# Facilities Study Report

# For

# Physical Interconnection of

# PJM Generation Interconnection Request
# Project ID AH1-545

# "Wylie Ridge-Tidd 345 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 Monongahela Power Company (Mon Power), a FirstEnergy company.

This Facilities Study was performed to satisfy the Phase 2 Facilities Study requirement of the PJM Tariff. The Facilities 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 has proposed a solar Generating Facility located in Washington County, Pennsylvania. The installed facilities for AH1-545 will have a total Maximum Facility Output (MFO) of 200 MW with 20 MW of this output being recognized by PJM as Capacity.

### 2. POINT OF INTERCONNECTION (POI)

The Generating Facility will interconnect with the Mon Power transmission system via a newly constructed 345 kV three (3) breaker ring bus substation, tapping the Wylie Ridge – Tidd 345 kV line, Line Number 242, approximately 10.6 miles from Wylie Ridge substation.

The construction of the new interconnection substation will result in the splitting of the existing Wylie Ridge – Tidd 345 kV line, Line Number 242, into two lines on the transmission system. New line designations are to be determined.

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

### 3. POINT OF CHANGE IN OWNERSHIP (PCO)

The Point of Change in Ownership (PCO) will be located at the PD-owned dead-end structure outside the new TO-owned three (3) breaker ring bus interconnection substation fence line.

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

### 4. SCOPE OF PROJECT DEVELOPER 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 GSU 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, and Supervisory Control and Data Acquisition (SCADA) and telecommunications equipment to comply with the TO's Applicable Technical Requirements and Standards.
- The easements and associated rights of way for the TO owned substation along with the 345 kV line taps to the substation will be acquired by the Project Developer and transferred to the TO at no cost. Site preparation for the TO owned substation, including clearing, grading and an access road, as necessary, is assumed to be by the Project Developer. The access road design must be approved by FirstEnergy to ensure it provides adequate access to the substation to support construction and maintenance activities. Route selection, line design, and right-of-way acquisition for the Project Developer's facilities are not included in this report and are the responsibility of the Project Developer.

## B. Transmission Owner Facilities Study Results

The following is a description of Transmission Owner facilities for physical interconnection of the proposed AH1-545 project to Mon Power transmission system. These facilities shall be designed according to FirstEnergy Applicable Technical Requirements and Standards. Once built, Mon Power will own, operate, and maintain these Facilities.

### 1. TRANSMISSION OWNER INTERCONNECTION FACILITIES (TOIF)

1.1 New Interconnection Substation Line Terminal

Install line terminal equipment within the AH1-545 interconnection substation. Install one span from AH1-545 interconnection substation to the Project Developer-owned dead-end structure outside of TO substation fence.

- Structures Installed
    - 0.1 miles of double bundled 795 kcmil 26/7 ACSR conductor, shielded by (1) OPGW and (1) 7#8 Alumoweld.
    - Substation line exit facilities, including dead end structures and disconnect switches, described in the AH1-545 interconnection substation scope.
- Siting and Permitting
    - Full application will be required.
- Scope of work Assumptions
    - Location of PCO assumed
    - Location of generator substation assumed
    - A ground survey will be required for design and as-built.
    - Cost of mobilization/demobilization shared with line Loop scope of work.
    - Assume minimal social and ecological impacts.

- Assume no local opposition to the project.

- Ancillary Scope of Work
  - Project Management
    - Provide project management, coordination, administration, scheduling, material management and project development if required.

1.2 Energize and integrate generator Interconnection Facilities to the transmission system.

- Relay and Controls Scope of Work
  - Integrate Interconnection Facilities protection and controls to the transmission system.
  - Revise Relay settings.
- Ancillary Scope of Work
  - Project Management
    - Provide project management, coordination, administration, scheduling, material management and project development as required
  - Testing and Commissioning
    - Test and commission all new relay settings.

**2. STAND ALONE NETWORK UPGRADES**

2.1 New Interconnection Substation

A new three (3) breaker ring bus substation will be constructed along the Wylie Ridge – Tidd 345 kV transmission line to interconnect AH1-545 with the Mon Power transmission system.

The new substation will be located approximately 10.6 miles from Wylie Ridge Substation. The Project Developer will be responsible for acquiring all easements, properties, and permits that may be required to construct both the new interconnection switching station and the associated facilities. The Project Developer will also be responsible for the rough grade of the property and an access road to the proposed three-breaker ring bus site.

- Below Grade Scope of Work:
  - Ground grid, foundations, and cables for all substation equipment and structures.
- Above Grade Scope of Work:
  - (3) 345kV breakers in a ring bus configuration.
  - (1) medium control house including battery systems and RTU.
  - (3) 345kV circuit breakers.
  - (6) 345 kV bus disconnect switches.
  - (3) 345 kV MOAB line disconnect switches.

- (3) Sets of 345 kV CVTs.
- (9) 345 kV surge arresters.
- (3) 345 kV dead end structures.
- (1) SSVTs
- (3) 345kv Wave traps and tunes; Choice of wave trap and tuner is dependent on a detailed frequency study to select new frequencies to split the Tidd – Wylie Ridge 345kV line
- High security substation fence and cameras.

- Relay & Control Scope of Work
  - For the new 345kV Generator Lead Line:
    - (2) SEL-411L relays for primary and backup line protection over dedicated fiber.
    - Additional auxiliaries as needed to support the line protection.
  - For the Wylie Ridge 345kV line:
    - (1) SEL-421 relays for primary line protection over PLC.
    - (1) SEL-411L relays for backup line protection over PLC.
    - (1) UPLC to be used with primary line protection.
    - (1) UPLC to be used with backup line protection.
    - (1) UPLC to be used for direct transfer trip send and receive.
    - (1) lot of hybrids to couple the primary, backup, and DTT frequencies to the power line.
    - One (1) PCM-5350 to monitor primary power line carrier frequency.
    - (1) PCM-5350 to monitor backup power line carrier frequency.
    - (1) PCM-5350 to monitor direct transfer trip frequencies.
  - For the Tidd (AEP) 345kV line:
    - (1) SEL-421 relays for primary line protection over PLC.
    - (1) SEL-411L relays for backup line protection over PLC.
    - Detailed frequency study to select new frequencies to split the Tidd – Wylie Ridge 345kV line
    - (1) UPLC to be used with primary line protection
    - (1) UPLC to be used with backup line protection
    - (1) UPLC to be used for direct transfer trip send and receive
    - (1) lot of hybrids to couple the primary, backup and DTT frequencies to the power line
    - (1) PCM-5350 to monitor primary power line carrier frequency
    - (1) PCM-5350 to monitor backup power line carrier frequency
    - (1) PCM-5350 to monitor direct transfer trip frequencies

