

**Affected Transmission Owner Study Report**  
**For**  
**PJM Generation Interconnection Request**  
**Project ID AG2-086**

**“Mt. Jackson DP-Mt. Jackson 115 kV”**

## **Introduction**

This Affected Transmission Owner Study has been prepared in accordance with the PJM Open Access Transmission Tariff, as well as the Application and Studies Agreement between the Project Developer and PJM Interconnection, LLC (PJM or Transmission Provider (TP)). The Transmission Owner (TO) is Virginia Electric and Power Company d/b/a Dominion Energy Virginia (Dominion).

This Affected Transmission Owner Study was performed to satisfy the Phase 2 Facility Study requirement of the PJM Tariff. The Facility Study is intended to provide scope, cost and schedule estimates for the project as currently defined and approved for Phase 2 study. In the event project changes are made during DP2 that impact this report, updates will be provided as part of the Phase 3 report. Following execution of the project's final agreement, this report will not be updated to account for other changes made as part of the agreements modification clause and instead the scope change process will be followed.

## **A. Affected Transmission Owner Study Summary**

### **1. PROJECT DESCRIPTION**

The Project Developer (PD) has proposed a Solar Generating and Battery Storage Facility located in, Shenandoah County, Virginia with a designated PJM Project ID of AG2-086. The installed facilities will have a total Maximum Facility Output (MFO) of 75 MW with 45 MW of this output being recognized by PJM as Capacity.

The proposed generation interconnection is shown on the single line diagram in Attachment #1.

## **B. Affected Transmission Owner Study Results**

The following is a description of the planned Transmission Owner facilities for the interconnection of the proposed AG2-086 project. These facilities shall be designed according to all Dominion Applicable Technical Requirements and Standards in effect March 20<sup>th</sup>, 2026. Dominion Energy Virginia – Electric Transmission Facility Interconnection Requirements, Procedure Version 25.0, dated October 1, 2025, shall apply. Once built, Dominion will own, operate, and maintain these Facilities.

### **1. NETWORK UPGRADES**

#### **Mt Jackson Substation:**

An additional breaker will be installed at Mt Jackson Substation.

The proposed Three Breaker Ring scope is shown in Attachment #4 and Attachment #5.

**Three Breaker Ring at Mt Jackson Tap:**

The 115kV transmission line will be cut and looped into a new substation at the Mt Jackson Tap.

The proposed Three Breaker Ring scope is shown in Attachment #6 and Attachment #7.

**Upgrades to neighboring facilities:****Endless Caverns Substation**

The proposed neighboring facility scope is detailed in Attachment #8.

**Edinburg Substation**

The proposed neighboring facility scope is detailed in Attachment #9.

**2. MILESTONE SCHEDULE FOR COMPLETION OF [TO] WORK**

Facilities outlined in this report are estimated to take 36 months to construct, from the time the Generation Interconnection Agreement is fully executed. This schedule may be impacted by the timeline for procurement and installation of long lead items, the ability to obtain outages to construct and test the proposed facilities.

| Description            | Start<br>month | Finish<br>month |
|------------------------|----------------|-----------------|
| Detailed Design        | 1              | 10              |
| Permitting/Procurement | 2              | 26              |
| Construction           | 18             | 36              |

### **3. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE**

Assumptions can be found in Attachments #4-9.

### **8. LAND REQUIREMENTS FOR INTERCONNECTION SUBSTATION**

Land requirements for the Interconnection Substation needed for this interconnection project must meet the requirements in Dominion's Facility Interconnection Requirements and NERC Compliance Procedure FAC-001 posted on PJM's website.

Dominion would be responsible for the following expectations in the area of Real Estate.

- The land required for Dominion's substation and project specific areas around must be deeded over title-in-fee.
- Any additional land needed for Storm Water Management, Landscaping, and Wetlands/Wetlands Mitigation.
- Dominion Real Estate and Counsel will provide standard real estate checklist word document. Process needs to start at least 6 months prior to closing date.
- Required subdivision plat and associated documentation to be reviewed prior to subdividing parcel with the county.
- Suitable Access Road from Substation to a Virginia/North Carolina State Maintained Roadway.
- Dominion will require access road, transmission line and utilities easement to the Substation.
- Any other Land/Permitting requirements required by the Substation.

### **9. APPLICABLE TECHNICAL REQUIREMENTS AND STANDARDS**

These facilities shall be designed according to all Dominion Applicable Technical Requirements and Standards in effect March 20th, 2026. Dominion Energy Virginia – Electric Transmission Facility Interconnection Requirements, Procedure Version 25.0, dated October 1, 2025, shall apply.

