Facilities Study Report

For

Physical Interconnection of

PJM Generation Interconnection Request

Project ID AG2-270

“Clover 230 kV”

Introduction

This Facilities 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 Facility 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. Transmission Owner Facilities Study Summary

1. PROJECT DESCRIPTION

The Project Developer (PD) has proposed a Storage Generating Facility located in, Halifax County, Virginia with a designated PJM Project ID of AG2-270. The installed facilities will have a total Maximum Facility Output (MFO) of 150 MW with 105 MW of this output being recognized by PJM as Capacity.

2. POINT OF INTERCONNECTION (POI)

AG2-270 will interconnect with the Dominion transmission system via the existing Clover Substation.

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

3. POINT OF CHANGE IN OWNERSHIP

The Point of Change in Ownership will be the 230kV disconnect switch 4-hole pad on a transmission line structure located on Dominion property near the shared property boundary.

4. SCOPE OF PROJECT DEVELOPER INTERCONNECTION FACILITIES

Project Developer will design, build, own, operate and maintain the Project Developer Interconnection Facilities on Project Developer’s side of the Point of Change in Ownership (PCO). This includes, but is not limited to:

- Circuit breakers and associated equipment located between the high side of the MPT(s) or GSU(s) and the Point of Change in Ownership
- Generator lead line from the Generating Facility to the Point of Change in Ownership
- Relay and protective equipment, telecommunications equipment, and Supervisory Control and Data Acquisition (SCADA) to comply with the TO's Applicable Technical Requirements and Standards

B. Transmission Owner Facilities Study Results

The following is a description of the planned Transmission Owner facilities for the physical interconnection of the proposed AG2-270 projects to Dominion transmission system. 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. Once built, Dominion will own, operate, and maintain these Facilities.

1. TRANSMISSION OWNER INTERCONNECTION FACILITIES:

The Transmission Owner Interconnection Facilities include the portion of the interconnection switching station which is associated solely with the single feed to the generating facilities collector station. The equipment associated with the Transmission Owner Interconnection Facilities includes disconnect switch, conductors and connectors.

The proposed Transmission Owner Interconnection Facility scope is detailed in Attachment #3 and Attachment #4.

2. STAND ALONE NETWORK UPGRADES

No Stand Alone Network Upgrades have been Identified in this Facility Study Report.

3. NETWORK UPGRADES

Substation Expansion at Clover 230kV:

Clover Substation will be expanded to accommodate the new generation interconnection.

The proposed substation expansion scope is shown in Attachment #3.

4. OTHER SCOPE OF WORK

Other scope includes the metering accuracy CCVT's, metering accuracy CT's, and associated metering equipment.

5. MILESTONE SCHEDULE FOR COMPLETION OF [TO] WORK

Facilities outlined in this report are estimated to take 47 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 month	Finish month
Detailed Design	1	10
Permitting/Procurement	2	37
Construction	27	47

6. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

Assumptions can be found in Attachments #3-4.

7. REVENUE METERING REQUIREMENTS

All revenue metering needed for this interconnection project must meet the metering requirements stated in Appendix 2, section 8 of the AG2-270 GIA, and in PJM Manuals M01 and M14D. The details of applicable revenue metering requirements are given in the Dominion Energy Virginia – Electric Transmission Facility Interconnection Requirements (FIR) Rev 25.0 posted on PJM website.

The revenue metering will be installed on the Dominion side of the Point of Change in Ownership will be installed, owned and maintained by Dominion.

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.

The Project Developer is responsible for the following expectations in the area Real Estate.

- Land and/or Permitting associated with the Generation Facility and the Generation Line to the Point of Change in Ownership (PCO) structure.

