Facilities Study Report

For

Physical Interconnection of

PJM Generation Interconnection Request

Project ID AG2-516

Pecatonica 138kV

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 ComEd.

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 solar Generating Facility located in Winnebago County, Illinois with a designated PJM Project ID of AG2-516. The installed facilities will have a total Maximum Facility Output (MFO) of 120 MW with 72 MW of this output being recognized by PJM as Capacity.

2. POINT OF INTERCONNECTION (POI)

The Generating Facility will interconnect with the ComEd transmission system via a newly constructed 138kV breaker and a half substation, TSS 922 Pecatonica, tapping the TSS 119 Lancaster – TSS 171 Wempletown 138kV line, L.17121, approximately 14.6 miles from TSS 119 Lancaster and 8.5 miles from TSS 171 Wempletown.

The construction of the new interconnection substation will result in the splitting of the existing TSS 119 Lancaster – TSS 171 Wempletown 138kV line, L.17121 into two lines on the transmission system. The new L.92205 will connect TSS 922 Pecatonica to TSS 119 Lancaster and L.17121 will connect sTSS 922 Pecatonica to TSS 171 Wempletown.

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

3. POINT OF CHANGE IN OWNERSHIP

The Point in Change of Ownership will be located at the first dead-end structure of L.92203 inside the TSS 922 Pecatonica interconnection substation fence line.

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:

- One (1) 138kV gas circuit breaker

- One (1) 138kV disconnect switch
- One (1) 138kV generator lead line, 138kV L.92203, from the Generating Facility to the Point of Interconnection.
- Relaying at project developer facility to send a Transfer Trip to TSS 922 Pecatonica for 138kV CB Breaker Failure. Ability to isolate 87L and DTT (Direct Transfer Trip) functions is required. Example scheme/settings can be provided by ComEd.
- Install three (3) 1200:1 CCVTs on 138kV side of power transformers to be used for System 1 and System 2 relay protection.
- At Kestrel Solar generating station (AG2-516), in general, Generation Interconnection (GIC) to follow section 6.1 (Design F) of the latest version of ComEd Interconnection Guidelines for Generators at Transmission Level (Rev 2: Effective 12/16/2021).
    - New gas circuit breakers to auto trip and isolate for critical gas level.
    - New Tie Line terminal relay types to be the same as ComEd terminal relays. This includes relay firmware versions.
    - ComEd Protection and Control Engineering must review all Project Developer relay protection design drawings and relay settings.
    - Project Developer equipment impedance and/or test data must be provided to ComEd Protection and Control Engineering to model in a short circuit program. Examples include lines, transformers (include percent impedance and load loss), wind turbines, and inverters.
    - Project Developer to include over/under frequency and voltage protection at wind/solar farm collector bus. Suggested settings will be provided by ComEd. Under-frequency settings are to comply with MAIN Guide 1B.
    - Dual bus protection for 34.5kV bus.
    - Dual TRFM protection and site protection must be compliant with NERC & PJM requirements.
    - Metering is required to be installed per ComEd & PJM standards.
    - SCADA interface to ComEd will be required.
    - Witness testing by ComEd or a DA will be required and must be pre-scheduled at least 90 days in advance.
- New Gas Circuit breaker control for loss of SF6 gas condition should be as follows (see Engineering practice EP-5206-E):
    - For an open circuit breaker, when SF6 gas drops to the critical level, the close circuit of breaker shall be opened and motor operated disconnects on both sides of CB shall be opened.
    - For a closed SF6 gas circuit breaker, when SF6 gas drops to the critical level, the circuit breaker shall be opened and motor operated disconnects on both sides of CB shall be opened and the close circuit of the circuit breaker shall be opened.
- For any new equipment connected to the BES (Bulk Electric System rated at 100kV or above) the associated primary/System 1 and secondary/System 2 protective schemes to have a minimum redundant:

- Connected CTs (where available)
- PT secondary (where available)
- DC control circuits
- Auxiliary trip relays
- Circuit breaker trip coils (where available)
- Communication circuitry.

