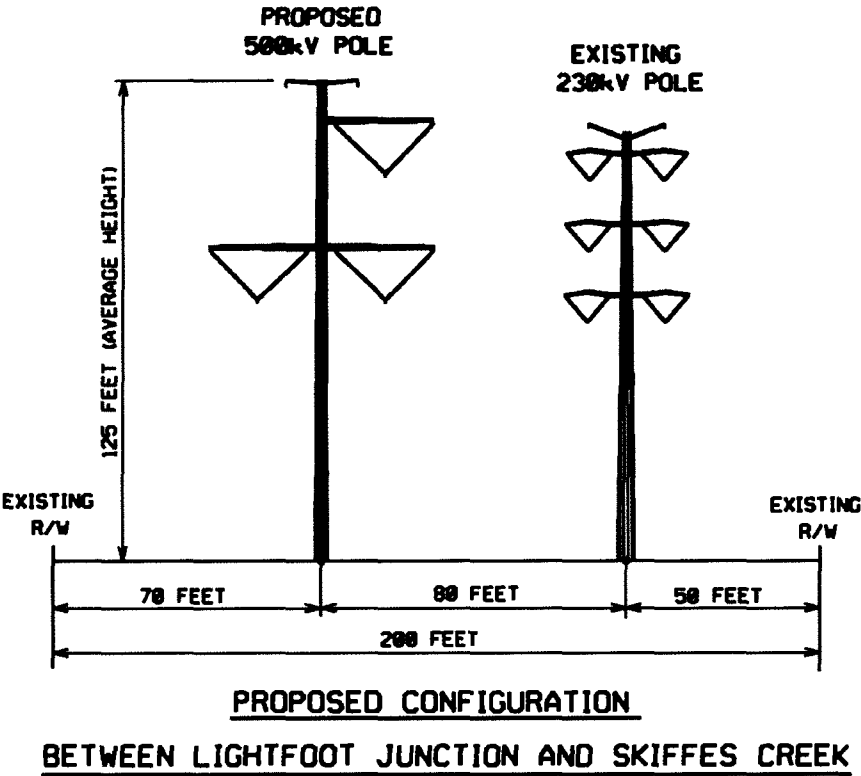
FIGURE 2.4-3



PROPOSED CONFIGURATION  
BETWEEN JOLLY POND ROAD AND LIGHTFOOT JUNCTION

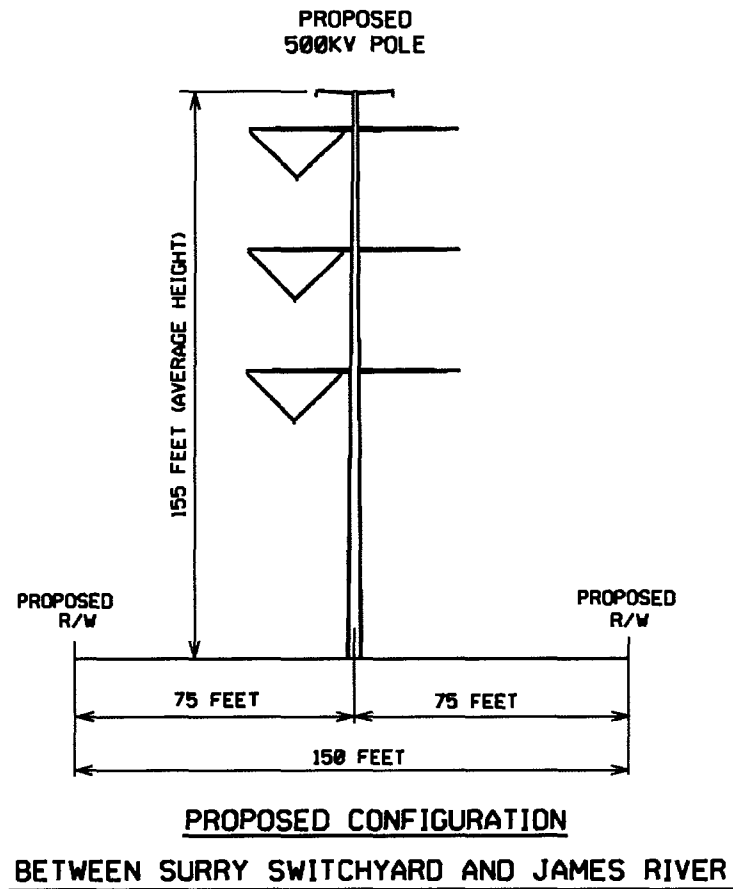
\*DDNSPEC\*

FIGURE 2.4-4



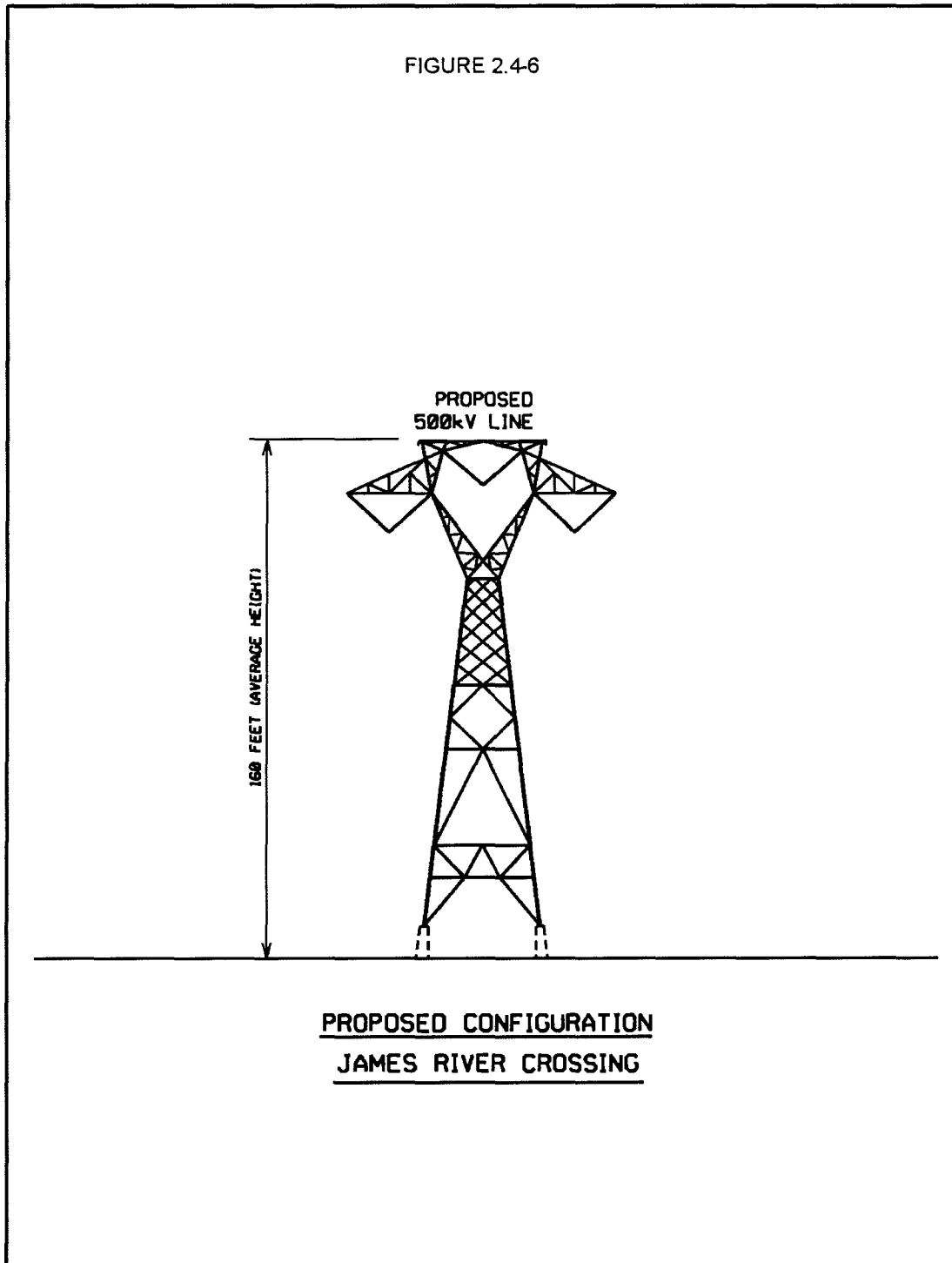
00GNSPEC

FIGURE 2.4-5



DCNSPEC

FIGURE 2.4-6



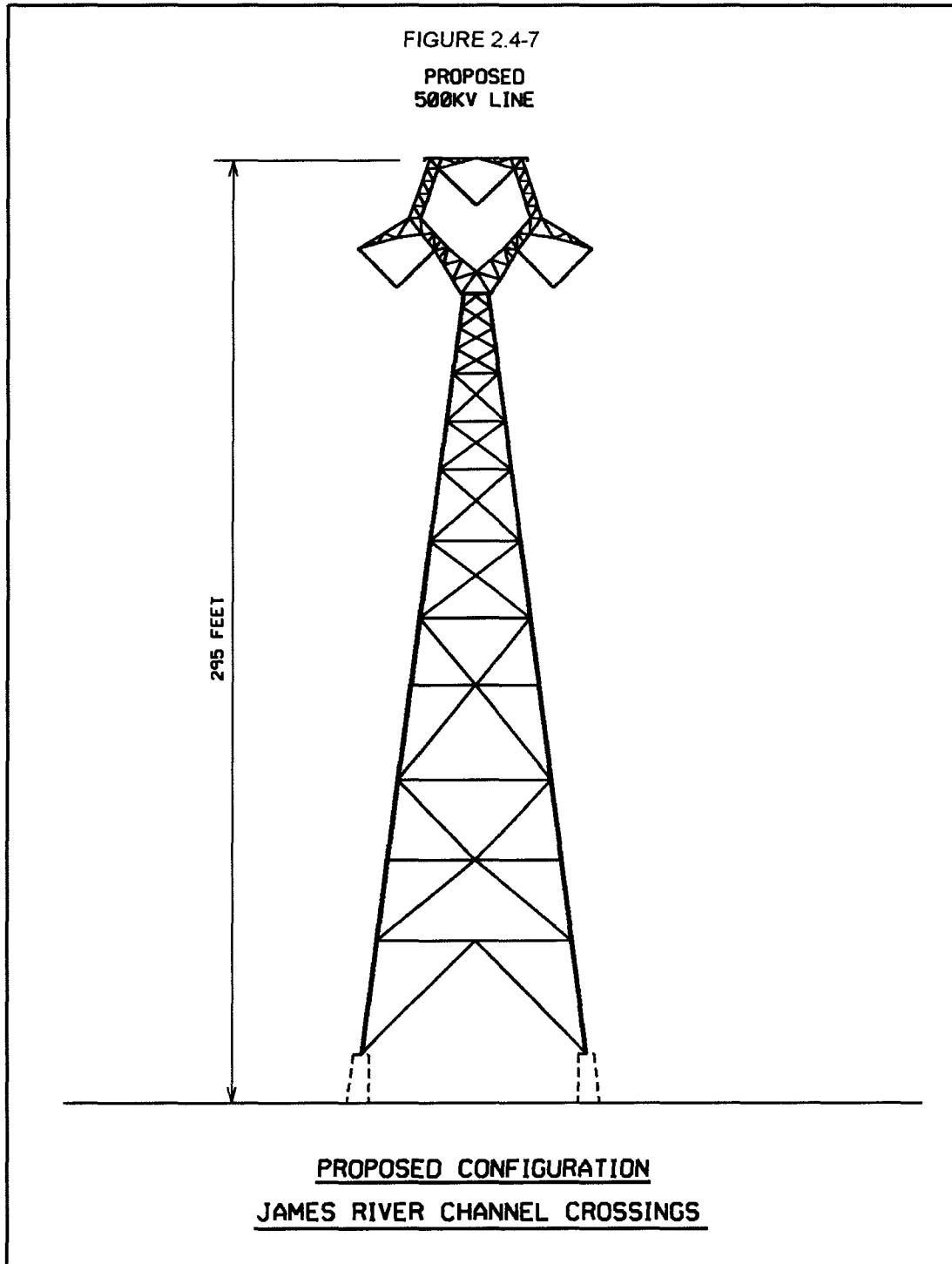
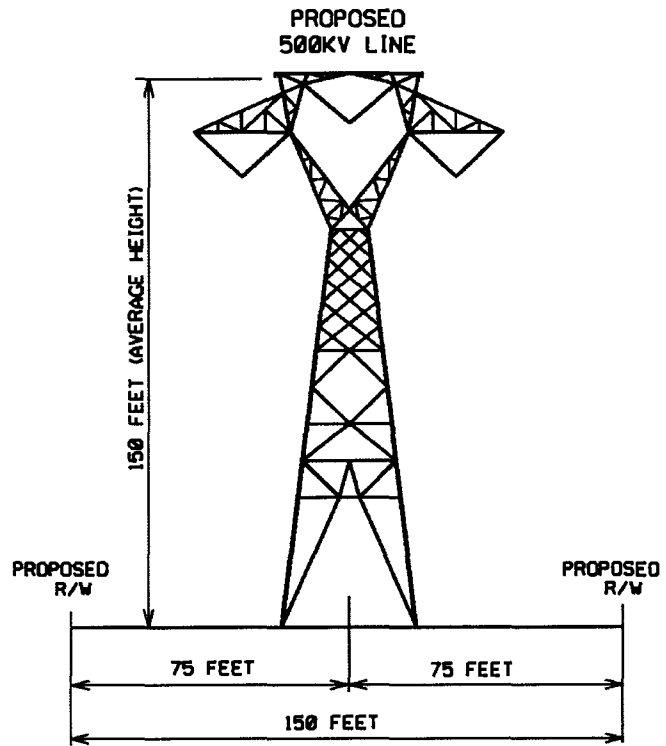


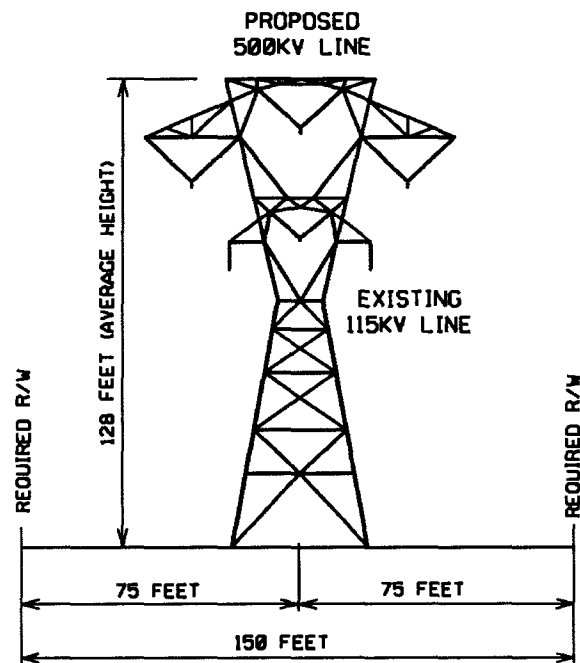
FIGURE 2.4-8



PROPOSED CONFIGURATION  
BETWEEN JAMES RIVER AND DOW CHEMICAL

#00NSPEC

FIGURE 2.4-9

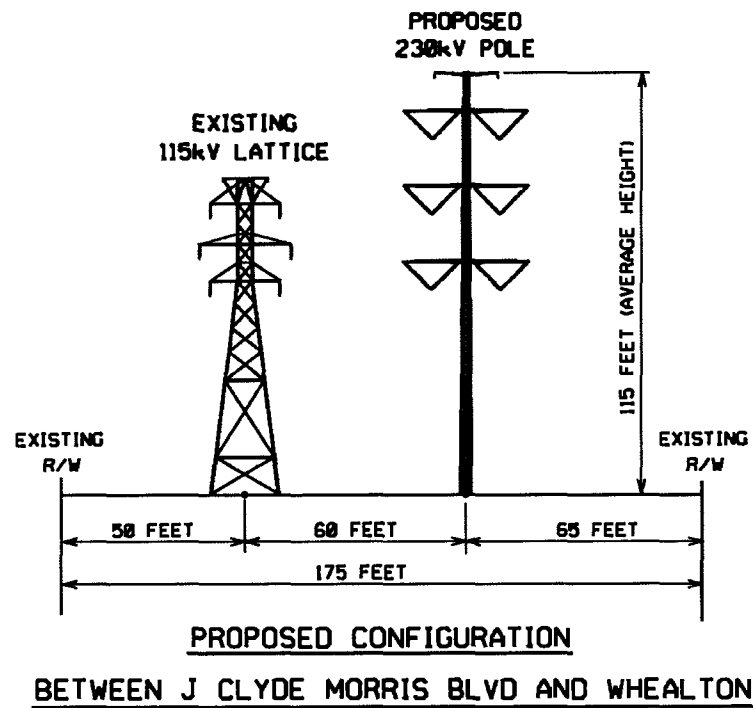


PROPOSED CONFIGURATION  
BETWEEN DOW CHEMICAL AND SKIFFES CREEK

•DGN SPEC•

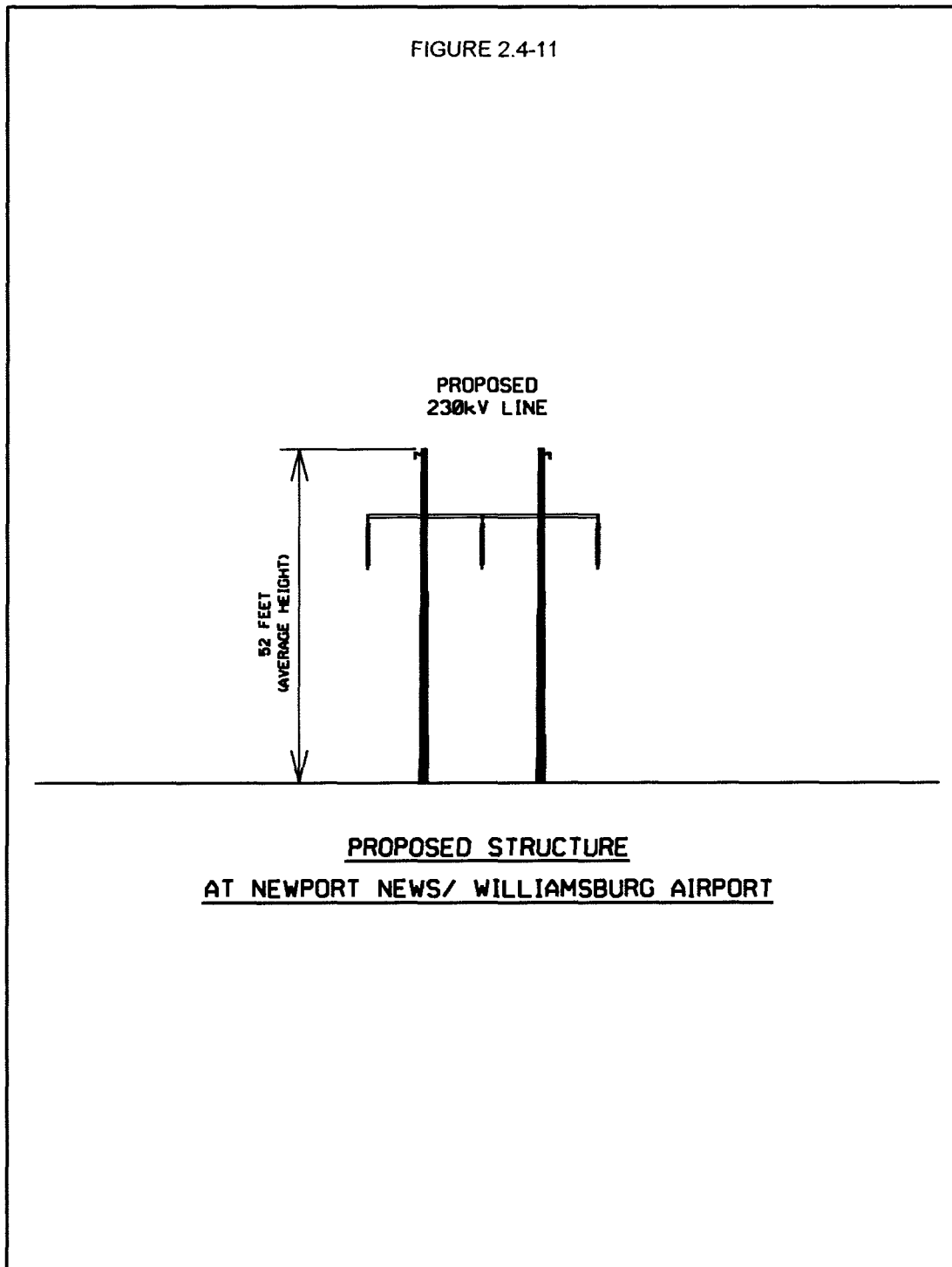


FIGURE 2.4-10



•DGN SPEC•

FIGURE 2.4-11



#DGN SPEC

## **2.5 CONSTRUCTION, OPERATION AND MAINTENANCE PROCESS**

Construction involves a number of steps, which are listed below:

- Detailed survey of the route alignment;
- Right-of-way acquisition and clearing;
- Construction of access roads, where necessary;
- Installation of tower foundations;
- Assembly and erection of new structures;
- Stringing and tensioning of the conductors; and
- Final clean-up and land restoration.

All appropriate materials for the proposed structures (both 500 kV and 230 kV) would be delivered and assembled at each structure location in the right-of-way. Detailed foundation design will not be completed until prior to construction; however, depending on soil conditions, could include poured concrete that requires excavation, or steel piles or caissons that might be vibrated or driven into the ground. Structures would be erected with a crane and anchored to the foundation during final assembly. If there is excess soil from foundation construction, it would be evenly distributed at each structure and the soil replanted and stabilized. In wetland areas, any excess soil would be removed and evenly distributed on an upland site within Dominion's right-of-way. Typical construction equipment would include hole diggers, cranes, wire-stringing rigs, tensioners, backhoes, and trucks.

All conductors and shield wires would be strung under tension. This system involves stringing a "lead line" between structures for the conductors and ground wires. The rope pulls a steel cable that is connected to the conductors and shield wires, which are pulled through neoprene stringing blocks to protect the conductor and shield wire from damage. Stringing the conductors and shield wires under tension protects the wires from possible damage should they be allowed to touch the ground, fences, or other objects.

Maintaining the right-of-way under the transmission lines is essential for the reliable operation of the line as well as public safety. Operation and maintenance of the line would consist of periodic inspections of the line and the right-of-way, occasional replacement of hardware as necessary, periodic clearing of vegetation, either mechanically or by selective, low volume application of approved herbicides of vegetation within the corridor, and the cutting of danger trees outside the right-of-way. Danger trees are trees outside the cleared corridor that are sufficiently tall to potentially impact the transmission line should the trees fall into the right-of-way. Periodic inspections would occur on a regular basis and utilize both aerial and walking patrols. Normal operation and maintenance would require only infrequent visits by Dominion or its contractors.

Most maintenance activities consist of selective, low-volume herbicide applications targeting only tree species on the right-of-way every 3 to 5 years, and the cutting of danger trees every 3 years. Dominion only uses herbicides that are approved by the U.S. Environmental Protection Agency (EPA) on power line rights-of-way.

## **River Construction**

The project would require construction of one in-stream 500 kV structure in the Chickahominy River along the Chickahominy Alternative or 16 in-stream 500 kV structures in the James River along the Surry Alternative. Seventeen in-stream structures would be required for the Surry Alternative with the James River Crossing Variation 1, 15 in-stream structures would be required for the Surry Alternative with the James River Crossing Variation 2, and the Surry Alternative with the James River Crossing Variation 3 would require 16 in-stream structures. Plans are for materials to be delivered by barge with foundation and tower construction work activities taking place from barge(s) at each structure location. If barge access is not feasible at the structure location in the Chickahominy River or at any of the shallow James River structures, a floatation mat system would be considered for use to allow material delivery, equipment access and a work area for the construction activities. The foundation system for each leg of the structure would consist of several steel or concrete piles connected together at the top with a poured in-place concrete cap. The piles would be driven down into the subsurface below the river bottom to the required design depth.

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

For the Surry Alternative, each structure in the James River would consist of a lattice structure with four support foundations and would require a total of approximately 20 piles; approximately 5 piles per foundation connected together at the top with a poured in-place concrete cap. Each pile would be driven into the subsurface below the river bottom to the required design depth. Vertical and battered piles would be utilized to satisfy design requirements. Anticipated maximum dimensions for the concrete cap are 12-foot by 12-foot by 6-foot. The top of the cap would be installed approximately 15 feet above the waterline. Total structure footprint with foundations would require a total area of approximately 90 feet by 90 feet for towers taller than 200 feet in height and 60 feet by 60 feet for towers less than 200 feet in height. A fender system consisting of driven piles would also be placed along the channel side of those structures on either side of the channels to protect them from collisions with ship traffic. The fenders would be approximately 100 linear feet.

Assembly and installation of all river structures would proceed as described above for land construction but from barges and conductors and shield wires would likely be initially pulled by boat across the river. Additionally, in the James River, structures would be located at least 250 feet from the toe of the channel of the designated shipping lanes and a minimum offset distance of 250 feet outside of designated dredge spoil areas, per direction from the U.S. Army Corps of Engineers (COE) and the U.S. Coast Guard (USCG).

## 2.6 RIGHT-OF-WAY WIDTH

The rights-of-way for various sections of the project vary considerably in width and consist of multiple transmission line configurations. Dominion developed a series of right-of-way cross sections that depict the structure types and dimensions and the associated right-of-way widths by MP for each section of the project. This information is summarized in Table 2.6-1.

The 500 kV Surry Alternative and James River Crossing Variation 1 would require the clearing (as needed) and utilization of 150 feet of new right-of-way in areas where it would be constructed as a new corridor for a total distance on land of about 0.67 mile.<sup>1</sup> The construction of the James River Crossing Variations 2 and 3 would require the clearing (as needed) and utilization of 150 feet of new right-of-way for a total distance on land of about 0.80 mile. In areas where these routes would utilize existing 115 kV or 230 kV transmission line corridors, it would require widening the existing 80- to 130-foot corridor to 150 feet wide.

The 500 kV Chickahominy Alternative would parallel Dominion's existing 500 kV Line #567 for a distance of approximately 0.78 mile as it proceeds south out of the Chickahominy Substation. In this short section, it would be adjacent to the existing right-of-way and would require clearing of the 125 to 150 feet of existing, but undeveloped, right-of-way. From where the new 500 kV line would leave Line #567 and proceed to Lightfoot Junction, the new corridor would require the clearing and utilization of the 150- to 250-foot existing, but previously undeveloped, right-of-way for a distance of approximately 24.15 miles. From Lightfoot Junction, where it joins Dominion's existing 115/230 kV (Lines #2113/58 and #2102/34) transmission line and the new Skiffes Creek Switching Station, a distance of approximately 12.94 miles, the 500 kV transmission line would not require the acquisition of any new right-of-way because it would be built completely within Dominion's existing rights-of-way, which vary in width. Despite the new 500 kV line being built within existing right-of-way, this Alternative would require the acquisition and clearing of two short sections of new right-of-way approximately 100 feet wide (total of approximately 4.0 acres) each at Kingsmill Substation for 230 kV line rearrangement into the substation.

Between Skiffes Creek Switching Station and Whealton, the new 230 kV transmission line would be built entirely within Dominion's existing rights-of-way, which vary in width. Dominion will need to clear an additional 100 feet of its existing right-of-way between MPs W10.99 and W11.92 to accommodate the construction of additional structures in this area. No additional clearing will be required elsewhere along the Skiffes Creek to Whealton Section.

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<sup>1</sup> This total does not include the portion of the route that crosses the property associated with the Surry Power Station because this right-of-way is owned by Dominion.

Dominion Virginia Power  
 Surry-Skiffes Creek 500 kV Transmission Line  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station

TABLE 2.6-1

**Surry-Skiffes Creek 500 kV Transmission Project  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

**Right-of-Way Cross Sections by Transmission Line Segment**

Proposed Right-of-Way Cross-Section <sup>a</sup>	Start Milepost	End Milepost	Total Length (Miles)	Appendix J Map Reference (Sheet No.)
<b>Surry Alternative</b>				
II.A.3.A	S0.00	S1.60	1.60	1 and 2
II.A.3.B	S1.60	S2.72	1.12	2 and 3
II.A.3.C	S2.72	S3.20	0.48	3
II.A.3.B	S3.20	S3.90	0.70	3 and 4
II.A.3.C	S3.90	S4.40	0.50	4 and 5
II.A.3.B	S4.40	S5.07	0.67	5
II.A.3.D	S5.07	S5.73	0.66	5 and 6
II.A.3.F	S5.73	S6.70	0.97	6 and 7
II.A.3.H	S6.70	S6.82	0.12	7
II.A.3.J	S6.82	S7.08	0.26	7
II.A.3.H	S7.08	S7.21	0.13	7
<b>Surry Alternative (James River Crossing Variation 1)</b>				
II.A.3.V1-1	JV1-0.00	JV1-1.65	1.65	1 and 2
II.A.3.V1-2	JV1-1.65	JV1-2.14	0.49	2 and 3
II.A.3.V1-1	JV1-2.14	JV1-2.95	0.81	3
II.A.3.V1-3	JV1-2.95	JV1-3.35	0.40	3 and 4
II.A.3.V1-1	JV1-3.35	JV1-4.00	0.65	4
II.A.3.V1-4	JV1-4.00	JV1-4.04	0.04	4
<b>Surry Alternative (James River Crossing Variation 2)</b>				
II.A.3.V2-1	JV2-0.00	JV2-1.17	1.17	1 and 2
II.A.3.V2-2	JV2-1.17	JV2-1.66	0.49	2
II.A.3.V2-1	JV2-1.66	JV2-2.55	0.89	2 and 3
II.A.3.V2-3	JV2-2.55	JV2-3.00	0.45	3
II.A.3.V2-1	JV2-3.00	JV2-3.72	0.72	3 and 4
II.A.3.V2-4	JV2-3.72	JV2-4.52	0.80	4 and 5
<b>Surry Alternative (James River Crossing Variation 3)</b>				
II.A.V3-1	JV3-0.00	JV3-1.47	1.47	1 and 2
II.A.V3-2	JV3-1.47	JV3-1.96	0.49	2
II.A.V3-1	JV3-1.96	JV3-2.90	0.94	3
II.A.V3-3	JV3-2.90	JV3-3.35	0.45	3 and 4
II.A.V3-1	JV3-3.35	JV3-4.05	0.70	4
II.A.V3-4	JV3-4.05	JV3-4.85	0.80	4 and 5
<b>Chickahominy Alternative</b>				
II.A.3.BB	C-0.07	C0.79	0.86	C1
II.A.3.CC	C0.79	C21.15	20.36	C1 – C16
II.A.3.DD				
II.A.3.EE	C21.15	C24.94	3.79	C16 – C18
II.A.3.FF				
II.A.3.HH	C24.94	C29.95	5.01	C18 – C22

Dominion Virginia Power  
 Surry-Skiffes Creek 500 kV Transmission Line  
 Skiffes Creek-Whealton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station

TABLE 2.6-1 (cont'd)

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

**Right-of-Way Cross Sections by Transmission Line Segment**

Proposed Right-of-Way Cross-Section <sup>a</sup>	Start Mile post	End Milepost	Total Length (Miles)	Appendix J Map Reference (Sheet No.)
II.A.3.JJ	C29.95	C35.17	5.22	C22 – C26
II.A.3.LL	C35.17	C35.78	0.61	C26
II.A.3.NN	C35.78	C37.89	2.11	C26 and C27
II.A.3.PP	K0.00	K2.04	2.04	C26 and C27
<b>Skiffes Creek to Whealton Section</b>				
II.A.3.b	0.00	1.18	1.18	W1
II.A.3.d	1.18	2.00	0.82	W1 and W2
II.A.3.f	2.00	2.60	0.60	W2
II.A.3.h	2.60	2.95	0.35	W2 and W3
II.A.3.j	2.95	6.60	3.65	W3 – W5
II.A.3.l	6.60	7.55	0.95	W5 and W6
II.A.3.n	7.55	8.36	0.81	W6
II.A.3.p	8.36	8.92	0.56	W6 and W7
II.A.3.r	8.92	9.24	0.32	W7
II.A.3.t	9.24	9.49	0.25	W7
II.A.3.v	9.49	10.00	0.51	W7
II.A.3.x	10.00	10.70	0.70	W7 and W8
II.A.3.z	10.77	10.99	0.29	W8
II.A.3.bb	10.99	11.92	0.93	W8
II.A.3.dd	11.92	16.82	4.90	W8 – W12
II.A.3.ff	16.82	19.10	2.28	W12 and W13
II.A.3.hh	19.10	19.48	0.38	W13 and W14
II.A.3.jj	19.48	19.85	0.37	W14
II.A.3.ll	19.85	20.22	0.37	W14

<sup>a</sup> The cross sections can be found in Section II.A.3 of the Commonwealth of Virginia SCC Application.



### **3.0 INVENTORY OF EXISTING CONDITIONS**

NRG identified and mapped existing land use, environmental, visual, and cultural features within the vicinity of the proposed project area. Data were collected, mapped, and plotted on U.S. Geological Survey (USGS) 7.5-minute series topographic quadrangles and recent (2011) high-resolution digital aerial photography using ArcGIS software (v. 10). Information was obtained from publicly available Geographic Information System (GIS) databases, agency websites and databases, published documents such as county or municipal land use plans, and communication with agency staff, stakeholders, and elected officials. In those cases where GIS data were not available for a particular environmental resource or other feature, NRG obtained the best available hard-copy or on-line map and hand digitized the information needed to complete the study.

The existing conditions along each component of the project are discussed below. The discussion of the Surry Alternative documents the four proposed alignments of the 500 kV route across the James River.

Table 3-1 identifies the categories of environmental features considered in the study. Descriptive information regarding these features within the study area is provided in subsequent sections.

#### **3.1 LAND USE**

##### **3.1.1 Land Ownership**

NRG quantified information on land ownership in the project area using publically available GIS databases and digital tract data obtained from Charles City County, James City County, Surry County, the City of Williamsburg, York County, the City of Newport News, and the City of Hampton. These data indicate that the majority of lands crossed by all route sections are privately owned with smaller portions of federal, state, county, and city land, existing rights-of-way, and land for which ownership is not listed. Figure 3.1.1-1 in Appendix A depicts landownership along each route segment. The paragraphs below describe the locations of non-private owned lands along each route segment.

The Chickahominy Alternative crosses two state-owned parcels between the Chickahominy Substation and Lightfoot Junction. These parcels are contiguous and are located between Wilcox Neck Road and the Chickahominy River between MPs C15.5 and C18.2. These parcels are regulated by the Virginia Board of Game and Inland Fisheries and are part of the Chickahominy WMA. This segment also crosses two James City County-owned parcels associated with Freedom Park located at Jolly Pond Road and Centerville Road between MPs C22.0 and C23.2.

Dominion Virginia Power  
 Surry-Skiffes Creek 500 kV Transmission Line  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station

TABLE 3-1

**Surry-Skiffes Creek 500 kV Transmission Project  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

**Environmental Features Considered in the Study Area**

Feature Type	Description
<b>Land Use</b>	
Land Ownership	<ul style="list-style-type: none"> <li>• Government Lands</li> <li>• Private Lands</li> </ul>
Recreational Areas	<ul style="list-style-type: none"> <li>• National, State, County, or Municipal Parks in the Project Vicinity</li> <li>• Federal, State, County or Municipal Managed Recreation Areas Crossed</li> <li>• Golf Courses</li> <li>• Recreation Trails (biking, hiking, birding, wildlife)</li> </ul>
Airport Facilities	<ul style="list-style-type: none"> <li>• Areas with Height Restrictions or Limitations in the Safety Overlay District</li> </ul>
Existing Land Use and Land Cover	<ul style="list-style-type: none"> <li>• Existing Subdivisions</li> <li>• Land Cover Types (e.g., Forest, Agricultural, Developed)</li> <li>• Residences, Churches, Schools, Cemeteries</li> </ul>
Planned Developments	<ul style="list-style-type: none"> <li>• Planned, Proposed or Conceptual Residential, Commercial, or Industrial Developments</li> </ul>
Land Use Planning and Zoning	<ul style="list-style-type: none"> <li>• Zoning Districts</li> </ul>
Conservation Lands	<ul style="list-style-type: none"> <li>• James City County Conservation Easements</li> <li>• Williamsburg Land Conservancy</li> <li>• Other Conservation Lands</li> <li>• Wetland Mitigation Banks</li> </ul>
<b>Environmental</b>	
Surface Waters	<ul style="list-style-type: none"> <li>• Wetlands</li> <li>• Waterbodies</li> </ul>
Protected or Managed Areas	<ul style="list-style-type: none"> <li>• Resource Protection Areas</li> <li>• Wildlife Management Areas</li> </ul>
Protected Species	<ul style="list-style-type: none"> <li>• Natural Heritage Resources</li> <li>• Threatened and Endangered Species</li> <li>• Bald Eagles</li> <li>• Oyster Beds</li> </ul>
Vegetation	<ul style="list-style-type: none"> <li>• Vegetation Characteristics</li> </ul>
<b>Visual</b>	
Visually Sensitive Areas	<ul style="list-style-type: none"> <li>• Viewsheds to and from Visually Sensitive Areas</li> <li>• Scenic Byways</li> <li>• Scenic Rivers</li> </ul>
<b>Cultural Resources</b>	
Cultural Resource Sites	<ul style="list-style-type: none"> <li>• Archaeological Sites</li> <li>• Historical or Architectural Sites</li> </ul>
<b>Geological</b>	
Mineral Resources	<ul style="list-style-type: none"> <li>• Mines or Quarries</li> </ul>
<b>Engineering</b>	
Length	<ul style="list-style-type: none"> <li>• Length of Routes</li> </ul>
Transportation Infrastructure Crossings	<ul style="list-style-type: none"> <li>• Roads</li> <li>• Railroads</li> </ul>
Greenfield Construction	<ul style="list-style-type: none"> <li>• New corridor (i.e., not adjacent to existing corridor)</li> </ul>
Riverine Construction	<ul style="list-style-type: none"> <li>• Federal Navigation and Shipping Channels</li> <li>• Dredging and Spoil Disposal</li> <li>• Clearances and Restricted Areas</li> </ul>

Dominion Virginia Power  
 Surry-Skiffes Creek 500 kV Transmission Line  
 Skiffes Creek-Whealton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station

TABLE 3-1 (cont'd)	
Surry-Skiffes Creek 500 kV Transmission Project Skiffes Creek-Whealton 230 kV Transmission Line Project Skiffes Creek 500 kV-230 kV-115 kV Switching Station	
Environmental Features Considered in the Study Area	
Feature Type	Description
Existing Corridors	
Existing Electric Facilities	<ul style="list-style-type: none"> <li>• Transmission or Distribution Lines</li> </ul>
Other Utilities	<ul style="list-style-type: none"> <li>• Pipelines</li> </ul>
Transportation Infrastructure	<ul style="list-style-type: none"> <li>• Roads or Railroads</li> </ul>

The Chickahominy Alternative crosses a number of federal, state, city, county, and federal-owned parcels between Lightfoot Junction and Skiffes Creek Substation. The route crosses a James City County-owned parcel associated with the Warhill Sports Complex between MPs C25.5 and C26.3. The route crosses a state-owned parcel just north of Route 658 in James City County near MP C27.4, which is managed by the Secretary of Veteran Affairs. The route crosses a parcel owned by the City of Williamsburg between MPs C28.9 and C29.9, portions of which are associated with Waller Mill Park. The route crosses a federally owned parcel associated with the Colonial National Historic Park Colonial Parkway just southeast of the crossing of Route 143 between MPs C31.9 and C32.0. Another state-owned parcel is crossed directly south of the Interstate 64 and Route 199 interchange between MPs C34.4 and C34.6. This parcel is part of Whitman Swamp and, based on 2011 aerial photography, is forested and undeveloped. In addition to these public lands, the route crosses multiple parcels owned by the Colonial Williamsburg Foundation on either side of Route 132 at MP C30.7.

The Surry Alternative and Surry Alternative with the James River Crossing Variation 1 cross lands that are all privately owned. For the Surry Alternative with the James River Crossing Variation 2 and 3, the route crosses one parcel that is owned by the James City County Economic Development Authority. This parcel is located between MPs JV2-4.4 and JV2-4.8 and JV3-4.1 and JV3-4.5. The parcel is part of the James River Commerce Center which is one of the designated James City County Enterprise Zones.

The Skiffes Creek to Whealton Section crosses a parcel of land owned by James City County, which extends from the terminus of Green Mount off of U.S. Route 60 south towards a clay pit off of Blow Flats Road between MPs W2.2 and W2.3. This parcel is part of the U.S. Route 60 relocation project discussed in more detail in Section 3.1.5 below. The route crosses multiple large and small parcels owned by the City of Newport News. The majority of these parcels are associated with the City of Newport News Park, which extends eastward from U.S. Route 60 between MPs W3.3 and W8.3; Harwoods Mill Park west of Route 17 and south of Route 173 between MPs W10.0 and W11.0, and W11.7 and W12.2; and the York County Sports Complex between MPs W11.0 and W11.7. Other city-owned parcels include a tract just south of Omni Boulevard and west of Route 17 between MPs W15.8 and W15.9, which is currently undeveloped, and two tracts near Diligence Drive west of Route 17 between MPs W16.2 and W16.3, which are part of a commercial district. The Skiffes Creek to Whealton Section crosses a federally owned parcel located just east of the Interstate 64 and Route 171 interchange between MPs W14.2 and W14.3. This parcel is managed by the Fort Monroe

Department of Public Works. The route also crosses a parcel owned by the City of Hampton located between Dunn Circle and Castle Haven Road near MP W18.4.

### **3.1.2 Recreation Areas**

NRG identified recreation areas through review of digital data sets and maps, USGS topographic quadrangles, and recent (2011) digital aerial photography. This review identified a variety of recreation areas either crossed or located within 0.25 mile of the alternative route sections. These areas are listed in Table 3.1.2-1, described below, and shown on Figure 3.1.2-1 in Appendix A.

#### **The Plantain Loop of the Virginia Birding and Wildlife Coastal Trail**

This trail connects historic and natural areas along the James River. The only trail of its kind in the United States, the Virginia Birding and Wildlife Trail provides drivable routes through various habitats and wildlife viewing areas while providing links to walking and biking trails. The trail runs for over 50 miles, primarily along Route 5 from Osborne Pike boat landing in Charles City to the Chickahominy Riverfront Park and then north to Interstate 64. Historic plantations, gardens, boating facilities, and a fish hatchery are among the recreation activities available along the trail (Virginia Department of Game and Inland Fisheries (VDGIF), 2011a).

#### **Chickahominy WMA**

This WMA occupies 5,217 acres of primarily woodland habitat in Charles City County between Wilcox Neck Road and the Chickahominy River. Morris Creek, which flows south through the WMA and along its southern boundary, as well as other smaller tidal creeks and marshy areas, provide areas of wetland diversity. The upland, though mainly wooded with mixed hardwood and pine stands, also features cultivated, mowed, and "old field" openings. Recreational opportunities within the WMA include hunting, fishing, observing and photographing wildlife, hiking, and target shooting. Facilities on the site include a shooting range, boat ramp, and maintained trails. The River Landing boat ramp access site is located in close proximity to the location where the Chickahominy Alternative would cross the Chickahominy River. This unpaved boat ramp provides direct access to the Chickahominy River and is best suited for smaller boats. A review of recent (2011) aerial photography places the boat ramp about 0.6 mile south of the proposed river crossing location. The Richmond Regional Planning Commission, as part of the Virginia Coastal Zone Management Program, is planning to develop better river access and amenities across public lands including the Chickahominy WMA. The portion of the Chickahominy River in the vicinity of the Chickahominy WMA and the proposed river crossing is not currently designated as a scenic river by the Commonwealth of Virginia; however, it has been identified as being worthy of future study (VDGIF, 2011b; Richmond Regional Planning District Commission, 2007; Virginia Department of Conservation and Recreation (VDCR, 2007).

Dominion Virginia Power  
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TABLE 3.1.2-1							
Surry-Skiffes Creek 500 kV Transmission Project Skiffes Creek-Whealton 230 kV Transmission Line Project Skiffes Creek 500 kV-230 kV-115 kV Switching Station							
Recreation Areas within 0.25 mile of Proposed Project							
Recreation Area	Approximate Milepost <sup>a</sup>	Chickahominy Alternative	Surry Alternative	Surry Alternative (James River Crossing Variation 1)	Surry Alternative (James River Crossing Variation 2)	Surry Alternative (James River Crossing Variation 3)	Skiffes Creek to Whealton Section
Plantation Loop of the Virginia Birding and Wildlife Coastal Trail	C4.2, C6.9	X					
Chickahominy WMA	C15.5	X					
Captain John Smith Chesapeake National Historic Trail	C18.3, S1.5	X	X	X	X	X	X
Freedom Park	C22.0	X					
Hog Island WMA	S1.5		X <sup>b</sup>	X <sup>b</sup>	X <sup>b</sup>	X <sup>b</sup>	X <sup>b</sup>
Carter's Grove Plantation	JV2-3.9, JV3-4.5				X <sup>b</sup>	X <sup>b</sup>	
Warhill Sports Complex	C25.5	X					
Lower Peninsula Loop of the Virginia Birding and Wildlife Coastal Trail	C26.3, C32.0, W5.8, W14.8, W16.2	X					X
Waller Mill Park	C28.7	X					
Colonial National Historical Park Colonial Parkway	C31.9	X					
Williamsburg Country Club	C34.9	X					
Busch Gardens Amusement Park	C35.7	X <sup>b</sup>					
Kingsmill Resort	K0.5	X					
Newport News Park	W3.3						X
Harwoods Mill Park	W10.0						X
York County Sports Complex	W11.0						X
Kiln Creek Park	W13.0						X <sup>b</sup>
Kiln Creek Golf Club and Resort	W13.5						X
Sandy Bottom Nature Park	W17.7						X <sup>b</sup>
Tucker-Capps Neighborhood Park	W19.8						X <sup>b</sup>
<sup>a</sup> Each milepost listed represents a single crossing of the feature. For features within 0.25 mile, but which are not crossed, the milepost represents the nearest milepost to the feature <sup>b</sup> Park is located within 0.25 mile of the route but it is not crossed.							

### Captain John Smith Chesapeake National Historic Trail

The Captain John Smith Chesapeake National Historic Trail (NHT) was established in 2006 as the first national water trail. The trail traces approximately 3,000 miles of John Smith's voyages on the Chesapeake Bay and nine of its major tributaries including the Chickahominy and James Rivers, which are both within the proposed project area (National Park Service

(NPS), 2006a). Interpretive historic markers and museums have been installed along the water trail, including trail buoys, which allow boaters to call a toll free number and hear a description of what the area was like at that location during John Smith's travels in the 1600s. There are many natural resource recreational viewing opportunities available along the water trail including various marsh habitats, shoreline habitats, forested wetlands, and beaches, from which visitors may view marine life, migratory fish, waterfowl, terrestrial wildlife, and vegetation.

The Chickahominy Water Trail Partnership is an extension of the NHT and a partnership between Charles City County, James City County, New Kent County, the Chickahominy Tribe, the James River Association, the Richmond Regional Planning District Commission, the VDCR, and the Friends of the John Smith Chesapeake Trail. This partnership was formed to offer opportunities to improve access to the trail, improve trail interpretation, and increase publicity. Two focus areas within the NHT are located in the project area and are described below (Charles City County, 2009a).

- Chickahominy River and Riverfront Park Focus Area – This focus area encompasses resources and sites along the tidal portion of the Chickahominy River, including the Chickahominy WMA. Chickahominy Riverfront Park (located about 4 miles south from the proposed crossing of the Chickahominy River) is the primary site for this focus area receiving 145,000 visitors annually. The area contains a river and marsh system that is considered nearly unspoiled and similar to conditions of the 1600s. Conditions adding to this unspoiled nature include long expanses of wooded shoreline with minimal interruptions from development, abundant native bird populations, extensive marshland, and untouched creek systems. Recreational opportunities within this focus area include boating, wildlife viewing, and camping, as well as connections to biking-walking trails. Within the Chickahominy WMA portion of the focus area, there are plans by the partnership to develop guided hiking tours.
- Chippokes Plantation State Park and the Hog Island WMA – This focus area encompasses Jamestown Island, Chippokes Plantation State Park, and the Hog Island WMA. These sites receive over 80,000 visitors annually. The area contains a broad section of the James River and Lower Chippokes Creek, which is considered to be reminiscent of how the creek appeared in the 1600s. Recreational opportunities along this focus area include boating, wildlife viewing, historical interpretive programming, and camping. Within the Hog Island WMA portion of the focus area, there are plans by the partnership to install orientation panels addressing the focus area (NPS, 2011).

The John Smith Chesapeake Trail also represents a historic resource. The historic significance of the trail is discussed in more detail below in Section 3.4.

### **Freedom Park**

This park is located in James City County between Jolly Pond Road and Centerville Road. The park consists of over 600 acres of forested land, meadows, and trails. Freedom Park is managed by James City County and has a historical background dating back to the 1650s. The park is the site of an eighteenth-century graveyard, the Revolutionary War Battle of Spencer's Ordinary (1781), and a seventeenth-century domicile which has been the subject of

archaeological research into the early colonial period (1680-1730). The park also includes the Williamsburg Botanical "Ellipse Garden," featuring more than 800 species of Virginia vegetation. Recreational opportunities within Freedom Park include hiking, biking, historical sites, and the botanical garden. There is a well-established mountain biking trail within Freedom Park that was built and is maintained by the Eastern Virginia Mountain Bike Association (EVMA). The trail is an intermediate-level, single-track trail. The trail system is still being developed with the goal of having 25 miles of single track within the park. As shown on Figure 4 in Appendix A, the current trails are located between Jolly Pond Road and Centerville Road and extend across the park. Additional facilities currently on site include picnic areas and parking lots. The Freedom Park Master Plan depicts additional facilities to be constructed in the future including sports courts, a swimming pool, a History Interpretive Center, an Environmental Education Center, and meeting facilities (James City County Parks and Recreation, 2011a).

### **Hog Island State WMA**

This WMA encompasses 3,908 acres within three discrete tracts in Surry and the Isle of Wright Counties. One of the tracts (Hog Island Tract) in Surry County is within the current project area on a peninsula north of the Surry Power Station. This tract contains a mixture of pine forests, open land, tidal marshes, and controlled ponds. These ponds are seasonally drained to produce native food for wildlife. Recreational opportunities within the Hog Island Tract include fishing, hunting, and wildlife viewing. There is one boat ramp located within the WMA for access to James River; however, it is located on the Carlisle Tract approximately 1.4 miles from the proposed project. Facilities on the Hog Island Tract include a 2-mile road connecting various wildlife viewing and access points (VDGIF, 2012a). The portion of the James River in proximity to the Hog Island State WMA at the proposed river crossing of the Surry Alternative has been designated as scenic by the Commonwealth of Virginia and as an America's Founding River.

### **Carter's Grove Plantation**

The plantation was built between 1750 and 1755. In the 1960s, the Colonial Williamsburg Foundation received the plantation as a gift and opened the house as a museum. Slave quarters were reconstructed to present a view of both sides of plantation life. The grounds were reconstructed in the 1970s. In 2008, the Colonial Williamsburg Foundation sold Carter's Grove to a private landowner. The plantation is no longer open to the public (NPS, 2012).

### **Warhill Sports Complex**

This facility is located in James City County just west of Route 199 and south of U.S. Route 60. Most local sporting events occur at the Warhill Sports Complex, which contains baseball, soccer, basketball, football, running, hiking, and fishing facilities. The baseball complex includes three lighted youth baseball fields, one lighted majors baseball field, four tee-ball fields, a concession building, and a playground. The soccer/multi-use fields complex includes six synthetic turf multiuse fields, four full-size and four intermediate grass soccer fields, and a concession building. In addition, the complex includes three outdoor basketball courts, a 1-mile paved multi-use trail, a 3.5-mile hiking trail, two ponds for shoreline fishing, the artificial turf Sanford B. Wanner Stadium, and the 50,000-square-foot Williamsburg Indoor Sports Complex. The Warhill Master Plan depicts additional facilities to be constructed in the future including a softball complex, a sports field complex, and a multi-purpose field complex (James City County Parks and Recreation, 2011b).

### **The Lower Peninsula Loop of the Virginia Birding and Wildlife Coastal Trail**

This trail runs for over 50 miles along existing roadways from York River State Park, south to James River, and in a southeasterly direction to the City of Hampton. Wildlife viewing, battle sites, and historic settlements are among the recreation activities available along this loop of the trail (VDGIF, 2011a).

### **Waller Mill Park**

This park, which is located in York County just east of Route 645 and west of Interstate 64, is operated by the City of Williamsburg. The 2,705-acre park is situated around its reservoir, which was opened to the public in July 1972. The 286-acre lake is open for fishing, boating, pedal boating, canoeing, and kayaking with a tunnel connecting the upper and lower sections of the lake. Facilities on site include picnic tables, shelters, a playground, and a dog park (City of Williamsburg, 2011).

### **The Colonial National Historical Park Colonial Parkway**

The parkway is a 23-mile scenic roadway constructed and managed by the NPS that extends from the York River in Yorktown to the James River in Jamestown. It connects Virginia's historic triangle, Jamestown, Williamsburg, and Yorktown, and is used by several million travelers each year. According to the NPS, the three-lane roadway allows motorists to appreciate the surrounding landscape, while reducing impact on natural and cultural resources and providing for traveler safety (NPS, 2006b).

### **Williamsburg Country Club**

This country club is located in James City County between Interstate 64, U.S. Routes 60/143, and Route 199. The private club has an 18-hole golf course, putting green, chipping and pitching green, and a clubhouse (Williamsburg Club 2010).



### **Busch Gardens Amusement Park**

This amusement park is located just south of the Williamsburg Country Club. The amusement park has many rides including roller coasters, water rides, and motion simulators. The park offers attractions including Broadway-type shows, animal acts, European villages, and a variety of restaurants (Busch Gardens Amusement Park (Busch Gardens), 2011).

### **Kingsmill Resort**

This golf course is located in the City of Williamsburg just southeast of Busch Gardens. The course is part of the greater Kingsmill Resort, which offers 5 restaurants, a 16,000-square-foot conference center, and 425 hotel rooms. Recreation opportunities include golfing, fitness and spa facilities, fishing, boating, Segway tours, and tennis. The private golf club offers 3 18-hole courses, including the Woods Course, and a par-3 9-hole course (Kingsmill Resort, 2011).

### **Newport News Park**

This city park is located in and managed by the City of Newport News between Interstate 64 and Route 17 in both the City and York County. The park is one of the largest municipal parks in the country, covering 8,000 acres of woodlands, meadows, and lakes. The park offers camping, fishing, boating, hiking, biking, golfing, and disc golfing opportunities. There are 188 campsites, 20 picnic shelters, playgrounds, an arboretum, archery range, 2 public golf courses, and a Discovery Center among the park facilities (Newport News Department of Parks, Recreation and Tourism, 2011).

### **Harwoods Mill Park**

This park is located south of Route 173 and west of Route 17 in York County. Recreational opportunities at the park include fishing, boating, and biking. Facilities available on site include boat rentals, boat ramp, picnic tables, baseball and softball fields, general sports fields, and a biking trail (VDGIF, 2011c).

### **York County Sports Complex**

This park is located within the surrounding Harwoods Mill Park south of Oriana Road. The park includes 13 lighted athletic fields including 2 instructional soccer fields, 4 regulation soccer fields, 5 youth baseball/softball fields, 1 adult softball field, and 1 adult baseball field. Facilities available on site include 3 concession stands, playgrounds, 31 picnic shelters, 2 miles of multipurpose paths, and a bike lane (York County Virginia, 2012).

### **Kiln Creek Park**

This park is located just east of the Kiln Creek Golf Club and Resort. The 21-acre park includes soccer, baseball, softball, and basketball facilities. The park also has playgrounds and picnic areas available to the public (York County Virginia, 2011).

### **The Kiln Creek Golf Club and Resort**

This private country club is located in the City of Newport News west of Route 17 and north of Interstate 64. The club offers an 18-hole course, 2 outdoor tennis courts, driving range, putting and chipping greens, and a day spa (Kiln Creek, 2010).

### **Sandy Bottom Nature Park**

This 456-acre park is located between Interstate 64 and Route 306 in the City of Hampton. The park offers boating, camping, fishing, and wildlife observation opportunities. Facilities available on site include a conference room, classroom, nature center, picnic shelters, and wildlife center (The City of Hampton Virginia, 2011a).

### **Tucker-Capps Neighborhood Park**

This park is located between Todds Lane and Whealton Road in the City of Hampton. This small community park has a baseball field, walking trail, and playground (The City of Hampton Virginia, 2011b).

## **3.1.3 Airport Facilities**

Airports are important considerations in routing and building new overhead electric transmission lines because of the potential for transmission line towers to affect airspace in and around these facilities. A summary of the airports in the vicinity of the project area and the airspace regulations that could have an impact on the project is provided below.

### **3.1.3.1 Airports near Project Area**

Dominion reviewed the FAA's website to identify public use airports, airports operated by a federal agency or the DOD, airports or heliports with at least one FAA-approved instrument approach procedure, and public use or military airports under construction (FAA, 2011). Based on this review, there are 10 airports or heliports located within 10 miles of the project facilities (see Figure 3.1.3-1 in Appendix A). Table 3.1.3-1 lists the airport or heliport name in the vicinity of each transmission line section, including airport identification number, distance and direction from the nearest Dominion facility, type of use, and maximum runway length. Langley Air Force Base and Felker Airfield have recently combined into Joint Base Langley Eustis (JBLE). However, the two facilities will be treated individually for the purposes of this Routing Study.

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TABLE 3.1.3-1  Surry-Skiffes Creek 500 kV Transmission Project Skiffes Creek-Whealton 230 kV Transmission Line Project Skiffes Creek 500 kV-230 kV-115 kV Switching Station  Airports and Heliports Located in the Vicinity of the Project					
Transmission Line Section	Airport Name	Airport ID	Approximate Distance and Direction From Dominion Facility (nautical miles)	Use	Maximum Runway Length (feet)
Chickahominy Alternative	New Kent County Airport	W96	4.2 NE	Public	3,600
Chickahominy Alternative	Richmond International Airport	RIC	7.6 NW	Public	9,003
Chickahominy Alternative	Williamsburg – Jamestown Airport	JGG	3.0 SW	Public	3,204
Chickahominy Alternative	Camp Peary Landing Strip	W94	2.4 NE	Military	5,018
Chickahominy Alternative	NWS Heliport	NCY	3.3 NE	Military	Not Applicable
Skiffes Creek to Whealton	Felker AAF Airport	FAF	3.4 SW	Military	3,025
Surry Alternative	Felker AAF Airport	FAF	3.1 S	Military	3,025
James River Crossing Variation 1	Felker AAF Airport	FAF	3.6 SE	Military	3,025
James River Crossing Variation 2	Felker AAF Airport	FAF	3.6 SE	Military	3,025
James Variation Crossing Variation 3	Felker AAF Airport	FAF	3.6 SE	Military	3,025
Skiffes Creek to Whealton	Newport News – Williamsburg International Airport	PHF	0.6 S	Public	8,003
Skiffes Creek to Whealton	Langley Air Force Base	LFI	3.5 E	Military	10,000
Skiffes Creek to Whealton	Comlantfl Heliport	NCL	8.8 SE	Military	Not Applicable
Skiffes Creek to Whealton	Norfolk Naval Station (Chambers Field)	NGU	8.8 SE	Military	8,371

### 3.1.3.2 Federal Aviation Regulations

The FAA is responsible for overseeing air transportation in the United States. The FAA focuses on air transportation safety, including the enforcement of safety standards for aircraft manufacturing, operation, and maintenance. The FAA also manages air traffic in the United States and evaluates physical objects that may affect the safety of aeronautical operations through an obstruction evaluation. The prime objective of the FAA in conducting an obstruction evaluation is to ensure the safety of air navigation and the efficient utilization of navigable airspace by aircraft.

The regulations that govern objects that may affect navigable airspace are codified in the Code of Federal Regulations (CFR) at 14 CFR Part 77 (Part 77). On July 21, 2010, the FAA amended Part 77. Following are the major changes in the final rule:

1. The final rule provides for an FAA Determination of Hazard or Determination of No Hazard to become effective 40 days after the date of issuance.
2. The final rule stipulates that a Determination of No Hazard to air navigation will expire 18 months after the effective date of the determination, or on the date the proposed construction or alteration is abandoned. Also, the final rule specifies that a Determination of Hazard to Air Navigation does not expire.
3. The final rule expands the requirements for notice to be sent to the FAA for proposed construction or alteration of structures on or near private use airports that have an instrument approach procedure.

A summary of the final rule as it relates to the proposed project is provided below. A copy of the final rule is included in Appendix B.

### **Civil Airport Imaginary Surfaces**

Civil airport imaginary surfaces have been established with relation to each airport and to each runway. The imaginary surfaces were developed to prevent existing or proposed objects from extending from the ground into navigable airspace. Following is a description of the civil imaginary surfaces:

- **Horizontal surface:** A horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of specified radii from the center of each end of the primary surface of each runway and connecting the adjacent arcs by lines tangent to those arcs.
- **Conical surface:** A surface extending outward and upward from the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.
- **Primary surface:** A surface longitudinally centered on a runway. The primary surface extends 200 feet beyond the end of each runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline.
- **Approach Surface:** A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end (e.g., precision instrument approach, visual approach, etc.).
- **Transitional Surface:** These surfaces extend outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces. Transitional surfaces for those portions of the precision approach

surface that project through and beyond the limits of the conical surface extend a distance of 5,000 feet measured horizontally from the edge of the approach surface and at right angles to the runway centerline.

### **U.S. Department of Defense Airport Imaginary Surfaces**

Similar to the civil airport imaginary surfaces described above, the DOD has established imaginary surfaces around military airports. Following is a description of the DOD airport imaginary surfaces:

- **Inner Horizontal Surface:** A plane that is oval in shape at a height of 150 feet above the established airfield elevation. The plane is constructed by scribing an arc with a radius of 7,500 feet about the centerline at the end of each runway and interconnecting these arcs with tangents.
- **Conical Surface:** A surface extending from the periphery of the inner horizontal surface outward and upward at a slope of 20 to 1 for a horizontal distance of 7,000 feet to a height of 500 feet above the established airfield elevation.
- **Outer Horizontal Surface:** A plane, located 500 feet above the established airfield elevation, extending outward from the outer periphery of the conical surface for a horizontal distance of 30,000 feet.
- **Primary Surface:** A surface located on the ground or water longitudinally centered on each runway with the same length as the runway. The width of the primary surface for runways is 2,000 feet. However, at established bases where substantial construction has taken place in accordance with a previous lateral clearance criteria, the 2,000-foot width may be reduced to the former criteria.
- **Clear Zone Surface:** A surface located on the ground or water at each end of the primary surface, with a length of 1,000 feet and the same width as the primary surface.
- **Approach Clearance Surface:** An inclined plane, symmetrical about the runway centerline extended, beginning 200 feet beyond each end of the primary surface at the centerline elevation of the runway end and extending for 50,000 feet. The slope of the approach clearance surface is 50 to 1 along the runway centerline extended until it reaches an elevation of 500 feet above the established airport elevation. It then continues horizontally at this elevation to a point 50,000 feet from the point of beginning. The width of this surface at the runway end is the same as the primary surface, it flares uniformly, and the width at 50,000 feet is 16,000 feet.
- **Transitional Surfaces:** These surfaces connect the primary surfaces, the first 200 feet of the clear zone surfaces, and the approach clearance surfaces to the inner horizontal surface, conical surface, outer horizontal surface, or other transitional surfaces. The slope of the transitional surface is 7 to 1 outward and upward at right angles to the runway centerline.

## **Terminal Instrument Procedures**

In addition to the civil and DOD airport imaginary surfaces, there are imaginary surfaces associated with terminal instrument procedures (TERPS). TERPS are procedures for instrument approach and departure of aircraft to and from civil and military airports. TERPS are used for airport obstruction analysis to protect airspace by establishing restrictions on the height of buildings, antennas, trees, and other objects as necessary to protect the airspace needed for aircraft during preparation for and completion of the landing or departure phases of flight. None of the Proposed or Alternative routes would exceed the TERPS surfaces of the airports identified in Table 3.1.3-1, with the exception of Felker Airfield at Fort Eustis Military Reservation.

## **Airport Meetings**

Dominion met with representatives from Langley Air Force Base to introduce the project and coordinate on airspace matters associated with DOD facilities near the project area. The representatives from Langley Air Force Base requested that Dominion evaluate the projects impact on the TERPS surfaces associated with Langley Air Force Base and Felker Airfield. The proposed Skiffes Creek-Wheaton 230 kV transmission line would not penetrate any of the TERPS surfaces associated with the Langley Air Force Base (see Figure 3.1.3-2 in Appendix A). However, the alignment of the Surry Alternative across the James River does penetrate the TERPS non-precision approach obstacle clearance surface associated with the Felker Airfield's current runway length (See Figures 3.1.3-3 and 3.1.3-4 in Appendix A). In the event that the DOD or the FAA determines that penetration of the TERPS surface is an unacceptable airspace obstruction, then two modified alignments of the Surry Alternative to the north have been developed (see Figures 3.1.3-5 and 3.1.3-6 in Appendix A).

In addition, Dominion met with representatives of Newport News/Williamsburg International Airport (International Airport) to discuss the project and evaluate the existing conditions at the International Airport. Dominion evaluated the Part 77 civil airport imaginary surfaces for the existing facilities and determined that the heights of the proposed structures would not exceed the most restrictive obstacle clearance surface (see Figure 3.1.3-7 in Appendix A). The International Airport concurred with this analysis.

## **FAA Notice Requirements and Timing**

Based on the runway categories and dimensional standards described above, a notice must be filed with the FAA if:

- Any construction or alteration is more than 200 feet above ground level at its site.
- Any construction or alteration exceeds an imaginary surface extending outward and upward at the following slope:
  - 25 to 1 for a horizontal distance of 5,000 feet from the nearest point of the nearest landing and takeoff area of each heliport;
  - 50 to 1 for a horizontal distance of 10,000 feet from the nearest point of the nearest runway that is no more than 3,200 feet in actual length; and

Dominion Virginia Power  
 Surry-Skiffes Creek 500 kV Transmission Line  
 Skiffes Creek-Whealton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station

- 100 to 1 for a horizontal distance of 20,000 feet from the nearest point of the nearest runway that is more than 3,200 feet in actual length.
- If requested by the FAA.

Construction or alteration of any structure that meets the notification requirements set forth above must submit a FAA Form 7460-1, Notice of Proposed Construction or Alteration (Notice) to the FAA Regional office having jurisdiction over the area within which the construction or alteration will be located or submitted electronically via the FAA website (see Appendix C). The information that needs to be provided with the Notice includes the coordinates, site elevation, and structure height above ground level for each pole/structure and the height of construction equipment, such as cranes.

Based on the current plans, the proposed transmission line structures would range in height from less than 100 feet tall along the Skiffes Creek-Whealton Transmission Line and up to 295 feet along the Surry Alternative's James River crossing. It is anticipated that cranes would be used to install the structures. Based on current plans, the proposed project would exceed the FAA notification thresholds described above at four airports. Table 3.1.3-2 identifies the airports that would require submitting a Notice to the FAA for the proposed facilities.

TABLE 3.1.3-2				
Surry-Skiffes Creek 500 kV Transmission Project Skiffes Creek-Whealton 230 kV Transmission Line Project Skiffes Creek 500 kV-230 kV-115 kV Switching Station				
Project Section Where FAA Notification is Required				
Project Section	Nearest Airport	Airport ID	Approximate Distance and Direction From Dominion Facility (nautical miles)	Use
Chickahominy Alternative	Camp Peary Landing Strip	W94	2.4 NE	Military
Skiffes Creek to Whealton	Newport News – Williamsburg International Airport	PHF	0.6 S	Public
Skiffes Creek to Whealton	Langley Air Force Base	LFI	3.5 E	Military
Surry Alternative	Felker AAF	FAF	3.6 SE	Military
James River Crossing Variation 1	Felker AAF	FAF	3.6 SE	Military
James River Crossing Variation 2	Felker AAF	FAF	3.6 SE	Military
James River Crossing Variation 3	Felker AAF	FAF	3.6 SE	Military

### 3.1.3.3 State and Local Regulations

#### Commonwealth of Virginia Aviation Regulations

Section 5.1-25.1 of the Code of Virginia (Va. Code) establishes that it is unlawful for a person to erect any structure which penetrates into or through any licensed airport's clear zone,

approach zone, imaginary surface, obstruction clearance surface, obstruction clearance zone, or surface or zone as described in regulations of the Virginia Department of Aviation (VDOA) or the FAA, without first securing a permit for its erection from the Board of Aviation. However, it also states that this requirement does not apply to any structure to be erected in a county, city, or town which has an ordinance regulating the height of such structures to prevent the penetration of zones and surfaces provided for in Part 77 and Rule 19 of the VDOA.

### **Local Airport Regulations**

Va. Code Sections 15.2-2280, 15.2-2282, 15.2-2293, and 15.2-2294, gives local jurisdictions the power to establish and regulate zoning districts, make airspace subject to their zoning ordinance, and establish airport safety zoning. Following is a summary of the zoning regulations applicable to the airports listed in Table 3.1.3-1.

#### York County – Airport Safety Management Overlay District

The Airport Safety Management Overlay regulations are intended to protect public health, safety, and welfare by ensuring that development will occur in such a way as to cause no interference with civil or military air traffic over the county. The purpose of these provisions is to restrict the height of structures and objects of natural right-of-way in the vicinity of any civil or military airport in the county or its environs. Specifically, these provisions are intended to apply to all areas of the county lying within or underneath an imaginary surface or surfaces surrounding any civil or military airport in accordance with the standards set forth in Part 77.25, 77.28, and 77.29, Subchapter C of Title 14 of the CFR (Obstruction Standards).

The special provisions established in this section apply to all areas designated by the county as airport safety zones in accordance with the standards set forth in the Obstruction Standards.

#### City of Newport News

The City of Newport News has established restricted-use zones to regulate the use of property in the vicinity of the Newport News/Williamsburg International Airport. The zones include all of the land lying beneath the approach surfaces, transitional surfaces, horizontal surfaces, and conical surfaces as they apply to this airport.

#### *Airport Zones and Height Limitations*

The various restricted-use zones include:

1. Precision instrument runway approach zone:
  - a. This zone applies to runway 7R-25L and the proposed runway 7L-25R.
  - b. The inner edge of this approach zone coincides with the width of the primary surface and is 1,000 feet wide. The approach zone expands outward uniformly at a slope of 50 to 1 to a width of 16,000 feet from the primary surface with an additional 40,000 feet at a slope of 40:1.
2. Runway larger than utility with a visibility minimum greater than 0.75-mile non-



precision instrument approach zone:

- a. This zone applies to runway 2-20
  - b. The inner edge of this approach zone coincides with the width of the primary surface and is 500 feet wide. The approach zone expands outward uniformly at a slope of 34 to 1 to a width of 3,500 feet at a horizontal distance of 10,000 feet from the primary surface.
3. Transitional zones: Slopes 7 to 1 beginning at the sides of and at the same elevation as the primary surface and the approach surface, and extending to a height of 150 feet mean sea level. In addition, there are established height limits sloping 7 to 1 upward beginning at the sides of and the same elevation as the approach surface, and extending to where they intersect the conical surface. Where the precision instrument runway approach zone projects beyond the conical zone, there are established height limits sloping 7 to 1 upward beginning at the sides of and the same elevation as the approach surface, and extending a horizontal distance of 5,000 feet measured at ninety-degree angles to the extended runway centerline.
4. Horizontal zone: The horizontal zone is established by swinging an arc of 10,000 feet from the center of each end of the primary surface of each runway and connecting the adjacent arcs by drawing lines tangent to those arcs. The horizontal zone does not include the approach and transitional zones.
- The horizontal zone is established at 150 feet above the airport elevation which amounts to a maximum height of 193 feet above mean sea level.
5. Conical zone: The conical zone is established as the area that commences at the periphery of the horizontal zone and slopes 20 to 1 upward beginning at the periphery of the horizontal zone for a distance of 4,000 feet.

An area located in more than one of the zones described above is considered to be only in the zone with the more restrictive height limitation. No structure shall be erected, altered, or maintained, and no tree shall be allowed to grow in any zone to a height in excess of the applicable height established for such zone.

The City of Newport News requires that the applicant provide a complete and duplicate form of the FAA Notice directly to the zoning administrator and the airport manager. The limits and notice requirements extend beyond and create additional notice requirements from those established by Part 77. The Notice areas near the Newport News/Williamsburg Airport are defined by:

- Constructing an arc of 36,500 feet from the geographical center of the airport (i.e., the airport reference point) and would include any structure that exceeds a height of 193 above mean sea level (150 feet above the airport elevation); or
- Penetrating an imaginary surface defined by a 100 to 1 slope from the nearest edge of any existing or planned runway pavement up to the 193 above mean sea level.

City of Hampton – Langley Flight Approach/Land Intensive Manufacturing District

The purpose of the Langley Flight Approach/Land Intensive Manufacturing District is to provide reasonable land use regulations for those industrial and commercial uses and to provide significant protection to the flight operations at Langley Air Force Base by allowing, in the area nearest the centerline of the runway and the end of the runway, only those uses that are not disrupted by, nor disrupting to, the base operations.

### **3.1.4 Existing Land Use and Land Cover**

Land use and land cover within the project vicinity was identified using the most currently available (2006) National Land Cover Dataset (NLCD) from the Multi-Resolution Land Characterization consortium. Existing land use for each route section is depicted on Figure 3.1.4-1 in Appendix A and quantified in Table 4-1. The existing subdivisions crossed by the route are depicted on Figure 3.1.4-2 in Appendix A.

The SCC requires that the number of dwellings within 500 feet of the route be considered. NRG identified buildings (including dwellings) through review of various digital data sets and maps, USGS topographic quadrangles, and recent (2011) aerial photography. Features found within 500 feet of project segment corridors include churches, cemeteries, and schools as well as other public, residential, commercial, and industrial buildings.

One church, two cemeteries, and two schools are located within 500 feet of the Chickahominy to Lightfoot Junction section of the Chickahominy Alternative. Cedar Grove Church and Cemetery are located in Charles City County about 300 feet north of MP C4.2 near the fork of Adkins Road and Cook Hill Road. There is an unnamed cemetery marked on USGS topographic quadrangles south of Horseshoe Road in Charles City County about 250 feet north of MP C13.9. This cemetery is not visible on 2011 aerial photographs but is assumed to be within 500 feet from the Chickahominy Alternative for the purposes of this review. Lois S. Hornsby Middle School and J. Blaine Blayton Elementary School are located in James City County about 500 feet east of MP C23.0 on Jolly Pond Road. Other buildings located within 500 feet of this section of the alternative primarily are agricultural facilities and rural residences scattered along the alternative. Additionally, as noted in Appendix D, there are two existing subdivisions located along this section of the alternative, both located near Lightfoot Junction.

At MP C10.0 of the Chickahominy Alternative near the junction of Sturgeon Road and Glebe Road, a long-range Air Route Surveillance Radar (ARSR) Type 3 facility owned and operated by the Departments of Defense and Homeland Security is located about 575 feet south of the centerline of the right-of-way. Dominion is in the process of consulting with the FAA on this facility and has determined that the facility should not be a constraint to the location of the 500 kV line or proposed structures (Personal Communication, Ian Atkins (FAA) and D. Lake (NRG), February 21, 2012)

One school and one public building are located within 500 feet of the Lightfoot Junction to Skiffes Creek section of the Chickahominy Alternative. Jamestown Academy is located between Route 658 and Route 645 in the City of Williamsburg about 275 feet southwest of MP C28.1. James City County Fire Department Station #2 is located southwest of Interstate 64 near Busch Gardens in James City County about 250 feet northeast of MP C36.1. The Lightfoot Junction to Skiffes Creek section of the Chickahominy Alternative is more developed and

progressively becomes more developed from north to south. There are a total of 1,556 buildings located within 500 feet of the corridor along the entire Chickahominy Alternative. The vast majority of these buildings are located along the section of the route between Lightfoot Junction and Skiffes Creek. These buildings primarily are residential (1,129 homes), including 26 existing subdivisions, and commercial structures. Appendix D lists the existing subdivisions crossed by the Chickahominy Alternative.

There are 84 residences within 500 feet of the Surry Alternative and the Surry Alternative with each of the three river James River Crossing Variations. These residences are all associated with the Windy Hill Mobile Home Park, Whispering Pines Mobile Home Park, and Skiffes Creek Terrace. There also are a few industrial and commercial buildings within 500 feet of the route. As noted in Appendix D, there is one existing residential subdivision located along the Surry Alternative near Skiffes Creek Switching Station. There is a second existing subdivision crossed by James River Crossing Variations 2 and 3. This is a commercial subdivision associated with the James River Commerce Center.

There are two public buildings, and one school located within 500 feet of the Skiffes Creek to Whealton section of the proposed project. The Newport News Fire Department Lee Hall Station 5 and Newport News Fire Department Training Center are both located just east of U.S. Route 60 in the City of Newport News about 300 feet north of MP W3.4. Dozier Middle School is located west of Interstate 64 and south of Industrial Park Drive in the City of Newport News near MP W5.3. The school building is more than 500 feet from the proposed project but the school's track and field is within 500 feet. The Skiffes Creek to Whealton Section crosses a number of high density population areas, which are highly developed. There are 2,007 buildings within 500 feet of the Skiffes Creek to Whealton section. These buildings primarily are residential, including 22 existing subdivisions, industrial, and commercial structures. Appendix D lists the existing subdivisions crossed by this segment of the route.

### **3.1.5 Planned Development**

NRG obtained information on planned future developments through consultations with county and city planning officials, the Chambers of Commerce and other stakeholders, and through publically available information. Planned future developments are described below and depicted on Figure 3.1.5-1 in Appendix A.

The Chickahominy Alternative 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 Chickahominy Alternative there are two planned development areas located near the project. 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 Chickahominy Alternative 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.

In James City County along the Skiffes Creek to Wheaton Section of the project, there is one parcel, owned by James City County, designated for the proposed Route 60 East Relocation/Pocahontas Trail Project crossed between MPs W2.2 and W2.3. The new road would consist of four lanes and would help meet current traffic demands as well as promote future industrial development. The proposed route of the road relocation project initially runs parallel to the existing U.S. Route 60 next to the CSX Railroad. The route would then cross property owned by Green Mount, just southeast of the proposed Skiffes Creek Switching Station, and then cross Skiffes Creek into the City of Newport News where it connects back to the existing U.S. Route 60 at the Fort Eustis Boulevard interchange. According to a James City County Memorandum dated October 25, 2011, the project has been suspended due to lack of funding; however, it remains part of the Long-Range Transportation Plan for James City County (James City County, 2011).

In the City of Newport News along the Skiffes Creek to Wheaton Section of the proposed route, there is a proposed residential community development known as Huntington Point located between Denbigh Boulevard and Fort Eustis Boulevard between MPs W7.2 and W8.7. This development includes the addition of a proposed Independence Boulevard, which would cross the Skiffes Creek to Wheaton Section of the route.

In addition to the planned developments discussed above, 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 Chickahominy Alternative 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 alternative routes.

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 area's close proximity to the Chickahominy River makes it an ideal location for additional recreational uses, including hunting, ecotourism, boating, and retreat centers (Charles City County, 2009b).

### **3.1.6 Land Use Planning and Zoning**

The Code of Virginia requires every governing body within the state to adopt a Comprehensive Plan that provides guidance for land use planning decisions within the territory of its jurisdiction. The plan identifies and describes the location, character, and extent of existing, proposed, or anticipated land uses, and identifies facilities (e.g., roads, housing, utilities, libraries, etc.) needed to serve current and future residents. Zoning is a tool used by land managers to implement the objectives of the Comprehensive Plan by defining standards for development and permissible uses within different land use categories. Comprehensive Plans are updated every 5 years to make adjustments for actual or projected changes in land use conditions or needs. Zoning ordinances may be modified by land managers or governing bodies or through requests from residents or businesses to change zoning designations or approve new uses. Charles City County, James City County, Surry County, the City of Williamsburg, York County, the City of Newport News, and the City of Hampton have all adopted Comprehensive Plans and zoning ordinances for their respective jurisdictions. NRG obtained GIS datasets for these zoning districts from each of the cities or counties crossed by the proposed facilities. Zoning categories vary across the districts. NRG analyzed the original zoning categories and standardized them into 12 categories that could be applied across all seven districts for the purposes of this review. Table 1 in Appendix E shows how the original zoning categories were renamed in this standardization process. Figure 3.1.6-1 in Appendix A depicts the zoning categories crossed by each route section.

The Chickahominy to Lightfoot Junction Section of the Chickahominy Alternative crosses land predominantly zoned as agricultural. The route begins on a small segment of industrially zoned land and continues for approximately 3.22 miles along land zoned as agricultural. After crossing one small industrial area near Samaria Lane, the route continues for approximately 17.76 miles across agriculturally zoned land. At this point, the route crosses approximately 2.03 miles of land zoned as special public interest, a portion of which is associated with Freedom Park. The route then crosses a small segment of agricultural land, a segment of mixed use land, and a final plot of agricultural land before reaching its terminus at Lightfoot Junction.

The Chickahominy Alternative then continues from Lightfoot Junction across an agriculturally zoned plot of land followed by two small (0.20-mile and 0.06-mile) segments of rural residential land between a 0.71-mile special public interest area associated with the Warhill Sports Complex. The route then crosses Route 199 and crosses approximately 1.32 miles of single-family residential, then 0.33 mile of multi-family residential, followed by 0.57 mile of single-family residential land. The route then traverses approximately 0.37 mile of commercial land located on both sides of U.S. Route 60. It then crosses approximately 1.50 miles of single-family residential followed by 0.49 mile of commercial land located on both sides of Route 132 in the City of Williamsburg. The route crosses one small (0.05-mile) piece of land zoned as a historic area, 0.43 mile of commercial areas on both sides of Route 5, and two small multi-family areas on either side of a 0.09-mile plot of land zoned as planned development before reaching the Colonial Parkway in the City of Williamsburg. The Colonial Parkway is zoned as special public interest. The route then follows approximately 1.42 miles of single-family residential, a smaller 0.48-mile commercial district, and another small 0.10-mile single-family residential area before reaching the interchange of Interstate 64 and Route 199. Between Route 199 and U.S. Route 60 this section crosses approximately 0.42 mile of single-family residential followed by 0.20 mile of mixed-family residential, 0.18 mile of single-family residential, and 0.21 mile of commercially zoned land. Between U.S. Route 60 and the Skiffes Creek Switching Station, the

route crosses two small industrial areas on either side of a small single-family area before crossing approximately 0.96 mile of single-family residential and 0.62 mile of rural residential land.

The Surry Alternative crosses land predominantly zoned as industrial. The route begins at the Surry Power Station and crosses approximately 1.52 miles of industrially zoned land. The route next crosses a small 150-foot segment of agriculturally zoned land. The route next crosses James River for approximately 3.53 miles. Upon coming onshore, the route extends across approximately 1.66 miles of industrially zoned land. The route then crosses a small parcel of rural residential land, approximately 0.29 mile of commercially zoned land, and an additional 0.15 mile of industrially zoned land and 0.16 mile of rural residential land.

The Surry Alternative with the James River Crossing Variation 1 would cross the same land types. The only differences would be that the crossing of the James River would be approximately 4.10 miles in length and, upon coming onshore, the route would extend across approximately 1.62 miles of industrially zoned land before crossing U.S. Route 60.

The Surry Alternative with the James River Crossing Variation 2 would cross the same land types. The crossing of the James River would be approximately 3.81 miles in length. Upon coming onshore, the route would extend across approximately 1.16 miles of industrially zoned land before crossing U.S. Route 60.

The Surry Alternative with the James River Crossing Variation 3 would cross the same land types. The crossing of the James River would be approximately 4.12 miles in length. Upon coming onshore, the route would extend across approximately 1.18 miles of industrially zoned land before crossing U.S. Route 60.

Portions of the industrially zoned land crossed by the Surry Alternative and the three James River Crossing Variations are owned by the BASF. This property is currently listed for sale and designated as an Enterprise Zone within James City County. Portions of the BASF property are characterized by the Virginia Department of Environmental Quality (VDEQ) as a hazardous waste site and portions have been landfilled and/or capped.

The Skiffes Creek to Wheaton Section of the proposed project begins on rural residential land before crossing approximately 3.19 miles of industrial land associated with the Green Mount Industrial Park. The route then crosses a small section of mixed-family residential land before crossing approximately 1.57 miles of special public interest land associated with Newport News Park. From here, the route then crosses approximately 1.74 miles of industrial and commercial lands on either side of Interstate 64. The route then crosses about 0.85 mile of residential lands, 1.16 miles of special public interest land, and 0.10 mile of commercial land before reaching Denbigh Boulevard in the City of Newport News. The route continues and crosses 0.10 mile of commercial land and 1.04 mile of industrial land before coming to Harwoods Mill Park and the York County Sports Complex. The route continues through 0.85 mile of single-family residential areas and enters the Kiln Creek Golf Club and Resort, which is zoned as a planned development and multi-family residential. The route then crosses Interstate 64 and crosses 1.53 miles of an industrial and commercial district before crossing Route 17. The remainder of the route, approximately 3.77 miles, is zoned as single-family residential.

The Chesapeake Bay Preservation Act (CBPA) (Chapter 25 of Title 10.0 of the Code of Virginia) establishes a program to protect and improve the quality of water of the Chesapeake Bay. The focus of the CBPA is to protect sensitive land areas that are adjacent to tributaries of the Chesapeake Bay which, if improperly developed, can contribute to water quality degradation of the bay and its tributaries. As protected under the CBPA, Resource Protection Areas (RPAs) are sensitive lands at or near the shoreline that have an intrinsic water quality value due to the ecological and biological processes they perform. RPA components include tidal wetlands, tidal shores, non-tidal wetlands connected by surface flow and contiguous to tidal wetlands or tributary streams, and a minimum 100-foot buffer landward of the other RPA components. James City County, Charles City County, Surry County, and the City of Williamsburg have incorporated the CBPA into their zoning ordinances to implement requirements for protecting and improving water quality in RPAs.

Activities or facilities permitted in RPAs (with county approval) include water dependent facilities (such as docks), the redevelopment of already developed areas, and other specific uses. RPAs in the study area are generally located along the major waterways identified in Section 3.2.2 below and their tributaries. In James City County, all lands that are not within a designated RPA are designated Resource Management Areas (RMAs). RMAs are land types that, if improperly developed, have a potential to degrade water quality or to damage the protective features of the RPA. RMAs are required to be contiguous to the entire inland boundary of the RPA. Rights-of-way and development are not limited in RMAs as long as a proposal meets the requirements of the underlying zoning of the land and conforms to the requirements outlined in the counties' CBPA Overlay Zoning Ordinances. In Charles City County and the City of Williamsburg, RMAs are limited to those areas adjoining to any RPA where there is an overlap of soils delineated as highly erodible and soils delineated as highly permeable, those areas adjacent to any RPA delineated as a 100-year floodplain, and an area 25 feet in width landward and adjoining to the entire inland boundary of the RPA. In Surry County, RMAs include all remaining areas (outside of RPAs) that are located within the James River Watershed (Charles City County, 2003; James City County, 1990; and NPS, 1994).

Construction of electric transmission lines is conditionally exempt from the CBPA provided it complies with applicable regulations; therefore, the project is not subject to restrictions in RPAs or RMAs.

NRG reviewed county zoning ordinances and comprehensive plans for Charles City County, Surry County, and James City County to identify any potential conflicts with zoning and the proposed project. These counties were reviewed because they contain those portions of the proposed alternatives where there is undeveloped but existing right-of-way or where a new right-of-way would be required. As indicated below, several of the counties crossed by the proposed or alternative route sections require a special use permit for certain utilities. However, according to Va. Code § 56-46.1.F, SCC approval of transmission lines 138 kV and above preempts local zoning ordinances and special use permitting.

In Charles City County, central utility systems with rights-of-way greater than or equal to 30 feet in width are considered permitted uses in most zoning districts subject to a special use permit. These utility systems must also comply with county environmental and site plan ordinances and regulations. Two zoning districts, multi-family residential and planned use, do not approve utility systems with rights-of-way greater than or equal to 30 feet in width (Charles

City County, 2006). The Chickahominy Alternative does not cross any Charles City County lands zoned as multi-family or planned use.

In James City County, electrical transmission lines with a capacity of 69 kV or greater are permitted by special use permit in most zoning districts. They are permitted without special use permits in the industrial zoning district. In the planned development district, expansions and extensions of utilities are permitted if they service the planned development, and in planned unit development districts there is no mention of utility rights-of-way. James City County has a floodplain overlay district that regulates land uses in floodplain areas. In these districts utility facilities and structures must be built in a way that eliminates the chance of damage during a 100-year flood event (James City County, 2011). James City County also has a Greenspace Program in effect where the County purchases lands for sale and they become part of the county's conservation easement areas.

The Surry Alternative crosses 1.52 miles of land within Surry County zoned as a mixture of industrial and agricultural. These two zoning categories both require special use permits for major utility projects. Surry County also has a floodplain overlay district that regulates land uses in floodplain areas. In these districts, utility facilities and structures must be built in a way that eliminates the chance of damage during a 100-year flood event (Surry County, 2010).

### **3.1.7 Conservation Easements**

The Virginia Open-Space Land Act provides for the creation of open-space easements by public bodies as a means of preserving open space or significant natural, cultural, and recreational resources on public or private lands. Most easements created under the act are held by the Virginia Outdoors Foundation (VOF), but any state agency is authorized to create and hold an open-space easement. The Virginia Conservation Easement Act similarly provides for the creation of conservation easements on public or private lands but under the auspices of charitable organizations (such as conservation trusts) rather than public agencies. The Virginia Agricultural and Forestal Districts (AFD) Act provides for the creation of conservation districts. These districts are designed to conserve, protect, and encourage the development and improvement of a locality's agricultural and forestal land for the production of food and other products, while also conserving and protecting land as valued natural and ecological resources. James City County has developed AFDs and Charles City County is working to establish acreage limits on districts but to date no AFDs have been designated in Charles City County. In all three cases, easements and conservation districts are designed to preserve and protect open space or other resources in perpetuity. Easements negotiated with private landowners allow the lands to remain in private ownership but with protections imposed to limit or restrict land uses on the property.

NRG identified four areas along the Chickahominy Alternative that are protected through conservation easements or districts, managed by entities other than VOF, based on information obtained from the VDCR, Virginia Department of Historic Resources (VDHR), and from a review of available city and county AFD data. These areas are shown on Figure 3.1.7-1 in Appendix A. Two of the conservation easements are managed by the Williamsburg Land Conservancy (WLC) and two are privately owned AFD conservation districts.

The Chickahominy Alternative crosses two AFD conservation districts under private ownership in James City County. 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 U.S. Route 60 and north of Centerville Road. The Chickahominy Alternative crosses this AFD near MP C24.6.

A 6.9 acre-WLC conservation easement under private ownership is located adjacent to the Lightfoot Junction to Skiffes Creek Section 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 0.97 mile south of the Lightfoot Substation. The Lightfoot Junction to Skiffes Creek Section 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 two parcels appear to be part of a contiguous easement located approximately 3.9 linear miles southeast of the Lightfoot Substation.

### **3.1.8 Other Conservation Lands**

NRG obtained information on other conservation lands through review of a digital Conservation Lands dataset obtained from the VDCR. The dataset identifies "lands of conservation and recreational interest" in Virginia, including federal, state, local, and privately owned lands. NRG's review of the dataset identified the following six conservation lands in addition to those discussed above under Conservation Easements: Chickahominy WMA is under the jurisdiction of the VDGIF; Freedom Park and Warhill Sports Complex, under the jurisdiction of James City County; Waller Mill Park, under the jurisdiction of the City of Williamsburg; the Colonial National Historic Park Colonial Parkway, under the jurisdiction of the NPS; and the City of Newport News Park, under the jurisdiction of the City of Newport News. Each of these conservation lands are all considered areas of recreational interest and are discussed in more detail in Section 3.1.2.

## **3.2 NATURAL RESOURCES**

### **3.2.1 Wetlands**

For the purposes of this environmental review, NRG identified wetlands within the project area using data provided by the Williamsburg Environmental Group, Inc. (WEG). WEG utilized several desktop data sources to map wetlands within the existing and proposed right-of-way corridors. A copy of WEG's report is contained in Appendix F. These sources included USGS 7.5 minute series topographic quadrangle maps, National Wetland Inventory Online Maps obtained from the U.S. Fish and Wildlife Service (FWS), soils data from the Natural Resources Conservation Service Web Soil Survey, Digital Orthophoto Quarter Quads dating from March of 1994, and aerial photography dating from 2005. WEG did not field delineate wetlands within its study area.

Wetland complexes in the project area are found in association with most major rivers, creeks, and their tributaries including Possum Run, Bradley Run, East Run, Stony Run, Collins Run, Dockman Swamp, Tonyham Swamp, Barrows Creek, Parson Creek, Blackstump Creek, Chickahominy River, Gordon Creek, Colby Swamp, Yarmouth Creek, Longhill Swamp, Chisel Run, Queen Creek, Whiteman Swamp, Rhine River, King Creek, Skiffes Creek, Warwick River, Poquoson River, Brick Kiln Creek, Newmarket Creek, Wood Creek, and the James River. WEG's Offsite Wetland and Waters Analysis (May 2012) data indicate a large forested wetland

complex is located along the Charles City County and New Kent County line and a large forested and emergent wetland complex is located along the Charles City County and James City County line. Both of these dominant wetland features are located adjacent to the banks of the Chickahominy River and its tributaries in association with the Chickahominy River floodplain. A small wetland complex on the east bank of the James River was also identified. This complex consists of forested, emergent, and tidal wetlands associated with Wood Creek and Skiffes Creek. The majority of the wetlands in the project area are characterized as palustrine emergent/palustrine scrub-shrub, followed in order of prevalence by palustrine forested wetlands and tidal wetlands. The majority of wetlands in the project area outfall to the Chickahominy and James Rivers; therefore, these wetlands are subject to the jurisdiction of the COE and the Virginia Department of Environmental Quality under Sections 404 and 401 of the Clean Water Act (CWA), respectively.

### **3.2.2 Waterbodies**

#### **Rivers and Section 10 Waters**

NRG identified and mapped waterbodies in the project area using publicly available GIS databases, USGS topographic maps, and recent (2011) digital aerial photography. The two major rivers being crossed by the project are the Chickahominy and James Rivers. The Chickahominy River meanders throughout much of the area north of the Chickahominy Alternative before flowing to the south across the Chickahominy Alternative between MPs C18.2 and C18.5, eventually outfalling to the James River. This crossing of the Chickahominy River is approximately 0.35 miles (1,840 linear feet). The Surry Alternative and James River Crossing Variations 1, 2, and 3 include crossings of the James River from Surry County to James City County, Virginia. This portion of the river has been designated as scenic in the Scenic River program by the VDCR. The purpose of the program is to aid in protecting rivers that are valued for their scenic, recreational, historic, and natural characteristics. Both the Surry Alternative and the James River Crossing Variations 1, 2, and 3 span two navigational channels. The Surry Alternative crosses the river between MPs S1.5 and S5.1 for approximately 3.58 miles (18,902 linear feet). If constructed with James River Crossing Variation 1, 2 or 3, the length of the river crossing for the Surry Alternative would be approximately 4.12 miles (21,754 linear feet), 3.82 miles (20,170 linear feet) or 4.13 miles (21,806 linear feet), respectively. Additional river crossings include the Warwick, Rhine, and Poquoson Rivers.

Under Section 10 of the Rivers and Harbors Act of 1899, the COE has jurisdiction over navigable waters subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible to use, to transport interstate or foreign commerce. The Chickahominy River south of Walker Dam Lock, Skiffes Creek, and the James River are considered to be Section 10 navigable waterbodies. Crossings of these waters would require a permit and/or coordination with the COE. Similarly, activities within and over subaqueous lands are regulated by §28.2-1200 of the Code of Virginia and require a permit from the Virginia Marine Resources Commission.

#### **Other Perennial or Intermittent Streams**

The alternative routes cross several stream systems, including Possum Run, Bradley Run, East Run, Stony Run, Collins Run, Dockman Swamp, Tonyham Swamp, Barrows Creek, Parson Creek, Blackstump Creek, Chickahominy River, Gordon Creek, Colby Swamp,

Yarmouth Creek, Longhill Swamp, Chisel Run, Queen Creek, Whiteman Swamp, Rhine River, King Creek, Skiffes Creek, Warwick River, Poquoson River, Brick Kiln Creek, Newmarket Creek, Wood Creek, the James River, and associated tributaries.