## 10. ENVIRONMENTAL AND PERMITTING

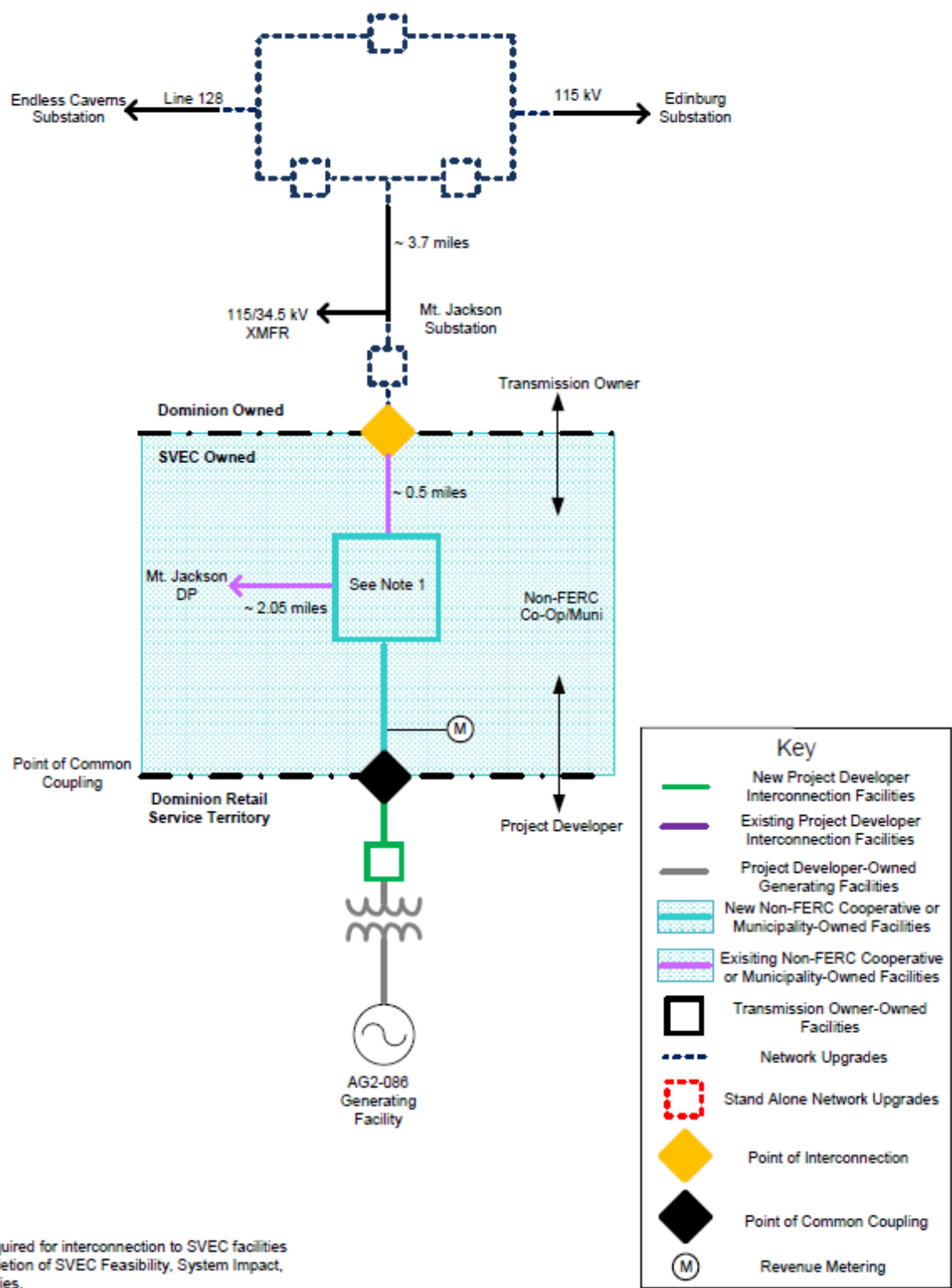
The Dominion would be responsible for the following expectations in the area of Environmental and Permitting.

- Assessment of environmental impacts related to the Interconnection Facility and/or Network Upgrades including:
  - Environmental Impact Study requirements
  - Environmental Permitting
- Dominion will require a stormwater easement for substation specific stormwater design BMP's to allow access to and use of the facilities.
  - A maintenance agreement should be in place in perpetuity 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 Substation

## **C. APPENDICES**

|                |                                                                                      |
|----------------|--------------------------------------------------------------------------------------|
| Attachment #1: | Single line Diagram for the Network Upgrades                                         |
| Attachment #2: | Substation General Arrangement – Mt Jackson Tap Three-Breaker Ring                   |
| Attachment #3: | Substation General Arrangement – Mt Jackson Substation                               |
| Attachment #4: | Network Upgrade – Mt Jackson Substation                                              |
| Attachment #5: | Network Upgrade – Transmission Tie-in at Mt Jackson Substation                       |
| Attachment #6: | Network Upgrade – Three-Breaker Ring at Mt Jackson Tap                               |
| Attachment #7: | Network Upgrade – Transmission Tie-in Scope for Three-Breaker Ring at Mt Jackson Tap |
| Attachment #8: | Network Upgrade – Endless Caverns Substation                                         |
| Attachment #9: | Network Upgrade – Edinburg Substation                                                |

Attachment #1: Single line Diagram for the Network Upgrade



Note 1: Details required for interconnection to SVEC facilities are pending completion of SVEC Feasibility, System Impact, and Facilities Studies.

[illegible]

PRELIMINARY NOT FOR CONSTRUCTION

## **Project Summary**

Project number AG2-086 provides for the initial construction of a new 115kV interconnect line into the existing Mt. Jackson Station in Shenandoah County, Virginia.

The objective of this project is to add one new 115kV breaker to be installed at Mt. Jackson Station to an existing SVEC transmission line structure.