- All changes to topology, including generation, must be modeled during the Phase 1 study for PRC-027 compliance. A protection system coordination study is required for new BES buses or when there is a 15% (or greater) change in fault current for an existing BES bus. Setting changes may be required per the outcome of this coordination study.
- Relay and protective equipment, telecommunications equipment, and Supervisory Control and Data Acquisition (SCADA) to comply with ComEd's Applicable Technical Requirements and Standards. 345kV L.92203 will require two Single Mode Fiber paths from TSS 922 Pecatonica to the developer substation control building AG2-516. One fiber path will be dedicated for System 1 relays/schemes, and the other will be dedicated for System 2 relays/schemes. These fiber paths will need to be physically diverse from each other, and each should contain a minimum of 48 Single Mode Fibers. Both fiber cables will be owned and maintained by the Project Developer, and the demarcation of ownership will be in an FDP within the TSS 922 Pecatonica control building.
- Power output from the Project Developer site shall be in accordance with the power quality standards contained in the IEEE Standard 519. The generating units and all associated equipment at the Project Developer site shall not introduce any distortion of ComEd's waveform or telephone or carrier interference that is inconsistent or conflicts with such standard.

B. Transmission Owner Facilities Study Results

The following is a description of the planned Transmission Owner facilities for the physical interconnection of the proposed AG2-516 project to ComEd transmission system. These facilities shall be designed according to ComEd Applicable Technical Requirements and Standards. Once built, ComEd will own, operate, and maintain these Facilities.

1. TRANSMISSION OWNER INTERCONNECTION FACILITIES:

The ComEd Interconnection Facilities will include, but not limited to, the following:

- A 138kV dead-end structure and foundation within the fence of the Interconnection Substation, to terminate the Project Developer's generator lead line.
- Line conductor from the dead-end structure to the bus position in the switchyard of the interconnection substation.
- One (1) Motor Operated Disconnect (MOD) switch. Disconnect switch shall have a minimum nameplate capability of 3126/3366/4023/4806 A (747/805/962/1149 MVA) SN/SLTE/SSTE/SLD.
- Three (3) metering CTs, three metering PTs, or a combination unit, meters, and associated equipment to meter L.92203.

- Install equipment necessary to provide bi-directional revenue metering (kWH, kVARH) and real time data (kW, kVAR, and circuit breaker status and 138kV voltage) for 138kV L.92203, on the ComEd side of the POI per ComEd applicable standards.

- Three (3) surge arrestors.
- Foundations and structures.

2. STAND ALONE NETWORK UPGRADES

For new interconnection substation:

TSS 922 Pecatonica Interconnection Substation

A new ring bus substation, TSS 922 Pecatonica 138kV, will be constructed along the L.17121 138kV transmission line to interconnect the project with the ComEd transmission system.

- Two (2) 345kV transmission line dead-end structures with testing to check proper phase and identification is correct.
- Six (6) 345kV station class surge arresters.
- The substation relaying will employ IEC 61850 “Generation 2” design using GOOSE tripping (all ComEd schemes). During detailed engineering, consult Relay Engineer for latest standards and reference prior ComEd projects.
- For 138kV line L.17121 terminal to TSS 171 Wempletown, install System 1 11-1/SEL-421-5 and a System 2 11-2/SEL-311C-1 step distance relaying scheme per GDD1936. Utilize full 3000:5 CT ratio for both systems of line relaying. Install appropriately sized wave trap, line tuner, CCVT with Carrier accessories, and other Carrier equipment required including 61850 model RFL GARD Direct Comparison Blocking (DCB).
- For 138KV L92201 terminal to TDC 386 Pecatonica, install dual SEL-411Ls to perform step distance protection for line tap (L92201) going to TDC 386 Pecatonica (~0.5 miles). Add a new Fiber path, Single Mode Fiber, minimum count of 48 for each cable, ComEd owned/maintained, between TSS 922 Pecatonica and TDC 386 Pecatonica for line L92201.
- For 138kV line L.92203, install System 1 87L-1/SEL-411L-1 and a System 2 87L-2/SEL-411L-1 current differential scheme. Utilize full 3000:5 CT ratio for both systems of line relaying. In addition, install load rejection logic such that transfer trip is initiated on both System 1 and System 2 relaying to Project Developer site if both BT1-2 and BT2-3 at TSS 922 are opened (referred to GDD 4003 for load rejection design).
- For 138kV line L.92205 (formerly L17121), install System 1 11-1/SEL-421-5 and a System 2 11-2/SEL-311C-1 step distance relaying scheme per GDD1936. Utilize full 3000:5 CT ratio for both systems of line relaying. Utilize wave trap for DCB on System 1. Install appropriately sized wave trap, line tuner, CCVT with Carrier accessories, and other Carrier equipment required for L.92205 at TSS 922 Pecatonica. In addition, install load rejection logic such that any of the below conditions occur (logic via 52b breaker aux contacts: 138kV BT 1-2 and BT 2-3 breakers are open.
- For all new outdoor 138kV GCBs, for SCADA controls and 50BF/79/25 functions, use dual SEL-451 relays for S1 and S2. Hardwire Bus pots to SEL-451 for synch closing. Hardwire critical gas trips to breaker MODs. Auto-reclosing will be enabled on all Overhead lines, if applicable. Both relays will be in a relay cabinet to be located near the breaker with MB