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 PERMITING

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

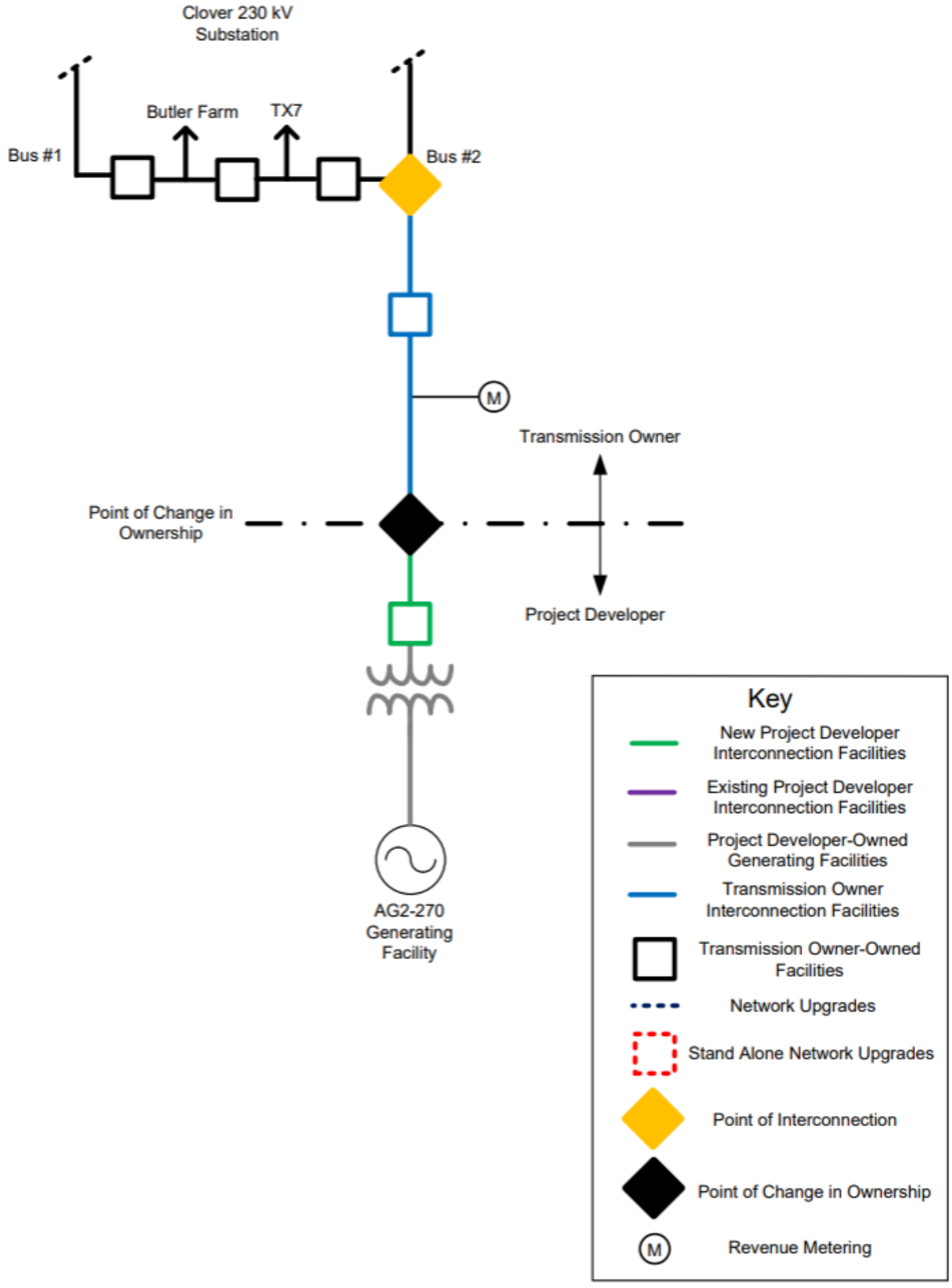
The Project Developer is responsible for the following expectations in the area Environmental and Permitting.

- Environmental and/or Permitting associated with the Generation Facility and the Generation Line to the Point in Change in Ownership (PCO) structure.