        - One relay for each of the 345kV breaker positions (three total):
        - (3) SEL-451 relay
        - Additional lockouts and auxiliaries as needed
    - For general relaying support:
        - (1) lot of SEL-3350 or similar data concentrator RTACs for relay remote access.
        - (1) lot of Arbiter 1094b or similar GPS Clocks for timing.
        - (1) lot of Qualitrol TWS systems for traveling wave monitoring, for networked lines >100kV.
        - (1) lot of SEL-3555 or similar data concentrator RTACs for use as PMU data concentration.
- Scope of work Assumptions
    - Assume 4000 A, 63kA 345kv CBs
    - Assume (2) 125 VDC battery system per FE standard
    - Assume 9 relay panels
- Transmission Owner Permits Required:
    - Siting included in separate estimate request for T-Line.
- Ancillary Scope of Work
    - Project Management
        - Provide project management, coordination, administration, scheduling, material management and project development as required
    - Forestry
        - None
    - Real Estate & Right-Of-Way
        - Real estate support will be needed for new substation. Developer responsible for acquiring land for new substation and loop to new substation.
        - Real estate estimate has been included for:
            - Internal support including document review, project planning meetings, subcontractor oversight and assistance with transfer of assets if required.
            - External support for general project support, and minimal construction support and damage settlements/releases.
            - Direct damage payments not included in estimate.
            - Kept GIS / R&R for installation of structures.
    - Environmental
        - Environmental support for new Interconnection substation.
        - Environmental Filming (Documentation of Existing roads are required)

        - Road bonds are required
        - Environmental Development of Permit Binder is required.
        - Access and Aerial crossing permits are included
        - Environmental Cultural Resource Consultation is required.
        - Environmental Construction walk down is required.
        - RTE consultation letters are included
        - Wetland Delineations and WDR are required
        - Stormwater permits and local approvals are assumed
        - Internal environmental engineering and external project management costs are included.
    - Revenue Metering
        - None
    - Information Technology
        - Network equipment and scopes described in sections 2.2, 2.3 and 2.4.
        - Estimate SCADA work at AH1-545 Substation to support HMI, security cameras, breaker, relays, RTU, meters, wave trap, MOAB, GOAB, battery charger, data concentrator, PCM, battery monitor, disconnect switch installation.
    - Distribution
        - Back-up power station service at new Interconnection Substation AH1-545 from the region.
    - Testing and Commissioning
        - Testing and commissioning of all substation equipment.
- Standard Design References:
    - FirstEnergy's *Requirements for Transmission Connected Facilities*: www.pjm.com/planning/design-engineering/to-tech-standards.aspx.
    - PJM Protection Standard (PJM Manual 7): https://pjm.com/-/media/documents/manuals/m07.ashx
- Mon Power Protection Specification:
    - Refer to *Attachment 4* of this document.
- Material List and Equipment Ratings:
    - Refer to *Attachment 3*.

2.2 ADSS Fiber Installation

- Install/Test approximately 6.25 miles of 48F/SM from the AH1-545 Control House to the Parkview

Substation Control House.

- Underground ADSS will be utilized for approximately 1.04 miles from the substation control building to the riser pole 1W7458-MP50.
- One span of aerial fiber is used for river crossings in the middle of this underground build.
- Aerial ADSS Fiber will be utilized for approximately 5.08 miles from riser pole 1W7458-MP50 to just outside the Parkview substation control house.
- Underground fiber runs of 0.1 miles, and 0.01 miles are utilized throughout this longer aerial run to transition through areas with limited distribution infrastructure and property constraints.
- Install/Test approximately 0.08 miles of 48F/SM from the AH1-545 Control House to the AH1-545 PCO.
- Underground ADSS will be utilized from the substation control building to the PCO just East of the AH1-545 substation yard.
- Install/Test another approximately 0.08-mile run of 48F/SM from the AH1-545 Control House to the AH1-545 PCO.
- Underground ADSS will be utilized from the substation control building to the PCO just East of the AH1-545 substation yard.

## 2.3 MPLS Equipment

- Estimated design, installation, and testing/commissioning for MPLS equipment for SCADA transport at new AH1-545 Substation. Assumed SCADA work is included in this cost.
- Estimated cost associated with Crossbow engineering and materials at AH1-545 Substation.

## 2.4 Fiber

- Fiber runs from AH1-545 Substation control house to the PCO.

## 2.5 New Interconnection Substation – FE Option to Build Scope

FirstEnergy work at new Interconnection Substation

- Above Grade
    - Install (1) security system and camera system.
    - Install (1) indoor security AC cabinet.
- Relay and Control Scope of Work
    - Install (1) network fiber termination rack.
    - Programming of SCADA RTU.
- Scope of Work Assumptions
    - Assumed developer will install camera foundations and conduits to FirstEnergy standards.

- Assumed 2 weeks of testing and commissioning for testing to Transmission Control Centers.
- Assumed Project Developer will install fiber from generator station to OTB station and bring fiber into control house.
- FirstEnergy will be responsible for network fiber.

- Ancillary Scope of Work
  - Project Management
    - Provide project management, coordination, administration, scheduling, material management and project development as required.
  - Information Technology
    - Refer to sections 2.2, 2.3 & 2.4 for SCADA backhaul connection and MPLS installation
  - Testing and Commissioning
    - Testing of new site to Transmission Control Center; perform functional testing as required

## 3. NETWORK UPGRADES

3.1 Wylie Ridge – Tidd 345 kV, Line Number 242

The Wylie Ridge – Tidd 345 kV, Line Number 242, will be cut and looped into the new interconnection substation at a point approximately 10.6 miles from Wylie Ridge substation, between structures 15 and 14.

- Existing Conditions
  - Per TAMI the existing line is constructed on double circuit, lattice tower structures, but appear to only be strung on the west side. Existing conductor is double bundled 954 kcmil 45/7 ACSR shielded by (2) 7#8 Alumoweld.
- Structures Installed
  - (2) single circuit steel monopole dead-end structures on concrete foundations.
  - 0.2 miles of double bundled 954 kcmil 45/7 ACSR conductor shielded by (1) OPGW and (1) 7#8 Alumoweld.
  - Transfer existing conductors to new dead-end structures.
- Structures Removed
  - Approximately 0.03 miles of double bundled 954 kcmil 45/7 ACSR conductor and (2) 7#8 Alumoweld shield wire.
- Permitting
  - Full Application will be required.
- Scope of Work Assumptions
  - Outage can be obtained to perform line construction.

- A ground survey will be required for design and as-built.
- It is assumed the existing conductor and shield wire are in adequate condition and can be transferred. An engineering analysis during project development will be required.
- It is assumed the adjacent structures are in adequate condition and can handle the new loading. An engineering analysis during project development will be required.
- The loop cut-in and substation location were not provided in detail. A general area was provided. Specific substation location and layout will be required during project development and execution. Scope of project may change.
- Project Station is located in Pennsylvania and the Tidd AEP - Wylie Ridge 345kV Line that will loop into the station is located in West Virginia.
- Assume that a ground survey is required.
- Assume that outage requirements can be met.

- Ancillary Scope of Work
  - Project Management
    - Provide project management, coordination, administration, scheduling, material management and project development if required
  - Forestry
    - Some clearing is required
    - Approximately 2.0 acres of forestry clearing required
  - Real Estate & Right-Of-Way
    - Rights & restrictions review on existing line
    - New ROW will be required
    - Assuming only internal consultive support is needed with 1 access road and 1 laydown yard.
    - Real estate estimate has been included for:
      - Internal support including document review, project planning meetings, subcontractor oversight and assistance with transfer of assets if required.
      - External support for general project support, and minimal construction support and damage settlements/releases.
      - Direct damage payments not included in estimate.
      - Kept GIS / R&R for installation of structures.
  - Environmental
    - Road Bonds are required.
    - Environmental Filming (Documentation of Existing roads are required).
    - Environmental Development of Permit Binder is required.
    - Access and Aerial crossing permits are included.