connection between relays and wired to trip and close the CB. The relays can also be located inside the control building depending on the station layout. Utilize 3000:5 C800 CTs for all new 138kV SF6 gas circuit breakers.

- Install a SEL-2411 relay for Remote Trip, Close, “89a”, “89af”, “89b”, & “89bf’ statuses to be sent to SCADA. Include local FDP in the cabinet with redundant single mode fibers.
- All 138kV circuit breakers are required to have a SEL-2411 relay pre-installed inside of the breaker control cabinet for monitoring. Multimode fiber from the yard to the control building is required.
- Four (4) 138kV circuit breakers with a minimum nameplate capability of 3126/3366/4023/4806 A (747/805/962/1149 MVA) SN/SLTE/SSTE/SLD continuous, and interrupting capability of 63kA at -40°F. Circuit breaker to be equipped with a motor operated disconnect switch (MOD) on both sides of the breaker. All equipment associated with the breaker termination should meet or exceed the thermal capability of the breaker including CB disconnects, leads, CTs, metering, relays, etc. Nameplates to reflect actual maximum capability of equipment (NOT minimum requirements specified).
- Twelve (12) 138kV motor operated breaker disconnect switches: one (1) on each side of the 138kV circuit breakers and one (1) for each 138kV transmission line (L.92201, L.92203, L.92205, L.17121). These disconnect switches shall have the same minimum thermal capability as the circuit breakers above
- Twelve (12) 138kV CCVT’s, 1200:1, without carrier accessories used for System 1 and System 2 relay protection (3 CCVT’s for each 138kV Bus).
- Foundations and structures for all new equipment.
- A 138kV control building to ComEd specifications to accommodate 125 VDC battery system, DC distribution panels, relay panels, communication, SCADA, metering equipment, marshalling cabinet, aux AC power panels, building HVAC system, fire/security system, and battery monitoring. Building shall be masonry or precast
- Fiber, All Network devices to be installed with provisions for the future devices.
    - Only Station Bus Fiber to be used.
    - All Station Bus fiber will be run in Panduit covered fiber through and will be OM3 50mm MM Fiber, 12 count jumper.
    - Jumpers will be spliced in a Main FDP Cabinet. One Main FDP for each A & B Network. Main FDP will have LC Connected jumpers to the SDN Switches.
    - Remote end of OM3 fiber jumpers will be spliced into a Corning DIN Rail Mount FDP.
    - Local LC Connectors will be used to go between the Local A or Local B FDP to the S1 and S2 5A & 5B ports respectively.

SCADA network will be based on IEC61850 design for previous ComEd projects.

- Install one (1) SCADA Cabinet that contains:
    - One (1) Raymar-Telenetics modem and Black Box Splitter
        - Three (3) serial connections from RTU RTAC and two (2) from ENG RTAC.
    - One (1) SEL-3555 RTU RTAC (3555#QP5W)
        - Install one pair of serial fiber connections for each Project Developer RTU data

exchange to be coordinated with ComEd SCADA Engineering:

- Breaker statuses
- MW, MVAR, MWh and voltage values

  - One (1) SEL-3555 ENG RTAC (3555#QP5W) with mouse, keyboard, and monitor on the engineering desk
  - One (1) SEL-3555 PDC RTAC (3555#QP5W)
  - Two (2) SEL-3555 HMI RTAC (3555#QP5W) with mouse, keyboard, and monitor on the operator desk
  - One (1) Omicron Station Scout RBX1
  - One (1) Local/Remote Switch, wired to I/O DPAC 1 IN101
  - One (1) SEL-3350 Blueframe with DMA
  - ComEd-owned revenue meter shall connect to IP switch architecture.
- Install Two (2) Station Bus Cabinets, each with:
  - One (1) SEL-2488 GPS Clock
  - One (1) SEL-3350 Blueframe with Flow Controller
  - SEL-2741 Station Bus Switches
    - Number of switches to be determined in deteailed engineering design.
  - One (1) SEL-2440 I/O DPAC, 48 Digital Inputs
  - One (1) RSG-910C Access Switch
- Install One (1) Desk Hoffman Box with:
  - DC to AC Inverter
  - One (1) 2x2 Ethernet RJ45 Patch Box with connections to:
    - Station Bus A via RSG-910C
    - Station Bus B via RSG-910C
    - SCADA WAN via SEL-2731
    - Corporate Access via UCOMM patch panel
- Install one (1) Operator Desk with:
  - Two (2) 27” Monitors (HMI 1 and HMI 2 RTACs)
  - Two (2) Keyboard and Mouse
  - One (1) Ergotron LX Dual Mount Stacking Arm
- One (1) Engineer Desk with:
  - Two (2) 27” Monitors (ENG RTAC and Spare)
  - Two (2) Keyboard and Mouse
  - One (1) Ergotron LX Dual Mount Stacking Arm

- One (1) UCOMM Rack
    - One (1) Nokia 7705 SAR-H MPLS Router
    - One (1) Checkpoint 1570R Firewall
    - One (1) SEL-2730U Corporate Access Switch
- Connect metering group-provided revenue meter to station IP architecture.
- Witness testing by ComEd is required and must be scheduled 90 days in advance.
- For any new equipment connected to the Bulk Electric System, rated at 100kV or above, ComEd requires the associated System 1 and System 2 protective schemes to have a minimum redundancy; connected CTs, PTs, DC control circuits, auxiliary trip relays, circuit breaker trip coils, and communication circuitry.
- Dedicated site drainage pond shall be provided for the new TSS 922 Pecatonica substation in addition to the substation footprint and to be exclusively used by ComEd.
- Drainage pond property and storm water piping system shall be conveyed to ComEd.
- The Project Developer will be responsible for the cost of security system design and installation. Substation security level and requirements shall be assigned/determined by Exelon Security Operations. All fencing and security design shall be coordinated with and approved by Exelon Security team
- All relaying is to be in accordance with PJM Protection Standards.
- All new or upgraded facilities are to be in accordance with the PJM Transmission 7 Substation Design Subcommittee Technical Requirements.
- It is the responsibility of the Project Developer to obtain any permitting required for this project. See environmental section for details.
- Bus, insulators, supports, and equipment leads shall follow ComEd standards.

Installation of Auxiliary Power Services (3PH – 12kV)

- Normal Source – R8601 – Existing 3-phase circuit originating out of TDC 386 Pecatonica runs along East side of N Pecatonica Rd. Due to proximity to new station, it is assumed this will be the normal source for auxiliary power. The proposed tap location is between F# 283161X2 and tap to TR 283161A2. New facilities to consist of approximately 1,200’ of new duct and UG cable. Proposed padmount transformer sizing is assumed to be 500KVA.
- Emergency Source – B552 – Proposed tap location is located near the intersection of N Pecatonica Rd and Farm School Rd. New facilities include a terminal pole set West of EMC# 282204S275 and approximately 24,500’ of new duct and underground cable. Proposed padmount transformer sizing is assumed to be 500KVA. Capacity Planning approval required for both load additions. There are currently only 2 circuits originating from TDC 386 Pecatonica. Due to source diversity concerns, it is assumed that utilizing R8602 for an emergency source is not viable even though it would reduce overall scope distances. It is also assumed that an underground solution for B552 would be desired to eliminate multiple scope portions being associated with the same overhead pole line. Installation type may be able to be updated pending Capacity Planning approval/feedback.

3. NETWORK UPGRADES

The Wempletown - Lancaster 138kV line will be cut and looped into the new interconnection substation. The new conductor type will be 1113 kcmil ACSR and the new shield wire type will be 7#6 Alumoweld. Approximately 0.73 circuit miles of conductor and shield wire will be installed to facilitate the cut-in.

The following structure replacements and installations are required for the cut-in to TSS 922 Pecatonica substation.