The Chickahominy River meanders throughout much of the area north of the Chickahominy Alternative before flowing to the south across the Chickahominy Alternative between MPs C18.2 and C18.5, eventually outfalling to the James River. The majority of waterbodies and their tributaries crossed by the alternative route flow south to the Chickahominy River and/or directly to the James River, including Possum Run, Bradley Run, East Run, Stony Run, Collins Run, Dockman Swamp, Tonyham Swamp, Barrows Creek, Parson Creek, Blackstump Creek, Chickahominy River, Gordon Creek, Colby Swamp, Yarmouth Creek, Longhill Swamp, Chisel Run, Rhine River, Skiffes Creek, Warwick River, Newmarket Creek and Wood Creek. Queen Creek, Whiteman Swamp, and King Creek drain to the York River, flowing generally to the east/northeast. Brick Kiln Creek and Newmarket Creek are located in the southernmost portion of the project area and flow generally east to Back River. The Poquoson River outfalls directly to Chesapeake Bay.

### **Reservoirs, Ponds and Other Waterbodies**

In addition to these stream systems, the route sections cross Scotts Pond in James City County; and Harwoods Mill, Waller Mill, and Williamsburg Country Club Lake Reservoirs in York County; and Lee Hall Reservoir in the City of Newport News.

Scotts Pond is a small (approximately 6-acre) waterbody located adjacent to and east of Route 199 in James City County. The pond is bordered by residential development to the north and east, and by Route 199 and Dominion's existing transmission corridor to the south and west. The Lightfoot Junction to Skiffes Creek Section of the Chickahominy Alternative crosses Scotts Pond near MP C26.8. Construction of the Lightfoot Junction to Skiffes Creek Section would require reconfigured crossings in this location; however, no additional right-of-way would be required.

Harwoods Mill Reservoir is a 265-acre impoundment and the terminal reservoir for the City of Newport News water supply system. Water is pumped into Harwoods Mill from Chickahominy, Diascund, and Little Creek Reservoirs. The Skiffes Creek to Whealton Section crosses Harwoods Mill Reservoir in two locations – between MPs W10.3 and W10.6 and between MPs W11.8 and W12.1. Construction of the Skiffes Creek to Whealton Section would require reconfigured crossings of Harwoods Mill Reservoir; however, no additional right-of-way would be required. The existing right-of-way measures 250 feet in width between MPs W10.99 and W11.92; however, only approximately 150 feet of the right-of-way has been cleared of vegetation. Due to the proximity of the existing right-of-way to Newport News/Williamsburg Airport, Dominion will need to clear the remaining 100 feet of its existing right-of-way to accommodate the construction of additional structures in this area. No additional clearing will be required elsewhere along the Skiffes Creek to Whealton section.

Waller Mill Reservoir is a 360-acre reservoir owned by the City of Williamsburg located within the boundaries of Waller Mill Park. Waller Mill Park is described in Section 3.1.6 of this document. The Lightfoot Junction to Skiffes Creek Section of the Chickahominy Alternative crosses the Waller Mill Reservoir between MPs C29.6 and C29.8. Construction of the Lightfoot

Junction to Skiffes Creek Section would require reconfigured crossings of Waller Mill Reservoir; however, no additional right-of-way would be required.

Williamsburg Country Club Lake Reservoir is an approximately 13-acre waterbody located adjacent to the Williamsburg Golf Course. Williamsburg Country Club Lake Reservoir outfalls to King Creek, and ultimately to the York River. The Lightfoot Junction to Skiffes Creek Section of the Chickahominy Alternative crosses Williamsburg Country Club Lake Reservoir between MPs C35.2 and C35.3. Construction of the Lightfoot Junction to Skiffes Creek Section would require a reconfigured crossing of Williamsburg Country Club Lake Reservoir; however, no additional right-of-way would be required.

Lee Hall is a 230-acre reservoir owned by the City of Newport News. The reservoir is located within the Newport News Park. Lee Hall Reservoir is located a few miles to the west of Newport News and is easily visible from Interstate 64 and SR 143. Both roads have bridges that cross the reservoir. The bridges of these two roads divide the upper and middle basins of the reservoir. The middle and lower basins are connected by pipe and fishing is prohibited from the lower basin. A water treatment plant draws from the lower basin. Construction of the Skiffes Creek to Wheaton Section will require reconfigured crossings of Lee Hall Reservoir; however, no additional right-of-way will be required.

### **3.2.3 Virginia Department of Conservation and Recreation Natural Heritage Resources Screening**

NRG reviewed the VDCR's Natural Heritage Resources (NHR) Program screening dataset to identify areas of ecological significance within the project area. As described below, the dataset includes three components: Conservation Sites, General Location Areas, and Karst Screening Areas.

- 1) Conservation Sites represent key areas of the landscape and are worthy of protection and stewardship action because of the natural heritage resources and habitat they support. Conservation sites are areas built around one or more elements, such as a rare plant or animal or significant natural community or geological feature. Sites are designed to include the element and, where possible, its associated habitat and/or buffer or other adjacent land thought necessary for the element's conservation. For rare aquatic species, the VDCR defines Stream Conservation Units (SCUs), which identify stream reaches that contain aquatic natural heritage resources, including upstream and downstream buffer and tributaries associated with this reach.
- 2) General Location Areas for Natural Heritage Resources represent the approximate locations of documented natural heritage resource occurrences that were not incorporated into Conservation Sites, either because they are poor quality, their location was not precisely identified, or they have not been verified in over 20 years. These approximate locations, which typically (but not always) are defined to encompass a 1-mile-diameter circle, are included in the dataset because they indicate areas with relatively high potential for natural heritage resource occurrences. Depending on the apparent suitability of local habitat, the

VDCR may recommend biological surveys when reviewing projects that intersect these locations.

- 3) Karst Screening Areas represent regions of karst topography that harbor significant cave communities and natural heritage resources. In most cases karst areas involve a series of hydrologically connected caves and cavities that span a large area. Each significant karst feature is buffered by an area encompassing a 3-kilometer radius. These regions are in the process of being evaluated and delineated as Conservation Sites.

The VDCR dataset identified nine Conservation Sites in the project area, including five with state-listed species present. The locations of the VDCR NHR Conservation Sites identified in the VDCR NHR data are depicted on Figure 3.2.3-1. Conservation sites are given a biodiversity significance ranking of 1 to 5 based on rarity, quality, and number of natural heritage resources they contain. One of the eight sites in the study area is ranked B1 (Outstanding priority), four sites are ranked B2 (Very High priority); one is ranked B3 (High priority); and two are ranked B5, the lowest ranking, which indicates that the area is “of general biodiversity significance.” In addition the VDCR data identified three General Location Areas, all of which were identified as “vascular plant” locations with no further detail provided. The VDCR data did not identify any Karst Screening Areas in proximity to the project.

Old Neck Creek is a Conservation Site located in Charles City County that supports rare plants, animals, and ecological communities. The VDCR’s NHR Program ranks this area as a B2 - Very High priority conservation site. The Chickahominy Alternative crosses Old Neck Creek between MPs C16.6 and C18.0.

Yarmouth Creek is a Conservation Site located in Charles City County which supports rare plants, animals, and ecological communities, and according to the VDCR’s NHR Program plays a critical role in ecosystem and species health and viability. The VDCR’s NHR Program ranks this area as a B2 - Very High priority conservation site. The Chickahominy Alternative 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. The NHR ranks this location as a B3 - High priority conservation area. The Chickahominy Alternative 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 consisting of gentle slopes, seeps, and slow-moving headwaters of Chisel Run with mixed hardwood and pine dominated uplands. The VDCR’s NHR Program ranks this area as a B2 - Very High priority conservation site. The Lightfoot Junction to Skiffes Creek Section of the Chickahominy Alternative crosses the Powhatan Creek Natural Area between MPs C25.9 and C26.8 and between MPs K0.1 and K0.8.

Grove Creek is a Conservation Site located in James City County that supports numerous rare plants and ecological communities. According to the 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. The VDCR's NHR Program ranks this area as a B1 - Outstanding priority conservation site. The Lightfoot Junction to Skiffes Creek Section of the Chickahominy Alternative crosses the Grove Creek conservation site between MPs C35.9 and C36.1.

Gravel Neck is a conservation site located in Surry County that supports at least one rare animal species. 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. The VDCR's NHR Program ranks this area as B5, which indicates that the area is "of general biodiversity significance." The Surry Alternative intersects the Gravel Neck Conservation Site between MPs S0.8 and S1.3. The Surry Alternative with James River Crossing Variations 1, 2, and 3 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. To obtain the most current eagle nest data, NRG reviewed the 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. The VDCR's NHR Program ranks this area as B5, which indicates that the area is "of general biodiversity significance." The Surry Alternative and the Surry Alternative 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.

Grafton Ponds is a Conservation Site located in the City of Newport News which supports numerous rare plants, animals, and ecological communities. According to the 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. The VDCR's NHR Program ranks this area as a B2 - Very high priority conservation land. The Skiffes Creek to Wheaton Section 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. The VDCR's NHR Program considers this site a B5 - General Interest conservation land. The Skiffes Creek to Wheaton Section 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. The Lightfoot Junction to Skiffes Creek Section of the Chickahominy Alternative crosses the northernmost General Location Area where it overlaps the Grove Creek Conservation Site between MPs C35.9 and C36.2. A second General Location Area overlaps the Grafton Ponds Conservation Site. The Skiffes Creek to

Whealton Section crosses this area between MPs W7.4 and W7.9. The Skiffes Creek to Whealton Section crosses a third General Location Area between MPs W14.2 and W14.5.

### 3.2.4 Protected Species

Digital data was obtained from the VDCR's NHR Program and from the VDGIF to identify locations within the study area that potentially support protected species. NRG also conducted county queries of the VDCR NHR website, the VDGIF Virginia Fish and Wildlife Information Service website, and reviewed threatened and endangered species lists maintained by the FWS for each county. Species occurrences reported by the federal and state species lists were evaluated against the VDGIF's digital *EnviroReview Listed SppObs* data, and the VDCR's EOREps datasets. A summary of the findings is provided in Sections 3.2.4.1 and 3.2.4.3 below.

The VDCR's EOREps are mapped representations of plants, animals, and exemplary natural communities which are tracked by the VDCR's NHR Program due to their rarity. Each occurrence is represented by a polygon indicating its known location. The polygons are intended to indicate the full known aerial extent of the occurrence, modified to account for the locational uncertainty of the source data. The VDGIF's Species Observation (SppObs) dataset includes all verified species documentations maintained by VDGIF. The EOREps and SppObs datasets documented several occurrences of plants, animals, and exemplary natural communities within the project routes. These occurrences are discussed further in Sections 3.2.4.2 and 3.2.4.4 below.

The VDGIF Anadromous Fish Use dataset identified the Chickahominy River and the James River as confirmed anadromous fish waters. The VDGIF Anadromous Fish Use dataset also identified Skiffes Creek as potential anadromous fish waters. Construction of the Chickahominy Alternative route would require crossing of the Chickahominy River between about MPs C18.1 and C18.5 in a location identified by the VDGIF as confirmed anadromous fish waters for the alewife (*Alosa pseudoharengus*), American shad (*Alosa sapidissima*), blueback herring (*Alosa aestivalis*), hickory shad (*Alosa mediocris*), striped bass (*Morone saxatilis*) and yellow perch (*Perca flavescens*). The Chickahominy Alternative traverses the Chickahominy River for approximately 1,840 feet in this location.

Construction of the Surry Alternative would require crossing of the James River between MPs S1.5 and S5.1 in a location identified by the VDGIF as confirmed anadromous fish waters for the same above-referenced species. The Surry Alternative traverses the James River for approximately 18,638 feet in this location. James River Crossing Variation 1 would cross anadromous fish waters between MPs S1.5 and JV1-4.1 for approximately 21,648 feet. James River Crossing Variation 2 would cross anadromous fish waters between MPs S1.5 and JV2-3.8 for approximately 20,117 feet. James River Crossing Variation 3 would cross anadromous fish waters between MPs S1.5 and JV3-4.1 for approximately 21,754 feet.

The VDGIF Anadromous Fish Use dataset also identified Skiffes Creek as potential anadromous fish waters. Construction of the Surry Alternative or James River Crossing Variation 1 would require crossing of the Skiffes Creek between MPs S5.8 and S5.9 in proximity to a location identified by the VDGIF as potential anadromous fish waters. The Surry Alternative and James River Crossing Variation 1 traverse Skiffes Creek for approximately 300 feet in this location. This crossing is likely capable of being spanned without affecting Skiffes Creek.

Construction of the Skiffes Creek to Whealton Section would also require crossing Skiffes Creek between MPs W2.8 and W2.9 in a location identified by VDGIF as potential anadromous fish waters. The transmission line crossing of Skiffes Creek at this location is about 750 feet long and is likely capable of being spanned without affecting Skiffes Creek.

The VDGIF provides general guidance for the protection of anadromous fish and other wildlife resources via time of year restrictions, focusing on times of year during which certain species may be most sensitive to human activities such as construction and land clearing. According to the VDGIF this general guidance does not constitute a list of best management practices to protect imperiled or sensitive wildlife species or their habitats; nor, is adherence to these restrictions essential for every project. The recommendations should be considered as guidance for project planning and scheduling of construction activities that may impact the identified wildlife species (VDGIF, 2012b).

According to the March 7, 2012 VDGIF Time of Year Restrictions Table, crossings of the Chickahominy River and the James River may be subject to construction time of year restrictions beginning February 15 and ending June 30 if any in-water work is proposed. A portion of the Surry Alternative and James River Crossing Variations are located in proximity to an exemption area (Tribell Shoals Channel) subject to timing restrictions beginning February 15 and ending June 15. Project-specific restrictions, if any, would be evaluated during permitting, and modification or waiver of these time-of-year standards may be considered on a case-by-case basis.

The VDGIF data did not identify any colonial waterbird colonies within 1,000 feet of the routes. The nearest documented waterbird colony is located approximately 0.5 mile southeast of the Lightfoot Junction to Skiffes Creek Section of the Chickahominy Alternative, near MP C21.5. The colony consisted of great blue heron and was documented in 2003. For James River Crossing Variation 1, MP JV1-1.6 of the route is located approximately 0.61 mile from a second great blue heron colony, located within the Hog Island WMA. James River Crossing Variations 2 and 3 are located between 0.5 and 1.0 miles from this colony. In addition to the aforementioned colony, there are three additional records of colonial waterbird colonies on Hog Island; two are great blue heron; one is great blue heron and great egret. These three additional colonies are located 0.5 and 2 miles from the routes.

#### **3.2.4.1 James River Fisheries**

The passage of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) in 1976 and the Sustainable Fisheries and Conservation Act (SFCA) of 1996, authorized the National Marine Fisheries Service (NMFS) to manage fisheries within the 200-mile-wide Exclusive Economic Zone (EEZ) along the coasts of the United States to address human impacts on the marine environment and to prioritize identification and management of Essential Fish Habitat (EFH). EFH is defined in the MSFCMA as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Under the MSFCMA, EFH must be identified and conserved. The act requires Regional Fishery Management Councils (RFMC) to identify and describe EFH for each life stage of the managed species within their jurisdiction. EFH for several species (described below) have been identified in the James River at the proposed crossing of the Surry Alternative and James River Crossing Variations 1, 2, and 3. No EFH was identified within the Chickahominy River crossing.



EFH for all life stages of king mackerel (*Scomberomorus cavalla*), Spanish mackerel (*Scomberomorus maculatus*), cobia (*Rachycentron canadum*), and red drum (*Sciaenops ocellatus*) are identified at the James River crossing area of the Surry Alternative and James River Crossing Variations 1, 2, and 3. Habitat for king mackerel and Spanish mackerel includes sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters, from the surf to the shelf break zone, but from the Gulf Stream shoreward, including Sargassum. In addition, designated habitat includes all coastal inlets and all state-designated nursery habitats of particular importance to coastal migratory pelagics. EFH for cobia also includes high salinity bays, estuaries, and seagrass habitat (National Oceanic and Atmospheric Administration (NOAA), 2012).

EFH for red drum (*Sciaenops ocellatus*) includes all of the following habitats to a depth of 50 meters offshore: tidal freshwater; estuarine emergent vegetated wetlands (flooded saltmarshes, brackish marsh, tidal creeks); estuarine scrub-shrub (mangrove fringe); submerged rooted vascular plants (sea grasses); oyster reefs and shell banks; unconsolidated bottom (soft sediments); ocean high salinity surf zones; and artificial reefs. Habitat Areas of Particular Concern (HAPC) for red drum include all coastal inlets, all state-designated nursery habitats of particular importance to red drum. Seagrass beds, shallow areas of estuarine rivers and mainland shorelines, are where many red drum reside during the summer. The various inlets, adjoining channels, sounds, and outer bars of ocean inlets are critical areas for spawning activity as well as feeding and daily movements and may be affected by constant dredging, jettying, or excessive boat traffic. Adult red drum spend a lot of time in these areas during spring and fall with large concentrations located near the least trafficked inlets (NOAA, 2012).

EFH for juvenile and adult windowpane flounder (*Scophthalmus aquosus*), bluefish (*Pomatomus saltatrix*), Atlantic butterfish (*Peprilus triacanthus*), and black sea bass (*Centropristis striata*) was also identified at the crossing of the Surry Alternative and James River Crossing Variations 1, 2, and 3. EFH for windowpane flounder includes bottom habitats with substrate of mud or fine-grained sand. Windowpane flounder are most often observed spawning during the months of February through December with a peak in May in the Mid-Atlantic (NOAA, 2012).

Inshore EFH for bluefish includes major estuaries in the Mid-Atlantic. Generally, juveniles occur from May through October, and adults from April through October. Bluefish adults are highly migratory and distribution varies seasonally and according to the size of the individuals comprising the schools (NOAA, 2012).

Inshore EFH for Atlantic butterfish is found in the "mixing" and/or "seawater" portions of all the estuaries where butterfish are "common," "abundant," or "highly abundant" on the Atlantic coast. Generally, butterfish are collected in depths between 33 and 1200 feet and temperatures between 37° and 82°F (NOAA, 2012).

Inshore EFH for black sea bass includes estuaries where black sea bass are identified as being "common," "abundant," or "highly abundant" in the NOAA's Estuarine Living Marine Resources (ELMR) database for the "mixing" and "seawater" salinity zones. Juveniles are found in estuaries in the summer and spring. Generally, juvenile black sea bass are found in waters warmer than 43°F with salinities greater than 18 parts per trillion (ppt) and coastal areas, but they winter offshore. Juvenile black sea bass are usually found in association with rough

bottom, shellfish, and eelgrass beds, as well as man-made structures in sandy-shelly areas; offshore clam beds and shell patches may also be used during the wintering. Adults are generally found in estuaries from May through October. Wintering adults (November through April) are generally offshore (NOAA, 2012).

EFH for larval and juvenile stages of summer flounder (*Paralichthys dentatus*) and dusky shark (*Carcharhinus obscurus*) is also identified. Inshore EFH for the summer flounder includes all of the estuaries where summer flounder are identified as being present (rare, common, abundant, or highly abundant) in the ELMR database for the "mixing" and "seawater" salinity zones. In general, juveniles use several estuarine habitats as nursery areas, including salt marsh creeks, seagrass beds, mudflats, and open bay areas in water temperatures greater than 37°F and salinities from 10 to 30 ppt range. Generally, adult summer flounder inhabit shallow coastal and estuarine waters during warmer months and move offshore on the outer Continental Shelf at depths of 500 feet in colder months (NOAA, 2012).

EFH for the dusky shark includes shallow coastal waters, inlets, and estuaries to the 25 meter isobaths (NOAA, 2012).

Larval and adult EFH is identified in the project area for sandbar shark (*Carcharhinus plumbeus*). Larval EFH includes nursery areas in shallow coastal waters during the summer. Adult EFH includes shallow coastal areas from the coast to the 50 meter isobaths. HAPC important nursery and pupping grounds have been identified in shallow areas in the lower Chesapeake Bay (NOAA, 2012).

The Atlantic sturgeon (*Acipenser oxyrinchus*) is not a managed fishery species. However, it was recently listed as federally endangered and is known to occur in the James River, within the project area. The sturgeon is anadromous, primarily residing in marine and estuarine environments, but spawns in freshwater. Adults spawn in deep parts of large rivers and typically deposit their eggs on hard surfaces. Larvae primarily use benthic habitat, including gravely substrate. Juveniles and sub-adults prefer estuarine waters and coastal areas with sandy or gravely substrate.

#### **3.2.4.2 Federally and State-Listed Endangered and Threatened Species**

Species occurrences reported by the FWS Virginia Field Office and the VDCR NHR county lists were evaluated against the VDGIF's digital EnviroReview Listed SppObs data, and the VDCR's EOReps datasets, which display species occurrences at the local level. A summary of the federally and state-listed species documented within the counties and cities crossed by the project is presented in Table 3.2.4-1. The documented locations of federally and state-listed species that are crossed by the right-of-way are described in further detail below. Species having no federally or state-listed endangered or threatened status are described in Section 3.2.4.3 of this document.

Dominion Virginia Power  
 Surry-Skiffes Creek 500 kV Transmission Line  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station

TABLE 3.2.4-1

**Surry-Skiffes Creek 500 kV Transmission Project  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

**Federally and State-Listed Species Occurrence in Vicinity of Proposed Project**

Common Name	Scientific Name	Federal Status	State Status	Global Rank	Habitat	County/City Documented	Route Section Occurrence
<b>Federally Listed Species</b>							
<b>Plants</b>							
Small whorled pogonia	<i>Isotria medeoloides</i>	LT	LE	G2	Acidic soils, in dry to mesic second-growth, deciduous or deciduous-coniferous forests	Charles City County, James City County, City of Williamsburg, York County	1*, 2, 3, 4
Swamp pink	<i>Helonias bullata</i>	LT	LE	G3	Restricted to forested wetlands that are groundwater influenced and are perennially water-saturated with a low frequency of inundation	Charles City County	1
Sensitive joint vetch	<i>Aeschynomene virginica</i>	LT	LT	G2	Fresh to slightly brackish tidal river shores and estuarine-river marsh borders	Charles City County, James City County, Surry County	1, 2, 3, 4
<b>Animals</b>							
Atlantic Sturgeon	<i>Acipenser oxyrinchus</i>	LE	LE	G3	Primarily marine, but close to shore, when not breeding; migrates to rivers for spawning, moves downstream afterward	Charles City County, James City County, Surry County, City of Newport News	1, 2, 3, 4
Northeastern beach tiger beetle	<i>Cicindela dorsalis dorsalis</i>	LT	LT	G4T2	Occurs from about the foredune to the high tide line on ocean and bay beaches only; Larvae live in burrows in the sand	City of Hampton	3
Piping plover	<i>Charadrius melodus</i>	LT	LT	G3	Breeds on sandy upper beaches, especially where scattered grass tufts are present, and sparsely vegetated shores and islands of shallow lakes, ponds, rivers, and impoundments	City of Hampton	3

Dominion Virginia Power  
 Surry-Skiffes Creek 500 kV Transmission Line  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station

TABLE 3.2.4-1 (cont'd)

**Surry-Skiffes Creek 500 kV Transmission Project  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

**Federally and State-Listed Species Occurrence in Vicinity of Proposed Project**

Common Name	Scientific Name	Federal Status	State Status	Global Rank	Habitat	County/City Documented	Route Section Occurrence
<b>State-Listed Species</b>							
<b>Plants</b>							
Harper's fimbriatilis	<i>Fimbristylis perpusilla</i>	SOC	LE	G2	Found predominantly on fine-textured substrates, sometimes with a sandy component	York County	2, 3*
Narrow-leaved spatterdock	<i>Nuphar sagittifolia</i>	SOC	LT	G2	Primarily coastal-plain blackwater streams or tidal estuaries, occasionally in lakes or brownwater streams	Charles City County, James City County	1, 2, 3, 4
New Jersey Rush	<i>Juncus caesariensis</i>	SOC	LT	G2G3	Very acidic, sphagnum, extremely wet spring or seep areas with a stable source of flowing water, but without standing water	Charles City County, James City County, City of Williamsburg, York County	1, 2, 3, 4
<b>Animals</b>							
Bald Eagle	<i>Haliaeetus leucocephalus</i>	SOC	LT	G5	Habitat includes areas close to coastal areas, bays, rivers, lakes, or other bodies of water that provide concentrations of food sources, including fish, waterfowl, and wading birds.	Charles City County, James City County, York County, Surry County, City of Newport News, City of Hampton	1*, 2, 3, 4*
Blackbanded Sunfish	<i>Enneacanthus chaetodon</i>	none	LE	G4	Quiet, shallow, heavily vegetated, non-turbid, darkly stained, slightly to very acidic waters sand- and mud-bottomed creeks, small to medium rivers, ponds, lakes, and roadside drainage ditches	Surry County	4
Canebrake Rattlesnake	<i>Crotalus horridus</i>	none	LE	G4	Occupies a wide range of habitat types	York County, City of Hampton, City of Newport News	2, 3*
Eastern Big-eared Bat	<i>Corynorhinus rafinesquii macrotis</i>	None	LE	G3G4TN R	The eastern big-eared bat is incidental in Virginia because it has adapted to temperate, arboreal zones found only in the extreme southeast. It is most often found in houses, or sometimes in hollow trees, behind loose bark, in culverts, or in caves and mines.	Surry County	4

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TABLE 3.2.4-1 (cont'd)

**Surry-Skiffes Creek 500 kV Transmission Project  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

**Federally and State-Listed Species Occurrence in Vicinity of Proposed Project**

Common Name	Scientific Name	Federal Status	State Status	Global Rank	Habitat	County/City Documented	Route Section Occurrence
Tiger Salamander	<i>Ambystoma tigrinum</i>	none	LE	G5	Virtually any habitat, providing there is a terrestrial substrate suitable for burrowing and a body of water nearby suitable for breeding	York County	2, 3
Barking Treefrog	<i>Hyla gratiosa</i>	none	LT	G5	Sandy areas in pine savannas and in low wet woods and swamps	Surry County, York County	2, 3, 4
Gull-billed Tern	<i>Gelochelidon nilotica</i>	none	LT	G5	Coastlines, salt marshes, estuaries, lagoons, plowed fields, and less frequently along rivers, around lakes, and in freshwater marshes	City of Hampton	3
Peregrine Falcon	<i>Falco peregrinus</i>	none	LT	G4	Various open situations from tundra, moorlands, steppe, and seacoasts, especially where there are suitable nesting cliffs, to mountains, open forested regions, and human population centers. When not breeding, occurs in areas where prey concentrate, including farmlands, marshes, lakeshores, river mouths, tidal flats, dunes and beaches, broad river valleys, cities, and airports.	Charles City County, York County, City of Newport News,	1, 2, 3
Mabee's Salamander	<i>Ambystoma mabeei</i>	none	LT	G4	Breeds in fish-free vernal ponds in large clear-cut areas and in ephemeral sinkhole ponds up to 1.5 m deep	James City County, York County, City of Hampton	1, 2, 3*, 4

**Federal/State Status:**

LE – Listed as endangered.

LT – Listed as threatened.

SOC – Species of Concern

**Global Rank:**

G2 – Six to 20 documented occurrences or few remaining individuals globally. Very rare and imperiled. G3 – Twenty-one to 100 documented occurrences. Either very rare and local throughout its range or found locally in a restricted range.

G4 – Common and apparently secure globally, though it may be rare in parts of its range, especially at the periphery.

G5 – Very common and demonstrably secure, though it may be rare in parts of its range, especially at the periphery.

T# – Rank of subspecies or variety.

NR – Not Ranked

**Route Section:**

1 – Chickahominy to Lightfoot Junction Section

2 – Lightfoot Junction to Skiffes Creek Section

3 – Skiffes Creek to Wheaton Section

4 – Surry Alternative, James River Crossing Variations 1, 2, and 3

\* – Species occurrence documented within route section

The data review identified several federally listed species protected under the Federal Endangered Species Act (ESA) and the Virginia ESA, including the Atlantic sturgeon, sensitive joint-vetch (*Aeschynomene virginica*), swamp pink (*Helonias bullata*), small whorled pogonia (*Isotria medeoloides*), piping plover (*Charadrius melodus*), and the Northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*). The Atlantic Sturgeon has been documented in Charles City County, James City County, Surry County, and the City of Newport News. The sensitive joint-vetch has been documented in Charles City County, James City County, and Surry County. Swamp pink has been documented in Charles City County. The small whorled pogonia has been documented in Charles City County, James City County, the City of Williamsburg, and York County. The piping plover and the Northeastern beach tiger beetle observations were documented within the City of Hampton.

The data review also identified several state-only listed species protected under the Virginia ESA including the New Jersey rush (*Juncus caesariensis*), narrow-leaved spatterdock (*Nuphar sagittifolia*), Harper's fimbriatylis (*Fimbristylis perpusilla*), peregrine falcon (*Falco peregrinus*), gull-billed tern (*Gelochelidon nilotica*), barking treefrog (*Hyla gratiosa*), blackbanded sunfish (*Enneacanthus chaetodon*), Eastern big-eared bat (*Corynorhinus rafinesquii macrotis*), Eastern tiger salamander (*Ambystoma tigrinum*), Mabee's Salamander (*Ambystoma mabeei*) canebrake rattlesnake (*Crotalus horridus*), and the bald eagle. The New Jersey rush has been documented in Charles City County, James City County, the City of Williamsburg, and York County. The narrow-leaved spatterdock and the rare skipper have been documented in James City County only. Harper's fimbriatylis has been documented in York County only. The peregrine falcon has been documented in Charles City County, York County, and the City of Newport News. The gull-billed tern has been documented in the City of Hampton. The barking treefrog has been documented in Surry County and York County. The blackbanded sunfish and Eastern big-eared bat have been documented in Surry County. The Eastern tiger salamander has been documented in York County. Mabee's Salamander has been documented in James City County, York County, and the City of Hampton. The canebrake rattlesnake has been documented in York County, the City of Newport News, and the City of Hampton. The bald eagle has been documented in Charles City County, James City County, Surry County, York County, the City of Newport News, and the City of Hampton. The bald eagle is addressed in Section 3.2.4.2 of this document.

For simplicity, federally and state-listed endangered and threatened species occurrences are summarized in Table 3.2.4-1 below and federal Species of Concern (SOCs) and non-listed species are summarized in Section 3.2.4.3 of this document.

The VDCR EOREps dataset identified one occurrence of the small whorled pogonia within the Chickahominy Alternative. The occurrence was documented in 2005 in association with the Lightfoot Conservation Site. The occurrence area is located between MPs C24.2 and C24.3 in James City County.

The VDCR EOREps dataset identified one occurrence of Harper's fimbriatylis along the Skiffes Creek to Wheaton Section. The occurrence was documented in 2008 in association with the Grafton Ponds conservation site. The occurrence is located between MPs W8.2 and W8.3 in York County.

According to VDGIF, the portion of the Skiffes Creek to Wheaton Section of the project east of the Interstate 64 crossing intersects with several documented occurrences of Mabee's

salamander in the City of Hampton. In addition, there are also numerous documented occurrences of the canebrake rattlesnake in this same location as well.

#### **3.2.4.3 Bald Eagle Management**

The bald eagle is no longer listed under the federal ESA, but is a state-listed threatened species in Virginia under the Virginia Endangered Species Act and protected under Va. Code § 29.1-521 and VDGIF regulations (4 VAC 15-30-10). The bald eagle is also protected under the federal Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The Bald Eagle Protection Guidelines for Virginia (2000) provide management practices for avoiding take of bald eagles and outline restrictions on construction activities within defined management zones. Proposed activities that have the potential to affect bald eagles are evaluated by the VDGIF on a case-by-case basis.

According to the CCB, the project is located within the James River Eagle Concentration Area. The James River Concentration Area can support over 400 adults, immature, and juvenile eagles at one time. CCB conducts seasonal boat and plane surveys to count eagles in concentration areas. To obtain the most current eagle nest data, NRG reviewed the 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, the Primary Management Zone of Nest JC1101 intersects the Chickahominy Alternative right-of-way between MPs C19.3 and C19.7 in James City County. The secondary management zone of Nest JC1101 extends between MPs C19.2 and C19.8. The VAEagles website also indicates Secondary Management Zone of Nest JC0404 intersects the right-of-way for the Chickahominy Alternative between MPs C18.9 and C19.1 in James City County and the Secondary Management Zone of Nest JC0403 intersects the Chickahominy Alternative right-of-way between MPs C19.4 and C19.5 in James City County.

The Primary Management Zone of Nest SU0901 is intersected by the right-of-way for the Surry Alternative and James River Crossing Variations between MPs S1.3 and S1.6 in Surry County. The Secondary Management Zone of Nest SU0901 is intersected by the right-of-way for the Surry Alternative and James River Crossing Variations from MP S1.1 to MP S1.8 and from MP S-1.1 to MP JV1, JV2, and JV3-0.2, respectively.

The Secondary Management Zone of Eagle Nest SU0501 is intersected by the right-of-way for James River Crossing Variations 1 and 3, from MP JV1-1.0 to MP JV1-1.5 and from MP JV1-1.0 to MP JV3-1.4, respectively.

In summary, the study area intersects the Primary and/or Secondary Management Zones of five bald eagle nests (Nests JC1101, JC0403, JC0404, SU0501, and SU0901; see Figure 3.2.4-1 in Appendix A). The presence of bald eagle nests is considered a significant constraint for routing.

#### 3.2.4.4 Species of Concern and Other Documented Occurrences

The data review identified several federally and state-listed Species of Concern (SOCs), including the winter quillwort (*Isoetes hyemalis*), the Virginia least trillium (*Trillium pusillum* var. *virginianum*), the creamflower tick-trefoil (*Desmodium ochroleucum*) and the rare skipper (*Problema bulenta*). The Virginia least trillium has been documented in Charles City County, James City County, the City of Williamsburg, the City of Hampton, and York County. The winter quillwort has been documented in Charles City County. The creamflower tick-trefoil has been documented in Surry County. The rare skipper has been documented in Charles City County, James City County, and Surry County.

The data review identified several occurrences of Globally Ranked “non-listed” species (species not listed at the federal or state level) within the project corridor. These species were not reported by the FWS Virginia Field Office lists because they are not federally or state-listed species. Personal communication with the VDCR indicated that these species are taken into consideration based on Global Rank. NatureServe, an international network of Natural Heritage Programs, assigns a Global Rank based on rarity and conservation status. Species ranked “G1” (global rank 1/critically imperiled) or “G2” (global rank 2/imperiled) are most at risk. Forest certification systems, such as the Sustainable Forestry Initiative, protect all “G1” and “G2” species and natural communities, even if they are not listed and protected under the ESA. According to the federal and state datasets reviewed, no “G1” species have been documented within the project corridor. A summary of the federally and state-listed SOC and the VDCR-reported non-listed species is included in Table 3.2.4-2. SOC and non-listed species typically are not afforded the same level of protection as federally and state-listed endangered and threatened species. The locations of documented species that are crossed by the right-of-way are described in further detail below.

The VDCR EOREps dataset identified several non-listed species occurrences within the project corridor. An isolated occurrence of the Mountain Camellia (*Stewartia ovata*) was documented within the Lightfoot to Skiffes Creek Section of the project in association with areal occurrences of mesic forest and Coastal Plain/Piedmont Basic Seepage Swamp. The Mountain Camellia occurrence was documented within the Grove Creek conservation site in 2002 between MPs C35.8 and C36.2 of the Chickahominy Alternative in James City County.

Two areal occurrences of the Cuthbert Turtlehead (*Chelone cuthbertii*) were documented within the Skiffes Creek to Wheaton Section of the project. The occurrences were documented in 1990 in association with the Grafton Ponds conservation site. They are located near MPs W6.6, W6.8, and W8.3 in the City of Newport News.

An areal occurrence of Lance-leaved Loosestrife (*Lythrum lanceolatum*) was documented within the Skiffes Creek to Wheaton Section of the project between MPs W7.4 and W7.9 in the City of Newport News. This occurrence was documented in 1940.

An areal occurrence of Pine-barren reed-grass (*Calamovilfa brevipilis*) was documented within the Skiffes Creek to Wheaton Section of the project near MP W8.2 in the City of Newport News. The occurrence was documented in association with the Grafton Ponds conservation site in 1995.



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TABLE 3.2.4-2

**Surry-Skiffes Creek 500 kV Transmission Project  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station  
 Surry Point to Skiffes Creek**

**Species of Concern and Non-Listed Species Occurrence in Vicinity of Proposed Project**

Common Name	Scientific Name	Federal Status	State Status	Global Rank	Habitat	County/City Documented	Route Section Occurrence
<b>Other (Not Listed)</b>							
Plants							
Virginia Least Trillium	<i>Trillium pusillum</i> var. <i>virginianum</i>	SOC	none	G3T2	Low, alluvial woodlands	Charles City County, James City County, Surry County, City of Williamsburg, York, City of Hampton	1, 2, 3, 4
Winter Quillwort	<i>Isoetes hyemalis</i>	SOC	none	G2G3	Most commonly in shallow, running water in creeks, sloughs, and along densely shaded river shores in deciduous and mixed swamp forests	Charles City County,	1
Creamflower Tick-trefoil	<i>Desmodium ochroleucum</i>	none	SOC	G2	Mixed forest, forest edge, forest/woodland, old field, woodland hardwoods	Surry	4
Cuthbert's turtlehead	<i>Chelone cuthbertii</i>	none	none	G3	Bogs & wet meadows	City of Newport News	3*
False Hop Sedge	<i>Carex lupuliformis</i>	none	none	G4	Occasionally inundated openings within scrub-shrub emergent marshes	City of Newport News	3*
Lance-leaved loosestrife	<i>Lythrum lanceolatum</i>	none	none	G5T5	Marshes, flatwoods, and wet depressions	City of Newport News	3*
Mountain Camellia	<i>Stewartia ovata</i>	none	none	G4	Understory of hardwood forests, often near streams	James City County	1, 2*, 3, 4
Pine-barren Reed-grass	<i>Calamovilfa brevipilis</i>	none	none	G4	Sandy, shaded bogs, swamps, stream banks and bogs	City of Newport News	3*
Slender Marsh Pink	<i>Sabatia campanulata</i>	none	none	G5	Wet pine savannahs, along shores of ponds, in flatwoods	City of Newport News	3*
False Hop Sedge	<i>Carex lupuliformis</i>	none	none	G4	Typically a species of river bottoms, swamps in knee-deep waters, or in the back-waters of streams possessing heavy soils and subject to severe flooding	City of Newport News	3*

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TABLE 3.2.4-2 (cont'd)							
Surry-Skiffes Creek 500 kV Transmission Project Skiffes Creek-Wheaton 230 kV Transmission Line Project Skiffes Creek 500 kV-230 kV-115 kV Switching Station Surry Point to Skiffes Creek							
Species of Concern and Non-Listed Species Occurrence in Vicinity of Proposed Project							
Common Name	Scientific Name	Federal Status	State Status	Global Rank	Habitat	County/City Documented	Route Section Occurrence
Umbrella Flatsedge	<i>Cyperus diandrus</i>	none	none	G5	Edges of waterbodies including fresh to somewhat brackish tidal marshes	City of Newport News	3*
Animals							
Rare Skipper	<i>Problema bulenta</i>	SOC	none	G2G3	Wetlands along tidal rivers	James City County, Charles City County, Surry County	1, 2, 3, 4
Federal/State Status: SOC – Species of Concern							
Global Rank: G2 – Six to 20 documented occurrences, or few remaining individuals globally. Very rare and imperiled. G3 – Twenty-one to 100 documented occurrences. Either very rare and local throughout its range or found locally in a restricted range. G4 – Common and apparently secure globally, though it may be rare in parts of its range, especially at the periphery. G5 – Very common and demonstrably secure, though it may be rare in parts of its range, especially at the periphery. T# – Rank of subspecies or variety.							
Route Segment: 1 –Chickahominy to Lightfoot Junction Section 2 – Lightfoot Junction to Skiffes Creek Section 3 – Skiffes Creek to Wheaton Section 4 – Surry Alternative, James River Crossing Variations 1, 2, and 3 * – Species occurrence documented within route section							

An areal occurrence of slender marsh pink (*Sabatia campanulata*) was documented within the Skiffes Creek to Wheaton Section of the project near MP W8.4 in the City of Newport News. The occurrence was documented in association with the Grafton Ponds conservation site.

The VDCR EOREps dataset identified areal occurrences of false hop sedge (*Carex lupuliformis*) and umbrella flatsedge (*Cyperus diandrus*) within the Skiffes Creek to Wheaton Section of the project. The false hop sedge occurrence was documented in 1950 between MP W14.2 and W14.5 in the City of Newport News. The umbrella flatsedge occurrence was documented in 1937 between MPs W14.2 and W14.5 in the City of Newport News.

### 3.2.5 Vegetation

With the exception of the Chickahominy to Lightfoot Junction Section of the Chickahominy Alternative, a portion of the Surry Alternative, and 8.42 acres of the Skiffes Creek to Wheaton 230 kV transmission line existing right-of-way, the project corridor consists primarily of Dominion's maintained right-of-way. Dominion will need to clear an additional 100 feet of its

existing right-of-way between MPs W10.99 and W11.92 of the Skiffes Creek to Wheaton Section to accommodate the construction of additional structures in this area. The character of the maintained right-of-way is not anticipated to change as a result of the proposed project. The Chickahominy Alternative and the Surry Alternative span a portion of Virginia's Coastal Plain characterized by broad uplands gently dissected by streams. The majority of these corridors, approximately 90 percent, consist of forested uplands and wetlands. The remaining 10 percent appears to have been cleared for agricultural purposes.

In general, the upland forests that originally covered much of the Virginia Coastal Plain have been extensively cleared or altered, so it is now difficult to determine which species and natural communities were once prevalent. Likewise, much of the contemporary forest located within the Chickahominy Alternative consists of successional or silvicultural stands of loblolly pine (*Pinus taeda*), and secondary pine-hardwood forests that have developed after repeated cutting or agricultural abandonment. The most mature remnant stands on mesic uplands are characterized by associations of American beech (*Fagus grandifolia*), oaks (*Quercus* spp.), and American holly (*Ilex opaca* var. *opaca*). Patches of drier oak-dominated forest and steep bluffs with dense forests of chestnut oak (*Quercus prinus*), beech, and mountain-laurel (*Kalmia latifolia*) are also fairly common in this region.

The diversity of wetlands in this region spans a range of freshwater to saline, lunar-tidal estuaries; tidal and palustrine swamps; non-riverine, groundwater-saturated flats; seasonally flooded ponds and depressions; seepage slope wetlands; and various tidal and non-tidal aquatic habitats. Extensive saturated peatlands of the Embayed Region support fire-suppressed, but still locally extensive, stands of Atlantic white-cedar (*Chamaecyparis thyoides*) and pocosin vegetation dominated by pond pine (*Pinus serotina*) and evergreen shrubs (VDCR, 2011).

### **3.3 VISUAL CHARACTERISTICS**

NRG identified visually sensitive areas in the project area through review of recent (2011) digital aerial photography and during a series of field reviews. Visually sensitive areas were defined as areas of an undeveloped or rural character, places where an electric transmission line would be out of character with the surrounding visual characteristics of the landscape, or individual sites possessing unique scenic qualities or viewsheds. Examples of visually sensitive areas could include residential or recreational areas; historic, traditional, or rural landscapes; open space; natural features; biking or hiking trails; scenic byways; and individual sites such as historic sites or buildings.

For purposes of a discussion of visual characteristics, the project area can be divided into two main and substantially different areas: the eastern, more rural area between the Chickahominy Substation and Lightfoot Junction; and the more densely developed areas to the west between Lightfoot Junction and the Wheaton Substation in the City of Hampton. The eastern area consists primarily of a mix of rural forested or agricultural areas, wetlands, and riverine or lake shoreline areas more typical of undeveloped rural areas in southern Virginia. The Chickahominy Alternative in this area crosses through mostly forested lands, some which have been recently cut for forest product sales. Scattered throughout the forested areas are agricultural fields that provide visual openings in the otherwise forested landscape. Much of this area is flat to rolling hills with steeper forested areas located in the eastern portion near Jolly Pond Road that support public recreational opportunities, including walking trails and developed

mountain bike trails. Residential development in this area is sparse and widely scattered, giving a feel of a mostly undeveloped rural character.

A scenic viewshed of note in this area is provided by the Chickahominy River, which is wide in the project area and very sparsely developed with an occasional seasonal or year round home. This section of the river has potential components that have been identified in the state's scenic rivers program as being worthy of further study. Land access to the river in the project area is limited to a few private drives on the western shore, including a state-owned boat ramp area; no public access is available via the eastern shore.

The eastern part of the Chickahominy Alternative between Lightfoot Junction and the proposed Skiffes Creek Switching Station, and the Skiffes Creek to Wheaton Section would all be located on existing transmission line rights-of-way containing multiple existing transmission lines. This area consists primarily of much more densely developed areas just to the west of Interstate 64 and traversing parts of James City, Williamsburg, York, Newport News, and Hampton. The views along Dominion's existing right-of-way in these areas consist of more densely developed commercial and light industrial areas, interspersed with residential subdivisions as the route progresses to the south. In addition to Dominion's existing transmission line corridor, within which this entire section of the project would be located, other major corridors within view of the route consist of Interstate 64, SR 60, Routes 143 and 199, and the CSX Railroad.

Individual areas crossed by the existing right-of-way between Lightfoot Junction and the Wheaton Substation that could be considered visually sensitive include several short sections of county parks in Williamsburg (Waller Park) and Newport News City that offer short, interspersed views of wooded areas within the County. In addition to the existing Dominion transmission line that already crosses these areas, some are also crossed by existing railroads and highways. Another potentially visually sensitive area crossed by the Chickahominy Alternative is the Williamsburg Colonial Parkway, which is a Parkway within the NPS system and has been designated a Virginia Scenic Byway and an American Byway. The Parkway is currently crossed by Dominion's existing transmission lines at the border of the City of Williamsburg and York County. The 23-mile scenic route connects the historic sites of Jamestown, Williamsburg, and Yorktown.

The 7.42-mile-long Surry Alternative (7.95-mile-long Surry Alternative with the James River Crossing Variation 1, 7.17-mile-long Surry Alternative with the James River Crossing Variation 2, and 7.50-mile-long Surry Alternative with the James River Crossing Variation 3), which progresses from the Surry Switching Station in Surry County east to the proposed Skiffes Creek Switching Station, would cross a mixture of undeveloped lands, a broad water landscape and developed areas zoned for industrial uses. On the west side of the James River, the Surry Alternative route would cross both industrially developed land and a small forested area before crossing a wide expanse of the James River. On the eastern side of the James River, the Surry Alternative and the Surry Alternative with the James River Crossing Variation 1 would cross an area zoned primarily for industrial development, utilizing a small area of new right-of-way and an existing transmission line corridor that would need to be expanded by between 20 and 70 feet to accommodate the new 500 kV transmission line. The Surry Alternative with the James River Crossing Variations 2 and 3 would likewise cross an area zoned primarily for industrial development on the eastern side of the James River. However, the transmission line would be collocated with an existing pipeline corridor and the aforementioned transmission line right-of-way.

A significant scenic component of this route is the James River; the river crossing would be approximately 3.53 miles long (4.10-mile-long with the James River Crossing Variation 1, 3.81 mile-long with the James River Crossing Variation 2, and 4.12-mile-long with the James River Crossing Variation 3). This section of the James River has been designated as a scenic river in the state's Scenic River's Program. Although this broad section of river contains primarily forested areas or tidal marshlands on both sides of the crossing, it is located in a fairly developed working area of the river characterized by two shipping channels that are routinely dredged, active shipping, and industrial development on both sides of the river. This area of the river adjacent to, downstream, and across the river from Hog Island contains a major power station and multiple high voltage transmission lines on the west side of the river and an abandoned DOW chemical plant on the east side of the river, both of which distract from the scenic quality of the river section. Occupying most of the shoreline south and southeast of the crossing is Fort Eustis Army Transportation Center, which allows no public access to the shoreline. In addition to the scenic qualities of the river section, this section of the river has several historical components, which must be taken into account when conducting a visual assessment of the Surry Alternative. These include the proximity to and potential views from Jamestown Island, the Colonial Parkway, and Carter's Grove Plantation. These are each discussed further in Section 5.2.3.

### **3.4 CULTURAL RESOURCES CONDITIONS**

Dominion retained Cultural Resources, Inc. (CRI) to conduct a cultural resources literature review for the project. This review area included a 1.5-mile buffer of each project component for historic and architectural resources and for archaeological sites. To satisfy the VDHR 2008 *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* (2008) (*Guidelines*), CRI's review considered National Historic Landmark (NHL) properties located within a 1.5-mile radius of the centerline; National Register of Historic Places (NRHP)-listed properties, NHLs, battlefields, and historic landscapes within a 1.0-mile radius of the centerline; NRHP-eligible and -listed properties, NHLs, battlefields, and historic landscapes within a 0.5-mile radius of the centerline; and architectural resources and archaeological sites located within the right-of-way for each project component. Copies of CRI's reports are provided in Appendix G.

CRI examined site files maintained by the VDHR and NPS to identify previously recorded archaeological, historical, and architectural sites within the 1.5-mile tiered study area, including sites listed in or eligible for listing in the NRHP. The *Update to the Civil War Sites Advisory Commission's Report on the Nation's Civil War Battlefields* (NPS 2009) and the *Final Comprehensive Management Plan and Environmental Assessment for the Captain John Smith Chesapeake National Historic Trail* (NPS, 2011) were reviewed as well as local historical information, historic maps, and Google Earth 2011 aerial photography.

CRI conducted field assessments of known NRHP-eligible or -listed architectural resources in accordance with the VDHR *Guidelines*. Digital photographs of each architectural resource and surrounding setting were recorded, where visible from a public right-of-way, to accurately represent the viewshed of the site. Photo simulations were prepared to assess visual affects on NRHP-eligible or -listed architectural resources within the tiered study area except where proposed towers are the same or lesser height than existing towers in or adjacent to the proposed right-of-way. For the previously recorded archaeological sites under

consideration, high resolution aerial imagery was examined to assess the current land condition and the spatial relationship between the sites and any existing transmission line facilities.

Limited areas of the project area have been subjected to survey for battlefield assessment by the American Battlefield Protection Program (ABPP) of the NPS, historic and architectural resources, or archaeological resources. Under the authority of the American Battlefield Protection Program Act of 1996, the Department of Interior is directed to provide updates to the Civil War Sites Advisory Commission (CWSAC) on the status of nationally significant Civil War battlefields. In Virginia, the ABPP conducted a field assessment of several battlefields to identify the historic extent of the battle (study area), the areas of fighting on the battlefield (core area located within the study area), and potential National Register boundaries. The results of this study were presented to the CWSAC in 2009. The study areas of four battlefields, St. Mary's Church, Williamsburg, Yorktown, and Big Bethel, are crossed by the project components or are located within the tiered study area.

NRG obtained site information, digitized site locations, and previous survey information using data provided by CRI. CRI's literature review identified 1,114 previously identified archaeological resources, 885 previously identified historic and architectural resources, and 154 previous investigations within 1.5 miles of the project components. An overview of these resources is provided in the following sections. Additionally, a summary of the cultural resources considered by the VDHR is provided by resource category for each project component. Archaeological site locations are considered confidential under the National Historic Preservation Act (NHPA); therefore, this study does not include a figure illustrating or depicting archaeological site locations. Unevaluated archaeological and architectural sites are treated by the VDHR as potentially eligible for listing in the NRHP.

### **3.4.1 Archaeological Sites**

CRI identified 1,114 previously recorded archaeological sites located within the 1.5 miles literature review area. Of these, 203 sites are characterized as prehistoric, 688 sites are characterized as historic, 115 sites contains both prehistoric and historic components, and the temporal affiliation of the remaining 108 sites is not reported in the VDHR files. Sites with prehistoric components are characterized as camps, shell middens, earthworks, resource processing/extraction sites, funerary sites, and indeterminate sites. Historic period sites consist of farmsteads and associated features, dwellings and other structures, cemeteries and churches, historic trash pits or trash scatters, transportation features, dams and ditches, education sites, commercial sites, shipwrecks, and military bases, camps, battlefields, or earthworks. Of the 1,114 sites, 1 is listed in the Virginia Landmarks Register (VLR) (44WB0005) and 6 are listed on both the VLR and the NRHP (44YO0060, 44YO0007, 44JC0014, 44JC0015, 44JC0050, and 44NK0072). Three of these seven VLR- and NRHP-listed sites (44YO0007/099-0065, 44YO0060/099-0070, and 44WB0005/137-0005) were also assigned an architecture/historic resource identification number by the VDHR, but none of them contain architectural structures.

Of the 1,114 known archaeological sites located within 1.5 miles of the literature review area, 10 sites occur within the proposed right-of-way of the Chickahominy Alternative. Eight of these sites have not been evaluated for listing in the NRHP (44CC0350, 44JC0195, 44JC1175, 44WB-0133-001, 44WB0133-0002, 44YO0220, 44YO0524, and 44YO0757). 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 site that is recorded as a Middle Woodland camp and a mid-nineteenth to early twentieth-century farmstead. Two sites, 44JC0195 and 44YO0757, have never been field verified through archaeological survey. Site 44JC0195 is a nineteenth century dwelling that was reported based on Civil War mapping by a local researcher in 1983. Site 44YO0757 is a nineteenth century domestic site that was identified by an informant.

Of the 10 sites within the right-of-way of the Chickahominy Alternative, 2 unevaluated sites, 44CC0350 and 44JC1175, are located in the Chickahominy to Lightfoot Section within 0.5 mile of approximate MPs C3.0 and C23.0, respectively. The remaining eight sites are located within existing right-of-way between approximate MPs C25.0 and C36.8 of the Lightfoot to Skiffes Creek Section. These eight sites include 44JC0195, 44JC1044, 44YO0524, 44YO0757, 44YO0220, 44WB0133-001, 44WB0133-002, and 44WB0066.

An additional two archaeological sites are located adjacent to the Chickahominy Alternative, including 44CC0369 and 44JC0194. Site 44CC0369 is located adjacent to the Chickahominy to Lightfoot Section between C0 and C1.0. Site 44JC0194 is located adjacent to existing right-of-way along the Lightfoot to Skiffes Creek Section between MPs C25.0 and C26.0. Both of these sites are unevaluated. Additionally, site 44JC0194 has never been field verified through archaeological survey and is reported as a nineteenth century dwelling based on Civil War mapping by a local researcher in 1983.

Thirteen previously identified archaeological sites are located wholly or partially within the existing right-of-way of the Skiffes Creek to Wheaton Section and occur between MPs W0 and W12.5. 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.

Site 44JC0662 was reported in 1991 as a late-eighteenth to late-nineteenth century domestic site identified within and adjacent to Dominion'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 and resulted in the identification of a single piece of bottle glass. Based on the archaeological inventory in 1994, the site was recommended not eligible for listing in the NRHP and the State Historic Preservation Office (SHPO) concurred with this recommendation. However, CRI recommends that site 44JC0662 retains archaeological potential and requires further assessment to determine the integrity of archaeological deposits and to determine the site boundaries in relation to Dominion's right-of-way.

The remaining seven sites are unevaluated (44YO0092, 44YO0180, 44YO0181, 44YO0183, 44YO0233, 44YO0237, 44YO0240). One unevaluated site (44JO0751) containing both prehistoric and historic components is located adjacent to the existing right-of-way.

Four previously recorded archaeological sites are located wholly or partially within the proposed right-of-way for the Surry Alternative and the Surry Alternative with the James River Crossing Variation 1. Two sites (44JC0649 and 44JC0650) are unevaluated. The VDHR determined two sites (44JC0662 and 44JC0663) not eligible for listing in the NRHP; however, CRI recommends additional work at site 44JC0662. Two sites (44JC0662 and 44JC0663) are crossed by the Surry Alternative with the James River Crossing Variation 2 and 3.

Crossings of archaeological sites were considered a constraint in this study due to the potential for an electric transmission line to impact archaeological deposits in these areas (for example, due to transmission structure placement or tree clearing within a site).

### **3.4.2 Historic and Architectural Sites**

CRI identified 885 historic or architectural sites located within the 1.5-mile literature review area. Many of these are found within the City of Williamsburg. The sites include houses, farms, battlefields (Civil War era) and other military sites, cemeteries, churches, commercial buildings, railroad buildings, and bridges. One site is listed in the NRHP; 2 sites are listed in the VLR; 31 sites are listed in both the NRHP and the VLR, including 7 of which also are NHLs.

The VDHR determined 23 additional sites eligible for listing in the NRHP. Of the remaining 828 sites, 150 are determined not eligible for listing in the NRHP and 678 have not been evaluated. The unevaluated sites are considered potentially eligible by the VDHR.

Of the 885 historic and architectural sites, 29 sites are located within 1.5 miles of all project components and were initially thought to represent resource types considered within the tiered study area identified in the VDHR *Guidelines*. CRI documented that 4 of the 29 sites were each assigned an architectural resource identification number by the VDHR and contain archaeological sites listed in the NRHP: Bryan Manor Plantation (44YO0007/099-0065); Burwell's Mill Complex Archaeological District (Whittaker's Mill) (099-5275); Bruton Parish Poorhouse (44YO0060/099-0070); and Oakland Farm Multiple Resource Area (Queen Hith Plantation) (121-0041). The Bryan Manor Plantation is an archaeological site; however, gravestones located in the cemetery within the site boundary represent the above-ground component. When last surveyed in 2007, the above-ground components of the Burwell's Mill Complex Archaeological District (Whittaker's Mill) (099-5275) consisted of Civil War earthworks, the colonial road, and some structures at the mill site. The Bruton Parish Poorhouse and Oakland Farm Multiple Resource Area (Queen Hith Plantation) are archaeological sites that do not contain architectural structures. The Capitol Landing/Queen Mary's Port (137-0056), also assigned only an architectural resource identification number, was originally recorded as an archaeological site and does not contain above-ground structures. The Bruton Poorhouse, Capitol Landing/Queen Mary's Port, and Oakland Farm Multiple Resource Area (Queen Hith Plantation) are not considered as architectural resources in this analysis. These archaeological sites are not located within the right-of-way of the project components and were not considered in CRI's archaeological assessment. The remaining 26 architectural resources are depicted on Figure 3.4.2-1 in Appendix A and their nearest MP locations are provided in Table 3.4.2-1.



Dominion Virginia Power  
 Surry-Skiffes Creek 500 kV Transmission Line  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station

TABLE 3.4.2-1

**Surry-Skiffes Creek 500 kV Transmission Project  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

**Historic and Architectural Resources within the Study Area**

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

Dominion Virginia Power  
 Surry-Skiffes Creek 500 kV Transmission Line  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station

TABLE 3.4.2-1 (cont'd)

**Surry-Skiffes Creek 500 kV Transmission Project  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

**Historic and Architectural Resources within the Study Area**

Transmission Line Section/ Site Number	Site Name	Nearest Milepost
137-0033	James Semple House (Randolph-Semple House)	C31.6
047-0002	Colonial National Historic Park Colonial Parkway	C31.9 <sup>b</sup>
099-5282	Battle of Williamsburg (Civil War)	C32.2 – C36.5 <sup>b</sup>
099-0040	Confederate Peninsular Defenses Fort 9 (Redoubt #9)	C33.1
099-0065	Bryan Manor Plantation Site	C33.2
099-5275	Burwell's Mill Complex Archaeological District (Whittaker's Mill)	C34.6
047-0001	Carter's Grove	C36.9
<b>SKIFFES CREEK TO WHEALTON SECTION</b>		
047-0001	Carter's Grove	W1.0
121-0016	Lee Hall	W2.3
099-5283	Battle of Yorktown (Civil War)	W2.4 – W12.5 <sup>b</sup>
121-5068	Village of Lee Hall Historic District	W2.8
099-5282	Battle of Williamsburg (Civil War)	W3.2 – W3.5 <sup>b</sup>
121-5031	Simon Read/Reid Curtis House (Boxwood Inn), 10 Elmhurst St	W3.4
121-0014	Lee Hall Railroad Station	W3.4
121-0050	Lee's Mill Earthworks (Battlefield Park)	W5.1 <sup>b</sup>
121-0060	Battle of Dam #1 (Lee's Mill Battlefield/Newport News Park)	W6.6
<sup>a</sup> The Surry Alternative and each of the three James River Crossing Variations have been mileposted independently. The milepost provided in the table for resources within proximity to the Surry Alternative and James River Crossing Variations represents the milepost of the closest route to the resource. <sup>b</sup> Resource located either all or in part within the right-of-way.		

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

Eighteen architectural sites considered as part of the Stage One Pre-application process are located within 1.5 miles of the Chickahominy Alternative. The Battle of Williamsburg (Civil War) (099-5282) and the Old Main Rural Historic District (018-5101) are unevaluated. Moss Side (018-0066), Saint Mary's Church Battlefield (Samaria Church) (018-5004), and Confederate Peninsular Defenses Fort 9 (Redoubt #9) (099-0040) were determined eligible for listing in the NRHP by the VDHR. However, the Confederate Peninsular Defenses Fort 9 (Redoubt #9) was demolished by improvements to Interstate 64. The Colonial National Historic Park Colonial Parkway (047-0002) is listed in the NRHP. Five sites are listed in the NRHP and VLR, including Poplar Springs (018-0018), Piney Grove (018-0063), Bryan Manor Plantation (099-0065), Burwell's Mill Complex and Archaeological District (Whittaker's Mill) (099-5275), and Eagle's Nest (Eagle Lodge/Margots/Claybancke) (018-0037). An additional seven sites are listed in the NRHP and VLR, and are NHLs. These seven sites are located within 1.5 miles of the Chickahominy Alternative and each resource is briefly described below. Five of the 18 sites

are located along the Chickahominy to Lightfoot Junction Section, including Poplar Springs, Piney Grove, Moss Side, Saint Mary's Church Battlefield (Samaria Church), and Eagle's Nest (Eagle Lodge/Margots/Claybancke). The remaining 13 sites are located along the Lightfoot Junction to Skiffes Creek Section.

Carter's Grove (047-0001) is a well-preserved example of a two-story, seven-bay, mid-eighteenth century Georgian dwelling. Carter's Grove was listed in the NRHP in 1969 and as a NHL in 1970. The site also is protected under a historic preservation easement held by the VDHR. The plantation house is surrounded by modern development but, within the plantation property, the house is situated close to the James River. Vegetation surrounding the plantation includes areas of tree lines, dense woods, and open fields. Carter's Grove is located within 0.5, 1.0, and 1.5 miles of the Lightfoot Junction to Skiffes Creek Section.

James Semple House (Randolph-Semple House) (137-0033) is a c. 1770 two-story frame dwelling. The house was listed on the NRHP and as a NHL in 1970. Additionally, the James Semple House is a contributing resource to the Williamsburg Historic District (137-0050). This house is located within 1.0 mile of the Lightfoot Junction to Skiffes Creek Section.

Williamsburg Historic District (137-0050) encompasses several structures included in this analysis: Bruton Parish Church (137-0007), the James Semple House (137-0033); Peyton Randolph House (137-0032); and the George Wythe House (137-0058). Many properties within the district are operated as a living-history tourist attraction. The district was listed in the NRHP in 1966 and as a NHL in 1960. The district is bounded on the north and east by Route 62. Beyond this boundary are areas of modern development. The district is located within 1.0 mile of the Lightfoot Junction to Skiffes Creek Section.

Bruton Parish Church (137-0007) is a brick structure that features a cruciform plan and dates to 1711. The church was listed in the NRHP and as a NHL in 1970. Bruton Parish Church is considered a contributing resource to the Williamsburg Historic District (137-0050). Sir Christopher Wren Building (William & Mary College, Main Building) (137-0013) is a c. 1695 four-story brick structure. One of the original buildings at the College of William and Mary, the house was listed in the NRHP in 1966 and as a NHL in 1960. This building is also associated with the Revolutionary War Route and Transportation Survey 1781-1782 (VDHR 000-8900-0097) and the unevaluated College of William and Mary Historic District (137-0061).

Peyton Randolph House (Peachy House) (137-0032) is a c. 1715 two-story frame dwelling with interior end corbelled chimneys. The house was listed in the NRHP and as a NHL in 1970. The resource is also a contributing resource to the Williamsburg Historic District (137-0050) and is associated with the Revolutionary War Route and Transportation Survey 1781-1782 (VDHR 000-8900-0097).

Wythe House (137-0058) is a c. 1755 two-story brick dwelling. The house was listed in the NRHP and as a NHL in 1970. The house is located in the western portion of the Williamsburg Historic District (137-0050) and is a contributing resource to the district.

Four resources extend from the right-of-way to the 0.5-, 1.0-, and 1.5-mile buffers: the Battle of Williamsburg (099-5282); the Old Main Rural Historic District (018-5101); Saint Mary's Church Battlefield (018-5004); and Colonial National Historic Park Colonial Parkway (047-002). The Battle of Williamsburg encompasses an estimated 10,370 acres. Colonial Williamsburg is

located within the current battlefield boundary. Much of the battlefield has undergone modern development, including the construction of Interstate 64; the construction of modern residential neighborhoods, commercial, and industrial complexes; and the Newport News Golf Course. The existing transmission line bisects the battlefield.

The Old Main Road Rural Historic District is located in Charles City County along portions of Route 615 and Route 623. A portion of the northern extent of the district is bounded by the Chickahominy River. The Chickahominy to Lightfoot Junction Section crosses the historic district within the Chickahominy to Lightfoot Junction Section. Eighty-two previously recorded architectural resources are located within the district boundary. Three of the resources considered by the VDHR within the 0.5-mile buffer are located within the district: Poplar Springs (018-0018); Piney Grove (018-0063); and Moss Slide (018-0066) and are described below. Poplar Springs also occurs in the 1.0-mile buffer. Each house is surrounded by large trees and open fields.

Saint Mary's Church Battlefield (1864) is located in Charles City County. The battlefield landscape consists of open agricultural fields with tree lines as well as densely wooded areas. Architectural resources are scattered within the boundary of the battlefield; however, most are not associated with the battlefield. Routes 602, 603, and 609 cross portions of the battlefield resource. Additionally, the current Chickahominy Substation is located in the northwestern corner of the battlefield.

The Colonial National Parkway was constructed between 1930 and 1958 as a scenic roadway connecting Jamestown, Williamsburg, and Yorktown. Within most of the Lightfoot Junction to Skiffes Creek Section the parkway is flanked by forested land.

Five architectural resources considered by the VDHR are located within the 0.5-mile buffer: Poplar Springs (018-0018); Piney Grove (018-0063); Moss Slide (018-0066); Confederate Peninsular Defenses Fort 9 (Redoubt #9) (099-0040); and Bryan Manor Plantation (099-0065). Poplar Springs is a c. 1809 one-and-a-half-story frame dwelling supported by a raised brick foundation. Originally constructed as a two-bay, side-hall plan, the house was expanded to three bays with an addition built to the east in 1840. The house sits on approximately 91 acres and is accessed by a long, straight gravel driveway. Located on either side of the driveway are open fields with several large trees bordering the driveway. A large expanse of open fields is located behind the house.

Piney Grove (c. 1800) is a one-and-a-half-story frame dwelling constructed of logs in a hall and parlor plan. An addition to the house was built in 1853 and an additional chimney was added during the mid-nineteenth. In the early twentieth century the porch was enlarged and a one-story block addition constructed. Piney Grove sits on approximately 5.2 acres on a relatively level lot and is accessed from a long driveway. A large expanse of lawn is adjacent to the front of the house. A variety of trees to the rear and north of the house provide vegetative screening.

Moss Side (c. 1850) is a wood-framed two-story dwelling. Several later outbuildings are located on the property and include a c. 1830 smoke/meat house, and a c. 1900 secondary dwelling and chicken coop. The house sits on a relatively level lot and is accessed from a long gravel driveway. Flanking the driveway are agricultural fields. Forested land largely surrounds the property.

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

Bryan Manor Plantation archaeological site is a mid-eighteenth century plantation complex. The site was listed on the NRHP in 1978. When last surveyed, the above-ground components of the Bryan site consisted of gravestones located in the cemetery.

One site is located within 0.5- and 1.0-mile buffers: Burwell's Mill Complex and Archaeological District (Whittaker's Mill) includes five archaeological sites adjacent to King's Creek. The location of the site is largely forested with deciduous trees and some evergreens. The site consists of a mill dam, mill race, borrow pit, mill foundation, and two structure foundations. Domestic sites and brick kilns associated with the mill complex, Civil War earthworks, and a segment of the principal colonial road between Williamsburg and Yorktown are represented within the district. The site was listed on the NRHP in 2008. When last surveyed in 2007, the above-ground components of the Whittaker's Mill archaeological complex consisted of Civil War earthworks, the colonial road, and some structures at the mill site. One site considered by the VDHR is located within 1.0 mile of the Chickahominy Alternate, including Eagle's Nest (Eagle Lodge/Margots/Claybancke) (018-0037). Eagle's Nest is a post-1700 brick dwelling constructed in an English bond pattern except for the north façade, which is laid in Flemish bond. This three-bay brick structure is thought to have been one or one-and-a-half stories above basement as originally built. In the nineteenth century the house was raised by the addition of a frame second story; presently the Eagle's Nest is a two-story house. Eagle's Nest is situated on a rise in the landscape that offers a view of the Chickahominy River and Eagle's Bottom Marsh.

Eleven architectural sites initially considered as part of the Stage One Pre-application process are located within 1.5 miles of the Skiffes Creek to Whealton Section. Two of the 11 sites, Big Bethel Battlefield (114-5297) and Fort Eustis Historic District (121-0105), were removed from consideration in the analysis of the Skiffes Creek to Whealton Section. Big Bethel Battlefield was the first land battle in Virginia. Major General Benjamin F. Butler sent converging columns from Hampton and Newport News against Confederate forces at Little and Big Bethel. The ABPP recommended the Big Bethel Battlefield as not eligible as an individual resource because the historic terrain of the landscape has been extensively altered; however, the ABPP suggests that opportunities exist to assess the area for commemorative purposes. The VDHR has determined the Big Bethel Battlefield to be ineligible for listing in the NRHP and therefore, it is not included in this analysis.

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

Three architectural sites are located within the existing right-of-way of the Skiffes Creek to Whealton Section: Battle of Yorktown (099-5283); Battle of Williamsburg (099-5282); and Lee's Mill Earthworks (Battlefield Park) (121-0050). The Battle of Yorktown is considered eligible by the VDHR. The ABPP recommended a portion of the Battle of Williamsburg eligible, but the VDHR considers this battlefield as unevaluated; therefore, this battlefield is included in

the analysis. Lee's Mill Earthworks is listed in the VLR and NRHP. Both the Battle of Williamsburg and the Battle of Yorktown are also within 0.5, 1.0, and 1.5 miles of the Skiffes Creek to Wheaton Section. Lee's Mill Earthworks is also within 0.5 and 1.0 mile.

The Battle of Yorktown (099-5283) covers an area of approximately 63,960 acres. This battlefield is part of the Union offensive referred to as the Peninsular Campaign. Several regiments under Union commander George McClellan troops met a regiment of the Confederate troops near Yorktown and attacked the Confederate line at Lee's Mill Dam No. 1. The battlefield resource consists of three main areas: the core area; the existing NRHP boundary; and a large area considered potentially eligible for listing in the NRHP (see Figure 3.4.2-1 in Appendix A). Portions of the NRHP-listed and potentially eligible battlefield areas fall within the right-of-way as well as within 1.0-mile buffer. The larger study area extends into the 1.5-mile buffer. The ABPP reports that only portions of the Yorktown battlefield landscape have been altered and many landscape features are intact.

The Battle of Williamsburg (Civil War) (099-5282) is an area comprising an estimated 10,370 acres. The Battle of Williamsburg, also known as the Battle of Fort Magruder, is associated with the Peninsula Campaign of May 1862. Brig. General Hooker encountered the Confederate rearguard near Williamsburg. Hooker attacked Fort Magruder and the Confederate counterattack almost overwhelmed the Union until another division arrived. An attack was mounted on the Confederate left flank. The Confederate army withdrew. The ABPP reports that the battlefield landscape has been fragmented, but may retain some features relating to the significance of the battlefield. CRI indicated the portion of the battlefield crossed by the alternative is not considered NRHP-eligible. Much of the area encompassed by the battlefield has been developed including the construction of Interstate 64, a number of modern residential neighborhoods, commercial and industrial complexes, and the Newport News Golf Course

Lee's Mill Earthworks (Battlefield Park) (121-0050) is listed in the NRHP and the VLR. The earthworks are located on a 10-acre parcel in the City of Newport News to the southwest of U.S. Route 60/Warwick Road. Entrance into the site is within a modern residential development. From the parking lot, the resource is accessed by a network of trails and comprises a redoubt, portions of a powder magazine, bomb proofs, and rifle pits built during the winter of 1861 and the spring of 1862. The features are part of the Confederate Warwick-Yorktown defensive line and the Battle of Lee's Mill. The property currently is owned by the City of Newport News Virginia War Museum and open to the public.

One additional historic and architectural site is located within 0.5 mile of the Skiffes Creek to Wheaton Section: Village of Lee Hall Historic District (121-5068). The Village of Lee Hall Historic District is considered potentially eligible. The Lee Hall Historic District (121-5068) is a collection of post 1881 architectural resources located within the present-day city of Newport News. The district includes two land parcels that join near the intersection of Warwick Boulevard (U.S. Route 60) and Ripley Street. The northern section is crossed by several roads; the southern section encompasses the residences on the west side of Warwick Boulevard from Ripley Street southward.

Three additional historic and architectural sites are located within 1.0 mile of the Skiffes Creek to Wheaton Section: Lee Hall Rail Road Station (121-0014); Simon Read/Reid Curtis House (Boxwood Inn) (121-5031); and Battle of Dam #1 (Lee's Mill Battlefield/Newport News Park) (121-0060). These three sites are listed in the VLR and NRHP.

Lee Hall Railroad Station (121-0014), also known as the Lee Hall Depot and the Lee Hall Train Depot, is a c. 1881 two-story frame Stick-style building with a central interior brick chimney. The building was listed in the NRHP in 2010 and is also listed in the VLR. The station is also included in the NRHP-eligible Village of Lee Hall Historic District (121-5068) as a contributing resource. In 2009, the building was moved across the railroad tracks to its current location.

The Simon Read/Reid Curtis House, also known as the Boxwood Inn (121-5031), is an 1896 two-and-a-half-story dwelling. The house was listed on the NRHP in 2009 and is considered a contributing resource to the Village of Lee Hall Historic District (121-5068).

The Battle of Dam #1 (Lee's Mill Battlefield/Newport News Park) (121-0060) encompasses approximately 143 acres of land to the northeast of the current transmission line. The property is discontinuous with the two sections separated by the city reservoir. The lands encompassed within the resource boundary were part of the 1862 Confederate defensive earthworks constructed during the Peninsula campaigns and the efforts of Union troops to capture Yorktown. The park was listed in the NRHP in 1995. The mainly forested portion of the park on the southeast side of the reservoir is utilized as a municipal golf course (Newport News Golf Course), picnic area, and campground with paved entrance roads. An additional transmission line, which connects to the transmission line currently under study to the southeast, bisects the battlefield park in a northwest-southeast direction.

Two sites are located within the 1.0- and 1.5-mile buffer zones of the Skiffes Creek to Whealton Section: Carter's Grove (047-001) and Lee Hall (121-0016). Carter's Grove is a well preserved example of a two-story, seven-bay, mid-eighteenth century Georgian dwelling. Carter's Grove was listed in the NRHP in 1969 and as a NHL in 1970. The site also is under a historic preservation easement held by the VDHR.

Lee Hall (121-0016) is a c. 1848 two-story masonry dwelling with interior brick chimneys. The house was listed in the NRHP in 1972. In 1999, the City of Newport News and the Commonwealth of Virginia Board of Historic Resources placed a preservation easement on the property in order to protect both the building's historic architectural features and its 12.29 acre setting.

Two architectural resources considered as part of the Stage One Pre-application process are located within 1.5 miles of the Surry Alternative and James River Crossing Variations 1, 2, and 3, including the Battle of Yorktown (099-5283) and Carter's Grove (047-0001). The Battle of Yorktown is within 1.0 and 1.5 miles and Carter's Grove is within 0.5, 1.0, and 1.5 miles of the Surry Alternative. Two unevaluated architectural resources are located within the right-of-way corridor, including Hog Island Wildlife Refuge (090-0121) and Sherry House (047-0113). Additionally, the Battle of Williamsburg (099-5283) is within 1.5 miles of the Surry Alternative. These four resources are within the same distance buffers for the Surry Alternative with the James River Crossing Variation 1.

One architectural resource, Carter's Grove (047-0001), considered as part of the Stage One Pre-application process, is located within 0.5, 1.0, and 1.5 miles of the Surry Alternative with James River Crossing Variation 2 and James River Crossing Variation 3. Two unevaluated architectural resources are located within the right-of-way corridor for both variations, including Hog Island Wildlife Refuge (090-0121) and Sherry House (047-0113). Additionally, the Battle of

Yorktown (099-5283) and the Battle of Williamsburg (099-5283) are located within 1.5 miles of James River Crossing Variation 2 and James River Crossing Variation 3.

The Battle of Yorktown (099-5283) is part of the Union offensive referred to as the Peninsular Campaign. Several regiments under Union commander George McClellan troops met a regiment of the Confederate troops near Yorktown and attacked the Confederate line at Lee's Mill Dam No. 1. Only a small portion of the battlefield falls within the 1.5 miles of the proposed Surry Alternative and the three James River Crossing Variations and is located south of U.S. Route 60 adjacent to Skiffes Creek near the western boundary of the battlefield resource in this area. This portion of the battlefield is not a core engagement area, but rather a portion of the larger battlefield study area as defined by the ABPP. The portion of the battlefield adjacent to Skiffes Creek is wooded and low-lying and a residential subdivision is located within the battlefield boundary immediately to the east. The ABPP of the NPS reports that portions of the Yorktown battlefield landscape have been altered and many landscape features are intact. The VDHR considers the Battle of Yorktown as unevaluated for its NRHP-eligibility.

Carter's Grove is a mid-eighteenth century dwelling listed in the NRHP and the VLR, and as a NHL. Additionally, Carter's Grove is protected under a historic preservation easement held by the VDHR. The plantation house is situated close the James River and is buffered from modern development by mature tree stands. U.S. Route 60 intersects the northeastern corner of the property. An existing transmission line, residential development, and an industrial complex are within 0.5 mile of the property.

The Battle of Williamsburg (Civil War) (099-5282) is an area comprising an estimated 10,370 acres. The Battle of Williamsburg, also known as the Battle of Fort Magruder, is associated with the Peninsula Campaign of May 1862. Brig. General Hooker encountered the Confederate rearguard near Williamsburg. Hooker attacked Fort Magruder and the Confederate counterattack almost overwhelmed the Union until another division arrived. An attack was mounted on the Confederate left flank. The Confederate army withdrew. 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 NHT is crossed by the Chickahominy to Lightfoot Junction Section at the Chickahominy River, the Surry Alternative, and the three James River Crossing Variations at the James River. These alternatives cross the NHT 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. The Chickahominy to Lightfoot Junction Section crosses the trail in a largely undeveloped area. The Surry Alternative crosses the trail at the James River just north of a heavily industrialized area within James City County and enters the Surry Nuclear Power Station after traversing a portion of Hog Island Wildlife Refuge. This section of the James River is a commercial shipping channel.

Crossings of the historic and architectural sites, particularly the listed and eligible properties, battlefields, NHLs, and NHTs were considered constraints in this study due to the potential for an electric transmission line to impact the integrity of a site. Impacts on sites could include direct effects associated with tower placement or tree clearing or indirect effects associated with viewsheds to and from sites.



### **3.4.3 Summary of Existing Survey Data Performed Under Section 106 or Section 110 of the National Historic Preservation Act**

The VDHR files document 154 recorded cultural resource investigations within 1.5 miles of the project components. Just over half (87) of these investigations were undertaken as part of the local/state or federal review between 1990 and 2011. Thirteen of these 87 studies included treatment plans, archaeological data recovery, and other specialized studies. The remainder of the investigations that were formally reviewed include archaeological inventory and evaluation; architecture reconnaissance and intensive level survey; and cultural landscape inventories for highway expansion, housing and commercial development, pipeline projects, and public lands projects.

Under the authority of the American Battlefield Protection Program Act of 1996, the Department of Interior is directed to provide updates to the CWSAC on the status of nationally significant Civil War battlefields. In Virginia, the ABPP conducted a field assessment of several battlefields to identify the historic extent of the battle (study area), the areas of fighting on the battlefield (core area located within the study area), and potential National Register boundaries. The results of this study were presented to the CWSAC in 2009. The study areas of four battlefields, St. Mary's Church, Williamsburg, Yorktown, and Big Bethel, are crossed by the project components and are depicted on Figure 3.4.2-1 in Appendix A.

## **3.5 NAVIGATION CONSTRAINTS**

### **3.5.1 Federal Navigation and Shipping Channels**

Shipping channels and federal navigation channels within the project area were identified using NOAA's Office of the Coast Guard Survey chart number 12248 and the COE Tribell Shoal Channel after Dredging Survey of July 2011. Mapping indicates the presence of two navigation channels in the James River at the crossings of the Surry Alternative and James River Crossing Variations. The Tribell Shoal Federal Navigation Channel is located along the eastern portion of the river, and a second unnamed navigation channel is located along the western portion of the river. The Tribell Shoal Channel is used primarily by container vessels bound for the Richmond Deepwater Terminal. The channel is approximately 5 miles long, 300 feet wide, and approximately 26 feet deep. Activities within and over the federal navigation channel are regulated by the COE and USCG. The Surry Alternative and the James River Crossing Variations 1, 2, and 3 span the Tribell Shoal Channel for approximately 890, 680, 750, and 800 feet, respectively. The western channel is utilized primarily by tug and barge traffic and has a water depth of 15-19 feet. While this channel is not a Federal channel, the USCG regulates navigational clearances through its Bridge Division. The Surry Alternative and the James River Crossing Variations 1, 2, and 3 span the western channel for approximately 940, 920, 1000, and 940 feet, respectively.

### **3.5.2 Dredging and Spoil Disposal**

The Tribell Shoal Channel is a critical federal navigational channel. Due to the transition from salt to fresh water at this location in the James River, increased sedimentation and shoaling occurs, and the channel requires regular dredging in order to maintain sufficient navigational depths. Dredging and maintenance activities are managed by the COE. Dredging activities generally occur on an annual basis, but may occur more or less frequently depending

on need and availability of resources. The duration of in-stream dredging activities can last from 2 weeks to 1.5 months and typically occurs in the summer months due to time of year restrictions for anadromous fish areas (February 15-June 15).

The last dredging of the Tribell Shoal Channel was in July of 2011. Dredge spoils from this and other dredging events are disposed of in the designated Dredge Spoil Disposal Area. This area is located approximately 600 feet east of the Tribell Shoal channel. The disposal area is approximately 1,200 feet wide and follows the contour of the channel. Dredge spoils are transported to the spoil area through a pipeline. The pipeline is primarily submerged on the river bottom, but is above the water at the dredging operation and discharging end. Depending on the location of dredging operation in the channel and the location of deposition of dredge spoil, the pipeline could stretch over 5 miles. During dredging, equipment may be anchored as much as 75 to 100 feet outside of the defined channel. No dredging occurs in the western channel.

### **3.5.3 Clearances and Restricted Areas**

The Virginia Marine Resources Commission (VMRC) regulates activities within state-owned subaqueous bottom, including the issuance of private shellfish (oyster) ground leases. The surveyed boundaries of existing private oyster lease areas within the project area are shown on Figure 3.5.3-1 in Appendix A. Plat 17064 is approximately 98 acres in size, located just off the east bank of the James River. Plat 19800 is approximately 245.5 acres in size, and surrounds plat 17064 to the west and south. Both the Surry Alternative and James River Crossing Variation 1 cross these plats. Plat 19774 is approximately 185.4 acres in size, located just north of plats 17064 and 19800 and is crossed by James River Crossing Variation 3. Plats 19725 (238.1 acres) and 19727 (100.9 acres) are located in the center of the James River in both Surry and James City Counties. Both James River Crossing Variations 1 and 3 cross plat 19725, while the Surry Alternative crosses plat 19727. Plat 19205 (249.3 acres) is located on the west bank of the James River, bordering the Hog Island WMA and is crossed by James River Crossing Variations 1 and 3. No routes cross through any public Baylor Grounds.

A restricted area associated with the James River Reserve Fleet, an anchorage of retired vessels, is located south of the Surry Alternative and James River Crossing Variations in the James River. This area, at its nearest point, is about 2.2 miles from the Surry Alternative. This is a restricted area governed by COE code 33 CFR 162.270 Restricted Areas in Vicinity of Maritime Administration Reserve Fleets. No vessel or person, unless approved by the enforcing agency, is permitted to cruise or anchor within 500 feet of the outer limits of this area.

A restricted area associated with the army base Fort Eustis for army training and small craft testing is located south of the project in the James River. This area, at its nearest point, is about 1 mile from the Surry Alternative. This area is governed by COE code 33 CFR 344.280 James River between the Entrance to Skiffes Creek and Mulberry Point, VA. No vessel or person, unless approved by the Commanding General of Fort Eustis, is permitted to remain in or enter the restricted area.

Additional buffers and restricted areas associated with the navigational channels and dredge spoil area within the crossing area of the James River were determined through consultation between Dominion and the COE (Norfolk District). In order to provide adequate navigational buffers, towers at the crossing locations must be located at least 250 feet from the

toe of the Tribell Shoal Channel and the dredge spoil area, and at least 100 feet from the toe of the western channel. Dominion would maintain the required minimum buffers from each of these restricted areas. For the Surry Alternative, the approximate minimum span of these restricted areas, including the 250-foot buffers, would be 1,390 linear feet at the Tribell Shoal Channel; 1,760 linear feet at the dredge spoil area; and 1,440 linear feet at the western channel. For James River Crossing Variation 1, the approximate minimum span of these restricted areas, including the 250-foot buffers, would be 1,180 linear feet at the Tribell Shoal Channel; 1,650 linear feet at the dredge spoil area; and 1,420 linear feet at the western channel. For James River Crossing Variation 2, the approximate minimum span of these restricted areas, including the 250-foot buffers, would be 1,250 linear feet at the Tribell Shoal Channel; 1,820 linear feet at the dredge spoil area; and 1,500 linear feet at the western channel. For James River Crossing Variation 3, the approximate minimum span of these restricted areas, including the 250-foot buffers, would be 1,300 linear feet at the Tribell Shoal Channel; 1,670 linear feet at the dredge spoil area; and 1,440 linear feet at the western channel.

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

A pipeline right-of-way crosses the James River. It is approximately 2,400 feet wide at the west bank and 1,600 feet at the east bank. There are three pipelines in the area, from north to south: an 8-inch outside diameter (O.D.) Commonwealth Natural Gas Co. (CNGC) gas line; a 15-inch O.D. Colonial Pipeline Co. (CPC) petroleum line; and a 12.75-inch O.D. CNGC gas line. The Surry Alternative and James River Variations would initially intersect the pipeline area as soon as they begin crossing the James River, MP S1.5. James River Variations 1 and 3 would intersect the pipeline area again at MPs JV1-2.6 and JV3-3.9. There are no specific clearance requirements for this pipeline area. However, adequate safe distances would be required for tower placement.

Several permanent private aids (markers) to navigation exist offshore of the cooling water canal at the Surry Power Station. The markers are named "9," "7," "5," "3," and "1" proceeding from west to east. Though these markers are regulated by the COE, marking authority rests with the USCG and maintenance is at the expense of the private responsible party. The markers are owned by Dominion.

### **3.6 GEOLOGICAL CONSTRAINTS**

The proposed project falls entirely within the Coastal Plain geologic province. This province is characterized by its terraced landscape, which extends from the province boundary near Richmond east to the Atlantic Ocean. Quaternary and late Tertiary sand, silt, clay, and gravel deposits cover the majority of the province. The western portion of the province, known as the upland sub-province, has an elevation range of 60 to 250 feet. The sub-province's physiography is classified by wide upland regions with minor slopes and areas with stream erosion and steeper slopes. The eastern portion of the province, known as the lowland sub-province, has an elevation range of 0 to 60 feet. This sub-province's physiography is classified by flat lowland regions with little relief (Virginia Division of Mineral Resources, 1993; William and Mary Department of Geology, 2011).

#### **3.6.1 Mineral Resources**

NRG identified mineral resource areas through review of publically available datasets, USGS topographic quadrangles, and recent (2011) digital aerial photographs. There are three mineral resources identified in the project vicinity. None of these are located within the proposed study corridors. Along the Chickahominy Alternative, there is one sand pit located approximately 0.35 mile north of the corridor near MP C2.3 in Charles City County east of Barnetts Road and north of Samaria Lane. This land is owned by USA Waste of Virginia and appears to be part of a large landfill. Along the Skiffes Creek to Wheaton Section of the route, there is one clay pit and one gravel pit within 0.5 mile of the proposed project. The clay pit is located approximately 0.23 mile southwest of the corridor at MP W2.3 in the Green Mount Industrial Park west of Skiffes Creek. The gravel pit is located approximately 0.31 mile northeast of the corridor just east of the Skiffes Creek crossing near MP W2.7.

### **3.7 EXISTING CORRIDORS**

NRG identified existing corridors within the study area through desktop review of USGS topographic quadrangles, recent (2011) digital aerial photography, various publicly available data layers, and through site visits and field review of the area. Existing corridors within the study area that were identified consist of existing electric transmission and pipeline facilities and railroad corridors. These existing corridors are described below. The existing corridors were only identified for the sections of the project that would require new or additional right-of-way (i.e., the Chickahominy Alternative and the Surry Alternative).

An area extending for a distance of about 3 miles to the north or east of Dominion's existing transmission line between the Chickahominy Substation and the Lightfoot Junction and 3 miles south of the Chickahominy Alternative was examined. This study area also encompassed the area between the alternative routes (see Figure 3.7-1 in Appendix A).

There are two existing Dominion electrical transmission corridors within the area described above. The first transmission corridor extends from Chickahominy Substation across Charles City, New Kent, and James City Counties to Lightfoot Junction and then continues south from Lightfoot Junction through James City County, the City of Williamsburg, and York County to Skiffes Creek. The portion of this corridor between the Chickahominy Substation and Lightfoot Junction is located north of and roughly parallel to the Chickahominy Alternative. The segment of this corridor between Lightfoot Junction and Skiffes Creek is coterminous with the

proposed route of the Chickahominy Alternative (i.e., this portion of the proposed Chickahominy Alternative would be constructed within this same right-of way). As discussed in greater detail in Appendix H, the section of this existing corridor between the Chickahominy Substation and Lightfoot Junction was examined as a potential routing opportunity. However, it was determined not to be an electrically acceptable solution for the project because it would not address projected violations of mandatory NERC Reliability Standards.

A second Dominion transmission corridor in the area extends southeast from the Chickahominy Substation through Charles City, Prince George, and Surry Counties to the Surry Power Station in Surry County, Virginia. This corridor does not present a routing opportunity because it generally does not follow an alignment that could electrically connect with the Skiffes Creek Switching Station. It was, however, paralleled for 0.78 mile immediately south of the Chickahominy Substation by the Chickahominy Alternative route.

Another potential corridor in this area is a Chesapeake and Ohio Railroad corridor that originates in Richmond and terminates near Newport News, Virginia. The railroad corridor follows a winding course that roughly parallels, and in a few places is collocated with, Dominion's existing transmission corridor between Chickahominy and the site of the proposed Skiffes Creek Switching Station (south of Williamsburg in James City County and Newport News). The railroad corridor presented a potential routing opportunity. However, it crosses through a number of towns and heavily developed areas, especially in the City of Williamsburg and James City and York Counties. In addition, the segment of the railroad corridor that extends through New Kent and Charles City Counties follows a meandering route that connects several of the small towns in the area and, therefore, would not be an optimal alignment for a transmission line.

A Colonial Pipeline products pipeline right-of-way extends southeast from Richmond, Virginia to the U.S. Navy Supply Center in Marlbank, Virginia (see Figure 3.7-2 in Appendix A). This 50-foot-wide pipeline right-of-way is located about 3 miles south of the Chickahominy Alternative and follows an alignment that crosses Henrico, Charles City, and James City Counties, the City of Newport News, and York County. A potential route utilizing this corridor would originate at the Chickahominy Substation and continue south for 4.15 miles adjacent to the east side of Dominion's existing transmission right-of-way (Line #567) until it intersects with the Colonial Pipeline right-of-way. From this point, the route would continue east along the pipeline corridor towards Skiffes Creek. As discussed in more detail below, this corridor does not represent a viable routing opportunity because it would impact a large number of significant resources and would require new right-of-way through several densely populated and highly developed residential and commercial areas.

The portion of the Colonial Pipeline route in Charles City County is primarily rural consisting principally of agricultural and forested lands, with little residential development. Based on the use of a 150-foot-wide right-of-way for a 500 kV transmission line, approximately 527 acres of trees would need to be cleared along the route for the construction of the project. As the route continues east and crosses the Chickahominy River into James City County, the landscape becomes progressively more developed. In particular, the route crosses approximately 25 existing subdivisions in James City County. The construction of a transmission line through this heavily congested area; either adjacent to the existing pipeline right-of-way or on a new right-of-way; would require the taking of a large number of houses.

Moreover, in some areas, the area surrounding the pipeline right-of-way is so developed that there is no space available for the construction of a transmission line.

Much of the pipeline route through Charles City and James City County runs parallel with SR 5, the John Tyler Memorial Highway. The majority of the route is approximately 400 feet from SR 5. The route gets as close as 85 feet from SR 5 on the west side of the Chickahominy River crossing. Route 5 has been designated by the Commonwealth of Virginia as a Virginia Scenic Byway (Virginia Department of Transportation, 2010). A Virginia Byway offers travelers a view of the state that is uncommon and revealing. Each byway leads to scenes of natural beauty and places of historical and social significance. For much of its distance, Route 5 generally parallels the north bank of the James River. A few of the larger and older extant James River Plantations are crossed by the route. From west to east, these include the Piney Grove at Southall's Plantation, North Bend Plantation, and Sherwood Forest Plantation. Several of the plantation homes are listed on the NRHP and also constitute NHLs.

The portion of Route 5 collocated with the Colonial Pipeline is part of the Plantation Loop of the Virginia Birding and Wildlife Coastal Trail in addition to being considered a state scenic byway. The Virginia Birding and Wildlife Coastal Trail is a driving trail established by the VDGIF that provides travelers opportunities to view a wide variety of wildlife and have a quality recreation experience (VDGIF, 2008). The James River is the main water source for the sites on the loop, which include various parks, boat landings, plantations, and a fish hatchery. These sites offer a diversity of habitat including riverside shores, riparian thickets, eastern arboreal forests, mixed-deciduous woodlands, grassy meadows, and the waters of the James River.

The pipeline corridor also crosses multiple significant recreational areas. The route crosses approximately 0.83 mile of the Chickahominy Riverfront Park on the east side of the Chickahominy River. The pipeline right-of-way crosses a number of features within the park including sports fields and a pond, and is located approximately 750 feet from an existing boat ramp. The portion of the Chickahominy River that is crossed by the pipeline is part of the Captain John Smith Chesapeake NHT. Chickahominy Riverfront Park has been designated as a focus area for this portion of the trail due to its recreational opportunities and unspoiled natural conditions. The park receives 145,000 visitors annually. Finally, the pipeline route also crosses approximately 1 mile of Busch Gardens and about 0.74 mile of the Kingsmill Resort.

The portion of Charles City and James City Counties crossed by the pipeline route represents a historically significant area. The pipeline corridor crosses a notable number of historic resources in these counties, including Saint Mary's Church Battlefield in Charles City County, Old Main Road Historic District in Charles City County, Colonial National Historical Park Colonial Parkway in James City County, Battle of Williamsburg Battlefield in James City County, and Carter's Grove Plantation in James City County. Some of these are all well-traveled tourist and recreational areas. The pipeline route also passes in close proximity to a variety of NRHP-listed sites including Nance Major House and Store, Bell Air, Glebe of Westover Parish, Tyler John House, Pinewoods, and Powhatan.

The construction of a transmission line along the route of the Colonial Pipeline would have a significant impact on a variety of environmental and cultural resources and also affect a number of significant recreation areas as well. In particular, the route would directly impact Chickahominy Riverfront Park and Busch Gardens and pass through and/or in the immediate vicinity of a number of important historic sites. The pipeline corridor also traverses a heavily

developed portion of James City County, crossing a number of densely populated residential areas. The installation of a transmission line along the route also would have a negative visual impact on a significant portion of the Virginia Birding and Wildlife Coastal Trail and a Scenic Byway. The construction of a new transmission corridor through these areas also would affect a large number of homes. Finally, the installation of a transmission line adjacent to the pipeline route would require an entirely new right-of-way. Consequently, the Colonial Pipeline corridor does not represent a viable routing opportunity.