        - Environmental Cultural Resource Consultation is required.
        - Environmental Construction walk down is required.
        - RTE consultation letters are included.
        - Wetland delineations and WDR are required.
        - Stormwater permits and local approvals are assumed.
        - Internal environmental engineering and external project management costs are included.
    - Revenue Metering
        - None
    - Information Technology
        - None
    - Access Road Construction
        - Access roads will be required, terrain is flat, approximately 0.2 miles.
    - Distribution
        - None

3.2 Wylie Ridge Substation

Install new primary and backup wave traps and line tuners at Wylie Ridge Substation. Frequency Study to be performed to determine new frequencies. Revise relay settings at Wylie Ridge.

- Below Grade Scope of Work:
    - Foundations and cables for (2) new wave traps and tuners.
- Above Grade Scope of Work:
    - Install (2) new 345kv wave traps and tuners including stands.
- Relay & Control Scope of Work
    - Review and revise relay settings.
    - Frequency study.
- Scope of Work Assumptions:
    - Assume 2000A Wave trap.
- Ancillary Scope of Work
    - Project Management
        - Environmental support needed to review drawings and determine if any permitting will be required for new foundations and below grade work.
        - Assume all work will occur within the existing substation and minimal permitting will be needed.

        - Internal environmental engineering and external project management is included
    - Environmental
        - Provide project management, coordination, administration, scheduling, material management and project development if required.
    - Information Technology
        - Estimate SCADA work at Wylie Ridge Substation to support wave trap installation.
    - Testing and Commissioning
        - Testing and commissioning of new wave traps and line tuners and auxillary equipment, as needed.

3.3 Tidd Substation (AEP Ohio Transmission Company Inc.)

AEP Ohio Transmission Company Inc. will review and revise (as needed) the protective relay settings at the Tidd 345 kV Substation.

**4. Other Scope of Work**

4.1 Revenue metering.

Provide revenue metering panel within new AH1-545 Control House. Integrate revenue metering to Interconnection Substation. Provide new 3-phase 345 kV Free-standing CT/VT Combo Units.

- Below Grade Scope of Work:
    - (1) Lot of excavation, conduit, backfill, grounding, and wiring between Free Standing CT/VT Combo units to revenue metering.
    - (1) Lot of foundations for Free-standing CT/VT 345 kV Combo Unit.
- Above Grade Scope of Work:
    - (1) set of 3-phase Free Standing CT/VT Combo Unit 345 kV.
- Relay & Control Scope of Work
    - (1) New Revenue Metering Panel with test switches. The material for the Revenue Meter to be included in revenue metering support estimate.
- Scope of Work Assumptions:
    - It is assumed current and voltage signals will be pulled from new 3-phase free standing CT/VT Combo Units. Costs for these combo units are included in the AH1-545 interconnection substation scope.
    - Assumes enough room in AH1-545 Control house to support a new revenue metering panel.
    - Assumes enough room in AH1-545 substation to add in free standing CT/VT Combo Units.
    - Assumes the same crew that is constructing the OTB FE Work scope will be adding the revenue metering panel and freestanding CT/VT combo units.
    - Temp const facilities and construction general conditions (Scope Capture) are included in AH1-

545 interconnection substation scope.

### 4.2 Option to Build Oversight

FirstEnergy oversight of developer design and construction of new interconnection substation at a high risk site location.

- Below Grade
    - Must meet FirstEnergy standards - Option to Build.
- Above Grade
    - Must meet FirstEnergy standards - Option to Build.
- Relay and Controls Scope of Work
    - Must meet FirstEnergy standards - Option to Build.
- Scope of Work Assumptions
    - Engineering oversight for review/comment of OTB site design for meeting FirstEnergy Standards.
    - Geotechnical/site/civil oversight for review/comment of OTB site grading design for meeting FirstEnergy standards.
    - Construction Oversight assumed for 6 months (note: potential for additional oversight for Geotech/site/civil site construction for challenging projects).
    - Developer responsible for apparatus testing of devices and supplying results to FirstEnergy.
    - FirstEnergy commissioning oversight is assumed for duration of construction.
    - Developer responsible for providing final 3D As-builts per FE direction, oversight, and approval.
- Ancillary Scope of Work
    - Project Management
        - Coordinate with developer and provide project management, coordination, administration, scheduling, material management and project development for FirstEnergy scope of work.
        - Provide construction oversight for project construction duration.
    - Forestry
        - Completed by Developer.
    - Real Estate and Right-of-Way
        - Support as required for transfer of property to FirstEnergy upon construction completion
        - Internal support including document review, project planning meetings, assistance with transfer of assets as required.

- Environmental
  - Environmental review of proposed site.
- Testing and Commissioning
  - Commissioning review of developer supplied information and witness of critical testing

## 5. MILESTONE SCHEDULE FOR COMPLETION OF Mon Power WORK

Facilities outlined in this report are estimated to take 58 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 |
|---|---|---|
| Preliminary Engineering | 1 | 2 |
| Detailed Engineering | 3 | 47 |
| Siting, Permitting & Real Estate | 5 | 47 |
| Equipment Delivery | 49 | 49 |
| Construction | 50 | 56 |
| Testing and Commissioning | 54 | 58 |

## 6. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

6.1 Scope Assumptions:

- Project Developer will coordinate design and alignment of proposed 345 kV generator lead line with the Transmission Owner for review of any clearance, right-of-way or right-of-way encroachment issues with TO owned facilities.
- Project Developer will coordinate design and construction of proposed 345 kV lead line. For these areas, the Project Developer shall provide TO with proposed drawings prior to construction and as-built drawings, confirmed by as-built survey data post-construction.
- Transmission Owner's preference would be to limit interference and avoid transmission line crossings with new 345 kV terminal positions. As a minimum, Project Developer facilities should not encroach within 100 feet of TO centerline at blowout conditions. If Project Developer's line design does not comply with this requirement TO would need to review this area as a special exception.
- Additional costs will be incurred by the Project Developer, if final alignment of the 345 kV generator lead line causes encroachments, changes, or modifications to any existing or relocated TO facilities.
- Project Developer is responsible for making all arrangements for electric distribution service (if required) for its generation station. No costs or schedule are included herein.

- All new generator only and new generator plus load facilities must be isolated from the Mon Power Transmission System by a Power Transformer with a winding configuration meeting the requirements in FirstEnergy's "Requirements for Transmission Connected Facilities" document.

6.2 Cost Estimate Assumptions:

- The cost estimates provided in this report were developed as of February 25, 2026, based upon current market conditions. Hence, they are subject to significant changes in the event that project implementation is delayed. Notwithstanding the cost estimates from this report being used in the Generator Interconnection Agreement for the related project, Mon Power reserves the right to re-evaluate and provide a more accurate cost estimate during the implementation phase of the project. In accordance with section 217 of the Open Access Transmission Tariff, the Project Developer will be responsible for 100 percent of the actual costs of the facilities required to accommodate its Interconnection Request.
- Mon Power reserves the right to charge the Project Developer operation and maintenance expenses to maintain the Project Developer attachment facilities, including metering facilities, owned by Mon Power. These costs will be specified in the Generator Interconnection Agreement.