Structure Number	Line Number	Existing Structure Type	Comments
81	17121	90' LS1227	Replace with new single-circuit vertical configuration deadend steel pole
81D	17121	N/A	Install new single-circuit delta configuration deadend steel pole
81E	17121	N/A	Install new single-circuit vertical configuration deadend steel pole
81F	92205	N/A	Install new single-circuit horizontal configuration deadend steel pole
81G	92205	N/A	Install new single-circuit vertical configuration deadend steel pole
82	92205	80’ LS1231	Install new single-circuit vertical configuration deadend steel pole
82D	92205	N/A	Install new single-circuit delta configuration deadend steel pole
83	92201	40' EM10396	Replace structure to the south of existing structure
83D	92201	N/A	Install new single-circuit horizontal configuration deadend steel pole
83E	92201	N/A	Install new single-circuit vertical configuration deadend steel pole
83F	92201	N/A	Install new single-circuit delta configuration deadend steel pole

Upgrades to neighboring facilities:

TSS 119 Lancaster

- For existing 138kV L92205 (Former L17121), upgrade existing line relays System 1 SEL-321-1 relay to a SEL-421-5 & System 2 P443 relay to SEL-311C per GDD1936. System 1 communication will be via Power Line Carrier (PLC).
- Replace existing line CB SEL-251C & SEL 279H relays with new SEL-451-5 relay to perform 50BF & 79 functions. Revise reclosing settings as needed
- Install new appropriately sized wave trap, line tuner, CCVT with Carrier accessories, and other Carrier equipment required for L17121 at TSS 922 Pecatonica.
- Relabel 138kV L17121 to L92205 (physical labels and station prints).
- Review and reset 138kV L92205 (old L17121) relay settings.
- Update substation labels and mimic panel to reflect new line number and remote end.
- Install one (1) new SCADA SEL-3350 RTAC with local remote switch
- Replace existing Magnum 6K25 Master Switch with RST-2228 and install dual RST-2228 Aux Switches for new IP relays.
- Replace existing SEL-2407 GPS Clock with SEL-2488.
- Install SEL-2440 DPAC for hardwired alarms
- Update substation labels and mimic panel to reflect new line number and remote end.

TSS 171 Wempletown

- Install appropriately sized wave trap, line tuner, CCVT with Carrier accessories, and other Carrier equipment required including IEC61850 model RFL GARD DCB.
- Reuse existing 138kV L17121 SEL-421-5 & SEL-311C-1 relays to maintain existing protection scheme per GDD1936. System 1 communication to be accomplished via PLC.
- Reuse 138kV L.17121 CB 50BF/25/79 SEL-451-5 relay. Revise reclosing settings as needed.
- Update substation labels and mimic panel to reflect new line number and remote end.

TDC 386 Pecatonica

- Install dual SEL-2411 to transmit/receive DTT via MB to/from TSS 922 Pecatonica.
    - Enable Circuit Switcher Failure (CSF) scheme to transmit transfer trip via Mirrored Bit (MB)-direct fiber connections to TSS 922.
    - Install one (1) fiber distribution panel (FDP) to terminate new 48-count fiber to/from TSS 922 Pecatonica.
- Install one (1) new SEL-3350 RTAC with local remote switch.
- Install one (1) new RST2228 Master Switch.

- Install one (1) SEL-2488 GPS Clock.
- Install one (1) SEL-2440 DPAC.

Installation of fiber cable circuits

- Build two separate Single Mode Fiber paths between TSS 922 Pecatonica and the AG2-516 substation building. One fiber path will be dedicated for System 1 Relay/schemes, and the other will be dedicated for System 2 Relays/schemes. These Fiber paths will need to be physically diverse from each other, and each should contain a minimum of 48 Single Mode Fibers. Both of these Fiber cables will be owned and maintained by the Project Developer, and the demarcation of ownership will be in an FDP within the TSS 922 Pecatonica control building.
- Build Fiber path between existing TDC 386 Pecatonica and proposed TSS 922 Pecatonica substations. The proposed route between stations runs along N Pecatonica Rd and consists of approximately 2,400' of new duct and underground fiber. There are no existing fiber facilities within the project extents. If redundant paths between stations are desired, duct layout can be split to account for independent pathways. New fiber to be Single Mode, minimum 48-ct. This path is to be owned and maintained by ComEd and separate from any Project Developer fiber installations.

