

Generation Interconnection Request
Combined Feasibility / System Impact
Study Report

Queue Position #T86
Bradford 34.5 kV
(North Towanda)
1.6 MW
(1.5 MW Capacity)

March 2008

General

Northern Tier Landfill has proposed the replacement of their existing 800 kW methane fired generator at their facilities in Burlington County, Pennsylvania (shown in Figure 4 of the Appendix) with a 1.6 MW unit. This generation has a proposed in-service date of July 1, 2008. The Queue Position #T86 project was studied as an injection of 1.5 MW at the existing Northern Tier Landfill facility on the Milan 34.5 kV circuit, which is fed out of North Towanda substation. Queue Position #T86 was evaluated for compliance with reliability criteria for summer peak conditions in 2012

Direct Connection

It is proposed that the project be connected at the present 34.5 kV metering point for the plant facilities of Northern Tier Landfill located at RR3 Box 324, Troy PA, 16947 (shown in Figure 4 of the Appendix).

Northern Tier Solid Waste Authority is responsible for constructing all of the facilities on its side of the Point of Interconnection. The Point of Interconnection is between the 34.5 kV line and generating plant substation, which is the 34.5kV switch. It will be the developer's responsibility to obtain any needed right-of-way between the plant site and FirstEnergy's facilities.

The proposed Interconnection Facilities must be designed in accordance with the FirstEnergy "Requirements for Transmission Connected Facilities" document located at the "FirstEnergy" link on the web page located at:

<http://www.pjm.com/planning/trans-standard.html>

The Interconnection Customer must request access to the document listed above from PJM in order to receive the necessary password for access to the document.

Operational metering is also required for this generation connection. These requirements are also outlined in FirstEnergy "Requirements for Transmission Connected Facilities" document. Existing revenue metering has been determined to be adequate for this project. Therefore, since no changes are required, there will be no costs to the developer for revenue metering.

Direct Transfer Trip (DTT) using a developer provided communications channel is required from Penelec's North Towanda Substation and Penelec's Saco Road Recloser on pole# 6N-665 that feed the generator. The type of communication channel shall be specified and/or approved by FirstEnergy. Currently, the generator would be fed from the North Towanda substation and the cost estimates provided assume that DTT will be from North Towanda substation and the Saco Road Recloser. The DTT scheme will trip the 480V low – side transformer breaker at Northern Tier's facility for any operation of either the 34.5 kV Milan breaker at Penelec's North Towanda Substation or Penelec's 34.5kV Saco Road Recloser on pole# 6N-665.

Below are conceptual estimates for the engineering/construction associated with Direct Connection requirements.

Item	Description	Conceptual Cost Estimate
1	Relay and control work at East Towanda substation and at the Saco Rd. Recloser to accommodate the connections into the DTT scheme provided by the developer.	\$ 150,000 (Refined Estimates TBD)
2	Revenue metering	Existing revenue metering is adequate for this project \$0

Conceptual Estimate: \$ 150,000 (Refined Estimates TBD)
 Estimated Lead Time: TBD from signed IA

Notes:

- Detailed Engineering & Construction Estimates to be provided during detailed engineering associated with work to be performed during construction of the project under the Interconnection Construction Service Agreement (The Interconnection Customer must provide additional information on the DTT scheme for detailed engineering estimates to be provided)
- The above estimates do not include 1) tax gross-up, 2) property costs and site development up to rough grade which is to be provided by the developer, 3) interconnection metering and generation SCADA to be provided by the developer, 4) engineering and field activities for design review and commissioning of the developer’s facilities, and 5) real estate costs that may be required for right-of-way easements to extend the single circuit 34.5 kV line.

Outstanding issues that need to be resolved prior to the start of construction activities are as follows:

1. An updated One-Line Diagram that shows PTs connected to the 480 volt main bus that will be used as a synchronism input to the generator relay.
2. An interlocking scheme between the 480 volt transformer low-side circuit breaker and the 480 volt generator circuit breaker, such that the 480V transformer low-side circuit breaker can only be closed when the generator circuit breaker is open.
3. The existing 34.5kV high-side 50E Power Fuses will need replaced with S&C Standard Speed 40E Power fuses. Developer to determine the type of existing fuse holder.
4. As stated above, the Developer shall provide to First Energy Corp. the manufacturer’s specifications on the Direct Transfer Trip (DTT) they propose to use to accomplish the DTT scheme described above. First Energy Corp. will then provide a detailed cost estimate for Penelec personnel to connect the DTT equipment to the equipment at North Towanda Substation and at the Saco Road Recloser on pole# 6N-665. Developer will provide technical assistance, if requested, to commission the DTT Scheme equipment at the Penelec Facilities.
5. The 480V Automatic Transfer Switch that connects the normally open (NO) 100kW Generator with 400 amp panel DP1 and the main 1.6MW generator bus shall be an “Open Transition”. It shall not be permitted to be a “Closed Transition switch.

