PJM Facilities Study Report

For

Network Upgrade N9151

Transition Cycle #1

June 2025

Introduction

This Facilities Study has been prepared in accordance with the PJM Open Access Transmission Tariff and PJM Manuals. The Transmission Owner (TO) is Virginia Electric and Power Company (VEPCO or Dominion).

A. Project Description

The System Impact Study for PJM Interconnection Transition Cycle #1 has identified the need for PJM Network Upgrade N9151. The scope of this Network Upgrade includes the following:

- Upgrade 0.76 Miles of 115kV transmission line 93 from Watkins Corner Substation to Southampton Substation

B. Transmission Owner Facilities Study Results

1. Detailed Scope of work for Network Upgrade N9151:

The following is a detailed description of Transmission Owner Upgrades for Network Upgrade N9151. These facilities shall be designed according to the Transmission Owner's Applicable Technical Requirements and Standards. Once built the Transmission Owner will own, operate, and maintain these facilities.

See Preliminary Scoping Summaries located in the Appendices, Attachment #1, #2 and #3.

2. MILESTONE SCHEDULE FOR COMPLETION OF DOMINION WORK

Facilities outlined in this report are estimated to take 42 months to construct, from the time of full execution of the Generation Interconnection Agreement and completion of a construction kickoff call. This schedule may be impacted by the timeline for procurement and installation of long lead items and the ability to obtain outages to construct and test the proposed facilities.

Description	Start month	Finish month
Engineering	1	30
Permitting/Procurement	3	38
Construction	36	42

3. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

- The preliminary construction schedule is dependent on outage availability.
- See Attachment 1 and 2– Preliminary Scoping Summary – Substation for additional assumptions
- See Attachment 3 – Preliminary Scoping Summary – Transmission line for additional assumptions

4. LAND REQUIREMENTS

Dominion will be responsible for the following expectations in the area of Real Estate:

- Any additional land needed for Storm Water Management, Landscaping, and Wetlands/Wetlands Mitigation.
- Any other Land/Permitting requirements required by the Network Upgrade

5. ENVIRONMENTAL AND PERMITING

Dominion will be responsible for the following expectations in the area of Environmental and Permitting:

- Assessment of environmental impacts related to the Network Upgrade including:
    - Environmental Impact Study requirements
    - Environmental Permitting
- A stormwater easement and/or specific stormwater design BMP's to allow access to and use of the facilities, including a maintenance agreement for said stormwater facilities.
- Conditional Use Permit for Substation
- Any additional land needed for Storm Water Management, Landscaping, and Wetlands/Wetlands Mitigation
- Any other Permitting requirements required by the Network Upgrade

C. APPENDICES

Attachment #1: Preliminary Scoping Summary – Substation Southampton

Attachment #2: Preliminary Scoping Summary – Substation Watkins Corner

Attachment #3: Preliminary Scoping Summary – Transmission

Project Number: N9151 – Southampton Substation

Project Description: Replace Line Lead for Line 93

SUBSTATION SCOPE OF WORK

Date: 06/20/2025

Revision Number: 0

Project Summary

Network upgrade N9151 provides for the uprate of line 93 at Southampton Substation in Southampton County, Virginia.

Purchase and install substation material – Network Upgrade:

1. Conductors, connectors, and grounding materials as per engineering standards

Purchase and install relay material – Network Upgrade:

1. One (1), 1340 – 24” dual SEL-411L DCB/PLC line panel

Remove relay material – Network Upgrade:

1. Remove Panel No. 5

Attachment #2

Project Number: N9151 – Watkins Corner

Project Description: Replace Line Lead for Line 93

SUBSTATION SCOPE OF WORK

Date: 06/20/2025

Revision Number: 0

Project Summary

Network upgrade N9151 provides for the uprate of line 93 at Watkins Corner Substation in Southampton County, Virginia.

Purchase and install substation material – Network Upgrade:

1. Conductors, connectors, and grounding materials as per engineering standards

Attachment #3

115 kV LINE #93

Watkins Corner – Southampton

PROJECT N9151

PRELIMINARY SCOPING SUMMARY

This project serves to rebuild 115 kV Line 93 from Watkins Corner Substation to Southampton Substation for approximately 0.76 miles, which is located in Southampton County, VA. See **Figure 1** for the project location. The proposed work requires no additional land and will all be completed within the existing 100' right of way. The project will install a total of four (4) new structures. This project will require a CPCN filing due to the structure replacements.