### **Purchase and install substation material – Network Upgrade:**

1. One (1), 115kV, 3000A, 40kAIC, SF-6 circuit breaker
2. Two (2), 115kV, 2000A, 3-phase center break gang operated switch
3. Three (3), 115kV, relay accuracy CCVT
4. Three (3), 90kV, 74kV MCOV surge arrester
5. One (1), 115kV, 2000A wave trap
6. Station stone as required
7. Station lighting as required
8. Steel structures as required including switch stands, bus supports, CCVT and wave trap supports
9. Foundations as required including equipment and bus support stands
10. Conductors, connectors, conduits, control cables, cable trough, and grounding materials as per engineering standards

### **Remove substation material – Network Upgrade:**

1. Two (2), 115kV, 800A wave trap
2. One (1), 115kV, 1200A disconnect switch
3. One (1), 115kV, CCVT
4. Steel structures as required including CCVT and wave trap supports
5. Foundations as required including equipment and bus support stands
6. Conductors, connectors, conduits, control cables, and grounding materials as per engineering standards

### **Purchase and install relay material – Network Upgrade:**

1. One (1), 1341 – 24” dual SEL-411L DCB/PLC straight bus line panel
2. One (1), 4510 – SEL-2411 breaker annunciator
3. One (1), 4526\_A – circuit breaker fiber optic make-up box
4. One (1), 4506 – 3-phase CCVT potential make-up box

### **Preliminary Scoping Summary**

This project serves to replace an existing backbone structure with a new 115 kV backbone structure in the existing Mount Jackson Substation, which is located in Shenandoah County, VA. Line 128 is being renumbered to 1XX2 between Mount Jackson Substation and Mount Jackson DP Substation. See **Figure 1** for the project location.

The proposed structure to be installed is one (1) 115 kV single circuit steel backbone. The new conductor will be single (1) 768 ACSS/TW (20/7) “Maumee” conductor and two (2) DNO-11410 OPGW.

|                                             |                              |
|---------------------------------------------|------------------------------|
| Length of Route                             | <b>0.03 miles</b>            |
| Location of the subject line (County/State) | <b>Shenandoah County, VA</b> |
| Total Number of Permanent Structures        | <b>1</b>                     |
| Total Number of Temporary Structures        | <b>0</b>                     |
| CPCN/SCC Required?                          | <b>No</b>                    |
| New ROW Required?                           | <b>No</b>                    |

This project will utilize current Dominion 115 kV standards. The conceptual estimate includes cost for the following:

### **Transmission Owner Build - Existing Facilities to be Removed**

#### **Structures**

| <b>Structure Type</b>               | <b>Dwg Number</b> | <b>Str. Qty.</b> |
|-------------------------------------|-------------------|------------------|
| 115 kV SC Steel A-frame<br>Backbone | -                 | 1                |

Wire: Mileage listed is per circuit.

| <b>Length<br/>(Miles)</b> | <b>Circuit</b> | <b># if Bundled-Wire Type "Name"</b> | <b>Start-End</b>                                                          |
|---------------------------|----------------|--------------------------------------|---------------------------------------------------------------------------|
| 0.03                      | 1              | Single (1) 636 ACSR (24/7) Conductor | Proposed SVEC Backbone<br>Structure – Existing SVEC<br>Monopole Structure |

### **Transmission Owner Build - Permanent Facilities to be Installed**

Structure: New structure will be galvanized steel.

| <b>Structure Type</b>              | <b>Dwg Number</b> | <b>Str. Qty.</b> |
|------------------------------------|-------------------|------------------|
| 115 kV SC Steel Backbone Structure | 11.955            | 1                |

Wire:

1. Mileage listed is per circuit
2. Conductor includes dampers. Static and Fiber includes dampers and splices.
  - Estimate includes approximately four (4) fiber splices

| Length<br>(Miles) | Circuit | # if Bundled-Wire Type "Name"                         | Start-End                                                                 |
|-------------------|---------|-------------------------------------------------------|---------------------------------------------------------------------------|
| 0.03              | 1       | Single (1) 768.2 ACSS/TW (20/7)<br>"Maumee" Conductor | Proposed SVEC Backbone<br>Structure – Existing SVEC<br>Monopole Structure |
| 0.03              | 2       | DNO-11410 OPGW                                        | Proposed SVEC Backbone<br>Structure – Existing SVEC<br>Monopole Structure |

### **Transmission Owner Build - Existing Facilities to be Modified**

1. Install three (3) new conductor crossing deadend assemblies [Reference Drawing 31.340] on one (1) existing SVEC Structure.
2. Install two (2) new OPGW deadend assemblies [Reference Drawing 96.060] on one (1) existing SVEC Structure.
3. Install two (2) new OPGW safety catch assemblies [Reference Drawing 96.210] on one (1) existing SVEC Structure.

### **Scope Notes/Assumptions**

1. Due to allocated amount of time, no PLS-CADD modeling was done for this project, which results in higher level scopes. Projects in the Transition Cycle 2 – Phase 2 will need to go through full conceptual engineering design prior reaching detailed engineering.
2. It is assumed that the existing SVEC monopole structure can be re-used as part of this project. More information will need to be obtained on this structure during detailed design to confirm that it does not need to be replaced.
3. This project does require acquisition of a laydown yard.