Figure 1 in the Appendix provides a conceptual one-line of the direct connection facilities needed.

Network Impacts

The Queue Position #T86 project was studied as total injection of 1.5 MW into the 34.5 kV Milian circuit out of North Towanda substation. Note that the project was modeled at the East Towanda 34.5kV facility for the PJM portion of the study as this is the most accurate point possible in PJM's model. Queue Position #T86 was evaluated for compliance with reliability criteria for summer peak conditions in 2012. Potential network impacts were as follows:

Generator Deliverability

(Single or N-1 contingencies for the Capacity portion only of the interconnection)

No identified problems.

Multiple Facility Contingency – Tower line Outages (MAAC Criteria IIC)

(Double Circuit Tower Line, Line with Failed Breaker and Bus Fault contingencies for the full energy output)

No identified problems.

Single Contingency

No identified problems.

Contribution to Previously Identified Overloads

(This project contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

Stability and Reactive Power Requirement

Not required due to size of project.

Short Circuit

No identified problems.

New System Reinforcements

None required.

Contribution to Previously Identified System Reinforcements

(Overloads initially caused by prior Queue positions with additional contribution to overloading by this project.)

None.

Cost Allocation

Queue Position #T86 project will be responsible for 100% of the Direct Connection Network Upgrades costs. Conceptual estimates for the engineering/construction associated with direct connection were provided. However, the developer needs to provide additional information on the DTT scheme for detailed engineering estimates. There were no system reinforcements identified to accommodate interconnection of this project.

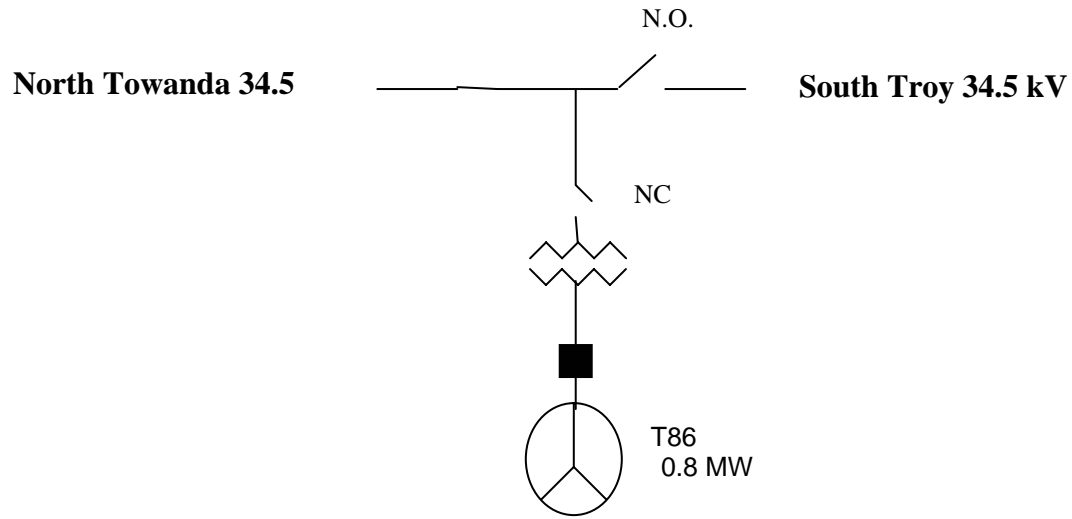
Summary

Conceptual estimates are provided under the assumption that the Point of Interconnection would be the existing 34.5kV switch for Northern Tier Solid Waste Authority. The generating unit site is located near RR3 Box 324, Troy Pennsylvania, 16947.

Direct Transfer Trip (DTT) using a developer provided communications channel is required from any substation that may feed the generator. Currently, the generator would be fed from the North Towanda substation and the cost estimates provided assume that DTT will only be from North Towanda substation. If the generator agrees to be disconnected from the 34.5kV system while Northern Tier Solid Waste Authority is fed from an alternate source, then DTT is not required from the other alternate sources (Alternate sources to feed this area are another circuit at Troy substation).