The portion of the existing line included in this scope consists primarily of 115 kV single circuit weathering steel lattice towers built in 1980. The proposed structures to be installed are 115 kV single circuit steel monopole structures. The existing twin bundled (2) 545.6 ACAR (15/7) conductor will be replaced with single (1) 768.2 ACSS/TW/HS (20/7) "Maumee" conductor. The existing two (2) 3#6 Alumoweld shield wire will be replaced with two (2) DNO-11410 OPGW.

Design Considerations:

EXISTING FACILITIES TO BE REMOVED:

1. Remove four (4) existing 115 kV single circuit weathering steel lattice towers as follows:
    a. Structures 93/34-37

2. Remove approximately 0.76 miles of twin bundled (2) 545.6 ACAR (15/7) conductor from existing backbone structure 93/33A to existing backbone structure 93/38 (140/37).

3. Remove approximately 0.76 miles of two (2) 3#6 Alumoweld shield wire from existing backbone structure 93/33A to existing backbone structure 93/38 (140/37).

EXISTING FACILITIES TO BE MODIFIED:

1. Remove and replace three (3) over-insulated 115kV conductor strain crossing assemblies [Reference Drawing 31.340] per structure on each of the following two (2) structures:
    a. Backbone structures 93/33A and 93/38 (140/37)
2. Remove and replace two (2) shield wire strain assemblies with OPGW strain assemblies [Reference Drawing 96.061], and two (2) shield wire safety catches with OPGW safety catch assemblies [Reference Drawing 96.100] per structure on each of the following two (2) structures:
    a. Backbone structures 93/33A and 93/38 (140/37)

PERMANENT FACILITIES TO BE INSTALLED:

1. Install four (4) 115 kV engineered steel single circuit suspension monopole structures [Reference Drawing 11.422] on foundations as follows:
    a. Structures 93/34-37
    b. See **Figure 2** for a visual of the proposed structure design.

2. Install approximately 0.76 miles of 3-phase single (1) 768.2 ACSS/TW/HS (20/7) “Maumee” conductor from existing backbone structure 93/33A to existing backbone structure 93/38 (140/37).

3. Install approximately 0.76 miles of two (2) DNO-11410 OPGW from existing backbone structure 93/33A to existing backbone structure 93/38 (140/37).
    a. This includes the installation of four (4) splices [Reference Drawing 96.601] as follows:
        i. Two (2), one on each leg, on existing backbone structure 93/33A
        ii. Two (2), one on each leg, on existing backbone structure 93/38 (140/37)

CONCEPTUAL SCOPE NOTES:

1. The portion of the existing line included in this scope consists primarily of single circuit weathering steel lattice towers installed in 1980. These structures are considered insufficient for the proposed conductor, resulting in the need for the line to be rebuilt. No PLS-CADD modeling was done for this project. Structures were replaced like for like and estimated using typical transmission right of way characteristics.

2. Structures are designed based off the following NESC code parameters: NESC Heavy, 90 mph wind, ¾” Ice & 30 mph wind regardless of project location.

3. It is assumed for detailed engineering that a LiDAR survey will be required.

4. Any potential height restrictions were not accounted for in this design.

5. An existing right of way width of 100’ is assumed, based on existing plan and profiles from Dominion Energy Virginia. No additional ROW is needed.

6. A wetland delineation has not been completed as part of this conceptual package.

7. Wire reel lengths were not accounted for this line design. The assumed pull pad locations to avoid tension splices will be determined during detailed design.

8. This project assumes that the spans and risers at Watkins Corner Substation and Southampton Substation will be replaced. Coordination will be required during detailed design.

CONCEPTUAL ESTIMATE NOTES:

1. Engineered steel pole costs were determined based off typical wind and weight spans, line angles, and average structure heights in the typical right of way associated with the structure type.

2. Steel pole foundation costs were based off the projects' location and structure type in the regional soil profile map. The regional soil profile map used for this project is Coastal Plains West.

3. The conceptual estimate assumes that a laydown yard is required for this project.

4. Prior to detailed engineering, a full land rights review would be required. A desktop review was completed to estimate the project costs.