6.3 Schedule Assumptions:

- This schedule assumes that all issues covered by the "Environmental, Real Estate and Permitting Issues" section of this document are resolved. Construction cannot begin until after all applicable permits and/or easements have been obtained.
- Mon Power's ability to support this schedule also depends on the feasibility of taking the required outages to support construction. Outages that are determined to negatively impact system reliability or cause congestion may be delayed or denied, at any time, even if they are submitted on time based on the Outage Submittal Rules in section 4.2.1 of PJM Manual 03. This includes, but is not limited to, outages requested between the months of June and September, as well as January and March, which typically get denied due to summer and winter peak conditions. Therefore, the construction schedule will be adjusted as needed to accommodate any outage restrictions that have been identified by Mon Power or the Transmission Provider.

## 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 AH1-545 GIA, and in PJM Manuals M01 and M14D. The details of applicable revenue metering requirements are given in the "Requirements for Transmission Connected Facilities" posted on PJM website.

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

The revenue metering system (particularly the revenue metering current transformers) shall be designed to accurately meter the light loads that will occur when the facility is not generating power and only back-feeding station service from the Transmission Owner. This may require the use of high accuracy extended range current transformers.

Transmission Owner will obtain real-time, site-specific, generation data from PJM, via the required communication link from Project Developer to PJM. Transmission Owner will work with PJM and Project Developer to ensure the generation data provided to PJM meets Transmission Owner's requirements.

These requirements are in addition to any metering required by PJM.

## 8. LAND REQUIREMENTS FOR INTERCONNECTION SUBSTATION

Land requirements for the Interconnection Substation needed for this interconnection project must meet the requirements in the following documents posted on PJM website.

- Requirements for Transmission Connected Facilities
- Geotechnical Design Requirements

The appropriate land requirements for a new Interconnection Substation are dependent on several electrical and physical factors/attributes. FirstEnergy will ultimately have to evaluate every property individually to assess the feasibility of construction, as well as any additional requirements that may be needed to support geotechnical and environmental concerns.

As a preliminary guide for site selection, FirstEnergy has provided a list of specifications for the substation size, Siting and Geotechnical standards, and Environmental requirements. It is important to note that these specifications are general, and as such, no construction activities should be performed on a selected site without prior approval from FirstEnergy.

### 8.1 Site Dimensions and Layout:

The typical new interconnection substation is a three-breaker-ring bus tapping an existing transmission line. The standard layout and dimensions of the substation are based on the voltage level of the interconnection system.

Below is a table summary of the typical substation dimensions for AH1-545. The standard requirement for a parking area has been included. However, Environmental, Geotechnical, and other factors may significantly increase the area required. For example, sites that require stormwater detention facilities will require area in addition to the typical dimensions provided in the table.

| 3 breaker Ring Bus Voltage | Dimension Size (ft) | Dimension Acres | Dimension size w/ 100ft buffer (ft) | Acre size w/ 100ft buffer | Parking (15 cars) 230ftx60ft | Total Acres (Buffer + Parking) |
|---|---|---|---|---|---|---|
| 345kV | 400x385 | 3.7 | 500x485 | 5.8 | 0.5 | 6.3 |

### 8.2 Real Estate Transfer

The preferred method for conveying a property to the TO is by “fee simple” transfer. If there are subdivisions or other conditions that hinder the ability for the Project Developer to convey the property by “fee simple” transfer, the TO may allow the use of an exclusive easement. These conditions should be discussed with the TO, and the accepted method of transfer should be confirmed early in the Interconnection process.

The Project Developer is required to obtain the following documents in the sequence listed below:

- Acquire the Interconnection Facilities property in fee from the property owner.
- Acquire an easement from the property owner for the Interconnection Facilities to the TO's T-Line (using the TO's template), if the size of property acquired doesn't sufficiently bi-sect the TO's existing right of way. If the property acquired by the Project Developer sufficiently overlaps the TO's existing right of way, this Interconnection Facilities easement is not needed.
- Provide access agreements to the TO from the property owners and Project Developer (this may be required if an exclusive easement is being used instead of conveying property to the TO in "fee simple".
- Provide an assignment of appropriate easement rights to the TO upon project completion. (Note: assignment must include all of TO's language in order to safely, operate and maintain facilities. It's critical that TO's easement templates are used when Project Developer is acquiring easements intended to be assigned to the TO.
- Provide deed conveyance of "fee simple" property for the Interconnection Facilities to the TO upon project completion and prior to transfer of title to personal property.

Document Exhibits:

Project Developer shall provide a survey and legal description detailing the location of the substation (preferably located adjacent to an existing transmission line right of way), ingress-egress to the substation from a dedicated public roadway, and easement for distribution and communication facilities and/or transmission facilities if necessary. This drawing shall be prepared by a licensed and registered surveyor and include at a minimum (ingress-egress, distribution and communication facilities locations may not need to be shown on the survey if property being conveyed is by "fee simple"):

- Legal description and survey of fee property being conveyed, including all lot split requirements
    - When property is conveyed to the TO by fee simple, the Project Developer is required to submit a completed Phase I Environmental Site Assessment (ESA) to the TO in accordance with all the requirements outlined in ASTM E 1527-05 prior to the start of construction of a substation property that will be transferred to the TO. Furthermore, if the Phase I ESA completed for the property documents the presence of any recognized environmental conditions (RECs), the Project Developer shall bear the cost and responsibility to complete a Phase II ESA in accordance with ASTM Standard E 1903-97 (Guide for Environmental Site Assessments: Phase II Environmental Site Assessment Process), however, final approval and property conveyance shall be at the sole discretion of the TO.
- Legal description for new transmission right of way (if "fee simple" conveyance is not used)
- Legal description for new distribution right of way (if "fee simple" conveyance is not used)
- Legal description for any other energy-related facilities that may be required (if "fee simple" conveyance is not used)
- Legal description for ingress-egress to a dedicated public roadway (if fee simple conveyance is not used)
- Survey drawing that shows:
    - New right of way along with the location of existing easements
    - Other existing facilities on the property
    - Names of adjoining property owners

- Basic drawing features: title block, north arrow, legend, graphic scale

8.3 Geotechnical and Siting Requirements:

Project Developer shall refer to Geotechnical Design Requirements provided on PJM's website. In addition, below are a list of standard siting guideline to account for when selecting a property for the interconnection substation:

- Slopes steeper than 2:1 and/or taller than 10' shall have slope stability performed.
- Factor of Safety (FS) shall be 1.5 for permanent condition.
- Minimum road width shall be 16'. AutoTurn Analysis shall be performed to accommodate the design vehicle needed inside the substation curve widening to be provided as necessary.
- Longitudinal slope for main access road to substation shall be 0.5%-10%. This is a mandatory design specification.
- Slope across the substation pad shall be 0.5%-2%.
- Every 20' vertical slope shall require a bench.

Site Grading and Preparation Responsibility:

It is the responsibility of the Project Developer to properly vet a proposed substation location. The proposed location should be reviewed by a Civil Engineer to determine the site's suitability for construction and operation as a substation (refer to Attachment 5 to FE's preliminary Geotechnical summary report). This should include a review of available information regarding the specific site location that should be considered when estimating constructability, risk, cost, and schedule. The substation is considered the substation and all associated FirstEnergy Facilities needed to operate and maintain the site such as, access roads, stormwater management facilities, walls/structures, and utilities. This review should include, but is not limited to:

- Geologic Hazards
  - Karst
  - Geologic formation/group
    - Hard bedrock (shallow bedrock difficult to excavate)
    - Weak bedrock
  - Landslide susceptibility and topography
  - Surficial soils survey
  - Coal resource mapping
- Environmental Hazards
  - Flood mapping
  - Wetland Mapping
  - Any pollution information that could affect construction.
  - Corrosivity
- Past development
  - Mining activity
  - Previously reclaimed site

## 9. APPLICABLE TECHNICAL REQUIREMENTS AND STANDARDS

The Requirements for Transmission Connected Facilities, Revision 7, dated January 27, 2026, shall apply.