4. OTHER SCOPE OF WORK

This section is not applicable.

5. MILESTONE SCHEDULE FOR COMPLETION OF ComEd WORK

Facilities outlined in this report are estimated to take 48 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	16
Permitting	16	36
Construction	36	48

6. ASSUMPTIONS IN DEVELOPING SCOPE/COST/SCHEDULE

- ComEd estimate does not include costs of design and construction of AG2-516 Kestrel Solar substation, and transmission as described in IC scope of work. ComEd estimated schedule is based on GIA/CSA contract being executed by all parties.

- ComEd estimate assumes that TSS 922 Pecatonica is low impact site (low security requirements). Chain linked fencing, non-motorized gate and no cameras.
- This study assumes that pursuant to PJM's site control requirements, the Project Developer is responsible for the acquisition of any land rights required for construction of a new substation.
- This cost estimate assumes that work will be performed during normal weekdays and with no overtime. Transmission line outages for construction have not been identified, but generally are available from September to May. These outages are controlled by PJM.
- Costs are based on 2026 rates and do not reflect a potential increase in Labor or Material costs after 2026.
- Foundation design assumes typical soil conditions at locations and will be subject to change after soil boring tests.
- The Project Developer will be responsible to request and bear the cost for relocation of existing transmission or distribution lines (including structures and other facilities) that may be required for transmission line crossings, the transport of any large equipment, such as turbines, rotors, turbine structures, cranes, etc. Formal submittal of this request to ComEd's TSO for ultimate review by PJM can be made 7 months prior to back feed request date.
- It is assumed no underground conflicts exist in the area of the new substation. Survey of the property will be acquired. Project Developer will be responsible for the cost of this survey.
- All upgrades to facilities included in this document will be required to meet latest ComEd standards.
- ComEd cost estimate is valid for six (6) months after Facilities Study release by PJM.
- Upgrades are subject to change based on detailed design development.
- It is assumed that ComEd facilities included in this document will not require a sound study
- TSS 922 Pecatonica shall be designed for a 100 yr bfe + 3ft at minimum. A flood study should be done early on to determine if any flood mitigations are needed such as elevating foundations. Due to the proposed location and proximity to a river, it is critical the substation design and layout is located in a suitable area that will have arrangements for proper storm water managements.
- ComEd will complete pre-design and post construction survey for the transmission and substation upgrades, as required. This includes, but is not limited to, the LIDAR survey and video imaging for transmission lines. Costs associated with this are at the expense of the Project Developer. Pre-design survey must be completed prior to detailed engineering.
- ComEd will complete geotechnical soil borings, resistivity study, and analysis for substation and transmission upgrades. Costs associated with this are at the expense of the IC.
- This study assumes the Project Developer will remove any trees and mitigate any wetlands present in the property that would restrict the cut-in to new TSS 922.
- Project Developer to upload as-built drawings to ComEd drawing system (Meridian).
- This Facilities Study is time dependent. If the project is not into construction within one year of the issuance, the study will be void and the project re-studied, requiring the completion of a new Facility Study.

- This document assumes that Project Developer has completed, tested, and conveyed to ComEd the new TSS 922 substation (per ComEd guidelines) and transmission line tie-in up to the existing ComEd right of way to allow for the 345kV line energization and back feed.
- All real property conveyed in fee to ComEd must be remediated to and all real property to which real property rights are transferred to ComEd (as determined in ComEd's discretion) must be remediated to IEPA's Tiered Approach to Corrective Action.
- Assume previous SWAT project to install high side circuit switcher and transformer protection package at TDC 386 Pecatonica.
- ComEd Capacity Planning to confirm the "normal" and "emergency" designations for the auxiliary power sources during detailed engineering.
- Shielding masts to prevent direct lightning strikes are required per ComEd standard.

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 AG2-516 GIA, and in PJM Manuals M01 and M14D. The details of applicable revenue metering requirements are given in the 'ComEd Interconnection Guidelines' posted on PJM website.