Figure 1

Existing



Evaluated

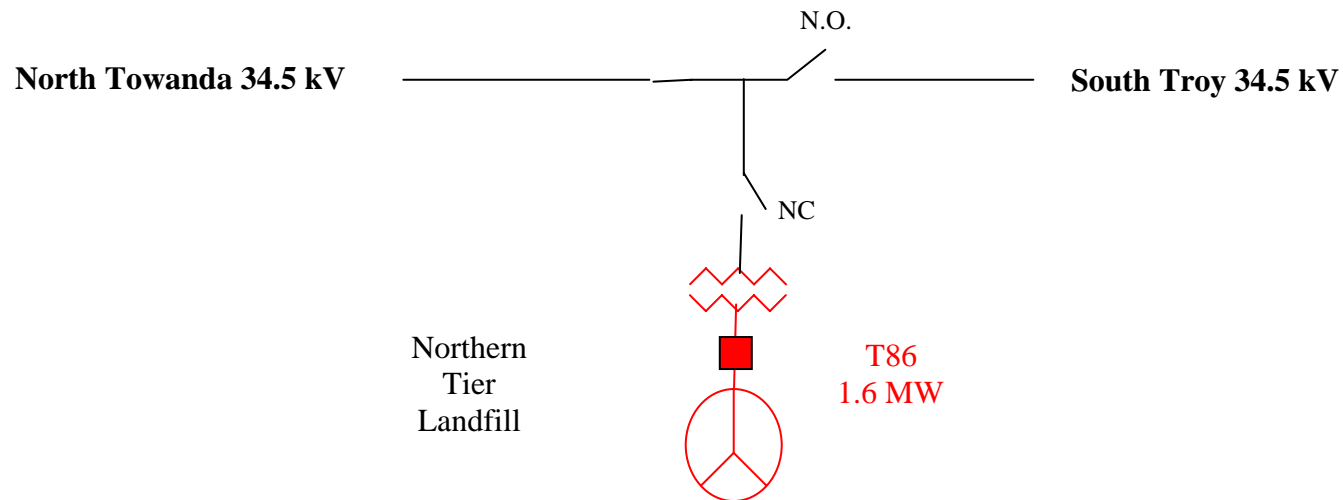


Figure 2
Geographic Depiction of North Towanda Substation

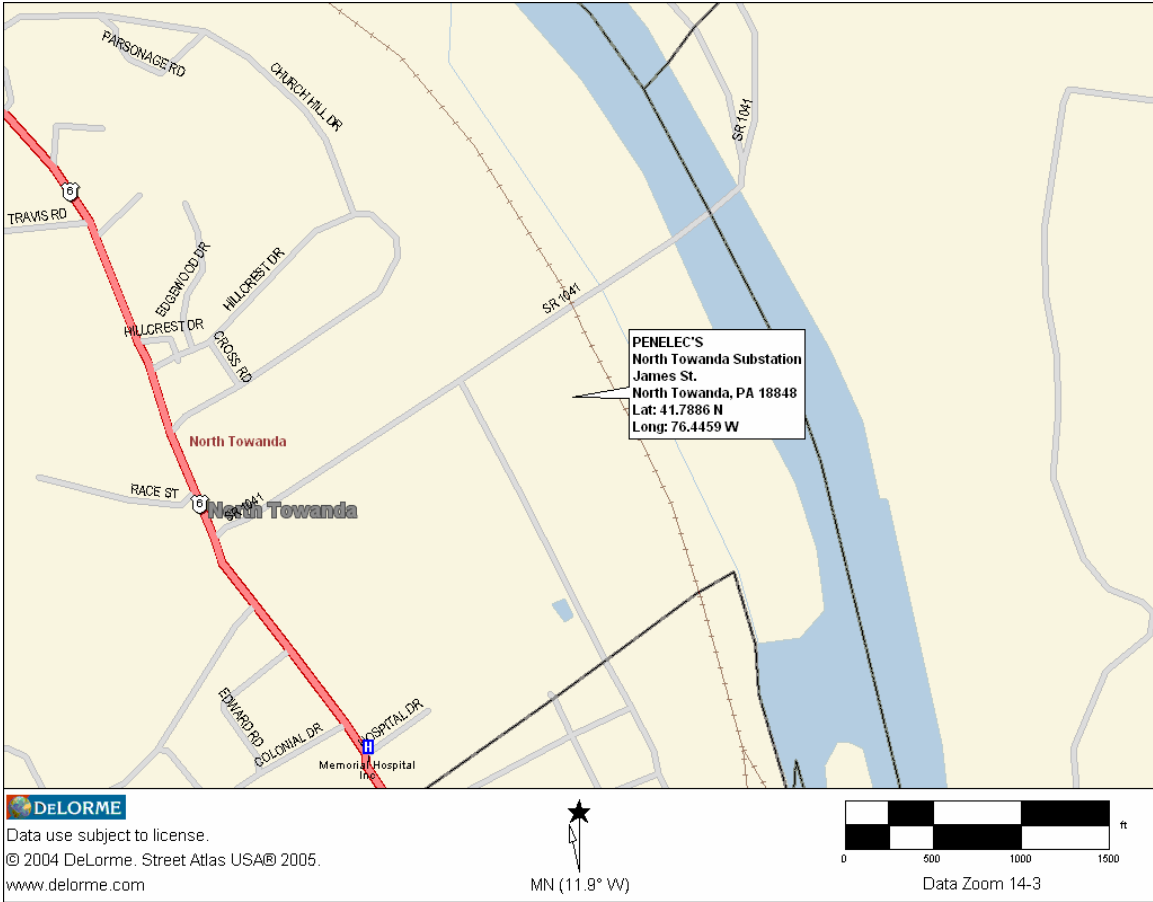