A potential routing opportunity is afforded by a lateral that diverges from the mainline of the Colonial Pipeline in southwestern James City County, crosses the James River, and continues southeast to the Norfolk Naval Shipyard in the City of Norfolk, Virginia (see Figure 3.7-2 in Appendix A). The portion of the Colonial Pipeline route that crosses the James River is collocated with two Columbia Gas natural gas pipelines. The potential use of this corridor by the Surry Alternative is discussed below in Section 4.2.6.

### **3.8 SKIFFES CREEK SWITCHING STATION**

The Skiffes Creek Switching Station will be located on a 51-acre parcel in James City County. The parcel is located in a forested area and is crossed by Dominion's existing electrical transmission right-of-way. The parcel is bounded to the west by forested land, to the south by Dominion's right-of-way, to the north by a railroad and SR 143 north of the railroad, and to the east by more forested land. Dominion anticipates that this facility will be located adjacent to and overlapping its existing transmission line corridor. The precise location of the facility will be determined following additional biological and cultural resources investigations of the area.

#### **3.8.1 Land Use**

The 51-acre parcel on which the proposed Skiffes Creek Switching Station would be located is private land owned by Dominion in James City County. The parcel is located on the northern side of the existing right-of-way on undeveloped forested land. There are no recreation areas located within 0.25 mile of the parcel. The closest recreation area is the James River Community Center, which is located approximately half a mile southwest of the parcel.

The parcel is zoned as rural residential and is located adjacent to the County Village Mobile Home Park and approximately 350 feet north of the Poplar Hall subdivision. There are no schools located within 500 feet of the parcel. The nearest school is the James River Elementary School, which is located approximately half a mile southwest of the proposed switching station. There are no conservation lands or easements crossed by the proposed switching station location. The nearest conservation easement is Carter's Grove Plantation (discussed in Section 3.4.2) located approximately half a mile southwest of the proposed switching station.

#### **3.8.2 Natural Resources**

The 51-acre parcel on which the proposed Skiffes Creek Switching Station would be constructed consists primarily of forested uplands. According to USGS and National Wetland Inventory data, an unnamed intermittent tributary to Skiffes Creek and its associated floodplain wetlands are located in the central portion of the project parcel. The FWS county lists, VDCR's NHR Program, and VDGIF identify six federally listed species protected under the ESA that

have the potential to occur within the parcel including the sensitive joint vetch, the small whorled pogonia, narrow-leaved spatterdock, New Jersey rush, bald eagle, and Mabee's salamander. The FWS county lists, VDCR's NHR Program, and VDGIF identify three federal SOC's and non-listed species that may potentially occur within the project parcel including the Virginia least trillium, the rare skipper, and the Atlantic sturgeon, which is a federal candidate species. These species have not been documented within the vicinity of the parcel on which the proposed Skiffes Creek Switching Station would be constructed; however, given the wooded upland and riverine wetland habitat types in the project vicinity, all of the identified species, except the Atlantic sturgeon, have the potential to occur on site.

### **3.8.3 Cultural Resources**

During October and November 2011, CRI completed background research to identify previously identified cultural resources within and adjacent to the parcel where the Skiffes Creek Switching Station will be constructed as well as within the tiered study area as defined in the VDHR's *Guidelines*. This research identified one previously recorded archaeological site, 44JC0662, within the parcel where the Skiffes Creek Switching Station will be constructed. Site 44JC0663, a historic trash pit that has been determined as ineligible for listing in the NRHP, is located immediately west of this parcel.

No known historic or architectural resources occur within the parcel where Skiffes Creek Switching Station will be constructed. However, Carter's Grove (047-0001), Colonial National Historical Park Colonial Parkway (047-0002), the Battle of Williamsburg (099-5282), and the Battle of Yorktown (099-5241) are located in the vicinity of the property on which the proposed switching station will be constructed. Carter's Grove is located within 0.5, 1.0, and 1.5 miles of the proposed switching station property. The Battle of Williamsburg (Civil War) is located within 1.0 and 1.5 miles of the proposed switching station property. The Battle of Yorktown (Civil War) is located within 1.5 miles of the proposed switching station property.



#### **4.0 500 KV ROUTES TO SKIFFES CREEK SWITCHING STATION - ANALYSIS OF ALTERNATIVES**

As described in Section 2.1, Dominion identified and considered two alternative 500 kV routes to bring power into the proposed Skiffes Creek Switching Station; the Chickahominy Alternative and the Surry Alternative. Environmental conditions along each of the alternative routes were identified, mapped, and reviewed as discussed in Section 3.0. Refer to Table 3-1 for a list of environmental features considered during the evaluation process. To further evaluate and consider the environmental advantages and disadvantages of each alternative route, the environmental features potentially affected by these alternatives were quantified for comparison purposes. A quantified environmental features comparison table for the two alternative routes considered for the 500 kV portion of this transmission line project is presented in Table 4-1. The locations of both routes are described below, together with a discussion and comparison of each route's environmental advantages and disadvantages.

Additionally, three alternate overhead transmission line crossing locations of the James River between Surry County and James City County were identified and compared with the corresponding segment of the proposed Surry Alternative route across the James River. These variations were developed to avoid potential impacts from the proposed crossing of the James River by the Surry Alternative to the airspace associated with Felker Airfield at Fort Eustis (James River Crossing Variations 1 and 3) and/or to take advantage of a routing opportunity presented by a pipeline corridor that crosses the James River to the north of the Surry Alternative and continues east across James City County (James River Crossing Variations 2 and 3). A description of the James River Crossing Variations 1, 2, and 3 and comparison of the crossing locations are presented in sections 4.2.5 and 4.3.1, respectively.

In addition to the studies and review of overhead alternatives for the James River Crossing Variations 1, 2, and 3 conducted by NRG and presented in this routing report, Dominion also considered an alternative submarine (i.e., underground) crossing of the James River, which was rejected as discussed in Appendix Section I.C of the SCC Application for this project.

Dominion Virginia Power  
 Surry-Skiffes Creek 500 kV Transmission Line  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500-230-115 kV Switching Station

TABLE 4-1

**Surry-Skiffes Creek 500 kV Transmission Project  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

**Chickahominy to Skiffes Creek and Surry to Skiffes Creek  
 Environmental Features Comparison <sup>a</sup>**

Environmental Features	Unit	Chickahominy Alternative	Surry Alternative	Surry Alternative With James River Crossing Variation 1	Surry Alternative With James River Crossing Variation 2	Surry Alternative With James River Crossing Variation 3
<b>Route Length</b>	miles	37.89	7.42 <sup>b</sup>	7.95 <sup>b</sup>	7.17 <sup>b</sup>	7.50 <sup>b</sup>
Charles City County	miles	18.3	0	0	0	0
James City County	miles	11.7	3.96	3.73	3.46	3.29
	miles		(2.34 portion on land)	(2.33 portion on land)	(1.84 portion on land)	(1.86 portion on land)
City of Williamsburg	miles	1.6	0	0	0	0
York County	miles	6.2	0	0	0	0
Surry County	miles	0	3.46	4.22	3.71	4.21
	miles		(1.52 portion on land)	(1.52 portion on land)	(1.52 portion on land)	(1.52 portion on land)
<b>Land Use Features/Constraints</b>						
Land Ownership (total) <sup>c</sup>	miles	36.19	3.75	3.74	3.26	3.28
Local Government Land	miles	3.73	0	0	0.38	0.38
Private Land <sup>d</sup>	miles	28.53	3.75	3.74	2.88	2.90
State Land	miles	2.71	0	0	0	0
Federal Land	miles	0.12	0	0	0	0
Colonial Williamsburg	miles	0.94	0	0	0	0
Roads Rights-of-Way Crossed	miles	0.15	0	0	0	0
New/Additional Easement Required	acres	0	18.27	18.17	18.35	18.67
Private Parcels Crossed (total)	number	300	7	7	8	8
Charles City County	number	93	0	0	0	0
James City County	number	87	6	6	7	7
City of Williamsburg	number	22	0	0	0	0
York County	number	98	0	0	0	0
Surry County	number	0	1	1	1	1

Dominion Virginia Power  
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 Skiffes Creek 500 kV-230 kV-115 kV Switching Station

TABLE 4-1 (cont'd)

**Surry-Skiffes Creek 500 kV Transmission Project**  
**Skiffes Creek-Wheaton 230 kV Transmission Line Project**  
**Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

**Chickahominy to Skiffes Creek and Surry to Skiffes Creek**  
**Environmental Features Comparison <sup>a</sup>**

Environmental Features	Unit	Chickahominy Alternative	Surry Alternative	Surry Alternative With James River Crossing Variation 1	Surry Alternative With James River Crossing Variation 2	Surry Alternative With James River Crossing Variation 3
<b>Recreational Areas</b>						
Federal, State, County or Municipal Managed Recreation Areas Crossed	number (miles)	5 (4.6)	0 (0)	0 (0)	0 (0)	0 (0)
Golf Courses Crossed	number (miles)	2 (0.64)	0 (0)	0 (0)	0 (0)	0 (0)
<b>Trails Crossed</b>						
Birding & Wildlife Trails	number	4	0	0	0	0
Captain John Smith Chesapeake National Historic Trail	number	1	1	1	1	1
<b>Existing Land Use</b>						
Developed, Open Space	miles	3.79	0.92	0.91	0.75	0.75
Agriculture	miles	2.65	0.23	0.23	0.29	0.29
Forested Land	miles	20.93	1.05	1.06	1.06	1.09
Developed, High intensity	miles	0.04	0.08	0.08	0.08	0.08
Developed, Low/Medium intensity	miles	0.87	0.56	0.56	0.36	0.36
Open Marshland	miles	9.20	1.01	1.01	0.82	0.83
Open Water	miles	0.41	3.55	4.10	3.81	4.10
<b>Zoning</b>						
<b>Districts Crossed</b>						
Single Family Residential	miles	6.99	0	0	0	0
Multi-Family Residential	miles	0.60	0	0	0	0
Rural Residential	miles	0.91	0.18	0.18	0.18	0.18
Agricultural	miles	22.00	0.06	0.06	0.06	0.06
Commercial	miles	1.82	0.29	0.29	0.29	0.29
Industrial	miles	0.37	3.33	3.33	2.83	2.85

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TABLE 4-1 (cont'd)

**Surry-Skiffes Creek 500 kV Transmission Project  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

**Chickahominy to Skiffes Creek and Surry to Skiffes Creek  
 Environmental Features Comparison <sup>a</sup>**

Environmental Features	Unit	Chickahominy Alternative	Surry Alternative	Surry Alternative With James River Crossing Variation 1	Surry Alternative With James River Crossing Variation 2	Surry Alternative With James River Crossing Variation 3
Special Public Interest Areas	miles	2.85	0	0	0	0
Historic Places	miles	0.07	0	0	0	0
Planned Development	miles	0.09	0	0	0	0
Mixed Use	miles	0.99	0	0	0	0
Recreational Areas	miles	0	0	0	0	0
Fort Eustis Flight Approach	miles	0	0	0	0	0
Residential and Commercial Subdivisions						
Existing Subdivisions Crossed	number	28	1	1	2	2
	(miles)	(6.82)	(0.30)	(0.30)	(0.68)	(0.68)
Proposed/Approved Subdivisions Crossed	number	3	0	0	0	0
	(miles)	(1.79)	(0)	(0)	(0)	(0)
Other Land Use Constraints						
Residences within 500 feet <sup>e</sup>	number	1,129	84	84	84	84
Residences within 200 feet <sup>e</sup>	number	284	22	22	22	22
Residences within 100 feet <sup>e</sup>	number	56	16	16	16	16
Structures within right-of-way	number	22	1	1	1	1
Houses within right-of-way	number	4	1	1	1	1
Out Buildings	number	18	0	0	0	0
Commercial Buildings	number	0	0	0	0	0
Cemeteries within 500 feet	number	2	0	0	0	0
Churches within 500 feet	number	1	0	0	0	0
Schools within 500 feet	number	3	0	0	0	0
Multi-unit residential structures						
Multi-unit structures within 500 feet	number	59	15	15	15	15

Dominion Virginia Power  
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TABLE 4-1 (cont'd)

**Surry-Skiffes Creek 500 kV Transmission Project  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

**Chickahominy to Skiffes Creek and Surry to Skiffes Creek  
 Environmental Features Comparison <sup>a</sup>**

Environmental Features	Unit	Chickahominy Alternative	Surry Alternative	Surry Alternative With James River Crossing Variation 1	Surry Alternative With James River Crossing Variation 2	Surry Alternative With James River Crossing Variation 3
Multi-unit structures within 200 feet	number	16	0	0	0	0
<b>Conservation Lands</b>						
Federal Conservation Lands Crossed	number (miles)	1 (0.13)	0 (0)	0 (0)	0 (0)	0 (0)
State Conservation Lands Crossed	number (miles)	1 (2.61)	0 (0)	0 (0)	0 (0)	0 (0)
Local Government Conservation Lands Crossed	number (miles)	3 (2.68)	0 (0)	0 (0)	0 (0)	0 (0)
Williamsburg Land Conservancy Easements Crossed	number (miles)	2 (0.49)	0 (0)	0 (0)	0 (0)	0 (0)
Agricultural and Forest District Crossed	number (miles)	2 (2.65)	0 (0)	0 (0)	0 (0)	0 (0)
<b>Environmental Features/Constraints</b>						
<b>Surface Waters</b>						
Surface Waters Crossed in right-of-way (Total Surface Waters Area Affected) <sup>1</sup>	miles (acres)	0.61 (11.26)	3.61 (65.72)	4.15 (75.54)	3.23 (70.00)	4.16 (75.76)
Waters (fresh water streams)	miles (acres)	0.07 (1.35)	0.00 (0.06)	0.00 (0.06)	0.00 (0.07)	0.00 (0.07)
Waters – Open (lakes and ponds)	miles (acres)	0.16 (3.03)	0.03 (0.57)	0.03 (0.57)	0.03 (0.57)	0.03 (0.57)
Waters-Tidal	miles (acres)	0.38 (6.88)	3.58 (65.09)	4.12 (74.91)	3.82 (69.36)	4.13 (75.12)

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TABLE 4-1 (cont'd)

**Surry-Skiffes Creek 500 kV Transmission Project  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
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**Chickahominy to Skiffes Creek and Surry to Skiffes Creek  
 Environmental Features Comparison <sup>a</sup>**

Environmental Features	Unit	Chickahominy Alternative	Surry Alternative	Surry Alternative With James River Crossing Variation 1	Surry Alternative With James River Crossing Variation 2	Surry Alternative With James River Crossing Variation 3
<b>Wetlands</b>						
Wetlands Crossed in right-of-way	miles	7.55	0.13	0.13	0.06	0.06
(Total Wetland Area Affected) <sup>1</sup>	(acres)	(145.61)	(2.64)	(2.64)	(1.17)	(1.17)
Palustrine Emergent/Palustrine	miles	1.54	0.05	0.05	0.03	0.03
Scrub-Shrub Wetlands	(acres)	(31.33)	(0.82)	(0.82)	(0.44)	(0.44)
Forested Wetlands	miles	5.62	0.01	0.01	0.03	0.03
	(acres)	(106.91)	(0.62)	(0.62)	(0.73)	(0.73)
Tidal Wetlands	miles	0.39	0.07	0.07	0.00	0.00
	(acres)	(7.37)	(1.20)	(1.20)	(0.00)	(0.00)
Perennial Waterbodies Crossed (total)	number	64	3	3	2	2
Less than 300 feet in width	number	63	2	2	1	1
Between 300 and 600 feet in width	number	0	0	0	0	0
Greater than 600 feet in width	number	1	1	1	1	1
Section 10 Navigable	number	1	1	1	1	1
Shipping Channels Crossed (total)	number	0	2	2	2	2
	(feet)		(1,830)	(1,600)	(1,750)	(1,740)
Tribell Shoal	feet	0	890	680	750	800
Western Channel	feet	0	940	920	1000	940
Dredge Disposal Areas Crossed	number	0	1	1	1	1
	(feet)		(1,260)	(1,150)	(1,320)	(1,170)
Forest Land to be Cleared within Right- of-Way	acres	420.45	20.13	20.09	19.90	20.10
<b>Protected or Managed Lands</b>						
Resource Protection Areas Crossed	miles	5.21	3.94	4.48	3.92	4.32
Wildlife Management Areas	miles	2.61	0	0	0	0

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TABLE 4-1 (cont'd)

**Surry-Skiffes Creek 500 kV Transmission Project  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

**Chickahominy to Skiffes Creek and Surry to Skiffes Creek  
 Environmental Features Comparison <sup>a</sup>**

Environmental Features	Unit	Chickahominy Alternative	Surry Alternative	Surry Alternative With James River Crossing Variation 1	Surry Alternative With James River Crossing Variation 2	Surry Alternative With James River Crossing Variation 3
<b>Sensitive Species and Habitat</b>						
Bald Eagle nests within 750 feet (Center for Biology, 2011 data) <sup>9</sup>	number	1	1	1	1	1
Bald Eagle nests between 750 and 1,320 feet (Center for Biology, 2011 data) <sup>9</sup>	number	2	0	1	0	1
<b>Natural Heritage Resources</b>						
<b>Biodiversity Rank</b>						
B1 – Outstanding	number (miles)	1 (0.17)	0	0	0	0
B2 – Very high	number (miles)	3 (3.78)	0	0	0	0
B3 – High	number (miles)	1 (1.21)	0	0	0	0
B4 – Moderate	number (miles)	0	0	0	0	0
B5 – General Interest/Open Space	number (miles)	0	2 (0.70)	2 (0.70)	2 (0.70)	2 (0.70)
No Rank	number (miles)	1 (0.31)	0	0	0	0
State-owned Subaqueous Bottomlands	acres (square feet)	0 (0)	0.79 (34,300)	0.82 (35,525)	0.76 (33,075)	0.79 (34,300)
Towers Located on Private Oyster Beds	number	0	4	6	0	4
Private Oyster Beds – Tower Footprint Area	(acres)	(0)	(0.11)	(0.17)	(0)	(0.11)

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TABLE 4-1 (cont'd)

**Surry-Skiffes Creek 500 kV Transmission Project  
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**Chickahominy to Skiffes Creek and Surry to Skiffes Creek  
 Environmental Features Comparison <sup>a</sup>**

Environmental Features	Unit	Chickahominy Alternative	Surry Alternative	Surry Alternative With James River Crossing Variation 1	Surry Alternative With James River Crossing Variation 2	Surry Alternative With James River Crossing Variation 3
<b>Cultural Resource Features/Constraints</b>						
Archaeological Sites Within right-of-way	number	10	4	4	2	2
National Register-Eligible and -Listed Properties, Battlefields, Historic Landscapes, and National Historic Landmarks within right-of-way	number	4	1	1	1	1
National Register-Eligible and -Listed Properties, Battlefields, Historic Landscapes, and National Historic Landmarks within 0.5 mile	number	11	1	1	1	1
National Register-Listed Properties, Battlefields, Historic Landscapes, and National Historic Landmarks between 0.5 and 1.0 mile	number	11	2	2	1	1
National Historic Landmarks between 1.0 and 1.5 miles	number	7	1	1	1	1
<b>Visual Features/Constraints</b>						
Scenic Byways Crossed	number	1	0	0	0	0
Visually Sensitive Corridors	number	1	1	1	1	1
Length (total)	miles	37.89	7.42	7.95	7.17	7.50
Roads Crossed	total	66	8	8	5	5
U.S. or State Highways	number	10	1	1	1	1
County or Local Roads	number	56	7	7	4	4
Active Railroads Crossed	number	4	0	0	0	0
<b>Routing Opportunities</b>						
Collocated <sup>h</sup>	miles	13.0	3.17	3.17	2.55	2.55
Greenfield (land and water)	miles	24.3 <sup>i</sup>	4.25	4.78	4.62	4.95



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TABLE 4-1 (cont'd)

**Surry-Skiffes Creek 500 kV Transmission Project  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

**Chickahominy to Skiffes Creek and Surry to Skiffes Creek  
 Environmental Features Comparison <sup>a</sup>**

Environmental Features	Unit	Chickahominy Alternative	Surry Alternative	Surry Alternative With James River Crossing Variation 1	Surry Alternative With James River Crossing Variation 2	Surry Alternative With James River Crossing Variation 3
<sup>a</sup>	The numbers in this table have been rounded for presentation purposes. Sums do not always equal the total of addends due to rounding error or spatial discrepancies in data sets used to identify constraints.					
<sup>b</sup>	The crossing of the James River accounts for 3.53 miles of the Surry Alternative, 4.1 miles of the Surry Alternative with the James River Crossing Variation 1, 3.81 miles of the Surry Alternative with the James River Crossing Variation 2, and for 4.12 miles of the Surry Alternative with the James River Crossing Variation 3.					
<sup>c</sup>	Land ownership does not include water crossings.					
<sup>d</sup>	Total includes a small amount of unknown land ownership that is assumed to be private land.					
<sup>e</sup>	Distances of buildings from the centerline and within the right-of-way were determined based on aerial photography and are subject to field verification.					
<sup>f</sup>	These numbers are based on a desktop wetland assessment completed by Williamsburg Environmental Group, Inc.					
<sup>g</sup>	To avoid reporting duplicate eagle nests, a nest reported within 750 ft. of the right-of-way was not reported between 750 and 1,320 ft. That is, intersections of the proposed right-of-way with the primary and secondary management zones are considered mutually exclusive					
<sup>h</sup>	Within about 60 feet of the existing electric facility, pipeline, railroad, or road.					
<sup>i</sup>	A total of 24.2 miles consists of existing but undeveloped right-of-way between Chickahominy and Lightfoot Junction. In addition, 0.2 mile of new right-of-way would be required at the tie-in to the Kingsmill Substation between mileposts K0.3 and K0.4.					

## **4.1 CHICKAHOMINY ALTERNATIVE**

### **4.1.1 Land Use**

#### **Land Ownership/Land Use**

While the majority (75.3 percent) of lands crossed by the Chickahominy Alternative are privately owned (see Table 4-1), about 3.73 miles (9.7 percent) are owned by either James City County (Freedom Park and Warhill Sports Complex) or the City of Williamsburg (Waller Mill Park), 2.71 miles (7.1 percent) are owned by the state (Chickahominy WMA), 0.94 mile (2.5 percent) are owned by Colonial Williamsburg and 0.12 mile (0.3 percent) consist of the federally owned lands (Colonial Parkway). Although these are government-owned lands, Dominion already has obtained an easement across these lands and would not require additional rights-of-way. Of the private lands crossed on this alternative, approximately 300 privately owned land parcels are crossed by the existing easements.

The right-of-way along the Chickahominy Alternative is primarily forested between Chickahominy Substation and Lightfoot Junction (i.e., Dominion's existing but undeveloped easement) and varies in width from 150 feet to 250 feet. This section of the alternative consists primarily of forestlands, including forested wetlands (20.93 miles or 55.2 percent of the entire alternative). Development of this section of right-of-way would require the clearing of about 420.25 acres of trees. While this section of the Chickahominy Alternative is mostly forested, it is zoned primarily for agricultural development. Other land uses that would be crossed by the entire Chickahominy Alternative consist of about 2.65 miles of agricultural lands (7.0 percent) and 9.20 miles of open marsh and emergent/scrub-shrub wetland (24.3 percent). The right-of-way along the portion of the Chickahominy Alternative between Lightfoot Junction and Skiffes Creek would be located entirely on existing rights-of-way and would not require the clearing of forestlands, wetlands, or any changes in existing land uses. However, it would cross approximately 0.87 mile of medium to high density residential areas.

#### **Recreational Use**

The Chickahominy Alternative crosses four recreation areas between the Chickahominy Substation and Lightfoot Junction where existing undeveloped right-of-way would need to be cleared. The Plantain Loop of the Virginia Birding and Wildlife Coastal Trail would be crossed twice by the Chickahominy Alternative; once each at Adkins Road (MP C4.2) and Courthouse Road (MP C6.9). Because of the developed nature of these existing roadways the route alternative is expected to have minor visual impacts on trail users and would not affect access to the trail.

The Chickahominy Alternative also crosses approximately 2.65 miles of the northern edge of the Chickahominy WMA. The proposed route would cross the Chickahominy WMA and Chickahominy River approximately 0.62 mile north of the existing river landing boat ramp. At this time it is not expected that construction of the proposed project would impact access to the boat ramp. The Chickahominy Alternative route would cross one WMA road off of Eagle's Nest Road north of the boat ramp, but current river access should not be affected.

The Chickahominy Alternative crosses the Captain John Smith Chesapeake NHT at the Chickahominy River crossing. The route would not impact access to the water trail however the

addition of transmission towers to area would add a change in the visual character of the area as discussed below in Section 4.1.3.

The Chickahominy Alternative would cross an existing mountain bike trail system located within Freedom Park in approximately six locations between Jolly Pond Road and Centerville Road. The trail system was developed and is used extensively by the EVMA and is open to the public. Although access to and use of the trail could be temporarily affected during project construction, Dominion would work with the EVMA to limit the amount and duration of trail closure.

The Chickahominy Alternative crosses six other recreation areas between Lightfoot Junction and Skiffes Creek. These areas include: Warhill Sports Complex, Lower Peninsula Loop of the Virginia Birding and Wildlife Coastal Trail, Waller Mill Park, the Colonial Parkway, Williamsburg Country Club, and Kingsmill Resort. Although this portion of the alternative would be constructed entirely within existing transmission corridor right-of-way and no new right-of-way would be needed, some temporary impacts may occur in these recreational areas during construction. Temporary affects include short-term facilities closure or limitations on access to parts of the facility that contain portions of Dominion's existing right-of-way. The Kingsmill Resort property is located in the area where the route of the transmission line splits into two rights-of-way at U.S. Route 60 (MP C35.8). While the southernmost segment of the right-of-way crosses the Kingsmill Resort property, the golf course itself is not crossed and should not be affected.

### **Residential, Existing, and Planned Developments**

Houses are scattered widely throughout the Chickahominy Alternative route section between Chickahominy and Lightfoot Junction with little concentrated development or subdivisions. While Dominion acquired the easement for this portion of the Chickahominy Alternative in the 1970s, it has remained uncleared and undeveloped by Dominion, which may be why there are currently four houses and three outbuildings, including a garage, located within the boundaries of the easement. Dominion has been in communication with landowners to have these unauthorized encroachments removed. Only two subdivisions are crossed by this section of the alternative for a total distance of about 200 feet. Both subdivisions (James Shire Settlement and Colonial Heritage) are located at Lightfoot Junction (see Figure 3.1.4-2 in Appendix A). South of Lightfoot Junction, residential development becomes denser and progressively gets more developed as the alternative moves towards Skiffes Creek. Twenty-six (26) subdivisions are crossed by this portion of the Chickahominy Alternative for a total distance of about 6.82 miles. All of these subdivisions would be crossed entirely within Dominion's existing rights-of-way. There are currently 15 outbuildings encroaching within the right-of-way, which would need to be removed. Along the entire Chickahominy Alternative, there are approximately 1,129 houses located within 500 feet of the centerline, about 284 houses located within 200 feet and about 56 located within 100 feet.

The Chickahominy Alternative crosses 1.79 miles of planned developments including Colonial Heritage, Alexander Commons Offices, and Powell Plantation. The 3026 Richmond Road development discussed in Section 3.1.5 borders, but is not crossed by the existing right-of-way. The Colonial Heritage development (James City County) would be crossed by the new proposed 500 kV line in the undeveloped existing right-of-way between Chickahominy Substation and Lightfoot Junction. 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 between Lightfoot Junction and the proposed Skiffes Creek Switching Station (see Figure 3.1.5-1 in Appendix A). In all of these planned developments the proposed facilities would be installed entirely within the existing right-of-way, developed and undeveloped, and no new right-of-way would be needed. Consequently, there should be no effects on the planning or development of these residential and office developments.

## **Zoning**

As shown in Table 4-1, the Chickahominy Alternative would cross the following zoning districts: single family residential (6.99 miles or 18.4 percent), multi-family residential (0.60 mile or 1.6 percent), rural residential (0.91 mile or 2.4 percent), agricultural (22.00 miles or 58.1 percent), commercial (1.82 miles or 4.8 percent), industrial (0.37 mile or 1.0 percent), special public interest areas (2.85 miles or 7.5 percent), historic places (0.07 mile or 0.2 percent), planned development (0.09 mile or 0.2 percent), and mixed use (0.99 mile or 2.6 percent). The areas zoned for special public interest areas currently contain public lands owned by James City Community (Warhill Sports Complex on Opportunity Way) and the United States (Colonial Parkway). Since the new transmission lines would be installed entirely within existing right-of-way and no new right-of-way would be acquired, the construction and operation of the proposed facilities should not directly or indirectly affect land uses or zoning within the project area.

## **Conservation Lands**

The Chickahominy Alternative would cross a total of 8.56 miles of conservation lands managed by various entities (see Table 4-1). Dominion consulted with the VOF regarding conservation easements in the project vicinity, who indicated that there are no VOF managed easements within the project vicinity. They also indicated that properties are placed under VOF easement throughout the year and additional easements may be identified as the project moves forward. Dominion would continue to consult with the VOF regarding any potential new easements in the project area.

### **4.1.2 Natural Resources**

#### **Wetlands**

Based on WEG's Offsite Wetland and Waters Analysis data (May 2012), the portion of the Chickahominy Alternative that would be constructed on currently undeveloped right-of-way between Chickahominy Substation and Lightfoot Junction would cross about 7.55 miles of wetland habitat, and would require the clearing and/or disturbance of up to about 145.61 acres of wetland area. While most wetlands would be spanned, forested wetlands (PFO<sub>1.4</sub>) and scrub-shrub wetlands (PSS<sub>1.7</sub>) would require at least initial vegetation clearing and forested wetlands would be permanently converted to scrub-shrub wetlands. Of the 145.61 acres of wetland habitat that could be disturbed along this section of the route, about 106.91 acres (73 percent) consist of forested wetland while about 7.37 acres (5 percent) consist of tidal wetlands and 31.33 acres (22 percent) consist of palustrine emergent or palustrine scrub-shrub wetlands. All tidal wetlands are associated with the Chickahominy River crossing. Wetlands located along the section of the alternative between Lightfoot Junction and Skiffes Creek Switching Station are all located on existing cleared rights-of-way and would either be spanned or, during construction, would be matted to support construction vehicles, equipment and materials. Wetland disturbance along the existing right-of-way should be minimal. See Section 5.1.1.1 for

a detailed description of potential wetland impacts during construction along existing rights-of-way.

### **Waterbodies**

The Chickahominy Alternative would cross 64 perennial waterbodies, of which 63 are smaller perennial waterbodies and one, the Chickahominy River, is about 1,850 feet wide at the crossing location. Of the 63 smaller waterbodies, 3 are named open waterbodies (Scotts Pond, Waller Mill Reservoir, and Williamsburg Country Club Lake) and 5 are named streams including Chisel Run, King Creek, Longhill Swamp, Skiffes Creek, and Whiteman Swamp. Only the Chickahominy River is identified as a Section 10 Navigable Waters. Due to the length of the Chickahominy River crossing, Dominion would place one transmission line tower in a shallow part of the river about 200 feet from the edge of the eastern shoreline. The tower would be a steel pole H-frame about 195 feet tall and would be constructed from a barge and erected on steel and concrete pilings (see Section 2.5). All of the rest of the perennial waterbodies would be spanned with no in-stream construction. Construction access across streams would be accomplished by installing either timber mats and culverts or temporary bridges.

### **Protected and Managed Lands**

Protected or managed lands along this alternative route consist of about 5.21 miles of RPAs and about 2.61 miles of state-owned WMA. RPA lands along this route are associated primarily with the tidal lands along the Chickahominy River and other major rivers crossed by the project. The state-owned Chickahominy WMA is located in a large forested tract on the western side of the Chickahominy River. The area consists mostly of forested upland areas interspersed with forested wetlands and is used for outdoor recreation, including hunting. This area is discussed in more detail in Section 3.1.2.

### **Natural Heritage Resources Screening**

The Chickahominy Alternative in the area of the undeveloped right-of-way crosses some habitat with a VDCR-inventoried NHR biodiversity ranking of high to very high. All of this area is located in the drainage of the Chickahominy River. About 1.2 miles of fairly acidic upland hardwood forest located near Lightfoot Junction would be crossed that is ranked B-3 (potential for high diversity). Another larger area, a 3.2-mile-long section of mixed upland and wetland forest on the west side of the Chickahominy River, would also be crossed that is ranked as B-2 (potential for very high ecological diversity). Along this route, and particularly near the Chickahominy River, are multiple eagle nests, although most are fairly far from the route. Two, however, occur just barely within the 1,320-foot buffer area and a third nest occurs about 280 feet from the centerline (see Table 4-1).

Two other VDCR NHR biodiversity-ranked areas are crossed by the section of the alternative between Lightfoot Junction and Skiffes Creek that is located on existing right-of-way. The first area is ranked as B-2 but all work proposed by Dominion throughout this area would be completed within the existing right-of-way and no additional lands would be cleared or disturbed. The second area is ranked B-1 (potential for outstanding ecological diversity and habitat) is currently crossed by Dominion's existing 230 kV right-of-way in the Kingsmill area. This section of the alternative would require primarily removal and rebuilding of an existing single circuit 230 kV line to install a double circuit 230 kV line. While the majority of this construction would be

done within the existing, cleared right-of-way, a small portion of new easement (1.52 acres) would be required to construct and operate a rearrangement of Dominion's existing 230 kV system to reconnect to the Kingsmill Substation. This new easement would be located within the B-1 habitat area.

### **Federally and/or State-Listed Species**

Species occurrences reported by the FWS Virginia Field Office and the VDCR NHR county lists were evaluated against the VDGIF's digital EnviroReview Listed SppObs data, and the VDCR's EOREps datasets, which display species occurrences at the local level. A summary of the federally and state-listed species documented within the counties and independent cities crossed by the project is presented in Table 3.2.4-1. Species identified as federal SOCs but having no federally or state-listed status, as well as other non-listed species, are described in Section 3.2.4.4 of this document. In addition, the locations of documented species that are crossed by the right-of-way are described in further detail below.

The FWS county lists identify several federally listed species protected under the federal ESA, including the Atlantic sturgeon, sensitive joint-vetch (*Aeschynomene virginica*), and small whorled pogonia (*Isotria medeoloides*). According to the FWS, the Atlantic sturgeon has been documented in Charles City County and James City County. The sensitive joint-vetch has been documented in James City County. The small whorled pogonia has been documented in James City County, the City of Williamsburg, and York County.

The VDCR NHR website identified several state-listed species protected under Section 6 of the ESA including the peregrine falcon (*Falco peregrinus*), barking treefrog (*Hyla gratiosa*), the Eastern tiger salamander (*Ambystoma tigrinum*), Mabee's Salamander (*Ambystoma mabeei*), the Canebrake Rattlesnake (*Crotalus horridus*), and the bald eagle (*Haliaeetus leucocephalus*). According to the VDCR, the peregrine falcon, barking treefrog, Eastern tiger salamander, and canebrake rattlesnake have been documented in York County. Mabee's Salamander and the bald eagle have been documented in James City County and York County.

### **Bald Eagle Management**

To obtain the most current eagle nest data, NRG reviewed the 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, the Lightfoot Junction to Skiffes Creek Section does not intersect any primary or secondary management zones as identified in The Bald Eagle Protection Guidelines for Virginia (2000). Construction of the Lightfoot Junction to Skiffes Creek Section of the Chickahominy alternative is anticipated to have no effect on the bald eagle.

### **Federally Listed Species of Concern and Other Documented Occurrences**

In addition to federally listed SOCs reported by the FWS Virginia Field Office county and independent city lists, the VDCR EOREps dataset documented occurrences of "non-listed" species (species not listed at the federal or state level) with the project corridor. These species were not reported by the FWS Virginia Field Office lists because they are not federally or state-listed species. Personal communication with the VDCR indicated that these species are taken into consideration based on Global Rank. NatureServe, an international network of Natural Heritage Programs, assigns a Global Rank based on rarity and conservation status. Species

ranked “G1” (global rank 1/critically imperiled) or “G2” (global rank 2/imperiled) are most at risk (NatureServe, 2012). Forest certification systems, such as the Sustainable Forestry Initiative, protect all “G1” and “G2” species and natural communities, even if they are not listed and protected under the ESA (VSFI, 2012). According to the federal and state datasets reviewed, no “G1” species have been documented within the project corridor. SOC and non-listed species typically are not afforded the same level of protection as federally and state-listed endangered and threatened species. The locations of documented species that are crossed by the right-of-way are described in further detail below.

The FWS county list also identifies several federal SOC, including the New Jersey rush (*Juncus caesariensis*), the Virginia least trillium (*Trillium pusillum* var. *virginianum*), the rare skipper (*Problema bulenta*), narrow-leaved spatterdock (*Nuphar sagittifolia*) and Harper's fimbriatilis (*Fimbristylis perpusilla*). According to the FWS, the New Jersey rush and the Virginia least trillium have been documented in James City County, the City of Williamsburg, and York County. The narrow-leaved spatterdock and the rare skipper have been documented in James City County only. Harper's fimbriatilis has been documented in York County only. Harper's fimbriatilis is listed as endangered by the State of Virginia. The New Jersey rush and narrow-leaved spatterdock are listed as threatened in the State of Virginia.

The VDCR NHR website documented limited occurrences of the above referenced federally listed species and SOC within project counties in addition to those listed by the FWS. For simplicity, federally and state-listed species occurrences are summarized in Table 3.2.4-1 below and federal SOC and non-listed species are summarized in Section 3.2.4.4 of this document.

The VDCR EOREps dataset identified several non-listed species occurrences within the project corridor. An isolated occurrence of the Mountain Camellia (*Stewartia ovata*) was documented within the Lightfoot Junction to Skiffes Creek Section of the project in association with areal occurrences of mesic forest and Coastal Plain/Piedmont Basic Seepage Swamp. The Mountain Camellia occurrence was documented within the Grove Creek conservation site in 2002 between MPs C35.8 and C36.2 of the Chickahominy Alternative in James City County.

#### **4.1.3 Airports**

No airports or airspace would be affected by the construction of the Chickahominy Alternative.

#### **4.1.4 Visual Assessment**

Construction of a new 500 kV transmission along the undeveloped portion of the Chickahominy Alternative would alter the visual landscape of the rural area. The existing landscape includes primarily forested areas interspersed with agricultural fields and pastures. Rural roads crisscross the area and scattered rural residential development occurs in pockets along the entire length of the undeveloped right-of-way. The 500 kV structures that would be used from the Chickahominy Substation to Jolly Pond Road, with the exception of the Chickahominy River crossing, would consist of lattice structures that would average 111-foot-tall. From Jolly Pond Road to the interconnection with Dominion's existing right-of-way at Lightfoot Junction, the structure design would shift to a single steel pole, averaging about 135 feet tall (see section 2.4).

To assist in assessing the potential for the project to affect viewsheds or visually sensitive features, NRG retained TrueScape Ltd. to prepare visual simulations of the proposed transmission line structures at viewpoints (VPs) along the potential routes and existing transmission line rights-of-way described in Section 2. Viewpoint locations were selected to represent typical areas crossed by the proposed facilities. The simulations consist of scaled images of the proposed transmission line structures superimposed on photos from within the study area. The photos provide an indication of how the transmission structures and the associated rights-of-way would appear after construction of the project. A more detailed review of the methodology used by TrueScape and copies of the visual simulations for each viewpoint described below are provided in Appendix C.

VP1 (SR 603, Old Union Road), VP2 (The Glebe Lane) and VP3 (SR 611, Jolly Pond Road) are viewpoint locations along the portion of the Chickahominy Alternative that would be constructed on currently undeveloped right-of-way. While the structures would be taller than most trees in the area, they are generally only apparent in the visual landscape when close by or passing adjacent to or underneath them on a major road. More distant views are generally blocked by the existing trees. This would not be the case in open viewsheds such as fields or pasture, where the structures would be prominent in foreground or middle ground views. Longer views, even in open areas, tend to diminish the appearance of the structures.

There are five visually unique or sensitive features in the area between the Chickahominy Substation and the Chickahominy River that were reviewed to determine the potential visual affect from the project. These include the Saint Mary's Church Battlefield site and four historic homes: the Poplar Springs homesite, Moss Side, and the Piney Grove homesites all located along The Glebe Lane; and the Eagle's Nest homesite along the Chickahominy River south the Chickahominy River Crossing. These sites are all either listed or eligible for listing in the NRHP.

An example of views of the landscape from within the Saint Mary's Church Battlefield is presented in the simulation for VP1. The battlefield area is currently a mixture of some rural agricultural areas, but mostly forested lands with interspersed houses, roads, existing transmission line rights-of-way, a landfill, and a sand and gravel mining area. Most of the transmission line in this area would be located either along existing transmission lines or located in forested areas. From VP1, distant views of the new towers would be along the same right-of-way as existing towers of the same height and appearance and would not be expected to significantly change the visual character of this area of the battlefield. Other areas are primarily forested and short, foreground views of the transmission line would be limited to along roadways.

A simulated view (VP2) from near the Poplar Springs homesite was prepared from a viewpoint near the southwest corner of the Poplar Springs property along The Old Glebe Road. This point is about 1,075 feet southwest of the homesite and that much closer to the transmission line route. From VP2, the closest transmission line structure on the north side of The Glebe Lane would be obvious to travelers along the road, but structure height and appearance in the landscape would diminish quickly as the viewers look down the right-of-way into the distance. Structures in this area would be spaced on an average of about 1,000 feet. Views of the transmission line structures from the house, located 1,075 to the northeast away from the line, would be much less noticeable. Based on line of sight analysis using digital elevation modeling with ArcGIS 3D Analyst, NRG determined that the two towers that would be



located directly west of the Poplar Springs homesite would be entirely blocked from view by dense forest.

Views from Moss Side and Piney Grove homesites were not simulated due to the dense tree cover surrounding each homesite and the low probability of having views of the towers from these homesites. However, to determine more accurately if any of the towers that would be used in this area could be seen from these sites, and to assess the number of towers and how much of each tower could be seen, NRG used digital elevation data (3-meter cell size resolution) obtained from the U.S. Department of Agriculture that represented ground surface elevations along the sight lines. Tree height data for the mature forests in these areas was estimated to be between 60 to 80 feet tall based on information obtained from Dominion's forestry group familiar with tree work along transmission line rights-of-way in this part of Virginia. Consequently, an average tree height of 70 feet was used to model the mature forest canopy in this area. The tower design that would be used in this area would average approximately 111 feet tall. These data were used in combination with ArcGIS 3D Analyst to prepare cross-sectional sight lines to each tower location from a point 6 feet off the ground (eye level) directly in front of the main houses at each site. The sight line elevation profiles from Moss Side (see Figure 4.1.4-1 in Appendix A) and from Piney Grove (see Figure 4.1.4-2 in Appendix A) show which towers and how much of the towers could be seen from the main houses at the respective locations and which ones would be blocked by the trees.

Because of the scattered smaller and large trees located surrounding the Moss Side complex, only the top 23 feet of tower 7 would be visible from a distance of about 0.5 mile. All other towers that could reasonably be seen from this location would be blocked by the tree cover surrounding the house. Similarly, the dense tree cover surrounding the Piney Grove homesite, both on the north and south sides of The Glebe Lane, would block views of the towers that would be located near, and that could reasonably be expected to be seen from this house site.

For the line of sight analysis at the Eagle's Nest homesite, because it is located near the Charles City County line with James City County, most of the towers that could potentially be seen from this location are located in James City County on the east side of the river. For all line of sight analyses conducted across James City County, digital LIDAR elevation data (5-foot cell size resolution) obtained from the College of William and Mary for James City County was used to represent both the ground and vegetation (tree) surface elevations so that actual tree heights, rather than estimated tree heights could be used for vegetation modeling on the east side of the river. At this location (see Figure 4.1.4-3 in Appendix A), with the exception of the towers used to span the Chickahominy River, all other towers would average approximately 111 feet in height. The towers used to span the river would be 195 feet tall above the ground (west side) or river level (east side). From the line of sight analysis done for the Eagle's Nest homesite location, it was determined that the top 56 feet and 16 feet of the western and eastern towers used to span the river, respectively, would be visible from the front of the house. Additionally, the top 37 feet of the westernmost tower modeled (tower number 1) would be visible. Tower numbers 2 and 5 through 13 would not be visible from Eagle's Nest. This is partially due to a large-canopied tree located in the front yard of the homesite that would block views from the front of the house towards the transmission line on the east side of the river (see Figure 4.1.4-3 in Appendix A). Tower numbers 1 and 3 would be approximately 1.0 miles from Eagle's Nest and tower number 4 would be approximately 1.15 miles from the Eagle's Nest homesite.

Views of the proposed transmission line from the back of the Hornsby Middle & J.B. Blayton Elementary Schools on Jolly Pond Road (VP3), looking out over the sports fields would consist mostly of the conductors (transmission wires); views of the structures would mostly be obscured by the closer trees. The two schools are about 500 feet and 750 feet from the centerline of the right-of-way.

The Chickahominy River crossing on this alternative is approximately 1,850 feet wide. Due to the length of the river crossing, Dominion would place one transmission line tower on a slight rise about 40 feet above the west side of the river and would place the second tower in a shallow part of the river about 200 feet from the edge of the eastern shoreline. Both towers that support the crossing span would consist of a steel H-frame design about 195 feet tall (above existing ground or water level). Simulated views of this crossing are presented in VP13.

The portion of the Chickahominy River where the crossing would be located is within a segment of the river that is not currently designated by Virginia as a scenic river in the State's Scenic Rivers Program, but has potential scenic components and has been identified as being worthy of future study. This area of the river is fairly remote and only sparsely developed with a few scattered seasonal homes. The transmission line crossing, with a 195-foot-tall structure located in the river and another on the west shoreline, would represent a significant change to the scenic landscape of this section of the river. The adjoining 111-foot tall towers located in the marshlands immediately east of the river would also be visible from the river at the crossing location. The visual changes to the existing character of this section of the river would significantly reduce the conditions of the river which are considered similar to the conditions in the 1600s during John Smith's voyages.

The portion of the alternative would be constructed on existing transmission line right-of-way between Lightfoot Junction and Skiffes Creek by removing one set of structures and replacing them 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 would not substantially change the existing visual character along this section of the route. The new towers would be a different design or slightly taller than the remaining structures. Representative simulated views of viewpoints within this area of the alternative are captured in VP4 (Opportunity Way), VP5 (SR 60, Richmond Road), and VP6 (Tadich Drive).

#### **4.1.5 Cultural Resources**

Ten archaeological sites occur within the right-of-way of the Chickahominy Alternative. Eight of the 10 sites have not been evaluated for listing in the NRHP (44CC0350, 44JC0195, 44JC1175, 44WB-0133-0001, 44WB0133-0002, 44YO0220, 44YO0524, and 44YO0757). Two unevaluated sites (44JC0195 and 44YO0757) have not 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.

Eighteen architectural sites considered as part of the Stage One Pre-application process are located within 1.5 miles of the Chickahominy Alternative (see Section 3.4.2 and Table 3.4.2-1). CRI was retained by Dominion to conduct a Stage I Pre-Application Analysis for the Chickahominy Alternative that included background research and field reconnaissance. The background research included a review of the VDHR archives and data collected from the VDHR Data Sharing System (DSS) using the most current data (March 2011). Additionally, local histories and historical maps were examined to identify potential buildings and other cultural features that may be present within the study area. Google Earth 2011 aerial photography of current conditions was examined for the entire study area.

The field reconnaissance included the visual inspection and photo documentation of the following properties based on VDHR *Guidelines*:

- All NHLs located within 1.5 miles of the proposed right-of-way;
- All National Register listed or locally designated properties (including battlefields, historic landscapes, etc.) located within 1.0 mile of the proposed right-of-way;
- All National Register eligible properties located within 0.5 miles of the proposed right-of-way; and
- All buildings and structures located within the proposed right-of-way.

Documentation included digital photographs from public rights-of-way near the 18 architectural sites considered towards the Chickahominy Alternative. In addition, aerial photographs for each property showing the boundaries of the property, location of primary and secondary resources, a key to the ground photography, and depiction of the proposed right-of-way and distance from the resource were provided. CRI also provided a discussion of any potential impacts from the Chickahominy Alternative taking into account whether or not the setting of the property is a character-defining feature of the resource. The results of the field reconnaissance suggest that the Chickahominy Alternative would result in no visual impact or minimal visual impact to 15 architectural resources; moderate visual impact to 3 architectural resources; and no significant visual impact to any of the 18 architectural resources. A more detailed discussion of these results is found in CRI's report included in Appendix G.

Line of sight analyses were completed by NRG for three significant architectural resources, including Piney Grove (018-0063), Eagle's Nest (01-0037), and Moss Side (018-0066). Piney Grove, Poplar Springs, and Eagle's Nest are listed in the NRHP and VLR, and Moss Side has been determined eligible for listing in the NRHP. Additionally, Saint Mary's Church Battlefield (018-5004), a site determined eligible for listing in the NRHP, was reviewed to determine the potential visual affect from the project. A more detailed description of these analyses is provided in Section 4.1.4, but is briefly summarized here.

Both Moss Side and Piney Grove are surrounded by dense woods with few openings as confirmed during CRI's field investigation. The line of site analysis suggests that only the top 23 feet of tower 7 would be visible from a distance of about 0.5 mile from Moss Side (see Figure 4.1.4-1 in Appendix A). All other towers that could reasonably be seen from Moss Site would be

blocked by the tree cover surrounding the house. Similarly, the dense tree cover surrounding Piney Grove would block views of the towers that would be located near, and that could reasonably be expected to be seen from this historic property (See Figure 4.1.4-2). Based on line of sight analysis, NRG determined that the two towers that would be located directly west of the Poplar Springs main house would be entirely blocked from view by the dense forest documented during CRI's field investigation.

For the line of sight analysis at Eagle's Nest, most of the towers that could potentially be seen from this location are located on the east side of the river as well as the two 195-foot-tall towers used to span the river (see Figure 4.1.4-3). The analysis determined that the top 56 feet and 16 feet of the western and eastern towers used to span the river, respectively, would be visible from the front of the house. Additionally, the top 37 feet of the westernmost tower modeled would be visible. Tower numbers 2 and 5 through 13 would not be visible from Eagle's Nest due to a large-canopied tree located in the front yard of the homesite that would block views from the front of the house towards the transmission line on the east side of the river.

As documented in the visual simulation from VP1 and CRI's field study, the area encompassed by the Saint Mary's Church Battlefield is currently a mixture of some rural agricultural areas, but mostly forested lands with interspersed houses, roads, existing transmission line rights-of-way, a landfill, and a sand and gravel mining area. Most of the transmission line in this area would be located either along existing transmission lines or located in forested areas. Distant views of the new towers would be along the same right-of-way as existing towers of the same height and appearance and would not be expected to significantly change the visual character of this area of the battlefield. Other areas are primarily forested and short, foreground views of the transmission line would be limited to along roadways.

## **4.2 SURRY ALTERNATIVE**

### **4.2.1 Land Use**

All land crossing portions of both the Surry Alternative and the James River Crossing Variation 1 are privately owned. The James River Crossing Variations 2 and 3 both cross one parcel owned by the James City County Economic Development Authority, which is part of the James River Commerce Center. The Surry Alternative and all three James River Crossing Variations cross the Captain John Smith Chesapeake NHT and are located within 0.25 mile of the Hog Island WMA. Designated fishing areas are restricted to the western side of Hog Point and would not be affected by the proposed route. Hog Island is used for some limited hunting of both waterfowl and deer, fishing, bird watching, and hiking usually outside of warm weather due to the aggravation of mosquitoes and biting flies during warm weather. Access to WMA would not be impacted during construction as WMA is not crossed by the Surry Alternative or any of the James River Crossing Variations. James River Crossing Variations 2 and 3 are within 0.25 mile of Carter's Grove Plantation. This plantation is currently privately owned and not open to the public. The portion of the James River where the proposed crossing would be located is within a segment that is currently designated by the Commonwealth of Virginia as scenic. Potential visual impacts on recreationists on the James River, Hog Island WMA, and Carter's Grove are discussed in more detail in Section 4.2.3.

The right-of way along the Surry Alternative consists primarily of open water (3.55 miles or 47.8 percent), forested lands (1.05 miles or 14.2 percent), and open marshland (1.01 miles or 13.6 percent) and would require the clearing of about 20.13 acres of trees. The remaining lands

consist of 0.92 mile of developed open space, 0.56 mile of developed low/medium intensity, 0.23 mile of agriculture, and 0.08 mile of developed high intensity. While the route crosses primarily water, marshland, and forest, the land portion is zoned primarily as industrial (86.3 percent of land portion) and commercial (7.5 percent of land portion).

The right-of-way along the Surry Alternative with the James River Crossing Variation 1 also consists primarily of open water (4.10 miles or 51.6 percent), forested land (1.06 miles or 13.3 percent), and open marshland (1.01 miles or 12.7 percent) and would require the clearing of about 20.09 acres of trees. The remaining lands consist of 0.91 mile of developed open space, 0.56 mile of developed low/medium intensity, 0.23 mile of agriculture, and 0.08 mile of developed high intensity. While the variation crosses primarily water, marshland, and forest, the land portion on both sides of the river is zoned primarily as industrial (86.3 percent of land portion) and commercial (7.5 percent of land portion).

The right-of-way along the Surry Alternative with the James River Crossing Variation 2 also consists primarily of open water (3.81 miles or 53.1 percent), forested land (1.06 miles or 14.8 percent), and open marshland (0.82 mile or 11.4 percent) and would require the clearing of about 19.90 acres of trees. The remaining lands consist of 0.75 mile of developed open space, 0.36 mile of developed low/medium intensity, 0.29 mile of agriculture, and 0.08 mile of developed high intensity. While the variation crosses primarily water, marshland, and forest, the land portion on both sides of the river is zoned primarily as industrial (84.2 percent of land portion) and commercial (8.6 percent of land portion).

The right-of-way along the Surry Alternative with the James River Crossing Variation 3 also consists primarily of open water (4.10 miles or 54.7 percent), forested land (1.09 miles or 14.5 percent), and open marshland (0.83 mile or 11.1 percent) and would require the clearing of about 20.10 acres of trees. The remaining lands consist of 0.75 mile of developed open space, 0.36 mile of developed low/medium intensity, 0.29 mile of agriculture, and 0.08 mile of developed high intensity. While the variation crosses primarily water, marshland, and forest, the land portion on both sides of the river is zoned primarily as industrial (84.2 percent of land portion) and commercial (8.6 percent of land portion).

On the Surry County side of the James River the Surry Alternative and all three river crossing variations cross over land owned by Dominion and used for operations of its Surry Power Station. On the James City County side of the river, the routes would cross industrially zoned lands owned by BASF. On these lands, the Surry Alternative and Surry Alternative with James River Crossing Variation 1 cross approximately 200 feet north of a BASF's capped and sealed industrial main landfill area. Officials at James City County indicated that the landfilled areas are permanent and that the landfill cap on these areas cannot be compromised in any way. The river crossings have been routed to avoid potential impacts from the proposed crossing of the James River by the Surry Alternative to the airspace associated with Felker Army Airfield at Fort Eustis (Felker Airfield) (James River Crossing Variations 1 and 3) and/or to take advantage of a routing opportunity presented by a pipeline corridor that crosses the James River to the north of the Surry Alternative and continues east across James City County (James River Crossing Variations 2 and 3).

South of U.S. Route 60 buildings within 500 feet of the Surry Alternative and all three James River Crossing Variations are primarily industrial and commercial businesses. Residences along the routes are located on the north side of U.S. Route 60. There is one house located within the new right-of-way, which would have to be removed along this route

alternative. Only one subdivision (Whispering Pines Mobile Home) is crossed by this alternative for a total distance of 0.3 mile between U.S. Route 60 and Skiffes Creek Switching Station. A second existing subdivision (commercial) associated with the James River Commerce Center is crossed by the James River Crossing Variations 2 and 3 for a total distance of 0.38 mile. There is the potential that the new structures in the right-of-way would also be visible to residents in Skiffes Creek Terrace and Carter's Village. There are 84 residences located within 500 feet of the centerline, about 22 residences located within 200 feet of the centerline, and 16 located within 100 feet of the Surry Alternative and all three of the James River Crossing Variations.

A portion of the industrially zoned lands mentioned above 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 request has been made to the county. Some of the development ideas would require rezoning the industrial land and continued efforts of site remediation. James City County has expressed concerns that the route cuts through the BASF property in such a way that it may limit the potential locations and sizes of buildings developed on the property.

There are no managed conservation lands or conservation easements crossed by the Surry Alternative or any of the James River Crossing Variations. As noted in Section 4.1, Dominion consulted with the VOF regarding conservation easements in the project vicinity and would continue to consult with them regarding any potential new easements in the project area.

#### **4.2.2 Natural Resources**

##### **Wetlands**

Based on WEG's Offsite Wetland and Waters Analysis data (May 2012), the Surry Alternative and James River Crossing Variation 1 would both cross about 0.13 miles of wetland habitat, and would require the clearing and/or disturbance of up to about 2.64 acres of wetland area. While most wetlands would be spanned, forested wetlands (PFO) and scrub-shrub wetlands (PSS) would require at least initial vegetation clearing and forested wetlands would be permanently converted to scrub-shrub wetlands. Of the 2.64 acres of wetland habitat that could be disturbed along this section of the route, about 0.62 acres (23 percent) consist of forested wetland while about 1.2 acres (45 percent) consist of tidal wetlands and 0.82 acres (31 percent) consist of palustrine emergent or palustrine scrub-shrub wetlands. All tidal wetlands are associated with the Wood Creek crossing.

James River Crossing Variations 2 and 3 would both cross about 0.06 miles of wetland habitat, and would require the clearing and/or disturbance of up to about 1.17 acres of wetland area. While most wetlands would be spanned, forested wetlands (PFO) and scrub-shrub wetlands (PSS) would require at least initial vegetation clearing and forested wetlands would be permanently converted to scrub-shrub wetlands. Of the 1.17 acres of wetland habitat that could be disturbed along this section of the route, about 0.73 acres (62 percent) consist of forested wetland and 0.44 acres (38 percent) consist of palustrine emergent or palustrine scrub-shrub wetlands. There are no tidal wetlands within the variation.

While most wetlands along the route can be spanned, towers may be required to be placed within wetlands, including tidal wetlands. However, permanent impacts associated with

tower placement are generally minor as driven steel pile foundations can often be used in lieu of concrete fill. Temporary impacts on wetlands may occur as a result of construction access. All wetland soils would be protected from rutting and mixing caused by construction equipment by installing timber matting in cleared wetlands prior to construction. Forested wetlands are hand cleared to minimize ground disturbance.

## **Waterbodies**

The Surry Alternative crosses three perennial waterbodies. Of these, two are smaller perennial streams less than 300 feet wide at the crossing location. With the exception of the James River crossing, all streams and other waterbodies would be spanned. Both the Surry Alternative and the Surry Alternative with the James River Crossing Variations would require the placement of towers within the James River, approximately 16 towers for the Surry Alternative, 17 towers for James River Crossing Variation 1, 15 towers for James River Crossing Variation 2, and 16 towers for James River Crossing Variation 3. Towers would range in height from 135 feet to 295 feet with the larger towers being set back at least 250 feet from the edges of the federal navigation channel and western channel within the river. Towers would be steel lattice structures with four individual leg supports. The larger towers (>200 feet tall) would measure 90 feet by 90 feet (8,100 SF) at the base footprint, and smaller towers would measure 60 feet by 60 feet (3,600 SF). A fender system consisting of driven piles would be placed along the channelward side of each of the large towers to protect them from collisions with ship traffic. The fenders would be approximately 100 linear feet. Construction of the Surry Alternative or the Surry Alternative with James River Crossing Variations 1, 2 or 3 would require encroachment over 34,300 square feet (0.79 acres), 35,525 square feet (0.82 acres), 33,075 square feet (0.76 acres) or 34,300 square feet (0.79 acres) of state-owned subaqueous bottomlands, respectively. These permanent impacts will be required to be mitigated for through the payment of royalties to the Virginia Marine Resource Commission.

Construction activities within the river area are expected to last 12-18 months. No dredging is anticipated in the construction process; however, construction of the Surry Alternative may overlap with dredging of the Tribell Shoal Federal Navigation Channel. Coordination with the Norfolk District Branch of the COE would be necessary to prevent construction from interfering with the dredging operation. Construction of the transmission line in the river would require state permits, and Dominion is expected to be required by the VDGIF to adhere to the agency's current time of year restrictions from February 15 to June 15. Temporary noise and increased sedimentation and turbidity are expected for the duration of project construction. Permanent impacts may include possible alteration of micro-currents in the project area, as well as increased hard substrate for aquatic habitat provided by the towers. The aerial portion of the overhead line is not expected to have any temporary or permanent impacts.

The Surry Alternative crosses three private oyster leases and four towers would be placed in the lease areas: Towers 22 and 23 in plat number 19727; Tower 27 in plat number 19800; and Tower 28 in plat number 17064 (see Figure 3.5.3-1 in Appendix A). For James River Crossing Variation 1, four private oyster leases would be crossed, and six towers would be placed in three of the lease areas: Towers 18-21 in plat number 19205, Tower 24 in plat number 19725, and Tower 29 in plat number 17064. For James River Crossing Variation 3, three private oyster leases would be crossed, with four towers placed in these leased areas: Towers 18 and 19 in plat number 19205, Tower 23 in 19725 and Tower 28 in plat number 19774. As

these areas are privately owned, the placement of these towers within leased areas would require agreement and coordination with the individual lease holders. To construct the Surry Alternative, tower placement would result in a total displacement of 4,900 square feet (0.11 acre) of leased area. For James River Crossing Variation 1, tower placement would result in a total displacement of 7,405 square feet (0.17 acre) of leased area. Construction of James River Variation 3 would result in a total displacement of 4,900 square feet (0.11 acres) of leased area. Additional impacts on leased areas include temporary increased sedimentation and turbidity in the area immediately surrounding each tower during construction. Temporary impacts may also occur as a result of bottom disturbance due to anchoring of barges during low tides and within shallow water habitat areas.

The Surry Alternative and the James River Crossing Variations would cross a designated natural gas and product pipeline corridor within the James River, which would require coordination with the two pipeline companies that currently have pipelines within the corridor. The overhead crossing would have no impact on the pipeline easement area. Location of the towers would provide sufficient clearance of the pipelines to maintain safe construction and operational conditions for both the underground pipelines and the overhead transmission line. Therefore, no impacts are expected in association with this area.

The waters of the James River are known anadromous fish waters and the federally and state-listed endangered Atlantic Sturgeon has been documented in the vicinity of the project location. Due to the open design of the tower foundations (four steel pile footings), the towers are not expected to serve as an impediment to fish movement and should have no impact on the Atlantic sturgeon. Other than the previously mentioned temporary impacts, the project is not expected to have any permanent impacts on EFH or fisheries managed in the area. The federal listing of the sturgeon could prompt the designation of Critical Habitat within the James River, as there is a known distinct spawning population present. However, it is expected that adherence to designated time of year restrictions would minimize impacts on EFH and any listed fish species.

### **Federally and/or State-Listed Species**

The FWS county lists, VDCR's NHR Program and VDGIF identify 10 federally listed species protected under the ESA that have the potential to occur within the Surry Alternative. These species include the Atlantic sturgeon, the small whorled pogonia, the sensitive joint-vech, the bald eagle, narrow-leaved spatterdock, New Jersey rush, banded sunfish, Eastern big-eared bat, barking treefrog, and Mabee's salamander.

The FWS county lists, VDCR's NHR Program, and VDGIF identify four federal SOCs and non-listed species that may potentially occur within the project corridor including Virginia least trillium, creamflower tick-trefoil (*Desmodium ochroleucum*), the mountain camellia, and the rare skipper. The VDCR and VDGIF datasets did not identify any species occurrences within the Surry Alternative; however, habitat for this species may be present within the route. Permanent impacts could result from tower placement within habitat areas, and temporary impacts may occur during construction.

### **Bald Eagle Management**

Based on the CCB's 2011 survey, the Primary Management Zone of Nest SU0901 is intersected by the right-of-way for the Surry Alternative and James River Crossing Variations



between MPs S1.3 and S1.6 in Surry County (see Figure 3.2.4-1 in Appendix A). The Secondary Management Zone of Nest SU0901 is intersected by the right-of-way for the Surry Alternative and James River Crossing Variation 1 from MP S1.1 to MP S1.8 and from MP S-1.1 to MP JV1-0.2, respectively. The Secondary Management Zone of Eagle Nest SU0501 is intersected by the right-of-way for James River Crossing Variations 1 and 3, from MP JV1-1.0 to MP JV1-1.5 and from MP JV1-1.0 to MP JV3-1.4, respectively. If one of these routes is approved by the SCC, Dominion would coordinate with VDGIF regarding the encroachment of these management zones.

### **Protected and Managed Lands**

Protected or managed lands along the Surry Alternative route consist of approximately 3.94 miles of RPAs. RPA lands along this route are associated primarily with tidal lands along the James River, Wood Creek, and Skiffes Creek. If James River Crossing Variation 1, 2 or 3 was adopted, approximately 4.48 miles, 3.92 miles or 4.32 miles of RPA lands would be crossed by the route, respectively.

### **Natural Heritage Resource Screening**

The Surry Alternative crosses the Gravel Neck Conservation Site (MPs S0.8 to S1.3) and the Powerplant Outfall Habitat Zone (MPs S1.3 to S1.7). The Surry Alternative with James River Crossing Variations 1, 2, and 3 cross the Gravel Neck Conservation Site and the Powerplant Outfall Habitat Zone in approximately the same locations (see Figure 3.2.3-1 in Appendix A). Both sites have a VDCR NHR biodiversity ranking of B5. Both of these areas are located in Surry County, adjacent to the cooling water canal and in the Hog Island WMA. The routes span approximately 0.35 and 0.33 mile of the Gravel Neck Conservation and the Powerplant Outfall Habitat Zone, respectively. This portion of the routes would be located within existing right-of-way and no additional clearing would be required.

There are also multiple bald eagle nests along the Surry Alternative and James River Crossing Variations. However, only two have management zones which intersect the route (see Figure 3.2.4-1 in Appendix A). One is approximately 377 feet northeast of MP S1.4, near Tower 12 of the Surry Alternative. The other is approximately 893 feet northwest of MP JV1-1.2 of James River Crossing Variation 1, between Tower 19 and Tower 20. Construction activities which intersect the secondary management zone of the eagle nests are not permitted between December 15 and July 15.

Several colonial waterbird colonies are documented in to the vicinity of James River Crossing Variations 1 and 3, within the Hog Island WMA (see Figure 4.2.2-1 in Appendix A). These sites may be temporarily affected due to noise during construction but disturbance is expected to be minimal in duration and intensity. James River Crossing Variations 1 and 3 would not directly impact the colonial waterbird sites. However, bird collisions with transmission lines are a common concern throughout the United States, especially near bird concentration areas and major flyways. Although the Audubon Society has identified 19 Important Bird Areas (IBA) in Virginia based on at-risk species, species assemblages, and concentration of species, the closest one to the area where the Surry Alternative and James River Crossing Variations cross the James River is approximately 19 miles west of Hog Island, and as such should not be affected by the project.

Close to sea level in elevation, the Hog Island WMA is a mixture of flat, open land and pine forest interspersed with tidal marshes and controlled ponds. Intensive wildlife management of the island area immediately west of the proposed transmission line crossing of Hog Island and the James River includes a large dike system to create impoundments that are seasonally drained and flooded to produce native plant foods for wintering waterfowl. Surrounding fields provide an additional food source for waterfowl in the form of annual agricultural crops. In addition to attracting migratory waterfowl, there are four records of colonial waterbird colonies on Hog Island; three are great blue heron; one is great blue heron and great egret. Great blue heron eggs hatch after about 28 days and juveniles leave the nest after about 60 days. Based on this phenology, the heron colonies on Hog Island are expected to be active between mid-March and late July.

Species especially vulnerable to collisions with power lines include those that fly in flocks or are large and heavy-bodied with limited maneuverability, such as pelicans, herons, swans, geese, and cranes. In the vicinity of Hog Island, herons and geese would be the species most susceptible to collisions with transmission lines. Most collisions occur with the static line (shield wire) of transmission structures, which is typically the highest wire on the structure with the narrowest diameter, and therefore less visible than the energized conductor wires below.

Biological and environmental factors that influence collision risk include visibility, local habitats, species, flocking behavior, courtship, hunting, and territorial behaviors, flight altitude, migration corridors, and land use. Visibility is an important factor influencing collision risk. During low light at dawn and dusk and during inclement weather, the thinner static lines may be difficult to see. Habitats surrounding the power line can also influence collision risk, particularly if a power line bisects habitats used during daily activities.

In an attempt to comprehensively address the collision problem, the Avian Power Line Interaction Committee (APLIC) has provided guidance to the industry on avoiding avian power line strikes (APLIC, 2006). Bird collisions with power lines can be reduced by siting new power lines in lower risk areas and avoiding areas where high collision risk factors occur. Additionally, marking devices are often installed on spans where collisions are more likely to occur. Several high visibility devices are available that either coil or clamp onto the wires. Some products increase the visible diameter of the line where they are installed, while others have glow-in-the-dark, movement, color, or reflective properties that enhance the visibility of the line. Effectiveness studies of different marking devices have been conducted (see APLIC 2006) and others are currently underway. Although marking devices do not completely eliminate collisions, they can significantly reduce collision risk (APLIC 2006).

Additional impacts on other birds and wildlife throughout the remainder of the route may result from loss of forested habitat due to the permanent clearing of 20.23 acres of forested uplands and conversion of 0.62 acres of forested wetlands.

#### **4.2.3 Airports**

After identifying the Surry Alternative, during a meeting with Langley Air Force Base, officials requested that NRG conduct an obstruction assessment of the Terminal Instrument Procedures (TERPS) non-precision approach obstacle clearance surface associated with the aircraft approach to Felker Airfield at Fort Eustis Military Reservation. The portion of the Surry Alternative that crosses the James River would also cross the TERPS non-precision approach surface to Felker Airfield. Because the river crossing would also cross two shipping channels

that must be spanned with adequate aerial clearances to meet COE-specified safety requirements, transmission line towers located within the river crossing would vary in height from 150 feet tall up to 295 feet tall. Results of the obstacle clearance analysis were used to determine if any of the transmission line towers along the Surry Alternative would represent a flight hazard to landing aircraft. The analysis, using Felker Airfield's current runway length, determined that one of the towers that would be used to span the western shipping channel would penetrate the obstacle clearance surface by about 125 feet (see Figure 3.1.3-4 in Appendix A).

#### **4.2.4 Visual Assessment**

There are primarily two visually sensitive areas associated with the Surry Alternative: the James River crossing area, including views of the river crossing from the Colonial Parkway, Kingsmill on the James Subdivision and Carter's Grove Historic Site; and to a lesser extent, views from the Hog Island WMA. As discussed in section 3.2.2, this section of the James River is designated by the state as a scenic river segment in the state's scenic river program. The Virginia Department of Conservation and Historic Resources (VDCHR) indicated in its 1987 Lower James Scenic River study that minimal heavy industrial development, limited high density residential development, and a high percentage of riparian land owned by state and federal agencies devoted to protecting the land were important factors in designating the Lower James River as scenic. Other significant factors included the river segment having high step river banks and a near continuous buffer of trees, the size and scale of the river, and broad expanses of open water and extensive marshlands which support a wide variety of fish and wildlife (VDCHR, 1987).

The river also has a historical context that should be considered when assessing potential affects on the visual qualities that could result from the construction and operation of a transmission line across the water. Sites of historic interest nearby include Jamestown Island, the Colonial Parkway, and Carter's Grove Plantation. Dominion has consulted with the NPS (2012), who has indicated that this project falls within the viewshed of the Colonial Parkway and Jamestown Island, which are both units of the Colonial National Historic Park Colonial Parkway and are both listed on the NRHP. Views from all three of the locations mentioned above are discussed in detail below. Dominion has indicated that it would continue to consult with the NPS regarding views of potential structures from these locations. Additionally, the Kingsmill on the James Subdivision, a large residentially developed area and the Kingsmill Resort are located between approximately 3.6 and 4.0 miles across the water to the north of the Surry Alternative river crossing.

For these reasons, visual simulations of the transmission line and the three James River Crossing variations were conducted from several viewpoints set up at each of these areas. Each simulation was developed to determine how the transmission line structures and conductors would appear from each of the viewpoint locations. Each simulation is presented in Appendix C, and is described below.

#### **Jamestown Island**

The eastern tip of Jamestown Island is located approximately 4.6 miles west of the west side of the Surry Alternative river crossing. A walking trail on the island leads out to this eastern

tip. A viewpoint (VP12) was selected here to determine potential views of the transmission line from Jamestown Island. VP12 was identified along the beach area at the eastern tip of the island where a trail joins the beach. From this location, the simulation of the Surry Alternative shows that the tallest structures that would be used to span the two shipping channels would be located at a distance of approximately 5.2 miles (closest shipping channel) and 5.9 miles and would be only very faintly visible on a clear day under the right lighting conditions. Although most of the structures are partially hidden behind vegetation on Hog Island, the towers spanning the shipping channels are tall enough to extend above the treeline on the island. The James River Crossing Variations 1, 2, and 3 would be located about from 0.1 to 0.6 mile closer to the Jamestown Island VP12 than along the Surry Alternative. Variation 1 would appear to be only slightly more visible than if the towers were placed along the Surry Alternative and Variations 2 and 3 would appear to look the same as the Surry Alternative. Because of the lattice design used in construction of the towers, the silhouette of the towers against the skyline at these distances breaks up and becomes indistinct. Atmospheric conditions (e.g., haze, clouds, or fog) and different lighting conditions could further obscure the outline of the structures. From a distance of between 4.6 to over 5 miles away, the Surry Alternative and any of the route variations that cross the river would be barely visible. While existing power line structures and other infrastructure associated with the Surry Power Station are also visible from this location, the Surry Alternative route across the James River would represent a new, but only faintly visible addition to the river landscape. Dominion is in the process of continuing consultation with the NPS about potential views from this area.

### **Colonial Parkway**

Further east along the north side of the James River, the Colonial Parkway, a historic travel way connecting Colonial Williamsburg and Jamestown, travels parallel to the shoreline for about 2.4 miles where there are several pull-off areas with public access to the shoreline beach. VP9 was selected at one of the pull-offs that has direct views towards the transmission line river crossing location. The distance from this viewpoint to the Surry Alternative transmission line river crossing ranges from 4.7 to 5.7 miles. Views from this location to the towers would be either partially obscured by vegetation on Hog Island or would be in full view across open water. A simulated view of the crossing from this location indicates that, during the time of day the photo used for simulation was taken and under these lighting conditions, the view would be primarily restricted to those towers visible across open water (ten towers) and that the towers would be distantly visible crossing the river from Hog Island to the eastern shoreline of the James River. This view would represent an apparent addition of new energy infrastructure to the sweeping water views from the Colonial Parkway. While the James River Crossing Variations 1, 2, and 3 would be located from 0.4 to 0.8 mile closer to the Colonial Parkway viewpoint than the Surry Alternative, the photo simulations indicate that they would not appear to be noticeably more visible or apparent than if the towers were placed along the Surry Alternative. Dominion is in the process of continuing consultation with the NPS about potential views from this area.

### **Kingsmill on the James Subdivision**

About 1.9 miles east of VP9 are the boat docks, country club facilities, and residences associated with the Kingsmill on the James Subdivision. Two viewpoints were selected at this location; one from the dock area next to the water (VP10) and another from an overlook outside

of a nearby residential rental building (VP11), located at a slightly higher elevation than VP10. The distance from these viewpoints to the transmission line river crossing varies between about 3.5 miles and 4.2 miles. The views from both of these locations are very similar. Thirteen towers stretching from the western to the eastern shorelines of the James River would be visible from these two viewpoint locations. Under the clear weather conditions that the simulation photo was taken, the towers would be visible from both locations within the Kingsmill facilities. Approximately half of the towers that would be visible would be only partially silhouetted against the skyline. The lower portions of the towers would be backed by the forested horizon in the background. The portions of the towers that would be silhouetted against the skyline would be visible under clear weather conditions from the shoreline areas. While the James River Crossing Variations 1, 2, and 3 would be located about from 0.3 to 0.9 mile closer to the Kingsmill viewpoints than along the Surry Alternative, they would appear to be only slightly more visible than if the towers were placed along the Surry Alternative. This would be particularly apparent for the towers that would be located parallel to the river's west shoreline near Hog Island along Variations 1 and 3. From the Kingsmill VPs 10 and 11, the proposed transmission line structures would represent a new and apparent addition to the viewscape across the river.

### **Carter's Grove Plantation**

About 2.4 miles northeast of the river crossing is the Carter's Grove Plantation. Because of a dense tree line surrounding the south and southeast sides of the main house at Carter's Grove, and portions of the river shoreline in front of the house, the various routes across the river would only be partially visible from the Carter Grove Plantation. To assess potential visibility of the transmission line structures that would be used for the river crossing from the main Carter's Grove house, NRG used a combination of both a TrueScape photo simulation and Line of Sight Profiles constructed using LIDAR digital elevation data (5-foot cell size resolution) obtained from the College of William and Mary that represented both the ground and vegetation (tree) surface elevations. These elevation data were used in combination with ArcGIS 3D Analyst to prepare cross-sectional Line of Sight (LOS) profiles to each tower location from a point 6 feet off the ground (eye level) from directly in front of the main house (VP 15) facing the river and from a location between the main house and Route 60 (Pocahontas Trail) facing southeast to northeast for the onshore portion of the route. The same tower heights and locations used for this visual assessment, while estimated, were also used by Dominion for modeling span lengths for channel and pipeline crossings in the river and to conduct an FAA and DOD non-precision approach obstruction analysis associated with Felker Airfield at Fort Eustis.

The LOS elevation profile from Carter's Grove VP15 (see Figure 4.2.4-1 in Appendix A) show which towers and how much of the towers used in the river crossing could be seen from the main house at Carter's Grove and which ones would be blocked by the trees. Because of the dense tree line on the southeast side of the house and along portions of the shoreline, only 5 of the 15 towers in the river (towers 18 through 22) along the Surry Alternative would be visible from the main house at Carter's Grove. Because these towers would be viewed from an opening in the treeline near the shoreline, the entire height of each of these towers would be visible from the house at distances between 2.4 miles (tower 22) and 3.3 miles (tower 18). On a clear day the towers would likely be distant but visible. The photo simulation from VP15 (see Appendix C) confirms this conclusion.

The same process was used to determine visibility of towers along the three James River Crossing Variations. The LOS elevation profiles from Carter's Grove show that, similar to the Surry Alternative route, because of the dense tree line on the southeast side of the house and along portions of the shoreline, only a small number of the towers crossing the river would be visible from VP15, depending on which crossing variation is being viewed. For the James River Crossing Variation 1 (see Figure 4.2.4-2 in Appendix A), 3 of the 16 towers in the river would be all or partially visible. While all of tower 25 would be visible at a distance of about 2.0 miles, the top 246 feet of tower 26 would be visible at about 1.7 miles, and only the top 40 feet of tower 18 would be visible at 3.5 miles. Consequently, views from the main house would be limited to two towers, and the very top of a third tower, through breaks in the trees or over the top of trees. The photo simulation from VP15 to the James River Crossing Variation 1 indicates that only towers 25 and about the upper half of Tower 26 would be seen from this location. Because the towers are located between 1.75 and 2.0 miles from the Main House at Carter's Grove, the views on a clear day would be distant and limited to one and one half towers, but apparent.

For the James River Crossing Variation 2 (see Figure 4.2.4-3 in Appendix A), 6 of the 14 towers in the river would be all or partially visible. While only the top half of tower 24 would be visible from a distance of 1.7 miles, all of towers 23 through 19 would be visible from distances ranging from 1.9 miles to 3.0 miles, respectively. While views of the route would be limited to the same break in the trees along the shoreline as the James River Crossing Variation 1, alignment of the James River Crossing Variation 2, similar to the alignment of the Surry Alternative, is angled such that a greater number of towers are visible. The photo simulation from VP15 to the James River Crossing Variation 2 verifies that five full towers and the upper half of a sixth tower would be seen from this location. This alignment would represent a distinct and apparent, but distant view of new infrastructure across the river.

For the James River Crossing Variation 3 (see Figure 4.2.4-4 in Appendix A), only 3 of the 15 towers in the river would be all or partially visible. Only the top approximately 25 percent (40 feet) of tower 27 would be visible from a distance of about 0.8 mile. However, all of towers 25 and 26 would be visible from approximately 1.3 and 1.1 miles, respectively. The photo simulation from this location shows that while the top part of tower 27 is barely visible, towers 25 and 26, which are the taller towers required to span the eastern shipping channel, would be apparent from the main house location during clear weather conditions and, because of the tower height and closeness, would represent a distinct new visual addition to the visual landscape. From a visual perspective, although James River Crossing Variations 1 and 3, because they are located farther north on the river than the other two routes, would be between 0.4 and 0.7 mile closer to sensitive viewing areas such as the Colonial Parkway and Kingsmill Resort and Golf Club. Our review of all four routes from VPs 9, 10, 11, and 12, however, show that due to the long overall distances, there is not a significant difference in the visibility of all four routes from these viewpoints (i.e., all four routes represent distant views). Views from VP15 at Carter's Grove, however, are significantly different than from the Kings Mill and Colonial Parkway areas (see Section 4.2.4). This is due to a combination of two main factors; a generally shorter distance from the viewpoint to the routes and route orientation relative to the viewpoint and the sight lines from Carter's Grove. All three of the James River Crossing variations are closer to VP15 at Carter's Grove than to Kingsmill or the Colonial Parkway which results in the towers being more apparent. Views of the Surry Alternative route from Carter's Grove range from 2.5 miles to 3.3 miles and are more representative of views from the Kingsmill area.

Route orientation and distance from Carter's Grove, however, determine how many towers associated with each route can be seen. As shown in Table 4.2.4-1, five or more towers associated with the Surry Alternative and Variation 2 are visible with views of Variation 2 slightly closer and more apparent. Two full towers associated with Variation 3 would be visible from Carter's Grove, but these two towers are the two tallest (275 feet tall) and would be the closest, representing the highest visual impact of any of the routes. Views from Carter's Grove of James River Crossing Variation 1 would include one full tower and half of a second tower, but would be further away than Variation 3 and would represent the least visual impact for the four alternative crossing locations.

TABLE 4.2.4-1  Surry-Skiffes Creek 500 kV Transmission Project Skiffes Creek-Wheaton 230 kV Transmission Line Project Skiffes Creek 500 kV-230 kV-115 kV Switching Station  Tower Visibility from Carter's Grove (VP15)		
Route	Number of Towers Visible	Tower Distance from VP15 (miles)
Surry Alternative	5	2.4 – 3.3
James River Crossing Variation 1	1 ½	1.7 – 2.0
James River Crossing Variation 2	5 ½	1.7 – 3.0
James River Crossing Variation 3	2 ¼	0.8 – 1.3

A Line of Sight profile was also prepared and evaluated from a location between the main house and U.S. Route 60 (Pocahontas Trail) facing southeast to northeast for the onshore portion of the route. It was determined that no towers associated with the Surrey Alternative or from any of the James River Crossing Variations 1, 2, or 3 would be visible between the river and Skiffes Creek Switching Station from this side of Carter's Grove Main House (see Figure 4.2.4-5). This is due primarily to heavily forested areas between the house and the transmission line route.

### **U.S. Route 60 (Pocahontas Trail)**

A photographic simulation was also conducted at the crossing of U.S. Route 60 (Pocahontas Trail) (VP14). The view was simulated from the south side of the road facing north across the road. This simulation shows the tower that would be located on the north side of the crossing, the expanded right-of-way, and the location along the right-of-way where an existing house would be removed. There is currently an existing 115 kV transmission line at this road crossing. While the new structures would be larger than the existing towers, the visual affects at this location are not expected to be significant. There is currently a tower on both sides of the road and new towers would be located close to the positions of the existing towers. The 115 kV transmission line would be underbuilt on the new towers, so the number of conductors crossing the road would double.

### **Night Visibility**

For VPs 9, 10, 11, 12, and 15, another visibility issue to be considered is the lighting of some or all of the structures that are placed within the river as part of the river crossing. In general, the Federal Aviation Regulations (Part 77) require that all structures greater than 200 feet in height above ground level be evaluated to determine the need for hazard lighting. The

FAA would determine during its aeronautical study and review of the Skiffes Creek Project the height and location of proposed structures that would need to be lighted and the type of lighting system that would be used (e.g., white or red lighting, continuous lighting or flashing). Although structure lighting is generally limited to transmission line structures greater than 200 feet above ground level, the FAA may choose to require the lighting of additional structures depending on the determination of potential hazard to air space. Dominion is proposing four towers across the James River (i.e., those used to span the two shipping channels) be greater than 200 feet above ground (water) level.

While the visibility of these lights would likely not be apparent during daylight hours, particularly on sunny days, during dusk, dawn and at night, the tower lights would be visible from each of the VPs 9, 10, 11, and 12. Views of the tower lights from VP 12 are not suspected to be significant due to the distance. However, because the tops of the towers crossing the river would be located above the existing horizon behind the towers, night time views from VPs 9, 10, 11 and 15 would delineate the location of each lighted tower and would add a new and closer set of night time lights within the night views across the river.

#### **4.2.5 Cultural Resources**

Five previously recorded archaeological sites are located wholly or partially within the right-of-way for the proposed route. Three sites (44JC0649, 44JC0650, and 44SY0159) 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 44JC0662 to determine its National Register eligibility. Site 44SY0159 is reported as a prehistoric site of indeterminate age. This site has not been formally surveyed and evaluated. Site 44JC0662 is also within the property boundary of the proposed Skiffes Creek Switching Station.

These sites are characterized as an indeterminate historic site (44JC0649); indeterminate eighteenth-century site (44JC0650); indeterminate prehistoric site (44SY0159); and historic trash pit/scatter (44JC0662 and 44JC0663).

Two architectural resources considered as part of the Stage One Pre-application process are located within 1.5 miles of the Surry Alternative and the James River Crossing Variations 1 through 3, including the Battle of Yorktown (099-5283) and Carter's Grove (047-0001) (see Section 3.4.2 and Table 3.4.2-1). CRI was retained by Dominion to conduct a Stage I Pre-Application Analysis for the Surry Alternative and James River Crossing Variation. This analysis included background research and field reconnaissance as described in Section 4.1.5. The results of the field reconnaissance suggest that the Surry Alternative and James River Crossing Variations 1 through 3 would result in minimal visual impact to the Battle of Yorktown. However, the Surry Alternative and the James River Crossing Variations 1 and 2 represent a moderate visual impact to Carter's Grove and James River Crossing Variation 3 represents a significant visual impact to Carter's Grove. Only the onshore portions of these four alternatives would have no visual impact on this historic property. A more detailed discussion of these results is found in CRI's report included in Appendix G.

Additionally, a combination of both a TrueScape photo simulation (VP 15) and a GIS-based line of site analysis were completed for the Surry Alternative and the James River Crossing Variations 1 through 3 to assess site lines to each tower location from a point 6 feet off the ground from the front of the main house at Carter's Grove. These analyses (see Section 4.2.4) suggest that 5 of the 15 towers in the river along the Surry Alternative would be visible



from the main house at distances between 2.4 and 3.3 miles. For the James River Crossing Variation 1, 3 of the 16 towers in the river would be all or partially visible through breaks in the trees or over the top of trees. One tower would be wholly visible at a distance of about 2.0 miles; the top 246 feet of tower 26 would be visible at about 1.7 miles; and only the top 40 feet of tower 18 would be visible at 3.5 miles.

For the James River Crossing Variation 2, 6 of the 14 towers in the river would be all or partially visible from Carter's Grove at distances between 1.7 and 3.0 miles. The photo simulation from VP15 to the James River Crossing Variation 2 verifies that five full towers (23 through 19) and the upper half of a sixth tower (tower 24) would be seen from this location.

For the James River Crossing Variation 3, only 3 of the 15 towers in the river would be all or partially visible. The nearest tower (27) at approximately 0.8 mile from Carter's Grove would be partially visible. Towers 25 and 26, which are the taller towers required to span the eastern shipping channel, would be visible at approximately 1.3 and 1.1 miles, respectively. The photo simulation from this location suggests that the height and closeness of towers represent a distinct new visual addition to the visual landscape surrounding Carter's Grove.

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

#### **4.2.6 James River Crossing Variations**

Dominion identified and examined three crossings variations of the James River as alternatives to the river crossing location associated with the Surry Alternative. These variations have been designated as the James River Crossing Variations 1, 2, and 3 and their locations are described in detail in Section 2.1.2.1 (see Figure 4.2.6-1 in Appendix A).

##### **James River Crossing Variation 1**

To avoid penetration of the TERPS obstacle clearance surface while still being able to span the shipping channels, the James River Crossing Variation 1 was identified as an alternative to the river crossing location associated with the Surry Alternative. James River Crossing Variation 1 is located approximately 0.9 mile north or upstream of the Surry Alternative crossing. Crossing the river at this location would allow the route to cross under the TERPS obstacle clearance surface using shorter towers. This is due to the orientation of the TERPS surface and the relative location of the shipping channels in the river underneath the TERPS surface. By moving the river crossing location north and further away from Felker Airfield, the portion of the James River Crossing Variation 1 that passes underneath the TERPS surface would not simultaneously cross shipping channels (see Figure 3.1.3-5 in Appendix A). Consequently, shorter towers that would not penetrate the TERPS surface could be used while passing underneath the TERPS surface.

When siting this route variation, Dominion considered routing the variation across the eastern side of the Hog Island WMA instead of offshore of the island, but consultation with the VDGIF and the FWS indicated that a route across the Hog Island WMA would not be feasible. In a letter dated March 22, 2012 from FWS, Dominion was informed that Hog Island was purchased by the state using, in part, Pittman-Robertson Wildlife Restoration funds from the FWS. According to the FWS, lands purchased using these funds must be used only for the purpose for which the land was purchased. Siting a transmission line on the Hog Island WMA would violate 50 CFR Part 80 sections 80.11, 80.134, 80.135, and 80.136. If these rules are violated, the Commonwealth of Virginia would no longer be eligible to participate in the Pittman-Robertson Wildlife Restoration program, which would significantly cut its wildlife funding program. The FWS concluded by indicating that “there is no way under Federal law to accommodate the siting of this proposed transmission line on Hog Island WMA.”

### **James River Crossing Variations 2 and 3**

James River Crossing Variation 2 was developed to take advantage of a routing opportunity presented by a pipeline corridor that crosses the James River to the north of the Surry Alternative and continues east across James City County. This corridor contains two natural gas pipelines owned by Columbia Gas Transmission and a petroleum products pipeline owned by Colonial Pipeline Company. Since these existing pipelines cross the river and come onto the eastern shore at the north end of a large tract of property owned by BASF, the collocation of the proposed transmission corridor with this pipeline corridor also would avoid the bifurcation of this large parcel of land. BASF, in cooperation with James City County, is actively marketing this property for future development.

However, routing the proposed 500 kV transmission line parallel and adjacent to the portion of the pipeline corridor that crosses the James River would result in a route that is only slightly north of the Surry Alternative where it would cross under the TERPS surface. This alignment was found to affect the airspace associated with Felker Airfield, similar to the Surry Alternative (see Figure 4.2.6-2 in Appendix A). To avoid affecting the airspace associated with the Felker Airfield while still utilizing the existing pipeline corridor across the river, the James River Crossing Variation 3 was identified. This alignment is located about 0.6 mile north of the Surry Alternative and would parallel the pipeline corridor across the river and, similar to the James River Crossing Variation 2, would avoid bifurcation of the large BASF land tract. Additionally, it is located far enough north to avoid penetration of the TERPS surface (see Figure 3.1.3-6 in Appendix A).

## **4.3 COMPARISON AND ROUTE SELECTION**

### **4.3.1 James River Crossing Variations**

A comparative review of the four alternative crossings of the James River discussed above indicated that the salient differences between the routes include the amount of private and county lands each route crosses, the length of open marshland and water the routes crossed, the potential to affect eagle nests, and the number of towers that would be located within private oyster beds (see Table 4.3.1-1). Another significant difference between the routes that is not reflected in Table 4.3.1-1 includes the effect on the scenic nature of the James River in general and specifically to the Carter's Grove Historic site.

Dominion Virginia Power  
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 Skiffes Creek 500 kV-230 kV-115 kV Switching Station

TABLE 4.3.1-1

**Surry-Skiffes Creek 500 kV Transmission Project  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

**Surry Alternative and James River Crossing Variations  
 Environmental Features Comparison**

<b>Environmental Features</b>	<b>Unit</b>	<b>Surry Alternative</b>	<b>James River Crossing Variation 1</b>	<b>James River Crossing Variation 2</b>	<b>James River Crossing Variation 3</b>
<b>Route Length</b>	miles	5.00	5.53	4.75	5.08
<b>Land Use Features/Constraints</b>					
Private Land	miles	1.43	1.42	0.56	0.58
County Land	miles	0	0	0.38	0.38
<b>Existing Land Use</b>					
Developed, Open Space		0.29	0.28	0.12	0.12
Forested Land	miles	0.73	0.73	0.74	0.76
Open Marshland	miles	0.20	0.20	0.01	0.02
Open Water	miles	3.55	4.10	3.81	4.10
Towers Penetrating TERPS Surface	number	1	0	1	0
<b>Environmental Features/Constraints</b>					
<b>Surface Waters</b>					
Waters-Tidal	miles	3.58	4.12	3.82	4.13
<b>Wetlands</b>					
Wetlands Crossed in right-of- way (Total)	miles	0.09	0.09	0.02	0.02
Palustrine	miles	0.02	0.02	0.00	0.00
Emergent/Palustrine					
Scrub-Shrub Wetlands					
Forested Wetlands	miles	0.00	0.00	0.02	0.02
Tidal Wetlands	miles	0.07	0.07	0.00	0.00
<b>Shipping Channels Crossed</b>	number	2	2	2	2
	(feet)	(1,830)	(1,600)	(1,750)	(1,740)
<b>Dredge Disposal Areas Crossed</b>	number	1	1	1	1
	(feet)	(1,260)	(1,150)	(1,320)	(1,170)
<b>Forest Land to be Cleared within Right-of-Way</b>	acres	13.75	13.71	13.52	13.72
<b>Sensitive Species and Habitat</b>					
Bald Eagle nests within 750 feet (Center for Biology, 2011 data)	number	1	1	1	1
Bald Eagle nests between 750 and 1,320 feet (Center for Biology, 2011 data)	number	0	1	0	1
<b>Towers Located on Private Oyster Beds</b>	number	4	6	0	4

All four route variations are similar in length, with Variation 2 being the shortest at 4.75 miles long and Variation 1 being the longest at 5.53 miles long. While all four routes would cross private lands, the Surry Alternative and the James River Crossing Variation 1 would cross about 1.43 miles of private lands and no county lands, compared to about 0.57 mile of private lands for both Variations 2 and 3. Variations 2 and 3 would also each cross about 0.38 mile of James City County lands, which add significant risk to these routes associated with obtaining easements to cross the public lands. Additionally, all four routes would cross a wide section of the James River. The Surry Alternative and Route Variation 2, because of their more direct route across the river, would be about 0.55 to 0.29 mile shorter than Route Variations 1 and 3, respectively.

Another difference in the routes is the extent to which construction within private oyster beds would be required. While Variation 2 would not cross any private oyster beds, both the Surry Alternative and Variation 3 would require the construction of four towers each within oyster beds and Variation 2 would require the construction of six towers within existing oyster beds.

The James River Crossing Variations 1 and 3 would also parallel the shoreline of Hog Island between 850 and 2,135 feet offshore. This would result in both of these variations being located within the Secondary Management Zone of eagle nest SU0501 (about 850 feet from the nest), which is located in the Hog Island WMA. The corresponding segment of the Surry Alternative route and Route Variation 2 would not be near any eagle nests. Variations 1 and 3 would also be in closer proximity to several waterbird colonies documented within the Hog Island WMA (see Figure 4.2.2-1 in Appendix A). Although these sites could be temporarily affected due to noise during construction along this route, disturbance would be expected to be minimal and would not directly impact the colonial waterbird sites.

From a visual perspective, as discussed in detail in Section 4.2.4, the James River Crossing Variation 1 would represent views of the least number of towers of all the crossing variations, while still at a moderate distance, and would represent the lowest visual impact, both during daytime and night time from Carter's Grove.

Another important factor to consider when evaluating and comparing the two routes is the more difficult construction and the potential effects of construction associated with James River Crossing Variations 1 and 3. These routes would result in two additional considerations that would not affect the Surry Alternative or Variation 2: 1) Construction of about 0.8 mile (Variation 1) or 0.5 mile (Variation 3) in shallow waters near Hog Island that could require either the operation of low ground-weight/floating/tracked construction barges or dredging within oyster beds to allow access for construction barge traffic; and 2) the construction and installation of either two angle structures (Variation 1) or three angle structures (Variation 3) in the river, which have a larger footprint and would require more substantial foundation development within the river environment. In contrast, the Surry Alternative and Variation 2 would be a straight tangent across the river with no in-river angle structures.