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

- REVENUE METERING FOR PJM AND COMED
    - The revenue meter measures the wholesale energy output (Hourly compensated net MWH and Hourly compensated net MVARH) of the Generating Facility.
    - The metering equipment, including revenue meter and CT/PT shall be installed, at Project Developer's expense, at the interconnection substation on ComEd side of the Point of Change in Ownership.
    - ComEd shall own, operate, maintain, inspect, and test all the metering equipment as set forth in 'Testing of Metering Equipment' section of the PJM Tariff, at the Project Developer's expense.
- REAL-TIME METERING FOR PJM
    - The Project Developer shall install, own, operate, maintain, inspect, and test real-time metering equipment to measure and transmit directly to PJM the real time MW, MVAR, voltage and status of electrical equipment such as circuit breakers and Motor Operated Disconnect switches, in conformance with the requirements listed in PJM Manuals M-01 and M-14D, at the Project Developer's expense.
- RETAIL METERING FOR COMED
    - The AMI Meter measures the energy consumption by the Project Developer at transmission level and hence shall be designed to measure low MW flow.
    - The metering equipment including AMI Meter and CT/PT shall be installed at the interconnection substation on ComEd side of the POI, at the Project Developer's expense.
    - ComEd shall own, operate, maintain, inspect, and test all the metering equipment as set forth in the 'ComEd Interconnection Guidelines'.

8. LAND REQUIREMENTS FOR INTERCONNECTION SUBSTATION

Land requirements for the Interconnection Substation needed for this interconnection project must meet the requirements in the 'ComEd Interconnection Guidelines' and 'Guidelines on Land Requirements for Interconnection Substation' posted on PJM website.

Upon completion of the construction and installation of the interconnection substation, the tie-line, access road, stormwater detention facility and related improvements and facilities, and the satisfactory completion of testing of the interconnection substation acceptable to ComEd, the Project Developer shall transfer all the Property Rights and Permits to ComEd, at no cost or expense to ComEd, pursuant to documentation that is acceptable to ComEd, including (without limitation) the Property Transfer Documents in fee simple.

All real property conveyed in fee to ComEd must be remediated to and all real property to which real property rights are transferred to ComEd (as determined in ComEd's discretion) must be remediated to IEPA's Tiered Approach to Corrective Action Objectives (TACO) Tier 1 residential remediation standards.

Pursuant to PJM's site control requirements, the Project Developer is responsible for the acquisition of any land rights required for construction of a new substation. As such, the estimated total cost and schedule contemplated by this Facilities Study Report does not include the estimated cost and time necessary for the acquisition of any such land rights.

9. APPLICABLE TECHNICAL REQUIREMENTS AND STANDARDS

- ComEd Interconnection Guidelines (For Generators at Transmission Level), Rev. 2, Dated 12/16/2021
- ComEd Guidelines on Land Requirements for Interconnection Substations, Rev. 2, Dated January 2026