The Geotechnical Design Requirements, dated July 20, 2022, shall apply.

The FirstEnergy Approved Vendor List, dated February 6, 2026, shall apply.

The TPP-REF-003 Transmission Planning Criteria, Revision 10, dated December 19, 2023, shall apply.

Applicable Technical Requirements and Standard: The Connection Requirements for the AEP Transmission System Rev 7 dated 12/31/2025 shall apply.

## 10. ENVIRONMENTAL AND PERMITTING

The following are possible environmental, real estate and permitting issues:

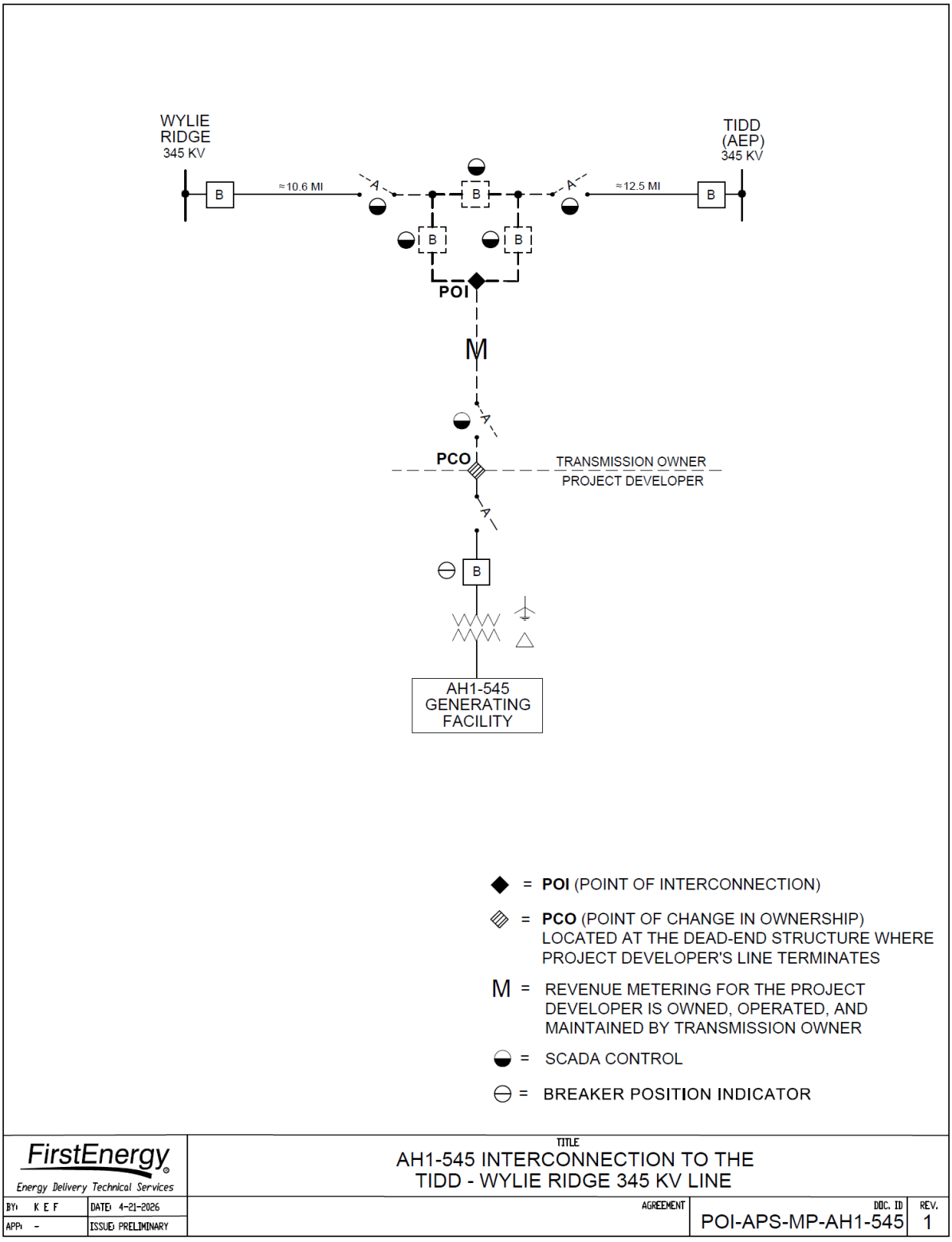
- Environmental permitting, Real Estate acquisition, and notifications to the state's Public Utilities Commission (PUC) vary, some up to twelve (12) months after preliminary engineering is completed to secure the required approvals.
- Prior to agreement by Project Developer to purchase the property, a Phase 1 Environmental Assessment should be conducted for the entire site to avoid assumption of environmental liabilities by Project Developer or Transmission Owner.
- The Transmission Owner interconnection substation may involve environmental surveys, permits, approvals and plans with federal, state, and/or local agencies.
- Assumed Project Developer is to provide all access rights, easements, ROW and permits necessary to complete the Project to the satisfaction of Transmission Owner. Environmental permitting shall encompass all federal, state, and local requirements, consultations, and agency coordination. Confirmation of meeting all permitting requirements shall be provided to Transmission Owner, prior to start of construction. Following construction and energization, confirmation of permit closeout shall be provided to the satisfaction of Transmission Owner, prior to transfer of ownership. If any of these elements are not included in the final agreement between Transmission Owner and Project Developer, twelve (12)-to-eighteen (18) months should be added to the Project Schedule to secure necessary permits, and additional costs would apply.
- Project Developer will provide copies of all the relative environmental permits and other necessary approvals to Transmission Owner before Transmission Owner accepts the Interconnection Facilities.
- Project Developer is required to install an access road from the new interconnection substation to the nearest public road (must be approved by Transmission Owner) and obtain access rights for Transmission Owner. Project Developer is responsible to maintain access road and ensure unimpeded access for Transmission Owner at all times.
- Project Developer is responsible for all property acquisition (including easements/rights-of-way (ROW)) for transmission, distribution and communication facilities needed for the generator interconnection.
- If Project Developer owns the project property, in fee title, Transmission Owner will require a fee property transfer for the interconnection substation site which may require subdivision approval, together with permanent access rights to and from the substation, as well as a perpetual easement for any transmission lines to the substation. Project Developer is responsible for all costs, including but not limited to subdivision, associated with the property transfer.
- If Project Developer leases the project property, the Project Developer will be required to obtain fee property from the underlying fee property owner, on behalf of Transmission Owner, for the interconnection substation site, together with permanent access rights to and from the substation, as well as a perpetual easement for any transmission lines to the substation.