All four routes would cross about the same number or length of wetlands, shipping channels and dredge disposal areas and both would cross and clear about the same amount of forested land in James City County.

A significant advantage of both the James River Crossing Variations 1 and 3 is that they would avoid penetration of and obstruction within the TERPS flight approach to Felker Airfield.

However, Dominion has not received a response to its request for comments on its Surry Alternative route and potential effects on operations at the airfield. Once more detailed engineering and survey are completed for the route across the James River, the FAA will conduct an aeronautical study of the routes to determine the potential for obstruction to airspace and how that might affect operations. Until those results are received, based on the consideration of the environmental advantages and disadvantages discussed above, particularly concerning the lower potential effects to oyster beds and eagle nest sites, visual impacts, lack of public lands crossed and ease of construction and affects due to construction, Dominion has selected the Surry Alternative as the preferred route across the James River and the James River Crossing Variation 1 as its alternative route across the James River.

#### **4.3.2 Chickahominy and Surry Route Alternatives**

Two factors most affect the comparison and selection of one alternative route over the other. The first factor is the substantially greater total length of the Chickahominy Alternative (37.89 miles) when compared to the much shorter Surry Alternative (7.42 miles). The second significant difference is related to the greater utilization of and need to develop new, previously undeveloped existing right-of-way on the Chickahominy Alternative (24.2 miles) compared to the development of 4.24 miles of new right-of-way on the Surry Alternative. Many of the remaining differences between the two route alternatives are related in some aspect to either the difference in route length or the development of new rights-of-way. Refer to Table 4-1 for a direct quantitative comparison of the resources that would be affected by both routes.

Directly related to length difference between the two routes, a primary advantage of the Surry Alternative is that it would cross and affect much less private lands (3.75 miles) compared to 28.53 miles of private lands that would be crossed by the Chickahominy Alternative. Similarly, the Surry Alternative would directly affect only 7 individual parcels of land while the Chickahominy Alternative would cross 300 individual land parcels. While the Chickahominy Alternative would cross more parcels of land than the Surry Route, an advantage of this alternative is that, with the exception of a small amount of easement required to reconfigure Dominion's 230 kV line into the Kingsmill Substation, the Chickahominy Alternative does not require the acquisition of additional easement for rights-of-way. The Surry Alternative would require Dominion to purchase about 18.27 acres of new easement.

Although both alternatives would utilize existing Dominion transmission line right-of-way, the Chickahominy Alternative would cross through somewhat more developed areas and for greater lengths than the Surry Alternative, resulting in the Chickahominy Alternative crossing within 500 feet of 1,129 homes, while the Surry Alternative would only cross within 500 feet of 84 homes. This is reflected in the number of residential subdivisions that would be crossed by each route: 28 subdivisions crossed by the Chickahominy Alternative compared to 1 crossed by the Surry Alternative. The Surry Route would require the purchase and removal of one house from within the right-of-way.

As discussed in Sections 3 and 4, the Chickahominy Alternative would utilize 24.2 miles of previously undeveloped right-of-way located in a rural, mostly forested and agricultural area. This would result in the crossing of about 21 miles of forested land which would require the clearing of about 420 acres of trees. Alternatively, the Surry Alternative would only cross a little more than 1 mile of forested land and, when widening of the existing right-of-way that would be utilized is considered, only about 20 acres of trees would need to be cleared.

Also related to the development of a new utility corridor through primarily forested lands is the amount of wetlands that could be disturbed. While both alternatives utilize existing transmission corridors, which generally does not significantly affect emergent or scrub-shrub wetlands on a long-term basis, the creation of new rights-of-way through primarily forested areas, as described above, would result in the permanent clearing of forested wetlands where crossed. A primary disadvantage of the Chickahominy Alternative is that it crosses approximately 5.62 miles of forested wetland, which would require the permanent clearing of about 106.91 acres of forested wetland. Alternatively, the Surry Alternative would only require the clearing of approximately 0.62 acre of forested wetlands.

Both alternative routes have significant river crossings, the Chickahominy River and the James River. Both rivers are part of the Captain John Smith Chesapeake NHT and both have scenic values that have been discussed above. A primary disadvantage associated with the use of the Chickahominy Alternative is related to the clearing of new right-of-way across a section of river with little or no development on either side of the river. A new transmission line crossing at this location would be inconsistent with existing uses and would significantly affect the natural scenic character of the entire crossing area. When compared to the Chickahominy River crossing site, the James River crossing is located in a more developed area in a working section of the river that contains a power station and associated transmission lines on one shoreline, a chemical plant on the other shoreline, an army base south of the crossing, and contains active shipping. Additionally, the majority of the eastern, undeveloped shoreline is zoned industrial. A transmission line crossing in this area would be more consistent with existing uses than that seen at the Chickahominy River crossing location.

For the reasons discussed above associated with total length, development of new rights-of-way, and the potential to affect landowners and the Chickahominy River area and associated natural resources, NRG recommends that the Surry Alternative be selected as the proposed route.

## 5.0 SKIFFES CREEK TO WHEALTON – RESOURCES AFFECTED

### 5.1 SKIFFES CREEK-WHEALTON 230 KV TRANSMISSION LINE REBUILD (SKIFFES CREEK TO WHEALTON SECTION)

The following section of the report discusses the environmental resources along the Skiffes Creek to Whealton Section of the project that could be affected during construction and operation of the proposed facilities. The entire Skiffes Creek-Whealton 230 kV Transmission Line will be constructed entirely within Dominion's existing right-of-way. With the exception of the Skiffes Creek Switching Station, which represents a new facility, this portion of the project largely consists of the rebuild and replacement of existing structures and will require no new additional right-of-way. The physical features (e.g., length, collocation, landownership) of the route and environmental resources that will be affected by the project are presented quantitatively below in Table 5-1.

TABLE 5-1		
Surry -Skiffes Creek 500 kV Transmission Project Skiffes Creek-Whealton 230 kV Transmission Line Project Skiffes Creek 500 kV-230 kV-115 kV Switching Station  Skiffes Creek-Whealton 230 kV Transmission Line Project Environmental Resources Affected <sup>a</sup>		
Environmental Features	Unit	Skiffes Creek to Whealton
<b>Route Length (Total)</b>	miles	20.2
York County	miles	6.4
City of Hampton	miles	2.5
James City County	miles	2.9
City of Newport News	miles	8.4
<b>Land Use Features/Constraints</b>		
Land Ownership		
Federal Government	miles	0.02
Local Government Lands	miles	4.76
Road Rights-of-Way Crossed	miles	0
Private Lands Crossed <sup>b</sup>	miles	15.29
Private Parcels Crossed (Total)	number	250
City of Hampton	number	110
City of Newport News	number	95
York County	number	35
James City	number	10
Recreational Areas		
State, County or Municipal Managed Recreation Areas Crossed	number (miles)	3 (4.16)
Golf Courses Crossed	number (miles)	1 (0.64)
Trails Crossed		
Birding and Wildlife Trails	number	3
Existing Land Use		
Developed Open Space	miles	6.43
Agricultural land	miles	0.41
Forested land	miles	6.56
Developed, High Intensity	miles	0.14
Developed, Low/Medium Intensity	miles	2.81
Open Marshland	miles	3.43
Open Water	miles	0.43

Dominion Virginia Power  
 Surry-Skiffes Creek 500 kV Transmission Line  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station

TABLE 5-1 (cont'd)

**Surry -Skiffes Creek 500 kV Transmission Project  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

**Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Environmental Resources Affected <sup>a</sup>**

<b>Environmental Features</b>	<b>Unit</b>	<b>Skiffes Creek to Wheaton</b>
<b>Zoning</b>		
Districts Crossed – City of Newport News, York County, and City of Hampton		
Single Family Residential	miles	7.42
Multi-family Residential	miles	1.11
Rural Residential	miles	0.16
Agricultural	miles	0
Commercial	miles	1.59
Industrial	miles	6.37
Special Public Interest Areas	miles	1.59
Historic Areas	miles	0
Recreational Areas	miles	0
Planned Development	miles	0.51
Langley Flight Approach	miles	0
Mixed Use	miles	1.16
<b>Residential</b>		
Existing Subdivisions Crossed	number (miles)	22 (7.99)
Planned Developments Crossed <sup>c</sup>	number (miles)	1 (1.50)
<b>Other Land Use Constraints <sup>d</sup></b>		
Residences within 500 feet	number	2,007
Residences within 200 feet	number	629
Residences within 100 feet	number	258
Structures within Right-of-Way	number	42
Houses	number	0
Outbuildings <sup>e</sup>	number	42
Commercial Buildings	number	0
Cemeteries within 500 feet	number	0
Churches within 500 feet	number	0
Schools within 500 feet	number	1
<b>Multi-unit residential structures</b>		
Multi-unit structures within 500 feet	number	33
Multi-unit structures within 200 feet	number	8
<b>Conservation Lands</b>		
Local Government Conservation Lands Crossed	number (miles)	2 (7.13)
<b>Environmental Constraints</b>		
<b>Surface Waters</b>		
Surface Water Area Crossed in Right-of-Way (Total) <sup>f</sup>	miles	0.86
(Total Surface Water Area Affected)	(acres)	(14.57)
Waters (freshwater streams)	miles (acres)	0.03 (0.72)
Waters- Open (lakes and ponds)	miles (acres)	0.79 (13.31)
Waters – Tidal	miles (acres)	0.04 (0.54)



Dominion Virginia Power  
 Surry-Skiffes Creek 500 kV Transmission Line  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station

TABLE 5-1 (cont'd)

**Surry -Skiffes Creek 500 kV Transmission Project  
 Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

**Skiffes Creek-Wheaton 230 kV Transmission Line Project  
 Environmental Resources Affected <sup>a</sup>**

<b>Environmental Features</b>	<b>Unit</b>	<b>Skiffes Creek to Wheaton</b>
<b>Wetlands</b>		
Wetland Area Crossed in Right-of-Way (Total) <sup>†</sup>	miles	4.32
(Wetland Area Affected)	(acres)	(80.30)
Palustrine Emergent and Palustrine Scrub-Shrub Wetlands	miles	4.02
	(acres)	(76.36)
Forested Wetlands	miles	0.12
	(acres)	(1.61)
Tidal Wetlands	miles	0.18
	(acres)	(2.33)
Perennial Waterbodies Crossed (Total)	number	29
Less than 300 feet in width	number	24
Between 300 and 600 feet in width	number	2
Greater than 600 feet in width	number	3
Section 10 Navigable	number	1
Forest Land to be Cleared within Right-of-Way	acres	7.00
<b>Protected or Managed Lands</b>		
Resource Protection Areas Crossed <sup>9</sup>	miles	0.33
Wildlife Management Areas	miles	0
<b>Sensitive Species and Habitat</b>		
Bald Eagle nests within 750 feet (Center for Conservation Biology, 2011 data)	number	0
Bald Eagle nests within 1,320 feet (Center for Conservation Biology, 2011 data)	number	0
Natural Heritage Resources	number	5
Biodiversity Rank		
B1 – Outstanding	number	0
	(miles)	(0)
B2 – Very High	number	1
	(miles)	(1.96)
B3 – High	number	0
	(miles)	(0)
B4 – Moderate	number	0
	(miles)	(0)
B5 – General Interest/Open Space	number	1
	(miles)	(1.07)
No Rank	number	3
	(miles)	(0.80)
<b>Cultural Resources Constraints</b>		
Archaeological Sites within Right-of-Way	number	13
National Register-Eligible and -Listed Properties, Battlefields, Historic Landscapes, and National Historic Landmarks within Right-of-Way		
	number	3
National Register-Eligible and -Listed Properties, Battlefields, Historic Landscapes, and National Historic Landmarks within 0.5 mile	number	4
National Register-Listed Properties, Battlefields, Historic Landscapes, and National Historic Landmarks between 0.5 and 1.0 mile	number	8
National Historic Landmarks between 1.0 and 1.5 miles	number	1
<b>Visual Constraints</b>		
Scenic Byways Crossed	number	0

Dominion Virginia Power  
 Surry-Skiffes Creek 500 kV Transmission Line  
 Skiffes Creek-Whealton 230 kV Transmission Line Project  
 Skiffes Creek 500 kV-230 kV-115 kV Switching Station

TABLE 5-1 (cont'd)

Surry -Skiffes Creek 500 kV Transmission Project Skiffes Creek-Whealton 230 kV Transmission Line Project Skiffes Creek 500 kV-230 kV-115 kV Switching Station  Skiffes Creek-Whealton 230 kV Transmission Line Project Environmental Resources Affected <sup>a</sup>		
Environmental Features	Unit	Skiffes Creek to Whealton
<b>Engineering Constraints</b>		
Length (total)	miles	20.21
Roads Crossed	total	57
U.S. or State Highways	number	8
County or Local Roads	number	49
Active Railroads Crossed	number	0
Existing Electric Facilities Crossed	number	0
<sup>a</sup> The numbers in this table have been rounded for presentation purposes. Sums do not always equal the total of addends due to rounding error or spatial discrepancies in data sets used to identify constraints. <sup>b</sup> Total includes unknown land ownership that is assumed to be private land. <sup>c</sup> Adjacent to right-of-way, not crossed. <sup>d</sup> Residence numbers include individual residences within multi-unit buildings (e.g., apartments) where applicable. Distances of buildings from the route were determined based on aerial photography and are subject to field verification. <sup>e</sup> Outbuildings were identified by aerial photography and consist of non-residential structures such as sheds, swimming pools, etc. Requires field verification for positive identification. <sup>f</sup> Based on a desktop review completed by Williamsburg Environmental Group, Inc. <sup>g</sup> Data is only for James City County and the City of Williamsburg.		

## 5.1.1 Land Use

### 5.1.1.1 Land Ownership

The Skiffes Creek to Whealton Section of the proposed route crosses 0.02 mile of federal land, 4.76 miles of local government land, and 15.29 miles of private land. The Skiffes Creek to Whealton Section will be installed entirely within the existing transmission corridor right-of-way, and no new right-of-way will be needed; therefore, no new landowners will be affected. As discussed above in Section 2.4 and depending on the specific line segment, some of the existing structures in the right-of-way between Skiffes Creek and Whealton will be replaced. In most locations, the new structures will be an average of about 5 feet taller than the existing structures. Within a 1.7-mile segment of the route between MPs W7.55 and W9.24, the towers will be 44 feet taller than the existing structures. This may increase the visibility of the new towers to landowners in these areas. Visual impacts are discussed in further detail in Section 5.1.4.

### 5.1.1.2 Recreation Areas

The Skiffes Creek to Whealton Section crosses 4.16 miles of city- and county-managed recreation areas, including Newport News Park, Harwoods Mill Park, and the York County Sports Complex. The route also crosses 0.64 mile of the Kiln Creek Golf Club Resort. In addition, the route crosses the Lower Peninsula Loop of the Virginia Birding and Wildlife Coastal Trail in three locations.

The Skiffes Creek to Whealton Section will be installed entirely within the existing transmission corridor right-of-way with approximately 8.42 acres of expansion into existing,

uncleared right-of-way. These 8.42 acres are located within Harwoods Mill Park and the York County Sports Complex between MPs W10.99 and W11.92. Approximately 7.0 of these acres are forested and will need to be cleared. The majority of facilities associated with the York County Sports Complex are north of the existing right-of-way and the clearing will take place on the south side. There are a few multipurpose trails that extend across the existing right-of-way and around three ponded areas within the uncleared right-of-way that will need to be cleared.

Operation of the project should have no direct impacts on these recreation areas because they are already crossed by cleared right-of-way. Some temporary impacts may occur during construction. Temporary affects could include short-term closure of facilities or limitations on access to parts of the facility that contain portions of Dominion's existing right-of-way. Replacement of the existing structures could have a minor visual effect on these areas, especially in those locations where the existing structures will be replaced with taller structures, which will occur within Harwoods Mill Park, Kiln Creek Golf Club Resort, and portions of Newport News Park. Since power lines and structures are already located in these areas, the long-term effect is expected to be minimal. While some of the structures within the segment of the right-of-way that crosses Newport News Park will be replaced with taller structures, others will be left in place and restrung with new conductors. Visual impacts are discussed in further detail in Section 5.1.4.

#### **5.1.1.3 Existing Land Use and Land Cover**

The proposed Skiffes Creek to Whealton line crosses a mixture of developed industrial, residential, and commercial areas. Based on review of the NLCD, the existing right-of-way in the project area between Skiffes Creek and Whealton crosses about 6.43 miles of developed/open space, 6.56 miles of forested land, 0.41 mile of agricultural land, 0.14 mile of high intensity developed land, 2.81 miles of medium or low intensity developed land, 3.43 miles of open marshland, and 0.43 mile of open water.

As noted in the table included in Appendix E, the Skiffes Creek to Whealton Section crosses 22 existing subdivisions accounting for 7.99 miles of the route. One of these subdivisions is located in James City County, 3 are in York County, 6 are in the City of Newport News, and 12 are in the City of Hampton. The density of houses in close proximity to the right-of-way increases within these existing subdivisions. As the route progresses from Skiffes Creek southeast to Whealton, the number and density of subdivisions increases.

Based on review of aerial photography, there are 2,007 houses within 500 feet of the centerline, 629 houses within 200 feet of the centerline, and 258 houses within 100 feet of the centerline. No houses or commercial buildings are located within the existing right-of-way; however, there are 42 outbuildings encroaching within the corridor that will need to be removed.

Because the Skiffes Creek to Whealton Section will be installed entirely within the existing transmission line corridor, no new right-of-way (i.e., no widening of the right-of-way) will be needed. Therefore, the project will result in only temporary, short-term effects on land uses, existing subdivisions, and residences in close proximity to the project during the construction phase.

#### **5.1.1.4 Planned Development**

The Skiffes Creek to Whealton Section of the project crosses 1.50 miles of planned development consisting entirely of the Huntington Point development. 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 Airport. The new transmission line in this area will consist of a second circuit of 230 kV. Within the planned development area, the proposed facilities will be installed entirely within Dominion's existing transmission corridor and no new right-of-way will be needed. Consequently, there will be no impacts on the planning or construction of the planned development.

The U.S. Route 60 East Relocation/Pocahontas Trail Project discussed in Section 3.1.5 has land designated for the future relocation of U.S. Route 60 that is currently crossed by Dominion's existing right-of-way; however, this project has been terminated due to lack of funding.

#### **5.1.1.5 Land Use Zoning**

As presented in Table 5-1, the Skiffes Creek to Whealton Section of the proposed project crosses the following lengths of zoning districts within the existing right-of-way; 7.42 miles of single-family residential (36.7 percent), 1.11 miles of multi-family residential (5.5 percent), 0.16 mile of rural residential (0.8 percent), 1.59 miles of commercial use (7.9 percent), 6.37 miles of industrial (31.5 percent), 1.59 miles of special public interest areas (9.4 percent), 0.51 mile of planned development (2.5 percent), and 1.16 miles of mixed use (5.7 percent). The areas zoned for special public interest areas are public lands owned by the City of Newport News (Newport News Waterworks). Since the new transmission line will be installed entirely within the existing transmission corridor and no new right-of-way will be required, the construction and operation of the proposed facilities will not directly or indirectly affect land uses or zoning within the project area.

#### **5.1.1.6 Conservation Easements**

No conservation easements are crossed by the Skiffes Creek to Whealton Section of the project.

#### **5.1.1.7 Other Conservation Lands**

The Skiffes Creek to Whealton Section of the proposed project crosses 7.13 miles of other conservation lands. These lands, which are discussed in more detail above in Section 3.1.8, are all considered recreational areas. Within these areas, the Skiffes Creek to Whealton Section will be installed entirely within Dominion's existing developed and undeveloped right-of-way and no new right-of-way will be needed. Approximately 8.42 acres of Dominion's existing uncleared right-of-way will need to be used within conservation lands that are located between MPs W10.99 and W11.92. Seven acres of this 8.42 acre area is forested land that will require clearing. Temporary effects could include short-term closure of recreational areas or limitations on access to parts of the recreational areas that contain portions of Dominion's right-of-way.

Replacement of existing structures could result in a visual impact on these areas in locations where taller structures are installed. This would occur in Harwoods Mill Park, and

portions of Newport News Park. Because the difference in structure size is small and the new structures will be installed in approximately the same locations as existing structures, the differences between existing and proposed conditions will be minimal.

### **5.1.2 Natural Resources**

Following is a description of potential effects on natural resources that may result from construction and operation of the Skiffes Creek to Whealton Section of the project. These resources include wetlands, waterbodies, conservation sites, and threatened and endangered wildlife habitat. The resources that could be affected are summarized in Table 5-1.

#### **5.1.2.1 Wetlands**

Based on WEG's Offsite Wetland and Waters Analysis data (April 2012), the existing Skiffes Creek to Whealton right-of-way contains approximately 4.32 linear miles of wetland crossings encompassing 76.36 acres of palustrine emergent/scrub-shrub wetlands, 2.33 acres of tidal wetlands, and 1.61 acres of forested wetlands. The existing right-of-way measures 250 feet in width between MP W10.99 and W11.92; however, only approximately 150 feet of the right-of-way has been cleared of vegetation. Due to the proximity of the existing right-of-way to Newport News/Williamsburg Airport, Dominion will need to clear the remaining 100 feet of its existing right-of-way to accommodate the construction of additional structures in this area. No additional clearing will be required elsewhere along the Skiffes Creek to Whealton Section. Construction and maintenance of the remainder of the proposed transmission line will not result in a significant change of vegetation type within the transmission line right-of-way. Because the remainder of the new transmission line will be constructed within the existing maintained right-of-way, no other forested wetlands will be cleared. Herbaceous vegetation will not be removed but could be temporarily damaged by construction equipment and vehicular movement. After construction, vegetation within the right-of-way will be allowed to revert to pre-construction conditions. All construction activities will be limited to Dominion's existing right-of-way.

To minimize impacts on wetland areas, the transmission line will be designed to span or avoid wetland areas where possible. Most of the wetlands in the Skiffes Creek to Whealton Section are associated with streams and rivers, and many can easily be spanned. Should the removal of woody shrub vegetation occur within wetlands, Dominion will use the least intrusive method reasonably possible to clear the corridor. Hand-cutting of vegetation will be conducted, where needed, to avoid and minimize impacts on streams and/or wetlands. There will be no change in contours or redirection of the flow of water, and the amount of spoilage from foundations and structure placement will be minimal. Excess soil in wetlands generated through foundation construction will be removed.

In wetlands, mats will be used for all construction equipment. Due to the availability of county and state highways and other existing roads, no new access roads will be necessary along this section of the project. If a section of line cannot be accessed from existing roads, Dominion may need to install a culvert, ford, or temporary bridge within the existing right-of-way to cross small creeks and streams. In such cases, some temporary fill material in wetlands adjacent to such crossings may be required. This fill will be placed on erosion control fabric and removed when work is completed, returning ground elevations to original contours. Potential impacts on wetlands will be temporary in nature.

Upon SCC approval of a route and final line engineering, Dominion will obtain the appropriate permits from the COE for any work within wetlands to ensure full compliance with Section 404 of the CWA and to minimize any potential impacts on wetlands located within the transmission line corridor.

#### **5.1.2.2 Waterbodies**

Based on the USGS National Hydrography Dataset (NHD), 29 perennial waterbodies will be crossed by the proposed transmission facilities on Dominion's existing right-of-way between Skiffes Creek and Wheaton. Of these, 24 are less than 300 feet in width, 2 are between 300 and 600 feet in width, and 3 are greater than 600 feet in width. The crossings include 2 named open waterbodies (Lee Hall and Harwoods Mill Reservoirs); and 10 named streams including Yarmouth Creek, Chisel Run, King Creek (2 crossings), Longhill Swamp, Skiffes Creek (3 crossings), Whiteman Swamp (2 crossings), Brick Kiln Creek (2 crossings), Newmarket Creek (3 crossings), Poquoson River (2 crossings), and Warwick River (2 crossings). Data from the WEG's Offsite Wetland and Waters Analysis (April 2012), indicate that 13.31 acres of open waters (lakes and ponds), 0.72 acre of other waters (freshwater streams), and 0.54 acre of tidal waters are within the existing right-of-way.

The average 900-foot span between transmission line structures proposed by Dominion may not be adequate to span Lee Hall Reservoir, Harwoods Mill Reservoir, and Skiffes Creek with its associated wetlands. All other streams and other surface water crossings are narrow enough that they can likely be spanned with normal spacing and height of the structures. Since no additional tree clearing outside of the existing right-of-way will be required, construction and operation of the project will not significantly affect surface water features along the transmission line route.

Short-term, minor water quality impacts could occur during the construction of the proposed project. Such impacts would be associated with the soils from disturbed areas being washed by storm water into adjacent waters during rainstorm events. Increased turbidity and localized sedimentation of the stream bottom may occur from the runoff. However, these impacts will be significantly reduced by the implementation of Dominion's erosion control measures, including the installation of erosion control structures and materials as well as setbacks from the edges of waterbodies.

All waterways will be maintained for proper drainage through the use of culverts or other crossing devices, according to Dominion's standard policies. Buffer zones of vegetation will be left at stream crossings. Where clearing of trees and/or woody shrubs is required, clearing within 100 feet of a stream will be conducted by hand. All vegetation will be cut at or slightly above ground level, and there will be no grubbing of stumps. Dominion will use sediment barriers along all waterways and steep slopes during construction to protect waterways from soil erosion and sedimentation. If a section of line cannot be accessed from existing roads, Dominion may need to install a culvert, ford, or temporary bridge to cross small creeks and streams. In such a case, there may be some temporary fill material required that will be placed on erosion control fabric and removed when work is completed, returning the surface to original contours.

Skiffes Creek is considered a navigable water under Section 10 of the Rivers and Harbors Act. Dominion will obtain the appropriate permit from the COE for this crossing.

### 5.1.2.3 Natural Heritage Resources

South of the proposed Skiffes Creek Switching Station, the existing right-of-way crosses Grafton Ponds and Airport-TABB conservation sites. As discussed above in Section 3.2.3., the VDCR's NHR Program ranks Grafton Ponds as B2 – Very High priority and Airport-TABB as B5 – general interest conservation lands. Impacts on these conservation sites are expected to be negligible during construction activities associated with reconfiguration and replacement of the existing structures within the existing right-of-way. The equipment and excavation required for the construction of new foundations and support structures will have a temporary impact on the ground surface, but will not result in permanent changes to the terrain. Herbaceous vegetation will not be removed, but could be damaged temporarily by construction equipment and vehicular movement. Following construction, the right-of-way will revert to pre-construction conditions.

### 5.1.2.4 Protected Species

Construction and maintenance of the new transmission line facilities could have some minor affects on wildlife. The existing right-of-way is 250 feet in width between MP W10.99 and W11.92; however, only approximately 150 feet of the right-of-way has been cleared of vegetation. Due to the proximity of the existing right-of-way to Newport News/Williamsburg Airport, Dominion will need to clear the remaining 100 feet of its existing right-of-way to accommodate the construction of additional structures in this area. Within the remainder of the corridor, the removal of forested vegetation within or adjacent to the existing right-of-way is not required, and construction of the Skiffes Creek to Whealton Section will not affect foraging, shelter, or nesting habitat. Construction activity may temporarily disturb and displace wildlife in limited areas of the right-of-way; however, impacts on most species will be short-term in nature, limited to the period of construction, and will consist primarily of displacement and disturbance from within the existing, cleared corridor. Some less mobile species occurring in the construction corridor could be directly impacted, and movements between segmented habitats could be impeded temporarily due to noise and human presence.

Construction of the Skiffes Creek to Whealton Section will require crossing Skiffes Creek between MPs W2.8 and W2.9 in a location identified by VDGIF as potential anadromous fish waters. The transmission line crossing of Skiffes Creek at this location is about 750 feet long and is likely capable of being spanned without affecting Skiffes Creek.

### Federally and/or State-Listed Species

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

Based on species occurrence data from the VDCR and VDGIF, the Skiffes Creek to Whealton right-of-way intersects areas of documented occurrence of three state-listed species including Harper's fimbriatilis, the canebrake rattlesnake (*crotalus horridus*) and Mabee's Salamander. The Skiffes Creek to Whealton right-of-way also intersects areas of documented

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

One occurrence of Harper's fimbriatilis was documented in 2008 in association with the Grafton Ponds conservation site between MPs W8.2 and W8.3 in York County. According to VDGIF, the portion of the Skiffes Creek to Whealton Section east of the Interstate 64 crossing intersects with several documented occurrences of the canebrake rattlesnake and Mabee's Salamander. The canebrake rattlesnake utilizes a wide range of upland and wetland habitat types while Mabee's Salamander is restricted to mesic and wet areas and requires vernal pools for breeding.

The existing right-of-way measures 250 feet in width between MPs W10.99 and W11.92; however, only approximately 150 feet of the right-of-way has been cleared of vegetation. Due to the proximity of the existing right-of-way to Newport News/Williamsburg Airport, Dominion will need to clear the remaining 100 feet of its existing right-of-way to accommodate the construction of additional structures in this area. Tree clearing or vegetation removal is not required in the remaining portion of the project corridor, and all ground disturbances will be restored to pre-construction condition; therefore, a significant permanent change in the character of the corridor is not anticipated. Due to the highly urbanized character of the Skiffes Creek to Whealton Section of the project, effects on the above-referenced species are expected to be minimal. The 900 foot average span (or greater if needed) between structures proposed by Dominion will likely be adequate to avoid sensitive areas, if identified, and thus avoid impacts on these species; however, species-specific surveys may be recommended prior to construction to determine if the potential presence for listed species or suitable listed species habitat exists. If identified, Dominion will work with the appropriate regulatory agencies to minimize any impacts on listed species and/or listed habitat(s).

### **Bald Eagle Management**

To obtain the most current eagle nest data, NRG reviewed the 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, the Skiffes Creek to Whealton Section does not intersect any primary or secondary management zones as identified in The Bald Eagle Protection Guidelines for Virginia (2000).

NRG and Dominion observed one bald eagle perching on an existing transmission tower within Skiffes Creek-Whealton 230 kV Transmission Line right-of-way during January 2012. A nest was observed at the top of the tower, located in York County Sports Complex, York County, in proximity to MP W11.1. A nest in proximity to this location was not reported by CCB, VDCR, or VDGIF data. Additional surveys may be required prior to construction to determine the ownership and activity level of the nest. If an eagle nest is identified in this location, Dominion will work with the appropriate jurisdictional agencies to minimize any impacts on this species.

### **Federally Listed Species of Concern and Other Documented Occurrences**

The FWS county lists, VDCR's NHR Program, and VDGIF identify nine federal SOCs and non-listed species that may potentially occur within the project corridor including the Virginia least trillium, Cuthbert's turtlehead (*Chelone cuthbertii*), false hop sedge (*Carex lupuliformis*),



lance-leaved loosestrife (*Lythrum lanceolatum*), mountain camellia (*Stewartia ovata*), pine-barren reed grass (*Calamovilfa brevipilis*), slender marsh pink (*Sabatia campanulata*), umbrella flatsedge (*Cyperus diandrus*), and the rare skipper. Personal communication with the VDCR indicated that these species are taken into consideration based on Global Rank.

The VDCR EOREps dataset identified two area occurrences of the Cuthbert turtlehead, one area occurrence of pine-barren reed-grass, and one area occurrence of slender marsh pink in proximity to the Skiffes Creek to Wheaton Section. The occurrences were documented between 1990 and 1995 in association with the Grafton Ponds conservation site. An occurrence of lance-leaved loosestrife was documented in association with a General Location Area near the intersection of Fort Eustis Boulevard and Richneck Road in the City of Newport News. Occurrences of false hop sedge and umbrella flatsedge were also documented in association with a VDCR-identified General Location Area in the eastern corner of the intersection of Interstate 64 and Victory Boulevard. These species are not federally or state-listed.

The existing right-of-way measures 250 feet in width between MPs W10.99 and W11.92; however, only approximately 150 feet of the right-of-way has been cleared of vegetation. Due to the proximity of the existing right-of-way to Newport News/Williamsburg Airport, Dominion will need to clear the remaining 100 feet of its existing right-of-way to accommodate the construction of additional structures in this area. Tree clearing or vegetation removal is not required in the remaining portion of the Skiffes Creek to Wheaton Section. Following construction, the right-of-way will revert to pre-construction conditions; therefore, a significant permanent change in the character of the corridor is not anticipated. Because construction activities in this cleared portion of the route will occur within Dominion's existing maintained right-of-way, it is unlikely that these species will be impacted. Species-specific surveys may be required prior to construction to determine the potential, if any, of the proposed project to affect these species. If identified, Dominion will work with the VDCR to minimize any impacts on these species and/or their habitat(s).

### **5.1.3 Airport**

#### **Airspace Evaluation**

##### **Identifying Obstruction Elevations**

Dominion used county/city-supplied contour data, to identify where potential height limitations may exist for construction equipment or transmission line structures. The first step involved creating an elevation model of the civil and DOD airport imaginary surfaces (imaginary surfaces) using the slopes and dimensions described in Sections 3.1.3.2 and 3.1.3.3. Dominion then obtained digital contour data from the counties crossed by the project and created the surface elevation model. By subtracting the ground surface elevation from the imaginary surface elevation, Dominion calculated the maximum allowable height in feet, which represents the distance from the ground surface to the imaginary surface.

None of the facilities proposed by Dominion within the Skiffes Creek to Wheaton Section will exceed any of the civil or DOD airport imaginary surfaces at the airports identified in Table 3.1.3-1

## **FAA Obstruction Evaluation**

As discussed in Section 3.1.3.2, a notice must be provided to the FAA for any construction or alteration of a structure that exceeds imaginary notification surfaces. Following receipt of a notice, the FAA will determine whether the effect of the proposed construction or alteration is a hazard to air navigation and the appropriate measures to be applied for the continued safety of air navigation.

As part of this review, the FAA applies a set of obstruction standards to determine obstructions to air navigation that may affect the safe and efficient use of navigable airspace and the operation of planned or existing air navigation and communication facilities. Part 77 defines an existing object (including a mobile object such as a construction crane) and a future object as an obstruction to air navigation if it is of greater height than any of the following heights or surfaces:

1. A height of 499 feet above ground level at the site of the object;
2. A height that is 200 feet above ground level, or above the established airport elevation, whichever is higher, within 3 nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile from the airport up to a maximum of 499 feet;
3. A height within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area, which would result in the vertical distance between any point on the object and an established minimum instrument flight altitude within that area or segment to be less than the required obstacle clearance;
4. A height within an en route obstacle clearance area, including turn and termination areas, of a Federal Airway or approved off-airway route, that would increase the minimum obstacle clearance altitude;
5. The surface of a takeoff and landing area of an airport or any imaginary surface established under §77.19 (Civil Airport Imaginary Surfaces), 77.21 (Department of Defense Airport Imaginary Surfaces), or 77.23 (Heliport Imaginary Surfaces). However, no part of the takeoff or landing area itself will be considered an obstruction.

The FAA will conduct an aeronautical study when requested by the sponsor of any proposed construction or alteration for which a notice is submitted or the FAA determines a study is necessary. The FAA conducts an aeronautical study to determine the impact of a proposed structure on aeronautical operations, procedures, and the safety of flight. These studies include the impact on arrival, departure, and en route procedures for aircraft operating under visual flight rules; the impact on arrival, departure, and en route procedures for aircraft flying under instrument flight rules; the impact on existing and planned public use airports; airport traffic capacity of existing public use airports and public use airport development plans received before the issuance of the final determination; minimum obstacle clearance altitudes, minimum instrument flight rules altitude, approved or planned instrument approach procedures,

and departure procedures; the potential impact on air navigation, communication facilities, and other surveillance systems; and the aeronautical effects resulting from the cumulative impact of a proposed construction or alteration of a structure when combined with the effects of other existing or proposed structures.

The FAA will issue a determination stating whether the proposed construction or alteration would be a hazard to air navigation. Following are the types of determinations that can be issued by the FAA:

- **Determination of Hazard to Air Navigation** when the aeronautical study concludes that the proposed construction or alteration will exceed an obstruction standard and would have a substantial aeronautical impact; or
- **Determination of No Hazard to Air Navigation** when a proposed structure does not exceed any of the obstruction standards and would not be a hazard to air navigation or the aeronautical study concludes that the proposed construction or alteration will exceed an obstruction standard but would not have a substantial aeronautical impact. A Determination of No Hazard to Air Navigation may include conditional provisions of a determination; supplemental notice requirements, when required; and/or marking and lighting recommendations, as appropriate.

The Skiffes Creek to Whealton Section will be constructed within Dominion'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 will be the same reduced heights (52 and 75 feet) as the existing structures that pass underneath the flight approach to both runways at the Newport News/Williamsburg Airport. On January 1, 2012 at a meeting with Newport News/Williamsburg Assistant Airport Directors, Melissa Cheaney and Ted Kitchens, Dominion demonstrated with a detailed elevation analyses that the new structures will not penetrate the approach surfaces to this airport (see Figure 3.1.3-7 in Appendix A). Dominion's Skiffes Creek to Whealton line will pass by Langley Air Force Base's main runway at a distance of about 3 miles. Dominion 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 will pass underneath the flight approach to Langley Air Force Base's main runway. Through analysis of both FAA Part 77 flight surfaces and TERPS surfaces, Dominion demonstrated to Langley Air Force Base officials that the proposed structures will not interfere with or penetrate the flight approaches to that airfield (see Figure 3.1.3-2 in Appendix A).

#### 5.1.4 Visual

To assist in assessing the potential for the project to affect viewsheds or visually sensitive features, NRG retained TrueScape Ltd. to prepare visual simulations of the proposed transmission line structures at points along the potential routes and existing transmission line rights-of-way as described in Section 2. The simulations consist of scaled images of power poles superimposed on photos from within the study area. The photos provide an indication of how the transmission structures and the associated rights-of-way will look after construction of the project. Copies of the visual simulations are provided in Appendix C.

The Skiffes Creek to Whealton Section will all be located on existing transmission line rights-of-way containing multiple existing transmission lines. These existing rights-of-way primarily cross densely developed areas to the south of Interstate 64 in James City and York Counties and the Cities of Newport News and Hampton. The views along Dominion's existing rights-of-way in these areas consist of densely developed commercial and light industrial areas, interspersed with residential subdivisions as the route progresses from north to south. In addition to the existing tower structures within Dominion's rights-of-way, other major corridors within view of the route consist of Interstate 64, SR 60, Routes 143 and 199, and the CSX Railroad.

VP7 (Industrial Park Drive) and VP8 (Devore Avenue) depict two typical locations along the Skiffes Creek to Whealton Section. VP7 illustrates a commercial/industrial area near MP W3. The transmission line route through this area parallels the CSX railroad and a distribution line. Construction in this section of the route will be limited to adding new wire to the existing structure. The present single circuit 230 kV transmission line will be replaced with to a double circuit 230 kV line. This will result in no new visual impact on the surrounding area.

VP8 illustrates a typical crossing of the Skiffes Creek to Whealton route through a residential area. There currently are two sets of lattice structures in the right-of-way in this area, which average 85 feet and 106 feet in height, respectively. The taller lattice structures will be replaced with double circuit weathering steel pole structures. These new structures will be slightly taller than the existing structures, extending to an average height of 115 feet. The new single pole structures will have a cleaner appearance than the lattice structures, which will render them less visible. Consequently, the replacement of the existing towers along this section of the right-of-way will result in no appreciable visible impact on the surrounding area.

### **5.1.5 Cultural Resources**

The Skiffes Creek to Whealton Section has the potential to impact archaeological, historic, and architectural resources listed in or eligible for listing in the VLR and the NRHP as described in Sections 3.4.1 and 3.4.2. The cultural resources possibly affected by the Skiffes Creek to Whealton Section are considered within a tiered study area as defined in the VDHR's *Guidelines*.

The Skiffes Creek to Whealton Section right-of-way contains 13 previously recorded archaeological sites, including: 1 site that is considered eligible for listing in the NRHP; 3 sites determined by the VDHR to be eligible for listing in the NRHP; 2 sites determined by the VDHR to be ineligible for listing in the NRHP; and 7 unevaluated archaeological sites. Additionally, 10 previously recorded historic and architectural resources occur within the study area, including 3 battlefields and 1 earthwork. Six of the 11 architectural resources are listed in the NRHP and VLR. One additional resource is listed in the NRHP and VLR as well as being designated a NHL. Since the Skiffes Creek to Whealton Section will be installed entirely within the existing transmission corridor right-of-way, no new right-of-way will be needed and minimal tree clearing is anticipated. To minimize direct impacts on archaeological, historic, and architectural sites located within the right-of-way, the transmission line will be designed to span or avoid these sites where possible.

The Skiffes Creek to Whealton Section contains a total of 11 previously recorded historic and architectural sites within the tiered study area; however, 1 site determined by the VDHR to

be ineligible for listing in the NRHP (Big Bethel Battlefield, 114-5297) was removed from consideration in the analysis of this section. The increase in structure height along certain segments of the route, and changes to the configurations of the structures, may result in visual impacts on those resources for which historic setting is a character defining feature. However, construction in this section will not substantially alter the character or setting of many of the cultural resources because the project will be installed entirely within the existing transmission corridor right-of-way and structure height will not change substantially. In general, existing structures will be removed and replaced with new structures.

To ensure consideration of impacts on historic resources, the Pre-application Analysis recommended in Section I of the VDHR's *Guidelines*, including ground photography from public access points and aerial photography review, was completed to assess visual impacts on known NRHP-eligible or -listed historic and architectural resources within the tiered study area. This Pre-Application Analysis is included in Appendix G. Data gathered on the possible effects of the proposed route on known cultural resources will be considered to assist in the development of ways to avoid, minimize, or mitigate affects on cultural resources in consultation with the VDHR.

Previous survey data suggests that extensive archaeological and historic architectural survey has not occurred across the entire 1.5-mile-wide study area. Therefore, possible impacts on unrecorded and/or unevaluated archaeological and architectural resources have not been assessed. In accordance with Section II of the VDHR's *Guidelines*, archaeological and architectural survey may be warranted prior to construction of the SCC-approved route to assess direct and indirect impacts on VLR- and NRHP-listed or -eligible resources. Dominion will determine whether survey is needed in consultation with the VDHR.

### **5.1.6 Geology**

#### **Mineral Resources**

There are two mineral resources located within half a mile of this segment of the proposed project. Both resources, as described above in Section 3.5.1, are located more than 0.4 mile from the existing right-of-way. Therefore, there will be no impacts on mineral resources along this segment of the proposed project.

## **5.2 SKIFFES CREEK SWITCHING STATION**

The Skiffes Creek Switching Station will be located on a 51-acre parcel in James City County. The parcel is located in a forested area and is crossed by a Dominion existing electrical transmission right-of-way. The parcel is bounded to the west by forested land, to the south by Dominion's right-of-way, to the north by a railroad and SR 143 north of the railroad, and to the east by more forested land. Dominion anticipates that this facility will be located adjacent to and overlapping its existing transmission line corridor. The precise location of the facility will be determined following additional biological and cultural resources investigations of the area.

## **5.2.1 Land Use**

### **5.2.1.1 Land Ownership and Land Use**

The Skiffes Creek Switching Station will be built on a 51-acre parcel of undeveloped forested land owned by Dominion in James City County. The parcel is located on the northern side of Dominion's existing right-of-way adjacent to the County Village Mobile Home Park parcel and approximately 350 feet north of the Poplar Hall subdivision. No new land purchases or easements will be required for construction or operation of the proposed facility.

No recreation areas, planned developments, conservation easements, or other conservation areas are located on or within 0.25 mile of the proposed switching station site parcel.

## **5.2.2 Natural Resources**

### **5.2.2.1 Wetlands and Waterbodies**

The parcel on which the Skiffes Creek Switching Station will be constructed is situated primarily within an upland, forested area. Skiffes Creek and its associated wetlands are located approximately 800 feet east of the existing right-of-way. An unnamed tributary to Skiffes Creek and its associated floodplain wetlands are located within the project corridor approximately 1,300 feet southeast of Tadich Drive.

### **5.2.2.2 Protected Species**

The project is not located within any areas identified by the VDCR as Conservation Sites, General Location Areas, or Karst Screening Areas.

## **Federally and/or State-Listed Species**

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

Based on species occurrence data from the FWS, VDCR, and VDGIF, no federally or state-listed species have been documented within the vicinity of Skiffes Creek Switching Station. However, given the wooded upland and riverine wetland habitat types in the project vicinity, these species have the potential to occur on site.

Construction and maintenance of the proposed switching station will result in a change of vegetation type within the right-of-way and permanent impacts are anticipated in the location of the building pad and associated impervious surfaces. Potential habitat for some of these species may occur within the Skiffes Creek Switching Station construction footprint, so care will

be taken to avoid sensitive plant species as the precise location of the facility on the parcel is determined.

### **Bald Eagle Management**

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

### **Federally Listed Species of Concern and Other Documented Occurrences**

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

The VDCR EOREps dataset identified an isolated occurrence of the Mountain Camellia (*Stewartia ovata*) within Dominion's existing right-of-way approximately 0.1 mile west of the Kingsmill Substation between MPs C35.9 and C36.2 in James City County. This species is not state or federally listed; however, it is ranked G4, meaning it is common and apparently secure globally, though it may be rare in parts of its range, especially at the periphery. Because the Mountain Camellia was documented in James City County, this species also has the potential to occur on site. Species-specific surveys may be required prior to construction to determine the potential, if any, of the proposed project to affect these species. If identified, Dominion will work with the VDCR to minimize any impacts on these species.

### **5.2.3 Cultural Resources**

No known historic or architectural resources occur within the parcel on which the Skiffes Creek Switching Station will be located. However, Carter's Grove (047-0001), Colonial National Historical Park Colonial Parkway (047-0002), the Battle of Williamsburg (099-5282), and the Battle of Yorktown (099-5241) are located in the vicinity of the proposed switching station parcel. Carter's Grove is located within 0.5, 1.0, 1.5 miles of the switching station parcel. The Battle of Williamsburg (Civil War) is located within 1.0 and 1.5 miles of the switching station parcel. The Battle of Yorktown (Civil War) is located within 1.5 miles of the switching station parcel.

One previously recorded archaeological site, 44JC0662, occurs within the parcel on which 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'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 SHPO concurred with this recommendation. However, CRI recommends that site 44JC0662 may retain archaeological potential and requires further assessment to determine the integrity of archaeological deposits and the site boundaries in relation to Dominion's right-of-way.

Archaeological and historic architectural surveys may be required prior to construction to assess direct and indirect impacts on VLR- and NRHP-listed or -eligible resources. Dominion will work with the VDHR to avoid, minimize, or mitigate any impacts on such resources.



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Dominion Virginia Power  
Surry-Skiffes Creek 500 kV Transmission Line  
Skiffes Creek-Wheaton 230 kV Transmission Line Project  
Skiffes Creek 500 kV-230 kV-115 kV Switching Station

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## **DOMINION VIRGINIA POWER**

**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**

## **APPENDIX A**

### **Figures**





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

Figure 2.0-1  
 Overview of the  
 Project Area

- ▲ Existing Substation/  
Switching Station
- △ Proposed  
Switching  
Station
- Transmission Line  
Junction/Facility
- Chickahominy  
Alternative
- Surry Alternative
- James River  
Crossing Variation 1
- James River  
Crossing Variation 2
- James River  
Crossing Variation 3
- Skiffes Creek to  
Wheulton Section



0 1.25 2.5 5 Miles

1:225,000





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

Figure 2.1-1  
Alternative Routes  
Considered

- Existing Substation/  
Switching Station
- Proposed  
Switching  
Station
- Chickahominy  
Alternative
- Surry Alternative
- James River  
Crossing Variation 1
- James River  
Crossing Variation 2
- James River  
Crossing Variation 3



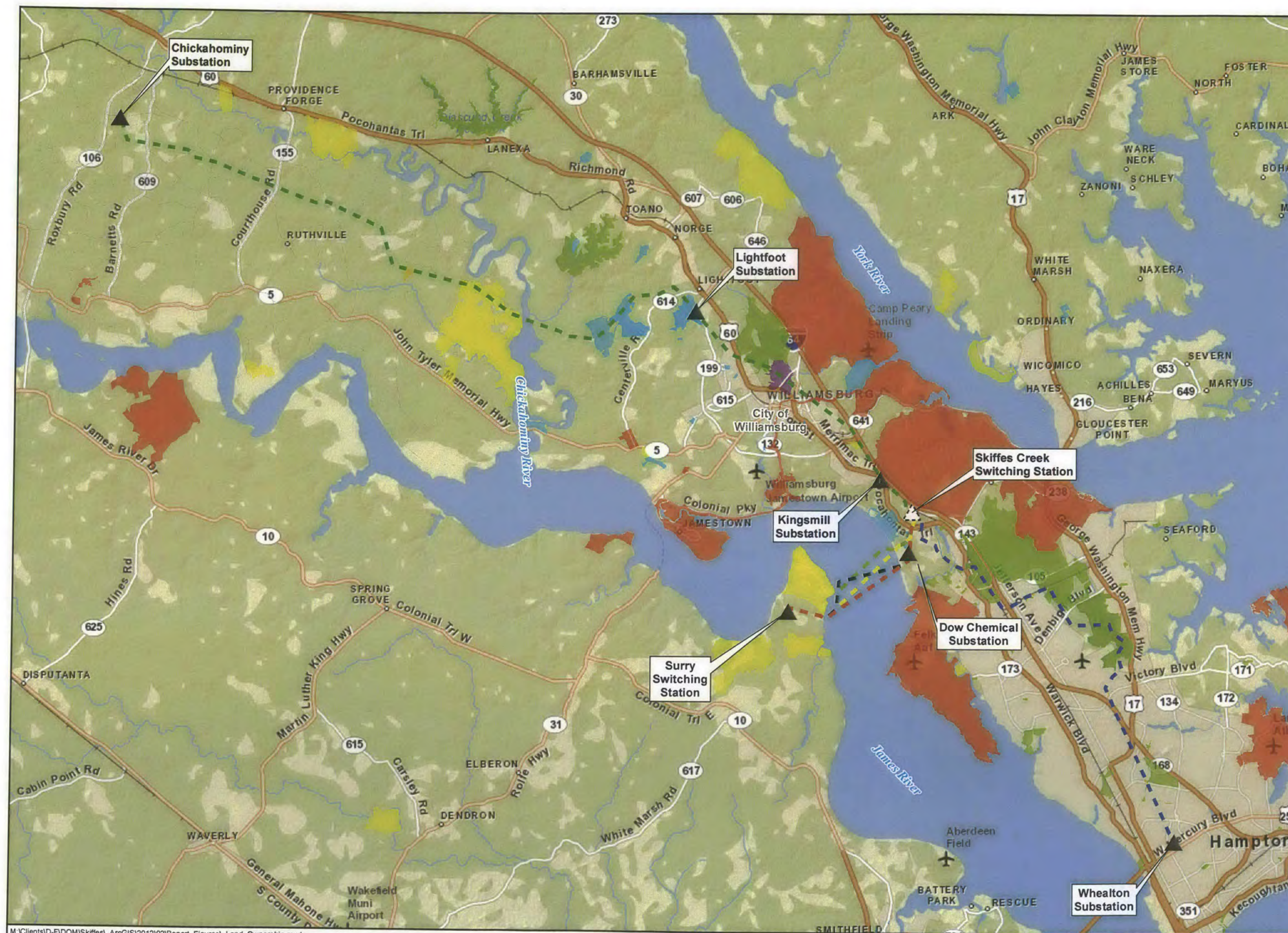
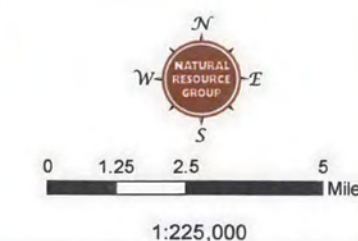
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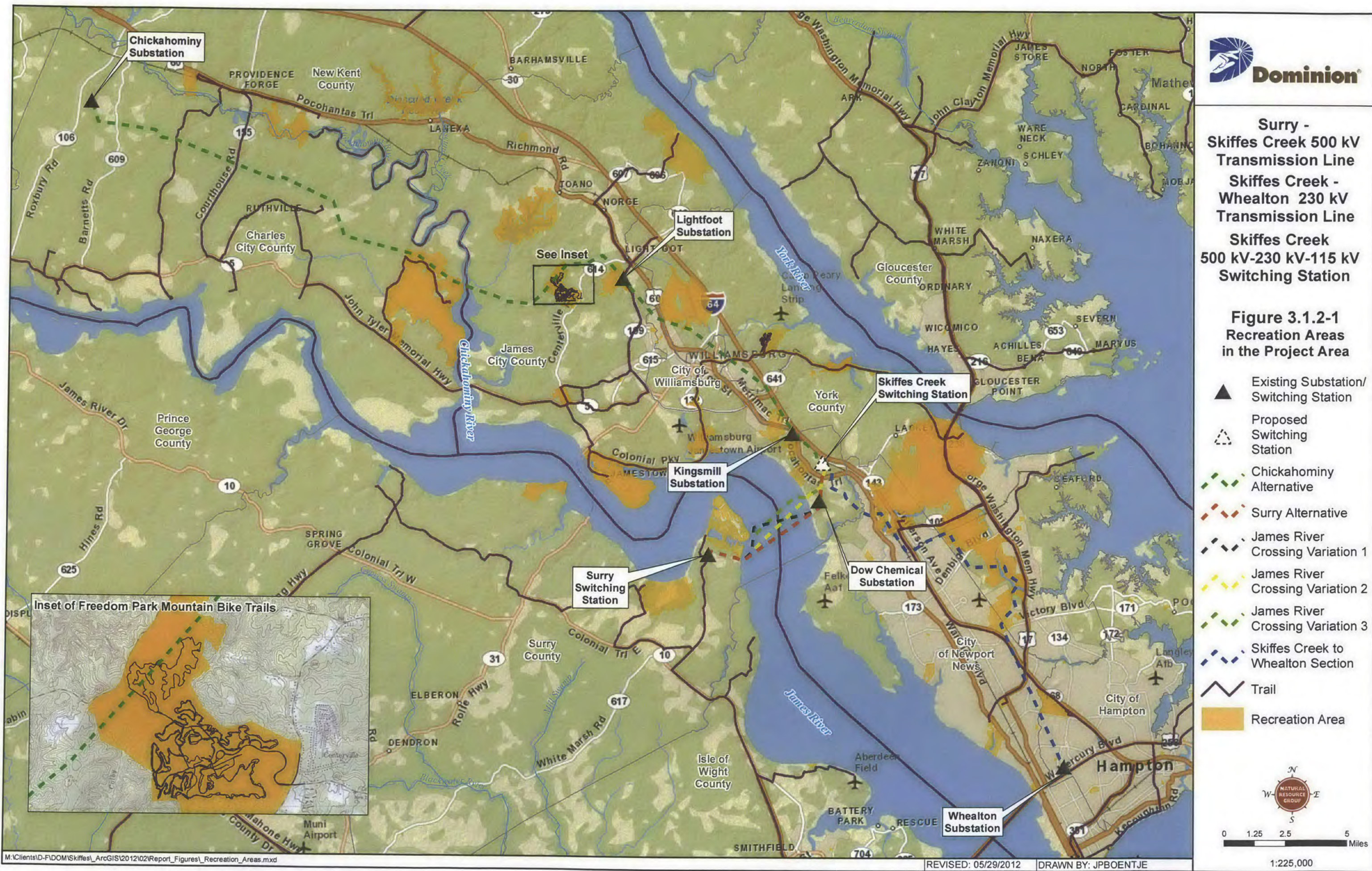
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Skiffes Creek 500 kV  
Transmission Line  
Skiffes Creek -  
Wheaton 230 kV  
Transmission Line  
Skiffes Creek  
500 kV-230 kV-115 kV  
Switching Station**

**Figure 3.1.1-1  
Land Ownership  
in the Project Area**

- ▲ Existing Substation/  
Switching Station
- ▲ Proposed  
Switching  
Station
- Chickahominy  
Alternative
- Surry Alternative
- James River  
Crossing Variation 1
- James River  
Crossing Variation 2
- James River  
Crossing Variation 3
- Skiffes Creek to  
Wheaton Section
- Federal Land
- State Land
- County Land
- City Land
- Colonial Williamsburg
- Private
- Unknown (Assumed Private)
- Road ROW







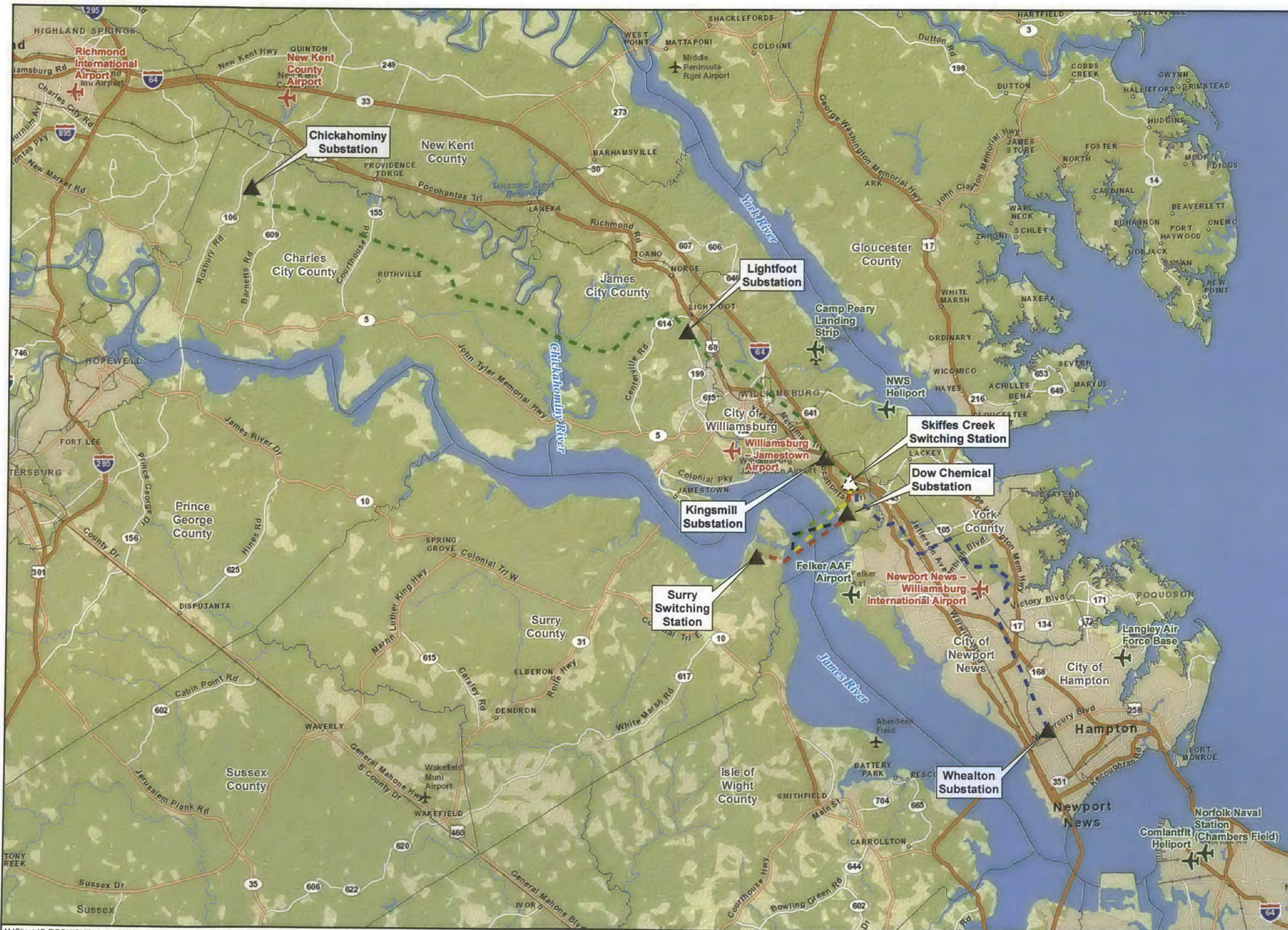
**Surry -  
Skiffes Creek 500 kV  
Transmission Line**

**Skiffes Creek -  
Whealton 230 kV  
Transmission Line**

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

**Figure 3.1.2-1  
Recreation Areas  
in the Project Area**





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

Figure 3.1.3-1  
Airports Located in  
the Project Area

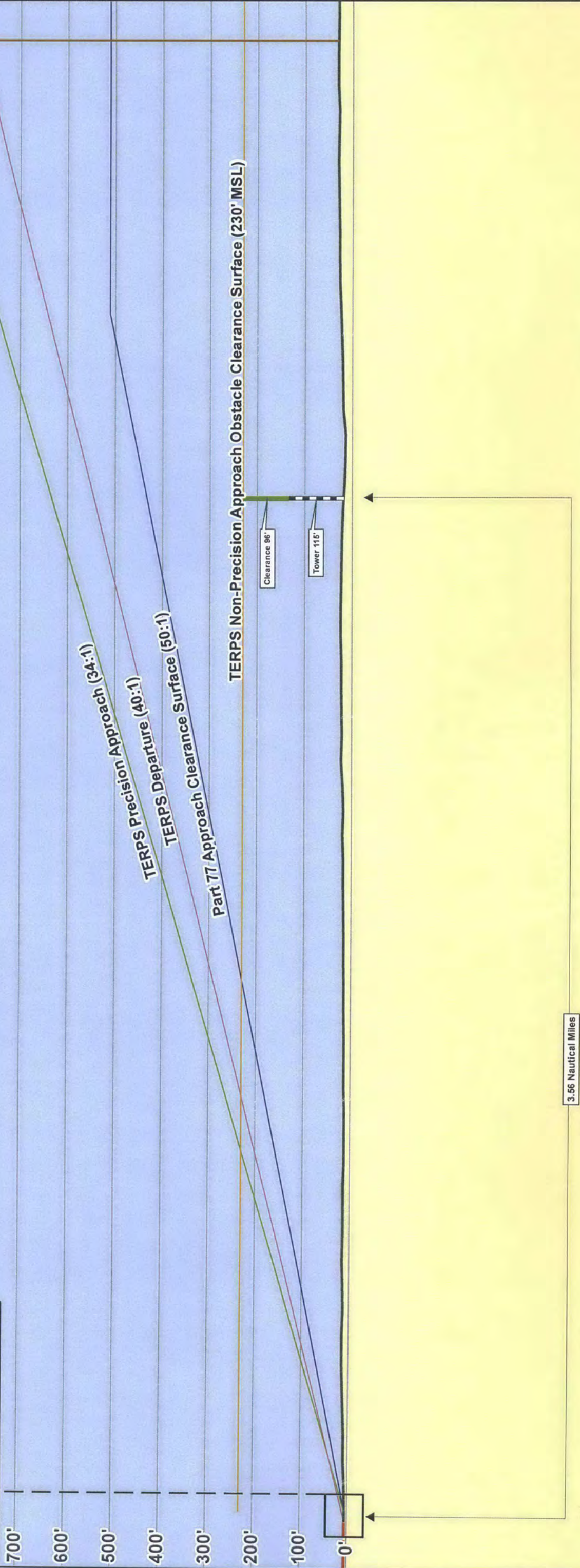
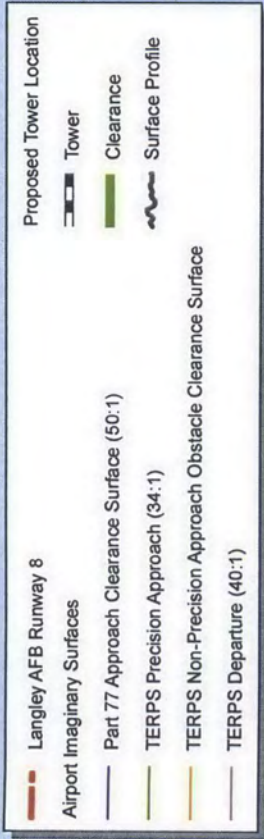
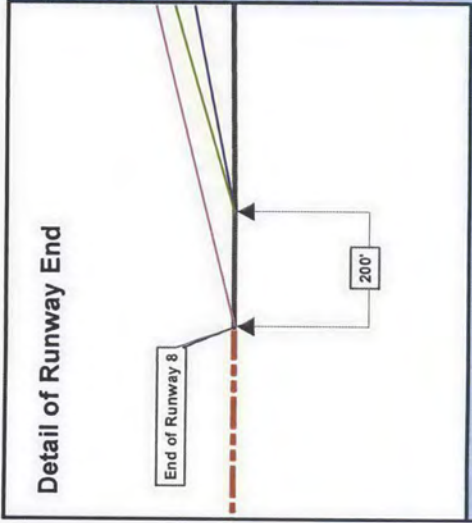
- Public Airport
- Military Airport
- Existing Substation/  
Switching Station
- Proposed  
Switching  
Station
- Chickahominy  
Alternative
- Surry Alternative
- James River  
Crossing Variation 1
- James River  
Crossing Variation 2
- James River  
Crossing Variation 3
- Skiffes Creek to  
Wheaton Section



0 2.5 5  
Miles

1:300,000



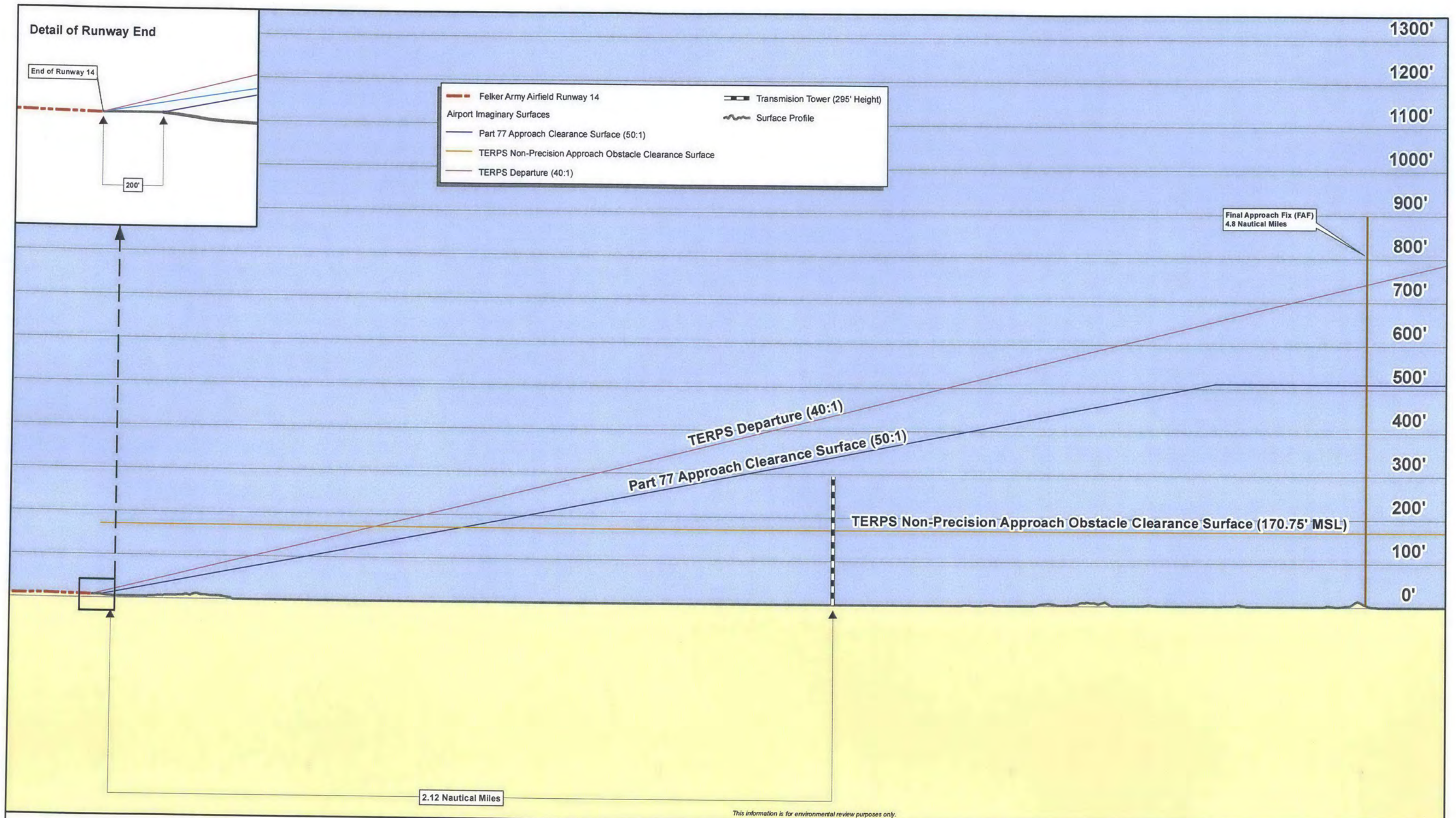


This information is for environmental review purposes only.

**Figure 3.1.3-2**  
**Skiffes Creek - Whealton 230 kV Transmission Line**  
**Langley Airforce Base Approach and TERPS Surfaces**  
**Vertical Exaggeration X 10**

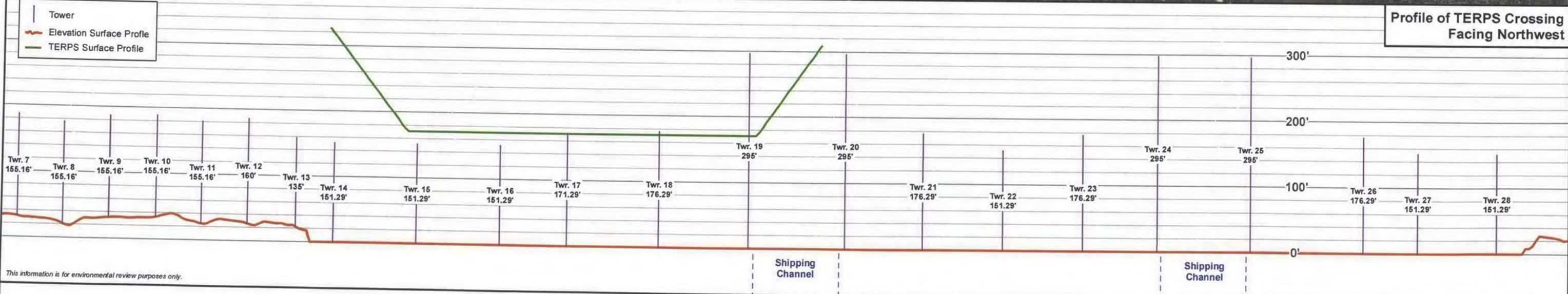
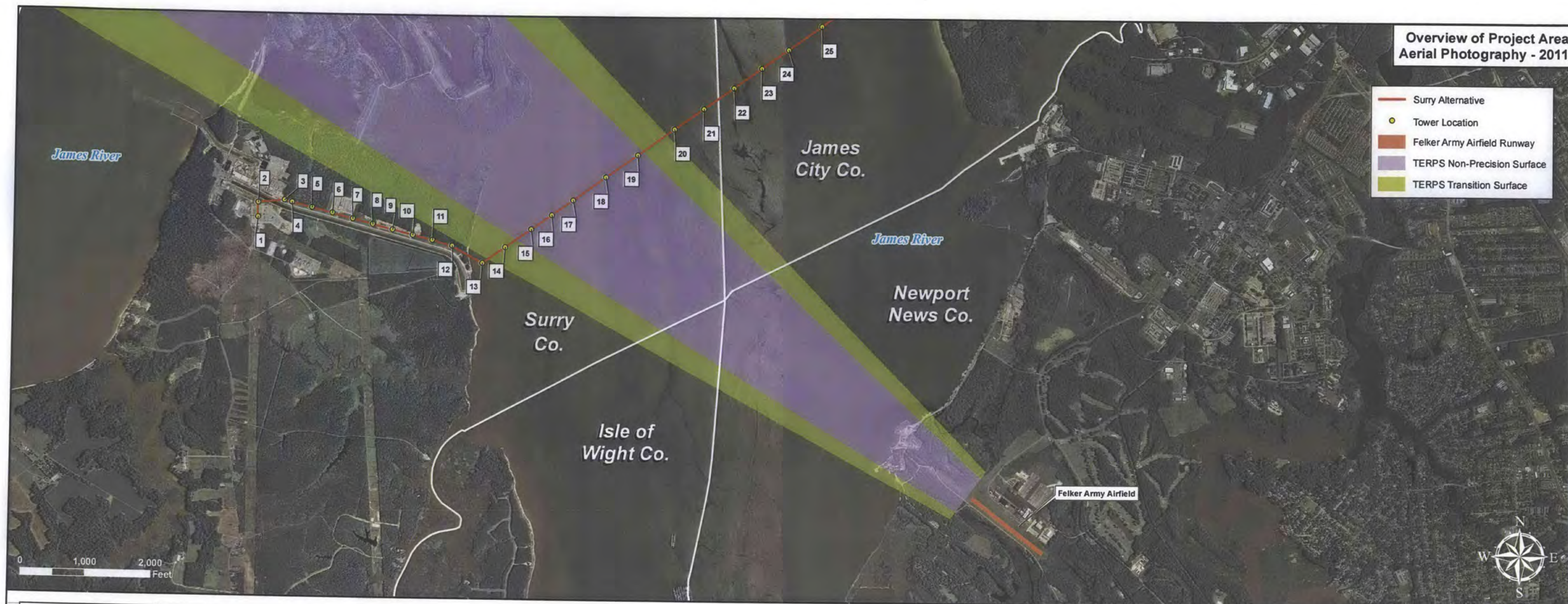






**Figure 3.1.3-3**  
**Surry - Skiffes Creek 500 kV Transmission Line**  
**Felker Army Airfield Approach and TERPS Surfaces**  
**Vertical Exaggeration X 10**

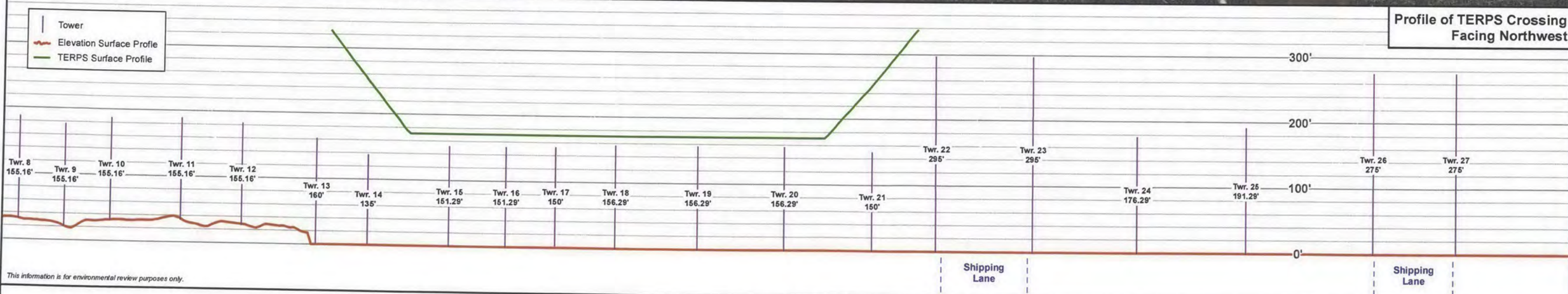
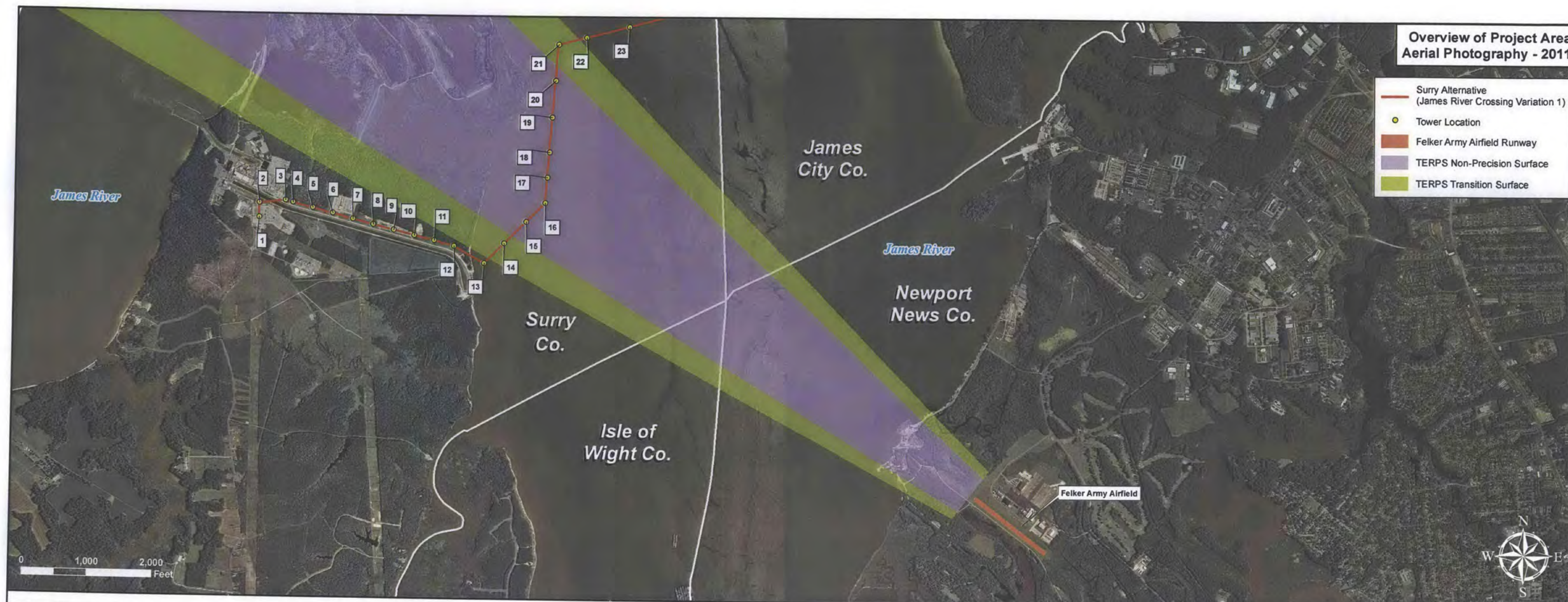




**Figure 3.1.3-4**  
**Surry - Skiffes Creek 500 kV Line, Surry Alternative**  
 Felker Army Airfield  
 TERPS Non-Precision Approach Obstacle Clearance Surface  
 Vertical Exaggeration X 10

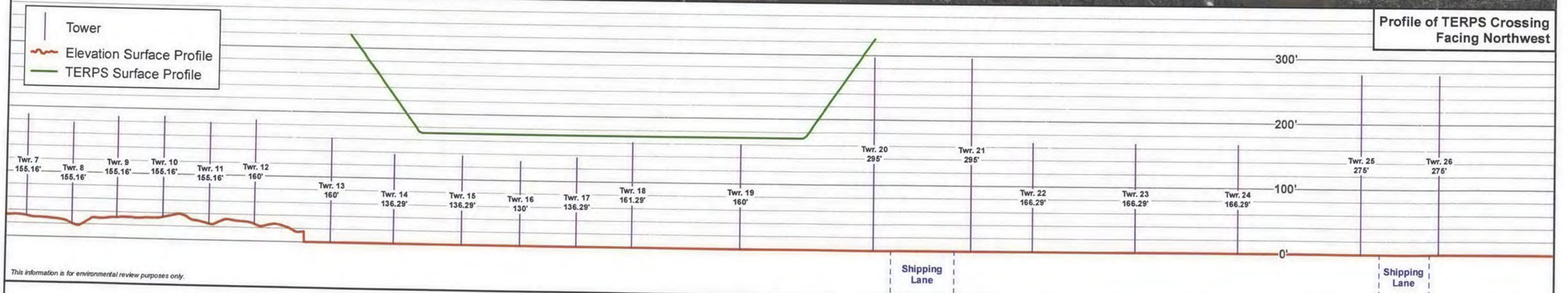
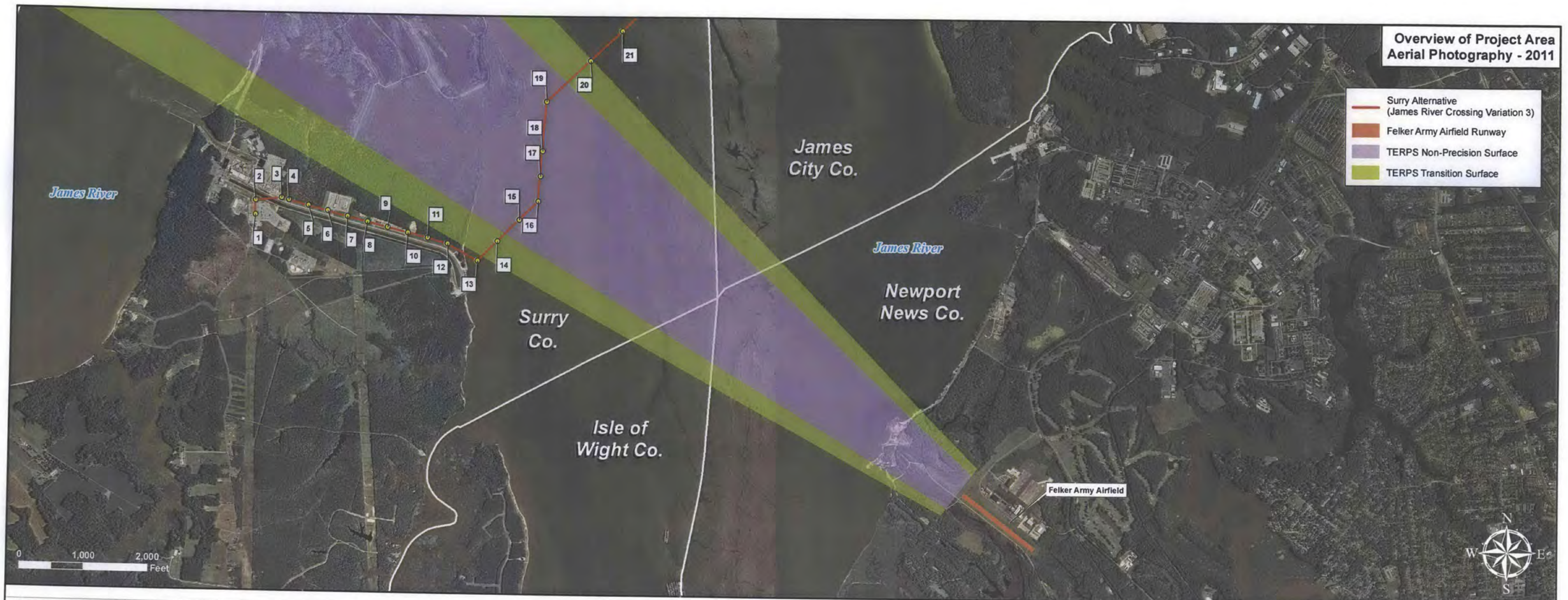






**Figure 3.1.3-5**  
**Surry - Skiffes Creek 500 kV Line, James River Crossing Variation 1**  
 Felker Army Airfield  
 TERPS Non-Precision Approach Obstacle Clearance Surface  
 Vertical Exaggeration X 10





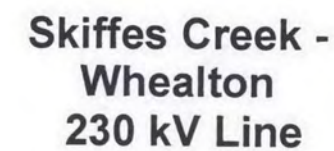
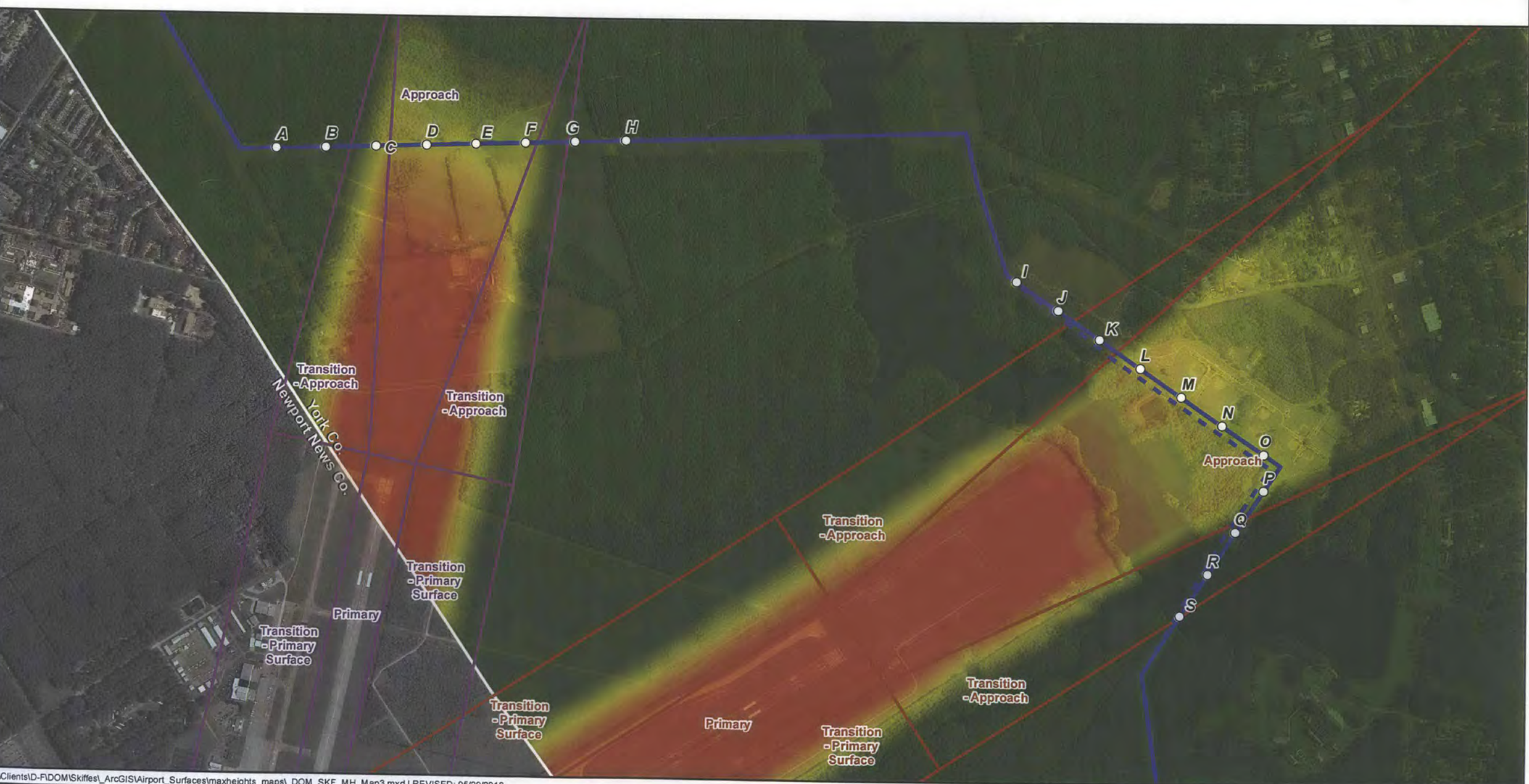
**Figure 3.1.3-6**  
**Surry - Skiffes Creek 500 kV Line, James River Crossing Variation 3**  
 Felker Army Airfield  
 TERPS Non-Precision Approach Obstacle Clearance Surface  
 Vertical Exaggeration X 10
























Profile of Maximum Tower Heights (Vertical Exaggeration x 10)

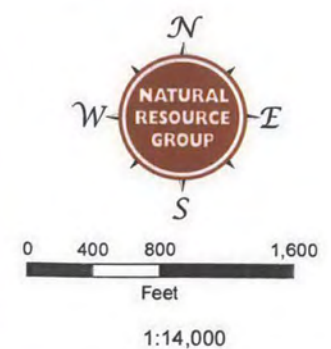
Point	Approximate Height (ft)
A	150
B	150
C	100
D	100
E	110
F	120
G	150
H	140
I	150
J	150
K	100
L	80
M	80
N	90
O	90
P	80
Q	100
R	120
S	150
T	150

Maximum Tower Height Profile

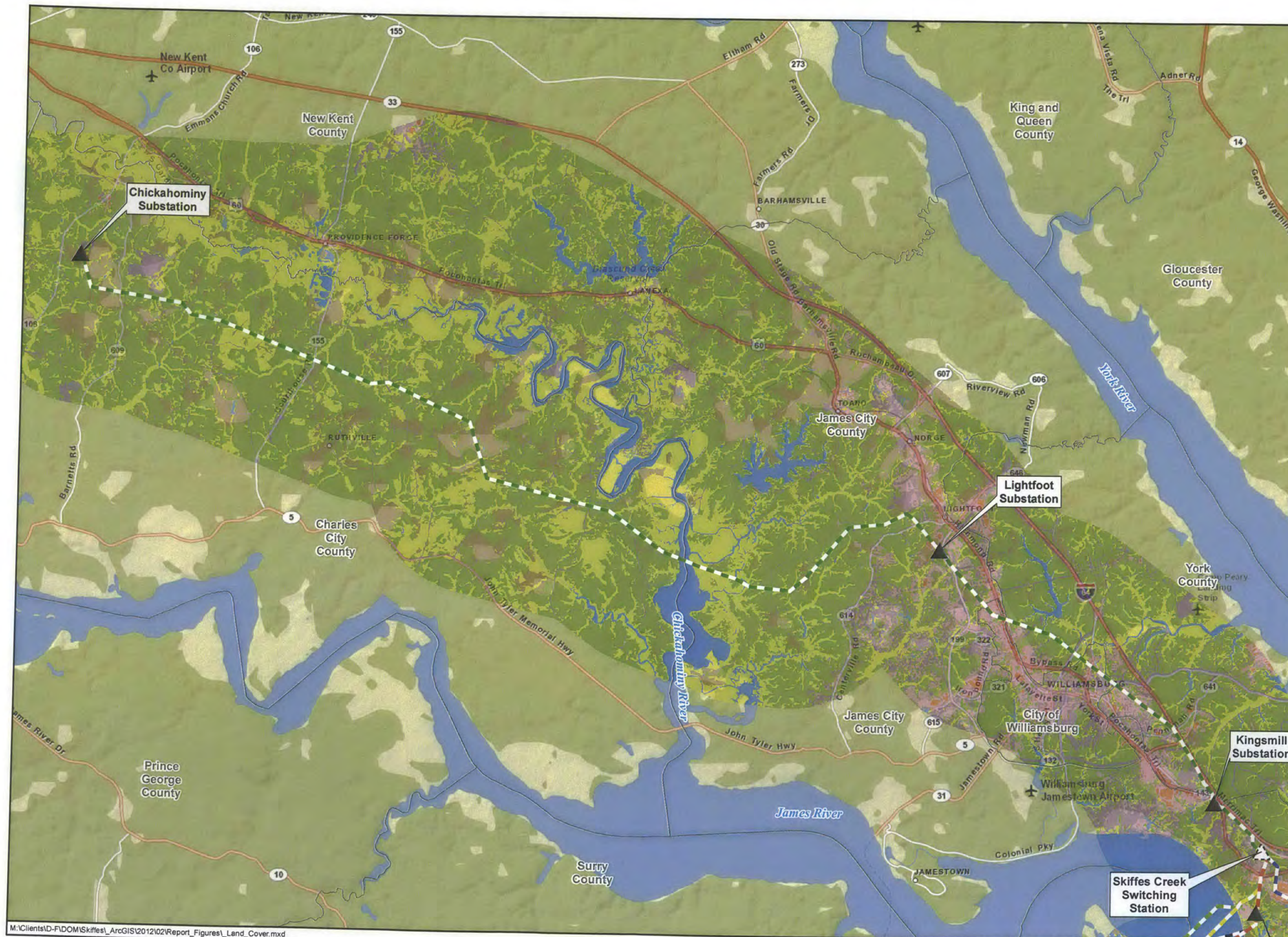


Allowable Tower  
Heights Near  
Newport News/  
Williamsburg Airport  
Existing Facilities

- 
-  230 kV Line, Existing  
 230 kV Line, Proposed  
 Civil Airport Imaginary Surface  
 20  
 25  
**Maximum Tower Height**  
 60' or Less  
 60-65'  
 65-70'  
 70-75'  
 75-80'  
 80-85'  
 85-90'  
 90 - 95  
 95-100'  
 100-105'  
 105-110'  
 110-115'  
 115-120'  
 120-125'  
 125-130'  
 Greater than 130'





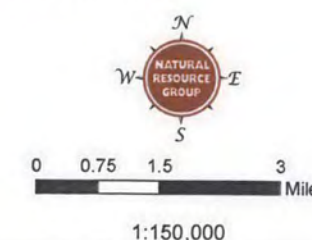


**Surry -  
Skiffes Creek 500 kV  
Transmission Line  
Skiffes Creek -  
Whealton 230 kV  
Transmission Line  
Skiffes Creek  
500 kV-230 kV-115 kV  
Switching Station**

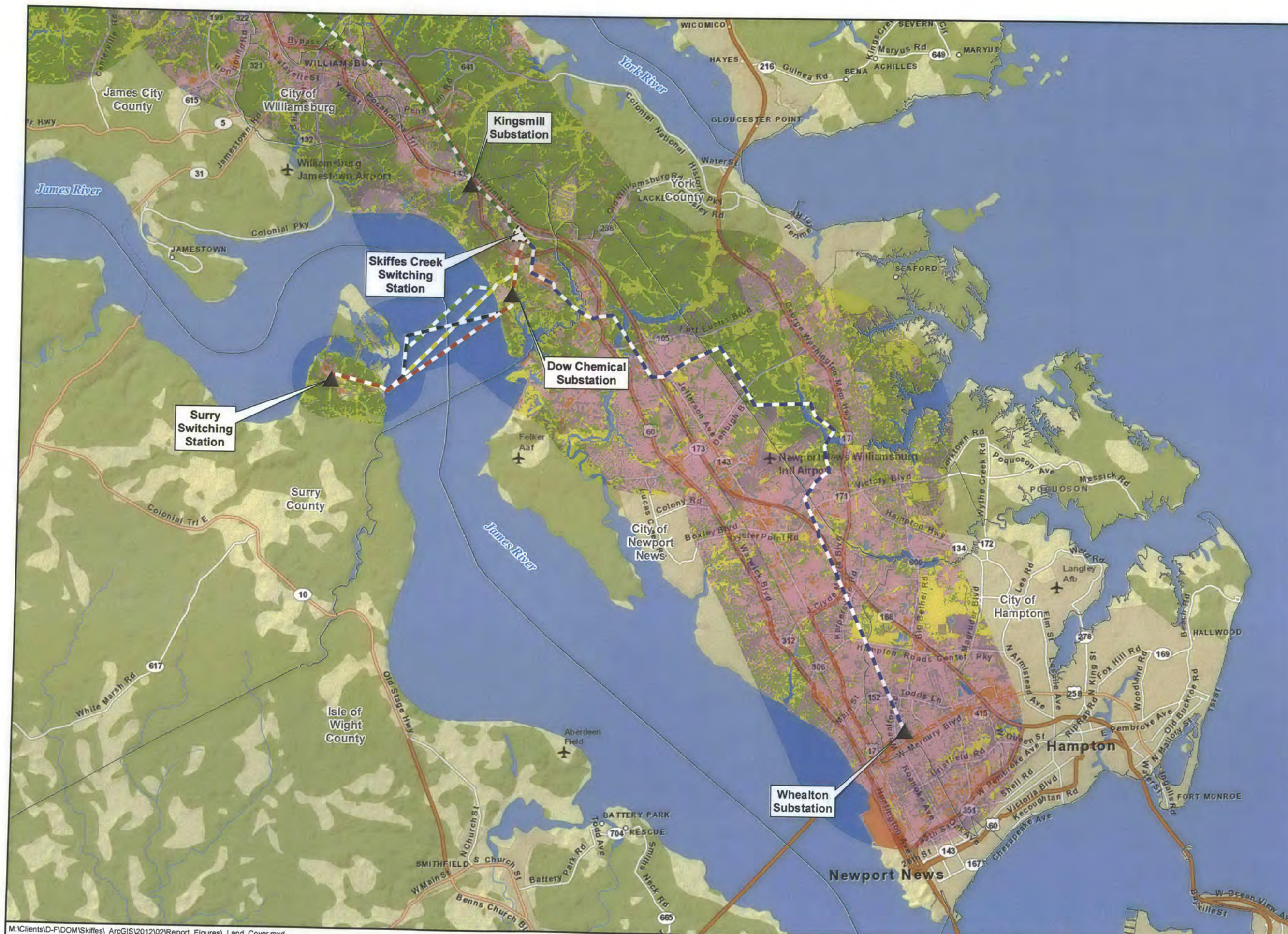
**Figure 3.1.4-1  
Land Cover Types  
in the Project Area**