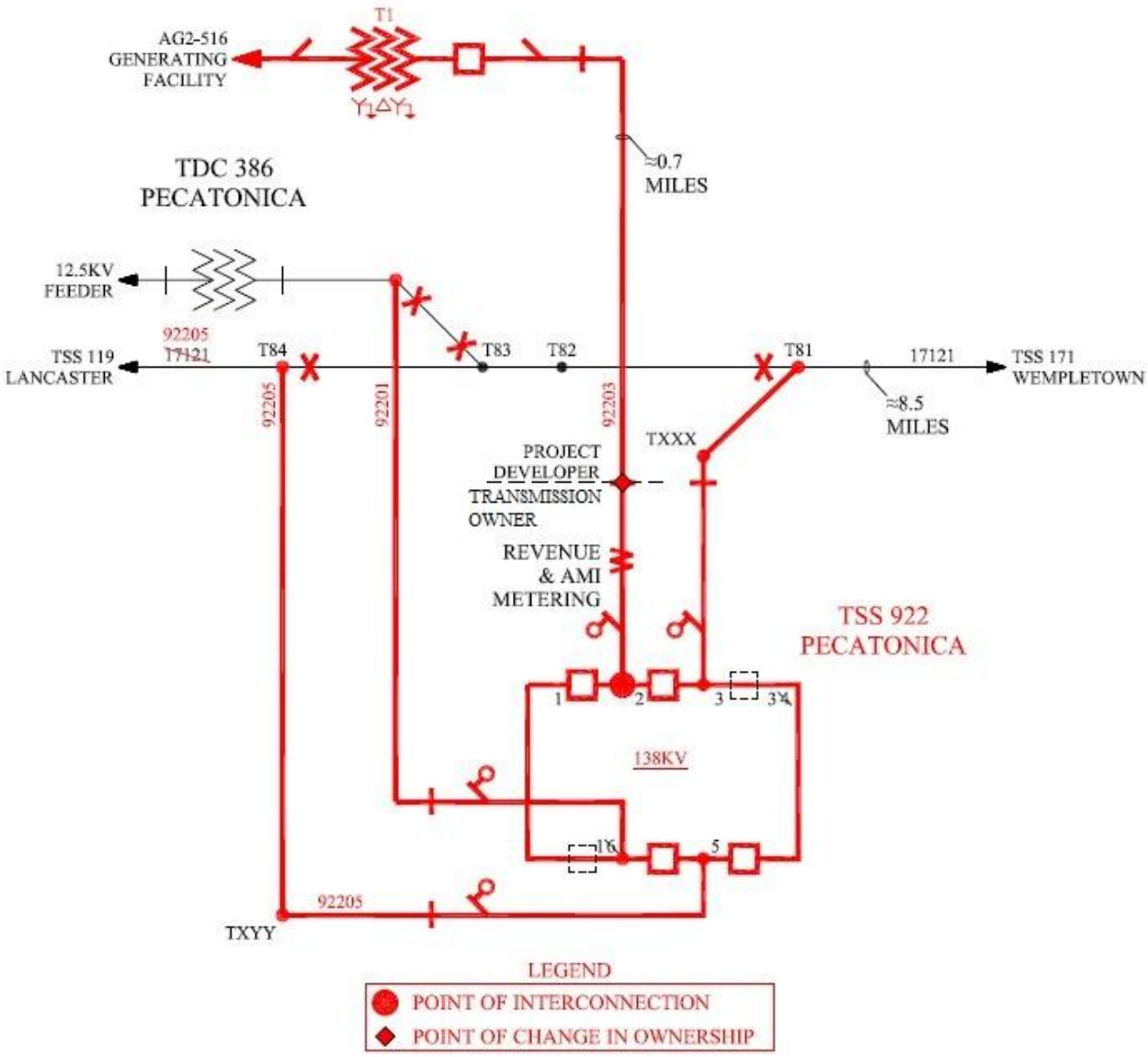
10. ENVIRONMENTAL AND PERMITING

- The Project Developer will be responsible to obtain all environmental approvals and permitting required for the construction of TSS 922 Pecatonica, AG2-516 Generating Facility, and 345kV L.92203
- ComEd will be responsible to obtain all environmental approvals and permitting required for L.92205, L.17121, and L.92201 work. This includes any endangered species studies and monitoring, as required. Costs associated with this permitting are at the expense of the Project Developer.
- The Project Developer will be responsible for site restoration required for substation and transmission upgrades. This includes, but is not limited to road restoration/improvements, wetland restoration, and farm field restoration/crop damage. Costs associated with this are at the expense of the Project Developer.
- The Project Developer will be responsible for the cost to purchase real estate or obtain the necessary right-of-way easement for all upgrades associated with this project. These associated upgrades are not included in the costs listed in this study.

- The Project Developer will be responsible for remediation costs for locations found to have environmental contaminations and remediation. This may require contaminated soil disposal as well as lead paint removal for existing structure work.
- It is assumed that all necessary permits will be obtained in a timely manner to allow engineering and construction to proceed according to the Milestone Schedule.
- It is assumed that conveyance of property and rights will be obtained to support the PJM Transmission Outage Schedule.
- It is assumed that the required Environmental Study will yield no impediments to the development of the site.
- ComEd will complete geotechnical soil borings, resistivity study, and analysis for substation and transmission upgrades. Costs associated with this are at the expense of the Project Developer.

C. APPENDICES

Attachment #1: Single line Diagram for the Physical Interconnection


T1
AG2-516
GENERATING
FACILITY
TDC 386
PECATONICA
≈0.7
MILES
12.5KV
FEEDER
92205
17121
TSS 119
LANCASTER
T84
T83
T82
T81
17121
TSS 171
WEMPLETOWN
≈8.5
MILES
92205
92201
92203
TXXX
PROJECT
DEVELOPER
TRANSMISSION
OWNER
REVENUE
& AMI
METERING
TSS 922
PECATONICA
1
2
3
3A
138KV
1A
5
92205
TXYY
LEGEND
POINT OF INTERCONNECTION
POINT OF CHANGE IN OWNERSHIP