nationalgrid

Lockport-Batavia Line 112
Rebuild Project

Exhibit E-5

Effect on Communications

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EXHIBIT E-5: EFFECT ON COMMUNICATIONS

E-5.1 INTRODUCTION

The Project[1] is expected to have no adverse effects on communications (*i.e.,* television, radio, microwave, etc.) during construction or operation. National Grid will comply with applicable sections of the latest version of the National Electric Safety Code ("NESC") related to appropriate spacing between power and communications cables. According to existing line drawings, buried fiber optic cables are located within or adjacent to portions of the existing right-of-way ("ROW"), and adequate separation between Rebuilt Line 112 and communication facilities will be maintained. As part of the final design, third parties that have underground communication cables within or adjacent to the Project ROW will be consulted to ensure that the precise location of the communication facilities are shown on the plan and profile drawings and that appropriate clearances are maintained. The signals transmitted along fiber optic cables are not distorted by any form of outside electronic, magnetic or radio frequency interference. Therefore, no impacts to the operations of fiber optic cables are anticipated from the Project and the continued operation of Line 112.

Radio noise is a complex function of conductor size, surface conditions, spacing, operating voltage and meteorological conditions. Weather effects such as variations in humidity, air density, wind and rain affect radio noise levels. For example, during a rain event there may be an increase in radio noise over that experienced during sunny days. Also, as the conductor ages, surface imperfections tend to be smoothed out by weathering, resulting in a reduction of a few decibels in noise as compared to the levels when the line is new. The proposed facilities are not expected to result in any interference with radio or television ("TV") reception because the proposed electric transmission facilities are similar to the existing facilities and will use existing ROW where no such interference has been reported. Nevertheless, National Grid will respond to any reports of possible interference and will investigate and resolve interference from its proposed improvements.

[1] In this exhibit, the term "Project" and numerous other capitalized terms are defined in the Glossary included in this Application.

E-5.3 EXISTING COMMUNICATIONS FACILITIES

National Grid identified the location of existing communications facilities within one mile of the Project ROW using the Federal Communications Commission ("FCC") on-line Antenna Structure Registration Search database, and during field surveys. Aboveground communications towers that are registered with the FCC and located within one mile of the Project ROW are presented in Table E-5.3-1.

As indicated in Table E-5.3-1, there are 2 communications towers registered with the FCC within one mile of the Project ROW. The nearest communications facility is located within the Project ROW, while the other communications facility is approximately 3,000 linear feet from the Project ROW. Figure E-5-1 depicts the location of these facilities.

E-5.4 TRANSMISSION EFFECTS ON COMMUNICATION FACILITIES

Communication interference from electric transmission lines can occur in different ways. They are as follows:

- **Corona Discharge:** Corona discharge is caused by the ionization of air at the conductor surface caused by the electric field. Corona discharge creates electromagnetic radiation or radio noise that can potentially distort a radio frequency communications signal.
- **Electrostatic Spark ('Gap noise'):** Electrostatic spark can be caused by a cracked insulator or loose hardware. If the electric field is strong enough, it can create a spark across the gap of the faulty hardware causing radio noise (a/k/a gap noise). This phenomenon is more common on electric distribution lines, and the utility will identify the source of the gap noise on a case-by-case basis and eliminate it by fixing the broken hardware.
- **Blocked or Re-Radiating Signal:** Electric transmission lines can also interfere with communication by blocking or re-radiating broadcast signal. A blocked signal would occur when the proposed structures are in the direct path of the signal that travels in a line-of-sight between the sending and receiving antennas. A re-radiated signal would occur when the proposed structure reflects a broadcast signal, and the receiving antenna receives both the direct and reflected signal, distorting the signal.

E-5.4.1 AM Radio Interference

Amplitude Modulated ("AM") radio signals can be susceptible to electric transmission line interference. The potential for corona and AM radio interference is a function of the line's voltage, conductor size, and weather condition. The potential for corona and AM radio interference increases as the transmission line voltage increases. Typically, 115kV transmission lines do not cause significant corona and are generally not a source of radio interference.

E-5.4.2 FM Radio Interference

Due to the much higher frequency, Frequency Modulated ("FM") radio signals are not known to be affected by corona interference.

E-5.4.3 Television Interference

In June 2009, the United States Congress required that all full-powered television signals be broadcast as digital signals. Class A TV stations subsequently converted from analog to digital broadcast in 2015. Digital TV broadcasts digitally, and at much higher frequencies than AM radio, and thus are not subject to corona interference and would not be blocked or re-radiated by the Project's proposed structures.

E-5.4.4 Telephone Interference

No telephone lines run longitudinally within the Project ROW, but Line 112 crosses telephone lines co-located at road crossings. Generally, telephone cables comprised of copper wire are shielded to minimize the potential for transmission line interference. Digital and fiber optic telephone communications are not known to be subject to transmission interference.