- ▲ Existing Substation/  
Switching Station
- ▲ Proposed  
Switching  
Station
- Chickahominy  
Alternative
- Surry Alternative
- James River  
Crossing Variation 1
- James River  
Crossing Variation 2
- James River  
Crossing Variation 3
- Skiffes Creek to  
Whealton Section
- Agricultural Land
- Forested Land
- Developed, Open Space
- Developed, High Intensity
- Developed, Low Intensity
- Open Marshland
- Open Water

Sheet 1 of 2





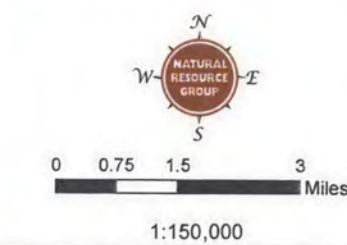


Surry -  
Skiffes Creek 500 kV  
Transmission Line  
Skiffes Creek -  
Whealton 230 kV  
Transmission Line  
Skiffes Creek  
500 kV-230 kV-115 kV  
Switching Station

Figure 3.1.4-1  
Land Cover Types  
in the Project Area

- Existing Substation/  
Switching Station
- Proposed  
Switching  
Station
- Chickahominy  
Alternative
- Surry Alternative
- James River  
Crossing Variation 1
- James River  
Crossing Variation 2
- James River  
Crossing Variation 3
- Skiffes Creek to  
Whealton Section
- Agricultural Land
- Forested Land
- Developed, Open Space
- Developed, High Intensity
- Developed, Low Intensity
- Open Marshland
- Open Water

Sheet 2 of 2





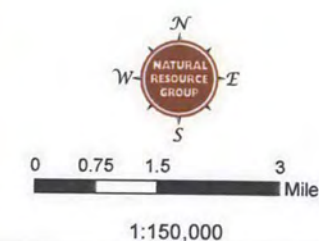


Surry -  
Skiffes Creek 500 kV  
Transmission Line  
Skiffes Creek -  
Wheaton 230 kV  
Transmission Line  
Skiffes Creek  
500 kV-230 kV-115 kV  
Switching Station

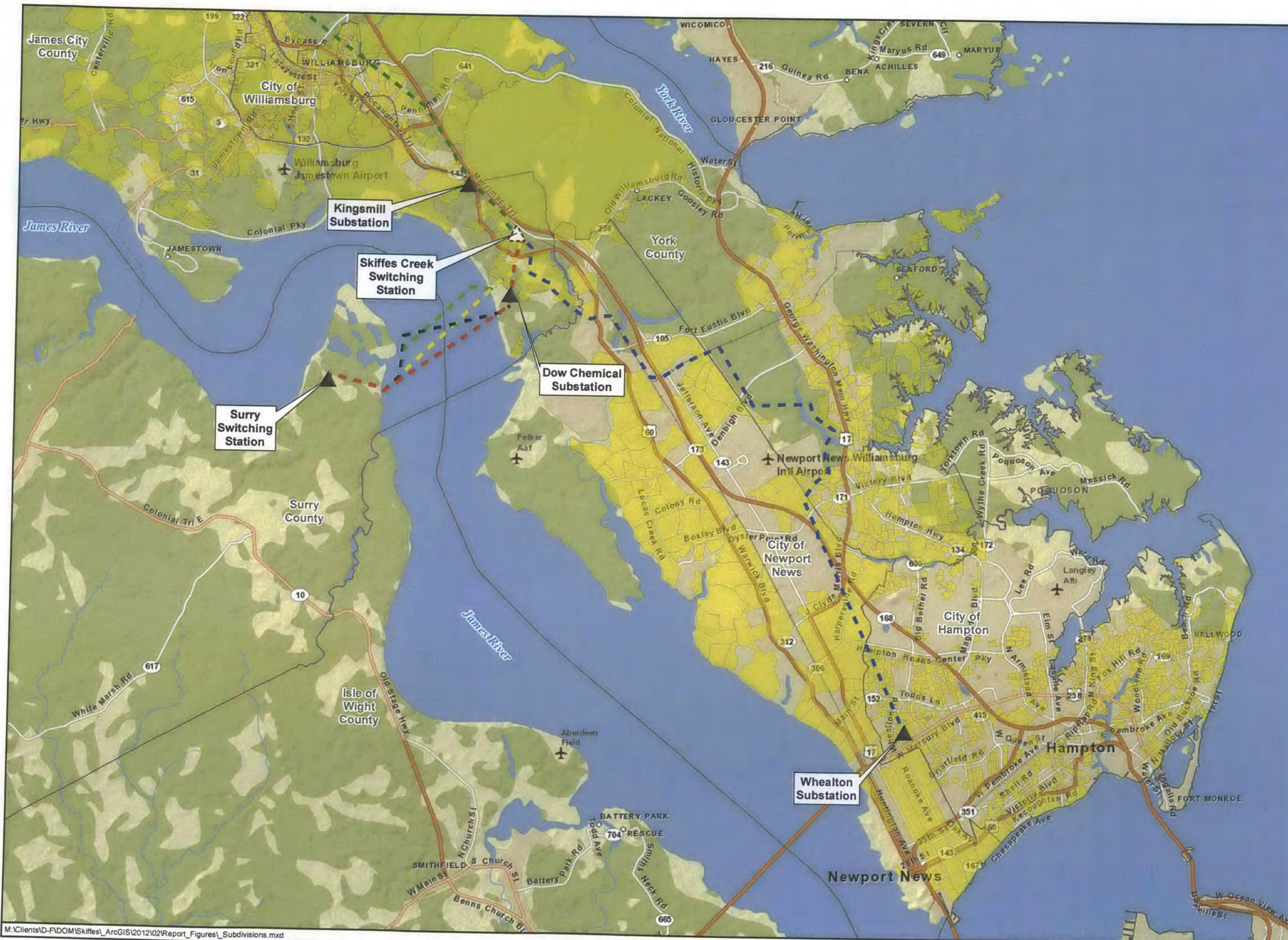
Figure 3.1.4-2  
Existing Subdivisions

- ▲ Existing Substation/  
Switching Station
- ▲ Proposed  
Switching  
Station
- Chickahominy  
Alternative
- Skiffes Creek to  
Wheaton Section
- Surry Alternative
- James River  
Crossing Variation 1
- James River  
Crossing Variation 2
- James River  
Crossing Variation 3
- Existing Subdivision

Sheet 1 of 2





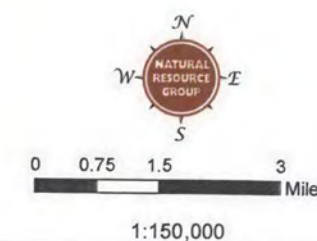


**Surry -  
 Skiffes Creek 500 kV  
 Transmission Line**  
**Skiffes Creek -  
 Wheulton 230 kV  
 Transmission Line**  
**Skiffes Creek  
 500 kV-230 kV-115 kV  
 Switching Station**

**Figure 3.1.4-2  
 Existing Subdivisions**

- ▲ Existing Substation/  
Switching Station
- △ Proposed  
Switching  
Station
- Chickahominy  
Alternative
- Skiffes Creek to  
Wheulton Section
- Surry Alternative
- James River  
Crossing Variation 1
- James River  
Crossing Variation 2
- James River  
Crossing Variation 3
- Existing Subdivision

Sheet 2 of 2





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

**Figure 3.1.5-1**  
 Planned Developments  
 and Development Centers

- ▲ Existing Substation/  
Switching Station
- △ Proposed  
Switching  
Station
- ◆ Chickahominy  
Alternative
- ◆ Skiffes Creek to  
Whealton Section
- Planned Development
- Development Center

Sheet 1 of 5









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Feet

1:16,000

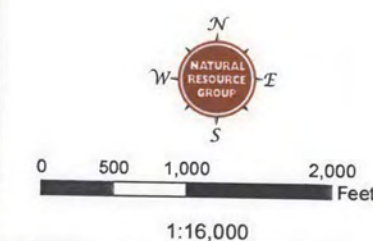


Surry -  
 Skiffes Creek 500 kV  
 Transmission Line  
 Skiffes Creek -  
 Whealton 230 kV  
 Transmission Line  
 Skiffes Creek  
 500 kV-230 kV-115 kV  
 Switching Station

**Figure 3.1.5-1**  
 Planned Developments  
 and Development Centers

-  Existing Substation/  
Switching Station
-  Proposed  
Switching  
Station
-  Chickahominy  
Alternative
-  Skiffes Creek to  
Whealton Section
-  Planned Development
-  Development Center

Sheet 2 of 5





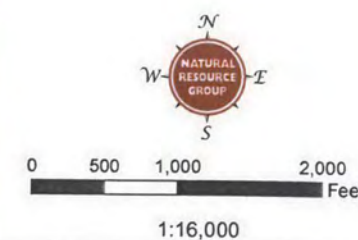


Surry -  
Skiffes Creek 500 kV  
Transmission Line  
Skiffes Creek -  
Wheaton 230 kV  
Transmission Line  
Skiffes Creek  
500 kV-230 kV-115 kV  
Switching Station

**Figure 3.1.5-1**  
Planned Developments  
and Development Centers

- ▲ Existing Substation/  
Switching Station
- △ Proposed  
Switching  
Station
- ◆ Chickahominy  
Alternative
- ◆ Skiffes Creek to  
Wheaton Section
- Planned Development
- Development Center

Sheet 3 of 5



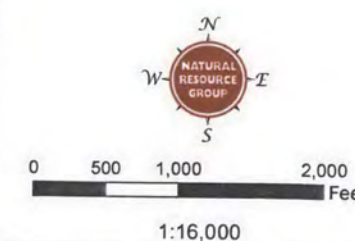


Surry -  
 Skiffes Creek 500 kV  
 Transmission Line  
 Skiffes Creek -  
 Whealton 230 kV  
 Transmission Line  
 Skiffes Creek  
 500 kV-230 kV-115 kV  
 Switching Station

**Figure 3.1.5-1**  
 Planned Developments  
 and Development Centers

- ▲ Existing Substation/  
Switching Station
- △ Proposed  
Switching  
Station
- ◆ Chickahominy  
Alternative
- ◆ Skiffes Creek to  
Whealton Section
- Planned Development
- Development Center

Sheet 4 of 5













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

**Figure 3.1.5-1**  
Planned Developments  
and Development Centers

-  Existing Substation/  
Switching Station
-  Proposed  
Switching  
Station
-  Chickahominy  
Alternative
-  Skiffes Creek to  
Whealton Section
-  Planned Development
-  Development Center

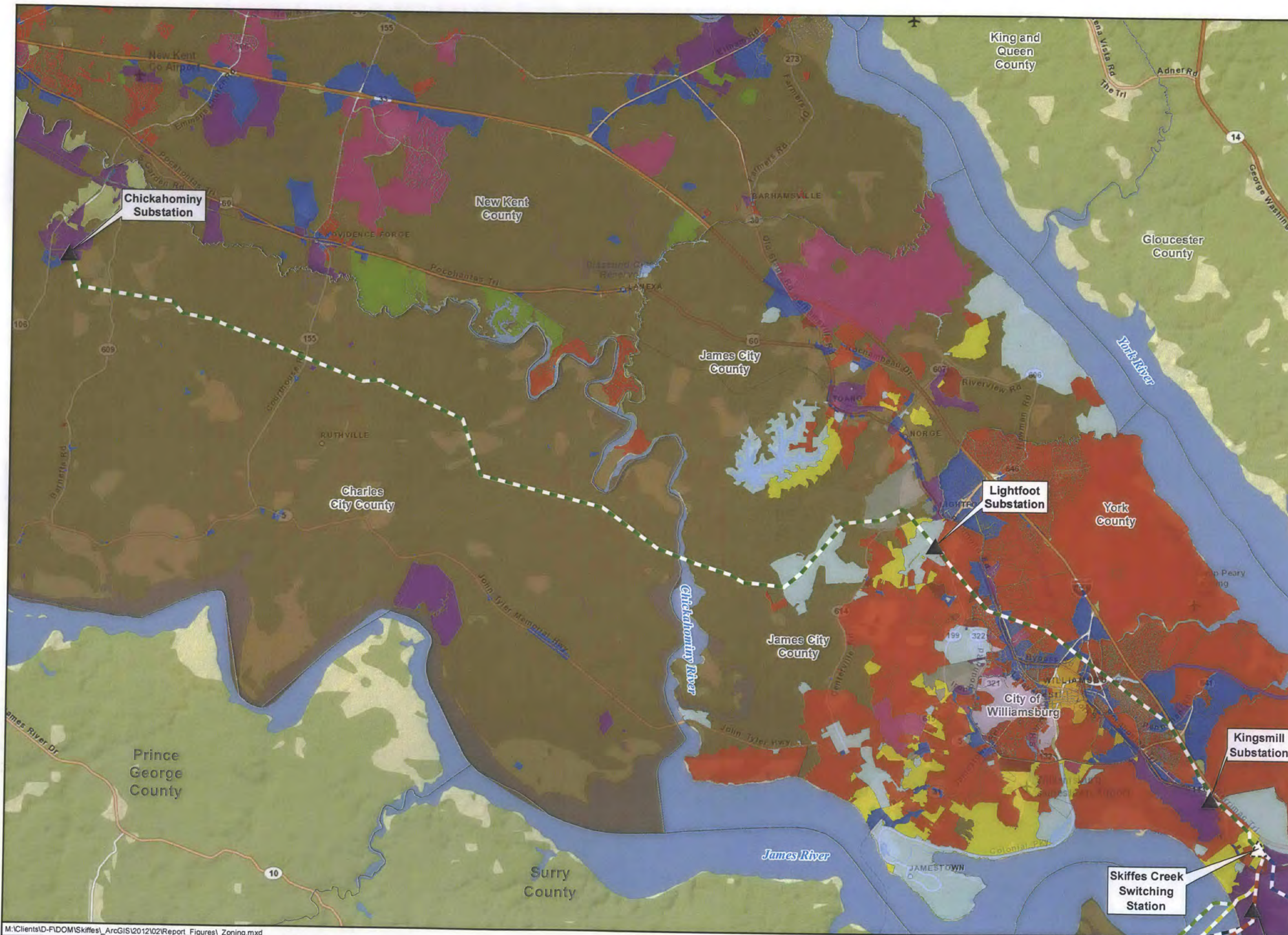
Sheet 5 of 5



0 500 1,000 2,000  
Feet

1:16,000



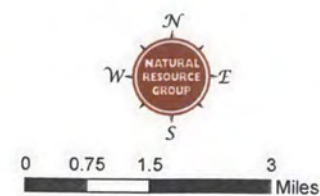


**Surry -  
Skiffes Creek 500 kV  
Transmission Line  
Skiffes Creek -  
Wheelton 230 kV  
Transmission Line  
Skiffes Creek  
500 kV-230 kV-115 kV  
Switching Station**

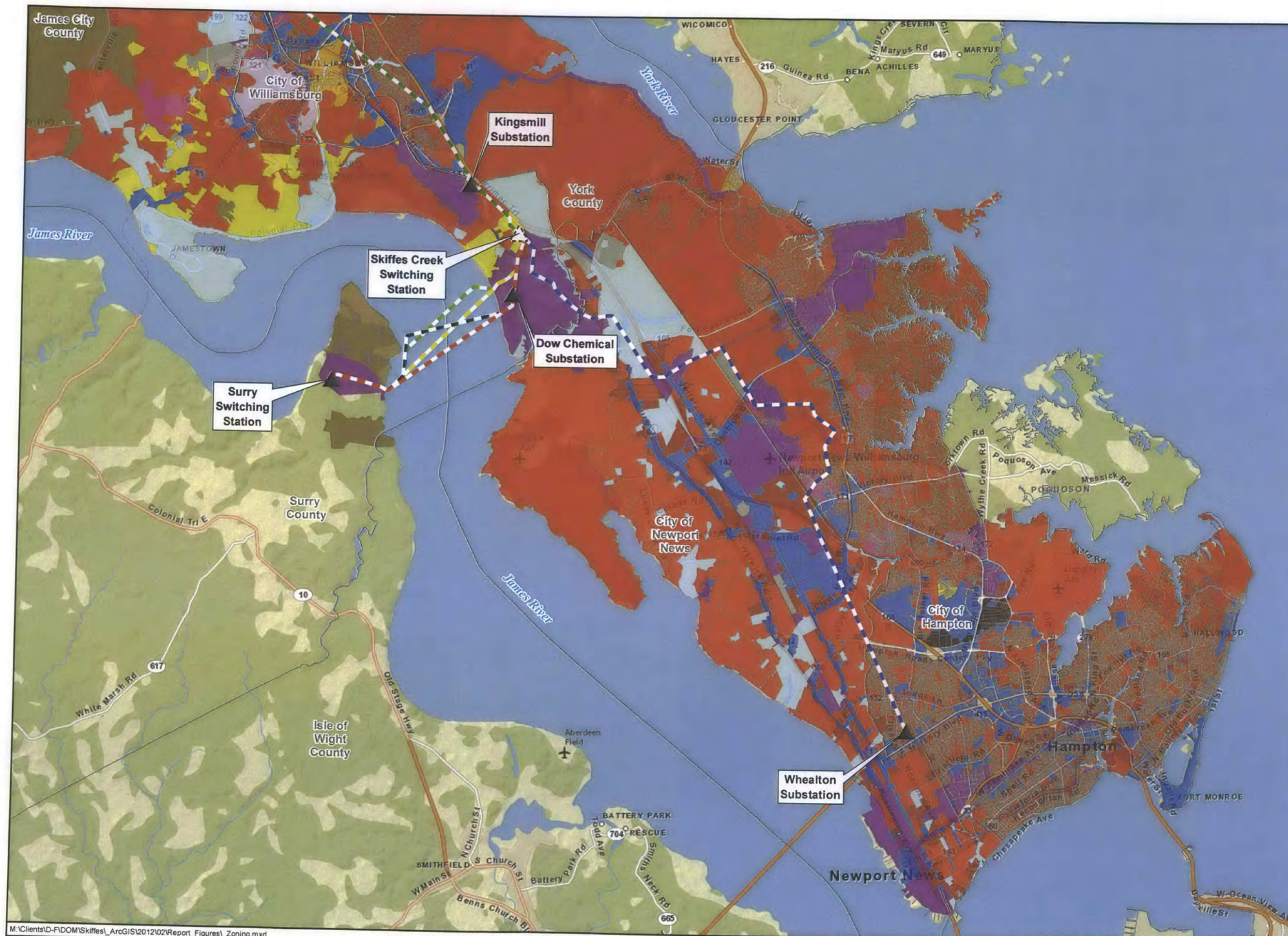
**Figure 3.1.6-1  
Zoning Districts  
in the Project Area**

- ▲ Existing Substation/  
Switching Station
- ▲ Proposed  
Switching  
Station
- ◆ Chickahominy  
Alternative
- ◆ Skiffes Creek to  
Wheelton Section
- ◆ Surry Alternative
- ◆ James River  
Crossing Variation 1
- ◆ James River  
Crossing Variation 2
- ◆ James River  
Crossing Variation 3
- Agricultural
- Commercial
- Industrial
- Multi-Family Residential
- Single-Family Residential
- Rural Residential
- Historic Areas
- Planned Development
- Recreational Areas
- Special Public Interest Areas
- Langley Flight Approach
- William and Mary District
- Mixed Use

Sheet 1 of 2





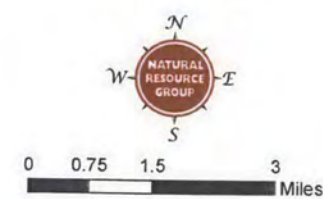


**Surry -  
Skiffes Creek 500 kV  
Transmission Line  
Skiffes Creek -  
Wheaton 230 kV  
Transmission Line  
Skiffes Creek  
500 kV-230 kV-115 kV  
Switching Station**

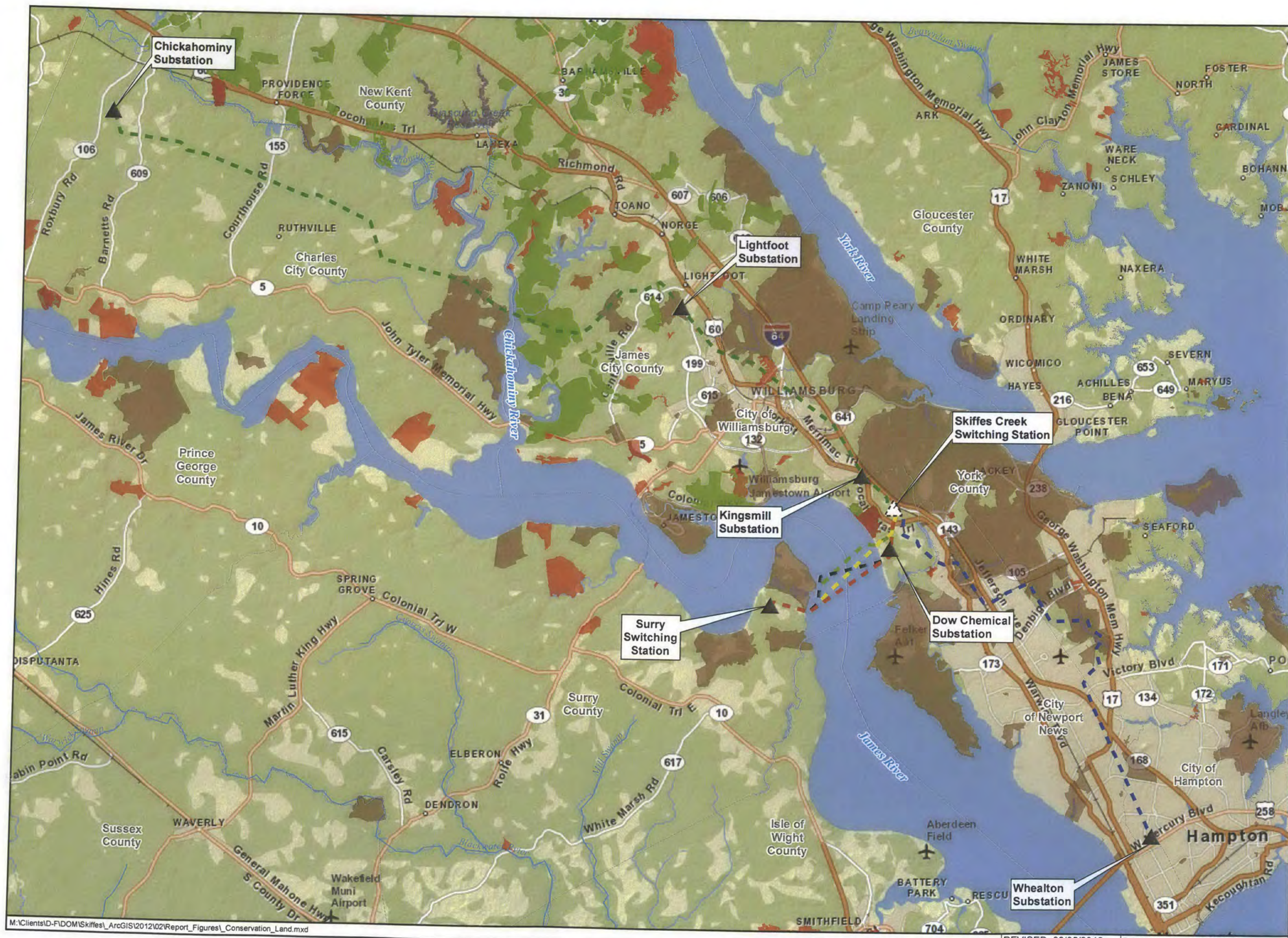
**Figure 3.1.6-1  
Zoning Districts  
in the Project Area**

- ▲ Existing Substation/  
Switching Station
- ▲ Proposed  
Switching  
Station
- ◆ Chickahominy  
Alternative
- ◆ Skiffes Creek to  
Wheaton Section
- ◆ Surry Alternative
- ◆ James River  
Crossing Variation 1
- ◆ James River  
Crossing Variation 2
- ◆ James River  
Crossing Variation 3
- Agricultural
- Commercial
- Industrial
- Multi-Family Residential
- Single-Family Residential
- Rural Residential
- Historic Areas
- Planned Development
- Recreational Areas
- Special Public Interest Areas
- Langley Flight Approach
- William and Mary District
- Mixed Use

Sheet 2 of 2



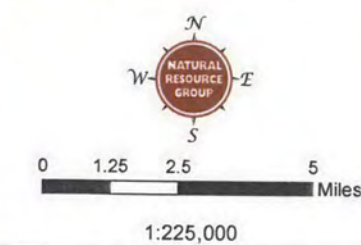




**Surry -**  
**Skiffes Creek 500 kV**  
**Transmission Line**  
**Skiffes Creek -**  
**Whealton 230 kV**  
**Transmission Line**  
**Skiffes Creek**  
**500 kV-230 kV-115 kV**  
**Switching Station**

**Figure 3.1.7-1**  
**Conservation Easements**  
**and Other Conservation**  
**Land in the Study Area**

- ▲ Existing Substation/  
Switching Station
- △ Proposed  
Switching  
Station
- Chickahominy  
Alternative
- Surry Alternative
- James River  
Crossing Variation 1
- James River  
Crossing Variation 2
- James River  
Crossing Variation 3
- Skiffes Creek to  
Whealton Section
- Conservation  
Easements
- Conservation Lands
- Agricultural/  
Forestral District



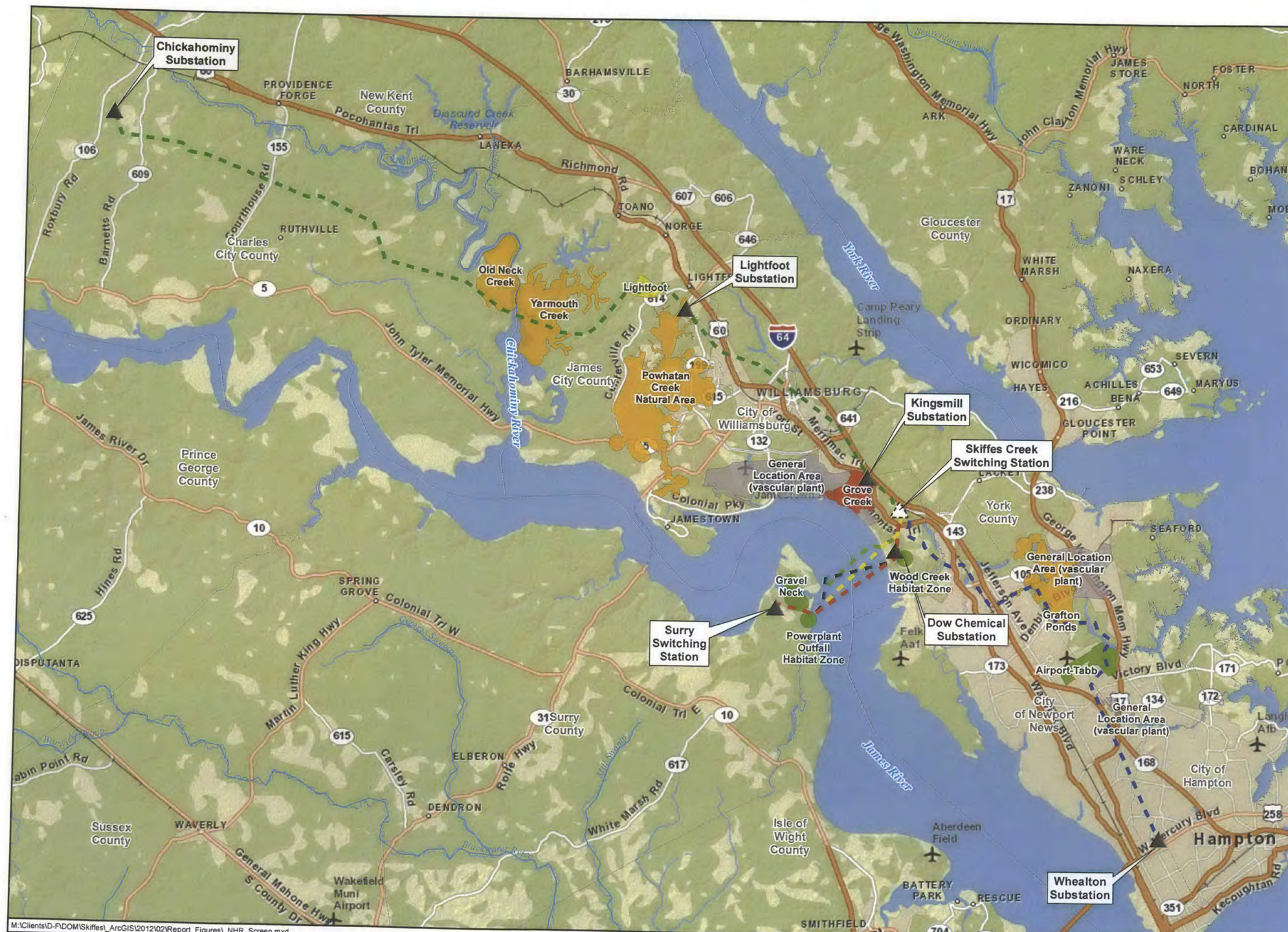
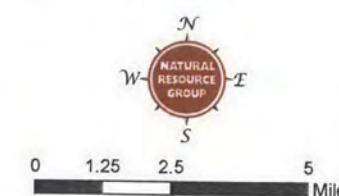




**Surry -  
Skiffes Creek 500 kV  
Transmission Line  
Skiffes Creek -  
Wheaton 230 kV  
Transmission Line  
Skiffes Creek  
500 kV-230 kV-115 kV  
Switching Station**

**Figure 3.2.3-1**  
Department of Conservation  
and Recreation - Natural  
Heritage Resources  
Screen Map

- ▲ Existing Substation/  
Switching Station
- ⬢ Proposed  
Switching  
Station
- Chickahominy  
Alternative
- Skiffes Creek to  
Wheaton Section
- Surry Alternative
- James River  
Crossing Variation 1
- James River  
Crossing Variation 2
- James River  
Crossing Variation 3
- B1 - Outstanding
- B2 - Very High
- B3 - High
- B4 - Moderate
- B5 - General Interest/  
Open Space
- Not Ranked



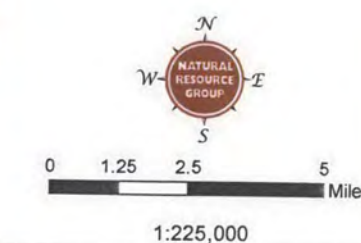




Surry -  
Skiffes Creek 500 kV  
Transmission Line  
Skiffes Creek -  
Wheaton 230 kV  
Transmission Line  
Skiffes Creek  
500 kV-230 kV-115 kV  
Switching Station

Figure 3.2.4-1  
Bald Eagle Nests  
in the Project Area

- Existing Substation/  
Switching Station
- Proposed  
Switching Station
- Eagle Nest
- Chickahominy  
Alternative
- Surry Alternative
- James River  
Crossing Variation 1
- James River  
Crossing Variation 2
- James River  
Crossing Variation 3
- Skiffes Creek to  
Wheaton Section
- 750' Primary  
Nest Buffer
- 1320' Secondary  
Nest Buffer







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

Figure 3.4.2-1  
Historical and  
Architectural Sites  
in the Project Area

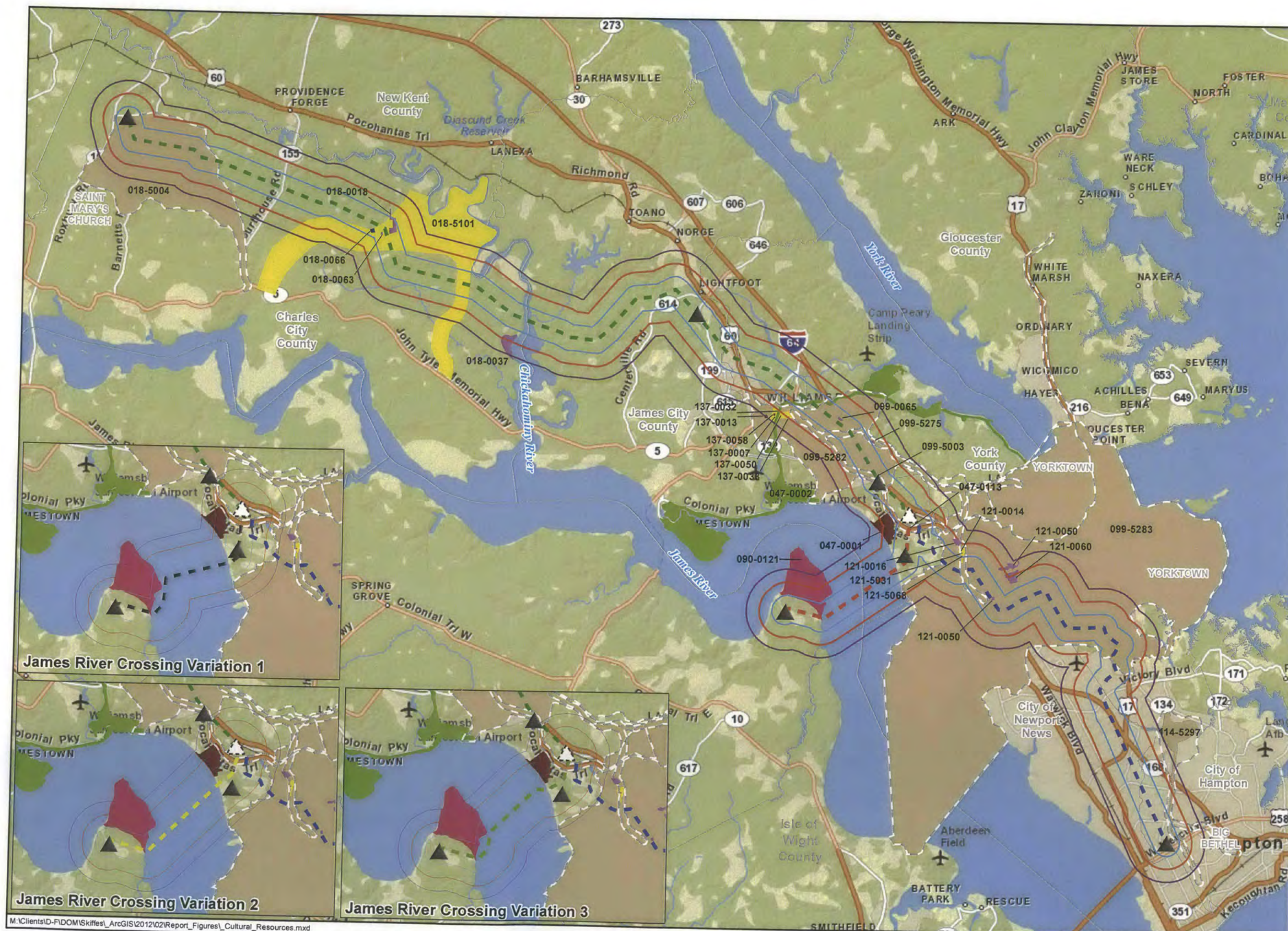
- Existing Substation/  
Switching Station
- Proposed  
Switching  
Station
- Chickahominy  
Alternative
- Skiffes Creek to  
Wheaton Section
- James River  
Crossing Variation
- Battlefield
- Historic District
- NHRP-Eligible
- NHRP
- Unevaluated
- VLR
- VLR and NHRP
- VLR<sup>1</sup>, NHRP<sup>2</sup>,  
and NHL
- ABPP Study Area
- 0.5 Mile Buffer
- 1 Mile Buffer
- 1.5 Mile Buffer

<sup>1</sup>VLR: Virginia Landmarks Register  
<sup>2</sup>NHRP: National Register of Historic Places  
<sup>3</sup>NHL: National Historic Landmark



1:225,000

0 1.25 2.5 5  
Miles



REVISED: 06/05/2012 DRAWN BY: JPBOENTJE



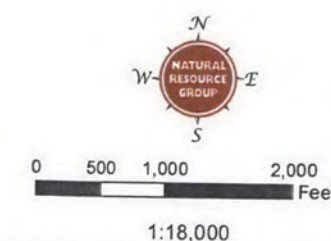


Surry -  
Skiffes Creek 500 kV  
Transmission Line  
Skiffes Creek -  
Wheaton 230 kV  
Transmission Line  
Skiffes Creek  
500 kV-230 kV-115 kV  
Switching Station

Figure 3.5.3-1  
Oyster Beds Crossed  
in the James River

Structures

- Surry Alternative
- James River Crossing Variation 1
- James River Crossing Variation 2
- James River Crossing Variation 3
- Surry Alternative
- James River Crossing Variation 1
- James River Crossing Variation 2
- James River Crossing Variation 3
- Oyster Bed



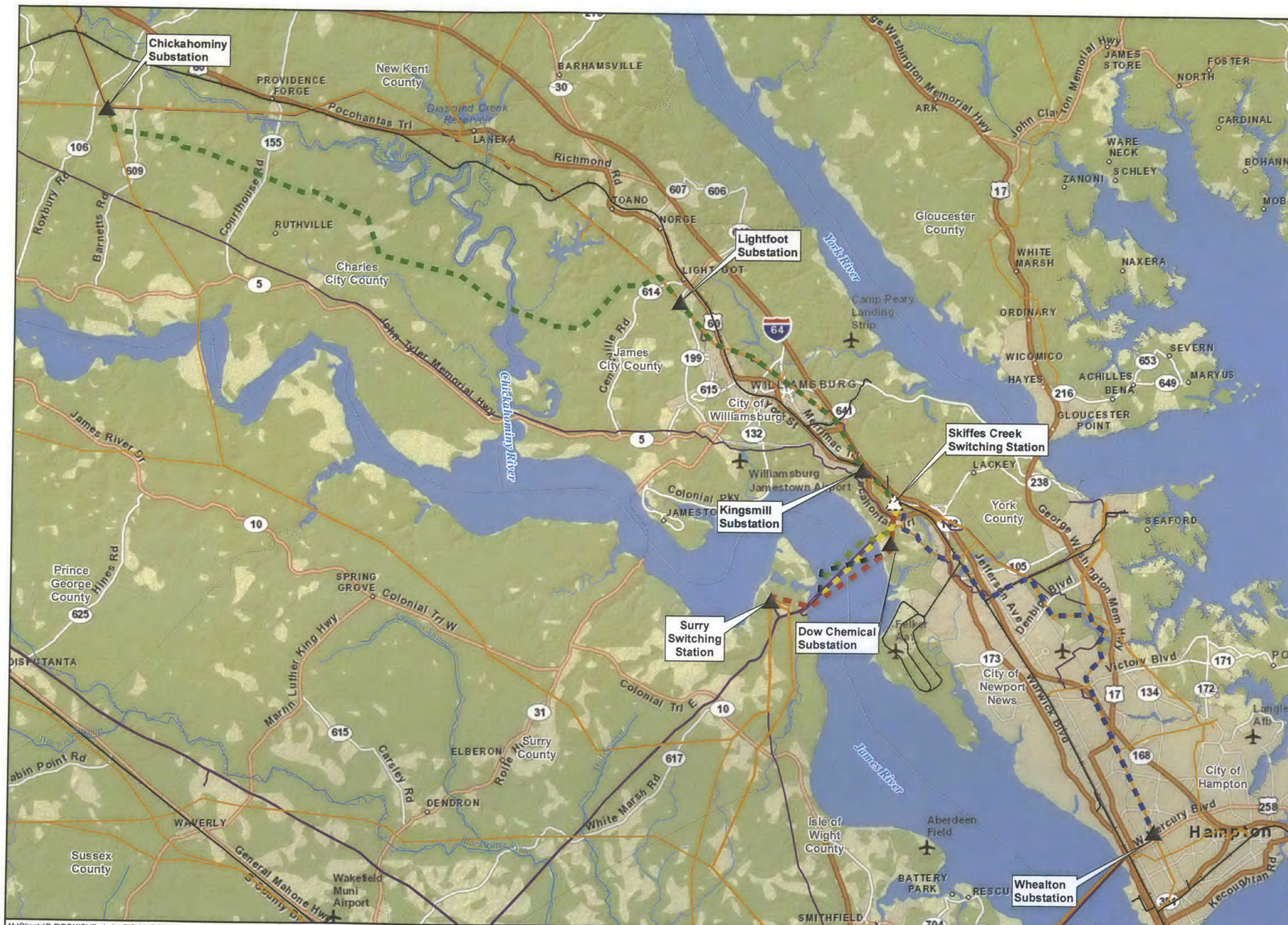
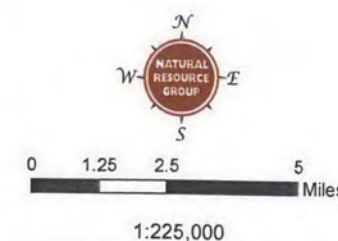




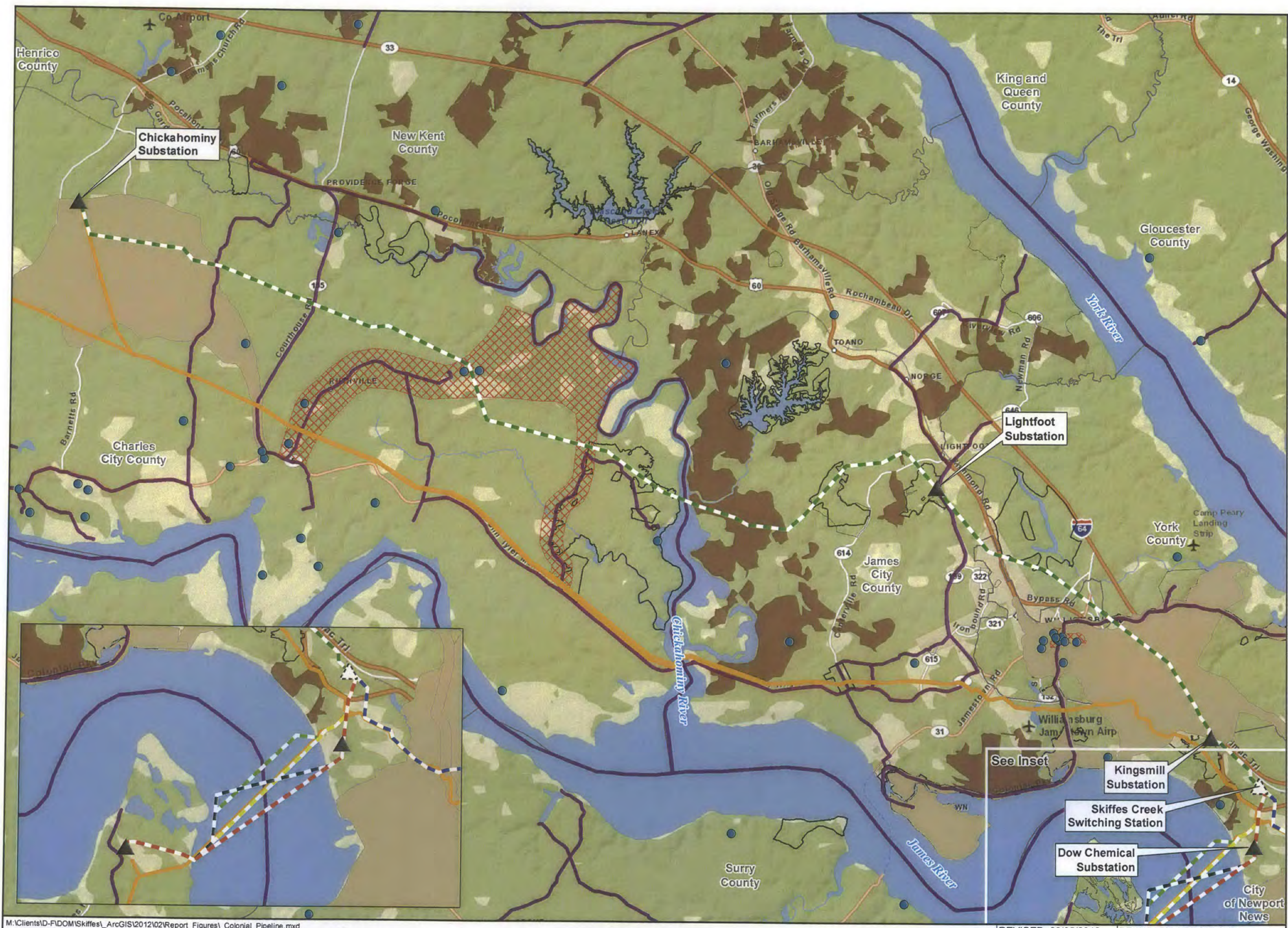
Surry -  
Skiffes Creek 500 kV  
Transmission Line  
Skiffes Creek -  
Wheaton 230 kV  
Transmission Line  
Skiffes Creek  
500 kV-230 kV-115 kV  
Switching Station

Figure 3.7-1  
Existing Corridors  
in the Study Area

- ▲ Existing Substation/  
Switching Station
- △ Proposed  
Switching Station
- ◆ Chickahominy  
Alternative
- ◆ Surry Alternative
- ◆ James River  
Crossing Variation 1
- ◆ James River  
Crossing Variation 2
- ◆ James River  
Crossing Variation 3
- ◆ Skiffes Creek to  
Wheaton Section
- Transmission Line
- Pipeline
- Railroad



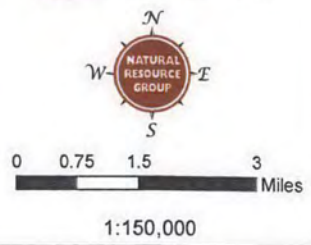




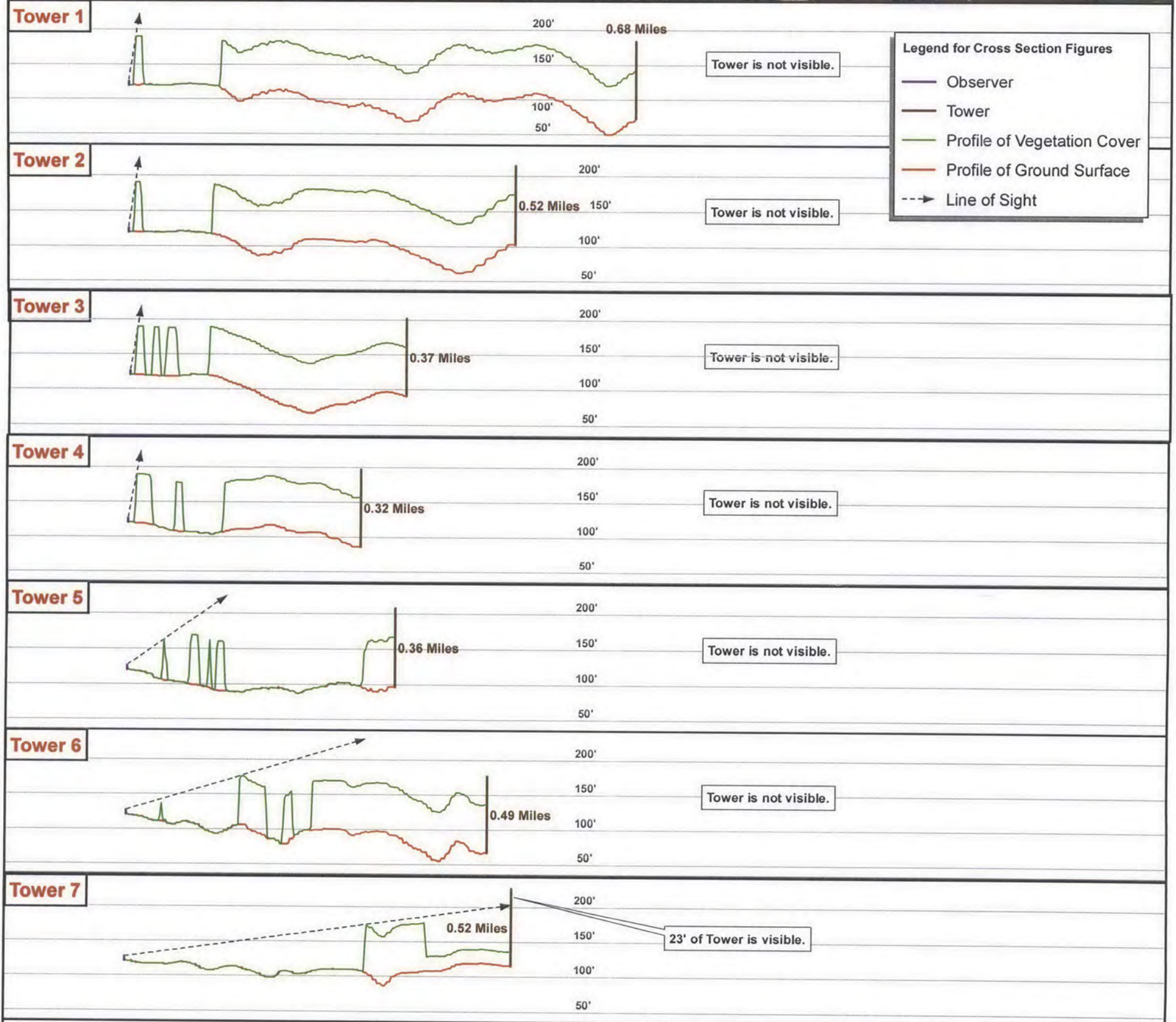
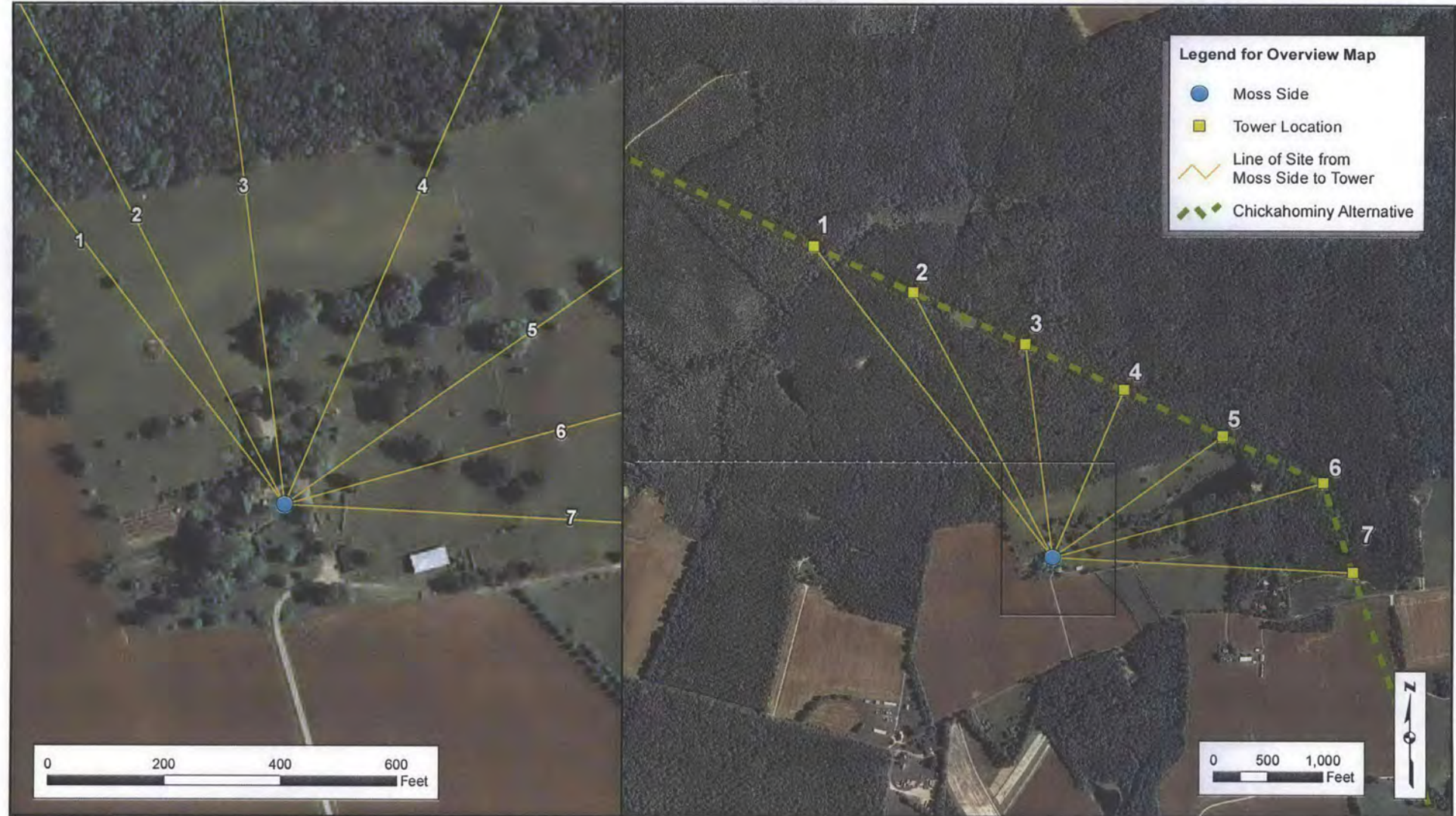
Surry -  
 Skiffes Creek 500 kV  
 Transmission Line  
 Skiffes Creek -  
 Wheelton 230 kV  
 Transmission Line  
 Skiffes Creek  
 500 kV-230 kV-115 kV  
 Switching Station

**Figure 3.7-2**  
**Colonial Pipeline**  
**Route**

- ▲ Existing Substation/  
Switching Station
- ▲ Proposed  
Switching  
Station
- Chickahominy  
Alternative
- Surry Alternative
- James River  
Crossing Variation 1
- James River  
Crossing Variation 2
- James River  
Crossing Variation 3
- Skiffes Creek to  
Wheelton Section
- Colonial Pipeline
- NRHP Site
- Trail/Scenic Byway
- Recreation Area
- ▨ Historic  
Architectural District
- Historic  
Architecture Site
- Agricultural/  
Forestral District
- Federal Land
- State Land
- County Land
- City Land
- Colonial Williamsburg



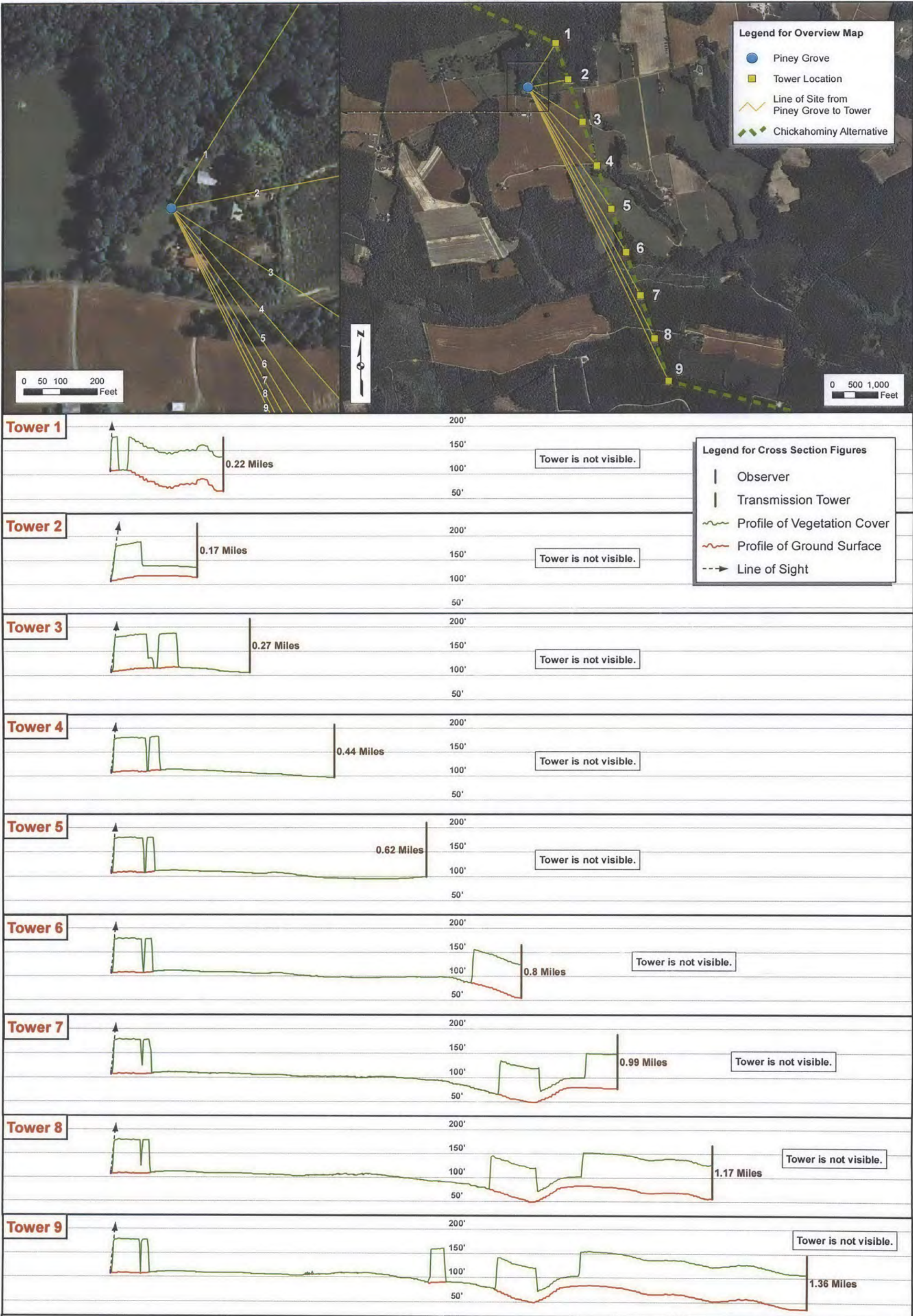




**Figure 4.1.4-1**  
**Surry - Skiffes Creek 500 kV Transmission Line**  
 Line of Sight and Tower Visibility Analysis from Moss Side  
 Chickahominy Alternative  
 Vertical Exaggeration X 5



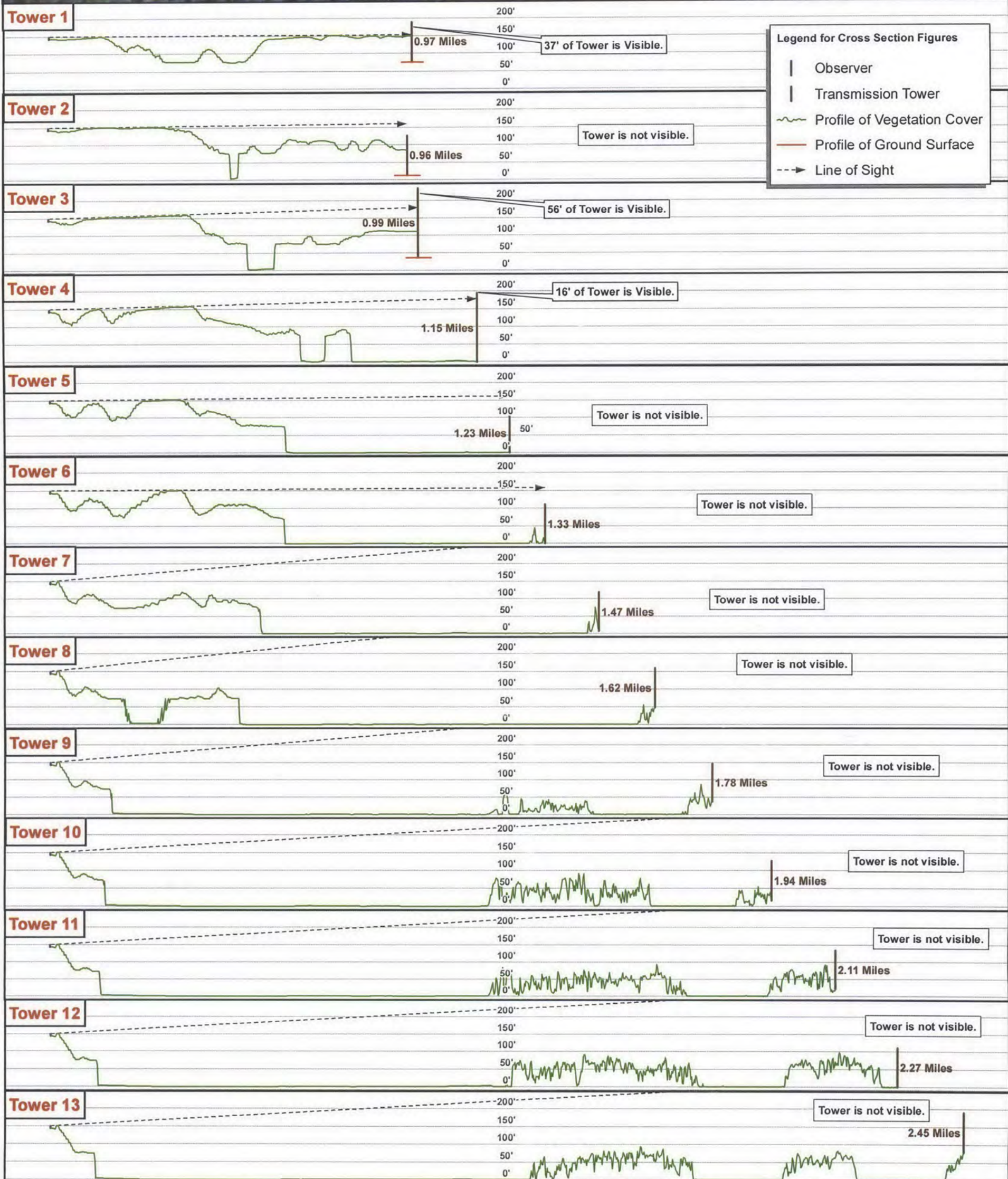




**Figure 4.1.4-2**  
**Surry - Skiffes Creek 500 kV Transmission Line**  
Line of Sight and Tower Visibility Analysis from Piney Grove  
Chickahominy Alternative  
Vertical Exaggeration X 5





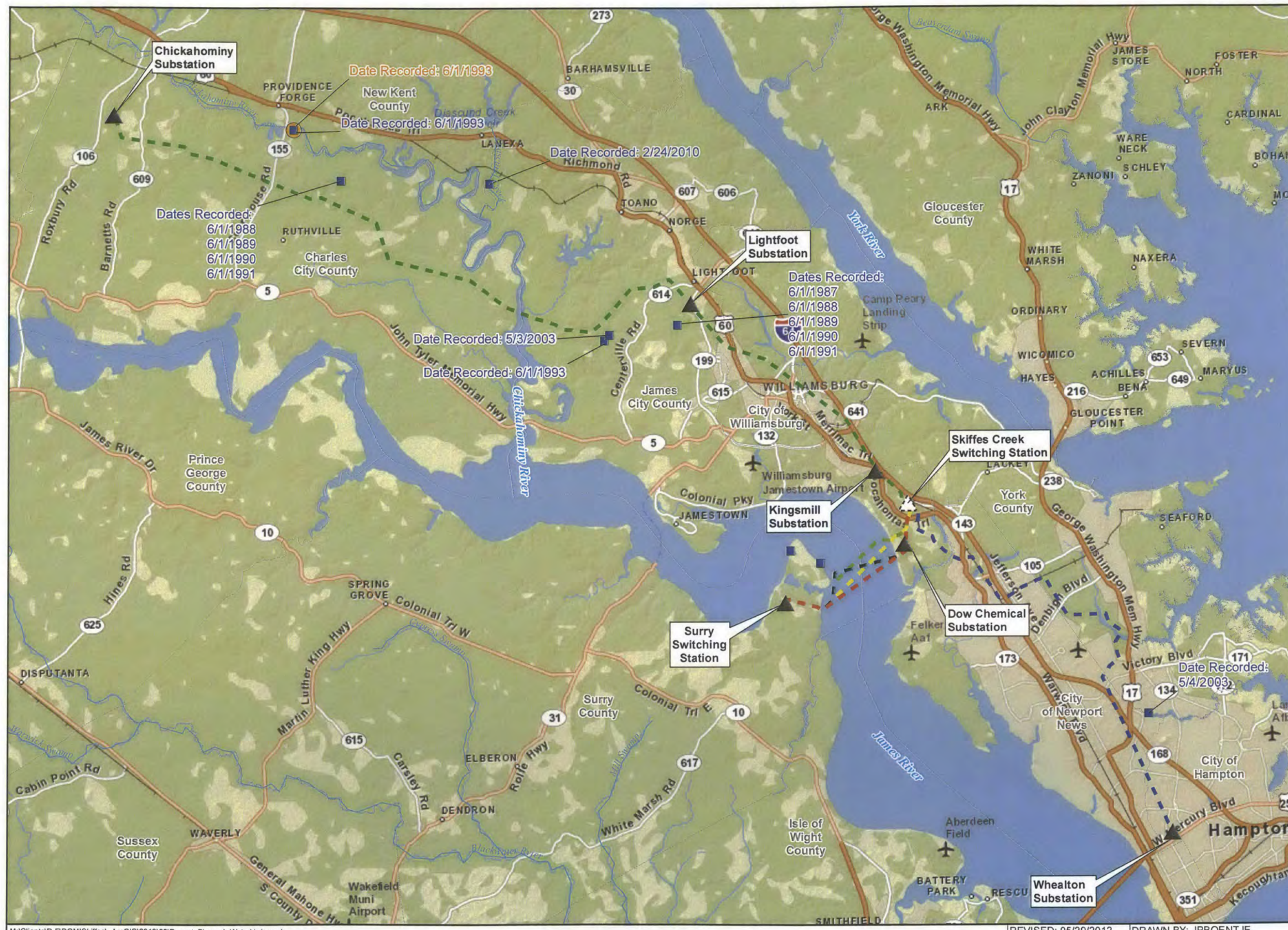
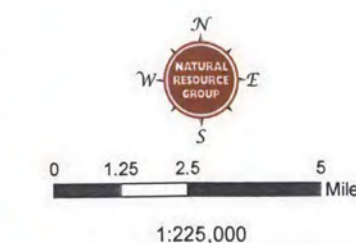




**Surry -  
Skiffes Creek 500 kV  
Transmission Line  
Skiffes Creek -  
Wheaton 230 kV  
Transmission Line  
Skiffes Creek  
500 kV-230 kV-115 kV  
Switching Station**

**Figure 4.2.2-1  
Colonial Waterbirds  
in the Study Area**

-  Great Egret
-  Great Blue Heron
-  Existing Substation/  
Switching Station
-  Proposed  
Switching  
Station
-  Chickahominy  
Alternative
-  Surry Alternative
-  James River  
Crossing Variation 1
-  James River  
Crossing Variation 2
-  James River  
Crossing Variation 3
-  Skiffes Creek to  
Wheaton Section





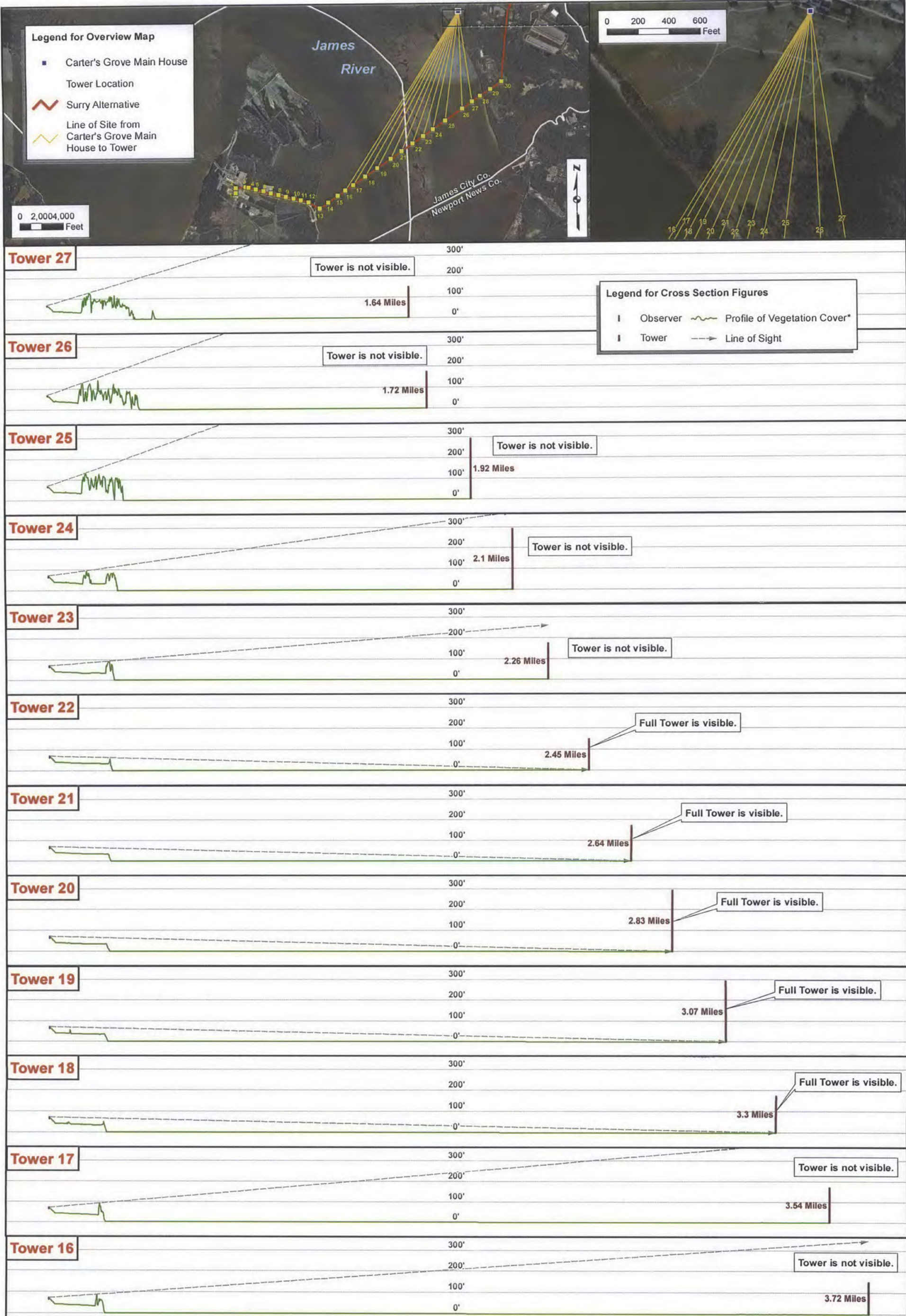


Figure 4.2.4-1

Surry - Skiffes Creek 500 kV Transmission Line

James River Crossing

Line of Sight and Tower Visibility Analysis from Carter's Grove House

Surry Alternative

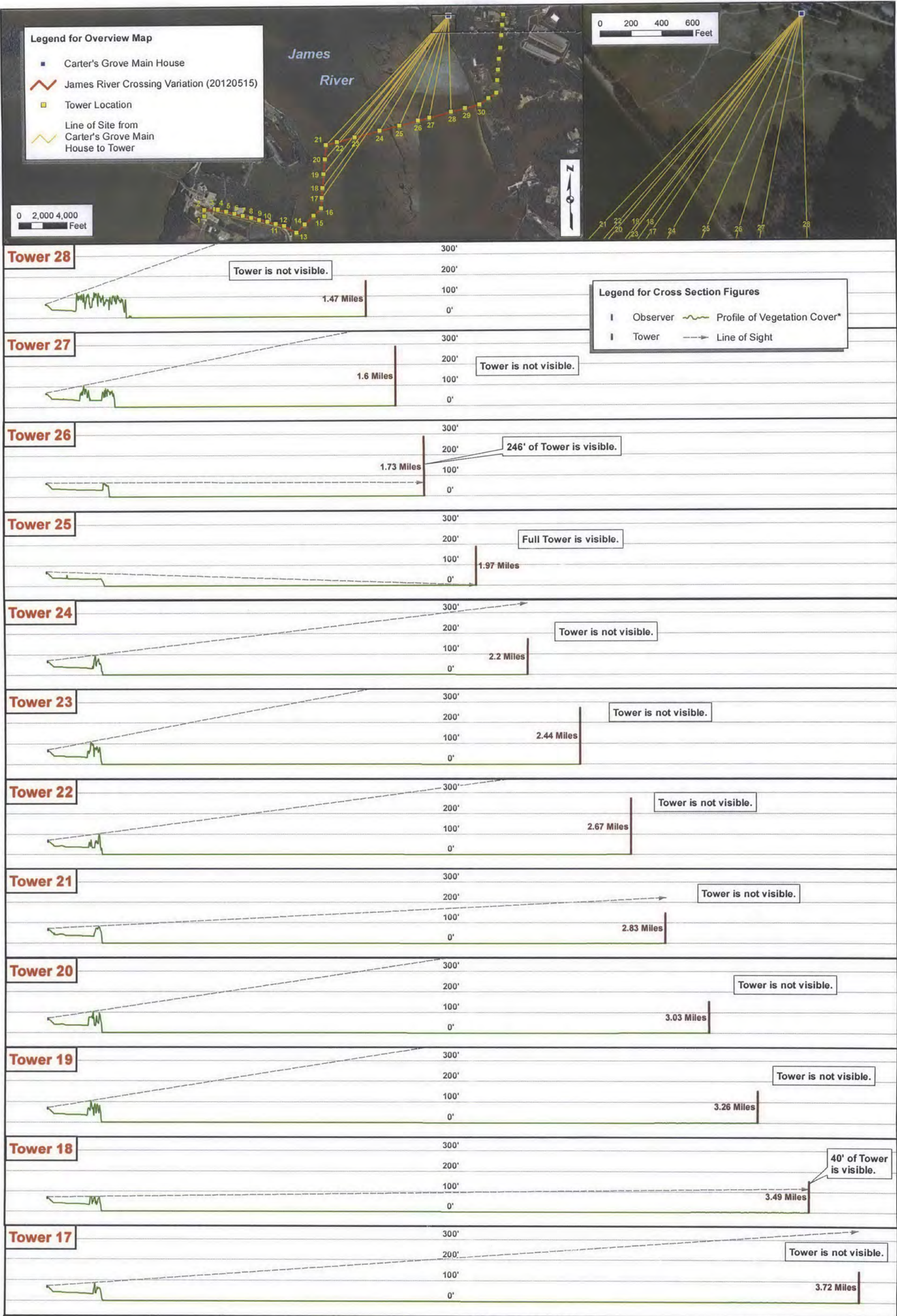
Vertical Exaggeration X 5



\*Elevation Data: 2010 11-County Coastal LIDAR DSM Files Representing Elevation of Vegetation Cover. Downloaded from College of William and Mary, Center for Geospatial Analysis - <http://www.wm.edu/as/cga/Data%20Services/VALIDAR/index.php>







**Figure 4.2.4-2**

**Surry - Skiffes Creek 500 kV Transmission Line**

James River Crossing

Line of Sight and Tower Visibility Analysis from Carter's Grove House

James River Crossing Variation 1

Vertical Exaggeration X 5



\*Elevation Data: 2010 11-County Coastal LIDAR DSM Files Representing Elevation of Vegetation Cover. Downloaded from College of William and Mary, Center for Geospatial Analysis - <http://www.wm.edu/as/cga/Data%20Services/VALIDAR/index.php>

M:\Clients\ID-F\DOM\Skiffes\ArcGIS\2012\04\Surry\DOM\_SKF\_Surry\_LineofSight\_Profiles\_James\_River\_Var.mxd REVISED: 05/31/2012



DRAWN BY: JPBOENTJE



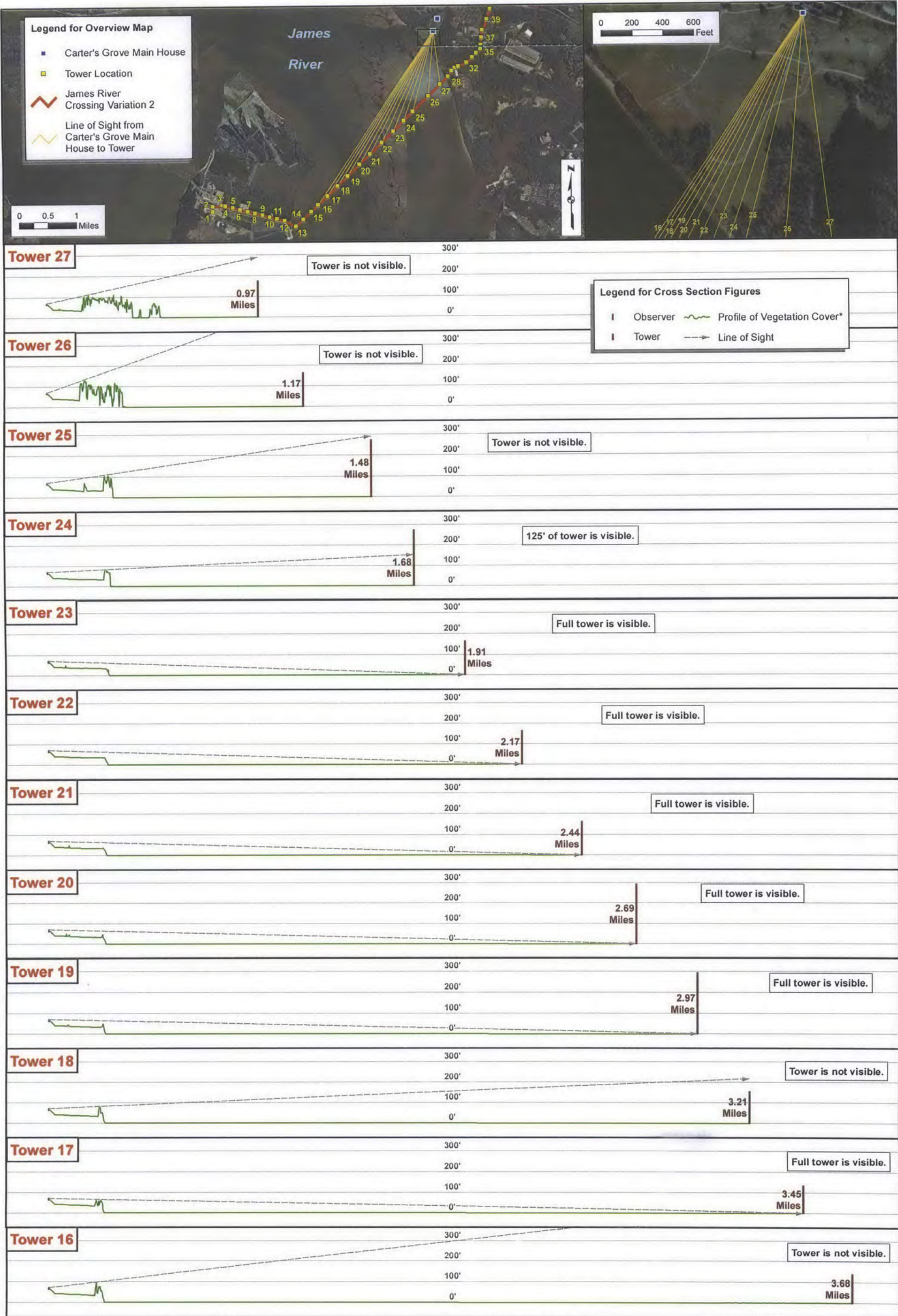


Figure 4.2.4-3

Surry - Skiffes Creek 500 kV Transmission Line  
James River Crossing Variation 2  
Line of Sight and Tower Visibility Analysis from Carter's Grove House  
Surry Alternative  
Vertical Exaggeration X 5



\*Elevation Data: 2010 11-County Coastal LIDAR DSM Files Representing Elevation of Vegetation Cover. Downloaded from College of William and Mary, Center for Geospatial Analysis - <http://www.wm.edu/as/cga/Data%20Services/VALIDAR/index.php>



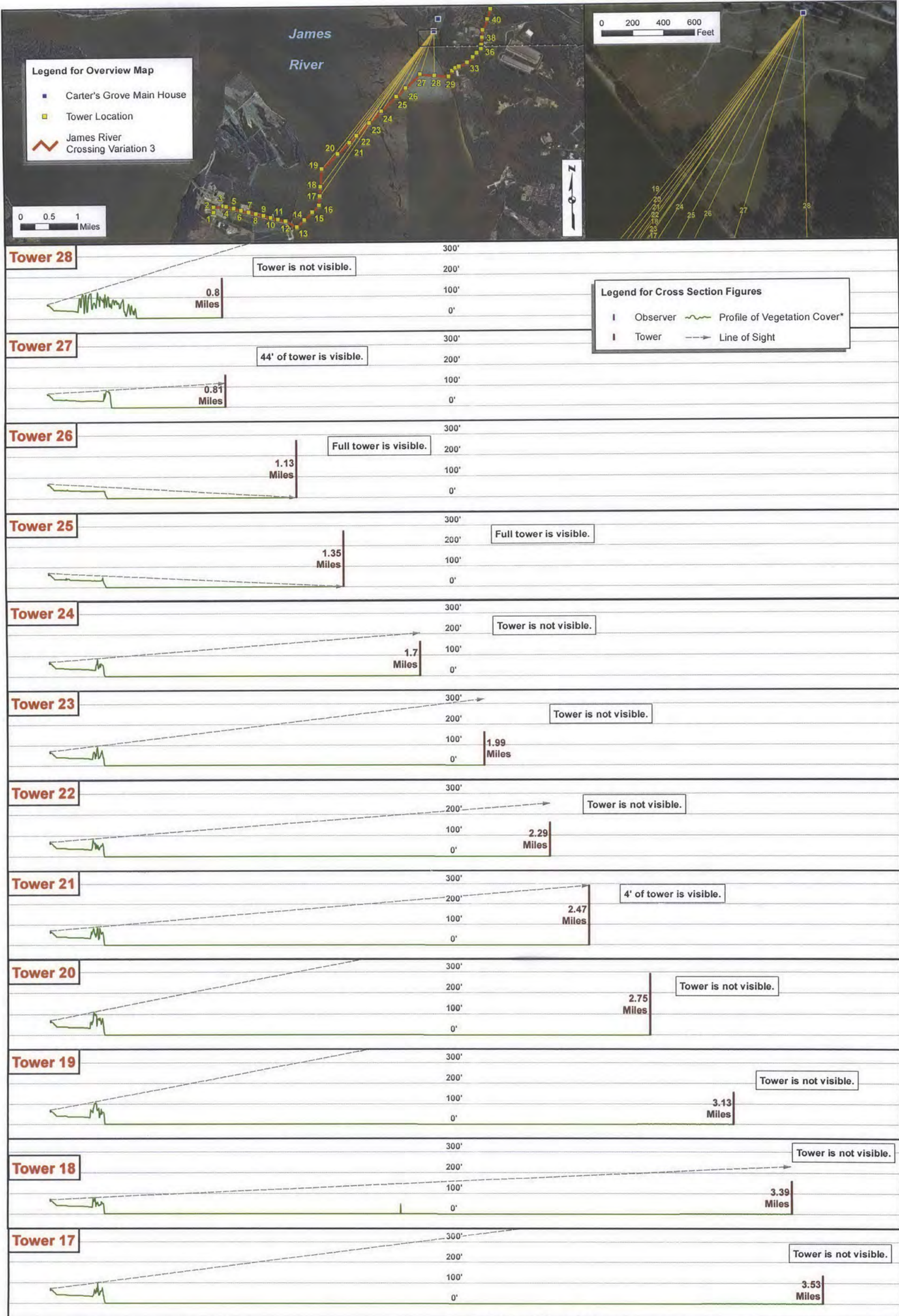


Figure 4.2.4-4

Surry - Skiffes Creek 500 kV Transmission Line

James River Crossing Variation 3

Line of Sight and Tower Visibility Analysis from Carter's Grove House

Surry Alternative

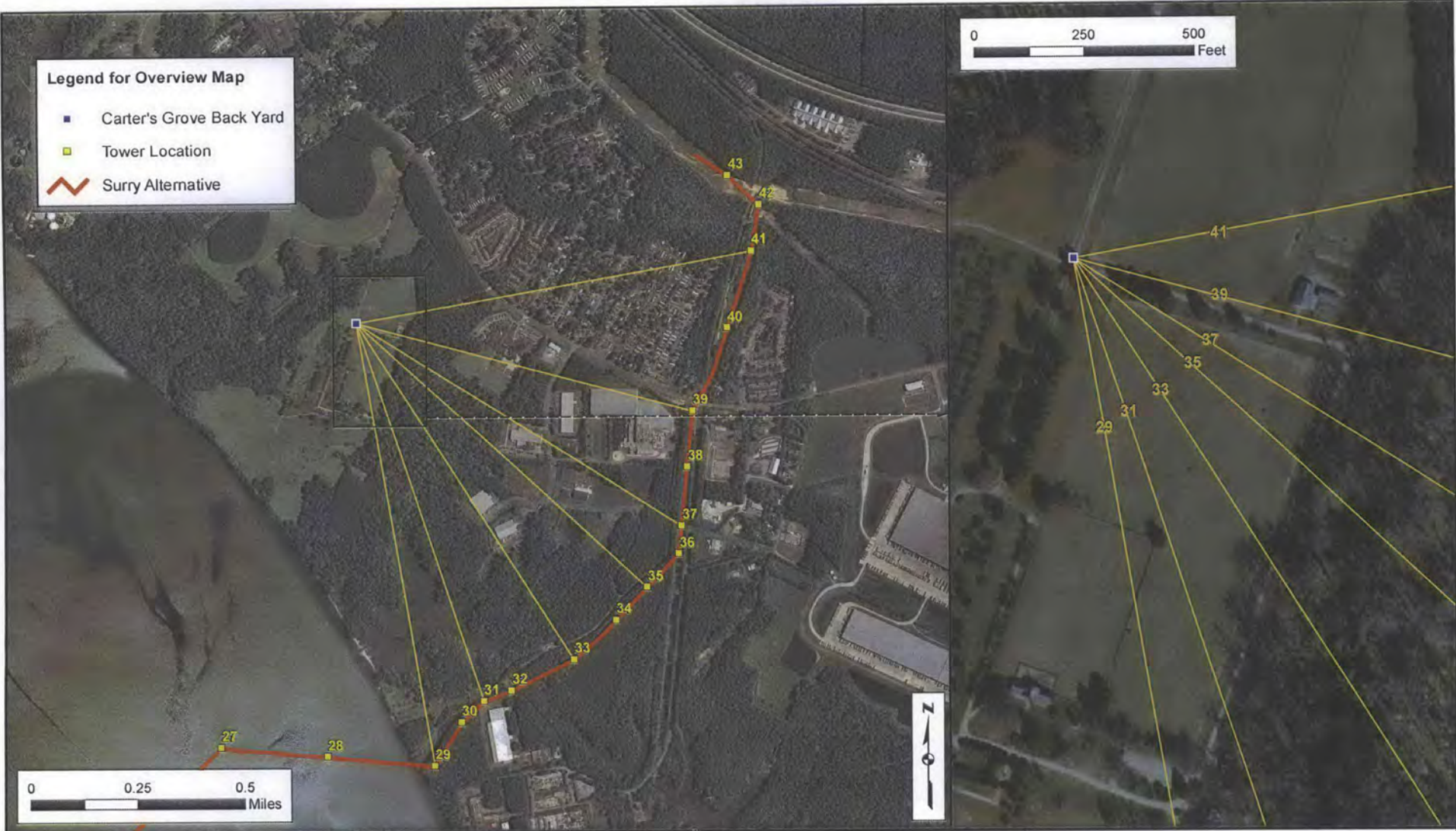
Vertical Exaggeration X 5



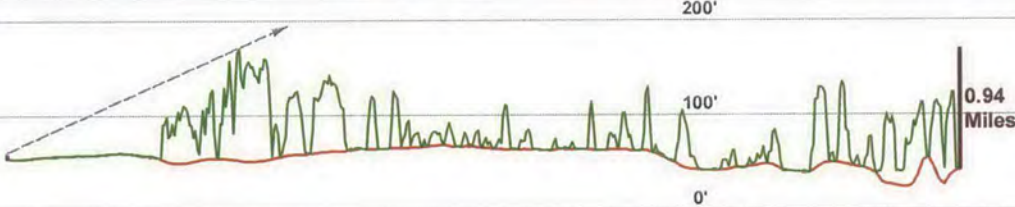
\*Elevation Data: 2010 11-County Coastal LIDAR DSM Files Representing Elevation of Vegetation Cover. Downloaded from College of William and Mary, Center for Geospatial Analysis - <http://www.wm.edu/as/cga/Data%20Services/VALIDAR/index.php>



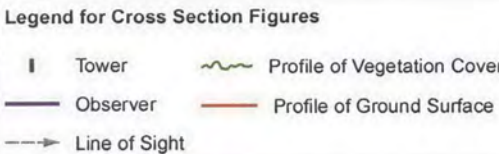




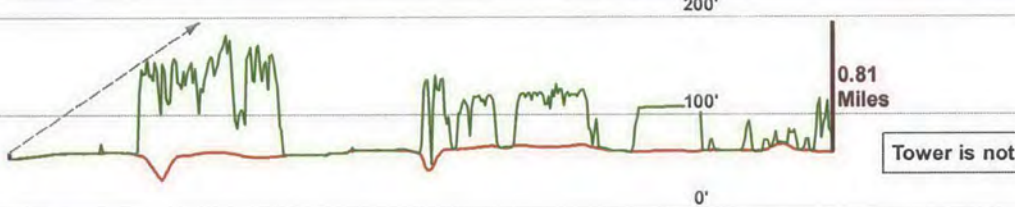
**Tower 41**



Tower is not visible.

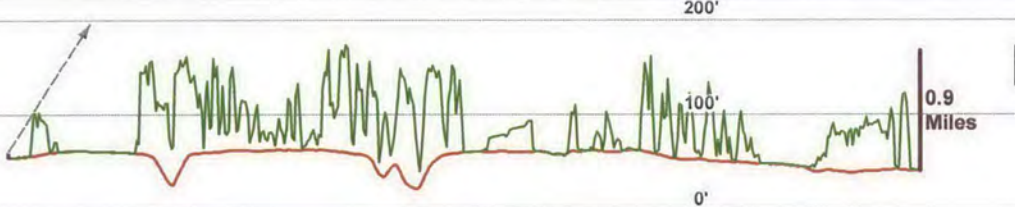


**Tower 39**



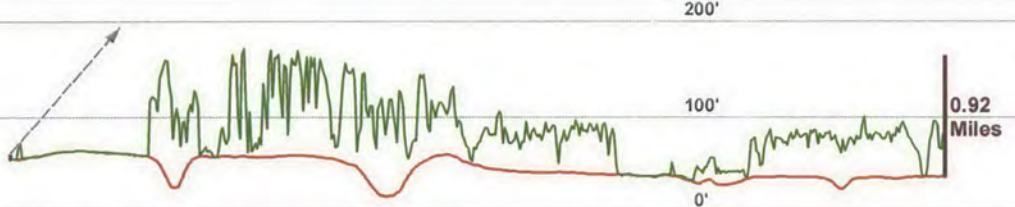
Tower is not visible.

**Tower 37**



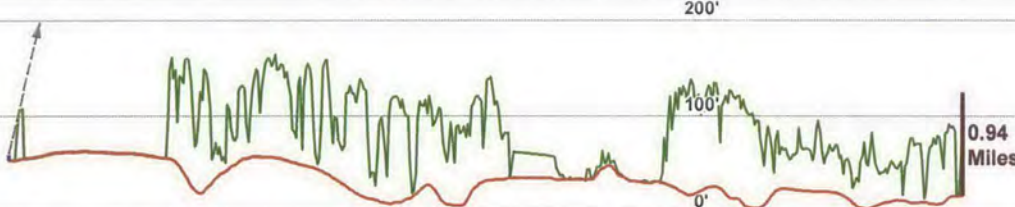
Tower is not visible.

**Tower 35**



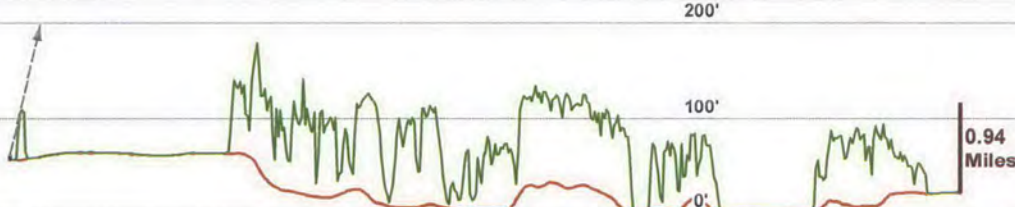
Tower is not visible.

**Tower 33**



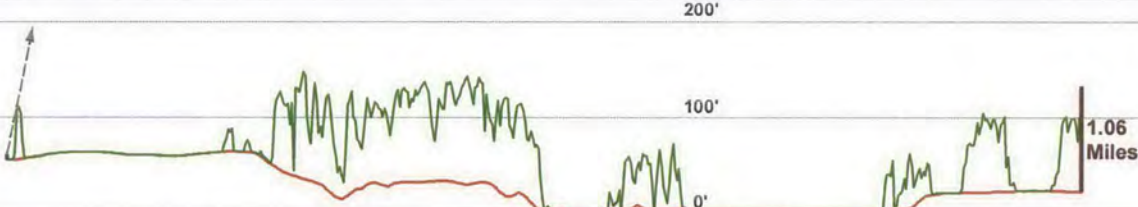
Tower is not visible.

**Tower 31**



Tower is not visible.

**Tower 29**



Tower is not visible.