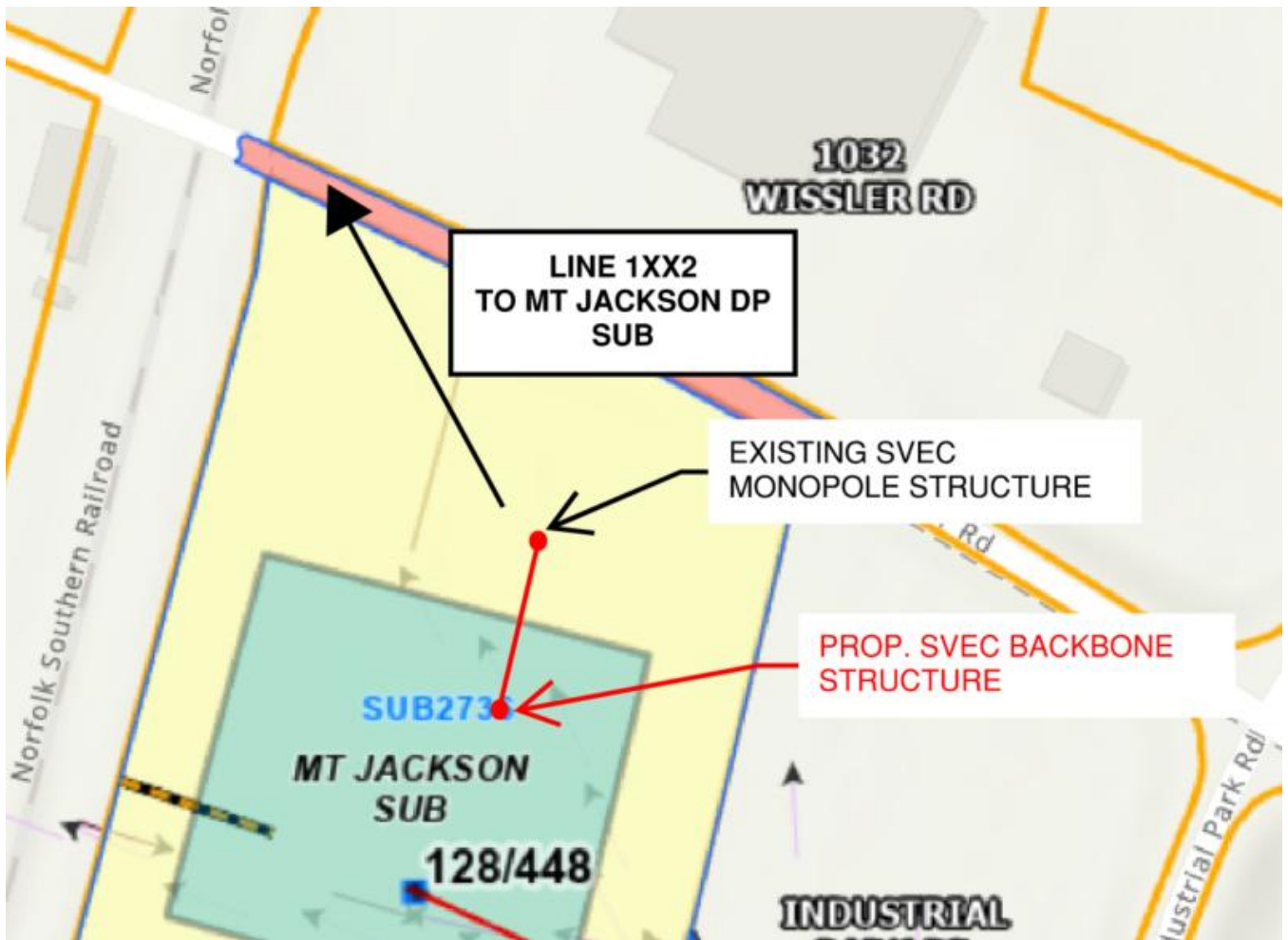
4. Project area code required loading include: NESC Heavy, 95 mph wind,  $\frac{3}{4}$ " Ice & 30 mph wind.
5. For detailed engineering, it is assumed LiDAR survey is required, including ROW file.
6. Crossing insulators will be used whenever crossing over substation fence.
7. The transmission team has identified 0 encroachments within the project area based off the .kmz and DEV MapViewer
8. A wetland delineation has not been completed as part of this conceptual package.
9. A substation general arrangement was provided by the conceptual substation engineering team. See **Figure 2** for the Mount Jackson Substation general arrangement used for this project.
10. The assumed reel lengths for this project are 12,000 feet.
11. Cross slopes are not accounted for in this conceptual design. Structures designed assuming a 1.5' foundation reveal at the center of the structure.
12. This project scope assumes that it is independent from other projects in the Transition Cycle. The following projects may impact the project scope if this assumption is incorrect.
  - a. AG2-086 (3B) – Line 128 Substation Cut-In near Mount Jackson Tap

### **Estimate Notes/Assumptions**

1. This scope and estimate for project AG2-086 refers to the "transmission-owner-to-build" execution approach. The transmission owner estimate includes the engineering, project management, and construction costs for the transmission assets on this project.
  - a. One (1) estimate has been provided for this scope.
    - i. Transmission Owner Build (TO)

2. Engineered steel pole costs were determined based off typical wind and weight spans, line angles, and average structure heights for each voltage. These inputs were used to derive an estimated steel pole weight, which was used to develop the structure costs. This was determined for the high-level estimate projects for Dominion Generation Interconnection Projects.
3. Engineered 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 Shenandoah Valley.
4. Survey cost were determined based on substation proposed location, fiber installation, and impacts on existing line.
5. It should be determined in detailed engineering if 115 kV over-insulated conductor assemblies are required for this project. For this estimate, over-insulated conductor assemblies were utilized.
6. Transition Cycle 2 - Phase 2 estimates utilize Dominion 2025 labor and material adjustment rates.