Powerline corona radio noise will also typically not cause interference to cellular telephone transmission and reception because cell phone carriers typically operate at a frequency much higher than AM and FM radio signals.

E-5.4.5 Microwave Communication

In general, microwave communication is not known to be subject to transmission line interference. An exception to this would be an instance where a transmission structure is constructed in a microwave path, since a microwave signal is typically a narrow band and line-of-sight. However, since the structures for Rebuilt Line 112 are proposed to be constructed in the same vicinity as the structures for Existing Line 112, the Project is not expected to affect microwave communication. There are approximately 3 microwave towers within one mile of the Project ROW; a review of the signal direction and height will be completed during final design of the Project to ensure that there will be no impacts.

E-5.5 RAILWAY INTERFERENCE

The Project ROW does not parallel or cross any active railroad lines so the Project will not interfere with any communication facilities associated with railroad operations.

E-5.6 MITIGATION STANDARDS

The Project is not expected to result in any interference with radio, television, or cell reception. National Grid will comply with applicable provisions of the NESC related to the appropriate spacing between the proposed transmission lines and communication facilities. Although National Grid has not received any complaints about Existing Line 112 from communication facility operators or the public, National Grid will document any reports of possible interference along the Project ROW and take appropriate follow-up actions.

During the final design of the proposed facilities and the development of the Project Environmental Management and Construction Plan ("EM&CP"), National Grid will contact potential third party underground communication cable operators to confirm the placement of their facilities within the ROW and appropriate offsets to maintain. In addition, with the assistance of Dig Safely New York, National Grid will conduct ground surveys for all existing underground facilities, including communication cables, to confirm placement of all underground facilities to ensure their location is accurately depicted on construction drawings, to ensure appropriate clearances and to verify that appropriate interference protections are in place.

E-5.7 TRANSMISSION LINE ELECTRIC AND MAGNETIC FIELDS

Opinion No. 78-13 (in Cases 26529 and 26559), effective June 19, 1978, established the Commission's interim standard for an electric field strength of 1.6 kV/m at the edge of the ROW as calculated at one meter above ground, with the line at rated voltage. The Commission's Statement of Interim Policy on Magnetic Fields of Major Electric Transmission Facilities (in Cases 26529 and 26559), effective September 11, 1990, set a limit for magnetic fields of 200 milliGauss ("mG") at the edge of the right of way as measured at one meter above ground when the circuit phase currents are equal to the winter-normal conductor rating. The results of the Electric and Magnetic Field Studies conducted by Burns & McDonnell, entitled *Electric Field and Magnetic Field (EMF) Analysis for Lockport-Batavia Line 112 Rebuild Project*, indicate that the maximum calculated electric and magnetic fields are well within the Commission's guidelines in all cases (See Appendix D of the Article VII Application).

EXHIBIT E-5 - EFFECT ON COMMUNICATIONS

TABLE AND FIGURE

Table E-5.3-1 Federal Communications Commission Antenna Structure Registrations Within One Mile of the Project ROW

Facility Address	Map ID No.	Geographic Location of the Facility		FCC Registration No.[a]	Type of Structure	Approximate Distance from 115kV Line (ft.)	Structure Height (ft.)
		Latitude	Longitude				
Hinman Road Lockport, NY	1	43° 08' 52.0"	78° 43' 11.0"	1002927	Tower[c]	0	80
Lincoln Avenue Extension Lockport, NY	2	43° 09' 4.2"	78° 40' 20.1"	1233085	Tower[c]	3000	57.9

Notes:

[a] Additional communication towers may be present, but only those with a verifiable FCC Registration Number are included in this table.