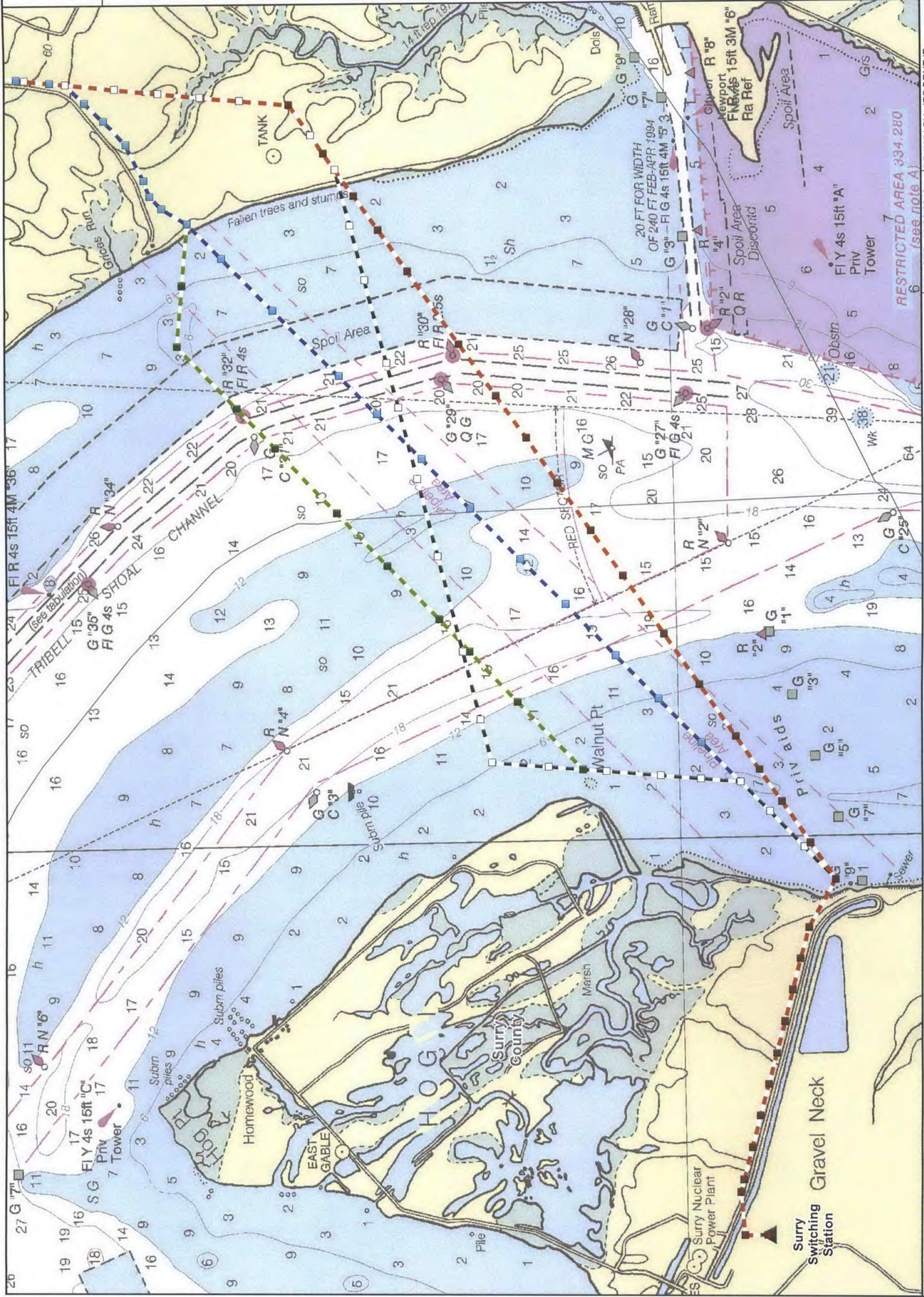


**Figure 4.2.4-5**  
**Surry - Skiffes Creek 500 kV Transmission Line**  
Surry Alternative  
Line of Sight and Tower Visibility Analysis from Carter's Grove  
Yard looking Southeast  
Vertical Exaggeration X 5



\*Elevation Data: 2010 11-County Coastal LIDAR DSM Files Representing Elevation of Vegetation Cover. Downloaded from College of William and Mary, Center for Geospatial Analysis - <http://www.wm.edu/as/cga/Data%20Services/VALIDAR/index.php>



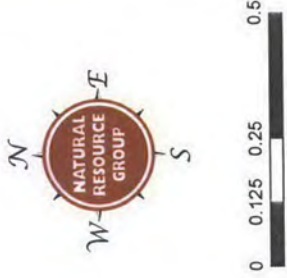


Surry -  
Skiffes Creek 500 kV  
Transmission Line  
Route Alternatives

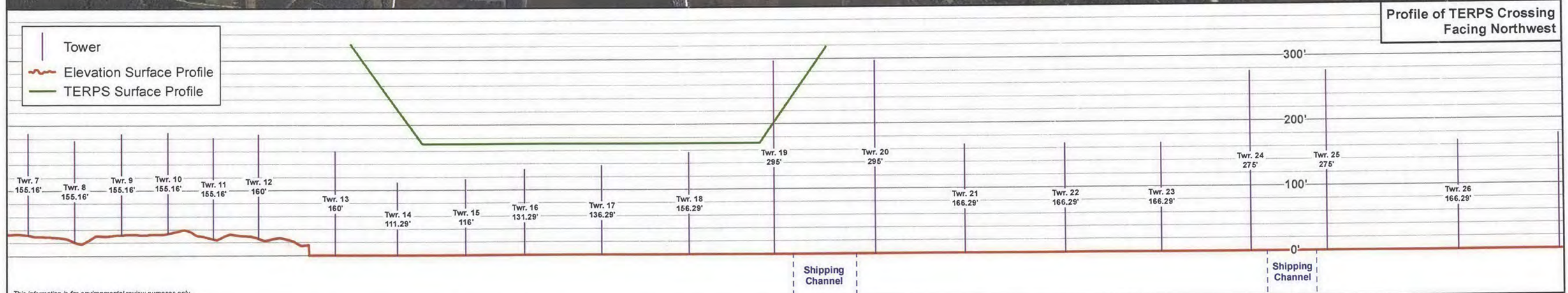
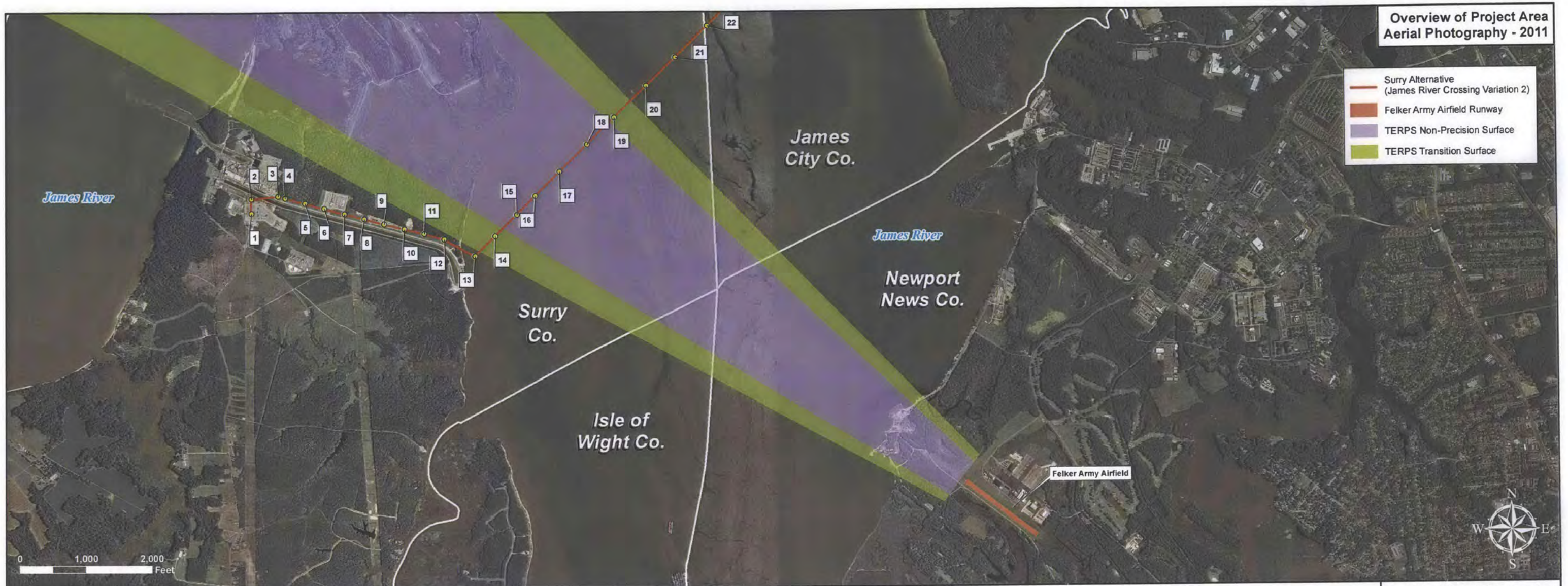
Figure 4.2.6-1

Structures

- Surry Alternative
- James River Crossing Variation 1
- James River Crossing Variation 2
- James River Crossing Variation 3
- Surry Alternative
- James River Crossing Variation 1
- James River Crossing Variation 2
- James River Crossing Variation 3







**Figure 4.2.6-2**  
**Surry - Skiffes Creek 500 kV Line, James River Crossing Variation 2**  
 Felker Army Airfield  
 TERPS Non-Precision Approach Obstacle Clearance Surface  
 Vertical Exaggeration X 10



## **DOMINION VIRGINIA POWER**

**Surry-Skiffes Creek 500 kV Transmission Line,  
Skiffes Creek-Wheaton 230 kV Transmission Line, and  
Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

## **APPENDIX B**

**Department of Transportation Federal Aviation Administration 14 CFR Part  
77. July 21, 2010. Final Rule: Safe Efficient Use and Preservation of the  
Navigable Airspace.**

**DEPARTMENT OF TRANSPORTATION****Federal Aviation Administration****14 CFR Part 77**

[Docket No. FAA-2006-25002; Amendment No. 77-13]

RIN 2120-AH31

**Safe, Efficient Use and Preservation of the Navigable Airspace**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule.

**SUMMARY:** This action amends the regulations governing objects that may affect the navigable airspace. These rules have not been revised in several decades, and the FAA has determined it is necessary to update the regulations, incorporate case law and legislative action, and simplify the rule language. These changes will improve safety and promote the efficient use of the National Airspace System.

**DATES:** This amendment becomes effective January 18, 2011.

**FOR FURTHER INFORMATION CONTACT:** For technical questions about this final rule contact Ellen Crum, Air Traffic Systems Operations, Airspace and Rules Group, AJR-33, Federal Aviation Administration, 800 Independence Ave., SW., Washington, DC 20591; telephone (202) 267-8783, facsimile (202) 267-9328. For legal questions about this final rule contact Lorelei Peter, Office of the Chief Counsel—Regulations Division, Federal Aviation Administration, 800 Independence Ave., SW., Washington, DC 20591; telephone (202) 267-3134, facsimile 202-267-7971.

**SUPPLEMENTARY INFORMATION:**

**Authority for This Rulemaking**

The Administrator has broad authority to regulate the safe and efficient use of the navigable airspace (49 U.S.C. 40103(a)). The Administrator is also authorized to issue air traffic rules and regulations to govern the flight, navigation, protection, and identification of aircraft for the protection of persons and property on the ground, and for the efficient use of the navigable airspace (49 U.S.C. 40103(b)). The Administrator may also conduct investigations and prescribe regulations, standards, and procedures in carrying out the authority under this part (49 U.S.C. 40113). The Administrator is authorized to protect civil aircraft in air commerce (49 U.S.C. 4470(a)(5)).

Under § 44701(a)(5), the Administrator promotes safe flight of civil aircraft in air commerce by prescribing regulations and minimum standards for other practices, methods, and procedures necessary for safety in air commerce and national security. Also, § 44718 provides that under regulations issued by the Administrator, notice to the agency is required for any construction, alteration, establishment, or expansion of a structure or sanitary landfill, when the notice will promote safety in air commerce, and the efficient use and preservation of the navigable airspace and airport traffic capacity at public use airports. This statutory provision also provides that, under regulations issued by the Administrator, the agency determines whether such construction or alteration is an obstruction of the navigable airspace, or an interference with air navigation facilities and equipment or the navigable airspace. If a determination is made that the construction or alteration creates an obstruction or otherwise interferes, the agency then conducts an aeronautical study to determine adverse impacts on the safe and efficient use of the airspace, facilities, or equipment.

**I. Background**

*A. Summary of the Notice of Proposed Rulemaking (NPRM)*

On June 13, 2006, the FAA published an NPRM that proposed to amend the regulations governing objects that may affect the navigable airspace (71 FR 34028). The FAA proposed to: Establish notification requirements and obstruction standards for transmitting on certain frequencies; revise obstruction standards for civil airport imaginary surfaces to more closely align these standards with FAA airport design and instrument approach procedure (IAP) criteria; revise current definitions and include new definitions; require proponents to file with the FAA a notice of proposed construction or alteration for structures near private use airports that have an FAA-approved IAP; and increase the number of days in which a notice must be filed with the FAA before beginning construction or alteration. The comment period closed on September 11, 2006.

*B. Summary of the Final Rule*

The following is a discussion of the major changes contained in the final rule. The provisions of the final rule that were modified based on comments the FAA received are discussed in the "Discussion of the Final Rule" section. Most of the amendments implemented

by the rule are intended to simplify the existing regulations.

This rule adds § 77.29 to incorporate the specific factors listed in P.L. 100-223 for consideration during an aeronautical study. The specific factors are listed in Appendix A to this preamble. Including this language in part 77 does not add or remove any of the factors currently considered in an aeronautical study.

This rule provides for an FAA Determination of Hazard or Determination of No Hazard to become effective 40 days after the date of issuance, unless a petition for discretionary review is received by the FAA within 30 days of issuance. In addition, the rule stipulates that a Determination of No Hazard to air navigation will expire 18 months after the effective date of the determination, or on the date the proposed construction or alteration is abandoned. Also, the rule specifies that a Determination of Hazard to Air Navigation does not expire.

This final rule adds information about the processing of petitions for discretionary review. It also excludes determinations for temporary structures and recommendations for marking and lighting from the discretionary review process. Because of the nature of temporary structures, it is not possible to apply the lengthy discretionary review process to these structures. Also, since marking and lighting recommendations are simply recommendations, there is a separate process for a waiver of, or deviation from, the recommendations.

This rule expands the requirements for notice to be sent to the FAA for proposed construction or alteration of structures on or near private use airports that have an IAP. Accordingly, if a private use airport has an FAA-approved IAP, then a construction sponsor must notify the FAA of a proposed construction or alteration that exceeds the notice criteria in § 77.17. This action will give the FAA enough time to adjust the IAP, if needed, and to inform those who use the IAP.

Also, IAPs at private use airports or heliports are not currently listed in any aeronautical publication. Sponsors of construction or alteration at or near a private use airport or heliport should consult the FAA Web site to determine whether an FAA-approved IAP is listed for that airport.<sup>1</sup> If the airport is listed on the Web site, the sponsor must file notice with the FAA.

Lastly, this rule incorporates minor edits to the regulatory text to distinguish

<sup>1</sup> <https://oeaaa.faa.gov>.



FAA surveillance systems from communication facilities.

### C. Summary of Comments

The FAA received approximately 115 comments from individuals, aviation associations, industry spectrum users, airlines, and other aviation businesses. Many commenters, including the Air Transport Association, generally supported the NPRM. Commenters supported specific proposals concerning evaluating the aeronautical impact of proposed construction on IAPs at private use airports; evaluating antenna installations that might affect air traffic or navigation; and the update and reformat of the regulations. Comments that did not support the proposed rule, and suggested changes, are discussed more fully in the "Discussion of the Final Rule" section.

The FAA received substantive comments on the following general areas of the proposal:

- Frequency notification requirements
- Time requirement to file notice with the FAA
- Civil Airport Imaginary Surfaces<sup>2</sup>
- One Engine Inoperative Procedures (OEI)
- Definitions
- Miscellaneous

## II. Discussion of the Final Rule

### A. Frequency Notification

The FAA's primary focus during the obstruction evaluation process is safety and efficiency of the navigable airspace. It is critical for the agency to be notified of pending construction of physical objects that may affect the safety of aeronautical operations. (See 49 U.S.C. 44718.) In today's National Airspace System (NAS), however, electromagnetic transmissions can adversely affect on-board flight avionics, navigation, communication, and surveillance facilities. The FAA has extensive authority to prescribe regulations and minimum standards necessary for safety in air commerce. (See 49 U.S.C. § 44701(a)(5).) In addition, the FAA has broad authority to develop policy and plans for the use of the navigable airspace. (See 49 U.S.C. 40103.) The FAA relied on these authorities in proposing the notice requirements for broadcast transmissions in the specified bands. As stated in the proposal, broadcast transmission on certain frequencies can

pose serious safety threats to avionics and ground based facilities. At the same time, the FAA recognizes the authority of the National Telecommunications and Information Administration (NTIA) and the Federal Communications Commission (FCC) to manage use of the radio spectrum.

The FAA concludes that its proposal to require notice for the proposed frequency bands was too broad. The proposed frequencies from the NPRM are listed in Appendix B to this preamble. The proposed frequencies in the shared (Federal and Non-Federal) bands are managed by an existing process involving several Federal agencies with an interest in spectrum use, which NTIA oversees under the Department of Commerce. It is not the FAA's intent to add a duplicative review and coordination process to that already stated above. In addition, the FAA has determined that some of the proposed frequencies originally listed and not in shared bands do not present concern. Therefore, the agency withdraws the proposed notice and obstruction standards on the shared frequency bands and those frequency bands that, historically, have not posed electromagnetic concerns,<sup>3</sup> when operating under typical specifications.

FM broadcast service transmissions operating in the 88.0–107.9 MHz frequency band pose the greatest concern to FAA navigation signals. The FAA, FCC and NTIA are collaborating on the best way to address this issue. A resolution of this issue is expected soon. Therefore, the proposals on FM broadcast service transmissions in the 88.0–107.9 MHz frequency band remain pending. The FAA will address the comments filed in this docket about the proposed frequency notice requirements and proposed EMI obstruction standards when a formal and collaborative decision is announced.

This rule does include evaluating electromagnetic effect (§§ 77.29 and 77.31), and it codifies the agency's current practices of studying the effects on aircraft navigation and communication facilities. These amendments in no way should be construed to affect the authority of NTIA and the FCC.

### B. Time Requirement To File Notice With the FAA

Automation improvements to the FAA's obstruction evaluation program allow the public to file notices of

proposed construction electronically, which facilitates the aeronautical study process and has reduced the overall processing time for these cases. The FAA proposed to require that notices of proposed construction or alterations must be filed with the FAA at least 60 days before construction starts or the application filing date for a construction permit, whichever is earliest. The current rule requires 30 days, which the FAA found inadequate for cases to be processed, particularly if additional information, via public comment period, was necessary to complete the study. At the time the FAA published the NPRM, the automation system was in the early stages, and the full benefits of the automation were not yet known. Commenters were split on their support of this proposal, depending on their interests. Comments from the aviation industry largely supported the extended time period. Comments filed by the building industry, however, opposed the extended time period, saying it was too long and would cause undue delay.

The FAA has seen great success with the automation system and concludes that requiring notice to be filed 60 days before construction or the permit application is not necessary. There are cases where circulating the proposal for public comment may be necessary and, consequently, these cases may require up to 45 days for processing. Therefore, the FAA adopts the requirement that notice must be filed with the FAA for proposed construction or alteration at least 45 days before either the date that construction begins, or the date of the construction permit application, whichever is earliest.

Because applications are required within 45 days of construction, the FAA, Department of Defense, and Department of Homeland Security should work together to conduct timely reviews. To that end, the FAA will respond to inquiries from applicants regarding the status of applications, the reason(s) for any delay, and the projected date of completion. As appropriate, the FAA will engage with other Federal Agencies such as the Department of Defense, the Department of Homeland Security, the Department of Energy, and the Department of Interior to expedite any further regulatory modifications and improvements to 14 CFR Part 77 to ensure there is a predictable, consistent, transparent, and timely application process for the wind industry.

Several commenters recommended separate notice requirements for reviewing a temporary structure that might be necessary under emergency-type circumstances. An example

<sup>2</sup> Civil airport imaginary surfaces are established surfaces based on the runway that are used to identify objects that may impact airport plans or aircraft departure/arrival procedures or routes. Section 77.19 describes five types of imaginary surfaces: horizontal, conical, primary, approach and transitional.

<sup>3</sup> 54–88 MHz; 150–216 MHz; 406–430 MHz; 931–940 MHz; 952–960 MHz; 1390–1400 MHz; 2500–2700 MHz; 3700–4200 MHz; 5000–5650 MHz; 5925–6225 MHz; 7450–8550 MHz; 14.2–14.4 GHz.

submitted in the comments was a construction crane that was necessary to replace air conditioning units on the roof of factories. The commenters contend that it is neither logical nor feasible to shut down a factory for 30 days while the FAA studies this temporary structure.

Situations like the one presented by these commenters are not uncommon. Regardless of whether the structure is temporary, it remains critical for the FAA to have notice of tall structures that can affect aeronautical operations. In most cases, the proponent of the structure contacts the FAA Obstruction Evaluation (OE) specialist and identifies the need for a quick review, for which the agency readily responds. While the FAA regrets any past delay in taking quick action on a particular case, the agency declines to set-up special procedures to address such cases. On the FAA's OE Web site,<sup>4</sup> the agency lists the contact information for the FAA specialist. If a sponsor is concerned with the time frame for the FAA's review, the agency encourages the sponsor to contact the FAA specialist directly.

### C. Civil Airport Imaginary Surfaces

The NPRM proposed, for a visual runway used by small aircraft or restricted to day-only instrument operations, that the width of the imaginary approach surface expand uniformly to 1,250 ft. If the runway is a visual runway, used by other than small aircraft or for instrument night circling, the surface width expands uniformly from 1,500 ft. to 3,500 ft. If the runway is a non-precision instrument or precision instrument runway, the surface width expands uniformly to 4,000 ft. and 16,000 ft., respectively. Other changes include removing approach surface widths of 1,500 ft. and 2,000 ft., and increasing the width for some non-precision runways from 2,000 ft. to 4,000 ft. The NPRM also proposed expanding the width of the primary approach surface of a non-precision instrument runway or precision instrument runway from 500 feet to 1,000 ft.

Many commenters opposed the proposed expansion of the primary surface. They argued that the proposed expansion would require airport operators to remove existing structures that would fall within the proposed expanded surface, which would result in a financial burden to airport owners and managers. Southwest Airlines, on the other hand, supported the proposal and stated the ability to study and

review more proposed structures is positive for airport safety.

Several comments stated that the imaginary surfaces in part 77 do not comport clearly with the surfaces used for obstacle clearance under the United States Standard for Terminal Instrument Procedures (TERPS) and, therefore, makes the part 77 surfaces useless as a project planning tool for airport development.

Similarly, another commenter argued that the Required Navigation Performance (RNP) lateral protection area is greater than the width of the primary surface and the RNP procedures TERPS surface is outside the part 77 imaginary surface. The commenter contends that an obstacle can adversely impact an RNP procedure, but not be characterized as an obstruction. This commenter recommends that the imaginary surfaces be expanded to include RNP procedures.

Several commenters specifically questioned whether current obstructions that fall within the newly expanded primary surface could impact an instrument procedure and result in the airport losing the instrument procedure. One airport authority was concerned about marking and lighting recommendations for existing structures that will now fall under the expanded primary surface.

The FAA proposed these changes to more closely align regulatory provisions in part 77 with TERPS criteria and airport design standards. The inconsistency between IAP criteria, airport design standards, and part 77 surfaces has been a source of confusion for both airport managers and the FAA. These specific proposals would not have altered the notice criteria. Instead, the proposals were meant to identify more proposed structures as obstructions that the FAA could study to determine if they would adversely affect the NAS.

However, since publication of the NPRM, the FAA has begun a coordinated effort to consolidate all agency requirements for the treatment of obstacles in the airport environment. Once completed, the new requirements will form the basis for revised civil airport imaginary surfaces. Thus, it would not be prudent to codify the proposals. Further, amending or expanding any of the civil airport imaginary surfaces at this time would not be in the best interest of the public. The FAA, therefore, withdraws all proposed modifications to the civil airport imaginary surfaces, including the chart format. The FAA will keep the civil airport imaginary surfaces rule as

it is currently described in 14 CFR 77.25.

### D. One Engine Inoperative Procedures

The NPRM specifically states that OEI procedures were not a part of the rulemaking. The NPRM further notes that the FAA has tasked the Airport Obstruction Standards Committee (AOSC) with examining this issue. Comments from the Air Transport Association, individual airlines, local airport authorities, and aviation organizations, asked the FAA to address OEI procedures. These comments have been forwarded to the AOSC for consideration. As appropriate, the FAA will advise the aviation industry and other interested persons, through the AOSC, of any policy changes.

### E. Definitions

The NPRM proposed replacing the term "utility runway" with the phrase "runway used by small aircraft". In addition, the NPRM proposed amending the definitions for precision, non-precision, and visual runways, as these definitions were no longer up-to-date with industry practices. The term "utility runway" is not widely used in industry so the NPRM proposed replacing the term. In addition, the NPRM proposed amending the definitions for precision and non-precision runways to address approaches that use other than ground based navigational aids, such as flight management systems (FMS) and global navigation satellite systems (GNSS). Because of technological advances, the former definitions for precision and non-precision runways are no longer accurate.

By removing the term "utility runway", commenters stated the portions of the rule that include the term became confusing. They note that the runway classifications and corresponding widths for the primary and approach surfaces in the tables in § 77.19(d)(e) are difficult to understand.

Several commenters confused the proposed definitions for precision and non-precision instrument runways with the definitions for precision and non-precision instrument approach procedures.<sup>5</sup> One commenter suggested the non-precision runway definition should exclude a runway that has a developed instrument approach procedure with visibility minimums of

<sup>5</sup> The FAA proposed definitions for the terms "precision instrument runway" and "non-precision instrument runway" to be based on the use of visibility minimums, rather than approach procedure classification, given that visibility is the critical factor during the visual portion of the approach.

<sup>4</sup> <https://oeaaa.faa.gov>.



one statute mile. This commenter contends that many small, general aviation airports have published procedures with one mile visibility under the current obstruction criteria of a utility runway. The commenter also notes that if the FAA adopts the proposal to limit non-precision runways to procedures with visibility minimums of one statute mile, then these small airports would need to have the more demanding primary surfaces and approach criteria. The commenter further says this could result in financial hardship for these airports and the airports may need to double the designated airspace around the runway. Another commenter stated that the new definition for a non-precision runway conflicts with FAA Advisory Circular 150/5300-13, Airport Design.

Commenters also indicated that the new definition and associated surfaces would take runways that currently qualify as utility into the non-precision category. They say these modifications could result in unfunded economic burdens on outlying airports with IAPs to utility runways that experience lower traffic densities. Additionally, commenters noted that many of these airports are configured with minimal infrastructure and could face significant airport expansion to obtain IAP services if the runway is categorized as non-precision.

Several commenters also stated that the proposed definitions of precision and non-precision runways try to redefine the current precision and non-precision instrument procedures because satellite technology could, in the future, enable non-precision approaches to become precision approaches.

Although the FAA proposed to revise these definitions, on further review, the agency has determined it should not revise them at this time. The definitions were proposed to support implementing satellite-based navigation. However, as the satellite-based navigation program has evolved during development of this rulemaking, the agency has learned of unintended consequences of the proposed definitions. For example, changing the runway definition creates infrastructure requirements that may be needed as the technology evolves. The FAA believes a more measured approach is needed before making any changes to the definitions. Thus, the agency will not adopt the proposed revisions to the definitions in this final rule.

#### *F. Extension to a Determination of No Hazard*

The NPRM proposed a provision for which an extension to the expiration date for a Determination of No Hazard may be granted. Specifically, it proposed that for structures not subject to FCC review, a Determination of No Hazard can be extended for a maximum of 18 months, if necessary. If more than 18 months is necessary, then a new aeronautical study would be initiated. For structures that require an FCC construction permit, the NPRM proposed that a Determination of No Hazard can be extended for up to 12 months, provided the sponsor submits evidence that an application for a construction permit was filed within 6 months of the date of issuance. The NPRM also proposed that if the FCC extends the original FCC construction completion date, the sponsor must request an extension of the FAA's Determination of No Hazard.

Many commenters found that the two time periods (18 and 12 months) were confusing. The FAA's review of this matter concluded that it is not necessary to continue the distinction between structures subject to FCC review from structures that do not need this review, simply to extend the expiration date. Therefore, for simplification and standardization, the FAA amends the time period for extensions to determinations of structures to 18 months, regardless of whether an FCC construction permit is necessary.

In addition, the FAA unintentionally omitted a section of the current rule from the NPRM. That section states that if the FCC denies a construction permit, the final determination expires on the date of the denial. The FAA has reinserted that section in this final rule.

#### *G. Effective Date*

The effective date of this final rule is 180 days from the date the rule is published in the **Federal Register**. The FAA needs this time to amend the automation system it uses to evaluate obstructions, amend relevant FAA orders, train employees, and educate the public.

#### *H. Miscellaneous*

One commenter said the requirement to file notice should extend to structures that would penetrate an imaginary surface relative to a planned or proposed airport. Specifically, this commenter seeks to incorporate the imaginary surfaces for evaluating obstructions under § 77.19(a) in the notice requirements for structures that are on or around a planned airport.

Section 77.9 requires notice for construction on an existing airport or an airport under construction. This section specifies an imaginary surface extending from the runway (in increments of 20,000 feet, 10,000 ft., or 5,000 ft., depending on the length of the airport's runway or heliport) at a specific slope for which notice is required if it would penetrate one of the surfaces for either an existing airport or an airport under construction. The above referenced surfaces, for which the longest surface would extend approximately 3.78 miles from the end of the runway, do not apply to a planned airport for which construction has yet to begin.

The effect of this commenter's request would be to require notice for up to approximately 3.5 miles (for the longest runway) for any construction that penetrates the 100 to 1 surface for a planned or proposed airport.

This comment is outside the scope of the NPRM. The essence of this comment would be a new notice requirement for planned or proposed airports. To accommodate this comment without providing the public an opportunity to comment on its impact would violate the Administrative Procedure Act.

Notwithstanding the above scope issue, to apply the imaginary surface from the notice requirements to planned or proposed airports would be difficult to implement. A planned or proposed airport can be at varying stages of development, with runway(s) location and configuration undetermined, navigational aids not sited, and instrument approach and departure procedures yet to be developed. It would be impossible for the FAA to study (and apply the obstruction standards) with any degree of certainty, to a proposed structure when the above listed airport issues are not defined. In addition, airport development can be subject to environmental laws and lengthy processes with alternative plans that must be analyzed. The FAA cannot "reserve" airspace on such speculative plans. The agency does study the impact of structures that are identified as obstructions on planned or proposed airports that are on file with the FAA. As the details of a planned airport become part of the "plan on file" with the FAA or the Airport Layout Plan, on which the FAA can rely, the FAA includes those details during the study.

Several commenters questioned the proposed removal of the regulatory provisions addressing antenna farms and whether any antenna farms currently exist. The FAA has not established any antenna farm area. Moreover, the regulations governing structures addresses the FAA needs

here. Thus, this rule removes the provisions governing antenna farms.

One commenter questioned why an object that is shielded by another structure is not subject to the notice requirements. This commenter contends that if the structure that shields an unreported structure is dismantled, there is no record of the first structure, nor is there any requirement to notify the FAA of this structure if the shielding structure is dismantled.

Section 77.15(a) provides that notice is not required for a structure if the shielding structure is of a substantial and permanent nature and is located in a congested area of a city, town, or settlement where the shielded structure will not adversely affect safety in air navigation. This exception does not apply in areas where there are only one or two other structures. The FAA has not experienced a situation like the one described by the commenter that can be attributed to this exception. This rule does expand the current supplemental notice requirements in § 77.11, and specifies that if a construction or alteration is abandoned, dismantled, or destroyed, notice must be provided to the FAA within 5 days after the construction is abandoned, dismantled, or destroyed. In the rare case where a shielding structure is abandoned, dismantled, or destroyed, the proponent must notify the FAA so that appropriate actions concerning adjacent structures can be initiated.

Prior to this rule, part 77 provided that a proposed or existing structure was an obstruction to air navigation if it was higher than 500 ft. above ground level (AGL). The minimum altitude to operate an aircraft over non-congested areas is 500 feet above the surface.<sup>6</sup> Consequently, an aircraft could be operating at 500 ft. AGL and encounter a structure that was 500 ft. AGL that might not have been studied by the FAA during the obstacle evaluation process. The FAA adopts the proposal that lowers the height of a structure identified as an obstruction from above 500 ft. to above 499 ft. Accordingly, all structures that are above 499 ft. tall will be obstructions, and the FAA will study them to determine their effect on the navigable airspace. This will ensure that all usable airspace at and above 500 ft. AGL is addressed during the aeronautical study and that this airspace

is protected from obstructions that may create a hazard to air navigation.

### III. Paperwork Reduction Act

The Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)) requires that the FAA consider the impact of paperwork and other information collection burdens imposed on the public. According to the 1995 amendments to the Paperwork Reduction Act (5 CFR 1320.8(b)(2)(vi)), an agency may not collect or sponsor the collection of information, nor may it impose an information collection requirement unless it displays a currently valid Office of Management and Budget (OMB) control number. As required by the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), the FAA submitted a copy of the new information collection requirements(s) discussed below to OMB for its review. Notice of OMB approval for this information collection will be published in a future **Federal Register** document.

Title 49 U.S.C. 44718 states, "By regulation or by order when necessary, the Secretary of Transportation shall require a person to give adequate public notice, in the form and way the Secretary prescribes, of the construction, alteration, establishment, or expansion, of a structure or sanitary landfill when public notice will promote:

- (1) safety in air commerce; and
- (2) the efficient use and preservation of the navigable airspace and of airport traffic capacity at public use airports."

This final rule implements the requirement for notification by requiring that notice be submitted to the FAA for proposed construction or alteration of structures on or near private use airports that have an IAP. Accordingly, if a private use airport has an FAA-approved IAP, then a construction sponsor is required to notify the FAA of a proposed construction or alteration that exceeds the notice criteria in § 77.17. This action will give the FAA adequate time to adjust the IAP, if needed, and to inform those who use the IAP. While IAPs at private use airports or heliports are not currently listed in any aeronautical publication, sponsors of construction or alteration at or near a private use airport or heliport can consult the FAA Web site<sup>7</sup> to determine whether an FAA-approved IAP is listed for that airport. If the airport is listed on the Web site, the sponsor must file notice with the FAA. The intent of these changes is to

improve safety and promote the efficient use of the National Airspace System.

The FAA estimates that on average, 3,325 Form 7460-1s would be filed annually. It is estimated to take 19 minutes, or 0.32 hours, to fill out each form. Hence, the estimated hour burden is:  $0.32 \text{ hours} \times 3,325 = 1,064 \text{ hours}$ .

The average cost for a firm to prepare the form itself is approximately \$40 per form. It is estimated that 20 percent of the forms filed would be filed this way. Thus, the estimated average annual reporting burden for companies to process this form in-house would be: (FAA Form 7460-1)  $\$40 \times 665 = \$26,600$ .

The average cost for a company to outsource this function to a contractor is approximately \$480 per report. It is estimated that 80 percent of the forms filed would be filed this way. Thus, the estimated average annual reporting burden for companies to outsource this function is: (FAA Form 7460-1)  $\$480 \times 2,660 = \$1,276,800$ .

It is estimated that roughly 30 percent of firms filing FAA Form 7460-1 will need to perform a site survey to complete the form. The cost of a site survey is \$790. Thus, the estimated annual reporting burden for companies who require a site survey would be: (FAA Form 7460-1)  $\$790 \times 998 = \$788,420$ .

Hence, the total annual cost to firms that fill out FAA Form 7460-1 is \$2,091,820.

In the proposed rule, the FAA asked for comments on the information collection burden. You may view the FAA's specific request in the proposed rule.<sup>8</sup> The FAA received comments from multiple commenters. The following is a summary of the comments with the FAA's response:

Several commenters stated that the FAA underestimated the costs, in terms of time and paperwork, associated with preparing a Form 7460-1, as well as the costs of filing an OE notice, so the FAA should revise its estimates. One commenter surveyed its members and the survey indicated that the cost of processing a Form 7460-1 in-house was \$406 and took about 1.6 hours per form. Further, the average hourly labor cost was found to be \$36 per hour. The commenter also stated that in addition to maps, a site survey is needed to complete Form 7460-1, which ensures the accuracy of the location and costs an average of \$768. Another commenter supported the notion of including the cost of a site survey in the cost estimation for filing a Form 7460-1. Another commenter suggested that the

<sup>6</sup> 14 CFR Section 91.119(c) provides that "Except when necessary for takeoff and landing, no person may operate an aircraft below the following altitudes: (b) Over other than congested areas. An altitude of 500 feet above the surface except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure."

<sup>7</sup> <https://oeaaa.faa.gov>.

<sup>8</sup> 71 FR 34028; June 13, 2006.



FAA increase its estimate for processing a Form 7460–1 in-house to \$40.

The FAA omitted the cost of a site survey in the preliminary analysis because a site survey is not required to complete a Form 7460–1. However, a site survey must be completed if it is requested by the FAA's Flight Procedure Office. The agency has revised the cost analysis to reflect the wider range of costs as supplied by the commenters. The FAA also revised its cost and paperwork analyses to include the cost of filing a form in-house, as well as the costs of a site survey.

A few commenters claimed that the FAA underestimated the time and paperwork costs associated with filing additional notices. Another commenter believed that the FAA underestimated the paperwork burden that will be placed on radio spectrum users.

The FAA completed a paperwork reduction package for the proposed rule, which did show the estimated paperwork costs. The paperwork costs were also shown in the initial regulatory evaluation and were available for review in the docket. However, the FAA has elected not to adopt the radio frequency notice requirements in this final rule. As a result, there will be no additional paperwork burden placed on radio spectrum users at this time.

A commenter stated that requiring applicants to provide notice to the FAA 60 days in advance could also increase the number of filings because of the rule change. Another commenter stated that extending the notice period for all proposed projects will cause undue delay in securing FAA approval and will delay the ability of utilities to develop new sites.

The FAA has reduced the filing time period from 60 days to 45 days. This should mitigate the delay expected by the commenters and allow them to continue their operations without much change. Thus, the FAA does not expect any delays in construction or operational deficiencies resulting from the final rule.

#### *International Compatibility*

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. The FAA has reviewed the corresponding ICAO Standards and Recommended Practices and has identified no new differences with these proposed regulations.

#### **IV. Regulatory Evaluation, Regulatory Flexibility Determination, International Trade Impact Assessment, and Unfunded Mandates Assessment**

Changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 (Pub. L. 96–354) requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Trade Agreements Act (Pub. L. 96–39) prohibits agencies from setting standards that create unnecessary obstacles to the foreign commerce of the United States. In developing U.S. standards, this Trade Act requires agencies to consider international standards and, where appropriate, that they be the basis of U.S. standards. Fourth, the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) requires agencies to prepare a written assessment of the costs, benefits, and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by state, local, or tribal governments, in the aggregate, or by the private sector, of \$100 million or more annually (adjusted for inflation with base year of 1995). This portion of the preamble summarizes the FAA's analysis of the economic impacts of this final rule. Readers seeking greater detail should read the full regulatory evaluation, a copy of which is in the docket for this rulemaking.

In conducting these analyses, the FAA has determined that this final rule has benefits that justify its costs and is not economically significant under Executive Order 12866; however, it is otherwise "significant" because of concerns raised by the National Telecommunications and Information Administration (NTIA) and the Federal Communications Commission (FCC) regarding the FAA's evaluation of potential electromagnetic effect during aeronautical studies. The final rule, if adopted, will not have a significant economic impact on a substantial number of small entities, will not create unnecessary obstacles to international trade, and will not impose an unfunded mandate on state, local, tribal governments, or on the private sector.

This final rule amends 14 CFR part 77. These amendments refer to the rules for obstruction evaluation standards, aeronautical studies, and notice provisions about objects that could create hazards to air navigation.

The FAA estimates the cost of this final rule to private industry will be approximately \$20.9 million (\$14.1 million, present value) over the next 10 years. The estimated cost of the final rule to the FAA will be approximately \$18.7 million (\$12.6 million, present value) over the next 10 years. Therefore, the total cost associated with the final rule will be approximately \$39.6 million (\$26.8 million, present value) over the next 10 years.

The final rule will enhance protection of aircraft approaches from unknown obstructions and unknown alteration projects on or near private use airports with FAA-approved instrument approach procedures (IAPs). The FAA contends that these qualitative benefits justify the costs of the final rule.

#### *Final Regulatory Flexibility Analysis*

The Regulatory Flexibility Act of 1980 establishes "as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the business, organizations, and governmental jurisdictions subject to regulation." To achieve that principle, the Act requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions. The Act covers a wide range of small entities, including small businesses, not-for-profit organizations and small governmental jurisdictions.

Agencies must perform a review to determine whether a proposed or final rule will have a significant economic impact on a substantial number of small entities. If the determination is that it will, the agency must prepare a regulatory flexibility analysis (RFA) as described in the Act.

However, if an agency determines that a proposed or final rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the 1980 Act provides that the head of the agency may so certify and an RFA is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

While the FAA does not maintain data on the size of businesses that file notices, the FAA estimates that approximately 40 percent of the OE notices will be filed by small businesses (comprised of business owners and private use airport owners) as defined by the Small Business Administration. Thus, in 2010 when the rule is expected to take effect, the FAA expects approximately 2,400 more OE notices

will be filed by affected parties. Of those applications filed, approximately 960 notices are estimated to be filed by small businesses (using 40 percent assumption).

For those small businesses that are inexperienced in submitting the necessary paperwork, the FAA believes they would either hire a consultant or spend as much as the consultant fee (\$480) in staff time to understand, research, complete, and submit the form(s). For the purpose of this regulatory flexibility assessment, the FAA assumes that it will cost all small entities approximately \$480 per case to meet the requirements of part 77.

It is unlikely that any individual small entity will file more than three OE notices in a calendar year. As a result, the FAA estimates that in virtually all cases, the cost of this rule to small businesses will not exceed \$1500 per small entity, a cost the FAA does not consider significant. Therefore, as the FAA Administrator, I certify that this rule will not have a significant economic impact on a substantial number of small entities.

#### *International Trade Impact Assessment*

The Trade Agreements Act of 1979 (Pub. L. 96–39), as amended by the Uruguay Round Agreements Act (Pub. L. 103–465), prohibits Federal agencies from establishing standards or engaging in related activities that create unnecessary obstacles to the foreign commerce of the United States. Pursuant to these Acts, the establishment of standards is not considered an unnecessary obstacle to the foreign commerce of the United States, so long as the standard has a legitimate domestic objective, such as the protection of safety, and does not operate in a manner that excludes imports that meet this objective. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards. The FAA has assessed the potential effect of this final rule and determined that it will have only a domestic impact and, therefore, will not create unnecessary obstacles to the foreign commerce of the United States.

#### *Unfunded Mandates Assessment*

Title II of the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) requires each Federal agency to prepare a written statement assessing the effects of any Federal mandate in a proposed or final agency rule that may result in an expenditure of \$100 million or more (in 1995 dollars) in any one year by state, local, and tribal governments, in the aggregate, or by the private sector; such

a mandate is deemed to be a “significant regulatory action.” The FAA currently uses an inflation-adjusted value of \$136.1 million in lieu of \$100 million. This final rule does not contain such a mandate; therefore, the requirements of Title II of the Act do not apply.

#### *Executive Order 13132, Federalism*

The FAA has analyzed this final rule under the principles and criteria of Executive Order 13132, Federalism. The FAA determined that this action will not have a substantial direct effect on the States, or the relationship between the Federal Government and the States, or on the distribution of power and responsibilities among the various levels of government, and, therefore, does not have federalism implications.

#### *Environmental Analysis*

FAA Order 1050.1E identifies FAA actions that are categorically excluded from preparation of an environmental assessment or environmental impact statement under the National Environmental Policy Act in the absence of extraordinary circumstances. The FAA has determined this rulemaking action qualifies for the categorical exclusion identified in paragraph 312f and involves no extraordinary circumstances.

#### *Regulations That Significantly Affect Energy Supply, Distribution, or Use*

The FAA has analyzed this final rule under Executive Order 13211, Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use (May 18, 2001). We have determined that it is not a “significant energy action” under the executive order because it is not a “significant regulatory action” under Executive Order 12866, and it is not likely to have a significant adverse effect on the supply, distribution, or use of energy.

#### *Availability of Rulemaking Documents*

You can get an electronic copy of rulemaking documents using the Internet by—

1. Searching the Federal eRulemaking Portal (<http://www.regulations.gov>);
2. Visiting the FAA’s Regulations and Policies Web page at [http://www.faa.gov/regulations\\_policies/](http://www.faa.gov/regulations_policies/); or
3. Accessing the Government Printing Office’s Web page at <http://www.gpoaccess.gov/fr/index.html>.

You can also get a copy by sending a request to the Federal Aviation Administration, Office of Rulemaking, ARM–1, 800 Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267–9680. Make sure to

identify the amendment number or docket number of this rulemaking.

Anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT’s complete Privacy Act statement in the **Federal Register** published on April 11, 2000 (Volume 65, Number 70; Pages 19477–78) or you may visit <http://DocketsInfo.dot.gov>.

#### *Small Business Regulatory Enforcement Fairness Act*

The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 requires FAA to comply with small entity requests for information or advice about compliance with statutes and regulations within its jurisdiction. If you are a small entity and you have a question regarding this document, you may contact your local FAA official, or the person listed under the **FOR FURTHER INFORMATION CONTACT** heading at the beginning of the preamble. You can find out more about SBREFA on the Internet at [http://www.faa.gov/regulations\\_policies/rulemaking/sbre\\_act/](http://www.faa.gov/regulations_policies/rulemaking/sbre_act/).

#### **Appendix A to the Preamble**

Under regulations (49 U.S.C. 44718) prescribed by the Secretary, if the Secretary decides that constructing or altering a structure may result in an obstruction of the navigable airspace or an interference with air navigation facilities and equipment or the navigable airspace, the Secretary shall conduct an aeronautical study to decide the extent of any adverse impact on the safe and efficient use of the airspace, facilities, or equipment. In conducting the study, the Secretary shall consider factors relevant to the efficient and effective use of the navigable airspace, including—

- (A) The impact on arrival, departure, and en route procedures for aircraft operating under visual flight rules;
- (B) The impact on arrival, departure, and en route procedures for aircraft operating under instrument flight rules;
- (C) The impact on existing public use airports and aeronautical facilities;
- (D) The impact on planned public use airports and aeronautical facilities; and
- (E) The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures.

#### **Appendix B to the Preamble**

The NPRM proposed that notice must be filed with the FAA for any construction of a new, or modification of an existing facility, *i.e.*—building, antenna structure, or any other man-made structure, which supports a radiating element(s) for the purpose of radio frequency transmissions operating on the following frequencies:



- (i) 54–108 MHz
- (ii) 150–216 MHz
- (iii) 406–430 MHz
- (iv) 931–940 MHz
- (v) 952–960 MHz
- (vi) 1390–1400 MHz
- (vii) 2500–2700 MHz
- (viii) 3700–4200 MHz
- (ix) 5000–5650 MHz
- (x) 5925–6525 MHz
- (xi) 7450–8550 MHz
- (xii) 14.2–14.4 GHz
- (xiii) 21.2–23.6 GHz

In addition, the NPRM proposed that any changes or modification to a system operating on one of the previously mentioned frequencies when specified in the original FAA determination, including:

- (i) Change in the authorized frequency;
- (ii) Addition of new frequencies;
- (iii) Increase in effective radiated power (ERP) equal or greater than 3 decibels;
- (iv) modification of radiating elements, including: (A) Antenna mounting locations(s) if increased 100 feet or more irrespective of whether the overall height is increased; (B) changes in antenna specification (including gain, beam-width, polarization, pattern); and (C) change in antenna azimuth/bearing (e.g. point-to-point microwave systems).

#### List of Subjects in 14 CFR Part 77

Administrative practice and procedure, Airports, Airspace, Aviation safety, Navigation (air), Reporting and recordkeeping requirements.

#### V. The Amendment

■ In consideration of the foregoing, the Federal Aviation Administration amends Chapter I of title 14, Code of Federal Regulations by revising part 77 to read as follows:

### PART 77—SAFE, EFFICIENT USE, AND PRESERVATION OF THE NAVIGABLE AIRSPACE

#### Subpart A—General

Sec.

- 77.1 Purpose.
- 77.3 Definitions.

#### Subpart B—Notice Requirements

- 77.5 Applicability.
- 77.7 Form and time of notice.
- 77.9 Construction or alteration requiring notice.
- 77.11 Supplemental notice requirements.

#### Subpart C—Standards for Determining Obstructions to Air Navigation or Navigational Aids or Facilities

- 77.13 Applicability.
- 77.15 Scope.
- 77.17 Obstruction standards.
- 77.19 Civil airport imaginary surfaces.
- 77.21 Department of Defense (DOD) airport imaginary surfaces.
- 77.23 Helipoint imaginary surfaces.

#### Subpart D—Aeronautical Studies and Determinations

- 77.25 Applicability.

- 77.27 Initiation of studies.
- 77.29 Evaluating aeronautical effect.
- 77.31 Determinations.
- 77.33 Effective period of determinations.
- 77.35 Extensions, terminations, revisions and corrections.

#### Subpart E—Petitions for Discretionary Review

- 77.37 General.
- 77.39 Contents of a petition.
- 77.41 Discretionary review results.

**Authority:** 49 U.S.C. 106 (g), 40103, 40113–40114, 44502, 44701, 44718, 46101–46102, 46104.

#### Subpart A—General

##### § 77.1 Purpose.

This part establishes:

- (a) The requirements to provide notice to the FAA of certain proposed construction, or the alteration of existing structures;
- (b) The standards used to determine obstructions to air navigation, and navigational and communication facilities;
- (c) The process for aeronautical studies of obstructions to air navigation or navigational facilities to determine the effect on the safe and efficient use of navigable airspace, air navigation facilities or equipment; and
- (d) The process to petition the FAA for discretionary review of determinations, revisions, and extensions of determinations.

##### § 77.3 Definitions.

For the purpose of this part:

*Non-precision instrument runway* means a runway having an existing instrument approach procedure utilizing air navigation facilities with only horizontal guidance, or area type navigation equipment, for which a straight-in non-precision instrument approach procedure has been approved, or planned, and for which no precision approach facilities are planned, or indicated on an FAA planning document or military service military airport planning document.

*Planned or proposed airport* is an airport that is the subject of at least one of the following documents received by the FAA:

- (1) Airport proposals submitted under 14 CFR part 157.
- (2) Airport Improvement Program requests for aid.
- (3) Notices of existing airports where prior notice of the airport construction or alteration was not provided as required by 14 CFR part 157.
- (4) Airport layout plans.
- (5) DOD proposals for airports used only by the U.S. Armed Forces.
- (6) DOD proposals on joint-use (civil-military) airports.

(7) Completed airport site selection feasibility study.

*Precision instrument runway* means a runway having an existing instrument approach procedure utilizing an Instrument Landing System (ILS), or a Precision Approach Radar (PAR). It also means a runway for which a precision approach system is planned and is so indicated by an FAA-approved airport layout plan; a military service approved military airport layout plan; any other FAA planning document, or military service military airport planning document.

*Public use airport* is an airport available for use by the general public without a requirement for prior approval of the airport owner or operator.

*Seaplane base* is considered to be an airport only if its sea lanes are outlined by visual markers.

*Utility runway* means a runway that is constructed for and intended to be used by propeller driven aircraft of 12,500 pounds maximum gross weight and less.

*Visual runway* means a runway intended solely for the operation of aircraft using visual approach procedures, with no straight-in instrument approach procedure and no instrument designation indicated on an FAA-approved airport layout plan, a military service approved military airport layout plan, or by any planning document submitted to the FAA by competent authority.

#### Subpart B—Notice Requirements

##### § 77.5 Applicability.

(a) If you propose any construction or alteration described in § 77.9, you must provide adequate notice to the FAA of that construction or alteration.

(b) If requested by the FAA, you must also file supplemental notice before the start date and upon completion of certain construction or alterations that are described in § 77.9.

(c) Notice received by the FAA under this subpart is used to:

(1) Evaluate the effect of the proposed construction or alteration on safety in air commerce and the efficient use and preservation of the navigable airspace and of airport traffic capacity at public use airports;

(2) Determine whether the effect of proposed construction or alteration is a hazard to air navigation;

(3) Determine appropriate marking and lighting recommendations, using FAA Advisory Circular 70/7460–1, Obstruction Marking and Lighting;

(4) Determine other appropriate measures to be applied for continued safety of air navigation; and

(5) Notify the aviation community of the construction or alteration of objects that affect the navigable airspace, including the revision of charts, when necessary.

#### **§ 77.7 Form and time of notice.**

(a) If you are required to file notice under § 77.9, you must submit to the FAA a completed FAA Form 7460–1, Notice of Proposed Construction or Alteration. FAA Form 7460–1 is available at FAA regional offices and on the Internet.

(b) You must submit this form at least 45 days before the start date of the proposed construction or alteration or the date an application for a construction permit is filed, whichever is earliest.

(c) If you propose construction or alteration that is also subject to the licensing requirements of the Federal Communications Commission (FCC), you must submit notice to the FAA on or before the date that the application is filed with the FCC.

(d) If you propose construction or alteration to an existing structure that exceeds 2,000 ft. in height above ground level (AGL), the FAA presumes it to be a hazard to air navigation that results in an inefficient use of airspace. You must include details explaining both why the proposal would not constitute a hazard to air navigation and why it would not cause an inefficient use of airspace.

(e) The 45-day advance notice requirement is waived if immediate construction or alteration is required because of an emergency involving essential public services, public health, or public safety. You may provide notice to the FAA by any available, expeditious means. You must file a completed FAA Form 7460–1 within 5 days of the initial notice to the FAA. Outside normal business hours, the nearest flight service station will accept emergency notices.

#### **§ 77.9 Construction or alteration requiring notice.**

If requested by the FAA, or if you propose any of the following types of construction or alteration, you must file notice with the FAA of:

(a) Any construction or alteration that is more than 200 ft. AGL at its site.

(b) Any construction or alteration that exceeds an imaginary surface extending outward and upward at any of the following slopes:

(1) 100 to 1 for a horizontal distance of 20,000 ft. from the nearest point of the nearest runway of each airport described in paragraph (d) of this section with its longest runway more than 3,200 ft. in actual length, excluding heliports.

(2) 50 to 1 for a horizontal distance of 10,000 ft. from the nearest point of the nearest runway of each airport described in paragraph (d) of this section with its longest runway no more than 3,200 ft. in actual length, excluding heliports.

(3) 25 to 1 for a horizontal distance of 5,000 ft. from the nearest point of the nearest landing and takeoff area of each heliport described in paragraph (d) of this section.

(c) Any highway, railroad, or other traverse way for mobile objects, of a height which, if adjusted upward 17 feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance, 15 feet for any other public roadway, 10 feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road, 23 feet for a railroad, and for a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it, would exceed a standard of paragraph (a) or (b) of this section.

(d) Any construction or alteration on any of the following airports and heliports:

(1) A public use airport listed in the Airport/Facility Directory, Alaska Supplement, or Pacific Chart Supplement of the U.S. Government Flight Information Publications;

(2) A military airport under construction, or an airport under construction that will be available for public use;

(3) An airport operated by a Federal agency or the DOD.

(4) An airport or heliport with at least one FAA-approved instrument approach procedure.

(e) You do not need to file notice for construction or alteration of:

(1) Any object that will be shielded by existing structures of a permanent and substantial nature or by natural terrain or topographic features of equal or greater height, and will be located in the congested area of a city, town, or settlement where the shielded structure will not adversely affect safety in air navigation;

(2) Any air navigation facility, airport visual approach or landing aid, aircraft arresting device, or meteorological device meeting FAA-approved siting criteria or an appropriate military service siting criteria on military airports, the location and height of which are fixed by its functional purpose;

(3) Any construction or alteration for which notice is required by any other FAA regulation.

(4) Any antenna structure of 20 feet or less in height, except one that would increase the height of another antenna structure.

#### **§ 77.11 Supplemental notice requirements.**

(a) You must file supplemental notice with the FAA when:

(1) The construction or alteration is more than 200 feet in height AGL at its site; or

(2) Requested by the FAA.

(b) You must file supplemental notice on a prescribed FAA form to be received within the time limits specified in the FAA determination. If no time limit has been specified, you must submit supplemental notice of construction to the FAA within 5 days after the structure reaches its greatest height.

(c) If you abandon a construction or alteration proposal that requires supplemental notice, you must submit notice to the FAA within 5 days after the project is abandoned.

(d) If the construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

### **Subpart C—Standards for Determining Obstructions to Air Navigation or Navigational Aids or Facilities**

#### **§ 77.13 Applicability.**

This subpart describes the standards used for determining obstructions to air navigation, navigational aids, or navigational facilities. These standards apply to the following:

(a) Any object of natural growth, terrain, or permanent or temporary construction or alteration, including equipment or materials used and any permanent or temporary apparatus.

(b) The alteration of any permanent or temporary existing structure by a change in its height, including appurtenances, or lateral dimensions, including equipment or material used therein.

#### **§ 77.15 Scope.**

(a) This subpart describes standards used to determine obstructions to air navigation that may affect the safe and efficient use of navigable airspace and the operation of planned or existing air navigation and communication facilities. Such facilities include air navigation aids, communication equipment, airports, Federal airways, instrument approach or departure procedures, and approved off-airway routes.

(b) Objects that are considered obstructions under the standards



described in this subpart are presumed hazards to air navigation unless further aeronautical study concludes that the object is not a hazard. Once further aeronautical study has been initiated, the FAA will use the standards in this subpart, along with FAA policy and guidance material, to determine if the object is a hazard to air navigation.

(c) The FAA will apply these standards with reference to an existing airport facility, and airport proposals received by the FAA, or the appropriate military service, before it issues a final determination.

(d) For airports having defined runways with specially prepared hard surfaces, the primary surface for each runway extends 200 feet beyond each end of the runway. For airports having defined strips or pathways used regularly for aircraft takeoffs and landings, and designated runways, without specially prepared hard surfaces, each end of the primary surface for each such runway shall coincide with the corresponding end of the runway. At airports, excluding seaplane bases, having a defined landing and takeoff area with no defined pathways for aircraft takeoffs and landings, a determination must be made as to which portions of the landing and takeoff area are regularly used as landing and takeoff pathways. Those determined pathways must be considered runways, and an appropriate primary surface as defined in § 77.19 will be considered as longitudinally centered on each such runway. Each end of that primary surface must coincide with the corresponding end of that runway.

(e) The standards in this subpart apply to construction or alteration proposals on an airport (including heliports and seaplane bases with marked lanes) if that airport is one of the following before the issuance of the final determination:

(1) Available for public use and is listed in the Airport/Facility Directory, Supplement Alaska, or Supplement Pacific of the U.S. Government Flight Information Publications; or

(2) A planned or proposed airport or an airport under construction of which the FAA has received actual notice, except DOD airports, where there is a clear indication the airport will be available for public use; or,

(3) An airport operated by a Federal agency or the DOD; or,

(4) An airport that has at least one FAA-approved instrument approach.

#### § 77.17 Obstruction standards.

(a) An existing object, including a mobile object, is, and a future object

would be an obstruction to air navigation if it is of greater height than any of the following heights or surfaces:

(1) A height of 499 feet AGL at the site of the object.

(2) A height that is 200 feet AGL, or above the established airport elevation, whichever is higher, within 3 nautical miles of the established reference point of an airport, excluding heliports, with its longest runway more than 3,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile from the airport up to a maximum of 499 feet.

(3) A height within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area, which would result in the vertical distance between any point on the object and an established minimum instrument flight altitude within that area or segment to be less than the required obstacle clearance.

(4) A height within an en route obstacle clearance area, including turn and termination areas, of a Federal Airway or approved off-airway route, that would increase the minimum obstacle clearance altitude.

(5) The surface of a takeoff and landing area of an airport or any imaginary surface established under § 77.19, 77.21, or 77.23. However, no part of the takeoff or landing area itself will be considered an obstruction.

(b) Except for traverse ways on or near an airport with an operative ground traffic control service furnished by an airport traffic control tower or by the airport management and coordinated with the air traffic control service, the standards of paragraph (a) of this section apply to traverse ways used or to be used for the passage of mobile objects only after the heights of these traverse ways are increased by:

(1) 17 feet for an Interstate Highway that is part of the National System of Military and Interstate Highways where overcrossings are designed for a minimum of 17 feet vertical distance.

(2) 15 feet for any other public roadway.

(3) 10 feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road.

(4) 23 feet for a railroad.

(5) For a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it.

#### § 77.19 Civil airport imaginary surfaces.

The following civil airport imaginary surfaces are established with relation to

the airport and to each runway. The size of each such imaginary surface is based on the category of each runway according to the type of approach available or planned for that runway. The slope and dimensions of the approach surface applied to each end of a runway are determined by the most precise approach procedure existing or planned for that runway end.

(a) *Horizontal surface.* A horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by SW.ing arcs of a specified radii from the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs. The radius of each arc is:

(1) 5,000 feet for all runways designated as utility or visual;

(2) 10,000 feet for all other runways. The radius of the arc specified for each end of a runway will have the same arithmetical value. That value will be the highest determined for either end of the runway. When a 5,000-foot arc is encompassed by tangents connecting two adjacent 10,000-foot arcs, the 5,000-foot arc shall be disregarded on the construction of the perimeter of the horizontal surface.

(b) *Conical surface.* A surface extending outward and upward from the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

(c) *Primary surface.* A surface longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of that runway; but when the runway has no specially prepared hard surface, the primary surface ends at each end of that runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline. The width of the primary surface is:

(1) 250 feet for utility runways having only visual approaches.

(2) 500 feet for utility runways having non-precision instrument approaches.

(3) For other than utility runways, the width is:

(i) 500 feet for visual runways having only visual approaches.

(ii) 500 feet for non-precision instrument runways having visibility minimums greater than three-fourths statute mile.

(iii) 1,000 feet for a non-precision instrument runway having a non-precision instrument approach with visibility minimums as low as three-fourths of a statute mile, and for precision instrument runways.

(iv) The width of the primary surface of a runway will be that width prescribed in this section for the most precise approach existing or planned for either end of that runway.

(d) *Approach surface.* A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end.

(1) The inner edge of the approach surface is the same width as the primary surface and it expands uniformly to a width of:

(i) 1,250 feet for that end of a utility runway with only visual approaches;

(ii) 1,500 feet for that end of a runway other than a utility runway with only visual approaches;

(iii) 2,000 feet for that end of a utility runway with a non-precision instrument approach;

(iv) 3,500 feet for that end of a non-precision instrument runway other than utility, having visibility minimums greater than three-fourths of a statute mile;

(v) 4,000 feet for that end of a non-precision instrument runway, other than utility, having a non-precision instrument approach with visibility minimums as low as three-fourths statute mile; and

(vi) 16,000 feet for precision instrument runways.

(2) The approach surface extends for a horizontal distance of:

(i) 5,000 feet at a slope of 20 to 1 for all utility and visual runways;

(ii) 10,000 feet at a slope of 34 to 1 for all non-precision instrument runways other than utility; and

(iii) 10,000 feet at a slope of 50 to 1 with an additional 40,000 feet at a slope of 40 to 1 for all precision instrument runways.

(3) The outer width of an approach surface to an end of a runway will be that width prescribed in this subsection for the most precise approach existing or planned for that runway end.

(e) *Transitional surface.* These surfaces extend outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces. Transitional surfaces for those portions of the precision approach surface which project through and beyond the limits of the conical surface, extend a distance of 5,000 feet measured horizontally from the edge of the approach surface and at right angles to the runway centerline.

#### **§ 77.21 Department of Defense (DOD) airport imaginary surfaces.**

(a) *Related to airport reference points.* These surfaces apply to all military airports. For the purposes of this section, a military airport is any airport operated by the DOD.

(1) *Inner horizontal surface.* A plane that is oval in shape at a height of 150 feet above the established airfield elevation. The plane is constructed by scribing an arc with a radius of 7,500 feet about the centerline at the end of each runway and interconnecting these arcs with tangents.

(2) *Conical surface.* A surface extending from the periphery of the inner horizontal surface outward and upward at a slope of 20 to 1 for a horizontal distance of 7,000 feet to a height of 500 feet above the established airfield elevation.

(3) *Outer horizontal surface.* A plane, located 500 feet above the established airfield elevation, extending outward from the outer periphery of the conical surface for a horizontal distance of 30,000 feet.

(b) *Related to runways.* These surfaces apply to all military airports.

(1) *Primary surface.* A surface located on the ground or water longitudinally centered on each runway with the same length as the runway. The width of the primary surface for runways is 2,000 feet. However, at established bases where substantial construction has taken place in accordance with a previous lateral clearance criteria, the 2,000-foot width may be reduced to the former criteria.

(2) *Clear zone surface.* A surface located on the ground or water at each end of the primary surface, with a length of 1,000 feet and the same width as the primary surface.

(3) *Approach clearance surface.* An inclined plane, symmetrical about the runway centerline extended, beginning 200 feet beyond each end of the primary surface at the centerline elevation of the runway end and extending for 50,000 feet. The slope of the approach clearance surface is 50 to 1 along the runway centerline extended until it reaches an elevation of 500 feet above the established airport elevation. It then continues horizontally at this elevation to a point 50,000 feet from the point of beginning. The width of this surface at the runway end is the same as the primary surface, it flares uniformly, and the width at 50,000 is 16,000 feet.

(4) *Transitional surfaces.* These surfaces connect the primary surfaces, the first 200 feet of the clear zone surfaces, and the approach clearance surfaces to the inner horizontal surface, conical surface, outer horizontal surface

or other transitional surfaces. The slope of the transitional surface is 7 to 1 outward and upward at right angles to the runway centerline.

#### **§ 77.23 Heliport imaginary surfaces.**

(a) *Primary surface.* The area of the primary surface coincides in size and shape with the designated take-off and landing area. This surface is a horizontal plane at the elevation of the established heliport elevation.

(b) *Approach surface.* The approach surface begins at each end of the heliport primary surface with the same width as the primary surface, and extends outward and upward for a horizontal distance of 4,000 feet where its width is 500 feet. The slope of the approach surface is 8 to 1 for civil heliports and 10 to 1 for military heliports.

(c) *Transitional surfaces.* These surfaces extend outward and upward from the lateral boundaries of the primary surface and from the approach surfaces at a slope of 2 to 1 for a distance of 250 feet measured horizontally from the centerline of the primary and approach surfaces.

### **Subpart D—Aeronautical Studies and Determinations**

#### **§ 77.25 Applicability.**

(a) This subpart applies to any aeronautical study of a proposed construction or alteration for which notice to the FAA is required under § 77.9.

(b) The purpose of an aeronautical study is to determine whether the aeronautical effects of the specific proposal and, where appropriate, the cumulative impact resulting from the proposed construction or alteration when combined with the effects of other existing or proposed structures, would constitute a hazard to air navigation.

(c) The obstruction standards in subpart C of this part are supplemented by other manuals and directives used in determining the effect on the navigable airspace of a proposed construction or alteration. When the FAA needs additional information, it may circulate a study to interested parties for comment.

#### **§ 77.27 Initiation of studies.**

The FAA will conduct an aeronautical study when:

(a) Requested by the sponsor of any proposed construction or alteration for which a notice is submitted; or

(b) The FAA determines a study is necessary.



**§ 77.29 Evaluating aeronautical effect.**

(a) The FAA conducts an aeronautical study to determine the impact of a proposed structure, an existing structure that has not yet been studied by the FAA, or an alteration of an existing structure on aeronautical operations, procedures, and the safety of flight. These studies include evaluating:

- (1) The impact on arrival, departure, and en route procedures for aircraft operating under visual flight rules;
- (2) The impact on arrival, departure, and en route procedures for aircraft operating under instrument flight rules;
- (3) The impact on existing and planned public use airports;
- (4) Airport traffic capacity of existing public use airports and public use airport development plans received before the issuance of the final determination;
- (5) Minimum obstacle clearance altitudes, minimum instrument flight rules altitudes, approved or planned instrument approach procedures, and departure procedures;
- (6) The potential effect on ATC radar, direction finders, ATC tower line-of-sight visibility, and physical or electromagnetic effects on air navigation, communication facilities, and other surveillance systems;
- (7) The aeronautical effects resulting from the cumulative impact of a proposed construction or alteration of a structure when combined with the effects of other existing or proposed structures.

(b) If you withdraw the proposed construction or alteration or revise it so that it is no longer identified as an obstruction, or if no further aeronautical study is necessary, the FAA may terminate the study.

**§ 77.31 Determinations.**

(a) The FAA will issue a determination stating whether the proposed construction or alteration would be a hazard to air navigation, and will advise all known interested persons.

(b) The FAA will make determinations based on the aeronautical study findings and will identify the following:

(1) The effects on VFR/IFR aeronautical departure/arrival operations, air traffic procedures, minimum flight altitudes, and existing, planned, or proposed airports listed in § 77.15(e) of which the FAA has received actual notice prior to issuance of a final determination.

(2) The extent of the physical and/or electromagnetic effect on the operation of existing or proposed air navigation

facilities, communication aids, or surveillance systems.

(c) The FAA will issue a Determination of Hazard to Air Navigation when the aeronautical study concludes that the proposed construction or alteration will exceed an obstruction standard and would have a substantial aeronautical impact.

(d) A Determination of No Hazard to Air Navigation will be issued when the aeronautical study concludes that the proposed construction or alteration will exceed an obstruction standard but would not have a substantial aeronautical impact to air navigation. A Determination of No Hazard to Air Navigation may include the following:

- (1) Conditional provisions of a determination.
- (2) Limitations necessary to minimize potential problems, such as the use of temporary construction equipment.
- (3) Supplemental notice requirements, when required.
- (4) Marking and lighting recommendations, as appropriate.
- (e) The FAA will issue a Determination of No Hazard to Air Navigation when a proposed structure does not exceed any of the obstruction standards and would not be a hazard to air navigation.

**§ 77.33 Effective period of determinations.**

(a) A determination issued under this subpart is effective 40 days after the date of issuance, unless a petition for discretionary review is received by the FAA within 30 days after issuance. The determination will not become final pending disposition of a petition for discretionary review.

(b) Unless extended, revised, or terminated, each Determination of No Hazard to Air Navigation issued under this subpart expires 18 months after the effective date of the determination, or on the date the proposed construction or alteration is abandoned, whichever is earlier.

(c) A Determination of Hazard to Air Navigation has no expiration date.

**§ 77.35 Extensions, terminations, revisions and corrections.**

(a) You may petition the FAA official that issued the Determination of No Hazard to Air Navigation to revise or reconsider the determination based on new facts or to extend the effective period of the determination, provided that:

(1) Actual structural work of the proposed construction or alteration, such as the laying of a foundation, but not including excavation, has not been started; and

(2) The petition is submitted at least 15 days before the expiration date of the

Determination of No Hazard to Air Navigation.

(b) A Determination of No Hazard to Air Navigation issued for those construction or alteration proposals not requiring an FCC construction permit may be extended by the FAA one time for a period not to exceed 18 months.

(c) A Determination of No Hazard to Air Navigation issued for a proposal requiring an FCC construction permit may be granted extensions for up to 18 months, provided that:

(1) You submit evidence that an application for a construction permit/license was filed with the FCC for the associated site within 6 months of issuance of the determination; and

(2) You submit evidence that additional time is warranted because of FCC requirements; and

(3) Where the FCC issues a construction permit, a final Determination of No Hazard to Air Navigation is effective until the date prescribed by the FCC for completion of the construction. If an extension of the original FCC completion date is needed, an extension of the FAA determination must be requested from the Obstruction Evaluation Service (OES).

(4) If the Commission refuses to issue a construction permit, the final determination expires on the date of its refusal.

**Subpart E—Petitions for Discretionary Review****§ 77.37 General.**

(a) If you are the sponsor, provided a substantive aeronautical comment on a proposal in an aeronautical study, or have a substantive aeronautical comment on the proposal but were not given an opportunity to state it, you may petition the FAA for a discretionary review of a determination, revision, or extension of a determination issued by the FAA.

(b) You may not file a petition for discretionary review for a Determination of No Hazard that is issued for a temporary structure, marking and lighting recommendation, or when a proposed structure or alteration does not exceed obstruction standards contained in subpart C of this part.

**§ 77.39 Contents of a petition.**

(a) You must file a petition for discretionary review in writing and it must be received by the FAA within 30 days after the issuance of a determination under § 77.31, or a revision or extension of the determination under § 77.35.

(b) The petition must contain a full statement of the aeronautical basis on

which the petition is made, and must include new information or facts not previously considered or presented during the aeronautical study, including valid aeronautical reasons why the determination, revisions, or extension made by the FAA should be reviewed.

(c) In the event that the last day of the 30-day filing period falls on a weekend or a day the Federal government is closed, the last day of the filing period is the next day that the government is open.

(d) The FAA will inform the petitioner or sponsor (if other than the petitioner) and the FCC (whenever an FCC-related proposal is involved) of the filing of the petition and that the determination is not final pending disposition of the petition.

#### § 77.41 Discretionary review results.

(a) If discretionary review is granted, the FAA will inform the petitioner and the sponsor (if other than the petitioner) of the issues to be studied and reviewed. The review may include a request for comments and a review of all records from the initial aeronautical study.

(b) If discretionary review is denied, the FAA will notify the petitioner and the sponsor (if other than the petitioner), and the FCC, whenever a FCC-related proposal is involved, of the basis for the denial along with a statement that the determination is final.

(c) After concluding the discretionary review process, the FAA will revise, affirm, or reverse the determination.

Issued in Washington, DC, on July 13, 2010.

J. Randolph Babbitt,  
Administrator.

[FR Doc. 2010-17767 Filed 7-20-10; 8:45 am]

BILLING CODE 4910-13-P

## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 97

[Docket No. 30734; Amdt. No. 3382]

#### Standard Instrument Approach Procedures, and Takeoff Minimums and Obstacle Departure Procedures; Miscellaneous Amendments

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

**SUMMARY:** This establishes, amends, suspends, or revokes Standard Instrument Approach Procedures (SIAPs) and associated Takeoff Minimums and Obstacle Departure

Procedures for operations at certain airports. These regulatory actions are needed because of the adoption of new or revised criteria, or because of changes occurring in the National Airspace System, such as the commissioning of new navigational facilities, adding new obstacles, or changing air traffic requirements. These changes are designed to provide safe and efficient use of the navigable airspace and to promote safe flight operations under instrument flight rules at the affected airports.

**DATES:** This rule is effective July 21, 2010. The compliance date for each SIAP, associated Takeoff Minimums, and ODP is specified in the amendatory provisions.

The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of July 21, 2010.

**ADDRESSES:** Availability of matters incorporated by reference in the amendment is as follows:

#### For Examination—

1. FAA Rules Docket, FAA Headquarters Building, 800 Independence Avenue, SW., Washington, DC 20591;
2. The FAA Regional Office of the region in which the affected airport is located;
3. The National Flight Procedures Office, 6500 South MacArthur Blvd., Oklahoma City, OK 73169; or
4. The National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: [http://www.archives.gov/federal\\_register/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html).

**Availability—**All SIAPs and Takeoff Minimums and ODPs are available online free of charge. Visit <http://www.nfdc.faa.gov> to register. Additionally, individual SIAP and Takeoff Minimums and ODP copies may be obtained from:

1. FAA Public Inquiry Center (APA-200), FAA Headquarters Building, 800 Independence Avenue, SW., Washington, DC 20591; or
2. The FAA Regional Office of the region in which the affected airport is located.

#### FOR FURTHER INFORMATION CONTACT:

Harry J. Hodges, Flight Procedure Standards Branch (AFS-420), Flight Technologies and Programs Divisions, Flight Standards Service, Federal Aviation Administration, Mike Monroney Aeronautical Center, 6500

South MacArthur Blvd., Oklahoma City, OK 73169 (Mail Address: P.O. Box 25082, Oklahoma City, OK 73125) Telephone: (405) 954-4164.

**SUPPLEMENTARY INFORMATION:** This rule amends Title 14 of the Code of Federal Regulations, Part 97 (14 CFR part 97), by establishing, amending, suspending, or revoking SIAPs, Takeoff Minimums and/or ODPs. The complete regulators description of each SIAP and its associated Takeoff Minimums or ODP for an identified airport is listed on FAA form documents which are incorporated by reference in this amendment under 5 U.S.C. 552(a), 1 CFR part 51, and 14 CFR part 97.20. The applicable FAA Forms are FAA Forms 8260-3, 8260-4, 8260-5, 8260-15A, and 8260-15B when required by an entry on 8260-15A.

The large number of SIAPs, Takeoff Minimums and ODPs, in addition to their complex nature and the need for a special format make publication in the **Federal Register** expensive and impractical. Furthermore, airmen do not use the regulatory text of the SIAPs, Takeoff Minimums or ODPs, but instead refer to their depiction on charts printed by publishers of aeronautical materials. The advantages of incorporation by reference are realized and publication of the complete description of each SIAP, Takeoff Minimums and ODP listed on FAA forms is unnecessary. This amendment provides the affected CFR sections and specifies the types of SIAPs and the effective dates of the associated Takeoff Minimums and ODPs. This amendment also identifies the airport and its location, the procedure, and the amendment number.

#### The Rule

This amendment to 14 CFR part 97 is effective upon publication of each separate SIAP, Takeoff Minimums and ODP as contained in the transmittal. Some SIAP and Takeoff Minimums and textual ODP amendments may have been issued previously by the FAA in a Flight Data Center (FDC) Notice to Airmen (NOTAM) as an emergency action of immediate flight safety relating directly to published aeronautical charts. The circumstances which created the need for some SIAP and Takeoff Minimums and ODP amendments may require making them effective in less than 30 days. For the remaining SIAPs and Takeoff Minimums and ODPs, an effective date at least 30 days after publication is provided.

Further, the SIAPs and Takeoff Minimums and ODPs contained in this amendment are based on the criteria contained in the U.S. Standard for Terminal Instrument Procedures



**DOMINION VIRGINIA POWER**

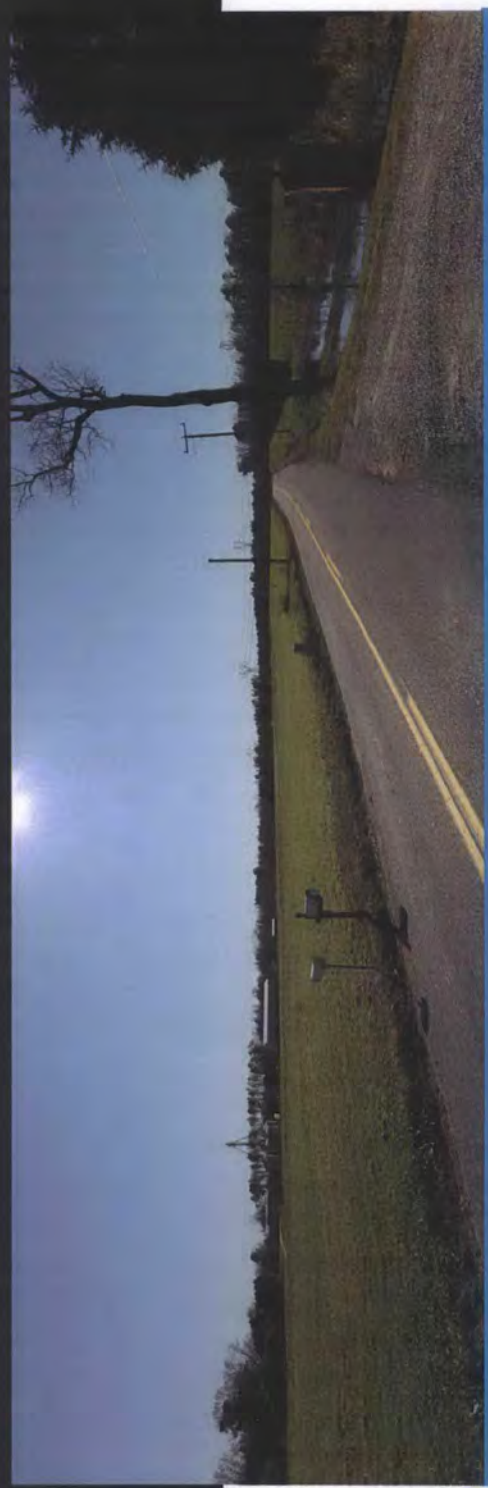
**Surry-Skiffes Creek 500 kV Transmission Line,  
Skiffes Creek-Whealton 230 kV Transmission Line, and  
Skiffes Creek 500 kV-230 kV-115 kV Switching Station**

**APPENDIX C**

**Visual Simulations**



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



Existing and Proposed Booklet  
May 2012



# Viewpoint Locations

**Viewpoint 01** - State Route 603 (Old Union Road)

**Viewpoint 02** - The Glebe Lane

**Viewpoint 03** - State Route 611 (Jelly Pond Road)

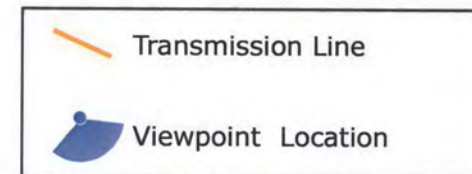
**Viewpoint 04** - Opportunity Way

**Viewpoint 05** - State Route 60 (Richmond Road)

**Viewpoint 06** - Tadich Drive

**Viewpoint 07** - Industrial Park Drive

**Viewpoint 08** - Devore Avenue










# Viewpoint Locations

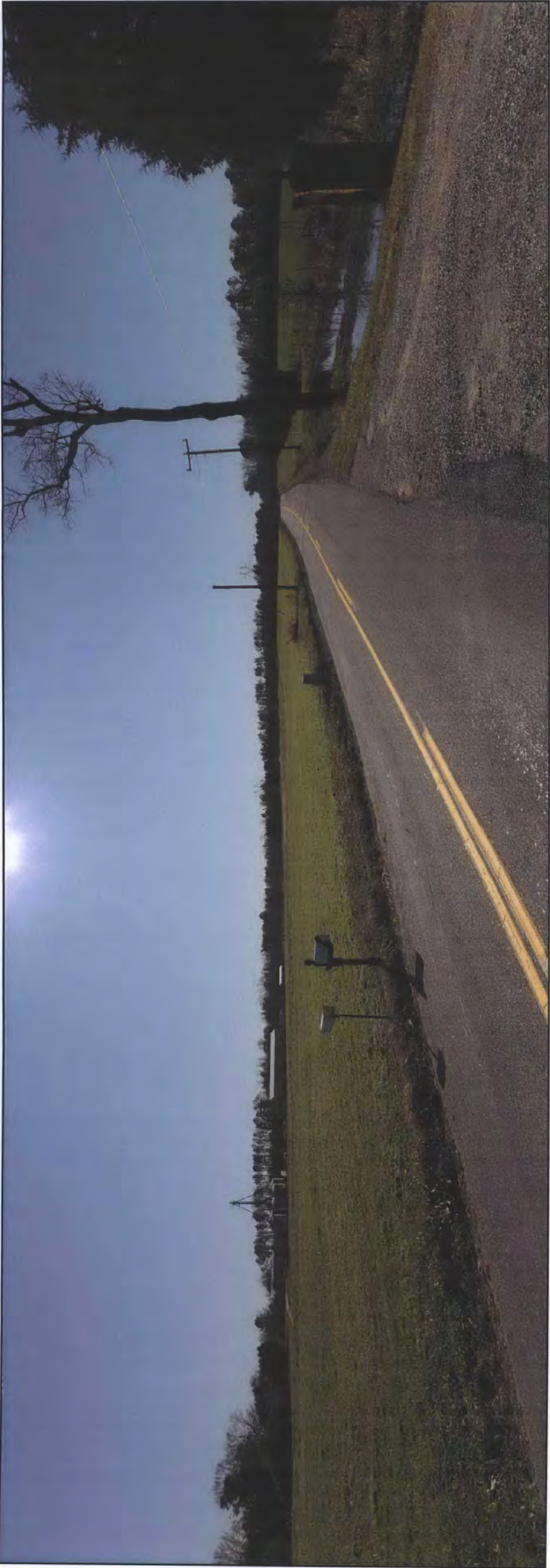


- Viewpoint 09** - Colonial Parkway
- Viewpoint 10** - Kingsmill Resort and Golf Club from Dock Area
- Viewpoint 11** - Kingsmill Resort and Golf Club from Overlook
- Viewpoint 12** - East End of Jamestown Island
- Viewpoint 13** - Chickahominy River
- Viewpoint 14** - State Route 60 (Pocahontas Trail)
- Viewpoint 15** - View from Main House at Carter's Grove

-  Viewpoint Location
-  Surry Alternative
-  James River Crossing Variation 1
-  James River Crossing Variation 2
-  James River Crossing Variation 3







Viewpoint 01 - State Route 603 (Old Union Road) - Looking Southwest - Existing View



Viewpoint 01 - State Route 603 (Old Union Road) - Looking Southwest - Proposed View

<div><b>Dominion</b> Surry-Skiffes Creek 500 kV Transmission Line Skiffes Creek-Wharton 230 kV Transmission Line Skiffes Creek 500-230-115 kV Switching Station</div>	<b>Viewpoint 01</b> State Route 603 (Old Union Road) Looking Southwest  Existing and Proposed	<div><div><div></div></div><div>Viewpoint Location</div><div>Transmission Line</div></div>		<div>Easting position (Virginia South Zone NAD83) 11874532.66 Northing position (Virginia South Zone NAD83)3465557.27 Elevation of viewpoint position (NAD 83) (ft): 126.73 Height of camera above ground (ft): 5.4 Date of photography: 24th November 2011 at 12:39 p.m. Orientation of view: SW Horizontal field of view: 124° Vertical field of view: 55°</div>		<div>NOTES: Viewpoint locations have been precision surveyed by <b>Dominion Virginia Power</b> Coordinator - Survey Services Jeffrey H. Brown, S.E. 701 East Oak Street Richmond, Va. 23219  No part of this photosimulation shall be altered in any way. Visual Assessments should be made from the full size TrueView™ only.</div>	<div>Photosimulation Created Using TrueView™ Technology  Provided by <b>TRUESCAPE</b> VISUAL COMMUNICATION  www.truescape.com</div>	DATE May 28, 2012	Tower placement in simulations is preliminary - final tower locations may change upon final design and survey
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Viewpoint 02 - The Glebe Lane - Looking South - Existing View



Viewpoint 02 - The Glebe Lane - Looking South - Proposed View

<div><div><div><div>Dominion</div><div>Surry-Skiffes Creek 300 kV Transmission Line Skiffes Creek-Wheaton 230 kV Transmission Line Skiffes Creek 500-230-115 kV Switching Station</div></div></div></div>	
Viewpoint 02	
The Glebe Lane Looking South	
Existing and Proposed	
<div><div><div><div></div></div><div><div></div></div></div><div>Viewpoint Location Transmission Line</div></div>	
<div><div><div><div>Easting position (Virginia South Zone NAD83) 11926711.14</div><div>Northing position (Virginia South Zone NAD83) 3663079.66</div><div>Elevation of viewpoint position (NAD 83) (ft): 112.28</div><div>Height of camera above ground (ft): 5.4</div><div>Date of photography: 26th November 2011 at 10:26 a.m.</div><div>Orientation of view: S</div><div>Horizontal field of view: 124°</div><div>Vertical field of view: 55°</div></div></div></div>	
<div>NOTES:</div> <div>Viewpoint locations have been precision surveyed by <b>Dominion Virginia Power</b> Construction Services Larry Hedblom, L.S. 701 East Cary Street Richmond, Va. 23219</div> <div>No part of this photosimulation shall be altered in any way. Visual Assessments should be made from the full size TrueView™ only.</div>	
<div>Photosimulation Created Using TrueView™ Technology</div> <div>Provided by <b>TRUESCAPE</b> VISUAL COMMUNICATION</div> <div>www.truescape.com</div>	
DATE	May 28, 2012
Tower placement in simulations is preliminary - final tower locations may change upon final design and survey	






**Viewpoint 03 - State Route 611 (Jolly Pond Road) - Looking East - Existing View**





**Viewpoint 03 - State Route 611 (Jolly Pond Road) - Looking East - Proposed View**



**Dominion**  
 Surry-Skiffes Creek 500 kV Transmission Line  
 Skiffes Creek-Wheaton 230 kV Transmission Line  
 Skiffes Creek 500-230-115 kV Switching Station

**Viewpoint 03**

State Route 611  
(Jolly Pond Road) - Looking East

Existing and Proposed

 Viewpoint Location  
 Transmission Line



Easting position (Virginia South Zone NAD83) **11975622.78**  
 Northing position (Virginia South Zone NAD83) **3649635.38**  
 Elevation of viewpoint position (NAD 83) (ft): **105.33**  
 Height of camera above ground (ft): **5.4**  
 Date of photography: **25th November 2011 at 3:38 p.m.**  
 Orientation of view: **E**  
 Horizontal field of view: **124°**  
 Vertical field of view: **55°**


NOTES:

Viewpoint locations have been precision surveyed by

**Dominion Virginia Power**  
 Coordinator - Survey Services  
 Larry Hedblom, L.S.  
 701 East Cary Street  
 Richmond, Va, 23219

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DATE **May 28, 2012**

Tower placement in simulations is preliminary - final tower locations may change upon final design and survey






**Viewpoint 04 - Opportunity Way - Looking Northeast - Existing View**






**Viewpoint 04 - Opportunity Way - Looking Northeast - Proposed View**



**Dominion**  
 Surry-Skiffes Creek 500 kV Transmission Line  
 Skiffes Creek-Wheaton 230 kV Transmission Line  
 Skiffes Creek 500-230-115 kV Switching Station

**Viewpoint 04**  
 Opportunity Way - Looking Northeast  
 Existing and Proposed

 Viewpoint Location  
 Transmission Line



Easting position (Virginia South Zone NAD83): **11988172.46**  
 Northing position (Virginia South Zone NAD83): **3648281.07**  
 Elevation of viewpoint position (NAD 83) (ft): **88.42**  
 Height of camera above ground (ft): **5.4**  
 Date of photography: **25th November 2011 at 3:15 p.m.**  
 Orientation of view: **NE**  
 Horizontal field of view: **124°**  
 Vertical field of view: **55°**

**NOTES:**

Viewpoint locations have been precision surveyed by  
**Dominion Virginia Power**  
 Coordinator - Survey Services  
 Larry Hedblom, L.S.  
 701 East Cary Street  
 Richmond, Va. 23219

No part of this photosimulation shall be altered in any way.

Visual Assessments should be made from the full size TrueView™ only.

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DATE **May 28, 2012**

Tower placement in simulations is preliminary - final tower locations may change upon final design and survey






**Viewpoint 05 - State Route 60 (Richmond Road) - Looking Southeast - Existing View**



**Viewpoint 05 - State Route 60 (Richmond Road) - Looking Southeast - Proposed View**




**Dominion**  
Surry-Skiffes Creek 500 kV Transmission Line  
Skiffes Creek-Wheaton 230 kV Transmission Line  
Skiffes Creek 500-230-115 kV Switching Station

**Viewpoint 05**  
State route 60  
(Richmond Road) - Looking Southeast  
Existing and Proposed

Viewpoint Location

Transmission Line



Easting position (Virginia South Zone NAD83)11998222.64

Northing position(Virginia South Zone NAD83)3638658.57

Elevation of viewpoint position (NAD 83) (ft): 88.34

Height of camera above ground (ft): 5.4

Date of photography: 25th November 2011 at 2:33 p.m.

Orientation of view: SE

Horizontal field of view: 124°

Vertical field of view: 55°

NOTES:  
Viewpoint locations have been precision surveyed by  
Dominion Virginia Power  
Coordinator - Survey Services  
Larry Hedblom, L.S.  
701 East Cary Street  
Richmond, Va. 23219  
  
No part of this photosimulation shall be altered in any way.  
Visual Assessments should be made from the full size TrueView™ only.

Photosimulation Created Using TrueView™ Technology

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DATE  
May 28, 2012

Tower placement in simulations is preliminary - final tower locations may change upon final design and survey





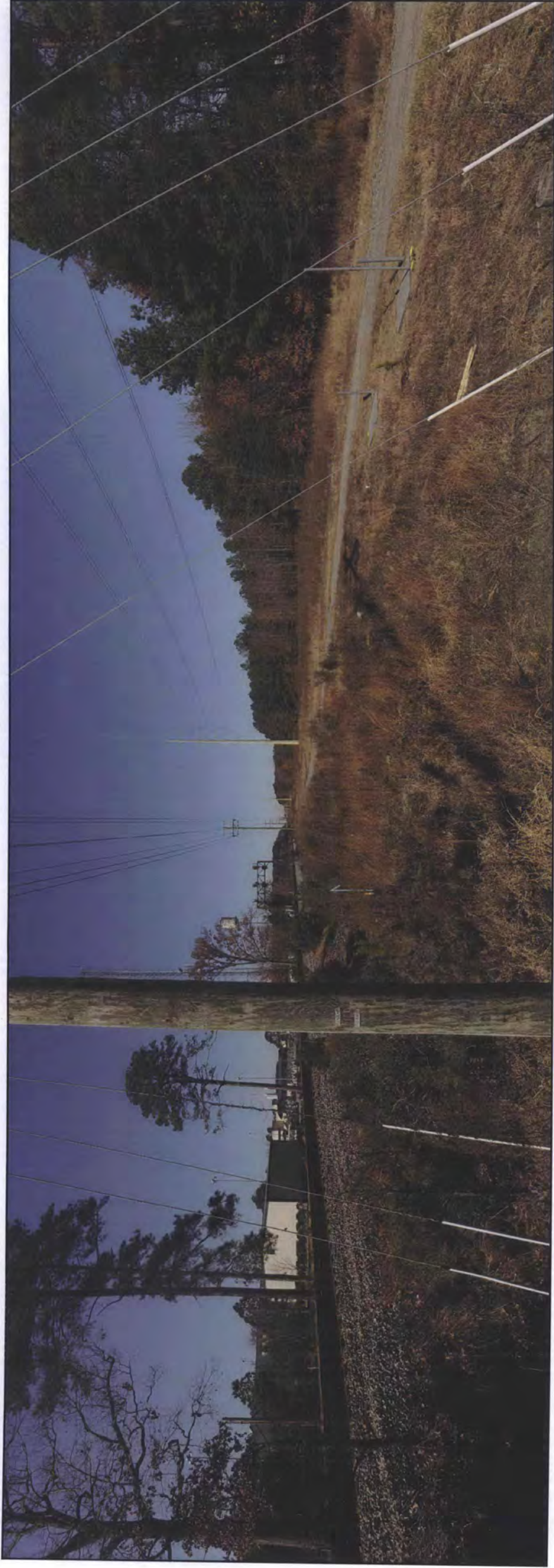
**Viewpoint 06 - Tadich Drive - Looking North - Existing View**



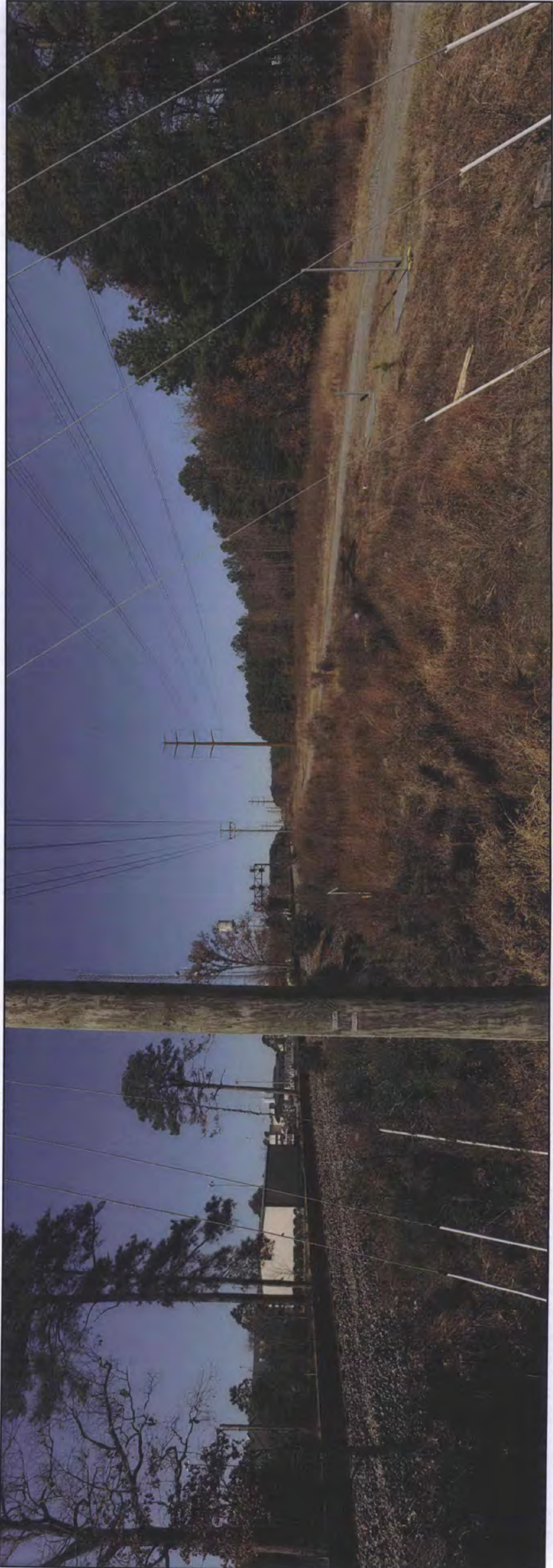
**Viewpoint 06 - Tadich Drive - Looking North - Proposed View**

 <b>Dominion</b> Surry-Skiffes Creek 500 kV Transmission Line Skiffes Creek-Wheaton 230 kV Transmission Line Skiffes Creek 500-230-115 kV Switching Station	
<b>Viewpoint 06</b> Tadich Drive - Looking North Existing and Proposed	
	
Easting position (Virginia South Zone NAD83) 12023390.17 Northing position (Virginia South Zone NAD83) 3609508.25 Elevation of viewpoint position (NAD 83) (ft): 78.24 Height of camera above ground (ft): 5.4 Date of photography: 25th November 2011 at 12.26 p.m. Orientation of view: N Horizontal field of view: 124° Vertical field of view: 55°	
NOTES: Viewpoint locations have been precision surveyed by <b>Dominion Virginia Power</b> Coordinator - Survey Services Larry Hedblom, L.S. 701 East Cary Street Richmond, Va. 23219 No part of this photosimulation shall be altered in any way. Visual Assessments should be made from the full size TrueView™ only.	
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Viewpoint 07 - Industrial Park Drive - Looking Northwest - Existing View



Viewpoint 07 - Industrial Park Drive - Looking Northwest - Proposed View



Surry-Stiffes Creek 500 kV Transmission Line  
Stiffes Creek-Wharton 230 kV Transmission Line  
Stiffes Creek 500-230-115 kV Switching Station

Viewpoint 07

Industrial Park Drive  
Looking Northwest  
Existing and Proposed

Viewpoint Location  
Transmission Line

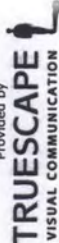


Existing position (Virginia South Zone MADS) 1203432.86  
Northing position (Virginia South Zone MADS) 3608598.23  
Elevation of viewpoint position (NAD 83) (ft): 74.75  
Height of camera above ground (ft): 5.4  
Date of photography: 28th November 2011 at 11:59 a.m.  
Orientation of view: NW  
Horizontal field of view: 124°  
Vertical field of view: 55°

NOTES:

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**Viewpoint 08 - Devore Avenue - Looking North - Existing View**



**Viewpoint 08 - Devore Avenue - Looking North - Proposed View**


**Dominion**  
 Surry-Skiffes Creek 500 kV Transmission Line  
 Skiffes Creek-Wheaton 230 kV Transmission Line  
 Skiffes Creek 500-230-115 kV Switching Station

**Viewpoint 08**  
 Devore Avenue - Looking North  
 Existing and Proposed



Easting position (Virginia South Zone NAD83) 12082086.90  
 Northing position (Virginia South Zone NAD83) 3551572.88  
 Elevation of viewpoint position (NAD 83) (ft): 20.30  
 Height of camera above ground (ft): 5.4  
 Date of photography: 25th November 2011 at 9:35 a.m.  
 Orientation of view: N  
 Horizontal field of view: 124°  
 Vertical field of view: 55°

NOTES:  
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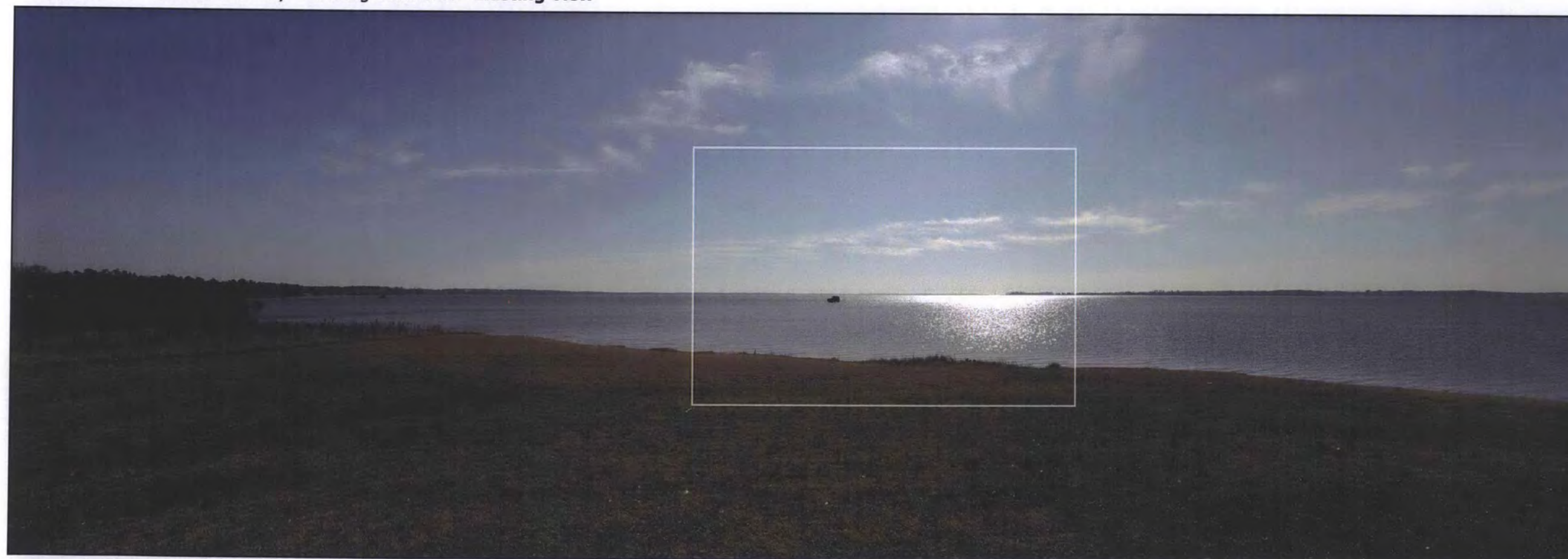
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**Viewpoint 09 - Colonial Parkway - Looking Southeast - Existing View**

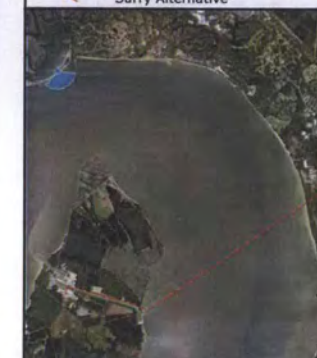


**Viewpoint 09 - Colonial Parkway - Looking Southeast - Surry Alternative - Proposed View**  
 White box indicates enlargement area (see next page)

**Viewpoint 09**  
 Colonial Parkway - Looking Southeast  
 Surry Alternative

Existing and Proposed View

- Viewpoint Location
- Tower Position
- Surry Alternative



Easting position (Virginia South Zone NAD83) 12007386.5  
 Northing position (Virginia South Zone NAD83) 3608577.6  
 Elevation of viewpoint position (NAD 83 / ft): 7.4  
 Height of camera above ground (ft): 5.4  
 Date of photography: 7th February 2012 at 7:17 a.m.  
 Orientation of view: SE  
 Horizontal field of view: 124°  
 Vertical field of view: 55°  
 Distance to Closest Visible Tower (miles): 4.4

**NOTES:**

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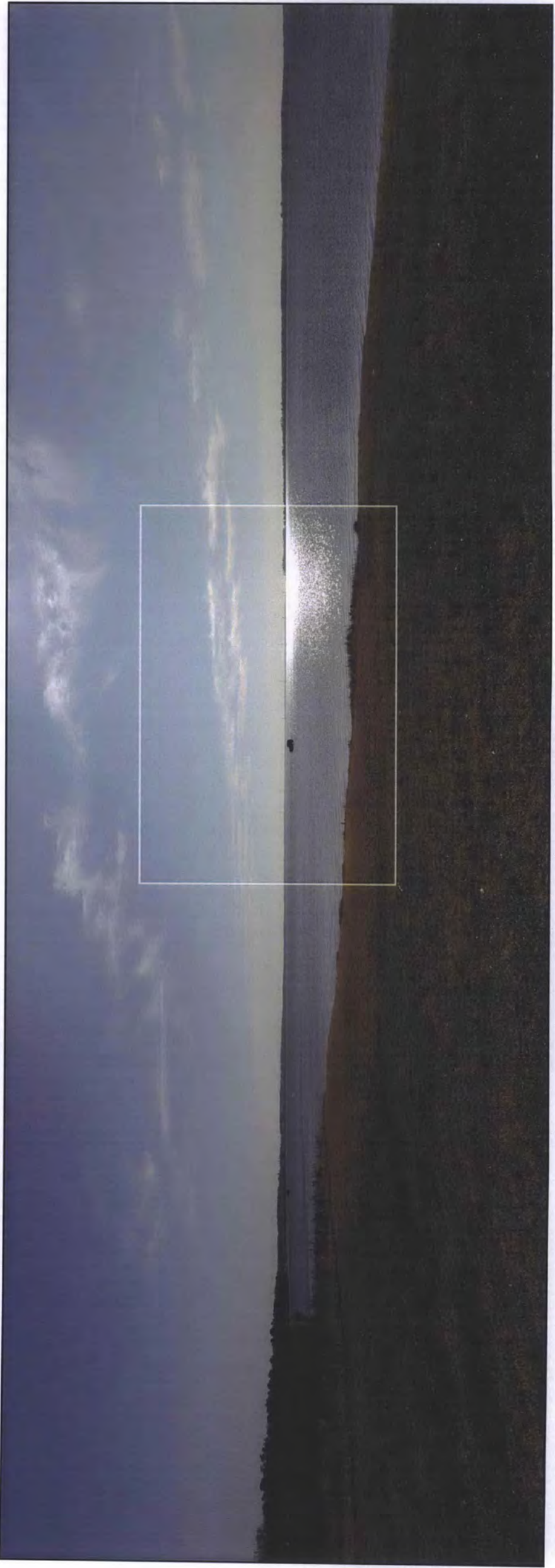


**Viewpoint 09** - Colonial Parkway - Looking Southeast - **Surry Alternative - Proposed View**  
Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.