**Figure 1 – Project Location**



## Project Summary

Project number AG2-086 provides for the initial construction of a new 115kV three breaker ring switching station between transmission structures 128/74 and 128/75 in Brunswick County, VA.

The objective of this project is to build a 115 kV three breaker ring bus to support AG2-086 single breaker addition at the existing Mt. Jackson Tap. The site is located along Virginia Electric and Power Company d/b/a Dominion Energy Virginia (Dominion) existing 115 kV, 128 line from Endless Caverns Substation, Mt. Jackson Substation and Edinburg Substation. This project serves as a network upgrade for the AG2-086 single breaker addition supporting a solar facility developed by Project Developer. Dominion will be responsible for land acquisition, permitting, site preparation, and grading activities.

Transmission line engineering is to renumber the existing line segment between the new 115kV three breaker ring switching station and Mt Jackson Substation as well as between the new station and Endless Caverns Substation. The existing line segment between the new 115kV three breaker ring switching station and Edinburg Caverns Substation shall remain line 128.

Additional work to be required at Edinburg Substation, Endless Caverns Substation and Mt Jackson Substation.

Security and fence type – design level 4.

### **Assumption:**

Currently, the scope and estimate assume Dominion standard spread footer foundations. Once the soil information is available and it is prudent to change the design to “helical pile foundations” the Dominion team should be informed to adjust the project estimate at the earliest possible opportunity.

### **Purchase and install substation material – Network Upgrade:**

1. Approximate station fence line dimensions of 285' x 270'. At a minimum, site preparation and grading will be required to extend 15' beyond these dimensions for station grounding. Additional property and site prep may be required for proper grading and stormwater management, etc.
2. Approximately 1,050 linear ft of 5/8" chain link, 12 ft tall, perimeter fence around the station along with the security cameras and integrators as per design 4 fence standards
3. Three (3), 115kV, 3000A, 40kAIC, SF-6 circuit breaker
4. Six (6), 115kV, 2000A, 3-phase center break gang operated switch
5. Nine (9), 115kV, relay accuracy CCVT
6. Two (2), 115kV, 2000A wave trap
7. Two (2) line turner

8. Nine (9), 90kV, 74kV MCOV surge arrester
9. Two (2), 115kV, 2000A, 2-phase center break switch (for PVT's)
10. Two (2), 115kV, 100KVA power PT's for station service
11. Two (2), 115kV, 10 in-lb., 125VDC motor operator
12. Two (2), 115kV, heavy duty steel backbone (by Transmission)
13. Four (4), shield wire poles and four spans of shield wire (by Transmission)
14. One (1), 24' x 40' control enclosure
15. One (1), 125 VDC, 300 Ah station battery and 50 Amp charger (size to be verified during detail engineering)
16. Approximately 164 ft of cable trough
17. Two (2), 38" x 38" x 42" precast yard pull box
18. Station stone as required
19. Station lighting as required
20. Steel structures as required include switch stands, bus supports, station service transformers, CCVT and wave trap supports
21. Foundations as required including control house, equipment, and bus support stands
22. Conductors, connectors, conduits, control cables, cable trough, and grounding materials as per engineering standards

**Purchase and install relay material – Network Upgrade:**

1. Three (3), 1510 - 24" dual SEL-351-7 transmission breaker with reclosing panel
2. Three (3), 4510 - SEL-2411 breaker annunciator
3. Two (2), 1340 - 24" dual SEL-411L DCB/PLC line panel
4. One (1), 1340 - 24" dual SEL-411L CD/Fiber line panel
5. Three (3), 4506 - 3-phase CCVT potential make-up box
6. One (1), 1603 - 24" SEL-451 islanding control scheme panel
7. Two (2), 4000 - station service potential make-up box
8. Two (2), 4548 - non-earthing switch MOAB control box
9. One (1), 4103 - non-earthing switch MOAB AC/DC distribution box
10. Two (2), 4018 - 500A station service AC distribution panel
11. Two (2), 4007 - 225A outdoor transmission yard AC NQOD
12. Two (2), 4019 - 225A 3-phase throw over switch
13. Two (2), 4016 - 600A PVT disconnect switch
14. One (1), 4153c - wall mount station battery monitor
15. One (1), 5618 - SEL-3555 communications panel
16. One (1), 1255 - station annunciator panel
17. One (1), 5021 - SEL-2411 RTU panel
18. One (1), 5609 - fiber optic management panel
19. Three (3), 4526\_A - circuit breaker fiber optic make-up box
20. One (1), 5202 - 26" APP 601 digital fault recorder
21. Six (6), 4040 - security fiber/power make-up box
22. One (1), 5603 - station network panel no. 1
23. One (1), 5603 - station network panel no. 2
24. One (1), 4051 - power block
25. One (1), 4042\_D1B - security utility - utility ATS
26. One (1), 4044 - 225A 1Ø outdoor main security AC NQOD
27. Two (2), 4040 - 100A 1Ø outdoor security AC NQOD
28. One (1), 5616 - station security panel
29. One (1), 5616 - station security fence panel
30. Two (2), 4018 - 225A station service AC distribution panel branch breaker
31. One (1), high voltage protection (HVP) box (provided by IT) (to be verified during detail engineering)
32. One (1), telephone interface box (to be verified during detail engineering)