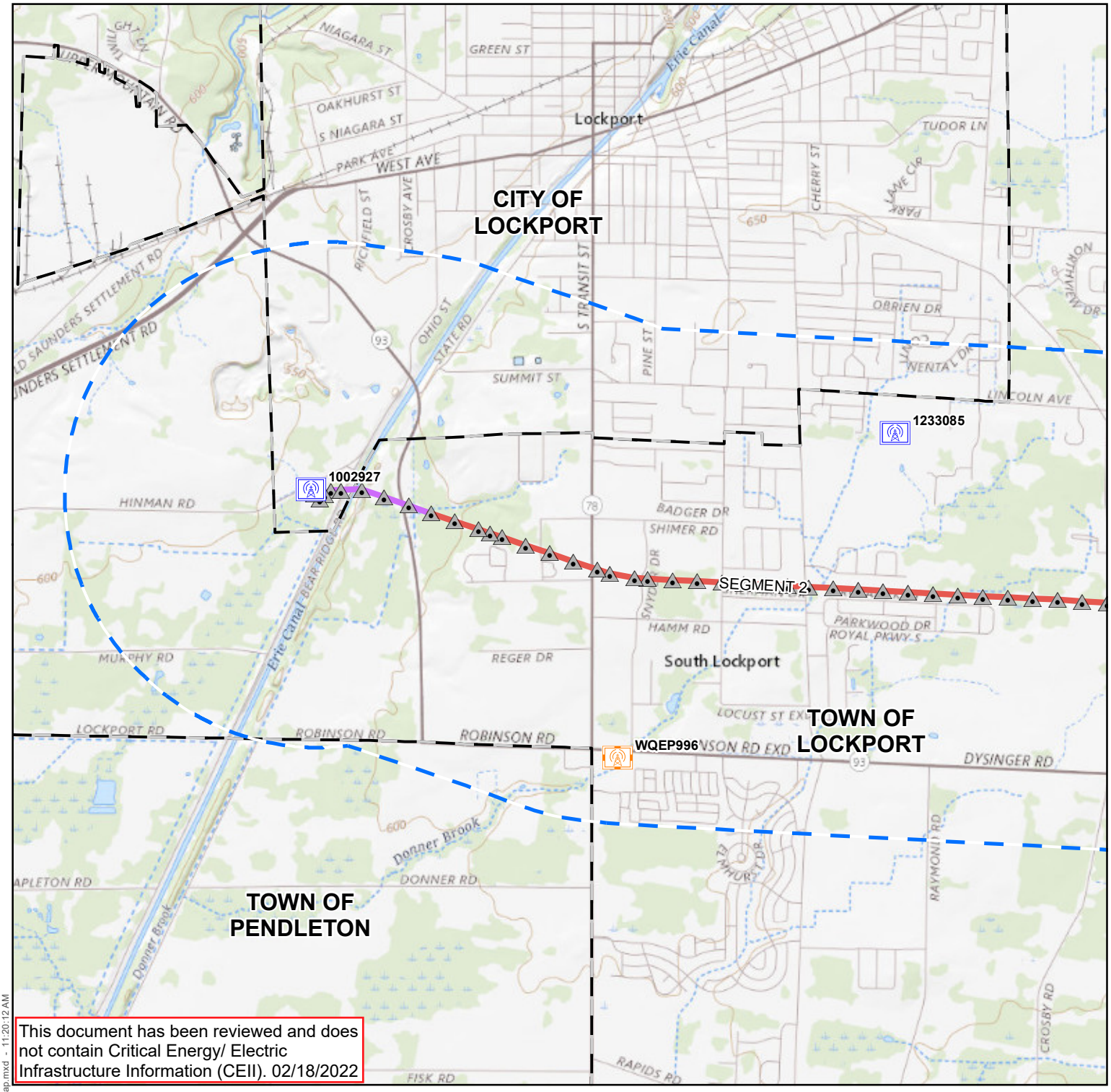
[b] lattice tower

[c] guyed structure used for communication purposes

Source: http://wireless2.fcc.gov/UlsApp/AsrSearch/asrRegistrationSearch.jsp

FIGURE E-5-1 FCC REGISTERED COMMUNICATION TOWERS WITHIN 1 MILE OF PROJECT ROW

(SHEETS 1 TO 6)



This document has been reviewed and does not contain Critical Energy/ Electric Infrastructure Information (CEII). 02/18/2022

Project USGS Quad(s):

Niagara (HUC 04120104)
Oak Orchard - Twelvemile (HUC 04130001)

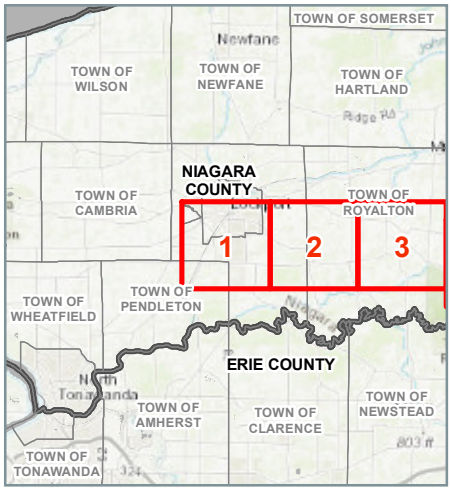
- FCC Antenna Structure Registration (Registration No.)
- Microwave Tower (Callsign)
- Structures
- 1 Mile from Project ROW
- Municipal Boundary

Data Sources:

United States Geological Survey 24k Topo Quad Map - usgs.gov

Author: MFA

Revision Date: 6/21/2021



Center of Project Study Limits:
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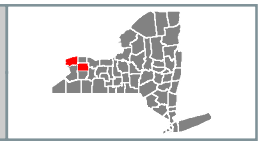

0 1,500 3,000 Feet

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NATIONAL GRID
LOCKPORT-BATAVIA #112 REBUILD PROJECT
FIGURE E-5-1
FCC REGISTERED COMMUNICATIONS TOWERS WITHIN 1 MILE OF PROJECT ROW