- All property rights must be surveyed and metes and bounds descriptions prepared for incorporation into Transmission Owner's document forms, for transfer of title.
- The Transmission Owner interconnection substation and transmission line loop will involve PUC notification/approval.
- All work occurs within an existing transmission line right-of-way or on Project Developer's property with access to all existing structures possible via that property and the right-of- way following established access routes that do not cross wetlands or streams.
- Project Developer will develop, and secure regulatory approval for, all necessary Erosion and Sediment Control (E&SC) plans and National Pollutant Discharge Elimination System (NPDES) permits.
- Project Developer will obtain all necessary permits.
- Project Developer will conduct all necessary wetlands and waterways studies and permits.
- Project Developer will conduct all necessary historical and archaeological studies.
- If the Project Developer plans to cross the transmission line right of way with facilities or access roads, please refer to the Transmission Rights-of-Way Restrictions information located at:

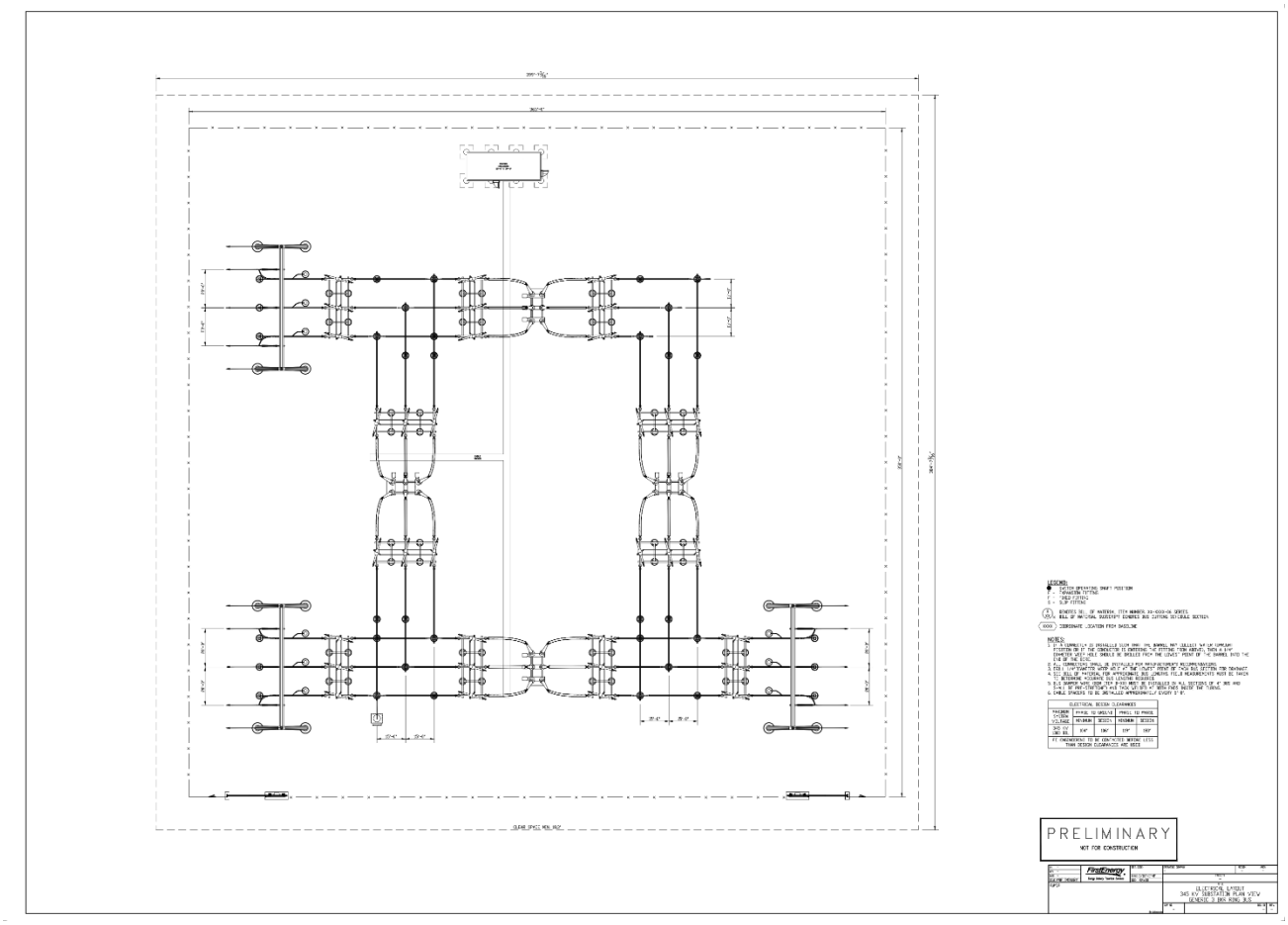
  https://www.firstenergycorp.com/help/safety/real-estate-power-lines/transmission-right-of-way.html#ROWform

# C. APPENDICES

## ATTACHMENT #1: SINGLE LINE DIAGRAM FOR THE PHYSICAL INTERCONNECTION



## ATTACHMENT #2: SUBSTATION GENERAL ARRANGEMENT



**ATTACHMENT #3: MATERIAL LIST AND EQUIPMENT RATINGS**

| Material/Equipment | Quantity |
|---|---|
| Cable Trench (lf) | 345 |
| Battery Charger (ea) | 2 |
| Remote Terminal Unit (RTU) (ea) | 4 |
| Insulator - Line - Porcelain/Glass (ea) | 1989 |
| Engineered Steel Poles (ea) | 7 |
| Steel Support Structure (ea) | 66 |
| Hard Bus - 1.5 inch (ft) | 240 |
| Hard Bus - 5 inch (ft) | 2060 |
| Battery Monitor (ea) | 2 |
| Package Control Enclosure - Prefabricated (ea) | 1 |
| Relay - Individual (ea) | 22 |
| Relay Panel (ea) | 10 |
| Circuit Breaker - 362 kV 63 kA (ea) | 3 |
| Anchor Bolt - Substation (ea) | 480 |
| Insulator - Substation - 345 kV (ea) | 27 |
| Line Trap - 345 kV (ea) | 5 |
| Surge Arrester - 345 kV (ea) | 9 |
| Capacitor Coupled Voltage Transformer (CCVT) - 345 kV (ea) | 12 |
| Current Transformer - Slip Over (CT) - 345 kV (ea) | 3 |
| Potential Transformer (PT) - 345 kV (ea) | 3 |
| Station Service Voltage Transformer (SSVT) - 345 kV (ea) | 1 |
| Security - Camera (ea) | 50 |
| Security - Physical Access Control (Badge Reader) (ea) | 2 |
| Battery - 125V (ea) | 2 |
| AC/DC Panelboard (ea) | 4 |
| Disconnect Switch - Substation - 345 kV (ea) | 9 |
| Switch - Motor Operator - Substation (ea) | 9 |
| Cable - Control/Communication (lf) | 33290 |
| Conductor - AAC (ft) | 1340 |
| Conductor - ACSR (ft) | 10454.4 |
| Conduit - Rigid (lf) | 1893 |
| Wire - Fiber - ADSS (ft) | 41774.023 |
| Wire - Fiber - Underground (ft) | 10146 |
| Wire - Shield - OHGW (lf) | 2592.4 |
| Wire - Shield - OPGW (lf) | 1742.4 |

**ATTACHMENT #4: PROTECTION SCOPE**

**Description:**

- AH1-545 345kV: Interconnection on Tidd (AEP) – Wylie Ridge 345kV Line.