Figure 3
Geographic Depiction of Saco Road Recloser on Pole# 6N-665

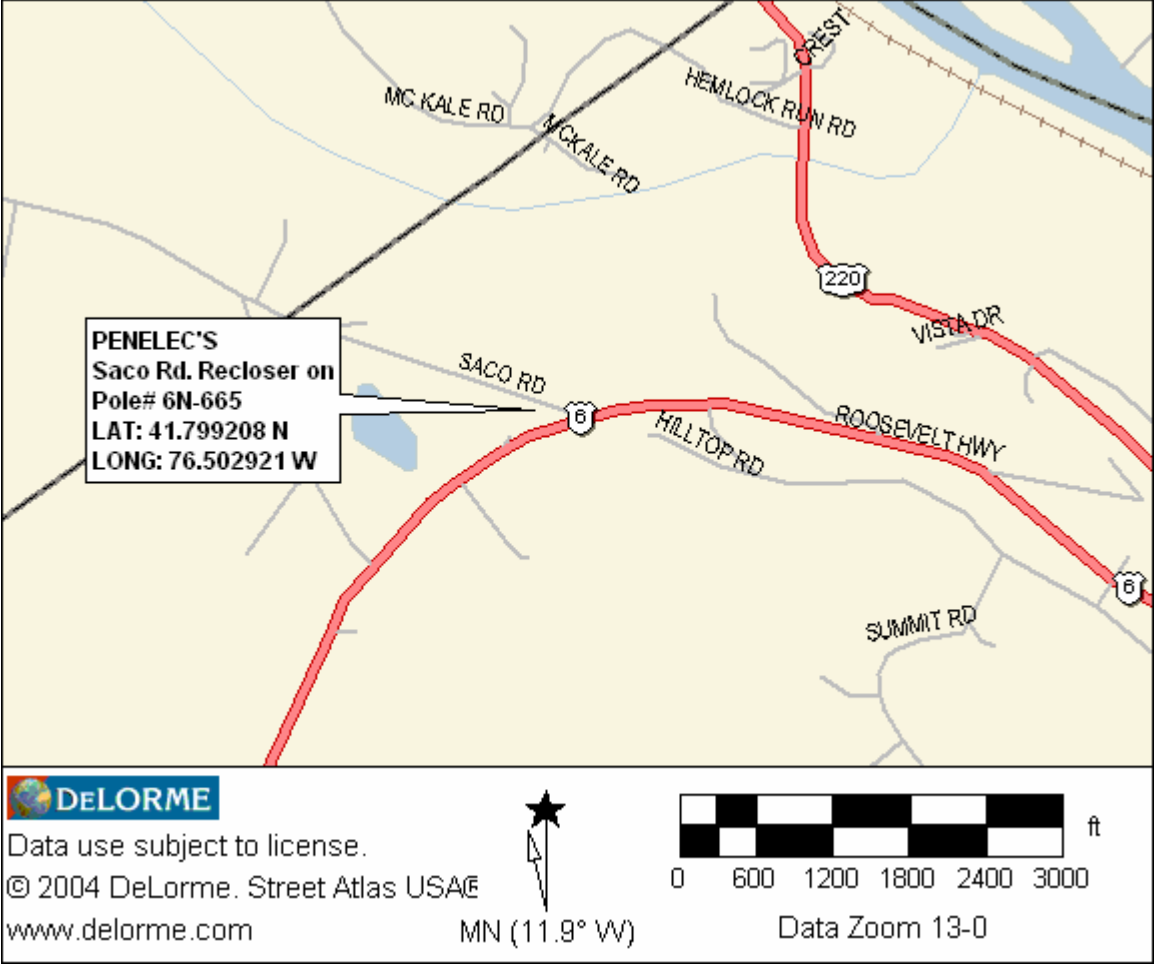


Figure 4
Geographic Depiction of Northern Tier Generation Site