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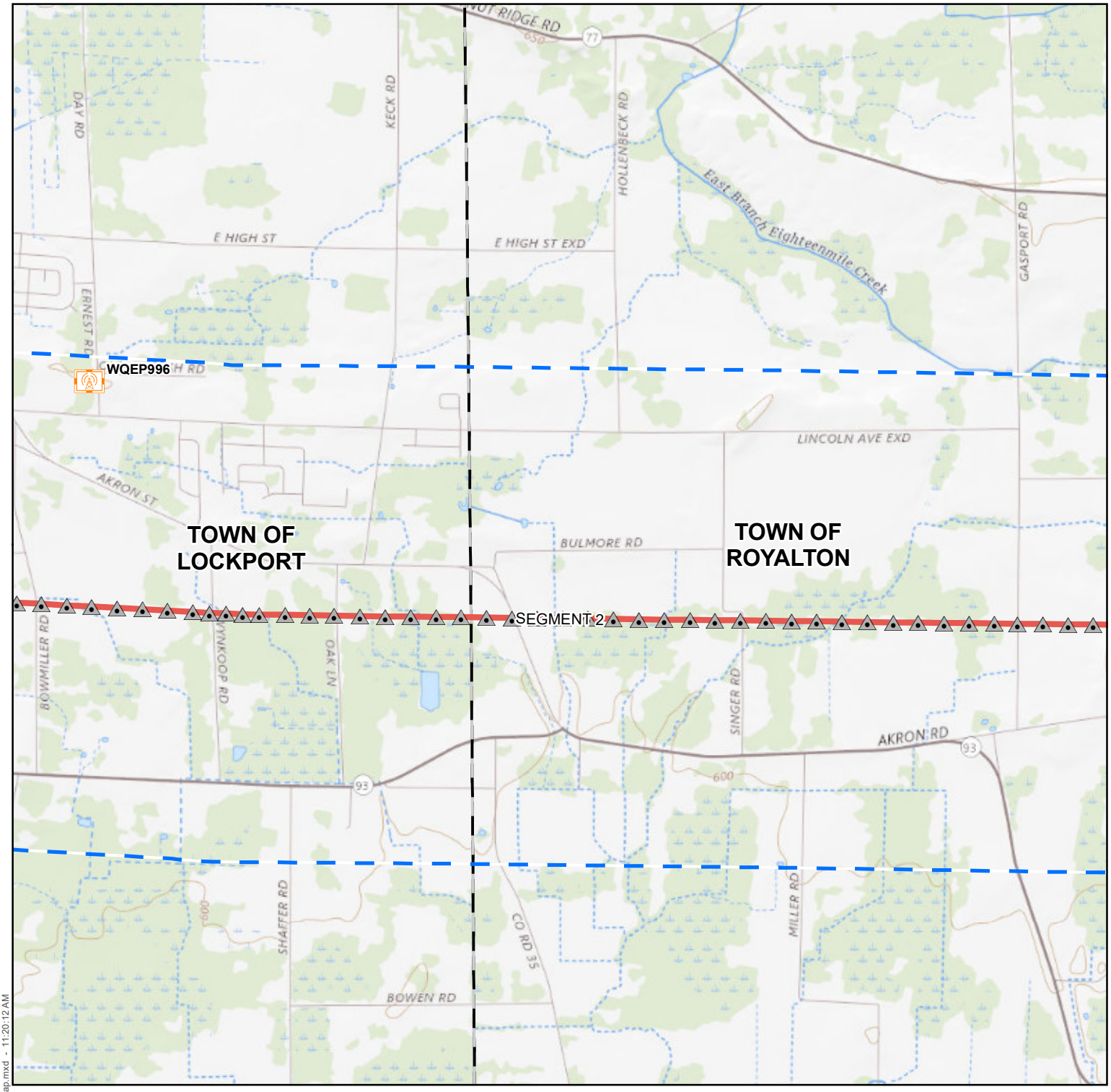

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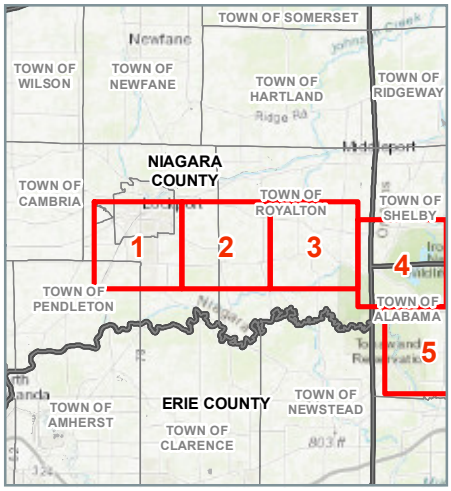
Data Sources:

United States Geological Survey 24k Topo Quad Map - usgs.gov

Author: MFA | Revision Date: 6/21/2021



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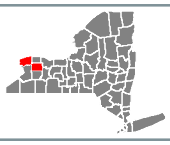