### **Preliminary Scoping Summary**

This project serves to cut in 115 kV line 128 into a new substation called AG2-086, which is to be located in Shenandoah County, VA. The line is to be cut-in between existing structures 128/75 and 128/76. Line 128 is being renumbered to 1XXX between Endless Caverns Substation and AG2-086 Substation. Additionally, the existing tap line to Mount Jackson Substation will be re-routed and terminated inside AG2-086 Substation. Line 128 is being renumbered to 1XX1 between AG2-086 Substation and Mount Jackson Substation. See **Figure 1** for the project location.

The proposed structures to be installed are two (2) 115 kV single circuit engineered steel double deadend H-frame structures, two (2) 115 kV single circuit steel backbones, two (2) 115 kV single circuit engineered steel double deadend 3-poles, and four (4) steel static poles. The new conductor and shield wire to be used will be single (1) 768.2 ACSS/TW (20/7) "Maumee" conductor and two (2) DNO-11410 OPGW. 7#7 Alumoweld will be utilized for shielding within AG2-086 Substation.

|                                             |                              |
|---------------------------------------------|------------------------------|
| Length of Route                             | <b>0.26 miles</b>            |
| Location of the subject line (County/State) | <b>Shenandoah County, VA</b> |
| Total Number of Permanent Structures        | <b>10</b>                    |
| Total Number of Temporary Structures        | <b>0</b>                     |
| CPCN/SCC Required?                          | <b>No</b>                    |
| New ROW Required?                           | <b>Yes</b>                   |

New ROW Required:

| <b>ROW Length</b>          | <b>ROW Width</b> |
|----------------------------|------------------|
| 0.06 Miles (See Note<br>1) | 20 ft.           |
| 0.10 Miles (See Note<br>2) | 20 ft.           |
| 0.10 Miles (See Note<br>3) | 40 ft.           |
| 0.18 Miles (See Note<br>4) | 120 ft.          |

**Notes:**

1. Additional ROW to be acquired will be from existing structure 128/74 (renumbered to 1XXX/74) to the AG2-086 Substation fence.
2. Additional ROW to be acquired will be from existing structure 128/77 to the AG2-086 Substation fence.
3. Additional ROW to be acquired will be from existing structure 128/404 (renumbered to 1XX1/404) to proposed structure 1XX1/403.
4. Additional ROW to be acquired will be from proposed structure 1XX1/403 to the AG2-086 Substation fence.

**Transmission Owner Build - Existing Facilities to be Removed**

Structures: 128/75, 128/76, 128/400, 128/401, 128/402 & 128/403 to be removed.

| <b>Structure Type</b>          | <b>Dwg<br/>Number</b> | <b>Str.<br/>Qty.</b> |
|--------------------------------|-----------------------|----------------------|
| 115 kV SC Steel DDE 3-<br>Pole | 1280100209            | 1                    |

|                                               |            |   |
|-----------------------------------------------|------------|---|
| 115 kV SC Steel SUS H-frame                   | 1280100204 | 1 |
| 115 kV SC Steel DE 3-Pole                     | 11.645     | 1 |
| 115 kV SC Steel DDE H-frame                   | 11.610     | 1 |
| 115 kV SC Steel 2-Pole Self Supporting Switch | 11.830     | 1 |
| 115 kV SC Steel SUS H-frame                   | 11.600     | 1 |

Switches: 12826, 12827, 12829

Wire: Mileage listed is per circuit.

| <b>Length<br/>(Miles)</b> | <b>Circuit</b> | <b># if Bundled-Wire Type "Name"</b> | <b>Start-End</b>                                 |
|---------------------------|----------------|--------------------------------------|--------------------------------------------------|
| 0.09                      | 1              | Single (1) 636 ACSR (24/7)           | Existing Str. 128/400 –<br>Existing Str. 128/403 |
| 0.09                      | 1              | DNO-11410 OPGW                       | Existing Str. 128/400 –<br>Existing Str. 128/403 |
| 0.06                      | 1              | Twin bundled (2) 636 ACSR (24/7)     | Existing Str. 128/75 –<br>Existing Str. 128/76   |
| 0.06                      | 2              | 3#6 Alumoweld shield wire            | Existing Str. 128/75 –<br>Existing Str. 128/76   |

**Transmission Owner Build - Permanent Facilities to be Installed**

Structures: See attached spreadsheet for heights and loading information. The proposed structure finishes are to be weathering steel within the existing corridor based on existing structure finishes in the area. Otherwise, all structures will be galvanized steel.

| <b>Structure Type</b>              | <b>Dwg Number</b>             | <b>Str. Qty.</b> |
|------------------------------------|-------------------------------|------------------|
| 115 kV SC ENGR Steel DDE 3-Pole    | 12.158 – 115 kV Configuration | 2                |
| 115 kV SC ENGR Steel DDE H-frame   | 12.165 – 115 kV Configuration | 2                |
| 115 kV SC Steel Backbone Structure | 11.955                        | 2                |
| Steel Static Pole                  | 9.008                         | 4                |