**Generator Facilities Protection Requirements**

- The generation delivery points must comply with the technical requirements detailed in the FirstEnergy "Requirements for Transmission Connected Facilities" document.

- The Generator Step-Up (GSU) transformer(s) connecting to the FE system shall have a grounded-wye winding configuration on the high side and a delta configuration on the low side. This establishes an effective ground on the transmission system and mitigates overvoltage conditions during ground faults. A delta connected winding on the low side provides isolation of zero-sequence currents such that the FE system will not be exposed to ground faults on the generator system.

- Single fully rated circuit breaker is required at the point of interconnection (POI).

- Two (2) SEL-411L's for primary and backup current differential protection are required for the transmission line connecting the FE interconnection substation to the generator system. These relays will use direct fiber that is routed to the FE interconnection substation. Part number and firmware shall be sent to FE for approval to confirm communications compatibility. It is assumed the 87L channel shall also be used to communicate anti-islanding DTT to the Project Developer. It is assumed the 87L channel shall also be used for breaker failure DTT communications.

- Redundant high speed protection schemes are required to protect the Project Developer owned equipment at POI voltage. Each zone of protection covering the POI voltage portion of the Project Developer's system, the GSU Transformer(s), and the POI voltage interconnection breaker, shall be protected by two independent relay schemes meeting the following redundancy requirements. Primary and backup relaying shall use independent CTs, and independent PTs or independent windings from the same PTs. Primary and backup relaying shall not have any common wiring, isolating switches, or auxiliary tripping relays. Redundancy of a protection system can be achieved by ensuring that there is no single point of failure between two locally independent primary and backup protection schemes for a given element. Relays from the same manufacturer are acceptable for both the primary and backup schemes.

- A protection scheme containing generator Intertie functions is required and must be able to provide tripping for the following functions: overfrequency, underfrequency, phase and zero-sequence overvoltage, phase undervoltage, directional overcurrent, and directional power. The current source and voltage source are to be at the Transmission POI voltage. The current source for the intertie relaying is preferred to be from CTs on the POI voltage interconnection breaker. The voltage source for the intertie relaying is preferred to be located between the high side of the GSU Transformer and the POI voltage interconnection breaker.

- C800 CTs must be used on the POI voltage portion of the Project Developer's system, and the CTs should not saturate for the maximum expected through-fault current at the tap ratio in use.

- The relaying system and interrupting device control circuits shall have a reliable source of power independent from the AC system or immune to AC system disturbance or loss (for example - DC battery and charger) to assure proper operation of the protection scheme.

- If there are multiple existing utility feeds, they shall not be paralleled. Either a mechanical or electrical interlock shall be in place to prevent paralleling of service points.

- The Project Developer's protection system shall be designed and constructed in accordance with all mandatory Protection and Control (PRC) standards established by the North American Electric Reliability Corporation (NERC). The Project Developer shall coordinate with FirstEnergy and the Regional Reliability Coordinator to determine all applicable PRC requirements and ensure the facility's design and operation achieve full compliance.

**The Project Developer is solely responsible for protecting its own equipment in such a manner that electrical faults or other disturbances on the FE transmission system do not damage its equipment.**

**FirstEnergy Protection Requirements**

To coordinate with proposed generator substation, the relay settings at the following stations will need adjusted (note that in some cases due to limitations of the existing relays, relays may need to be replaced):

The interconnection of the new generator to the Bulk Electric System (BES) transmission network will initiate a review of existing protection schemes and may introduce new requirements to ensure compliance with the PRC standards established by the NERC. Additional protection system upgrades at the interconnecting station, and potentially at other affected stations, will be determined by FirstEnergy and the Regional Reliability Coordinator during subsequent stages of the project, prior to detailed design.

- Wylie Ridge:
  - AH1-545 – Wylie Ridge 345kV line:
    - Review and revise relay settings as needed.
    - Install one (1) wave trap and one (1) line tuner to support the primary power line carrier scheme. Install one (1) wave trap and one (1) line tuner to support the backup power line carrier and direct transfer trip schemes. A detailed frequency study shall be performed to determine new frequencies to split the Tidd (AEP) – Wylie Ridge 345kV line and determine an appropriate available frequency for all schemes utilizing power line carrier. If the existing Tidd (AEP) 345kV power line carrier frequencies can be retained on the new line, then no new carrier equipment is required. Fiber may need to be installed if new frequencies cannot be accommodated.

- New AH1-545 Ring Bus Substation:
  - Install one (1) SEL-3350 RTAC for relay remote access, one (1) Qualitrol TWS system for traveling wave monitoring, one (1) Arbiter 1094B GPS clock for time synchronization, and (1) DFR for fault and disturbance recording.

  - Project Developer 345kV line:

- Install a standard line protection relay panel with Primary and Backup SEL-411L for line protection over fiber.
- Install one (1) set of three (3) 345kV CCVTs

- AH1-545 – Wylie Ridge 345kV line:
  - Install a standard line protection relay panel with Primary SEL-421 and Backup SEL-411L for line protection
  - Install a standard PLC communications relay panel including one (1) UPLC and one (1) PCM-5350 to support and monitor the primary scheme.
  - Install a standard PLC communications relay panel including one (1) UPLC and one (1) PCM-5350 to support and monitor the backup scheme
  - Install a standard PLC communications relay panel including one (1) UPLC and one (1) PCM-5350 to support and monitor the direct transfer trip scheme
  - Install one (1) wave trap and one (1) line tuner on Phase C to support the primary power line carrier scheme. Install (1) wave trap and (1) line tuner on Phase B to support the backup and DTT power line carrier schemes. A detailed frequency study shall be performed to determine new frequencies to split the Tidd (AEP) – Wylie Ridge 345kV line and determine an appropriate available frequency for all schemes utilizing power line carrier.
  - Install one (1) set of three (3) 345kV CCVTs

- AH1-545 – Tidd (AEP) 345kV line:
  - Install a standard line protection relay panel with Primary SEL-421 and Backup SEL-411L for line protection
  - Install a standard PLC communications relay panel including one (1) UPLC and one (1) PCM-5350 to support and monitor the primary scheme.
  - Install a standard PLC communications relay panel including one (1) UPLC and one (1) PCM-5350 to support and monitor the backup scheme
  - Install a standard PLC communications relay panel including one (1) UPLC and one (1) PCM-5350 to support and monitor the direct transfer trip scheme
  - Install one (1) wave trap and one (1) line tuner on Phase C to support the primary power line carrier scheme. Install one (1) wave trap and one (1) line tuner on Phase B to support the backup and DTT power line carrier schemes. A detailed frequency study shall be performed to determine new frequencies to split the Tidd (AEP) – Wylie Ridge 345kV line and determine an appropriate available frequency for all schemes utilizing power line carrier
  - Install one (1) set of three (3) 345kV CCVTs

- For each 345kV breaker position (three total):
  - Install one (1) appropriately rated circuit breaker for 345kV application, two (2) CTs per bushing
  - Install one (1) SEL-451 relay for 345kV breaker failure to trip protection

**Short Circuit Data**

The short circuit levels at the line tap to the 345 kV bus are the following:

Short Circuit values at 345 kV:
Three phase faults = 31.3 kA
Single line to ground fault = 22.1 kA

Transmission System Impedances at 345 kV, 100 MVA base:

Positive sequence Z1 = (0.0004 + j0.0053) (per unit)
Zero sequence Z0 = (0.0029 + j0.0117) (per unit)

The fault current and system impedance values are for the proposed tap location on the existing 345 kV line, for the normal system configuration connecting to Wylie Ridge and Tidd (AEP) substations. The fault currents provided are bolted, symmetrical values for present, normal transmission system conditions. Future increases in fault currents are possible and it is the Project Developer's responsibility to upgrade their equipment and/or protective equipment coordination when necessary.