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LOCKPORT-BATAVIA #112 REBUILD PROJECT
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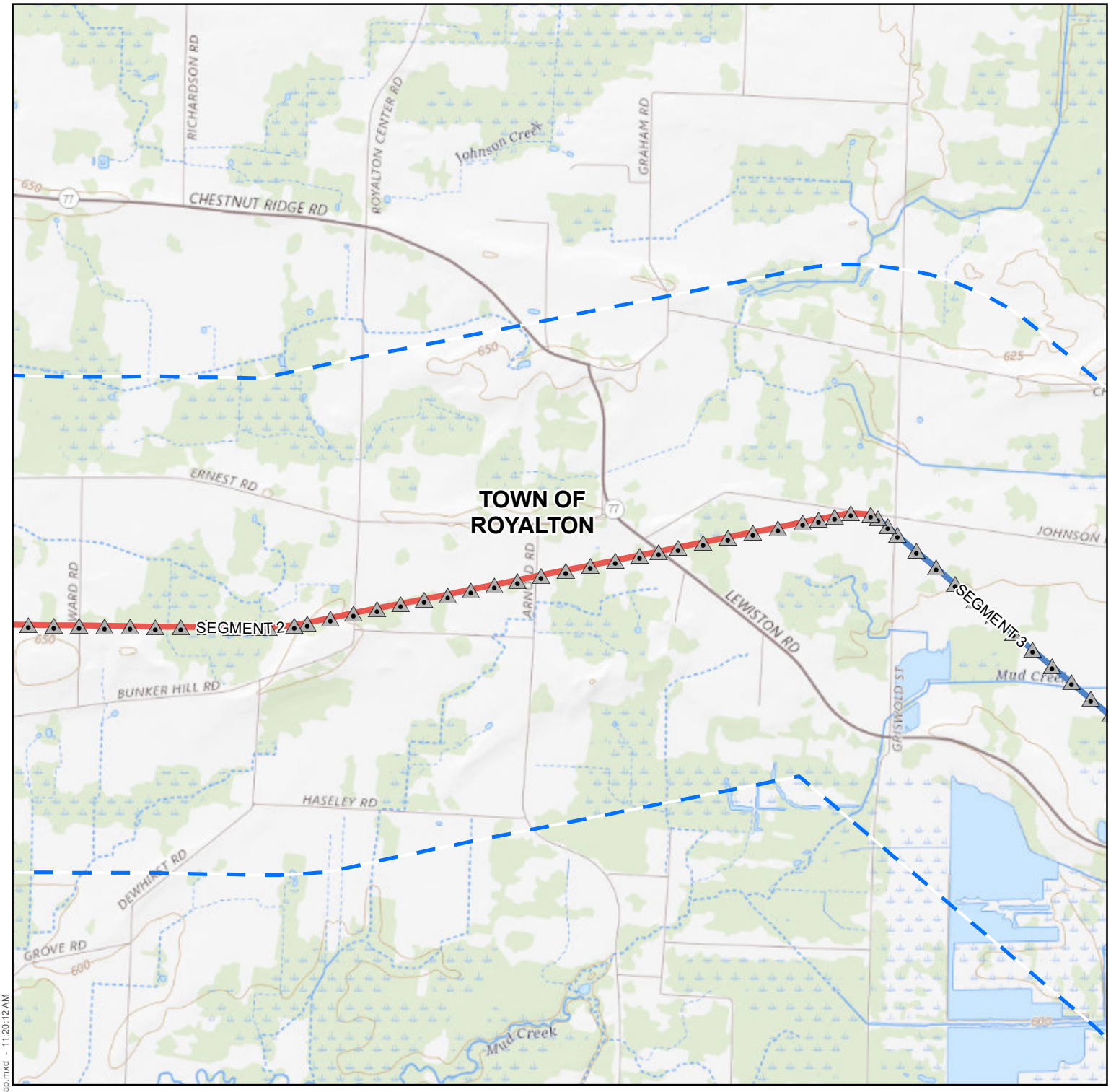

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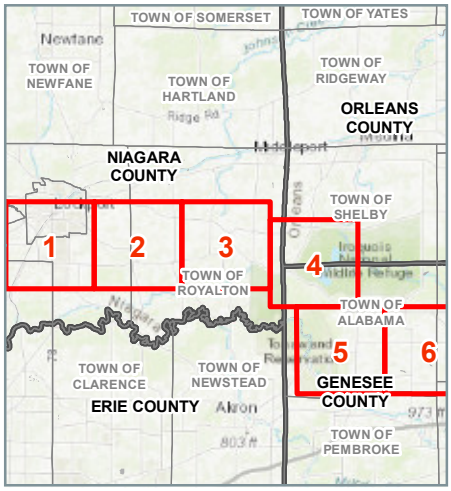

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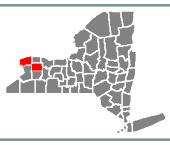