5. Access estimate cost inputs include the following assumptions:
    a. Work pad totals based on provided SOW and assumptions from kmz file. Assume 15 mats for tangents and 30 mats for angles at each work pad for reconductor work and 50 mats per pull pad.
    b. DDE structures assumed based off of wire reel lengths - based off of pull pad locations.
    c. Pull pad locations based on location of major road/water crossings and line mileage.
    d. Assuming that existing stone in Substations will be used for access per SOW and that access is existing or will be built by others before the start of construction. Assumes that the substations will be constructed with access roads built to and from Substations and work from inside the substations for Backbone installation.
    e. Assumes no delays due to permitting or real estate issues after work begins. Assume no schedule compressions from SOC/PJM.
    f. Assumes all clearing and forestry costs have been captured by others. No access costs for forestry activities included in this pricing.
    g. Stream crossing based on estimates from aerial imagery.
    h. Assumes that all existing roads may be dressed with stone that can remain at the end of the project. Assumes existing two track roads in many locations will be impermeable. No costs for stone road removal are included.

Figure 1 – Project Location

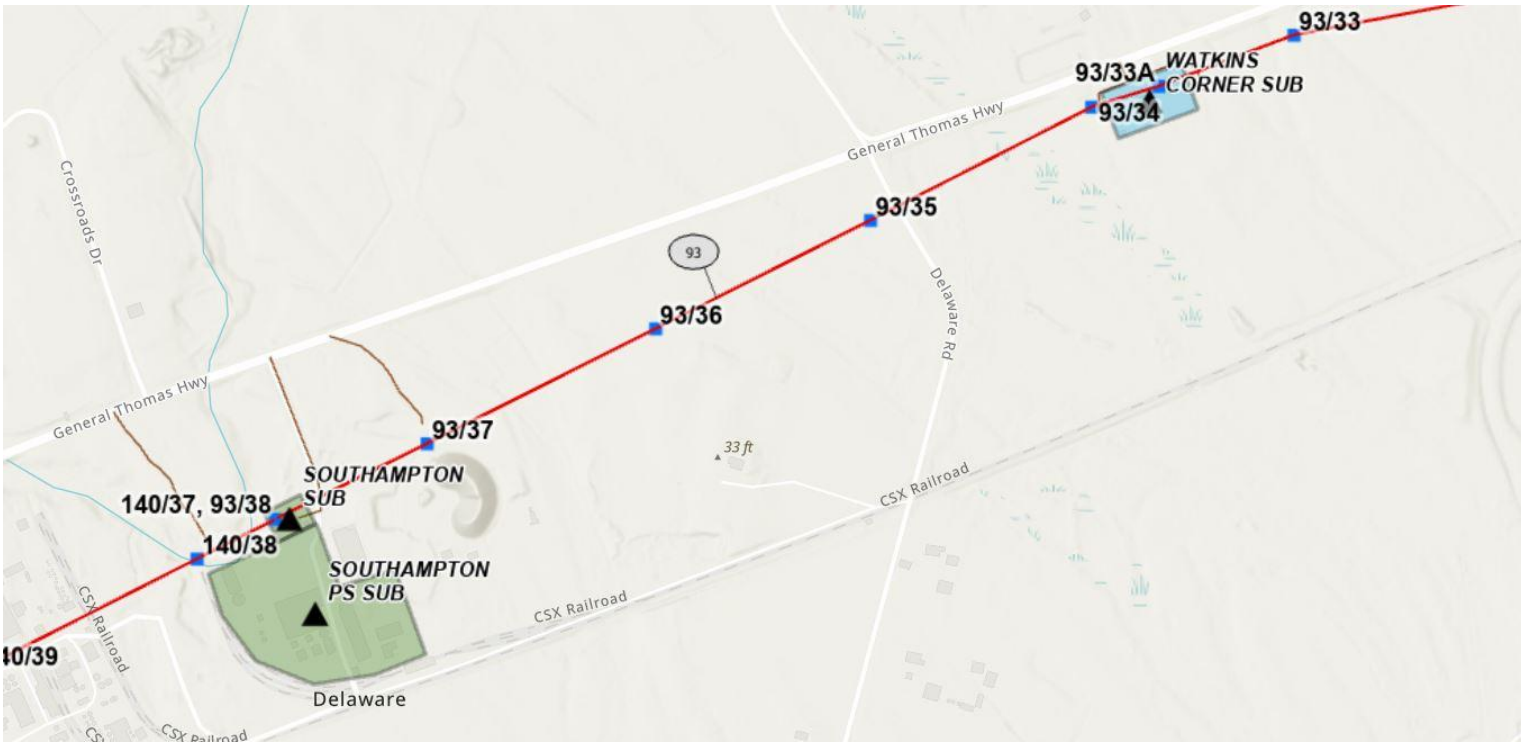
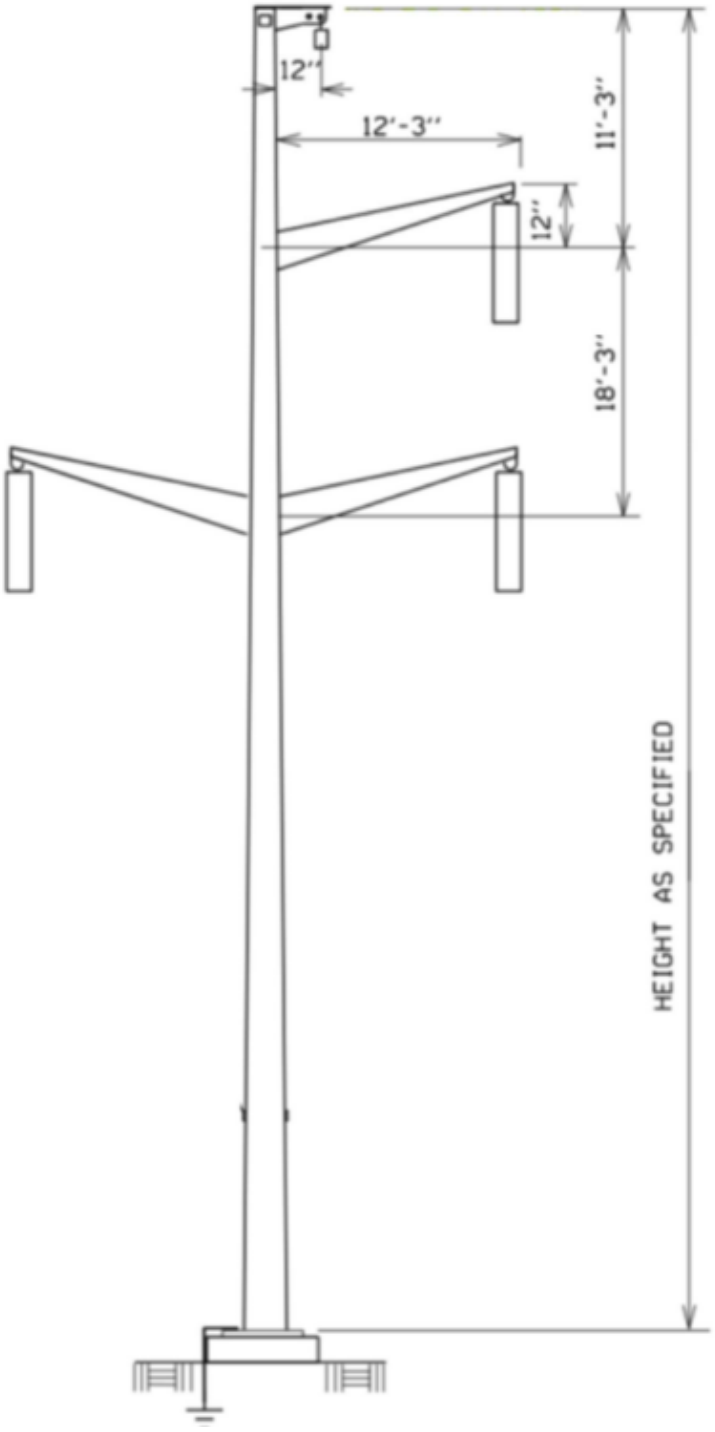


Figure 2 – Proposed Structure Configuration



Required Material Summary

Item	Qty
Engineered Structures	4
12,000-Ft OPGW Reels	1
12,000-Ft Conductor Reels	2