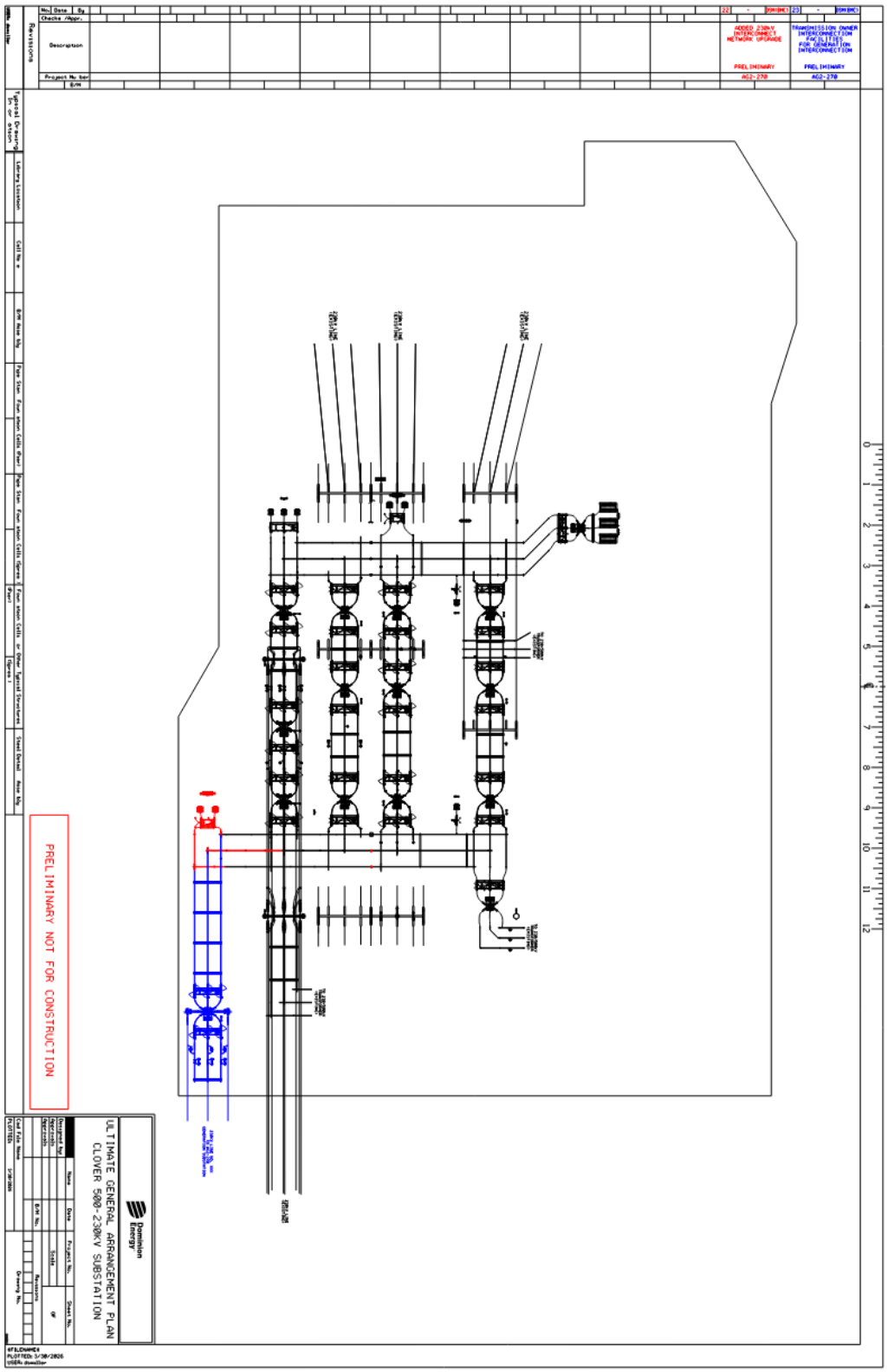
C. APPENDICES

Attachment #1:	Single line Diagram for the Physical Interconnection
Attachment #2:	Substation General Arrangement
Attachment #3:	Network Upgrade & Transmission Owner Interconnection Facility Scope - Substation
Attachment #4:	Transmission Owner Interconnection Facility Scope - Transmission

Attachment #1: Single line Diagram for the Physical Interconnection



Attachment #2: Substation General Arrangement



Attachment #3: Network Upgrade & Transmission Owner Interconnection Facility Scope - Substation

Project Summary

Project number AG2-270 provides for the initial construction of a new 230kV generation interconnect line into the existing Clover Substation in Halifax County, Virginia.

The objective of this project is to add one new line position and one new 230kV breaker installed at Clover Substation to support the new solar farm built by Project Developer.

The Generating Facilities is located 0.25 miles south of Clover Substation, sharing a property boundary with Dominion. The Point of Change in Ownership will be the 230kV disconnect switch 4-hole pad on a transmission line structure located on Dominion property near the shared property boundary. The Project Developer will bring its conductor to the demarcation point.

Transmission line engineering is to provide a new number for the new line between Clover substation and the 230kV solar farm interconnect.

