North Seneca Solar Project

ORES Permit Application No. 23-00036

1100-2.23 Exhibit 22

Electric and Magnetic Fields
Revision 1

Table of Contents

List of Appendices

EXHIBIT 22 ELECTRIC AND MAGNETIC FIELDS

The information presented in this Exhibit is derived from an electric and magnetic field (EMF) study (Appendix 22-A) prepared for the North Seneca Solar Project and addresses the requirements of Title 19 New York Codes, Rules and Regulations (16 NYCRR) §1100-2.23.

(a) Every Right-of-way Segment Having Unique Electric and Magnetic Field Characteristics

None of the electrical collection lines from the photovoltaic (PV) arrays to the collection substation will exceed 34.5 kilovolts (kV); therefore, the study did not examine rights-of-way (ROWs) for the 34.5 kV collection lines. However, the Facility will include new 115 kV overhead transmission line to connect the proposed collection substation to the proposed switchyard and a 115 kV overhead transmission line to connect the proposed utility POI switchyard to an existing National Grid (NG) multi-circuits 115 kV overhead transmission line. Modeling calculations identified existing EMFs and future EMFs that would result from the construction and operation of the transmission lines associated with the Facility.

The presumed right-of-way (ROW) width for the transmission interconnection from the POI switchyard to the existing transmission line is set at 150 feet.

A plan view map of the 115 kV line and ROW segments is provided in the attached Appendix 22-A Figure 1- Interconnection Aerial Image.

(b) For Each Right-of-way Segment, Base Case and Proposed Cross Sections Showing:

For the ROW segment, the EMF study (Appendix 22-A), provided both base case (where existing facilities are present) and proposed evaluations on a cross section within the alignment and the evaluated cross section is shown in the attached Appendix 22-A Figure 1 and Appendix 5-B in the 900 series Electrical drawings which includes, to scale, the following features:

- Existing National Grid overhead electric transmission, sub-transmission, and distribution facilities showing structural details and dimensions and identifying phase spacing, phasing, and any other characteristics affecting EMF emissions.
- Any known underground electric transmission, sub-transmission (i.e., 34.5 kV collection system), and distribution facilities.
- Facility ROW boundaries; and
- Geometry, details, and dimensions for all structures

(c) Enhanced Aerial Photos/Drawings Showing Exact Locations of Each:

Appendix 22-A provides an overview map of the ROW segment studied, showing plan view locations of the structures and facilities and distances from the ROW to the nearest residences.

(d) Electric and Magnetic Field Study

The results of the EMF study (Appendix 22-A) are described in the following sections.

(1) Licensed Professional Engineer

The final EMF study included in this Application is signed and stamped/sealed by Michael Nadeau, a licensed professional engineer registered and in good standing in the State of New York.

(2) Computer Software Program

The EMF Study used PLS-CADD 19.01 software to model the facilities and make the calculations.

(3) Electric Field Calculation Tables and Field Strength Graphs

The EMF Study modeled the strength and locations of electric fields to be generated by the Facility. Modeling was conducted at rated voltage, in this case 115kV. The measurement location was assumed to be 3.28 feet (1 meter) above grade, and the measurement interval was 5 feet. The EMF Study includes electric field strength graphs depicting electric fields along the width of the entire ROW out to 500 feet from the edge of the ROW on both sides. Software model calculation output tables and graphs are included as an attachment in the EMF Study.

(4) Magnetic Field Calculation Tables and Field Strength Graphs

The EMF Study modeled the strength and locations of magnetic fields to be generated by the Facility. Modeling was conducted at rated voltage, in this case 115kV. The measurement location was assumed to be 3.28 feet (1 meter) above grade, and the measurement interval was 5 feet. The maximum current flowing through National Grid existing lines is unknown currently. The amperage from the solar farm was modeled at the maximum conductor ampacity rated. For that reason, both segments analysis used maximum conductor ampacity of 907amps for conservatism and simplicity. Using this assumption, no expected change in amperage during summer, winter normal or emergency. Also, no expected changes during max. average annual load initially or max. average annual load @ 10 years out. See Appendix 22-A for additional details. Magnetic field strength graphs depicting magnetic fields along the width of the entire ROW and out to the property boundary of the Facility are included in the EMF study (see Appendix 22-A).

(5) Magnetic Field Calculation Tables and Field Strength Graphs for Maximum Annual Load within 10 Years

There is no expected change in amperage in maximum average load initially versus 10 years after initiation of operation. Therefore, the modeling of magnetic fields described in Section 22(d)(4) (including both the graphs and tables included in the EMF Study [Appendix 22-A]) is applicable to both initial operation and operation after 10 years.

(6) Base Case Magnetic Field Calculation Tables and Field Strength Graphs

The interconnection transmission lines will be constructed within the proposed Facility and connect to the adjoining National Grid ROW. The interconnect lines that connect the switchyard to the existing transmission line will have a defined width and the NY standards apply to these interconnect lines at the edge of the National Grid ROW.

(7) Conformance with Public Service Commission Interim Policy Standard

Based upon the study results, the overhead transmission line will meet the thresholds established by the Public Service Commission. The interconnect will create an electric field less than 1.6 kV/m as required at the edge of the ROW. The magnetic Field value for the field over the cable is less than the 200 milligauss threshold established by the Public Service Commission to be met at the edge of the ROW. Thus, the project does not exceed the required thresholds for any location within the ROW and meets the standards put forth by the Public Service Commission. The identified structures from the cable location were identified in the EMF Study and the distance from the facility. The electric fields beyond 500 feet are negligible.