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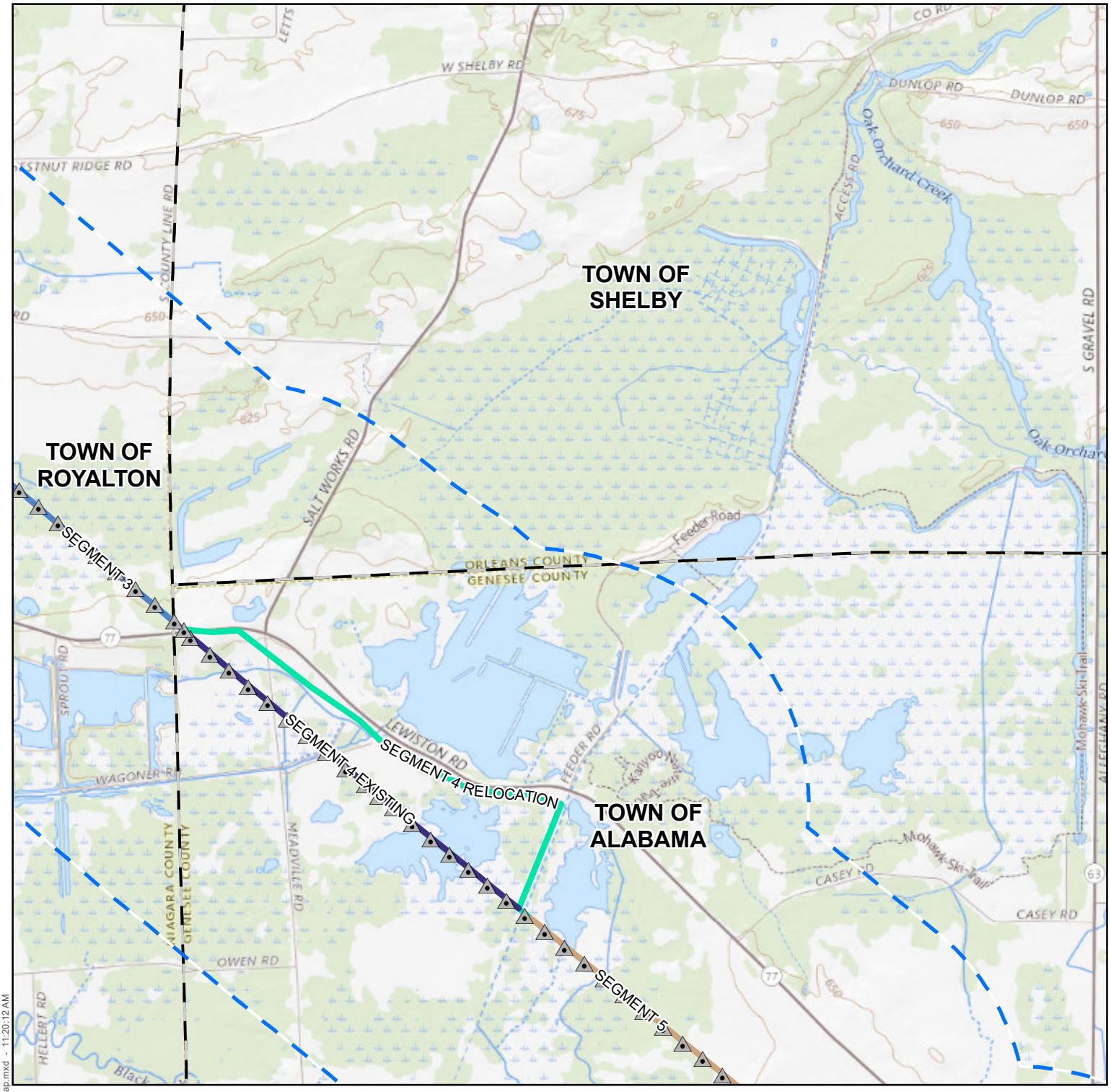

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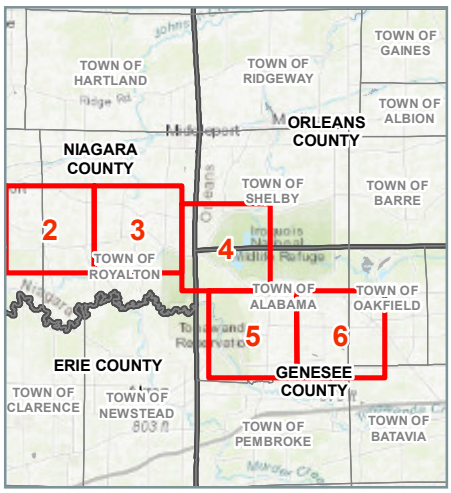

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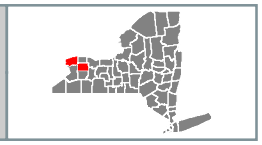