Assumption:

Currently, the scope and estimate assume Dominion standard spread footer foundation. 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. Two (2), 230kV, relay accuracy CCVT
2. One (1), 230kV, 3000A, 2-phase center break switch (for PVT’s)
3. Two (2), 230kV, 167KVA power PT's for station service
4. One (1), 230kV, 20 in-lb., 125VDC motor operator
5. Conductor, connectors, conduits, control cables, foundations, steel structures and grounding material as per engineering standards

Remove substation material – Network Upgrade:

1. Two (2), 230kV, 167kVA Power PT’s
2. One (1), 230kV, 3000A, 2-Pole disconnect switch
3. Steel structures as required including switch stands, bus supports, and CCVT supports
4. Foundations as required

Purchase and install relay material - Network Upgrade:

1. One (1), 1603 – 24” SEL-451 Islanding control scheme panel
2. One (1), 4506 – 3-phase CCVT potential make-up box
3. One (1), 4000 – station service potential make-up box
4. One (1), 4548 – non-earthing switch MOAB control box

The Transmission Owner Interconnection Facilities include the portion of the interconnecting switching station which is associated solely with the single feed to the generating facilities collector station. The equipment associated with the Transmission Owner Interconnection Facilities includes the disconnect switch, conductors and connectors.

Other Scope includes metering accuracy CCVT’s and metering accuracy CT’s.

Purchase and install substation material – Transmission Owner Interconnection Facilities:

1. One (1), 230kV, 4000A, 63kAIC, SF-6 circuit breaker
2. Two (2), 230kV, 4000A, 3-phase double end break switch
3. One (1), 230kV, 4000A, 3-phase center break gang operated switch (by Transmission)
4. Three (3), 230kV, surge arrester
5. One (1), 230kV, heavy duty steel backbone (by Transmission)
6. Conductor, connectors, conduits, control cables, foundations, steel structures and grounding material as per engineering standards

Purchase and install relay material – Transmission Owner Interconnection Facilities Upgrade:

1. One (1), 1340 – 24” dual SEL-411L CD/Fiber line panel
2. One (1), 1323 – 24” SEL-487E/735 PMU and PQ Monitoring Panel
3. One (1), 1510 – 24” dual SEL-351 transmission breaker with reclosing panel
4. One (1), 4510 – SEL-2411 breaker annunciator
5. One (1), 4526_A – circuit breaker fiber optic make-up box

Purchase and install metering material – Other:

1. Three (3), 230kV, metering accuracy CCVT
2. Three (3), 230kV, 500:5 metering accuracy CT
3. One (1), 1425 – 24” dual SEL-735 transmission and generator interconnect metering panel
4. One (1), 4524 – revenue metering CT make-up box
5. One (1), 4506 – 3-phase CCVT potential make-up box with metering (P4)

Attachment #4: Transmission Owner Interconnection Facility Scope - Transmission

Preliminary Scoping Summary

This project serves to construct a new 230 kV developer generation tie-in line from existing Clover Substation to a point of change in ownership (PCO) structure, which is located in Halifax County, VA. The new 230 kV circuit will hereby be referred to as line 2XXX. The point of change in ownership (PCO) structure will be proposed structure 2XXX/5, which is to be installed outside Clover Substation on Dominion owned property. The PCO structure is the demarcation point between Dominion Energy and the developer. See **Figure 1** for the project location.

This scope only includes the installations for the “Transmission Ownership Interconnection Facilities” (TOIF) for the gen-tie line. A "Network Upgrade" (NW) scope has not been provided due to no work to be completed for overhead transmission.

The proposed structures to be installed are three (3) 230 kV single circuit engineered steel double deadend 3-pole structures, one (1) 230 kV single circuit steel backbone, and one (1) 230 kV single circuit steel backbone with a switch attachment. The new conductor and shield wire to be used will be twin bundled (2) 768.2 ACSS/TW (20/7) “Maumee” conductor and two (2) DNO-11410 OPGW.

Length of Route	**0.27 miles**
Location of the subject line (County/State)	**Halifax County, VA**
Total Number of Permanent Structures	**5**
CPCN/SCC Required?	**No**
New ROW Required?	**Yes**

New ROW Required:

ROW Length	**ROW Width**
0.27 Miles	120 ft.