Wire:

1. Mileage listed is per circuit
2. Conductor includes dampers. Static and Fiber includes dampers and splices.
  - Estimate includes approximately ten (10) fiber splices

| <b>Length (Miles)</b> | <b>Circuit</b> | <b># if Bundled-Wire Type “Name”</b>               | <b>Start-End</b>                            |
|-----------------------|----------------|----------------------------------------------------|---------------------------------------------|
| 0.03                  | 1              | Single (1) 768.2 ACSS/TW (20/7) “Maumee” Conductor | Proposed Str. 1XXX/75 – Proposed BB 1XXX/76 |
| 0.03                  | 1              | Single (1) 768.2 ACSS/TW (20/7) “Maumee” Conductor | Proposed BB 128/75 – Proposed Str. 128/76   |

|      |   |                                                       |                                                                         |
|------|---|-------------------------------------------------------|-------------------------------------------------------------------------|
| 0.03 | 2 | DNO-11410 OPGW                                        | Proposed Str. 1XXX/75 –<br>Proposed BB 1XXX/76                          |
| 0.03 | 2 | DNO-11410 OPGW                                        | Proposed BB 128/75 –<br>Proposed Str. 128/76                            |
| 0.20 | 1 | Single (1) 768.2 ACSS/TW (20/7)<br>“Maumee” Conductor | Proposed BB 1XX1/401 –<br>Proposed Str. 1XX1/403                        |
| 0.20 | 2 | DNO-11410 OPGW                                        | Proposed BB 1XX1/401 –<br>Proposed Str. 1XX1/403                        |
| 0.09 | 1 | 7#7 Alumoweld Shield Wire                             | Between proposed static<br>poles and backbones in<br>AG2-086 Substation |

### **Transmission Owner Build - Existing Facilities to be Transferred or Modified**

1. Cut and transfer the existing twin bundled (2) 636 ACSR (24/7) conductor for Line 1XXX from existing structure 1XXX/75 onto proposed structure 1XXX/75.
2. Cut and transfer the existing twin bundled (2) 636 ACSR (24/7) conductor for Line 128 from existing structure 128/76 onto proposed structure 128/76.
3. Cut and transfer the existing two (2) 3#6 Alumoweld shield wires for Line 1XXX from existing structure 1XXX/75 onto proposed structure 1XXX/75.
4. Cut and transfer the existing two (2) 3#6 Alumoweld shield wires for Line 128 from existing structure 128/76 onto proposed structure 128/76.
5. Cut and transfer the existing single (1) 636 ACSR (24/7) conductor for Line 1XX1 from existing structure 128/403 onto proposed structure 1XX1/403.
6. Cut and transfer the existing one (1) DNO-11410 OPGW for Line 1XX1 from existing structure 128/403 onto proposed structure 1XX1/403.

### **Scope Notes/Assumptions**

1. Due to allocated amount of time, no PLS-CADD modeling was done for this project, which results in higher level scopes. Projects in the Transition Cycle 2 – Phase 2 will need to go through full conceptual engineering design prior reaching detailed engineering.
2. It is assumed that existing structures 128/404 (renumbered to 1XX1/404) and 128/77 can also be re-used as part of this project. Switch attachments will be removed from existing structures 1XXX/73 and 1XXX/74. More information will need to be obtained on these structures during detailed design to confirm that they do not need to be replaced.
3. This project does require acquisition of a laydown yard.
4. The generalized structure heights for this project are 65 ft for proposed structures 1XXX/75 and 128/76 and 65/50/65 ft for proposed structures 1XX1/402 and 1XX1/403. This was determined for the high-level estimate projects for Dominion Generation Interconnection Projects.
5. All deadend engineered steel structures outside the substation (Structures 1XXX/75, 128/76 and 1XX1/402) will be designed for full-construction deadend loading for construction conditions.
6. Project area code required loading include: NESC Heavy, 95 mph wind, ¾" Ice & 30 mph wind.
7. For detailed engineering, it is assumed LiDAR survey is required, including ROW file.
8. Crossing insulators will be used whenever crossing over substation fence.
9. An existing right of way width of 100 ft and 80 ft is assumed based on existing DEV MapViewer. Additional right of way will be acquired for this project to accommodate the 115 kV Dominion ROW preferences.
10. The transmission team has identified 0 encroachments within the project area based off the .kmz and DEV MapViewer.
11. A wetland delineation has not been completed as part of this conceptual package.
12. A substation general arrangement was provided by the conceptual substation engineering team. See **Figure 2** for the general arrangement used for this project.