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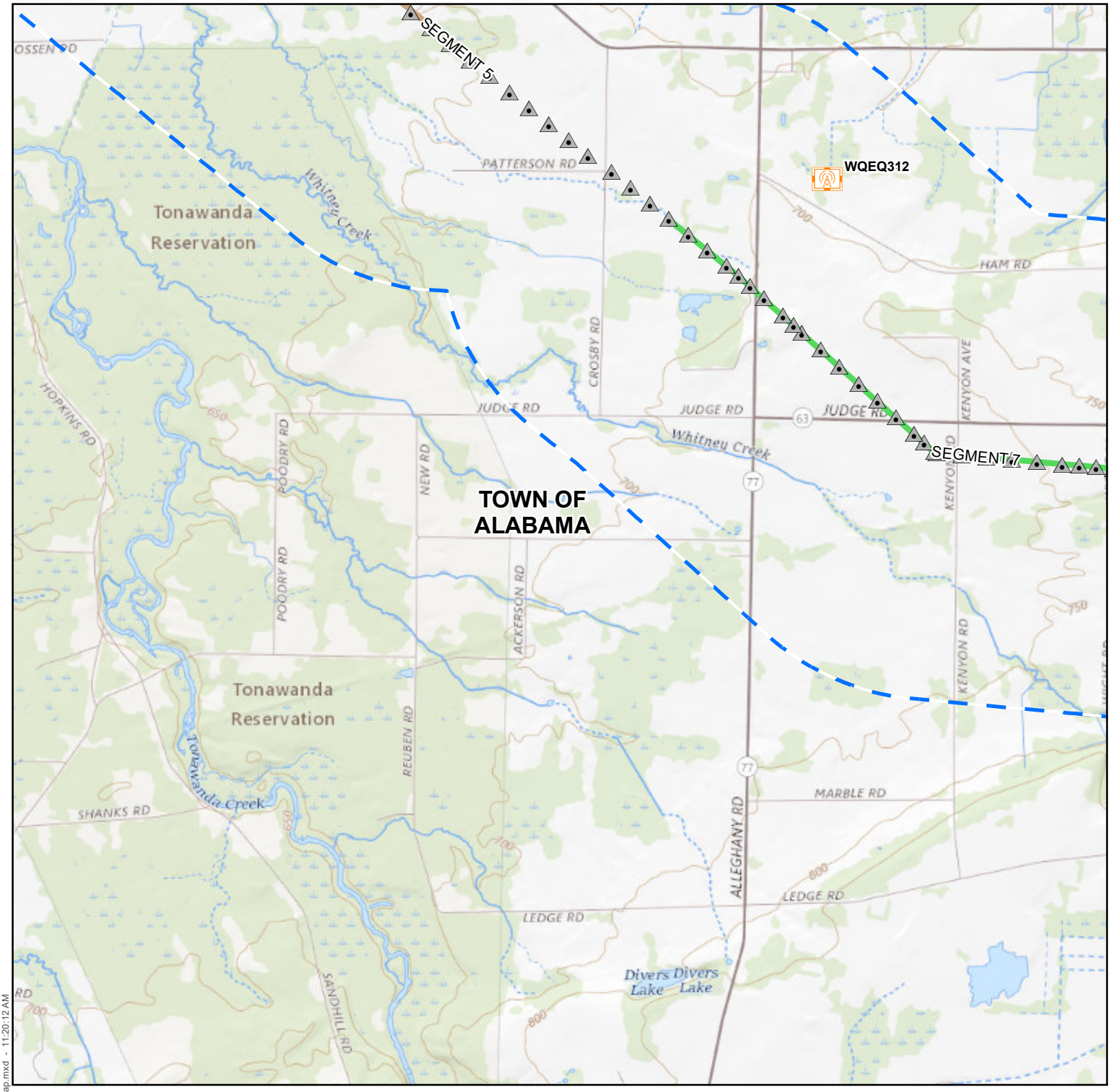

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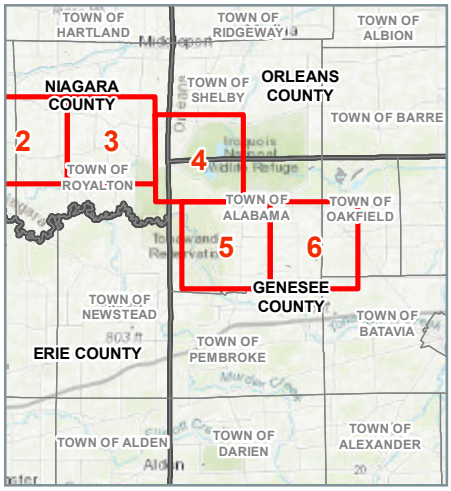

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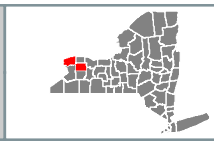

