

# **High Bridge Wind Project**

**Case No. 18-F-0262**

**1001.35 Exhibit 35**

**Electric and Magnetic Fields**

## EXHIBIT 35 ELECTRIC AND MAGNETIC FIELDS

The information presented in this Exhibit is derived from an Electric and Magnetic Field (EMF) Study prepared for the High Bridge Wind Project. The study is included as Appendix 35-A.

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

None of the electrical collection lines from the turbines to the collection station/point of interconnection (POI) station will exceed 34.5 kilovolts (kV); therefore, the Facility will not have transmission line rights-of-way (ROWs) for high voltage transmission power lines. However, a short approximately 200-foot segment of 115 kV transmission line between the collection and POI substations will be located on land controlled by the Applicant. Modeling calculations for the Facility identified existing EMFs and future EMFs that would result from construction and operation of the Facility. For the purposes of these calculations, a 75-foot-wide corridor of land was assumed for the transmission line (37.5 feet from centerline).

The collection ROW is assumed to range from 30 feet (15 feet from centerline) for each individual trench, with a maximum width of 75 feet for four parallel circuits. Table 35-1 below identifies the segment name and ROW width associated with each of these segments, as referred to in the EMF Study. A map of these segments is provided in the EMF Study (see Appendix 35-A).

**Table 35-1. Unique ROW Segments within the Facility**

ROW Segment Name	ROW Calculation
Case 1: Single Circuit Trench	1
Case 2: Two Circuit Parallel Trench	2
Case 3: Three Circuit Parallel Trench	3
Case 4: Four Circuit Parallel Trench	4
Case 5: 115kV Transmission Span	5

### (b) Right-of-way Segment Base Case and Proposed Cross Sections

For each of the unique ROW segments identified in Exhibit 35(a), the EMF study provides both base case (where existing facilities are present) and proposed cross sections that show, to scale, the following features:

- Any known 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;
- all underground gas transmission facilities;
- ROW boundaries; and
- structural details and dimensions for all structures (dimensions, phase spacing, phasing, and similar categories) and an overview map showing locations of structures.

The station numbers associated with each of the 5 unique ROW segments and the sheet on which they can be found in the Preliminary Design Drawings are indicated in Table 35-2, below.

**Table 35-2. Station Numbers at Each ROW Segment**

ROW Segment Name	ROW Width (feet)	Approximate Station Numbers	Preliminary Design Drawings Sheets
Case 1: Single Circuit Trench	30	G-1 through G-13	E-520-02
Case 2: Two Circuit Parallel Trench	45	H-1	E-520-02
Case 3: Three Circuit Parallel Trench	60	I-1	E-520-02
Case 4: Four Circuit Parallel Trench	75	J-1	E-520-02
Case 5: 115kV Transmission Span	75	T-1	T-100-01

(c) Enhanced Aerial Photos/Drawings Showing Exact Locations of Unique ROW Segments

The EMF study included in the Article 10 Application includes a set of aerial photos/drawings showing the exact location of each unique ROW segment and each cross-section and any residences or occupied buildings within the ROW segments. If no residence or occupied building is within the ROW segments, the measurement of the distance between the edge of the ROW segment and the nearest residence or occupied building is provided.

(d) Electric and Magnetic Field Study

(1) Licensed Professional Engineer

The EMF study, attached as Appendix 35-A to this Application, was signed and stamped/sealed by Krystian Sokolowski, a licensed professional engineer registered and in good standing in the State of New York.

(2) Computer Software Program

The EMF Study used CYMCAP 7.3 and PLSCADD software to model the facilities and make the calculations.

### (3) Electric Field Calculation Tables and Field Strength Graphs

The EMF Study (see Appendix 35-A) modeled the strength and locations of electric fields to be generated by the Facility. Modeling was conducted at rated voltage. The measurement location was assumed to be 3.28 feet (1 meter), and the measurement interval was 5 feet. The 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 are included as Appendices to the EMF Study. Digital copies of all input assumptions and outputs from the calculations will be provided under separate cover.

### (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. The measurement location was assumed to be 3.28 feet (1 meter) above grade, and the measurement interval was 5 feet. There is no expected change in amperage under any of the following conditions: summer normal, summer short term emergency, winter normal, and winter short term emergency. Therefore, the magnetic field modeling that was performed is applicable to any of these conditions. 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. Digital copies of all input assumptions and outputs for the calculations are being provided under separate cover.

### (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 Exhibit 35(d)(4), including both the graphs and tables included in the EMF Study, is applicable to both initial operation and operation after 10 years.

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

The generator lead line will be constructed within a new ROW created specifically for the proposed Facility; there are no existing power lines within this ROW. Consequently, this analysis is not applicable to the proposed Facility.