## ATTACHMENT #5: PRELIMINARY GEOTECHNICAL SUMMARY

**Observation & Concern Table:**

| Category | Source | Risk | Comment |
|---|---|---|---|
| Surficial Soil Survey | USDA Soil Survey | Moderate | Fine grained soil, potentially weak/soft soils |
| Geologic Formation/Group | PA/USGS Geologic Survey | Moderate | Anticipated shallow bedrock, coal |
| Karst | USGS/ TAMI 2 | Moderate | Bedrock mapped with minor limestone, TAMI indicates karst features |
| Landslide Susceptibility | GIS/Google Earth/FEMA Risk Map | High | Site is prone to landslides |
| Coal Mining and Oil and Gas Wells | PA/WV Geologic Survey/TAMI 2 | High | Site underlain by prior Island Creek Coal Co. mine. |
| Environmental Hazard | US Wetland Maps/FEMA | Low | Low risk of flooding |
| Past Development | TAMI/GIS MAP/Historic Aerials | Low | Undeveloped except for existing T-Line |

**Site Background / Geologic Hazards Potential**

This review was conducted to determine potential geologic hazards and risks at the proposed generator developer location (AH1-545). The reviewed location is in Jefferson Township, Washington County, Pennsylvania. This includes a proposed substation located along the Wylie Ridge – Tidd 345 kV transmission line. The substation would be located to the east of Tower 15, approximately 550 feet west of the West Virginia and Pennsylvania border. It should be noted that the Wylie Ridge – Tidd transmission line runs in a north south direction on the West Virginia side of the border. The existing transmission line operated by Mon Power was installed in 1942. The proposed substation would consist of (3) breaker 345kV ring bus with SCADA control. This location was reviewed for surficial soils survey, geologic formation/group, karst, landslide susceptibility, coal mining and oil and gas wells resource mapping, environmental hazards, and prior development. The review was performed to identify any geologic risks that could affect the project's budget, constructability, and/or schedule.

**Surficial Soil Survey**

The United States Department of Agriculture Web Soil Survey indicates that the site is currently mapped as the Udorthents strip mine (UkB), Culleoka channery silt loam (CaD), Weikert-Culleoka complex (WeB), and the Guernsey silt loam (GeB and GeC). The Udorthents soil series is typically used to classify disturbed lands especially from strip mining. The Culleoka channery silt loam is a well-drained fine loamy soil series found primarily on steep upland hillsides and narrow ridges. The Weikert-Culleoka complex is also well drained and typically underlain by shallow bedrock at depths less than 20 inches. The Guernsey silt loam is a silty well drained soil formed in colluvium and residuum. The Culleoka formation is mapped as Hydrologic

Soil Group (HSG) B classification, indicating the soils have a slow infiltration rate while all the other groups are rated as HSG C, D, or dual C/D classification. Group B soils have a moderate infiltration rate, while C and D soils have slow or very slow rates of infiltration. The depth to the water table is listed as within two feet of the surface in the Guernsey silt loam series but greater than 80 inches in all the other soil series. The soil series are generally fine-grained clays and silts with varying amounts of sand and gravel. The Guernsey silt loam series can contain highly plastic clays (CH) which could be problematic for foundation design.

**Geologic Formation/Group**

The site is located in the northern portion of the Waynesburg Hills Section of the Appalachian Plateaus Physiographic Province, which is characterized by a highly dissected upland with narrow hilltops and steel sloped valleys. The Geologic Map of Pennsylvania maps the site to be underlain by the Monongahela Group which is of the Late Pennsylvanian age. The Monongahela Group consists of cyclic sequences of limestone, shale, sandstone, the Pittsburg coal seam, and the Waynesburg coal seam. The coal seams in this area generally range from 275 to 410 feet thick. Additional information regarding the Monongahela Group is provided in Appendix B and bedding, fracturing, weathering, and other features typical of the formation. In addition, the site has mapped claystone which can be prone to swell. Based on the shallow depth to bedrock and underlying coal, some of which has been surface mined, the bedrock at the site would potentially create moderate construction related risks.

**Karst**

The site is underlain by the Monongahela Group which consists of limestone beds which are generally flat-lying, typically thin but locally thick, can be discontinuous in places, and are often interbedded with shale. The Transmission Asset Mapping Interface (TAMI 2) was reviewed, and the site appears to be mapped within an area prone to karst features. Based on the bedrock geology and karst mapping, there appears to be a moderate risk of karst related concerns for the site.

A determination of karst risk should be discussed in the sites geotechnical report to better understand the risk.

**Landslide Susceptibility**

The FEMA national risk index for Washington County rates the area as a very high risk to landslides. Pennsylvania maps the area among the highest landslide susceptible area in the state. Transmission Asset Mapping Interface (TAMI) was utilized to generate elevation profiles for the potential site area and are provided in Appendix D. The ground surface slopes downward from east to west and from south to north. While no excessively steep slopes are shown on the TAMI profile, the profile should be considered an approximation and given the strip mining that has occurred at the site, some loose soils could be present which are further susceptible to landslides.

**Resource mapping**

There is significant coal resources and mining activity in this region. Available historic mining maps indicate that strip mining by the Island Creek Coal Company occurred at the site. There is potential for uncontrolled fills, mine subsidence induced by loading and dramatic fluctuation in subsurface water. Several natural gas wells are located within both Washington County, Pennsylvania and in Brooke County West Virginia. Four natural gas wells are located within a 2-mile radius of the prospective site.

**Environmental Hazards**

Based on FEMA and U.S. Fish and Wildlife Service maps there are no wetlands or features that would cause an increased risk of flooding. An environmental study should still be conducted to confirm this prior to construction.

**Past Development**

The past development assessment of the site was based on aerial photography. Based on aerial photography dating back to 1952 this site has largely remained undisturbed indicating that the strip mining occurred prior to the 1950s. The size and exact extent of the mining is not easily discernible, and it will be difficult to understand what, if any, remedial efforts took place to reclaim the land once the mining stopped.

**Recommendations & Geotechnical Opinion**

List of Observations/Concerns Interconnection Facilities – Wylie-Tidd AH1-545:

1. This site is part of the Monongahela Group and contains both limestone and coal
2. Moderate potential for Karst
3. High risk for landslides
4. Low environmental impact risk
5. Mining activity present in the immediate area

**Preliminary Geotechnical Opinion**

The geotechnical conditions of this site seem to conclude that it is relatively high-risk location to develop a substation due to the coal mining that has occurred on the site, high risk of landslides, and karst related risks. Additional due diligence will be required to determine the extent of the coal mining and additional costs might be expected to determine the extent and any potential interference with the prospective substation site. This would include additional borings for both mining and karst. If mining is encountered higher foundation costs would be expected to mitigate mining. The above risk assessment does not confirm if the mining below grade is present below the site but it should be noted that the mining could potentially extend below the site and the estimate should assume that mining has occurred.