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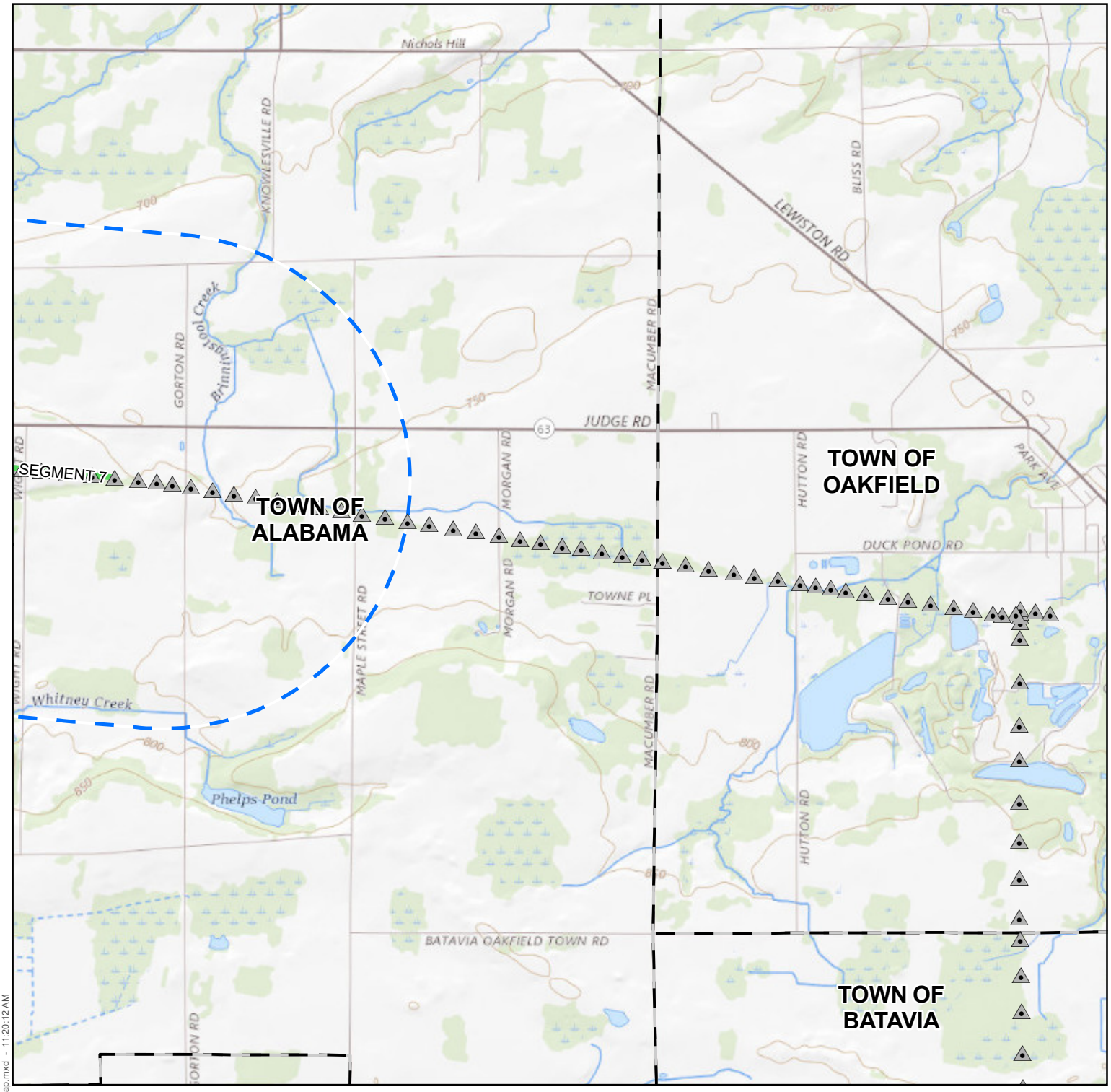

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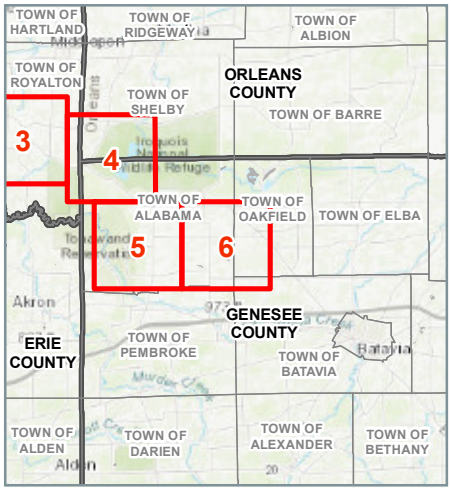

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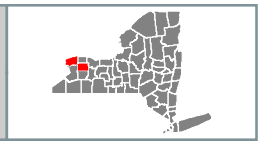

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