This project will utilize current Dominion 230 kV standards. The conceptual estimate includes cost for the following:

Transmission Owner Build - Existing Facilities to be Removed

Structures

Structure Type	Dwg Number	Str. Qty.
Steel Static Pole	9.008	1

Wire: Mileage listed is per circuit.

Length (Miles)	Circuit	# if Bundled-Wire Type "Name"	Start-End
0.04	1	7#7 Alumoweld Shield Wire	Existing Static Pole – Existing BB 2281/2

Transmission Owner Build - Permanent Facilities to be Installed

Structures: All structures will be galvanized steel.

Structure Type	Dwg Number	Str. Qty.
230 kV SC ENGR Steel DDE 3-Pole Structure	12.158	3
230 kV SC Steel Backbone w/ Switch Attachment - Includes a 4000 Amp Horizontal Switch	12.901	1
230 kV SC Steel Backbone	12.901	1

Wire:

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

Length (Miles)	Circuit	# If Bundled-Wire Type "Name"	Start-End
0.27	1	Twin Bundled (2) 768.2 ACSS/TW (20/7) "Maumee" Conductor	Proposed BB 2XXX/1 - Proposed BB 2XXX/5
0.27	2	DNO-11410 OPGW	Proposed BB 2XXX/1 - Proposed BB 2XXX/5

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. This project does require acquisition of a laydown yard.

3. The generalized structure height for this project is 75/60/75 ft for proposed structure 2XXX/2 and 125/110/125 ft for proposed structure 2XXX/3 and 2XXX/4. This was determined for the high-level estimate projects for Dominion Generation Interconnection Projects.

4. All deadend engineered steel structures outside the substation (Structures 2XXX/2) will be designed for full construction deadend loading for construction conditions.

5. Project area code required loading include: NESC Heavy, 95 mph wind, ¾" Ice & 30 mph wind.

6. For detailed engineering, a LiDAR survey is required, including ROW file and underground survey.

7. Crossing insulators will be used whenever crossing over substation fences and other transmission lines.

8. An additional 0.27 miles of 120 ft width right of way will need to be acquired for this project to accommodate the 230 kV Dominion ROW preferences.

9. The PCO structure 2XXX/5 is located outside Clover Station and will be installed on Dominion owned property. This structure will be the demarcation point between the developer and Dominion Energy.

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

11. A substation general arrangement was provided by the conceptual substation engineering team. See **Attachment #2** for the Clover Substation general arrangement used for this project.

12. The assumed reel lengths for this project are 12,000 feet.

13. Cross slopes are not accounted for in this conceptual design. Structures designed assuming a 1.5' foundation reveal at the center of the structure.

14. The developer collector station will be located approximately 0.30 miles to the southwest of Clover Substation.

15. This project scope assumes that it is independent from other projects in the Transition Cycle.

Estimate Notes/Assumptions

1. This scope and estimate for project AG2-270 refer to the "Transmission Ownership Interconnection Facilities" (TOIF). This includes the engineering, project management, and construction costs for the transmission assets between existing Clover Substation and proposed structure 2XXX/5. A "Network Upgrade" (NW) scope and estimate has not been provided due to no work to be completed for overhead transmission.

    a. One (1) estimate has been provided for this project.

        i. Transmission Ownership Interconnection Facilities (TOIF)

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.

    a. Due to allocated amount of time, proposed structures 2XXX/3 and 2XXX/4 engineered steel pole costs were derived based off the standard high-level estimate weights and the percentage height increase. The standard high-level estimate height for structure drawing 12.158 is 75/60/75 ft. The expected height for the proposed structures is 125/110/125 ft, which is approximately 67% taller than standard design for the high-level estimates. It was assumed that the engineered steel weight would be proportional to the increase in height.

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 Piedmont.

    a. Due to allocated amount of time, proposed structures 2XXX/3 and 2XXX/4 utilized foundation cost determined for standard structure 12.231 – DC DDE 3-pole structure. These foundation costs were assumed due to the increased height for the two (2) single circuit double deadend 3-pole structures to cross over the existing 115 kV transmission line.

4. Fiber will need to be installed for communication purposes. An additional $5k will be included on the general permitting cost due to the fiber installation.

5. Survey costs were determined based on substation proposed location, fiber installation, and impacts on existing line.

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

Figure 1 – Project Location