Viewpoint 09 - Colonial Parkway – Looking Southeast - Existing View



Viewpoint 09 - Colonial Parkway – Looking Southeast - James River Crossing Variation 1 - Proposed View  
White box indicates enlargement area (see next page)

 Dominion® Surry-Skiffes Creek 500 kV Transmission Line Skiffes Creek-Wheaton 230 kV Transmission Line Skiffes Creek 500-230-115 kV Switching Station	<b>Viewpoint 09</b> Colonial Parkway – Looking Southeast James River Crossing Variation 1  Existing and Proposed View	<div><div>Viewpoint Location</div><div><div>●</div> Tower Position</div><div><div>—</div> James River Crossing Variation 1</div></div> 	<div>Easting position (Virginia South Zone NAD83) 12007286.5</div> <div>Northing position (Virginia South Zone NAD83) 3608577.6</div> <div>Elevation of viewpoint position (NAO 83 / ft): 7.4</div> <div>Height of camera above ground (ft): 5.4</div> <div>Date of photography: 7th February 2012 at 7:17 a.m.</div> <div>Orientation of view: SE</div> <div>Horizontal field of view: 124°</div> <div>Vertical field of view: 55°</div> <div>Distance to Closest Visible Tower (miles) 3.57</div>		<div>NOTES:</div> <div>Viewpoint locations have been precision surveyed by</div> <div><b>Dominion Virginia Power</b></div> <div>Coordinator - Survey Services</div> <div>Larry Hedblom, L.S.</div> <div>701 East Cary Street</div> <div>Richmond, Va. 23219</div> <div>No part of this photosimulation shall be altered in any way.</div> <div>Visual Assessments should be made from the full size TrueView™ only.</div> <div>Photosimulation Created Using TrueView™ Technology</div> <div><b>TRUESCAPE</b> VISUAL COMMUNICATION</div> <div>Provided by</div> <div>www.truescape.com</div>	<div>DATE</div> <div>May 28, 2012</div>	<div>Tower placement in simulations is preliminary - final tower locations may change upon final design and survey</div>
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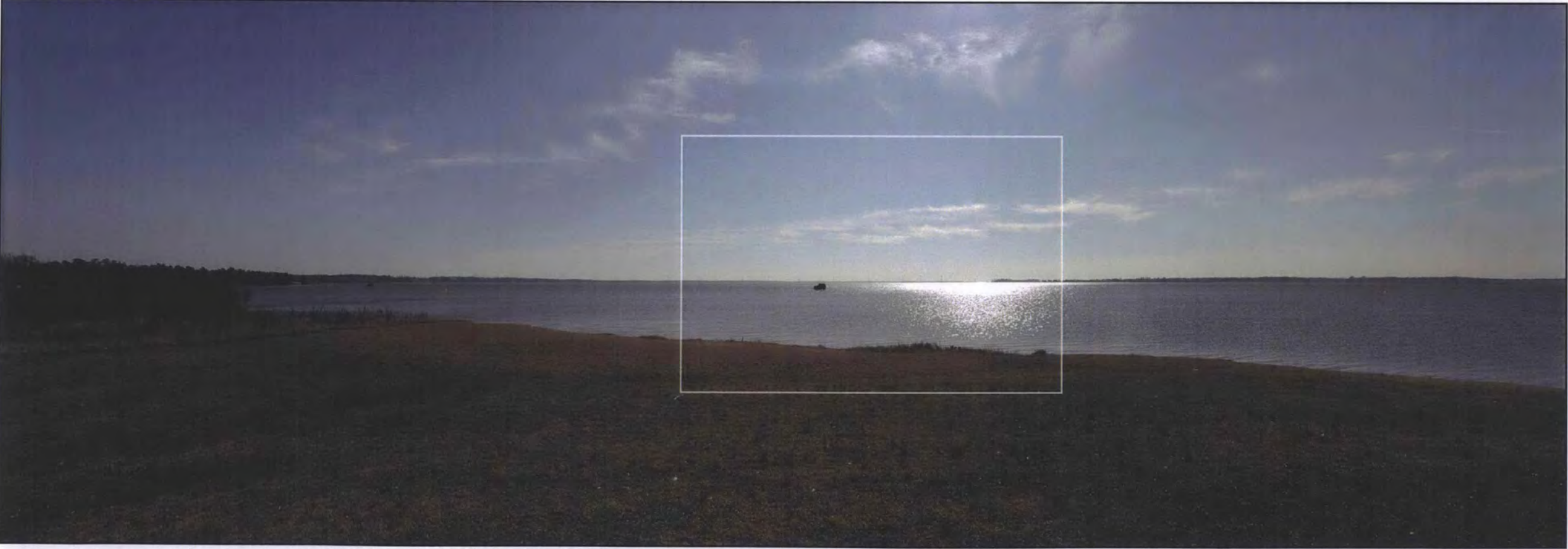


**Viewpoint 09** - Colonial Parkway - Looking Southeast - **James River Crossing Variation 1 - Proposed View**  
*Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.*






**Viewpoint 09 - Colonial Parkway – Looking Southeast - Existing View**



**Viewpoint 09 - Colonial Parkway – Looking Southeast - James River Crossing Variation 2 - Proposed View**  
*White box indicates enlargement area (see next page)*




**Dominion**  
Surry-Skiffes Creek 500 kV Transmission Line  
Skiffes Creek-Wheaton 230 kV Transmission Line  
Skiffes Creek 500-230-115 kV Switching Station

**Viewpoint 09**  
Colonial Parkway – Looking Southeast  
James River Crossing Variation 2

Existing and Proposed View

Viewpoint Location  
Tower Position  
James River Crossing Variation 2



Easting position (Virginia South Zone NAD83) 12007386.5  
Northing position (Virginia South Zone NAD83) 3608577.6  
Elevation of viewpoint position (NAD 83 / ft): 7.4  
Height of camera above ground (ft): 5.4  
Date of photography: 7th February 2012 at 7:17 a.m.  
Orientation of view: SE  
Horizontal field of view: 124°  
Vertical field of view: 55°  
Distance to Closest Visible Tower (miles) 4.21

NOTES:

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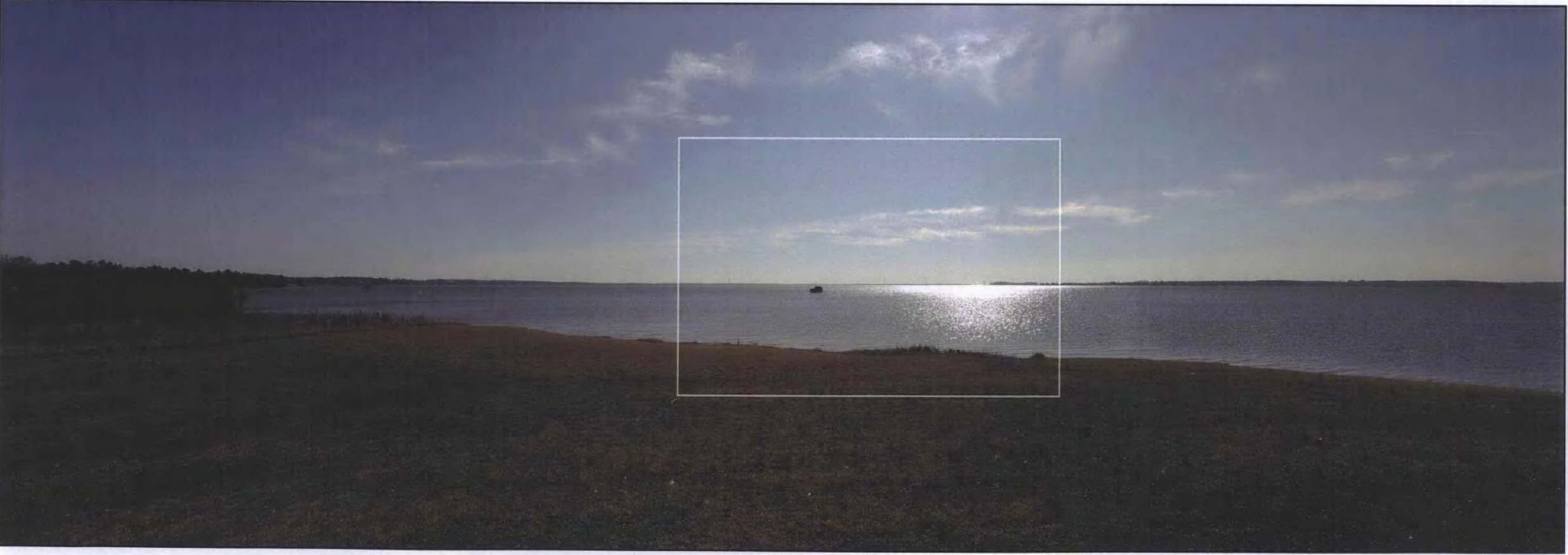


**Viewpoint 09** - Colonial Parkway – Looking Southeast - **James River Crossing Variation 2 - Proposed View**  
Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.






**Viewpoint 09 - Colonial Parkway – Looking Southeast - Existing View**



**Viewpoint 09 - Colonial Parkway – Looking Southeast - James River Crossing Variation 3 - Proposed View**  
*White box indicates enlargement area (see next page)*




**Dominion**  
Surry-Skiffes Creek 500 kV Transmission Line  
Skiffes Creek-Wheaton 230 kV Transmission Line  
Skiffes Creek 500-230-115 kV Switching Station

**Viewpoint 09**  
Colonial Parkway – Looking Southeast  
James River Crossing Variation 3

Existing and Proposed View

● Viewpoint Location  
● Tower Position  
— James River Crossing Variation 3



Easting position (Virginia South Zone NAD83) 12007386.5  
Northing position (Virginia South Zone NAD83) 3608577.6  
Elevation of viewpoint position (NAD 83 / ft): 7.4  
Height of camera above ground (ft): 5.4  
Date of photography: 7th February 2012 at 7:17 a.m.  
Orientation of view: SE  
Horizontal field of view: 124°  
Vertical field of view: 55°  
Distance to Closest Visible Tower (miles) 3.79

NOTES:

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**Viewpoint 09** - Colonial Parkway - Looking Southeast - **James River Crossing Variation 3 - Proposed View**  
*Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.*





**Viewpoint 10 - Kingsmill Resort and Golf Club from Dock Area - Looking South - Existing View**



**Viewpoint 10 - Kingsmill Resort and Golf Club from Dock Area - Looking South - Surry Alternative - Proposed View**  
*White box indicates enlargement area (see next page)*

**Viewpoint 10**  
 Kingsmill Resort and Golf Club from  
 Dock Area - Looking South  
 Surry Alternative

Existing and Proposed View

- Viewpoint Location
- Tower Position
- Surry Alternative



Easting position (Virginia South Zone NAD83) 12017825.6  
 Northing position (Virginia South Zone NAD83) 3609977.7  
 Elevation of viewpoint position (NAD 83 / ft): 13.9  
 Height of camera above ground (ft): 5.4  
 Date of photography: 7th February 2012 at 8:00 a.m.  
 Orientation of view: 5  
 Horizontal field of view: 124°  
 Vertical field of view: 55°  
 Distance to Closest Visible Tower (miles) 3.52

**NOTES:**

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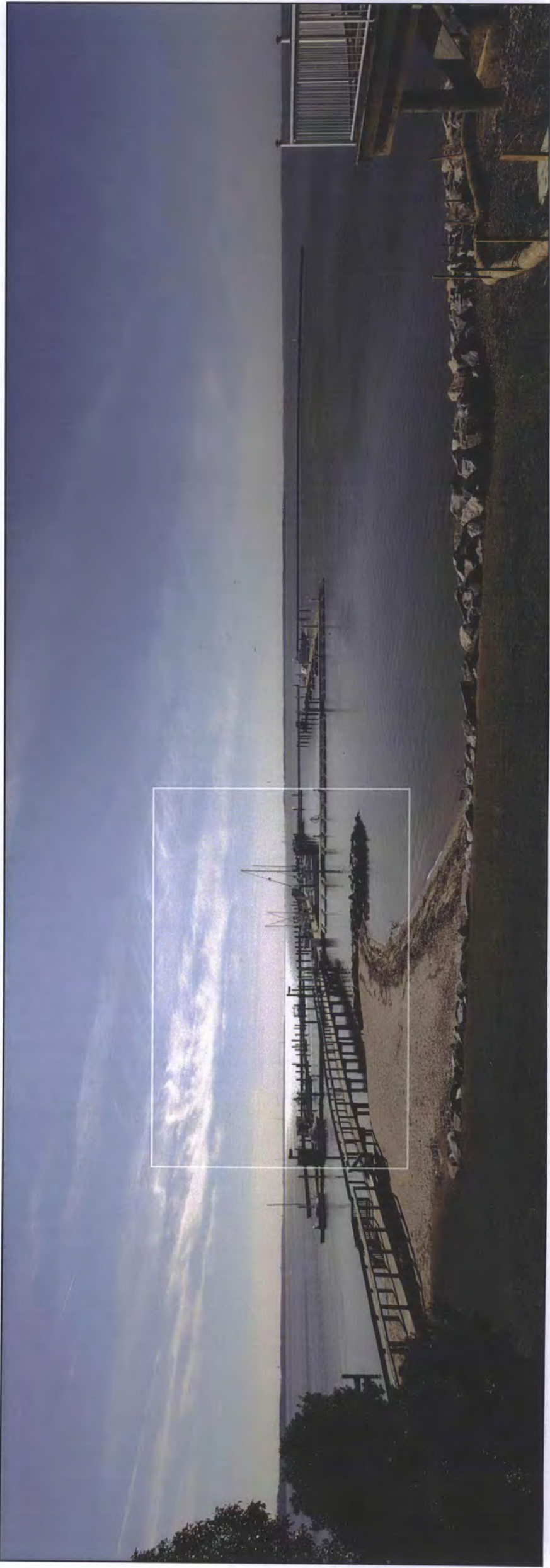


**Viewpoint 10** - Kingsmill Resort and Golf Club from Dock Area - Looking South - **Surry Alternative - Proposed View**  
Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.





Viewpoint 10 - Kingsmill Resort and Golf Club from Dock Area - Looking South - Existing View



Viewpoint 10 - Kingsmill Resort and Golf Club from Dock Area - Looking South - James River Crossing Variation 1 - Proposed View  
White box indicates enlargement area (see next page)



**Dominion**  
Surry-Skiffes Creek 500 kV Transmission Line  
Skiffes Creek-Wheaton 230 kV Transmission Line  
Skiffes Creek 500-230-115 kV Switching Station

**Viewpoint 10**  
Kingsmill Resort and Golf Club from  
Dock Area - Looking South  
James River Crossing Variation 1  
  
Existing and Proposed View

- Viewpoint Location
- Tower Position
  - James River Crossing Variation 1



Easting position (Virginia South Zone NAD83) 12017825.6  
Northing position (Virginia South Zone NAD83) 3699977.7  
Elevation of viewpoint position (NAD 83 / ft): 13.9  
Height of camera above ground (ft): 5.4  
Date of photography: 7th February 2012 at 8:00 a.m.  
Orientation of view: S  
Horizontal field of view: 126°  
Vertical field of view: 55°  
Distance to Closest Visible Tower (miles) 3.04

NOTES:  
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**Viewpoint 10** - Kingsmill Resort and Golf Club from Dock Area - Looking South - **James River Crossing Variation 1 - Proposed View**  
Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.






**Viewpoint 10 - Kingsmill Resort and Golf Club from Dock Area - Looking South - Existing View**



**Viewpoint 10 - Kingsmill Resort and Golf Club from Dock Area - Looking South - James River Crossing Variation 2 - Proposed View**  
*White box indicates enlargement area (see next page)*



**Dominion**  
Surry-Skiffes Creek 500 kV Transmission Line  
Skiffes Creek-Wheaton 230 kV Transmission Line  
Skiffes Creek 500-230-115 kV Switching Station


**Viewpoint 10**  
Kingsmill Resort and Golf Club from Dock Area - Looking South  
James River Crossing Variation 2

Existing and Proposed View

Viewpoint Location

Tower Position

James River Crossing Variation 2



Easting position (Virginia South Zone NAD83) **12017825.6**  
Northing position (Virginia South Zone NAD83) **3609977.7**  
Elevation of viewpoint position (NAD 83 / ft): **13.9**  
Height of camera above ground (ft): **5.4**  
Date of photography: **7th February 2012 at 8:00 a.m.**  
Orientation of view: **S**  
Horizontal field of view: **124°**  
Vertical field of view: **55°**  
Distance to Closest Visible Tower (miles) **3.04**

NOTES:

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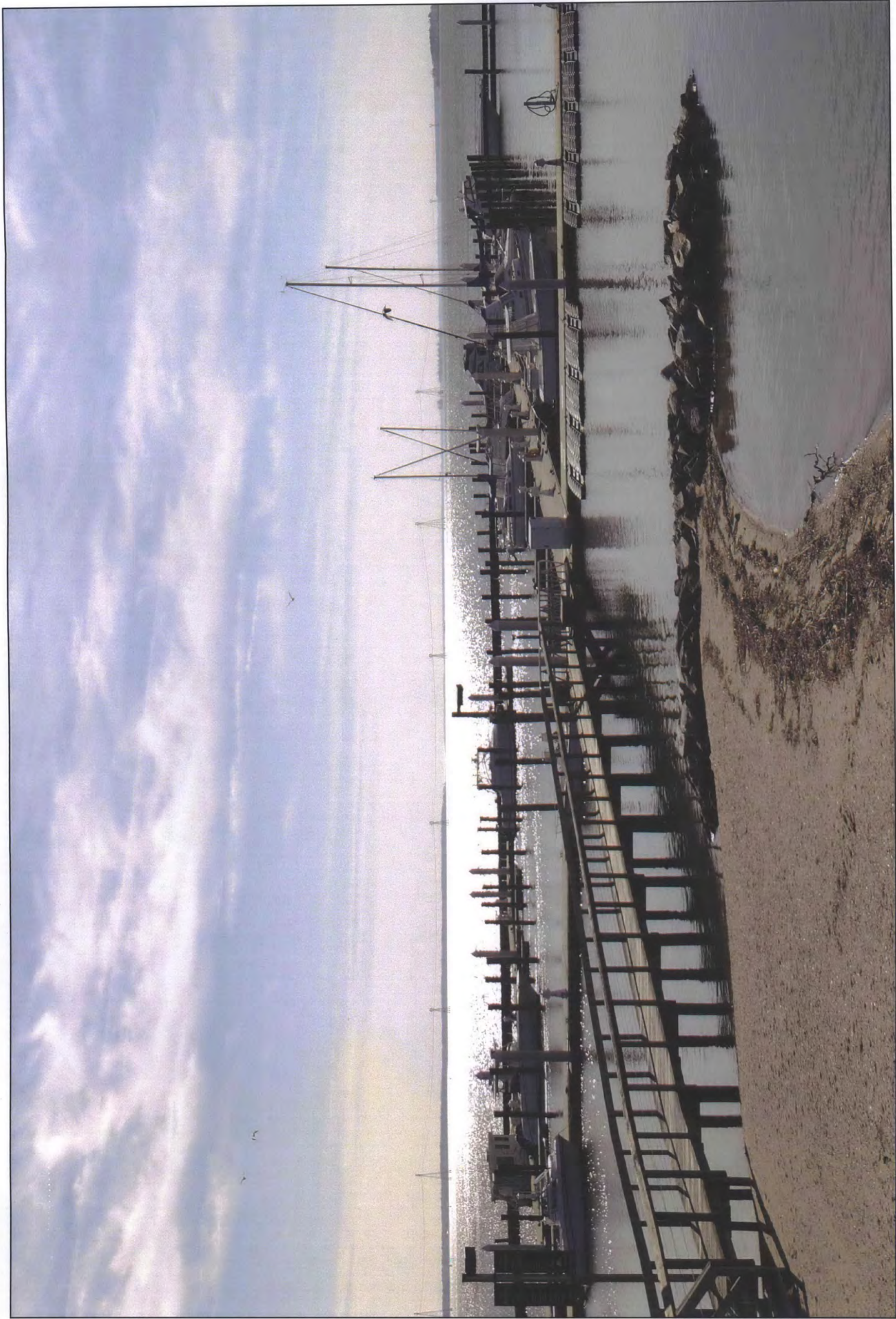
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**Viewpoint 10** - Kingsmill Resort and Golf Club from Dock Area - Looking South - **James River Crossing Variation 2** - **Proposed View**  
*Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.*






**Viewpoint 10 - Kingsmill Resort and Golf Club from Dock Area - Looking South - Existing View**



**Viewpoint 10 - Kingsmill Resort and Golf Club from Dock Area - Looking South - James River Crossing Variation 3 - Proposed View**  
*White box indicates enlargement area (see next page)*




**Dominion**  
Surry-Skiffes Creek 500 kV Transmission Line  
Skiffes Creek-Wheaton 230 kV Transmission Line  
Skiffes Creek 500-230-115 kV Switching Station

**Viewpoint 10**  
Kingsmill Resort and Golf Club from  
Dock Area - Looking South  
James River Crossing Variation 3

Existing and Proposed View

- Viewpoint Location
- Tower Position
- James River Crossing Variation 3



Easting position (Virginia South Zone NAD83) 12017825.6  
Northing position (Virginia South Zone NAD83) 3609977.7  
Elevation of viewpoint position (NAD 83 / ft): 13.9  
Height of camera above ground (ft): 5.4  
Date of photography: 7th February 2012 at 8:00 a.m.  
Orientation of view: S  
Horizontal field of view: 124°  
Vertical field of view: 55°  
Distance to Closest Visible Tower (miles) 2.67

NOTES:

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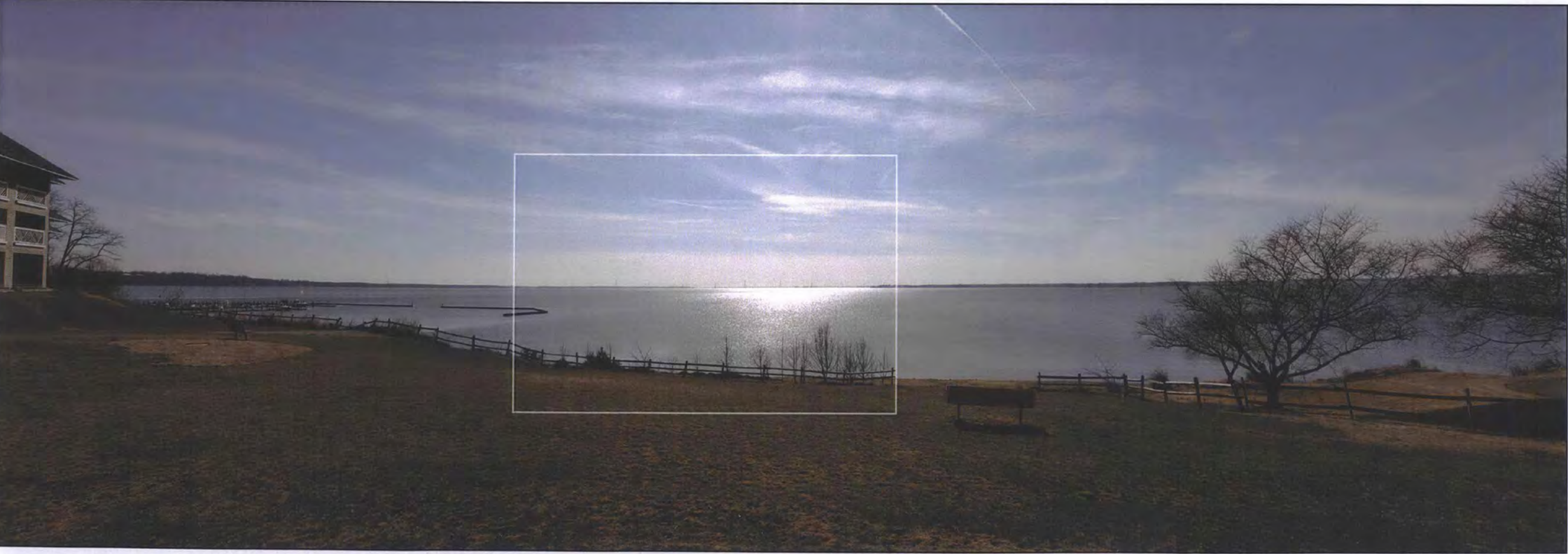


**Viewpoint 10** - Kingsmill Resort and Golf Club from Dock Area - Looking South - **James River Crossing Variation 3 - Proposed View**  
Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.






**Viewpoint 11 - Kingsmill Resort and Golf Club from Overlook - Looking South - Existing View**



**Viewpoint 11 - Kingsmill Resort and Golf Club from Overlook - Looking South - Surry Alternative - Proposed View**  
*White box indicates enlargement area (see next page)*




**Dominion**  
Surry-Skiffes Creek 500 kV Transmission Line  
Skiffes Creek-Wheaton 230 kV Transmission Line  
Skiffes Creek 500-230-115 kV Switching Station

**Viewpoint 11**  
Kingsmill Resort and Golf Club from  
Overlook - Looking South  
Surry Alternative

Existing and Proposed View

• Viewpoint Location  
• Tower Position  
— Surry Alternative



Easting position (Virginia South Zone NAD83) 12016668.4  
Northing position (Virginia South Zone NAD83) 3610148.9  
Elevation of viewpoint position (NAD 83 / ft): 35.8  
Height of camera above ground (ft): 5.4  
Date of photography: 7th February 2012 at 8:42 a.m.  
Orientation of view: 5  
Horizontal field of view: 124°  
Vertical field of view: 55°  
Distance to Closest Visible Tower (miles) 3.67

NOTES:

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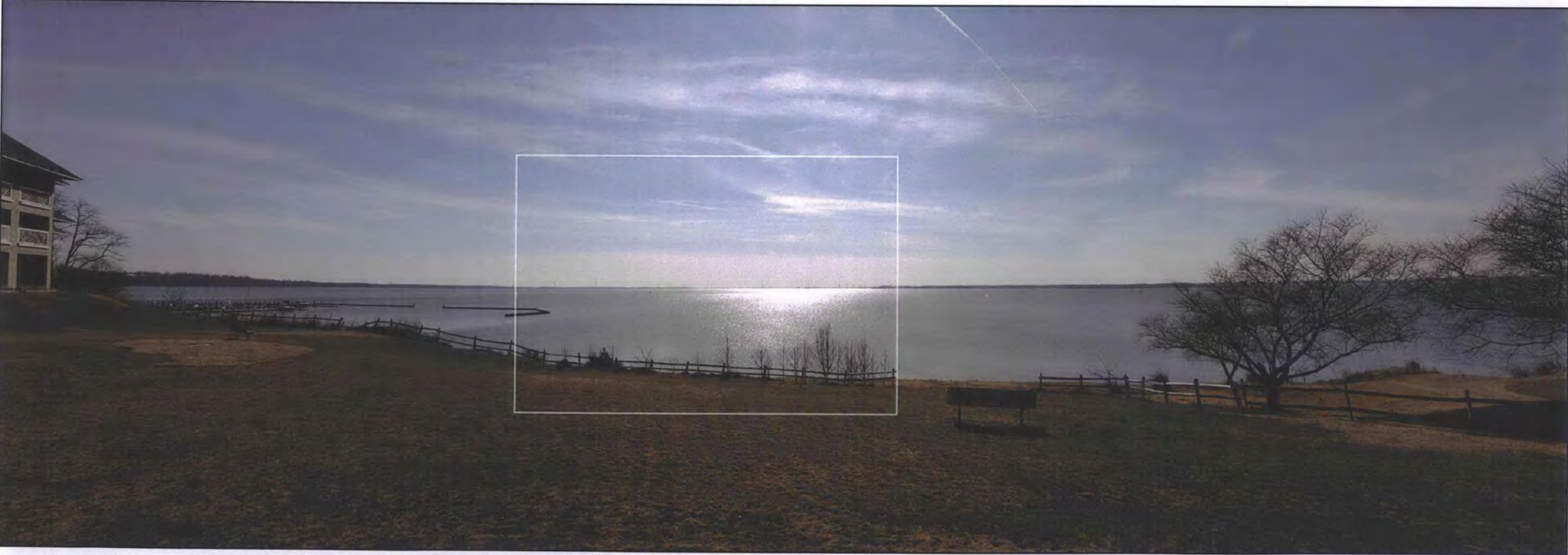


**Viewpoint 11** - Kingsmill Resort and Golf Club from Overlook - Looking South - **Surry Alternative - Proposed View**  
*Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.*





**Viewpoint 11 - Kingsmill Resort and Golf Club from Overlook - Looking South - Existing View**



**Viewpoint 11 - Kingsmill Resort and Golf Club from Overlook - Looking South - James River Crossing Variation 1 - Proposed View**  
*White box indicates enlargement area (see next page)*

**Viewpoint 11**  
 Kingsmill Resort and Golf Club from  
 Overlook - Looking South  
 James River Crossing Variation 1

Existing and Proposed View

- Viewpoint Location
- Tower Position
- James River Crossing Variation 1



Easting position (Virginia South Zone NAD83) 12016668.4  
 Northing position (Virginia South Zone NAD83) 3610148.9  
 Elevation of viewpoint position (NAD 83 / ft): 35.8  
 Height of camera above ground (ft): 5.4  
 Date of photography: 7th February 2012 at 8:42 a.m.  
 Orientation of view: S  
 Horizontal field of view: 124°  
 Vertical field of view: 55°  
 Distance to Closest Visible Tower (miles) 3.14

**NOTES:**  
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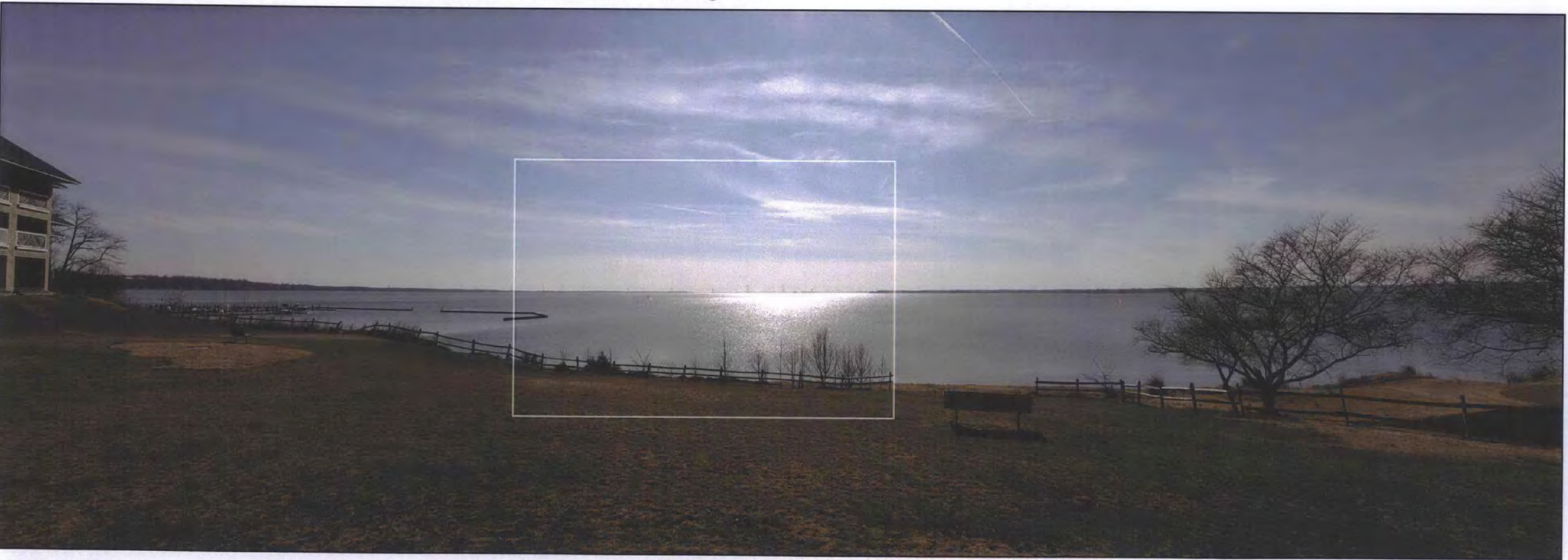


**Viewpoint 11** - Kingsmill Resort and Golf Club from Overlook - Looking South - **James River Crossing Variation 1** - **Proposed View**  
*Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.*






**Viewpoint 11 - Kingsmill Resort and Golf Club from Overlook - Looking South - Existing View**



**Viewpoint 11 - Kingsmill Resort and Golf Club from Overlook - Looking South - James River Crossing Variation 2 - Proposed View**  
White box indicates enlargement area (see next page)




**Dominion**  
Surry-Skiffes Creek 500 kV Transmission Line  
Skiffes Creek-Wheaton 230 kV Transmission Line  
Skiffes Creek 500-230-115 kV Switching Station

**Viewpoint 11**  
Kingsmill Resort and Golf Club from  
Overlook - Looking South  
James River Crossing Variation 2

Existing and Proposed View

• Viewpoint Location  
• Tower Position  
James River Crossing Variation 2



Easting position (Virginia South Zone NAD83) 12016668.4  
Northing position (Virginia South Zone NAD83) 3610148.9  
Elevation of viewpoint position (NAD 83 / ft): 35.8  
Height of camera above ground (ft): 5.4  
Date of photography: 7th February 2012 at 8:42 a.m.  
Orientation of view: 5  
Horizontal field of view: 124°  
Vertical field of view: 55°  
Distance to Closest Visible Tower (miles) 3.24

NOTES:

Viewpoint locations have been precision surveyed by  
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**Viewpoint 11** - Kingsmill Resort and Golf Club from Overlook - Looking South - **James River Crossing Variation 2 - Proposed View**  
Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.





**Viewpoint 11** - Kingsmill Resort and Golf Club from Overlook - Looking South - **Existing View**



**Viewpoint 11** - Kingsmill Resort and Golf Club from Overlook - Looking South - **James River Crossing Variation 3 - Proposed View**  
*White box indicates enlargement area (see next page)*

**Viewpoint 11**  
 Kingsmill Resort and Golf Club from  
 Overlook - Looking South  
 James River Crossing Variation 3

Existing and Proposed View

- Viewpoint Location
- Tower Position
- James River Crossing Variation 3



Easting position (Virginia South Zone NAD83) 12016668.4  
 Northing position (Virginia South Zone NAD83) 3610148.9  
 Elevation of viewpoint position (NAD 83 / ft): 35.8  
 Height of camera above ground (ft): 5.4  
 Date of photography: 7th February 2012 at 8:42 a.m.  
 Orientation of view: S  
 Horizontal field of view: 124°  
 Vertical field of view: 55°  
 Distance to Closest Visible Tower (miles) 2.82

**NOTES:**

Viewpoint locations have been precision surveyed by

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 Richmond, Va. 23219

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**Viewpoint 11** - Kingsmill Resort and Golf Club from Overlook - Looking South - **James River Crossing Variation 3** - **Proposed View**  
*Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.*





Viewpoint 12 - East End of Jamestown Island - Looking Southeast - Existing View



Viewpoint 12 - East End of Jamestown Island - Looking Southeast - Surry Alternative - Proposed View  
White box indicates enlargement area (see next page)

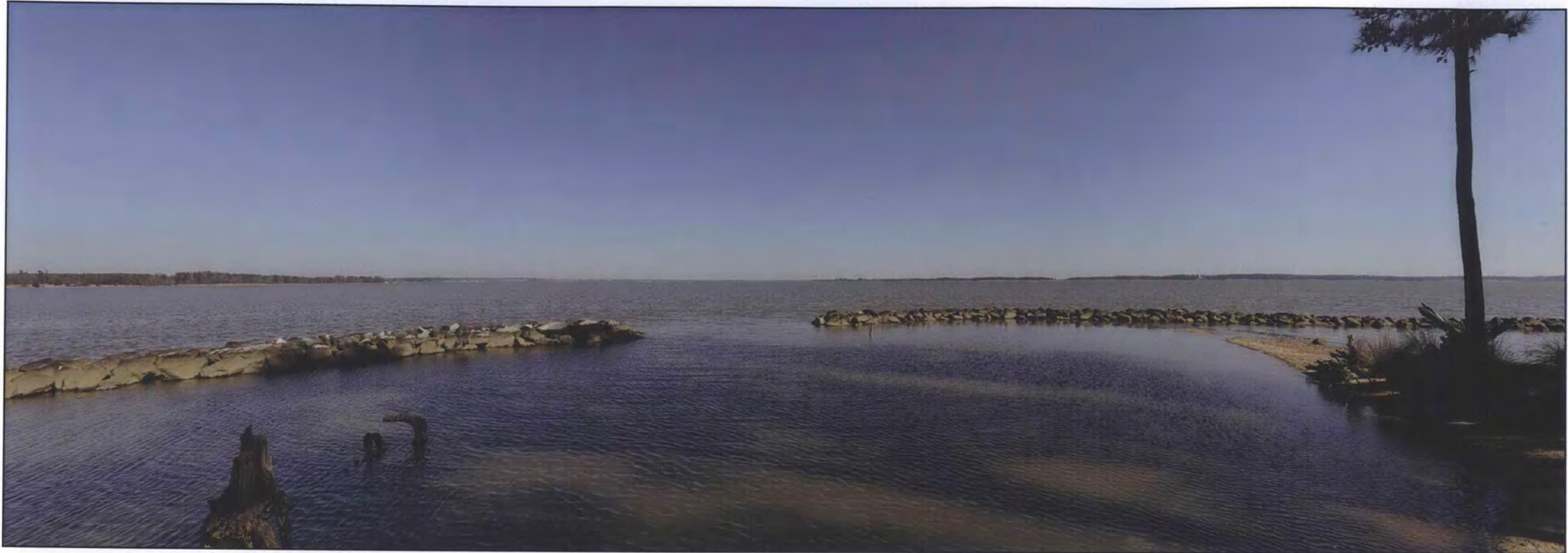
 <div><b>Dominion</b> Surry-Skiffes Creek 500 kV Transmission Line Skiffes Creek-Whaleton 230 kV Transmission Line Skiffes Creek 500-230-115 kV Switching Station</div>	<b>Viewpoint 12</b>  East End of Jamestown Island - Looking Southeast Surry Alternative  Existing and Proposed View	<div><div><div>● Viewpoint Location</div><div>● Tower Position</div><div>● Surry Alternative</div></div></div>	<div>Easting position (Virginia South Zone MGRS) 11966924.8 Northing position (Virginia South Zone NAD83) 3602298.2 Elevation of viewpoint position (NAD 83 / ft): 1.4 Height of camera above ground (ft): 5.4 Date of photography: 28th February 2012 at 11:23 a.m. Orientation of view: SE Horizontal field of view: 124° Vertical field of view: 55° Distance to Closest Visible Tower (miles) 3.52</div>		<div>NOTES: Viewpoint locations have been precision surveyed by <b>Dominion Virginia Power</b> <b>Coordinator - Survey Services</b> Larry Hedborn, L.S. 1000 West Main Street Richmond, VA 23219 No part of this photosimulation shall be altered in any way. Visual Assessments should be made from the full size TrueView™ only.</div>	<div>Photosimulation Created Using TrueView™ Technology <b>TRUESCAPE</b> VISUAL COMMUNICATION Provided by www.truescape.com</div>	DATE May 28, 2012	Tower placement in simulations is preliminary - final tower locations may change upon final design and survey
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**Viewpoint 12** - East End of Jamestown Island - Looking Southeast - **Surry Alternative** - **Proposed View**  
*Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.*





**Viewpoint 12 - East End of Jamestown Island - Looking Southeast - Existing View**



**Viewpoint 12 - East End of Jamestown Island - Looking Southeast - James River Crossing Variation 1 - Proposed View**  
*White box indicates enlargement area (see next page)*




**Dominion**  
Surry-Skiffes Creek 500 kV Transmission Line  
Skiffes Creek-Wheaton 230 kV Transmission Line  
Skiffes Creek 500-230-115 kV Switching Station

**Viewpoint 12**  
East End of Jamestown Island  
- Looking Southeast  
James River Crossing Variation 1

Existing and Proposed View

● Viewpoint Location  
● Tower Position  
James River Crossing Variation 1



Easting position (Virginia South Zone NAD83) **11996924.8**  
Northing position (Virginia South Zone NAD83) **3602298.2**  
Elevation of viewpoint position (NAD 83 / ft): **1.4**  
Height of camera above ground (ft): **5.4**  
Date of photography: **28th February 2012 at 11:23 a.m.**  
Orientation of view: **SE**  
Horizontal field of view: **124°**  
Vertical field of view: **55°**  
Distance to Closest Visible Tower (miles) **3.52**

NOTES:

Viewpoint locations have been precision surveyed by  
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**Viewpoint 12** - East End of Jamestown Island - Looking Southeast - **James River Crossing Variation 1 - Proposed View**  
*Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.*






**Viewpoint 12 - East End of Jamestown Island - Looking Southeast - Existing View**



**Viewpoint 12 - East End of Jamestown Island - Looking Southeast - James River Crossing Variation 2 - Proposed View**  
*White box indicates enlargement area (see next page)*




**Dominion**  
Surry-Skiffes Creek 500 kV Transmission Line  
Skiffes Creek-Wheaton 230 kV Transmission Line  
Skiffes Creek 500-230-115 kV Switching Station

**Viewpoint 12**  
East End of Jamestown Island  
- Looking Southeast  
James River Crossing Variation 2

Existing and Proposed View

Viewpoint Location  
Tower Position  
James River Crossing Variation 2



Easting position (Virginia South Zone NAD83) 11996924.8  
Northing position (Virginia South Zone NAD83) 3602298.2  
Elevation of viewpoint position (NAD 83 / ft): 1.4  
Height of camera above ground (ft): 5.4  
Date of photography: 28th February 2012 at 11:23 a.m.  
Orientation of view: SE  
Horizontal field of view: 124°  
Vertical field of view: 55°  
Distance to Closest Visible Tower (miles) 3.52

NOTES:

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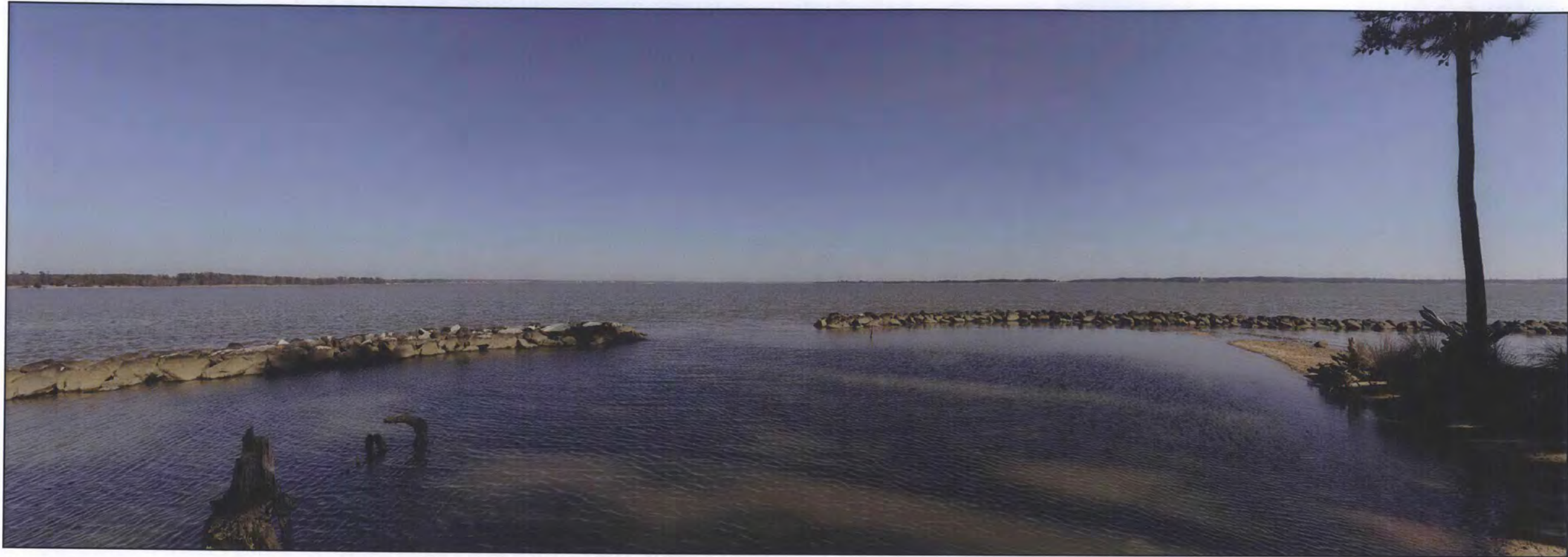
Tower placement in simulations is preliminary - final tower locations may change upon final design and survey



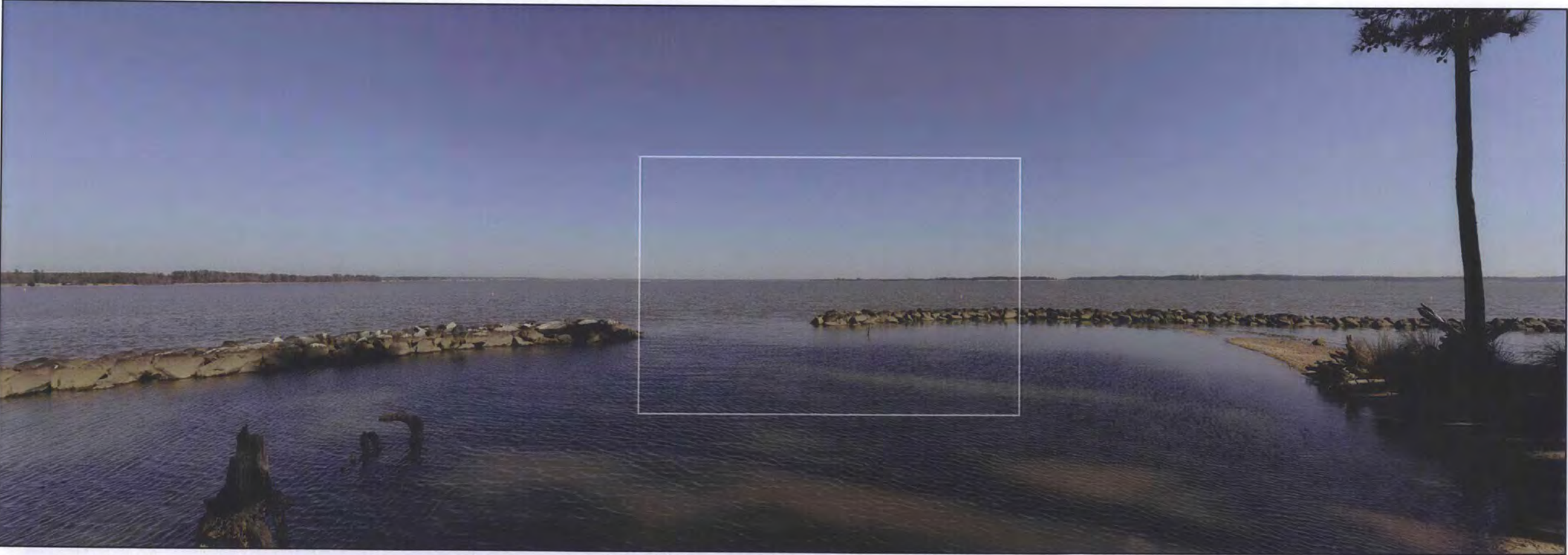


**Viewpoint 12** - East End of Jamestown Island - Looking Southeast - **James River Crossing Variation 2 - Proposed View**  
*Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.*






**Viewpoint 12 - East End of Jamestown Island - Looking Southeast - Existing View**



**Viewpoint 12 - East End of Jamestown Island - Looking Southeast - James River Crossing Variation 3 - Proposed View**  
*White box indicates enlargement area (see next page)*




**Dominion**  
 Surry-Skiffes Creek 500 kV Transmission Line  
 Skiffes Creek-Wheaton 230 kV Transmission Line  
 Skiffes Creek 500-230-115 kV Switching Station

**Viewpoint 12**  
 East End of Jamestown Island  
 - Looking Southeast  
 James River Crossing Variation 3

Existing and Proposed View

- Viewpoint Location
- Tower Position
- James River Crossing Variation 3



Easting position (Virginia South Zone NAD83)	11996924.8
Northing position (Virginia South Zone NAD83)	3602298.2
Elevation of viewpoint position (NAD 83 / ft):	1.4
Height of camera above ground (ft):	5.4
Date of photography:	28th February 2012 at 11:23 a.m.
Orientation of view:	SE
Horizontal field of view:	124°
Vertical field of view:	55°
Distance to Closest Visible Tower (miles)	3.52

**NOTES:**

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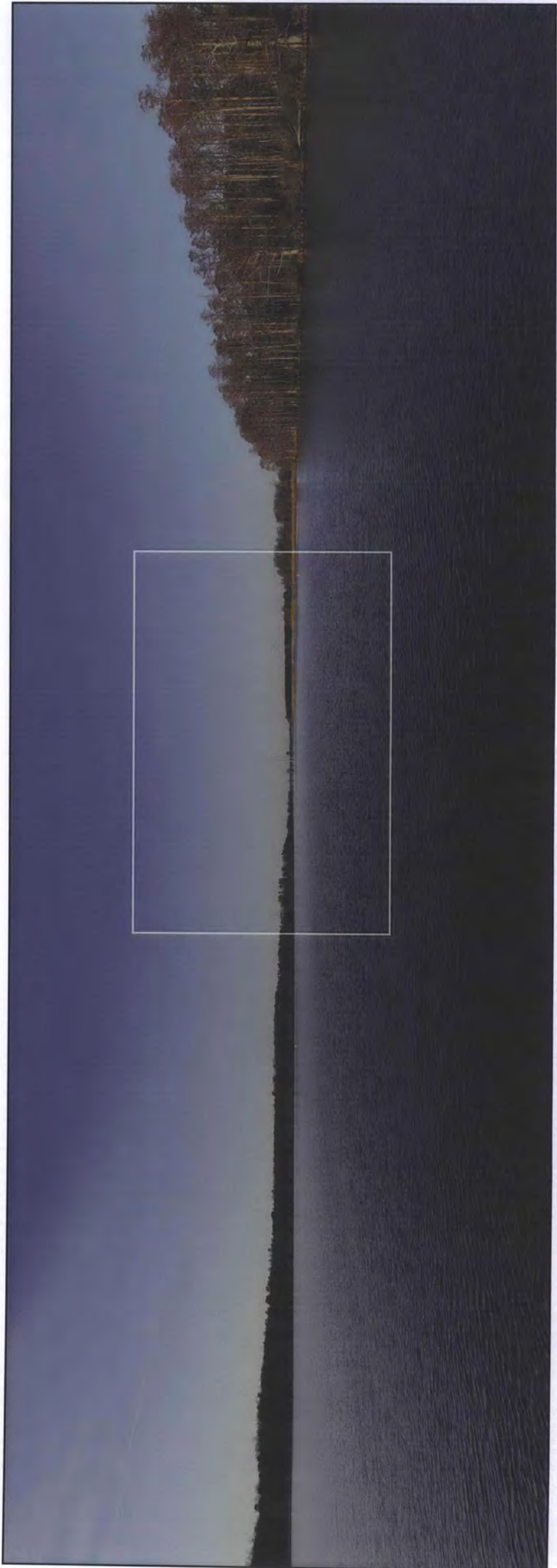


**Viewpoint 12** - East End of Jamestown Island - Looking Southeast - **James River Crossing Variation 3 - Proposed View**  
*Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.*







Viewpoint 13 - Chickahominy River - Looking Northwest - Existing View



Viewpoint 13 - Chickahominy River - Looking Northwest - Proposed View

<div><div><div>Dominion®</div><div>Surry-Stiffes Creek 500 kV Transmission Line Stiffes Creek-Wheaton 230 kV Transmission Line Stiffes Creek 500-230-115 kV Switching Station</div></div></div>		<div><div>Viewpoint 13</div><div>Chickahominy River</div><div>- Looking Northwest</div><div>Existing and Proposed</div></div>		<div><div><div><div>Viewpoint Location</div><div>Transmission Line</div></div><div><div></div><div></div></div></div></div>		<div><div>Easting position (Virginia South Zone NAD83) 11957071.8</div><div>Northing position (Virginia South Zone NAD83) 3642439.1</div><div>Elevation of viewpoint position (MAD 63 / ft): 1.3 5.4</div><div>Height of camera above ground (ft): 5.4</div><div>Date of photography: 7th February 2012 at 12:53 p.m.</div><div>Orientation of view: NW</div><div>Horizontal field of view: 124°</div><div>Vertical field of view: 55°</div><div>Distance to Closest Tower (miles) 0.49</div></div>				<div>NOTES:</div> <div>Viewpoint locations have been precision surveyed by</div> <div><div>Dominion Virginia Power</div><div>Coordinator - Survey Services</div><div>Larry Hedblom, L.S.</div><div>701 East Cary Street</div><div>Richmond, Va. 23219</div></div> <div>No part of this photosimulation shall be altered in any way.</div> <div>Visual Assessments should be made from the full size TrueView™ only.</div>		<div><div>Provided by</div><div><div>TRUESCAPE</div><div>VISUAL COMMUNICATION</div></div><div><div>Photosimulation Created Using</div><div>TrueView™ Technology</div></div><div>www.truescape.com</div></div>		<div>DATE May 28, 2012</div>		<div>Tower placement in simulations is preliminary - final tower locations may change upon final design and survey</div>	
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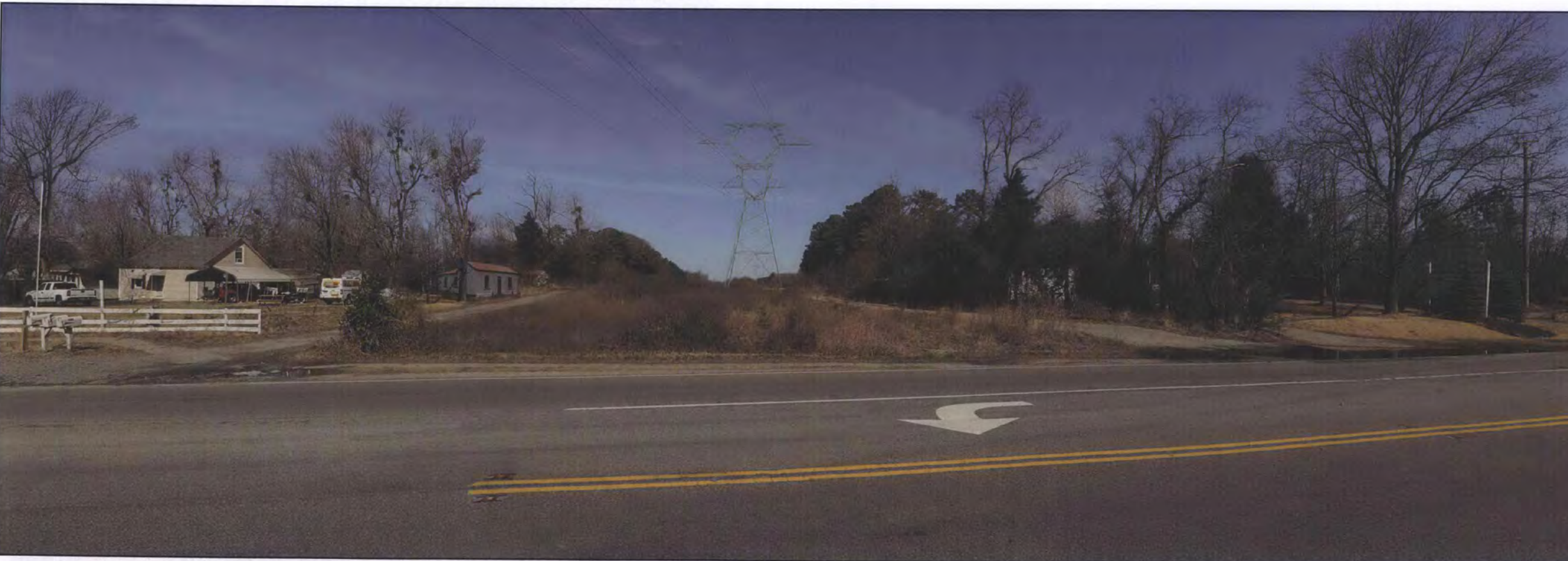
**Viewpoint 13 - Chickahominy River - Looking Northwest - Proposed View**

*Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.*






**Viewpoint 14 - State Route 60 (Pocahontas Trail) - Looking Northeast - Existing View**



**Viewpoint 14 - State Route 60 (Pocahontas Trail) - Looking Northeast - Proposed View**




**Dominion**  
 Surry-Skiffes Creek 500 kV Transmission Line  
 Skiffes Creek-Wheaton 230 kV Transmission Line  
 Skiffes Creek 500-230-115 kV Switching Station

**Viewpoint 14**  
 State Route 60 (Pocahontas Trail)  
 - Looking Northeast

Existing and Proposed

• Viewpoint Location  
 - Transmission Line



Easting position (Virginia South Zone NAD83) **12033637.9**  
 Northing position (Virginia South Zone NAD83) **3604410.7**  
 Elevation of viewpoint position (NAD 83 / ft): **63.3**  
 Height of camera above ground (ft): **5.4**  
 Date of photography: **7th February 2012 at 9:08 a.m.**  
 Orientation of view: **NE**  
 Horizontal field of view: **124°**  
 Vertical field of view: **55°**

NOTES:

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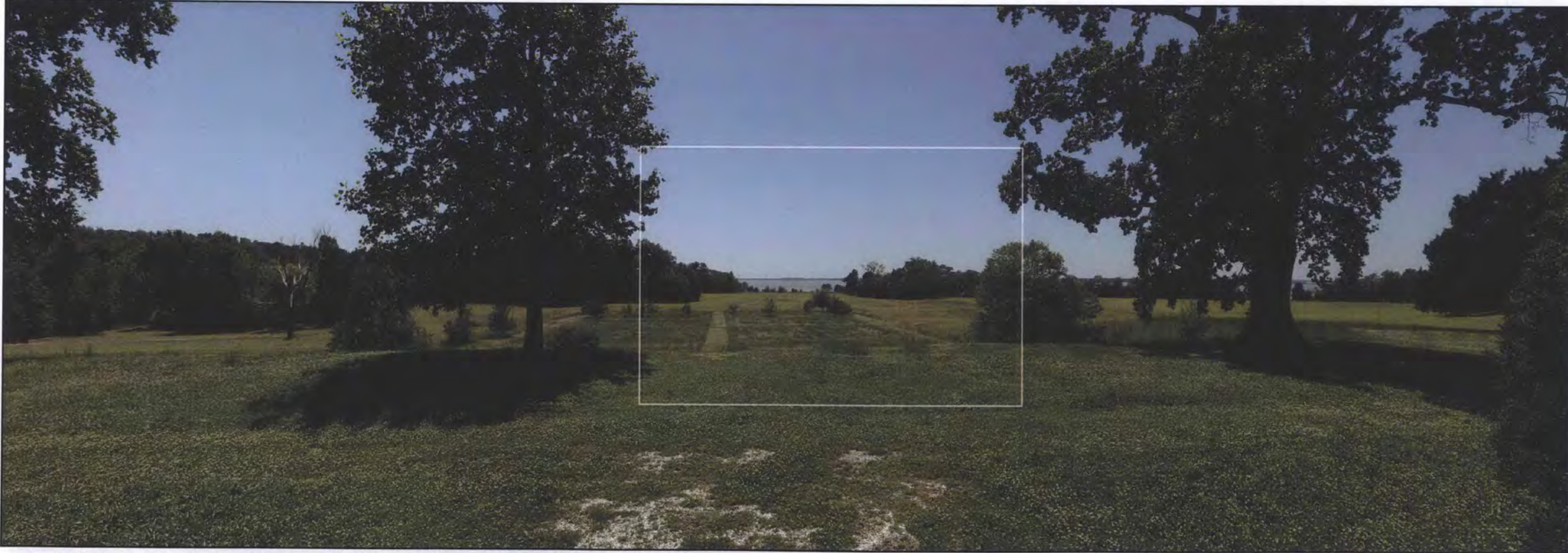
DATE **May 28, 2012**

Tower placement in simulations is preliminary - final tower locations may change upon final design and survey






**Viewpoint 15 - View from Main House at Carter's Grove - Looking Southwest - Existing View**




**Viewpoint 15 - View from Main House at Carter's Grove - Looking Southwest - Surry Alternative - Proposed View**



**Dominion**  
Surry-Skiffes Creek 500 kV Transmission Line  
Skiffes Creek-Wheaton 230 kV Transmission Line  
Skiffes Creek 500-230-115 kV Switching Station

**Viewpoint 15**  
View from Main House at Carter's Grove  
Looking Southwest  
Surry Alternative  
Existing and Proposed

Viewpoint Location  
Tower Position  
Surry Alternative



Easting position (Virginia South Zone NAD83) 12028981.5  
Northing position (Virginia South Zone NAD83) 3604320.9  
Elevation of viewpoint position (NAD 83 / ft): 68.0  
Height of camera above ground (ft): 5.4  
Date of photography: 11-May-12 at 1:22 p.m.  
Orientation of view: SW  
Horizontal field of view: 124°  
Vertical field of view: 55°  
Distance to Closest Visible Tower (miles) 2.46

NOTES:

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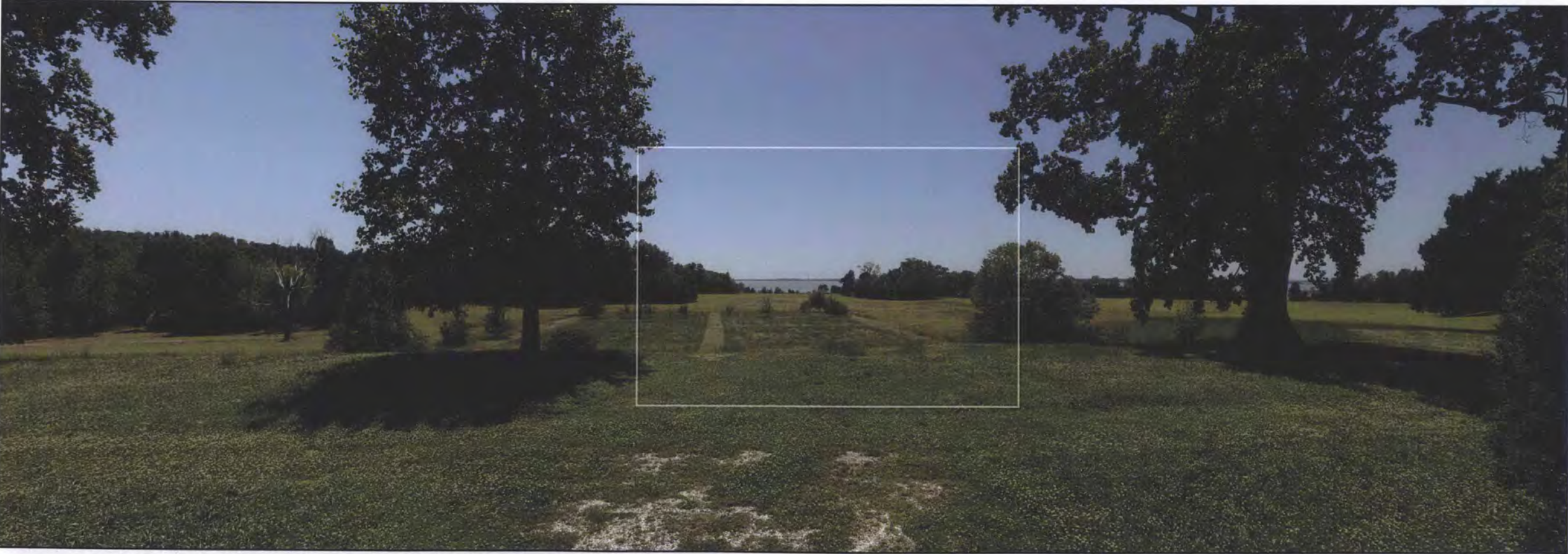


**Viewpoint 15** - View from Main House at Carter's Grove - Looking Southwest - **Surry Alternative - Proposed View**  
*Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.*






Viewpoint 15 - View from Main House at Carter's Grove - Looking Southwest - Existing View



Viewpoint 15 - View from Main House at Carter's Grove - Looking Southwest - James River Crossing Variation 1 - Proposed View



**Dominion**  
Surry-Skiffes Creek 500 kV Transmission Line  
Skiffes Creek-Wheaton 230 kV Transmission Line  
Skiffes Creek 500-230-115 kV Switching Station


**Viewpoint 15**

View from Main House at Carter's Grove  
Looking Southwest  
James River Crossing Variation 1  
Existing and Proposed

Viewpoint Location

Tower Position

James River Crossing Variation 1



Easting position (Virginia South Zone NAD83)12028981.5

Northing position (Virginia South Zone NAD83)3604320.9

Elevation of viewpoint position (NAD 83 / ft):68.0

Height of camera above ground (ft):5.4

Date of photography:11-May-12 at 1:22 p.m.

Orientation of view:SW

Horizontal field of view:124°

Vertical field of view:55°

Distance to Closest Visible Tower (miles)1.76

NOTES:

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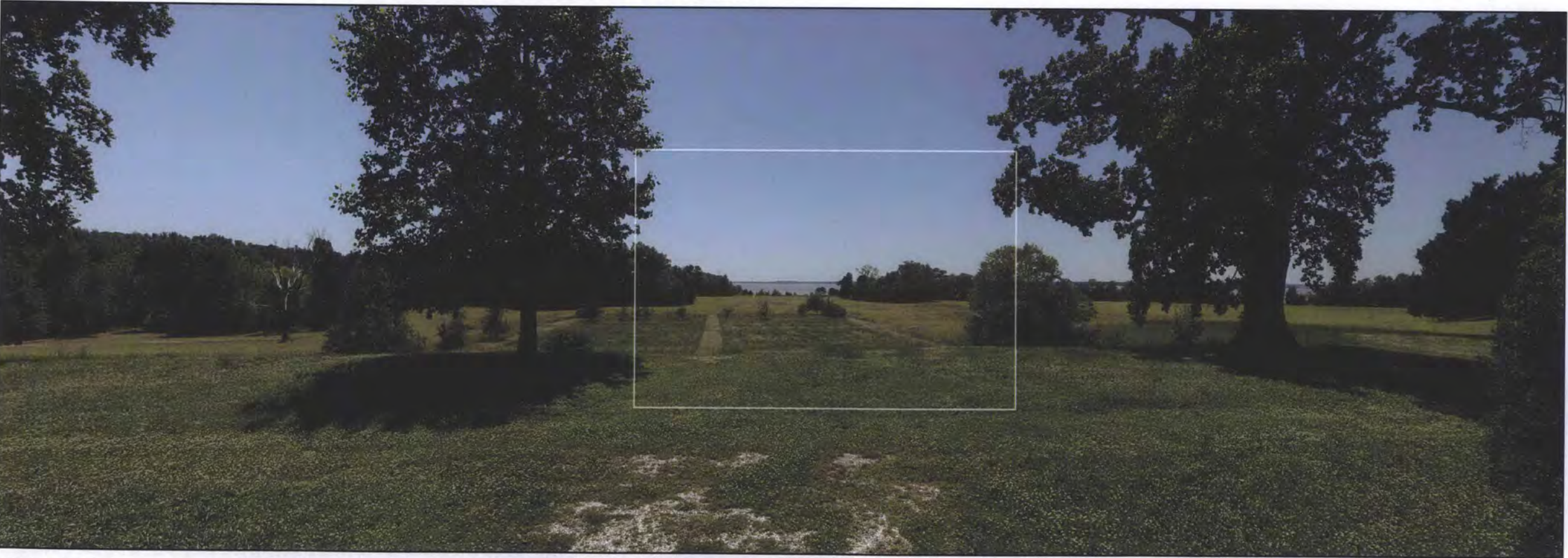


**Viewpoint 15** - View from Main House at Carter's Grove - Looking Southwest - **James River Crossing Variation 1 - Proposed View**  
*Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.*






**Viewpoint 15 - View from Main House at Carter's Grove - Looking Southwest - Existing View**



**Viewpoint 15 - View from Main House at Carter's Grove - Looking Southwest - James River Crossing Variation 2 - Proposed View**



**Dominion**  
Surry-Skiffes Creek 500 kV Transmission Line  
Skiffes Creek-Wheaton 230 kV Transmission Line  
Skiffes Creek 500-230-115 kV Switching Station


**Viewpoint 15**

View from Main House at Carter's Grove  
Looking Southwest  
James River Crossing Variation 2  
Existing and Proposed

● Viewpoint Location

○ Tower Position

— James River Crossing Variation 2



Easting position (Virginia South Zone NAD83) 12028981.5  
Northing position (Virginia South Zone NAD83) 3604320.9  
Elevation of viewpoint position (NAD 83 / ft): 68.0  
Height of camera above ground (ft): 5.4  
Date of photography: 11-May-12 at 1:22 p.m.  
Orientation of view: SW  
Horizontal field of view: 124°  
Vertical field of view: 55°  
Distance to Closest Visible Tower (miles) 1.68

NOTES:

Viewpoint locations have been precision surveyed by  
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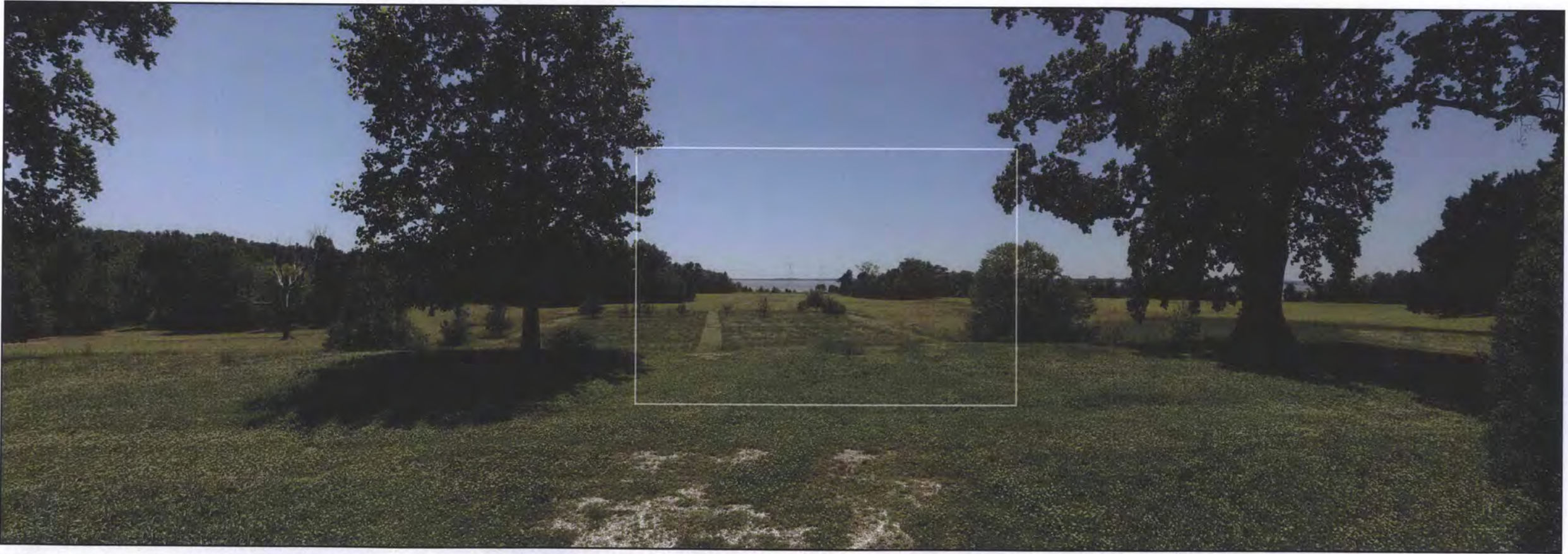


**Viewpoint 15** - View from Main House at Carter's Grove - Looking Southwest - **James River Crossing Variation 2 - Proposed View**  
*Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.*






**Viewpoint 15** - View from Main House at Carter's Grove - Looking Southwest - **Existing View**




**Viewpoint 15** - View from Main House at Carter's Grove - Looking Southwest - **James River Crossing Variation 3 - Proposed View**



**Dominion**  
Surry-Skiffes Creek 500 kV Transmission Line  
Skiffes Creek-Wheaton 230 kV Transmission Line  
Skiffes Creek 500-230-115 kV Switching Station

**Viewpoint 15**  
View from Main House at Carter's Grove  
Looking Southwest  
James River Crossing Variation 3  
Existing and Proposed

● Viewpoint Location  
● Tower Position  
— James River Crossing Variation 3



Easting position (Virginia South Zone NAD83) 12028981.5  
Northing position (Virginia South Zone NAD83) 3604320.9  
Elevation of viewpoint position (NAD 83 / ft): 68.0  
Height of camera above ground (ft): 5.4  
Date of photography: 11-May-12 at 1:22 p.m.  
Orientation of view: SW  
Horizontal field of view: 124°  
Vertical field of view: 55°  
Distance to Closest Visible Tower (miles) 0.82

NOTES:  
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**Viewpoint 15** - View from Main House at Carter's Grove - Looking Southwest - **James River Crossing Variation 3 - Proposed View**  
*Enlargement Area of previous page - enlarged to a representative view when printed on a 11 x 17 " page and viewed from approx. 20" distance.*



**DOMINION VIRGINIA POWER**

**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**

**APPENDIX D**

**Table of Subdivisions Crossed**



## Appendix D

**Surry-Skiffes Creek 500 kV Transmission Line, Skiffes Creek-Wheaton 230 kV Transmission Line, and Skiffes Creek 500 kV-230 kV-115 kV Switching Station  
Existing Subdivisions Crossed by Proposed Project**

Subdivision Name	Location	MP	Route Segment Crossed					
			Chickahominy Alternative	Surry Alternative	Surry Alternative (James River Crossing Variation 1)	Surry Alternative (James River Crossing Variation 2)	Surry Alternative (James River Crossing Variation 3)	Skiffes Creek to Wheaton
Colonial Heritage Golf Club Estates	James City County	C24.9	X					
James Shire Settlement	James City County	C24.9	X					
Marston's MHP	James City County	C25.1	X					
Camelot	James City County	C25.3	X					
Villages at Westminster	James City County	C26.4	X					
Scott's Pond	James City County	C26.7	X					
The Hamlet	James City County	C27.5	X					
Chisel Run	James City County	C27.6	X					
Stratford Hall	James City County	C27.9	X					
Municipal	The City of Williamsburg	C28.0	X					
Richmond Road West	The City of Williamsburg	C28.2	X					
Savannah Green	The City of Williamsburg	C28.3	X					
Waller Mill Park	York County	C28.9	X					
Museum Support	The City of Williamsburg	C30.9	X					
Second Street Commercial	The City of Williamsburg	C30.9,	X					
Capitol Landing Commercial	The City of Williamsburg	C31.0	X					
Capitol Landing Road	The City of Williamsburg	C31.1	X					
Royal Grant	York County	C31.8	X					

Appendix D

**Surry-Skiffes Creek 500 kV Transmission Line, Skiffes Creek-Wheaton 230 kV Transmission Line, and Skiffes Creek 500 kV-230 kV-115 kV Switching Station  
Existing Subdivisions Crossed by Proposed Project**

Subdivision Name	Location	MP	Route Segment Crossed					
			Chickahominy Alternative	Surry Alternative	Surry Alternative (James River Crossing Variation 1)	Surry Alternative (James River Crossing Variation 2)	Surry Alternative (James River Crossing Variation 3)	Skiffes Creek to Wheaton
Seans Glen	York County	C32.0	X					
Cobble Creek	York County	C32.4	X					
Vineyard Heights	York County	C32.6	X					
Queens Creek Estates	York County	C32.6	X					
Panther Place	York County	C33.1	X					
Busch Industrial Park	York County	C33.4	X					
Parkside Resort	York County	C35.3	X					
Wallace Woods	James City County	C36.7	X					
Harwood	James City County	C36.8	X					
County Village MHP	James City County	C37.3	X					
Whispering Pines	James City County	S6.8 <sup>a</sup>		X	X	X	X	
James River Commerce Center	James City County	JV2 4.1 JV3						
Green Mountain Industrial Park	James City County	W0.7						X
Skiffes Creek Landing	The City of Newport News	W3.0						X
Richneck	The City of Newport News	W6.9						X
York County Sports Complex	York County	W11.0						X
Foxwood	York County	W12.7						X
Rock Creek	York County	W13.2						X
Kiln Creek	The City of Newport News	W13.6						X
Deerfield	The City of	W14.4						X



Appendix D

**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  
Existing Subdivisions Crossed by Proposed Project**

Subdivision Name	Location	MP	Route Segment Crossed					
			Chickahominy Alternative	Surry Alternative	Surry Alternative (James River Crossing Variation 1)	Surry Alternative (James River Crossing Variation 2)	Surry Alternative (James River Crossing Variation 3)	Skiffes Creek to Whealton
	Newport News							
Morrison	The City of Newport News	W16.3						X
Robinson Terrace	The City of Newport News	W16.8						X
Marthas Landing at Michaels Woods	The City of Hampton	W17.8						X
Michaels Woods West	The City of Hampton	W18.1						X
Michaels Landing	The City of Hampton	W18.2						X
Michaels Woods of Northampton	The City of Hampton	W18.4						X
Farmington	The City of Hampton	W18.4						X
Ridgecrest	The City of Hampton	W19.1						X
Wellington Place	The City of Hampton	W19.3						X
Todd's Colony	The City of Hampton	W19.3						X
Whealton Terrace	The City of Hampton	W19.6						X
Whealton Heights	The City of Hampton	W19.8						X
Carson Heights	The City of Hampton	W20.0						X
Parkwood Estates	The City of Hampton	W20.0						X

<sup>a</sup> Inset footnote explaining MPs

**DOMINION VIRGINIA POWER**

**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**

**APPENDIX E**

**Original Zoning Categories, Descriptions, and  
Standardized Zoning Categories**



Appendix E Surry-Skiffes Creek 500 kV Transmission Line, Skiffes Creek to Wheaton 230 kV Transmission Line, and Skiffes Creek 500 kV-230 kV-115 kV Switching Station Original Zoning Categories, Descriptions, and Merged Zoning Categories		
Original Zoning Code	Zone Description <sup>a</sup>	Merged Zoning Category
<b>Charles City County <sup>a</sup></b>		
Agriculture	District offers opportunities for a combination of land uses that are considered necessary and beneficial to the County. Uses include; agricultural, forestal, limited residential, and applicable commercial.	Agricultural
Residential	District offers opportunities for denser areas of suburban residential development.	Single-Family Residential
Multi-Family Residential	District offers higher density areas of residential development including; apartments, townhouses, and other multi-family homes.	Multi-Family Residential
General Business	Designated areas in appropriate locations for service, retail, and public activities that serve large portions of the County. The County supports clustering of commercial development in these areas.	Commercial
Neighborhood Business	Designated areas for retail and personal service uses that serve the daily needs of smaller neighborhoods and populations.	Commercial
Tourist Business	Areas that are not appropriate for general business use including; hotels, recreational facilities, and restaurants. Areas may be associated with a historical site or special interest area.	Commercial
Light Industrial	Areas on or near major roads or railroads in Development Center that provide space for light manufacturing, fabricating, wholesale distribution, processing, and warehouse use.	Industrial
Heavy Industrial	Areas located away from residential development that provide space for heavy industrial uses with potential nuisance factors including; dust, smoke, vibration, odor, noise, and increased traffic.	Industrial
Planned Development-Industrial Park	District provides opportunities for warehousing, distribution centers, office and research, and light/medium intensity industrial uses in a well-designed and managed setting.	Planned Development
<b>James City County <sup>b</sup></b>		
General Agricultural	District includes areas typically outside primary service area and without utilities or urban services. The district maintains rural areas with uses for farming, forestry, low-density rural residential, and approved recreational and public activities.	Agricultural
General Business	District includes areas used to conduct general business activities required by the community on a frequent basis. These areas do not have heavy truck traffic or high levels of noise or light pollution.	Commercial
General Business Airport Approach	District has same regulations as general business district but is located in designated airport approach area.	Commercial
General Industrial	District includes areas where the primary use of the land is for industrial activities which are not compatible with residential or commercial districts.	Industrial
General Residential	District includes quiet areas designated for low-density residences and open spaces where low density development may occur in the future.	Single-Family Residential
General Residential Airport Approach	District has same regulations as general residential district but is located in the designated airport approach area.	Single-Family Residential
Limited Business	District provides areas of small to medium sized office, retail and service businesses with well-landscaped parking lots. These areas are away from heavy traffic, noise, dust, and light pollution and may be located closer to residential areas.	Commercial
Limited Business/Industrial	District includes areas where the primary use of the land is for limited business and industrial activities which are not typically compatible with residential or commercial	Industrial

	districts.	
Limited Residential	District includes quiet areas designated for low-density residences and open spaces where low density development may occur in the future. Commercial activities are prohibited from this district.	Single-Family Residential
Limited Residential Airport Approach	District has same regulations as limited residential district but is located in the designated airport approach area.	Single-Family Residential
Low-Density Residential	District includes areas where a quiet low-density housing quality has been established and where limited agricultural activities occur side-by-side with the residential land uses.	Single-Family Residential
Mixed Use	District includes areas that promote a wide variety of land uses occurring concurrently while; providing multi-use planned communities, promoting flexible and diversified land planning, reduces commuting by localizing community needs, and allowing denser development than normally permitted.	Mixed Use
Multi-Family Residential	District includes areas of moderate to high-density residences and areas where these developments are likely to occur in the future.	Multi-Family Residential
Multi-Family Residential Airport Approach	District has same regulations as multi-family residential district but is located in the designated airport approach area.	Multi-Family Residential
Planned Unit Development Commercial	District provides opportunities for commercial areas that promote efficient land use, promote flexible land development, allow a variety of land uses, and are protected by natural features and scenic beauty.	Planned Development
Planned Unit Development Residential	District provides opportunities for residential areas that promote efficient land use, promote flexible land development, allow a variety of land uses, and are protected by natural features and scenic beauty.	Single-Family Residential
Public Lands	District includes areas that are both publically owned and used for a public purpose.	Special Public Interest Areas
Public Lands Airport Approach	District has same regulations as public lands district but is located in the designated airport approach area.	Special Public Interest Areas
Residential Planned Community	District provides opportunities for residential areas that promote efficient land use, promote flexible land development, allow a variety of land uses, and are protected by natural features and scenic beauty.	Single-Family Residential
Residential Planned Community Airport Approach	District has same regulations as residential planned community but is located in the designated airport approach area.	Single-Family Residential
Rural Residential	District provides opportunities for residential areas which are within the primary service area and where utilities and urban services are planned but not fully in place. Areas that are suitable for farming, forestry, low-density residences, and approved recreational and public activities.	Rural Residential
Rural Residential Airport Approach	District has same regulations as rural residential but is located in the designated airport approach area.	Rural Residential
<b>Surry County <sup>c</sup></b>		
Agricultural-Rural Residence District	District provides areas to protect and conserve agricultural and forest lands in tracts large enough to preserve the rural characteristics of the surrounding communities.	Agricultural
General Industrial district	District provides areas environmentally suitable to industrial activities what will not create disturbances or hazards to the surrounding environment.	Industrial
<b>Williamsburg <sup>d</sup></b>		
Colonial Williamsburg Historic District	District protects, preserves, and maintains the Colonial Williamsburg Historic Area.	Historic Area
Corridor Business District	District provides areas for commercial and service uses along high traffic roads.	Commercial
Downtown Business District	District promotes harmonious development and redevelopment of downtown business areas near the College of William and Mary and the Colonial Williamsburg district.	Commercial
Downtown Residential District	District promotes harmonious development and redevelopment of downtown	Single-Family Residential



	residential areas near the College of William and Mary and the Colonial Williamsburg district.	
Economic Development District	District allows and promotes mixed land uses, provides landscaping and quality design, and enhances the city's property tax base.	Commercial
General Business District	District promotes mixed land uses along arterial streets and existing shopping centers at the Richmond Road/Monticello Avenue intersection. District is more urban than Corridor Business District.	Commercial
Limited Business Districts	Lower density versions of business districts described above.	Commercial
Limited Industrial District	District promotes low intensity and low density industrial uses in well landscaped settings that are compatible with surrounding land uses.	Industrial
Multi-family Dwelling District	District provides opportunities for residential areas of medium to high population density. Density and height of buildings are typically low enough to be compatible with surrounding single-family residential areas.	Multi-Family Residential
Museum Support District	District allows uses that are related to and support the purpose of the Colonial Williamsburg historic area.	Historic Areas
Planned Development District	District encourages creative design on large parcels of land owned by one entity, allow a variety of housing options, and promote beauty of landscape.	Planned Development
Single-family Dwelling Districts	District provides opportunities for low density single-family residences that promotes a suitable family environment.	Single-Family Residential
<b>York County *</b>		
Duplexes, Townhouses, Multiplexes, Apartments, and Condominiums	District provides opportunities for higher density living situations geared towards a renters market. Maximum density of units is ten per acre.	Multi-Family Residential
Economic Opportunity, Retail, Tourist-Related and Limited Industrial Activities	District provides a mixture of commercial, limited industrial, and tourist uses that support capital and employment intensive uses.	Commercial
General Business, Retail, Shopping Centers, Professional Services, Automotive Services	District provides opportunities for a wide array of commercial uses including those which require large outdoor displays, parking, and storage space. Located in areas with heavier traffic and less aesthetic appeal.	Commercial
General Industrial, Warehousing, Petroleum Production, Broad Range Industrial, Utility Facilities	District provides opportunities for a variety of industrial uses which may involve; odors, noise, increased traffic, vibrations or other impacts to surrounding land uses. To avoid disturbance with other land uses these districts are typically located in industrial parks away from residential areas.	Industrial
High Density Single-Family Detached	District provides opportunities for higher density (maximum of 3.0 units per acre) single-family residential developments located in areas with sufficient access to public services, transportation, and commercial centers.	Single-Family Residential
Limited Business, Limited Commercial Retail Use, Business with 9 to 5 character	District provides opportunities for commercial activities with a low external impact, which typically operate solely during daylight hours, and have little impact to nearby residential areas.	Commercial
Limited Industrial, Wholesale/Warehouse Activities, Industrial Uses, Utility Facilities	District provides opportunities for fabricating, processing, warehousing, assembling, and other light manufacturing uses. Districts are typically limited to industrial parks in order to preserve land and limit traffic.	Industrial
Low Density Single-Family Detached, Farming	District provides opportunities for single-family residential development with a maximum density of one dwelling per acre. Areas may have limited access to public utilities and/or have other environmental constraints.	Single-Family Residential
Low Density Single-Family Detached, Farming, Military, conservation Uses, Environmentally Sensitive Areas	District provides lands with the least intense zoning classification in the county. Land is primarily used for conservation areas and military uses. May also be used for low density residential development in an environmentally sensitive area not served by public utilities.	Single-Family Residential
Manufactured Homes within a Manufactured Home Subdivision	District provides opportunities for placing manufactured homes on set lots within a subdivision to encourage affordable housing opportunities for low-income	Single-Family Residential

	households.	
Medium Density Single-Family Detached	District provides opportunities for medium-density single-family residential developments with minimum lot requirements and maximum height restrictions.	Single-Family Residential
Neighborhood Business, Retail and Service Uses for nearby residential areas	District provides opportunities for limited commercial uses near or within residential districts. Districts are oriented to serve the day-to-day needs of nearby or surrounding residential neighborhoods. Types of uses permitted are limited to discourage traffic from outside the community.	Commercial
Planned Development	District encourages creative and innovative design and development of land. District should provide suitable open space while promoting high standards in development layout and design.	Planned Development
Residential and Nonresidential Uses within Historic Yorktown	District recognizes historical significance of Yorktown and interrelates all other land uses to contribute to and complement Yorktown. District promotes efficient land use, innovative design, and pedestrian-bicycle scale development.	Historic Areas
Waterfront Commercial, Marinas, Marine Supply Stores, Seafood Processing and Storage	District provides opportunities for a variety of activities geared towards and requiring water access. District may be found near residential areas and areas with limited vehicle access depending on locational characteristics of permitted activity.	Commercial
<b>City of Newport News</b>		
General Commercial District	District promotes a broad range of general commercial uses including retail sales and service, offices, business services, automotive and marine sales and services.	Commercial
Heavy Industrial District	District used for heavy industrial uses not to be located near residential developments.	Industrial
High Density Multiple Family Dwelling District	District provides high density multi-family housing while also maintaining sufficient open space and recreational areas.	Multi-Family Residential
Light Industrial District	District maintained for light industrial uses that also works with the surrounding districts.	Industrial
Low Density Multiple Family Dwelling District	District provides the opportunity for a mixture of single-family attached residences and adequate open space and recreational areas.	Multi-Family Residential
Manufactured Homes District	District established for high quality and aesthetically pleasing planned manufactured home parks.	Single-Family Residential
Medium Density Multiple Family Dwelling District	District established for moderately dense areas of multi-family housing that provide adequate open space and recreation areas.	Multi-Family Residential
Mixed Use District	District provides areas for a variety of uses including; high density residential, office, lodging, and retail.	Mixed-Use
Office District	District provides localized areas for businesses and professional offices. Typically in areas with lower vehicle traffic.	Commercial
Office Park District	District provides park-like settings for office buildings. Land is typically well organized and landscaped.	Commercial
Office/Research and Development District	District established to provide space for science centers, development parks, and office/research buildings. Also developed to promote local scientific research and technology.	Commercial
Oyster Point Business District	District established as concentrated area for business and professional offices, retail, cultural, financial, transportation, and entertainment uses.	Commercial
Oyster Point Business/Manufacturing District	District established as concentrated area for industrial, transportation, manufacturing, and institutional uses.	Commercial
Park District	District established to provide local public recreational areas.	Special Public Interest Areas
Regional Business District	District established to encourage development activities that enlarge local tax base, add employment opportunities, and provide local economic stability.	Commercial
Retail Commercial District	District provides areas for retail service and sales, offices, businesses and other general commercial uses.	Commercial



Single Family Dwelling Districts	Districts provide areas designated for lower density single-family housing. Densities are allowed up to 6.6 homes per acre.	Single-Family Residential
<b>City of Hampton<sup>9</sup></b>		
Neighborhood Commercial	District provides areas for small locally centralized businesses. Permitted uses in this district include; antique shops, news stand, drug store, pet shops, and restaurants. Apartment style housing is permitted above businesses in this district.	Commercial
Limited Commercial	District provides areas for businesses on heavier trafficked streets in less of a neighborhood setting. Permitted uses include; car dealerships, bowling allies, pawn shops, and veterinarians. Apartment style housing is permitted above businesses in this district.	Commercial
General Commercial	District provides areas for larger business. Permitted uses in this district include; laundromats, hotels, dance halls, and tattoo parlors.	Commercial
Limited Manufacturing	District provides appropriate and attractive locations for certain types of research, development, business, and manufacturing uses. Districts are typically closer to residential areas and allows for reduced commuting time for employees.	Industrial
Light Manufacturing	District permits all uses allowed in commercial districts except for venues with live entertainment or dancing. This includes restaurants, hotels, schools, community centers, and hospitals.	Industrial
Heavy Manufacturing	District permits all uses allowed in light manufacturing district except for any buildings with on-site retail sales.	Industrial
Langley Flight Approach; M4A, M4B, M5A, M5B, M5C	Districts provide large amounts of minimally populated land for commercial and industrial uses while also providing protection to the flight operations at Langley Air Force Base.	Langley Flight Approach
Multiple Dwelling; MD2, MD3, MD4	Districts provide lands for multi-family housing in higher densities including townhouses and other multi-family dwellings. Mobile homes and nursing homes require additional permits.	Multi-Family Residential
Multiple Dwelling Townhouse	District provides opportunities for townhouses on fee-simple lots. The majority of other uses require additional permits.	Multi-Family Residential
One Family Residence; R11, R13, R15, R22, R33	Districts provide opportunities for very low to low density single-family housing. Districts established to help protect environmentally sensitive areas and reduce hazards and negative impacts.	Single-Family Residential
Two Family Residence	District provides opportunities for varying densities of two family residences. Permitted uses in this district include duplex dwellings and two family houses.	Multi-Family Residential
One Family Residence	District provides opportunities for varying densities of single family residences.	Single-Family Residential
Multiple Residence	District provides opportunities for higher density residential developments. Permitted uses include; apartments, townhouses, mobile homes, tourist homes, and adult care facilities.	Multi-Family Residential
Rural Residence	District provides areas of low density single-family rural residences. Permitted uses include; places of worship, schools, parks, cemeteries, and hospitals.	Rural Residential
Residential Transition	District provides areas of transition between major thoroughfares and nearby low density residential areas. Land could be developed or redeveloped in a way that utilizes land without impacting residences.	Single-Family Residential
Special Public Interest Districts	Districts designated as having a substantial and special public interest use including environmental, cultural, and economic interests. Regulations in these districts are set to promote the purpose of district set in city plans and to encourage land use and development.	Special Public Interest Area

<sup>a</sup> Charles City County 2006

<sup>b</sup> James City County No Date

<sup>c</sup> Surry County, 2010. Because such a small portion of the proposed Surry Alternative falls within Surry County only the two zoning districts crossed by the route were reviewed.