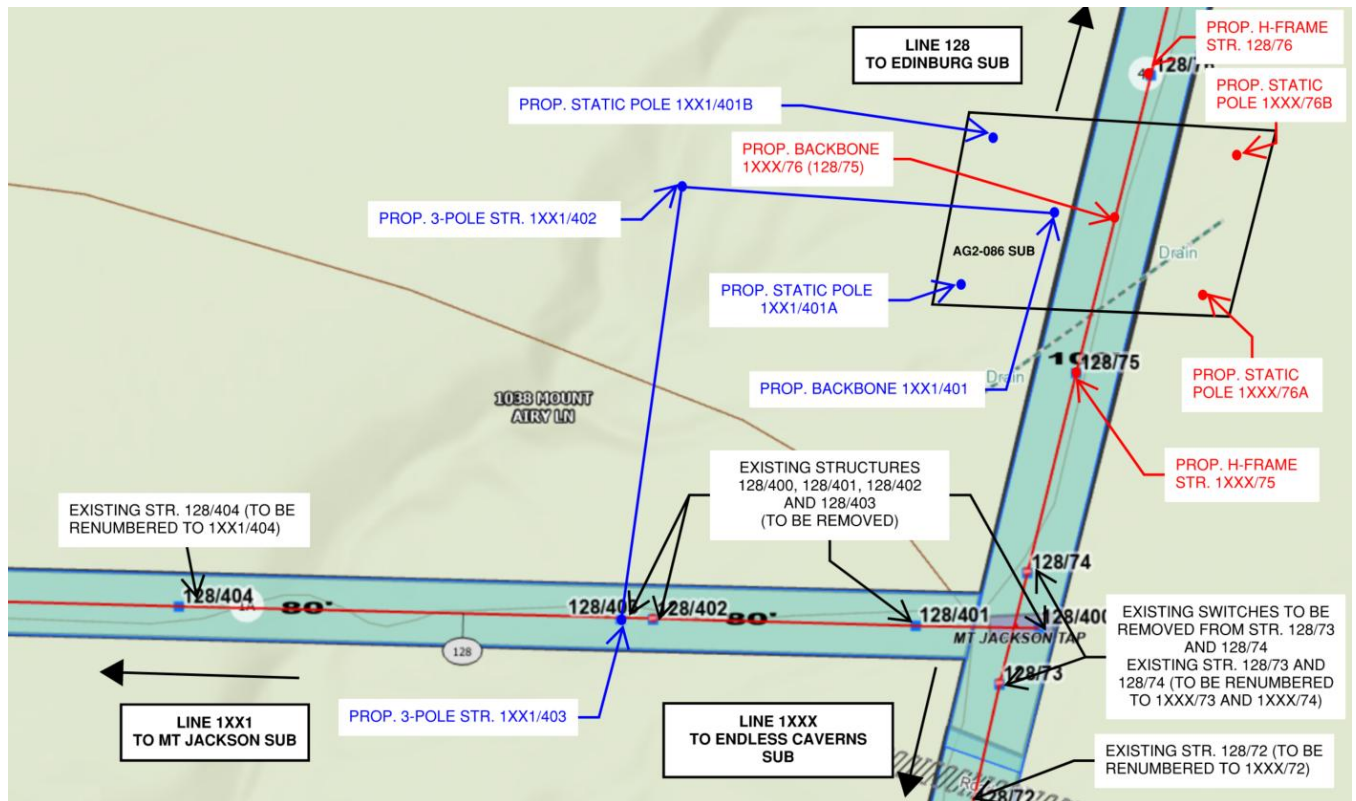
13. The assumed reel lengths for this project are 12,000 feet.
14. Cross slopes are not accounted for in this conceptual design. Structures designed assuming a 1.5' foundation reveal at the center of the structure.
15. This project scope assumes that it is independent from other projects in the Transition Cycle. The following projects may impact the project scope if this assumption is incorrect.
  - a. AG2-086 (SB) – Mount Jackson Substation Generation Interconnection

### **Estimate Notes/Assumptions**

1. This scope and estimate for project AG2-086 refers to the "transmission-owner-to-build" execution approach. The transmission owner estimate includes the engineering, project management, and construction costs for the transmission assets on this project.
  - a. One estimate has been provided for this scope.
    - i. Transmission Owner Build (TO)
2. Engineered steel pole costs were determined based off typical wind and weight spans, line angles, and average structure heights for each voltage. These inputs were used to derive an estimated steel pole weight, which was used to develop the structure costs. This was determined for the high-level estimate projects for Dominion Generation Interconnection Projects.
3. Engineered 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 Shenandoah Valley.
4. Survey cost were determined based on substation proposed location, fiber installation, and impacts on existing line.
5. The estimate associated with this scope includes a \$50,000 cost to account for the AC mitigation study for cathodic protection crossing the UG drain line between structures 128/75 and 128/76. It's assumed that this UG drain line can remain. The estimate does not include costs for relocating it.
6. It should be determined in detailed engineering if 115 kV over-insulated conductor assemblies are required for this project. For this estimate, over-insulated conductor assemblies were utilized.

7. Transition Cycle 2 - Phase 2 estimates utilize Dominion 2025 labor and material adjustment rates.

**Figure 1 – Project Location**



Attachment #8: Network Upgrade – Endless Caverns Substation

### **Project Summary**

Project AG2-086 provides for drawing work, relay resets, and field support necessary to change line 128 destination from Edinburg Substation to the New Three-breaker Ring at the Mt Jackson Tap. This project is the Remote End Network Upgrade for the AG2-086 Generator Interconnect project.

Attachment #9: Network Upgrade – Edinburg Substation

**Project Summary**

Project AG2-086 provides drawing work, relay resets, and field support necessary to change line 128 destination from Endless Caverns Substation to New Three-breaker Ring at the Mt Jackson Tap. The line number may change, Consult the construction one line. This project is the Remote End Network Upgrade for the AG2-086 Generator Interconnect project.