<sup>d</sup> City of Williamsburg 2010

<sup>e</sup> York County, 2007

<sup>f</sup> City of Newport News 2005

<sup>g</sup> City of Hampton 2009



**DOMINION VIRGINIA POWER**

**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**

**APPENDIX F**

**Wetland Desktop Review Reports**



May 25, 2012

Ms. Liz Harper  
Dominion Virginia Power  
701 East Cary Street, 12<sup>th</sup> Floor  
Richmond, Virginia 23219

**Re:    Offsite Wetland and Waters Analysis**  
**Surry – Skiffes Creek Proposed 500 kV Line**  
**Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 1)**  
**Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 2)**  
**Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 3)**  
**Chickahominy – Skiffes Creek Alternate 500kV Line**  
**Skiffes Creek 500 kV – 230 kV – 115 kV Proposed Switching Station**  
**Skiffes Creek – Whealton Proposed 230 kV Line**  
**Charles City County, James City County, York County, Surry County, City of**  
**Williamsburg, City of Newport News and City of Hampton, VA**  
**WEG Project #4652**

Dear Ms. Harper:

The following report presents the results of an offsite wetland investigation performed by Williamsburg Environmental Group, Inc. (WEG) for the Surry – Skiffes Creek Proposed 500 kV Line, Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 1), Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 2), Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variations 3), Chickahominy – Skiffes Creek Alternate 500 kV Line, Skiffes Creek 500 kV – 230 kV – 115 kV Proposed Switching Station, and the Skiffes Creek – Whealton Proposed 230 kV Line. The project area for these routes includes Charles City, James City, Surry, and York Counties, as well as the Cities of Williamsburg, Newport News and Hampton, Virginia (see attached Project Location Map). The purpose of this study is to determine the approximate location and extent of areas that have the potential for containing jurisdictional waters of the U.S. (WOUS), including wetlands, within the proposed and alternative routes using appropriate offsite resources.

#### **Project Area Description**

The project area is broken into 7 individual segments. The Surry – Skiffes Creek Proposed 500 kV Line and associated proposed James River Crossing Variations 1, 2 and 3 originate in Surry County and terminate at the Skiffes Creek 500 kV – 230 kV – 115 kV Proposed Switching Station. The Chickahominy – Skiffes Creek Alternate 500 kV Line originates in Charles City County and also terminates at the Skiffes Creek 500 kV – 230 kV – 115 kV Proposed Switching Station. From the proposed switching station, a 230 kV line segment common to all three lines, the Skiffes Creek – Whealton Proposed 230 kV Line, extends to the Whealton Substation. The individual segments analyzed are described in further detail below:



*Surry – Skiffes Creek Proposed 500 kV Line*

The Surry – Skiffes Creek Proposed 500 kV Line will extend approximately 7.42 miles from the Surry Nuclear Power Station in Surry County to the Skiffes Creek 500 kV – 230 kV – 115 kV Proposed Switching Station in James City County. The proposed line originates at the Surry Nuclear Power Plant where it parallels a man-made canal towards the James River. The line then turns northeast and travels approximately 3.5 miles across the river to James City County. From there, portions of the line will be located in new right-of-way (ROW) while other parts of the line will be co-located within an existing variable width ROW for a 115 kV line. The existing ROW, measuring 80 to 130 feet, will be required to be expanded to 150 feet to accommodate the 500 kV line.

*Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 1)*

James River Crossing Variation 1 will extend approximately 7.95 miles from the Surry Nuclear Power Station in Surry County to the Skiffes Creek 500 kV – 230 kV – 115 kV Proposed Switching Station in James City County. The proposed line originates at the Surry Nuclear Power Plant and follows the same route towards the James River as the Surry – Skiffes Creek Proposed 500 kV Line. The line then turns northeast for 0.6 mile, then north and runs offshore parallel to the Hog Island Wildlife Management Area for approximately 1 mile. The line then turns east to cross the James River for approximately 2.5 miles into James City County. From there, the line follows the same route as the previously described Surry – Skiffes Creek Proposed 500 kV Line.

*Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 2)*

James River Crossing Variation 2 will extend approximately 7.17 miles from the Surry Nuclear Power Station in Surry County to the Skiffes Creek 500 kV – 230 kV – 115 kV Proposed Switching Station in James City County. The proposed line originates at the Surry Nuclear Power Plant and follows the same route towards the James River as the Surry – Skiffes Creek Proposed 500 kV Line. At the river, the route varies by turning northeast and traveling approximately 3.81 miles across the river to James City County, making landfall approximately 0.64 miles north of the Surry – Skiffes Creek Proposed 500 kV Line. From there, the line will be located in a new 150 foot ROW. This route will continue for approximately 0.8 miles until it rejoins the existing variable width ROW as described previously for the Surry – Skiffes Creek Proposed 500 kV Line.

*Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 3)*

James River Crossing Variation 3 will extend approximately 7.5 miles from the Surry Nuclear Power Station in Surry County to the Skiffes Creek 500 kV – 230 kV – 115 kV Proposed Switching Station in James City County. The proposed line originates at the Surry Nuclear Power Plant and follows the same route towards the James River as the Surry – Skiffes Creek Proposed 500 kV Line. At the river, the route turns north and runs offshore parallel to the Hog Island Wildlife Management Area for approximately 0.8 miles. The line then turns northeast and crosses the James River for approximately 2.4 miles, before pivoting southeast and making landfall in James City County, approximately 0.64 miles north of the Surry – Skiffes Creek Proposed 500 kV Line. The total James River crossing is approximately 4.12 miles long. From there, the line will be located in a new 150 foot ROW. This route will continue for approximately 0.8 miles until it rejoins the existing variable width ROW as described previously for the Surry – Skiffes Creek Proposed 500 kV Line.

### *Chickahominy – Skiffes Creek Alternate 500 kV Line*

The Chickahominy – Skiffes Creek Alternate 500 kV Line extends southeast approximately 37.9 miles from the existing Chickahominy Substation in Charles City County to the Skiffes Creek 500 kV – 230 kV – 115 kV Proposed Switching Station in James City County. The 25-mile 150 to 250-foot wide ROW from the Chickahominy Substation to just north of the Lightfoot Substation is owned by Dominion but is not currently cleared and is not occupied by any existing transmission lines. The remaining 13.0 miles from just north of Lightfoot to the proposed switching station are within an existing cleared ROW and contain two existing 230 kV lines and two 115 kV lines.

### *Skiffes Creek 500 kV -- 230 kV – 115 kV Proposed Switching Station*

The proposed switching station is situated on an approximate 51.0-acre parcel located in James City County. The parcel sits south/southwest of I-64 and Route 143, just west of the Skiffes Creek Reservoir.

### *Skiffes Creek – Whealton Proposed 230 kV Line*

The Skiffes Creek – Whealton Proposed 230 kV Line extends approximately 20.2 miles from the Skiffes Creek 500 kV -- 230 kV – 115 kV Proposed Switching Station in James City County to the existing Whealton substation in the City of Hampton. In general, the existing 230 kV line will be rebuilt with the new 230 kV line being collocated on the replacement structures. All work will take place within the existing cleared variable width ROW, with the exception of a 1.16 mile section of the route located in the vicinity of the Harwood Mills Reservoir and the York County Sports Complex. In this area, approximately 100 feet of additional ROW will need to be cleared, widening the ROW in this section to 250 feet.

## **Methods**

Due to the preliminary nature of this study, the field methods outlined in the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region* were not applied to determine the limits of wetlands and other water features onsite. Instead several offsite resources were reviewed including the U.S. Geological Survey 7.5 minute Topographic Quadrangle Maps, the National Wetland Inventory (NWI) Online Maps administered by the U.S. Fish and Wildlife Service, the Natural Resources Conservation Service (NRCS) Web Soil Survey, Digital Orthophoto Quarter Quads (DOQQ) flown in March of 1994, and 2005 aerial photography. For an evaluation of this type, the dimensions of waters of the U.S., including wetlands are difficult to determine when using the highest resolution and most recent offsite reference materials. Large floodplains containing broad, flat topography can be assessed fairly accurately using aerial photography, however, smaller secondary drainages containing lower order streams and headwater wetlands are more difficult to evaluate and could contain a high degree of deviation when compared to field conditions. Similarly, distinguishing between scrub shrub wetlands and emergent wetlands using only offsite resources is difficult, and without field verification, may also contain a high degree of deviation. Therefore, all site conditions predicted as a part of this analysis and in the mapping provided are considered preliminary and should only be utilized for early stages of planning. Results of the analysis are provided for all 7 segments in the results section.



## Results

Based on the methods described above, the total area of jurisdictional features was determined for each of the identified project segments. A summary of the results for each individual line segment are presented below as well as in Table 1. Table 2 provides a summary of the total potential jurisdictional areas for the entire extent of each of the proposed and alternate routes.

### *Surry – Skiffes Creek Proposed 500 kV Line*

The USGS Quads for this proposed route show the alignment as being partially forested and traversing mostly level terrain. Named riverine and stream systems within the alignment include the James River, Wood Creek, and Skiffes Creek. Additional unnamed tributaries are also mapped within the alignment. Wetland systems are mapped in association with the James River, Wood Creek, and Skiffes Creek.

The NWI maps depict multiple wetland crossings along the easement associated with the James River, Wood Creek, and Skiffes Creek. These consist of both tidal and non-tidal open water bodies, tidal and non-tidal streams, secondary drainages, and large complexes of headwater wetlands. The majority of the wetlands identified within the easement are classified as palustrine scrub-shrub (PSS) and palustrine emergent (PEM) wetlands. Palustrine wetlands include all non-tidal wetlands dominated by vegetation and all such tidal wetlands where salinity, due to ocean derived salts, is below 0.05%. Tidal emergent wetlands and waters are also found in association with the James River and Wood Creek crossings.

Hydric soils found within the proposed easement for this line include Ackwater, Newflat, Peawick and Chickahominy silt loams, as well as Emporia and Johnston complexes, loamy Udorthents, and Bohicket muck. Other common soil types mapped within the alignment include Nevarc-remlik and Craven-Uchee complexes, Emporia fine sandy loam, and Slagle fine sandy loam.

A total of 68.35 acres (979 linear feet (LF)) of potential jurisdictional features were identified within the Surry – Skiffes Creek Proposed 500 kV Line route (Offsite Wetlands and Waters Analysis – Surry – Skiffes Creek Proposed 500 kV Line, Appendix A). These features include 0.62 acres of palustrine forested wetlands (PFO) and 0.82 acres of palustrine scrub-shrub/emergent wetlands (PSS/PEM). Approximately 0.57 acres of palustrine open water (POW) and 0.06 acres (406 LF) of stream channel are also contained within the project limits. The proposed alignment crosses 1.20 acres of riverine tidal emergent wetlands (R1EM) and 65.08 acres (573 LF) of estuarine tidal stream bed (E2SB).

### *Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 1)*

The USGS Quads for this proposed route show the alignment as being partially forested and traversing mostly level terrain. Named riverine and stream systems within the alignment include the James River, Wood Creek, and Skiffes Creek. Additional unnamed tributaries are also mapped within the alignment. Wetland systems are mapped in association with the James River, Wood Creek, and Skiffes Creek.

The NWI maps depict multiple wetland crossings along the easement associated with the James River, Wood Creek, and Skiffes Creek. These consist of both tidal and non-tidal open water bodies, tidal and non-tidal streams, secondary drainages, and large complexes of headwater wetlands. The majority of the wetlands identified within the easement are classified as palustrine scrub-shrub (PSS) and

palustrine emergent (PEM) wetlands. Palustrine wetlands include all non-tidal wetlands dominated by vegetation and all such tidal wetlands where salinity, due to ocean derived salts, is below 0.05%. Tidal emergent wetlands are also found in association with the James River and Wood Creek crossings. Tidal waters within the alignment include the James River and Wood Creek.

Hydric soils found within the proposed easement for this line include Ackwater, Newflat, Peawick and Chickahominy silt loams, as well as Emporia and Johnston complexes, loamy Udorthents, and Bohicket muck. Other common soil types mapped within the alignment include Nevarc-remlik and Craven-Uchee complexes, Emporia fine sandy loam, and Slagle fine sandy loam.

A total of 74.47 acres, (948 LF) of potential jurisdictional features were identified within the James River Crossing Variation 1 route (Offsite Wetlands and Waters Analysis – Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 1), Appendix B). These features include 0.63 acres of palustrine forested wetlands (PFO) and 0.78 acres of palustrine scrub-shrub/emergent wetlands (PSS/PEM). Approximately 0.30 acres of palustrine open water (POW) and 0.06 acres (395 LF) of stream channel are also contained within the project limits. The proposed alignment crosses 1.35 acres of riverine tidal emergent wetlands (R1EM) and 74.41 acres (553 LF) of estuarine tidal stream bed (E2SB).

*Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 2)*

The USGS Quads for this proposed route show the alignment as being partially forested and traversing mostly level terrain. Named riverine and stream systems within the alignment include the James River, Wood Creek, and Skiffes Creek. Additional unnamed tributaries are also mapped within the alignment. Wetland systems are mapped in association with the James River, Wood Creek, and Skiffes Creek.

The NWI maps depict multiple wetland crossings along the easement associated with the James River, Wood Creek, and Skiffes Creek. These consist of both tidal and non-tidal open water bodies, tidal and non-tidal streams, secondary drainages, and large complexes of headwater wetlands. The majority of the wetlands identified within the easement are classified as palustrine forested (PFO) wetlands. Palustrine wetlands include all non-tidal wetlands dominated by vegetation and all such tidal wetlands where salinity, due to ocean derived salts, is below 0.05%. Tidal waters within the alignment include the James River.

Hydric soils found within the proposed easement for this line include Ackwater, Newflat, Peawick and Chickahominy silt loams, as well as Emporia and Johnston complexes, loamy Udorthents, and Bohicket muck. Other common soil types mapped within the alignment include Nevarc-remlik and Craven-Uchee complexes, Emporia fine sandy loam, and Slagle fine sandy loam.

A total of 78.18 acres (143 LF) of potential jurisdictional features were identified within the James River Crossing Variation 2 route (Offsite Wetlands and Waters Analysis – Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 2), Appendix C). These features include 0.62 acres of palustrine forested wetlands (PFO) and 0.82 acres of palustrine scrub-shrub/emergent wetlands (PSS/PEM). Approximately 0.57 acres of palustrine open water (POW) and 0.06 acres (406 LF) of stream channel are also contained within the project limits. The proposed alignment crosses 74.91 acres of riverine tidal emergent wetlands (R1EM) and 74.91 acres (549 LF) of estuarine tidal stream bed (E2SB).



*Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 3)*

The USGS Quads for this proposed route show the alignment as being partially forested and traversing mostly level terrain. Named riverine and stream systems within the alignment include the James River, Wood Creek, and Skiffes Creek. Additional unnamed tributaries are also mapped within the alignment. Wetland systems are mapped in association with the James River, Wood Creek, and Skiffes Creek.

The NWI maps depict multiple wetland crossings along the easement associated with the James River, Wood Creek, and Skiffes Creek. These consist of both tidal and non-tidal open water bodies, tidal and non-tidal streams, secondary drainages, and large complexes of headwater wetlands. The majority of the wetlands identified within the easement are classified as palustrine forested (PFO) wetlands. Palustrine wetlands include all non-tidal wetlands dominated by vegetation and all such tidal wetlands where salinity, due to ocean derived salts, is below 0.05%. Tidal waters within the alignment include the James River.

Hydric soils found within the proposed easement for this line include Ackwater, Newflat, Peawick and Chickahominy silt loams, as well as Emporia and Johnston complexes, loamy Udorthents, and Bohicket muck. Other common soil types mapped within the alignment include Nevarc-remlik and Craven-Uchee complexes, Emporia fine sandy loam, and Slagle fine sandy loam.

A total of 200.82 acres, (6,930 LF) of potential jurisdictional features were identified within the James River Crossing Variation 3 route (Offsite Wetlands and Waters Analysis – Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 3), Appendix D). These features include 0.73 acres of palustrine forested wetlands (PFO) and 0.44 acres of palustrine scrub-shrub/emergent wetlands (PSS/PEM). Approximately 0.57 acres of palustrine open water (POW) and 0.07 acres (502 LF) of stream channel are also contained within the project limits. The proposed alignment crosses 75.12 acres (190 LF) of estuarine tidal stream bed (E2SB).

*Chickahominy – Skiffes Creek Alternate 500 kV Line*

The USGS Quads for this alternative show the alignment as being predominantly forested traversing mostly level terrain. Named riverine and stream systems within the alignment include the Chickahominy River, Possum Run, Bradley Run, Stony Run, Collins Run, Barrows Creek, Parsons Creek, Blackstump Creek, Yarmouth Creek and Chisel Run. The alignment also crosses Dockman Swamp, Tonyham Swamp, Colby Swamp, Long Hill Swamp and the Waller Mill Reservoir. Additional unnamed tributaries are also mapped within the alignment. Wetland systems are mapped in association with the Chickahominy River and Blackstump Creek.

The NWI maps depict multiple wetland crossings along the easement associated with the Chickahominy River, Waller Mill Reservoir, named stream systems, secondary drainages, and large complexes of headwater wetlands. The majority of the wetlands identified within the ROW are classified as palustrine forested (PFO) with isolated areas of palustrine scrub-shrub (PSS) and palustrine emergent (PEM) wetlands. Palustrine wetlands include all non-tidal wetlands dominated by vegetation and all such tidal wetlands where salinity, due to ocean derived salts, is below 0.05%. Freshwater tidal wetlands are also found in association with the Chickahominy River and Blackstump Creek crossings.

Hydric soils found within the proposed easement for this line segment include Lawnes muck, Roanoke silt loam, Bibb fine sandy loam, Chickahominy loam, Johnston complex, Levy silty clay, Nimmo fine sandy loam, Tomotley fine sandy loam and Bethera silt loam. Several partially hydric soils were also identified and include Dogue silt loam, Augusta sandy loam, Nansemond loamy sand, Newflat silt loam, Peawick silt loam, Dragston fine sandy loam, Emporia complex, Seabrook loamy fine sand, Slagle fine sandy loam and Udorthents.

A total of 159.29 acres (14,167 LF) of potential jurisdictional features were identified within the Chickahominy – Skiffes Creek Alternate 500 kV Line route (Offsite Wetlands and Waters Analysis -- Chickahominy – Skiffes Creek Alternate 500 kV Line, Appendix E). These features include 106.90 acres of non-tidal forested wetlands and 33.11 acres of non-tidal scrub-shrub/emergent wetlands. Approximately 3.62 acres of non-tidal open water and 1.41 acres (13,842 LF) of stream channel are also contained within the project limits. Riverine tidal wetlands and waters associated with the Chickahominy River crossing and Blackstump Creek crossing were also identified. The alignment crosses 7.37 acres of riverine tidal emergent wetlands (R1EM) and 6.88 acres (325 LF) of riverine tidal stream bed (R1SB).

#### *Skiffes Creek 500 kV -- 230 kV – 115 kV Proposed Switching Station*

The USGS Quads for this project segment depicts a predominantly forested site with nearly level to moderately sloping terrain. An existing utility easement is mapped within the southern boundary of the project limits running from the northwest to the southeast. Also, an unnamed intermittent tributary to Skiffes Creek is shown on-site and generally flows south. Finally, an aqueduct is depicted in the eastern portion of the project area and generally parallels Skiffes Creek.

The Natural Resources Conservation Service (NRCS) Web Soil Survey shows that the site is underlain primarily by Emporia complex, Craven-Uchee complex, Emporia fine sandy loam, Kempsville-Emporia fine sandy loam, Slagle fine sandy loam, and Uchee loamy fine sand. Emporia complex is classified by the NRCS as partially hydric.

The NWI maps depict no wetland features within the proposed switching station. Palustrine forested wetlands associated with Skiffes Creek are mapped to the south of the site.

A total of 2.46 acres (1,798 LF) of potential jurisdictional features were identified within the Skiffes Creek 500 kV -- 230 kV – 115 kV Proposed Switching Station (Offsite Wetlands and Waters Analysis -- Skiffes Creek 500 kV – 230 kV – 115 kV Proposed Switching Station, Appendix F). These features include 1.67 acres of non-tidal forested wetlands and 0.58 acres of non-tidal scrub-shrub/emergent wetlands. Approximately 0.21 acres (1,798 LF) of stream channel are also contained within the project limits.

#### *Skiffes Creek – Whealton Proposed 230 kV Line*

The USGS Quads for this segment of the project show the existing ROW as being cleared of forested vegetation with generally level terrain. Named systems within the alignment include Queen Creek, King Creek, Skiffes Creek, Jones Run, Brick Kiln Creek and Newmarket Creek. The ROW also crosses Whiteman Swamp, City Reservoir and Harwood's Mill Reservoir. Additional unnamed tributaries are mapped within the alignment. Wetlands are mapped at the Skiffes Creek and Harwood's Mill Reservoir crossings.



The NWI maps depict several wetland crossings along the existing easement. Estuarine intertidal emergent wetlands are depicted in the northwestern portion of the alignment associated with Skiffes Creek. Estuarine wetlands are deepwater and tidal with open, partial, or sporadic access to the ocean where salinity, due to ocean derived salts, is above 0.05%. Palustrine open water (POW) features are also depicted in association with the City Reservoir and Harwood's Mill Reservoir. The remaining wetland features mapped within the ROW are generally classified as PEM.

Hydric soils found within the existing 230 kV line easement include Levy silty clay and Axis very fine sandy loam. A number of partially hydric soils were also identified including Altavista-Urban land complex, Nimmo-Urban land complex, Peawick-Urban land complex, Augusta-Urban land complex, Slagle-Urban land complex, Tomotley-Urban land complex, Udorthents-Dump complex, Urban land, Yemassee-Urban land complex, Bethera-Urban land complex and Chickahominy-Urban land complex.

The Skiffes Creek – Whealton Proposed 230 kV alignment was found to have a total of 121.43 acres (4,440 LF) of potential jurisdictional features within the existing ROW (Offsite Wetlands and Waters Analysis – Skiffes Creek – Whealton Proposed 230 kV Line, Appendix G). These features include 1.61 acres of non-tidal forested wetlands and 103.54 acres of non-tidal scrub-shrub/emergent wetlands. Approximately 13.58 acres of non-tidal open water and 0.76 acres (4,313) of non-tidal stream channel are also contained within the project limits. Estuarine intertidal wetlands and waters associated with the Skiffes Creek crossing were also identified. The alignment crosses 1.32 acres of estuarine intertidal emergent wetlands (E2EM) and 0.62 acres (127 LF) of estuarine tidal stream bed (E2SB).

**Table 1.** Approximate Area of Potential Jurisdictional Features by Project Segment

<b>LINE SEGMENT</b>	<b>PFO Acres</b>	<b>PSS/PEM Acres</b>	<b>POW Acres</b>	<b>Streams Acres (LF)</b>	<b>Tidal Wetlands Acres</b>	<b>Tidal Waters Acres</b>	<b>TOTAL Acres (LF)</b>
<b>Surry-Skiffes Creek Proposed 500 kV Line</b>	0.62	0.82	0.57	0.06 (406)	1.20 <sup>a</sup>	65.08 <sup>d</sup> (573)	68.35 (979)
<b>Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 1)</b>	0.62	0.82	0.57	0.06 (406)	1.20	74.91 (549)	78.18 (955)
<b>Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 2)</b>	0.73	0.44	0.57	0.07 (502)	0.00	69.36 (195)	71.17 (697)
<b>Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 3)</b>	0.73	0.44	0.57	0.07 (502)	0.00	75.12 (190)	76.93 (692)
<b>Chickahominy-Skiffes Creek Alternate 500 kV Line</b>	106.90	33.11	3.62	1.41 (13,842)	7.37 <sup>a</sup>	6.88 <sup>c</sup> (325)	159.29 (14,167)
<b>Skiffes Creek 500 kV – 230 kV – 115 kV Proposed Switching Station</b>	1.67	0.58	0.00	0.21 (1,798)	0.00	0.00	2.46 (1,798)
<b>Skiffes Creek-Whealton Proposed 230 kV</b>	1.61	103.54	13.58	0.76 (4,313)	1.32 <sup>b</sup>	0.62 <sup>d</sup> (127)	121.43 (4,440)

<sup>a</sup>Riverine Tidal Emergent Wetlands (R1EM); <sup>b</sup>Estuarine Intertidal Emergent Wetlands (E2EM); <sup>c</sup>Riverine Tidal Stream Bed (R1SB);

<sup>d</sup>Estuarine Tidal Stream Bed (E2SB)



Table 2. Approximate Area of Potential Jurisdictional Features by Route

<b>ROUTE</b>	<b>PFO Acres</b>	<b>PSS/PEM Acres</b>	<b>POW Acres</b>	<b>Streams Acres (LF)</b>	<b>Tidal Wetlands Acres</b>	<b>Tidal Waters Acres</b>	<b>TOTAL Acres (LF)</b>
<b>Surry – Skiffes Creek - Whealton</b>	3.90	104.94	14.15	1.03 (6,517)	2.52	65.7 (700)	192.24 (7,217)
<b>Surry (James River Crossing Variation 1) – Skiffes Creek - Whealton</b>	3.90	104.94	14.15	1.03 (6,517)	2.52	75.53 (676)	202.07 (7,193)
<b>Surry (James River Crossing Variation 2) – Skiffes Creek - Whealton</b>	4.01	104.56	14.15	1.04 (6,613)	1.32	69.98 (322)	195.06 (6,935)
<b>Surry (James River Crossing Variation 3) – Skiffes Creek - Whealton</b>	4.01	104.56	14.15	1.04 (6,613)	1.32	75.74 (317)	200.82 (6,930)
<b>Chickahominy - Skiffes Creek - Whealton</b>	110.18	137.22	17.2	2.38 (19,953)	8.69	7.5 (452)	283.17 (20,405)

## Conclusion

Based on WEG's analysis of the above-mentioned offsite resources, the potential exists for jurisdictional features to occur in association with all major drainage features, some secondary drainages, and large expanses of groundwater driven headwater features, within each of the identified alternative transmission line segments.

The results of the offsite wetland evaluation predict the location of potential jurisdictional features without making field inspections, and should therefore be considered preliminary. In order to confirm the presence of jurisdictional waters of the U.S, including wetlands, as described in this report, WEG suggests that a detailed delineation of wetlands and other water of the U.S. be performed within the project area followed by confirmation by the U.S. Army Corps of Engineers.

Sincerely,

Williamsburg Environmental Group, Inc.

By:



Christine F. Conrad, Ph.D.  
Senior Regulatory Specialist



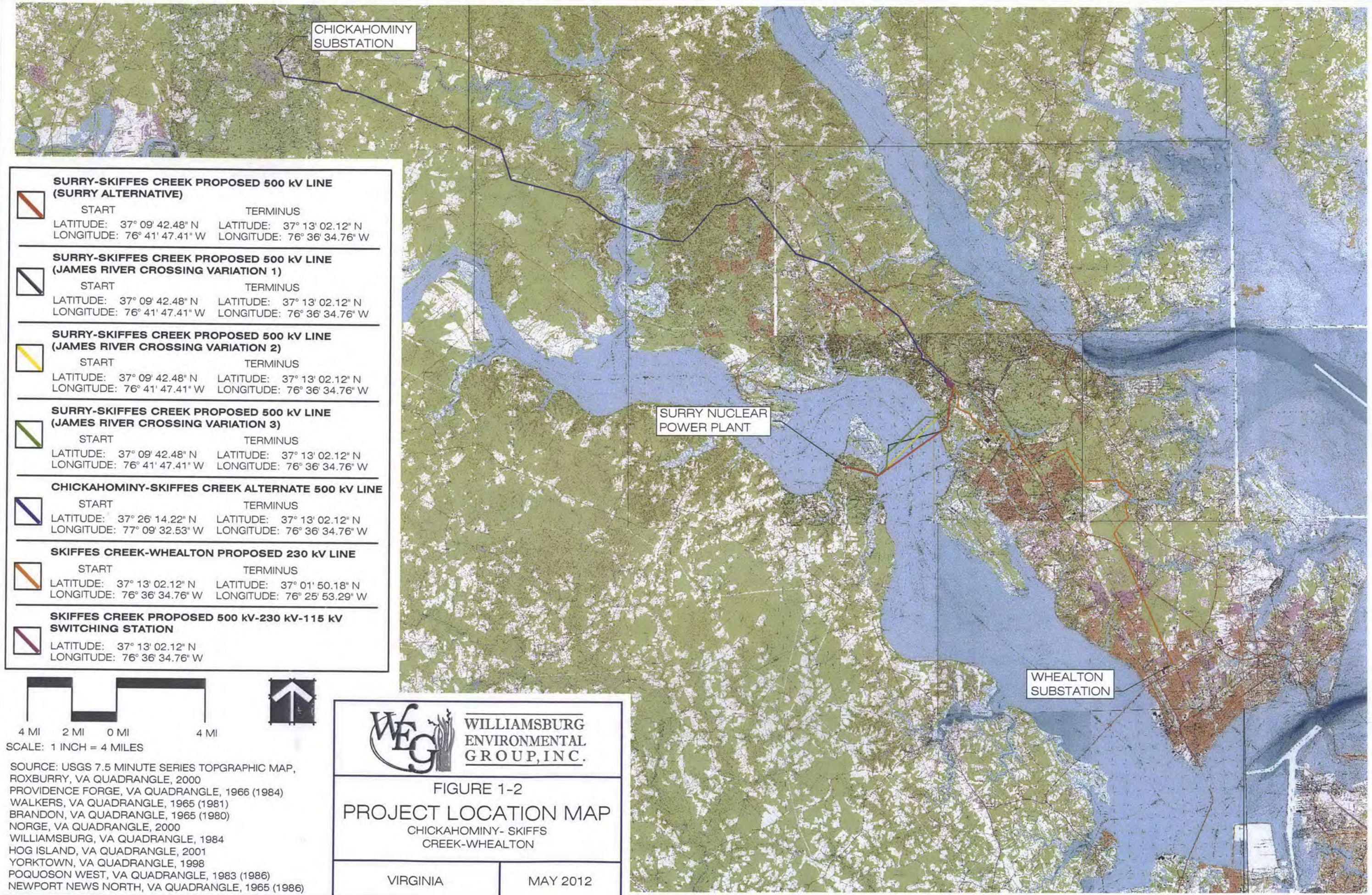
Kenny Presgraves, PWD  
Senior Ecologist

Enclosures

cc: Jon Berkin, Ph.D., Natural Resource Group, LLC



\\lan.wegnet.com\WEG\WMBGcad\4600s\4652- Chickahominy-Skiffes Creek-Wheaton\Submittals\Ecology\05-25-12\4652 - LOC MAP (05-25-12).dwg





## **APPENDIX A**

Surry – Skiffes Creek Proposed 500 kV Line






SURRY NUCLEAR  
POWER STATION

SHEET 2

SHEET 3

PROPOSED SKIFFES CREEK  
500KV-230KV-115KV  
SWITCHING STATION

LEGEND:	
	APPROXIMATE PFO WETLAND LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS
	APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE TIDAL STREAM CHANNEL LIMITS

SITE DATA:	
PROJECT LENGTH	7.26 MILES ±
PROJECT AREA	132.00 ACRES ±
PFO WETLANDS	0.82 ACRES ±
PSS/PEM WETLANDS	0.82 ACRES ±
OPEN WATER	0.57 ACRES ±
STREAM CHANNELS	0.06 ACRES ±
(EXCLUDING WETLANDS)	(406 L.F. ±)
TIDAL WETLANDS	1.20 ACRES ±
TIDAL STREAM CHANNELS	65.08 ACRES ±
(EXCLUDING WETLANDS)	(573 L.F. ±)

NOTE: THE APPROXIMATE LIMITS OF WETLANDS AND STREAM CHANNELS/OPEN WATERS SHOWN ON THIS MAP HAVE NOT BEEN FIELD SURVEY LOCATED AND ARE FOR PLANNING PURPOSES ONLY.



DATE: MAY 25, 2012  
JOB NUMBER: 4652

SCALE: 1 INCH = 2000 FEET

SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - INDEX SHEET 1 OF 3  
SURRY - SKIFFES CREEK  
PROPOSED 500KV LINE  
SURRY ALTERNATIVE  
SURRY AND JAMES CITY COUNTIES, VIRGINIA



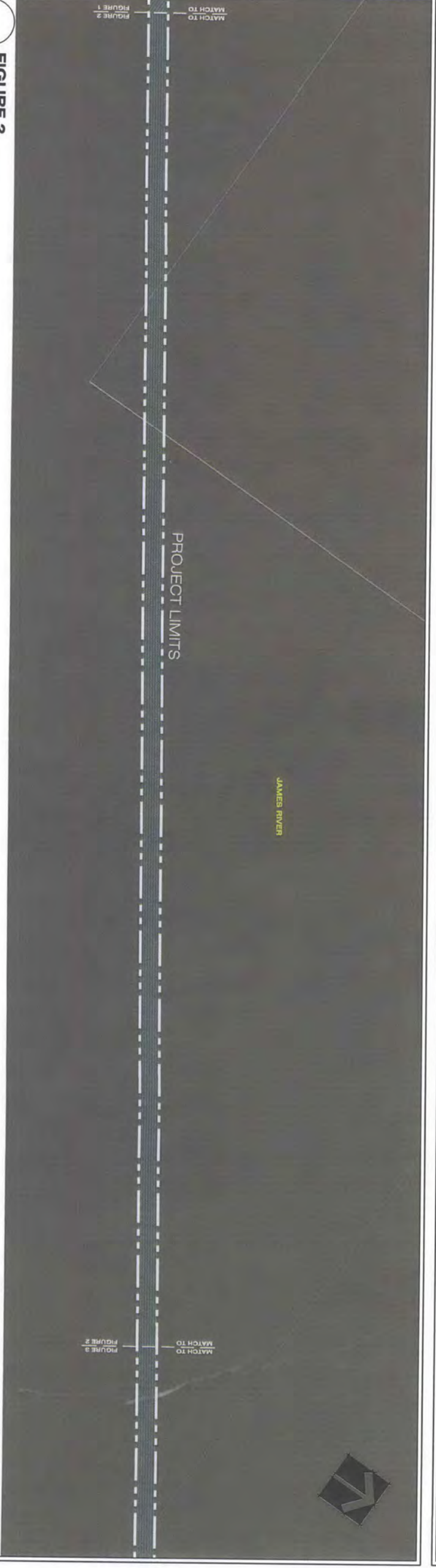
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Richmond, Virginia 23225  
(804) 267-3474  
150 Riverside Parkway, Suite 301  
Fredericksburg, Virginia 22406  
(540) 785-5544

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LEGEND:

	APPROXIMATE PFO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS



DATE: MAY 25, 2012  
JOB NUMBER: 4652  
SCALE: 1 INCH = 400 FEET

SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - SHEET 2 OF 3  
SURRY - SKIFFES CREEK  
PROPOSED 500kV LINE  
SURRY ALTERNATIVE  
SURRY AND JAMES CITY COUNTIES, VIRGINIA**

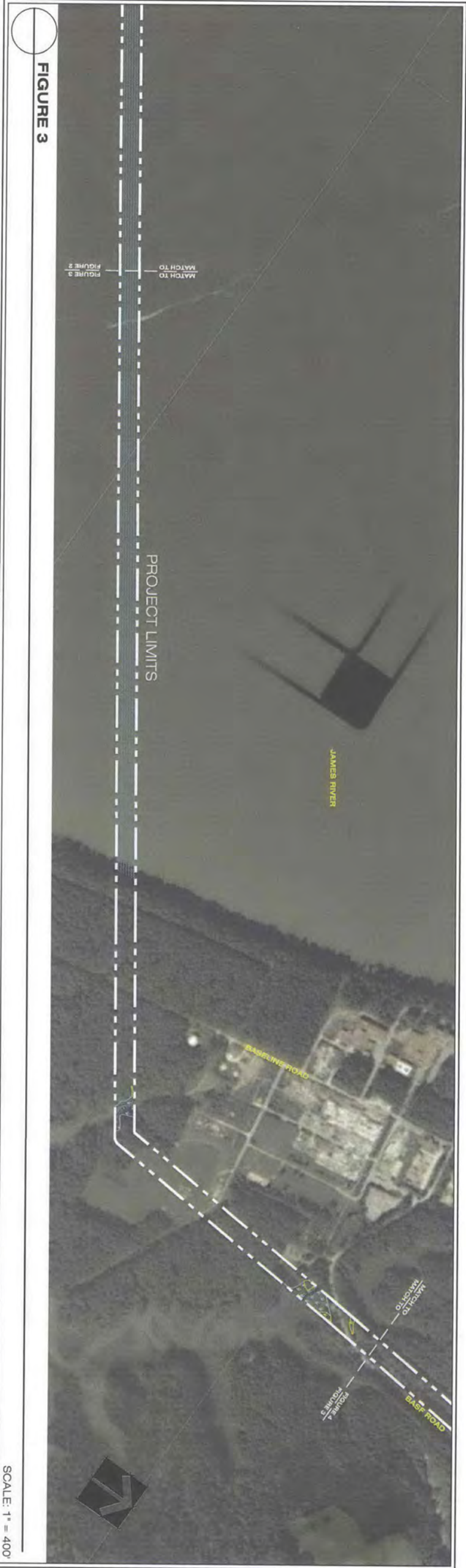


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(540) 785-5544  
Environmental Consultants



LEGEND:

	APPROXIMATE PFO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS



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SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - SHEET 3 OF 3  
SURRY - SKIFFES CREEK  
PROPOSED 500KV LINE  
SURRY ALTERNATIVE  
SURRY AND JAMES CITY COUNTIES, VIRGINIA**



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## **APPENDIX B**


Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 1)




**LEGEND:**




APPROXIMATE PFO WETLAND LIMITS




APPROXIMATE PSS/PEM WETLAND LIMITS




APPROXIMATE STREAM CHANNEL LIMITS



APPROXIMATE OPEN WATER LIMITS



APPROXIMATE TIDAL WETLAND LIMITS



APPROXIMATE TIDAL STREAM CHANNEL LIMITS

**SITE DATA:**

PROJECT LENGTH	7.79 MILES ±
PROJECT AREA	141.73 ACRES ±
PFO WETLANDS	0.82 ACRES ±
PSS/PEM WETLANDS	0.82 ACRES ±
OPEN WATER	0.57 ACRES ±
STREAM CHANNELS	0.06 ACRES ±
(EXCLUDING WETLANDS)	(406 L.F. ±)
TIDAL WETLANDS	1.20 ACRES ±
TIDAL STREAM CHANNELS	(549 L.F. ±)
(EXCLUDING WETLANDS)	

NOTE: THE APPROXIMATE LIMITS OF WETLANDS AND STREAM CHANNELS/OPEN WATERS SHOWN ON THIS MAP HAVE NOT BEEN FIELD SURVEY LOCATED AND ARE FOR PLANNING PURPOSES ONLY.



DATE: MAY 25, 2012  
JOB NUMBER: 4652  
SCALE: 1" INCH = 2000 FEET

SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

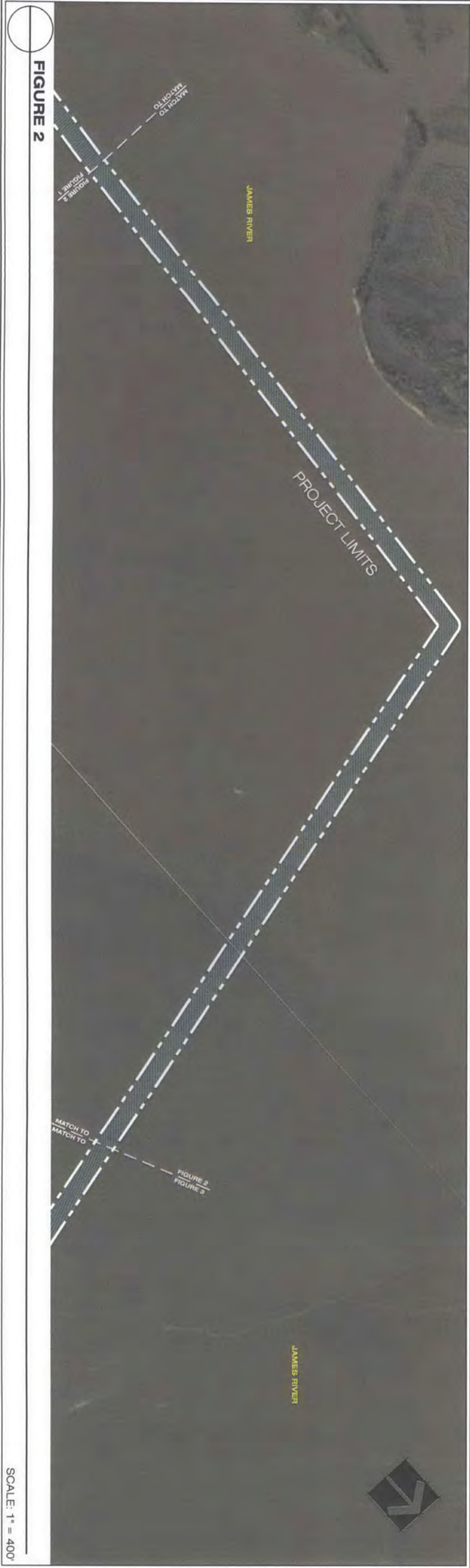
**OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - INDEX SHEET 1 OF 3  
SURRY - SKIFFES CREEK  
PROPOSED 500KV LINE  
JAMES RIVER CROSSING VARIATION 1  
SURRY AND JAMES CITY COUNTIES, VIRGINIA**



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(540) 785-5544

Environmental Consultants





LEGEND:

	APPROXIMATE PRO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS

DATE: MAY 25, 2012

JOB NUMBER: 4652

SCALE: 1 INCH = 400 FEET

SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - SHEET 2 OF 3  
SURRY - SKIFFES CREEK  
PROPOSED 500kV LINE  
JAMES RIVER CROSSING VARIATION 1  
SURRY AND JAMES CITY COUNTIES, VIRGINIA**



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LEGEND:

	APPROXIMATE PFO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS

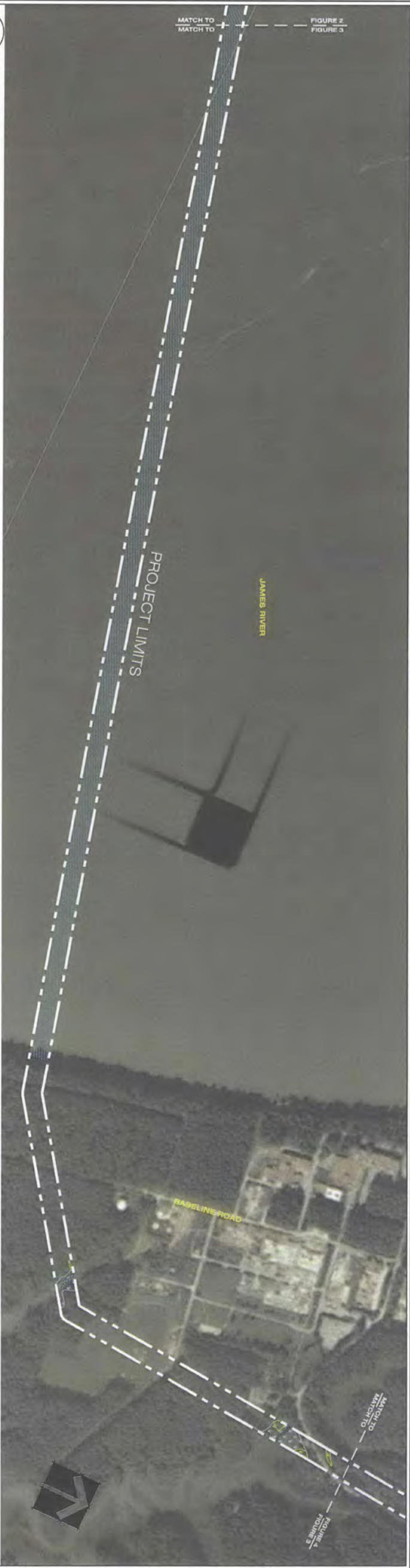


FIGURE 3

SCALE: 1" = 400'



FIGURE 4

SCALE: 1" = 400'

DATE: MAY 25, 2012

JOB NUMBER: 4652

SCALE: 1 INCH = 400 FEET

SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - SHEET 3 OF 3  
SURRY - SKIFFES CREEK  
PROPOSED 500kV LINE  
JAMES RIVER CROSSING VARIATION 1  
SURRY AND JAMES CITY COUNTIES, VIRGINIA**



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## **APPENDIX C**


Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 2)




**LEGEND:**




APPROXIMATE PFO WETLAND LIMITS




APPROXIMATE PSS/PEM WETLAND LIMITS




APPROXIMATE STREAM CHANNEL LIMITS



APPROXIMATE OPEN WATER LIMITS



APPROXIMATE TIDAL WETLAND LIMITS



APPROXIMATE TIDAL STREAM CHANNEL LIMITS

**SITE DATA:**

PROJECT LENGTH	7.01 MILES ±
PROJECT AREA	127.45 ACRES ±
PFO WETLANDS	0.73 ACRES ±
PEM/PSS WETLANDS	0.44 ACRES ±
OPEN WATER	0.57 ACRES ±
STREAM CHANNELS (EXCLUDING WETLANDS)	0.07 ACRES ±
TIDAL WETLANDS	69.36 ACRES ±
TIDAL STREAM CHANNELS (EXCLUDING WETLANDS)	195 L.F. ±

**NOTE:** THE APPROXIMATE LIMITS OF WETLANDS AND STREAM CHANNELS OPEN WATERS SHOWN ON THIS MAP HAVE NOT BEEN FIELD SURVEY LOCATED AND ARE FOR PLANNING PURPOSES ONLY.



DATE: MAY 25, 2012  
JOB NUMBER: 4652  
SCALE: 1 INCH = 2000 FEET  
SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - INDEX SHEET 1 OF 3  
SURRY - SKIFFES CREEK  
PROPOSED 500KV LINE  
JAMES RIVER CROSSING VARIATION 2  
SURRY AND JAMES CITY COUNTIES, VIRGINIA**



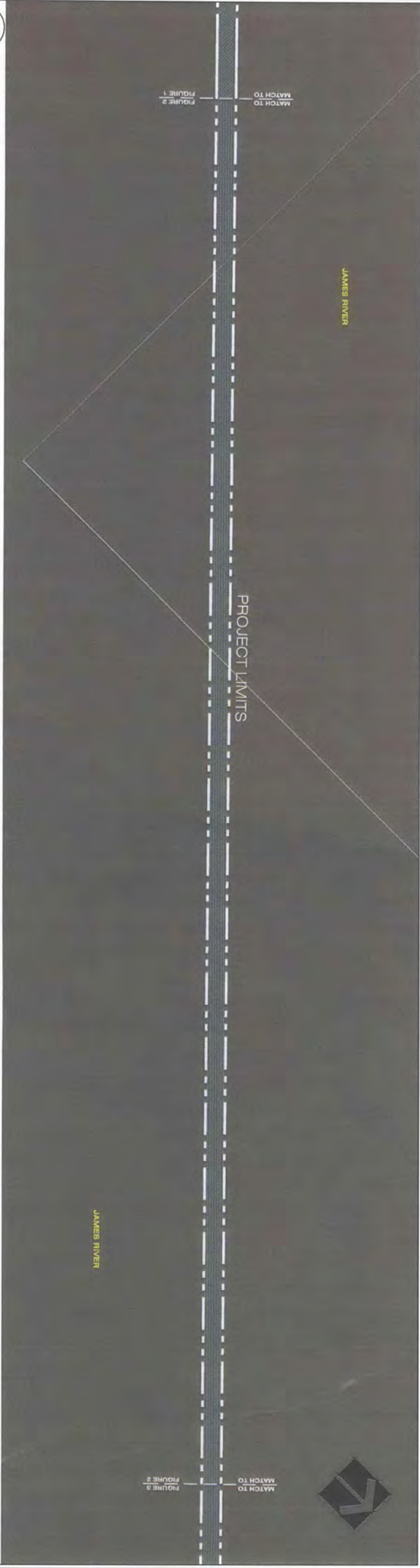
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LEGEND:

	APPROXIMATE PFO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS



DATE: MAY 25, 2012

JOB NUMBER: 4652

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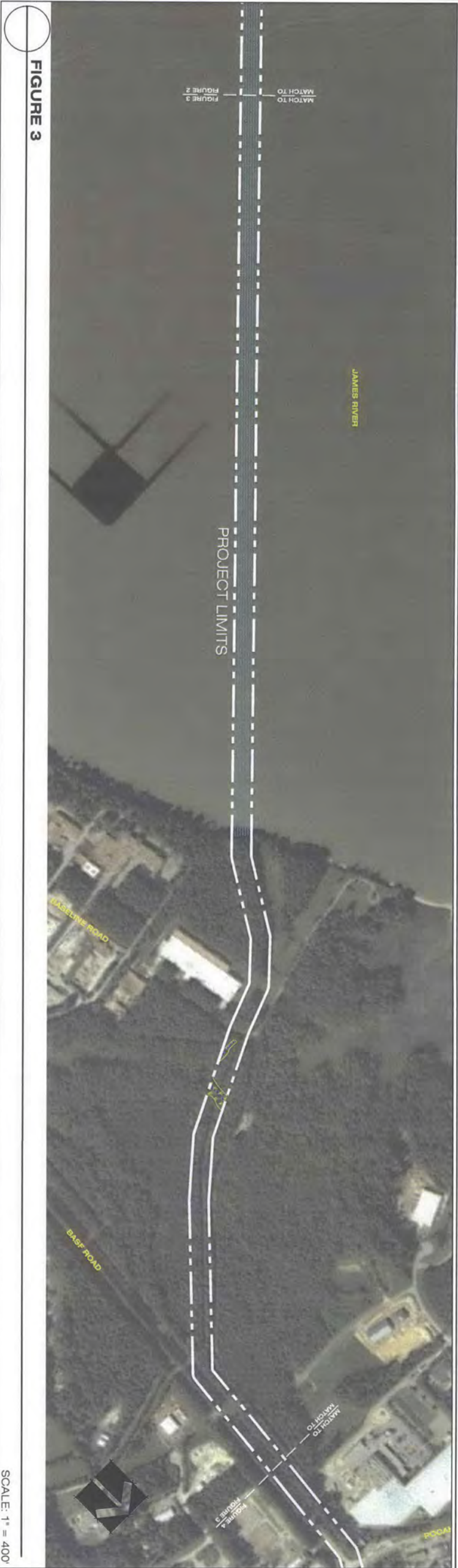
**OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - SHEET 2 OF 3  
SURRY - SKIFFES CREEK  
PROPOSED 500KV LINE  
JAMES RIVER CROSSING VARIATION 2  
SURRY AND JAMES CITY COUNTIES, VIRGINIA**



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LEGEND:

	APPROXIMATE PFO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS

DATE: MAY 25, 2012  
JOB NUMBER: 4652  
SCALE: 1 INCH = 400 FEET  
SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - SHEET 3 OF 3  
SURRY - SKIFFES CREEK  
PROPOSED 500KV LINE  
JAMES RIVER CROSSING VARIATION 2  
SURRY AND JAMES CITY COUNTIES, VIRGINIA**



5209 Center Street  
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150 Riverside Parkway, Suite 301  
Fredericksburg, Virginia 22406  
(540) 785-5544  
Environmental Consultants





## **APPENDIX D**


Surry – Skiffes Creek Proposed 500 kV Line (James River Crossing Variation 3)





**LEGEND:**


 APPROXIMATE PFO WETLAND LIMITS

 APPROXIMATE PSS/PEM WETLAND LIMITS

 APPROXIMATE STREAM CHANNEL LIMITS

 APPROXIMATE OPEN WATER LIMITS

 APPROXIMATE TIDAL WETLAND LIMITS

 APPROXIMATE TIDAL STREAM CHANNEL LIMITS

**SITE DATA:**

PROJECT LENGTH	7.34 MILES ±
PROJECT AREA	133.53 ACRES ±
PFO WETLANDS	0.73 ACRES ±
PEM/PSS WETLANDS	0.44 ACRES ±
OPEN WATER	0.57 ACRES ±
STREAM CHANNELS (EXCLUDING WETLANDS)	0.07 ACRES ±
TIDAL WETLANDS	(502 L.F. ±)
TIDAL STREAM CHANNELS (EXCLUDING WETLANDS)	0.00 ACRES ±
	75.12 ACRES ±
	(190 L.F. ±)

NOTE: THE APPROXIMATE LIMITS OF WETLANDS AND STREAM CHANNEL OPEN WATERS SHOWN ON THIS MAP HAVE NOT BEEN FIELD SURVEY LOCATED AND ARE FOR PLANNING PURPOSES ONLY.



DATE: MAY 25, 2012  
JOB NUMBER: 4652  
SCALE: 1 INCH = 2000 FEET  
SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS ANALYSIS MAP - INDEX SHEET 1 OF 3**  
**SURRY - SKIFFES CREEK**  
**PROPOSED 500KV LINE**  
**JAMES RIVER CROSSING VARIATION 3**  
**SURRY AND JAMES CITY COUNTIES, VIRGINIA**



**WILLIAMSBURG ENVIRONMENTAL GROUP, INC.**

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(540) 785-5544

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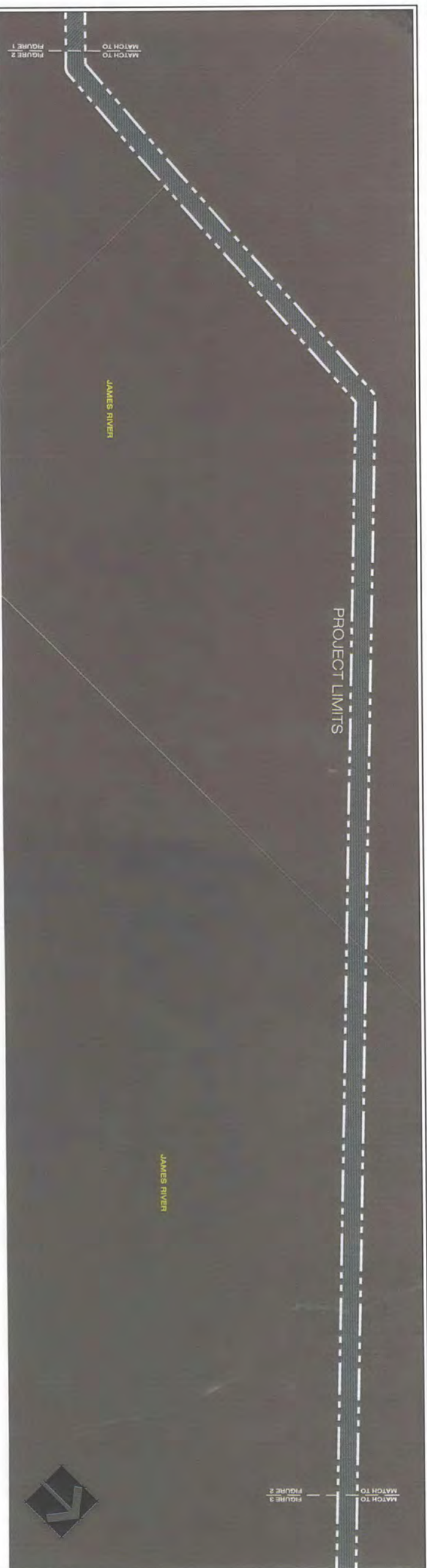


LEGEND:

	APPROXIMATE PFO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS



SCALE: 1" = 400'



SCALE: 1" = 400'

DATE: MAY 25, 2012  
JOB NUMBER: 4652  
SCALE: 1 INCH = 400 FEET  
SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - SHEET 2 OF 3  
SURRY - SKIFFES CREEK  
PROPOSED 500kV LINE  
JAMES RIVER CROSSING VARIATION 3  
SURRY AND JAMES CITY COUNTIES, VIRGINIA



5209 Center Street  
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(804) 267-3474  
150 Riverside Parkway, Suite 301  
Fredericksburg, Virginia 22406  
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LEGEND:

	APPROXIMATE PRO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS



SCALE: 1" = 400'



SCALE: 1" = 400'

DATE: MAY 25, 2012  
JOB NUMBER: 4652

SCALE: 1 INCH = 400 FEET

SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - SHEET 3 OF 3  
SURRY - SKIFFES CREEK  
PROPOSED 500KV LINE  
JAMES RIVER CROSSING VARIATION 3  
SURRY AND JAMES CITY COUNTIES, VIRGINIA**



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## **APPENDIX E**

Chickahominy – Skiffes Creek Alternate 500 kV Line



**LEGEND:**

APPROXIMATE PFO WETLAND LIMITS

APPROXIMATE PSS/PEM WETLAND LIMITS

APPROXIMATE STREAM CHANNEL LIMITS

APPROXIMATE OPEN WATER LIMITS

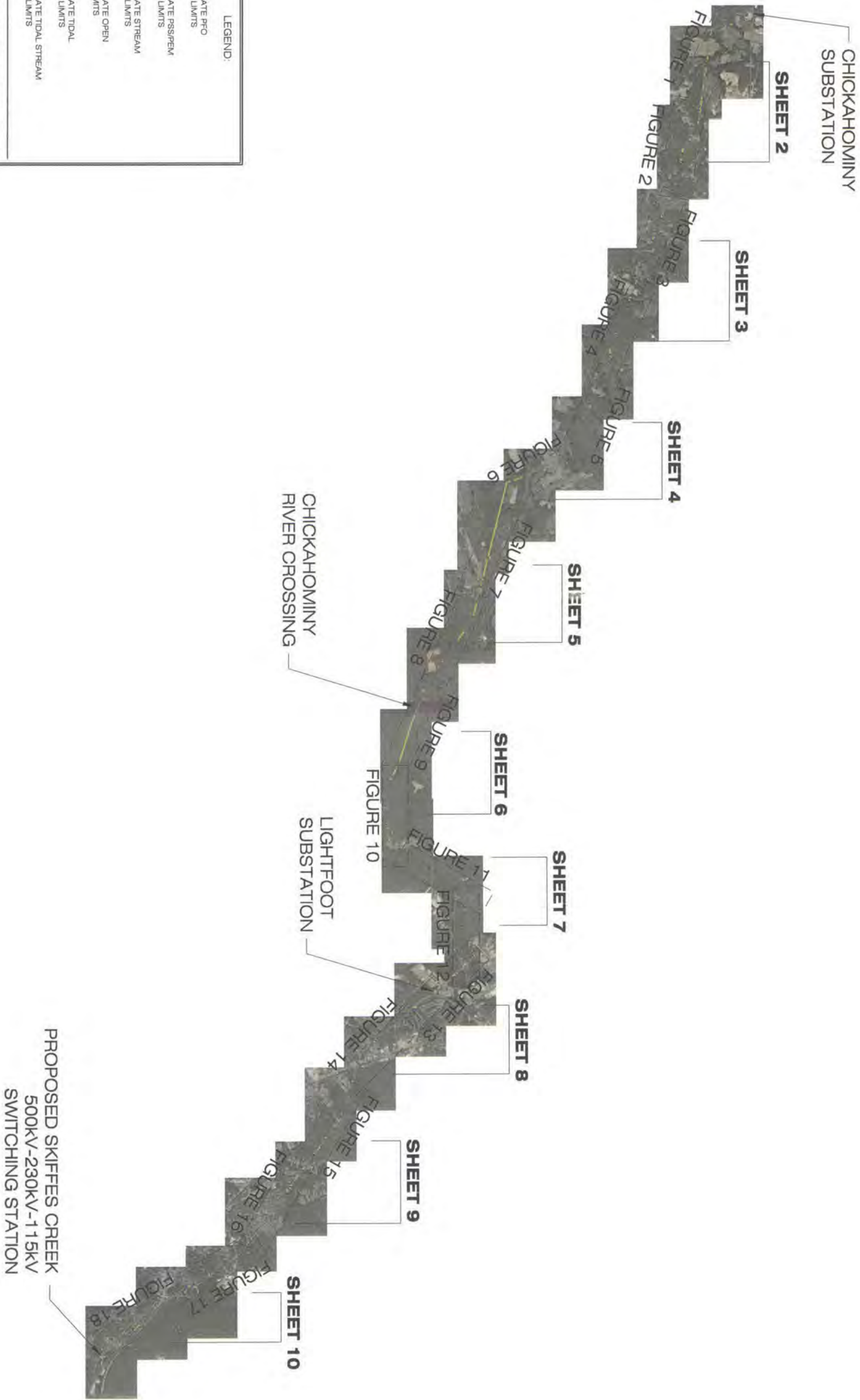
APPROXIMATE TIDAL WETLAND LIMITS

APPROXIMATE TIDAL STREAM CHANNEL LIMITS

**CHICKAHOMINY-SKIFFES CREEK 500 KV SITE DATA:**

PROJECT LENGTH	37.89 MILES ±
PROJECT AREA	779.99 ACRES ±
PFO WETLANDS	106.80 ACRES ±
PEM/PSS WETLANDS	33.11 ACRES ±
OPEN WATER	3.62 ACRES ±
STREAM CHANNELS (EXCLUDING WETLANDS)	1.41 ACRES ±
TIDAL WETLANDS	(13,842 L.F.±)
TIDAL STREAM CHANNELS (EXCLUDING WETLANDS)	7.37 ACRES ±
	6.88 ACRES ±
	(325 L.F.±)

**NOTE:** THE APPROXIMATE LIMITS OF WETLANDS AND STREAM CHANNELS/OPEN WATERS SHOWN ON THIS MAP HAVE NOT BEEN FIELD SURVEY LOCATED AND ARE FOR PLANNING PURPOSES ONLY.



DATE: MAY 25, 2012

JOB NUMBER: 4652

SCALE: 1 INCH = 6,000 FEET

SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - INDEX SHEET 1 OF 10  
CHICKAHOMINY-SKIFFES CREEK  
ALTERNATE 500KV LINE  
CHARLES CITY COUNTY, JAMES CITY COUNTY &  
CITY OF WILLIAMSBURG, VIRGINIA**



5209 Center Street  
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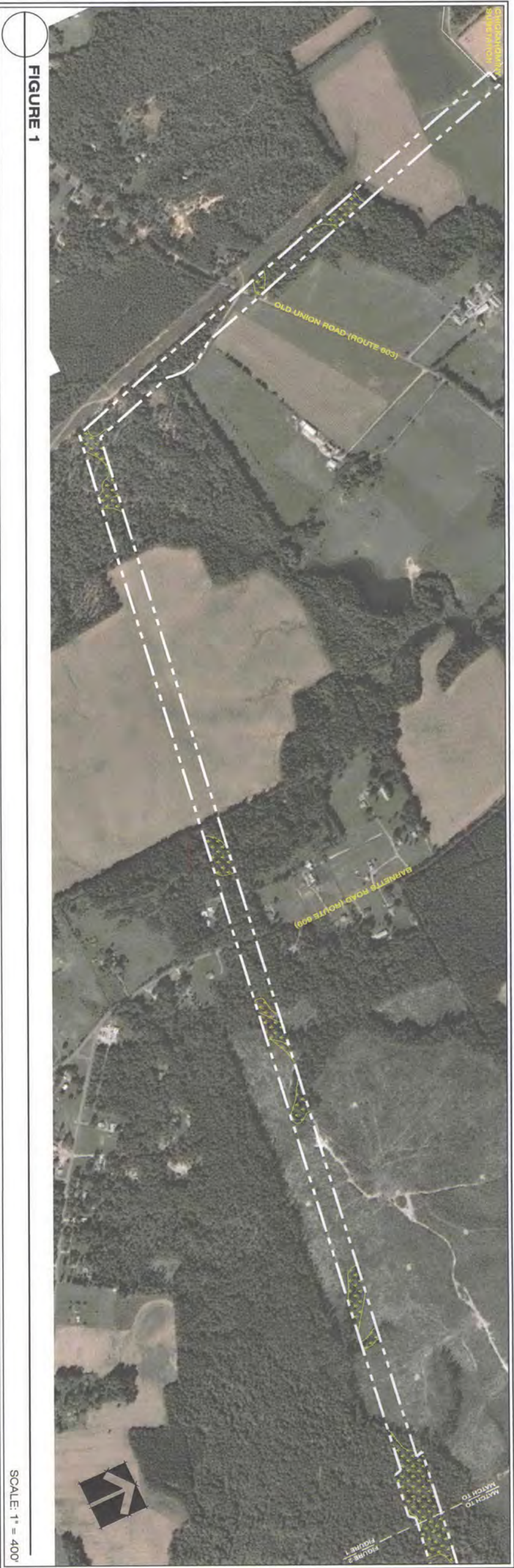
150 Riverside Parkway, Suite 301  
Fredericksburg, Virginia 22406  
(540) 785-5544

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LEGEND:

	APPROXIMATE PFO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS



DATE: MAY 25, 2012  
JOB NUMBER: 4652  
SCALE: 1 INCH = 400 FEET  
SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - SHEET 2 OF 10  
CHICKAHOMINY-SKIFFES CREEK  
ALTERNATE 500KV LINE  
CHARLES CITY COUNTY, JAMES CITY COUNTY &  
CITY OF WILLIAMSBURG, VIRGINIA**



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LEGEND:

	APPROXIMATE PFO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS



FIGURE 3

SCALE: 1" = 400'



FIGURE 4

SCALE: 1" = 400'

DATE: MAY 25, 2012

JOB NUMBER: 4652

SCALE: 1 INCH = 400 FEET

SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - SHEET 3 OF 10  
CHICKAHOMINY-SKIFFES CREEK  
ALTERNATE 500KV LINE  
CHARLES CITY COUNTY, JAMES CITY COUNTY &  
CITY OF WILLIAMSBURG, VIRGINIA



5209 Center Street  
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Richmond, Virginia 23225  
(804) 267-3474  
150 Riverside Parkway, Suite 301  
Fredericksburg, Virginia 22406  
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LEGEND:

	APPROXIMATE PFO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS



DATE: MAY 25, 2012

JOB NUMBER: 4652

SCALE: 1 INCH = 400 FEET

SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - SHEET 4 OF 10  
CHICKAHOMINY-SKIFFES CREEK  
ALTERNATE 500KV LINE**  
CHARLES CITY COUNTY, JAMES CITY COUNTY &  
CITY OF WILLIAMSBURG, VIRGINIA



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Fredericksburg, Virginia 22406  
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LEGEND:

	APPROXIMATE PRO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS



DATE: MAY 25, 2012  
JOB NUMBER: 4652  
SCALE: 1 INCH = 400 FEET  
SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - SHEET 5 OF 10  
CHICKAHOMINY-SKIFFES CREEK  
ALTERNATE 500KV LINE  
CHARLES CITY COUNTY, JAMES CITY COUNTY &  
CITY OF WILLIAMSBURG, VIRGINIA**



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Fredericksburg, Virginia 22406  
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LEGEND:

	APPROXIMATE PRO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE RSP/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS



FIGURE 9

SCALE: 1" = 400'



FIGURE 10

SCALE: 1" = 400'

DATE: MAY 25, 2012  
JOB NUMBER: 4652  
SCALE: 1 INCH = 400 FEET  
SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - SHEET 6 OF 10  
CHICKAHOMINY-SKIFFES CREEK  
ALTERNATE 500kV LINE  
CHARLES CITY COUNTY, JAMES CITY COUNTY &  
CITY OF WILLIAMSBURG, VIRGINIA



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Fredericksburg, Virginia 22406  
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LEGEND:

	APPROXIMATE PFO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS



FIGURE 11

SCALE: 1" = 400'



FIGURE 12

SCALE: 1" = 400'

DATE: MAY 25, 2012

JOB NUMBER: 4652

SCALE: 1 INCH = 400 FEET

SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - SHEET 7 OF 10  
CHICKAHOMINY-SKIFFES CREEK  
ALTERNATE 500KV LINE  
CHARLES CITY COUNTY, JAMES CITY COUNTY &  
CITY OF WILLIAMSBURG, VIRGINIA**



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LEGEND:

	APPROXIMATE PFO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS



FIGURE 13

SCALE: 1" = 400'



FIGURE 14

SCALE: 1" = 400'

DATE: MAY 25, 2012  
JOB NUMBER: 4652  
SCALE: 1 INCH = 400 FEET  
SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - SHEET 8 OF 10  
CHICKAHOMINY-SKIFFES CREEK  
ALTERNATE 500KV LINE**  
CHARLES CITY COUNTY, JAMES CITY COUNTY &  
CITY OF WILLIAMSBURG, VIRGINIA



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Fredericksburg, Virginia 22406  
(540) 785-5544  
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LEGEND:

	APPROXIMATE PFO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS



FIGURE 15

SCALE: 1" = 400'



FIGURE 16

SCALE: 1" = 400'

DATE: MAY 25, 2012

JOB NUMBER: 4652

SCALE: 1 INCH = 400 FEET

SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - SHEET 9 OF 10  
CHICKAHOMINY-SKIFFES CREEK  
ALTERNATE 500KV LINE  
CHARLES CITY COUNTY, JAMES CITY COUNTY &  
CITY OF WILLIAMSBURG, VIRGINIA



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LEGEND:

	APPROXIMATE PFO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS



FIGURE 17

SCALE: 1" = 400'



FIGURE 18

SCALE: 1" = 400'

DATE: MAY 25, 2012

JOB NUMBER: 4652

SCALE: 1 INCH = 400 FEET

SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - SHEET 10 OF 10  
CHICKAHOMINY-SKIFFES CREEK  
ALTERNATE 500KV LINE  
CHARLES CITY COUNTY, JAMES CITY COUNTY &  
CITY OF WILLIAMSBURG, VIRGINIA**



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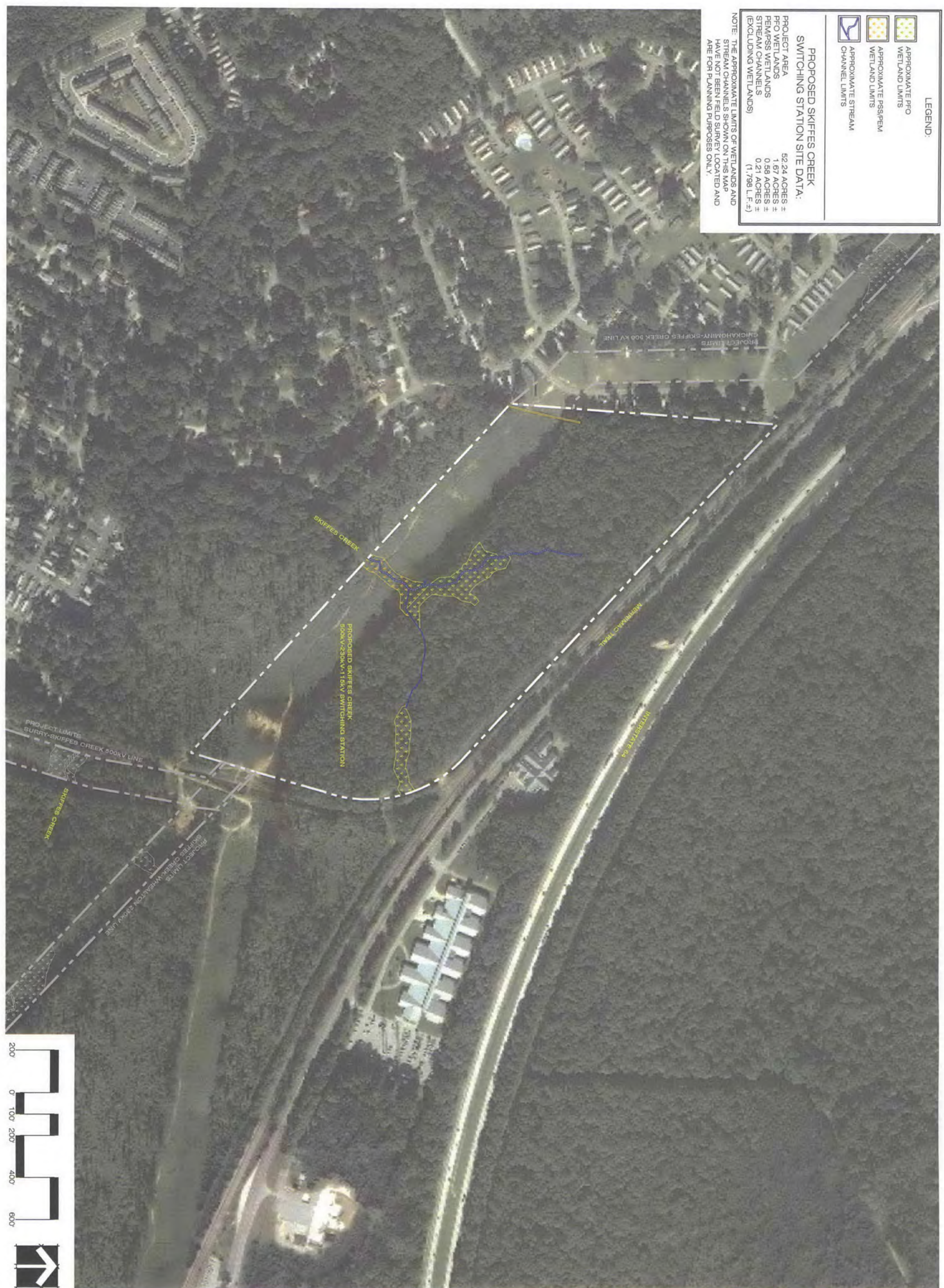
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## **APPENDIX F**

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





LEGEND:

APPROXIMATE PFO  
WETT AND LIMITSAPPROXIMATE PSS/PEN  
WETLAND LIMITS

APPROXIMATE STREAM  
CHANNEL LIMITS

PROPOSED SKIFFES CREEK  
SWITCHING STATION SITE DATA:

PROJECT AREA	52.24 ACRES ±
PFO WETLANDS	1.67 ACRES ±
PEM/PSS WETLANDS	0.58 ACRES ±
STREAM CHANNELS	0.21 ACRES ±
(EXCLUDING WETLANDS)	(1,798 L.F. ±)

NOTE: THE APPROXIMATE LIMITS OF WETLANDS AND STREAM CHANNELS SHOWN ON THIS MAP HAVE NOT BEEN FIELD SURVEY LOCATED AND ARE FOR PLANNING PURPOSES ONLY.

PROPOSED SKIFFS CREEK  
BOOKV-230KV-115KV SWITCHING STATION

An aerial photograph of a road intersection. Yellow text is overlaid on the image, rotated to follow the road's path. The text includes "MINIMUM 10' TRAIL" and "STATE 64".

PROJECT LIMITS  
SURREY-SKIFFES CREEK 500kV LINE

PROJECT LIMITS  
SHELLEY CREEK-WHEATON

DATE: MAY 25, 2012

JOB NUMBER: 4652

SCALE: 1 INCH = 200 FEET

SOURCE: BASE MAP PROVIDED BY DOMINION POWER  
AND NATURAL RESOURCES GROUP, INC.

## OFFSITE WETLANDS & WATERS ANALYSIS MAP

**SKIFFES CREEK 500kV - 230 kV - 115 kV  
PROPOSED SWITCHING STATION  
JAMES CITY COUNTY, VIRGINIA**



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## **APPENDIX G**

Skiffes Creek – Whealton Proposed 230 kV Line



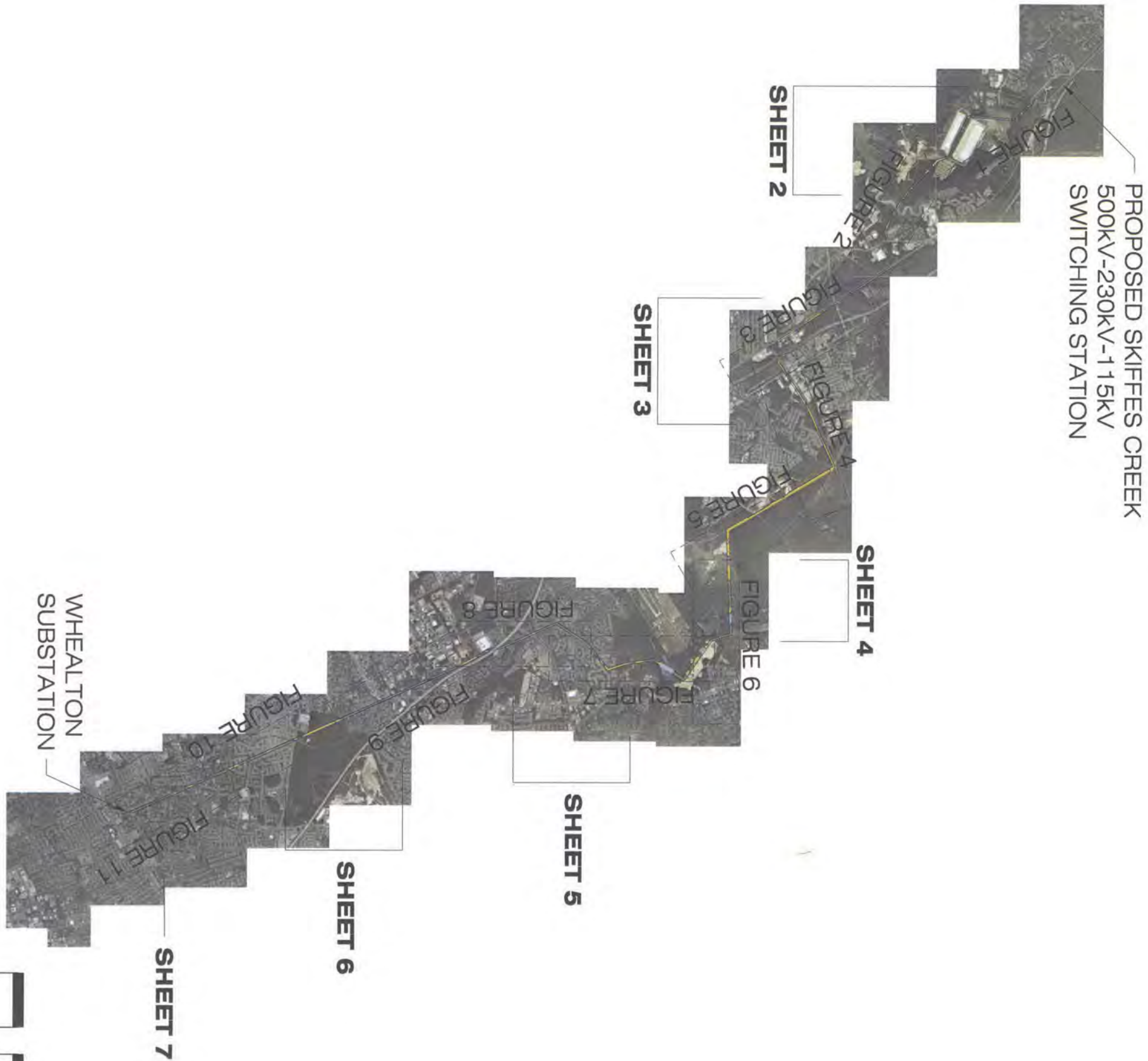
LEGEND:

	APPROXIMATE PRO WETLAND LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS
	APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE TIDAL STREAM CHANNEL LIMITS

SKIFFES CREEK-WHEALTON 230 KV  
SITE DATA:

PROJECT LENGTH	20.21 MILES ±
PROJECT AREA	380.07 ACRES ±
PRO WETLANDS	1.61 ACRES ±
PEM/PSS WETLANDS	103.54 ACRES ±
OPEN WATER	13.58 ACRES ±
STREAM CHANNELS (EXCLUDING WETLANDS)	0.76 ACRES ±
TIDAL WETLANDS	(4,313 L.F. ±)
TIDAL STREAM CHANNELS (EXCLUDING WETLANDS)	1.32 ACRES ±
	0.62 ACRES ±
	(127 L.F. ±)

NOTE: THE APPROXIMATE LIMITS OF WETLANDS AND STREAM CHANNEL/OPEN WATERS SHOWN ON THIS MAP HAVE NOT BEEN FIELD SURVEY LOCATED AND ARE FOR PLANNING PURPOSES ONLY.



DATE: MAY 25, 2012  
JOB NUMBER: 4652  
SCALE: 1 INCH = 4,000 FEET

SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

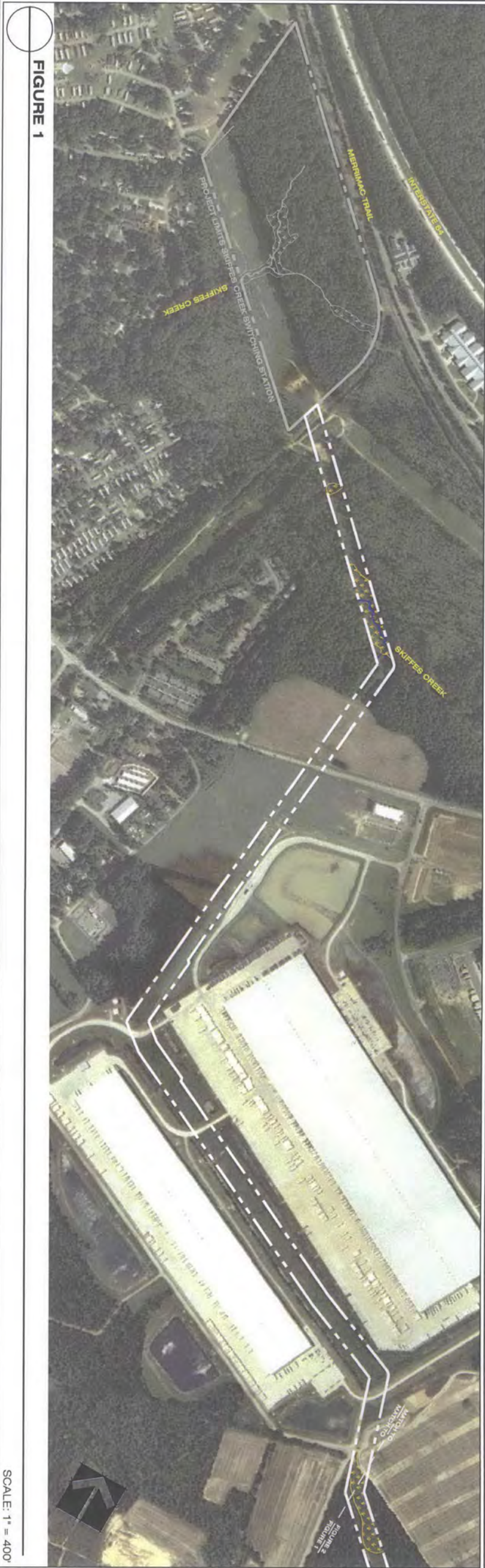
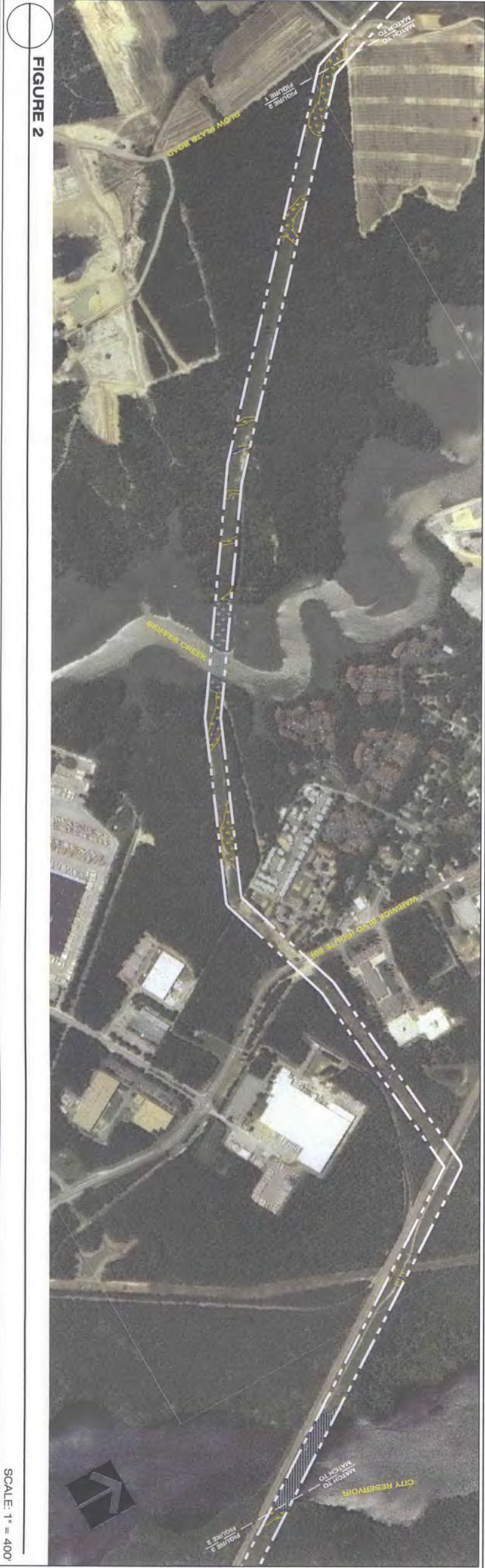
OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - INDEX SHEET 1 OF 7  
SKIFFES CREEK-WHEALTON  
PROPOSED 230kV LINE  
JAMES CITY COUNTY, YORK COUNTY, CITY OF  
NEWPORT NEWS & CITY OF HAMPTON, VIRGINIA



5209 Center Street  
Williamsburg, Virginia 23188  
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Fredericksburg, Virginia 22406  
(540) 785-5544

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**LEGEND:**

	APPROXIMATE PFO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS

DATE: MAY 25, 2012  
JOB NUMBER: 4652  
SCALE: 1 INCH = 400 FEET  
SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS ANALYSIS MAP - SHEET 2 OF 7**  
**SKIFFES CREEK-WHEALTON PROPOSED 230kV LINE**  
**JAMES CITY COUNTY, YORK COUNTY, CITY OF NEWPORT NEWS & CITY OF HAMPTON, VIRGINIA**

**WILLIAMSBURG ENVIRONMENTAL GROUP, INC.**

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Fredericksburg, Virginia 22406  
(540) 785-5544

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**LEGEND:**

	APPROXIMATE PFO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS

DATE: MAY 25, 2012  
JOB NUMBER: 4652  
SCALE: 1 INCH = 400 FEET  
SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS ANALYSIS MAP - SHEET 3 OF 7**  
**SKIFFES CREEK-WHEALTON PROPOSED 230KV LINE**  
**JAMES CITY COUNTY, YORK COUNTY, CITY OF NEWPORT NEWS & CITY OF HAMPTON, VIRGINIA**

**WILLIAMSBURG ENVIRONMENTAL GROUP, INC.**

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**LEGEND:**

	APPROXIMATE PFO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS

DATE: MAY 25, 2012  
JOB NUMBER: 4652  
SCALE: 1 INCH = 400 FEET  
SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS ANALYSIS MAP - SHEET 4 OF 7**  
**SKIFFES CREEK-WHEALTON PROPOSED 230KV LINE**  
**JAMES CITY COUNTY, YORK COUNTY, CITY OF NEWPORT NEWS & CITY OF HAMPTON, VIRGINIA**

**WILLIAMSBURG ENVIRONMENTAL GROUP, INC.**

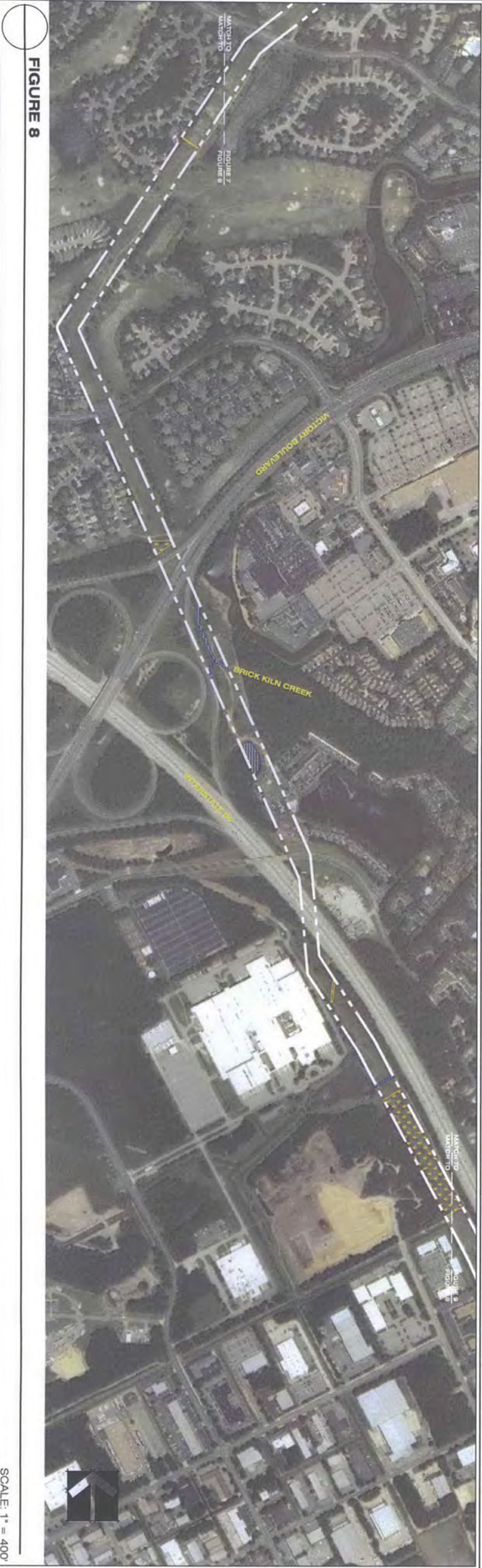
5209 Center Street  
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Richmond, Virginia 23225  
(804) 267-3474

150 Riverside Parkway, Suite 301  
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(540) 785-5544

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**LEGEND:**

	APPROXIMATE PRO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS

DATE: MAY 25, 2012  
JOB NUMBER: 4652  
SCALE: 1 INCH = 400 FEET  
SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS ANALYSIS MAP - SHEET 5 OF 7**  
**SKIFFES CREEK-WHEALTON PROPOSED 230KV LINE**  
**JAMES CITY COUNTY, YORK COUNTY, CITY OF NEWPORT NEWS & CITY OF HAMPTON, VIRGINIA**

**WILLIAMSBURG ENVIRONMENTAL GROUP, INC.**

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FIGURE 10

SCALE: 1" = 400'

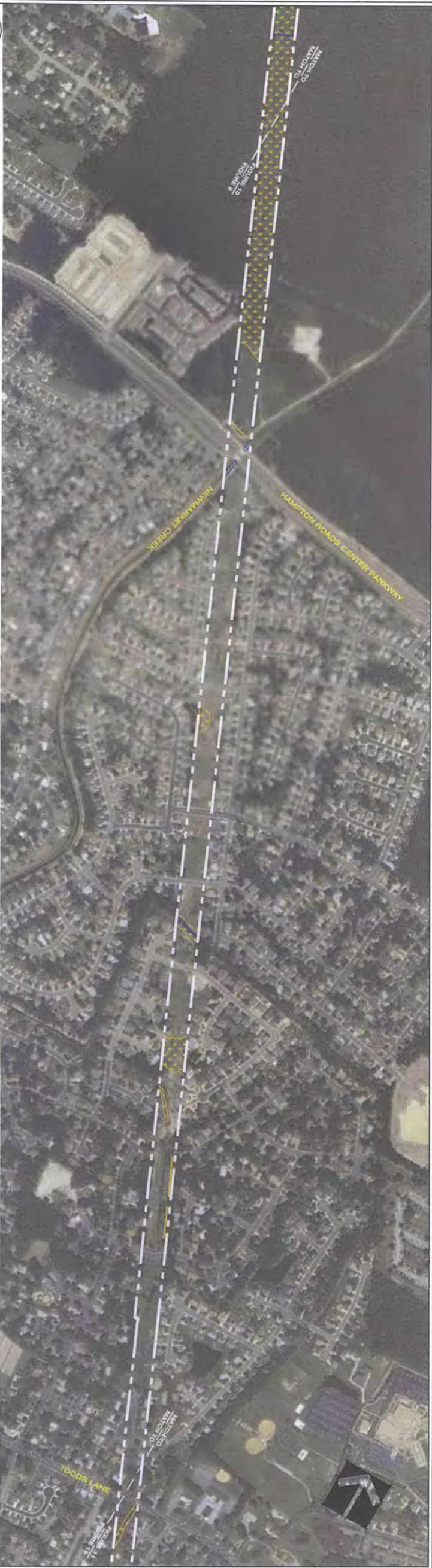


FIGURE 9

SCALE: 1" = 400'



LEGEND:

	APPROXIMATE PFO WETLAND LIMITS		APPROXIMATE OPEN WATER LIMITS
	APPROXIMATE PSS/PEM WETLAND LIMITS		APPROXIMATE TIDAL WETLAND LIMITS
	APPROXIMATE STREAM CHANNEL LIMITS		APPROXIMATE TIDAL STREAM CHANNEL LIMITS

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**OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - SHEET 6 OF 7  
SKIFFES CREEK-WHEALTON  
PROPOSED 230kV LINE**  
JAMES CITY COUNTY, YORK COUNTY, CITY OF  
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DATE: MAY 25, 2012

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SCALE: 1 INCH = 400 FEET

SOURCE: BASE MAP PROVIDED BY DOMINION POWER AND NATURAL RESOURCES GROUP, INC.

**OFFSITE WETLANDS & WATERS  
ANALYSIS MAP - SHEET 7 OF 7  
SKIFFES CREEK-WHEALTON  
PROPOSED 230kV LINE**  
JAMES CITY COUNTY, YORK COUNTY, CITY OF  
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