SOMERSET SOLAR, LLC

MATTER NO. 22-00026

§900-2.8 Exhibit 7

Appendix 7-A – Pre-Construction Noise Impact Assessment

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APPENDICES

ACRONYM LIST

AC	alternating current
ANSI	American National Standards Institute
ASA	American Standards Association
dBA	A-weighted decibel
dB	decibels
dBL	linear decibels
Facility Substation	Somerset Collector Substation
HDD	horizontal directional drilling
HVAC	heating, ventilation and air conditioning
Hz	Hertz
ISO	International for Organization Standardization
L_{eq}	equivalent continuous sound level
L_N	statistical
L_P	sound pressure level
L_W	sound power level
ML	monitoring locations
MW	megawatt
NYCRR	New York Codes, Rules and Regulations
NYS	New York State
NSA	noise sensitive areas
ORES	Office of Renewable Energy Siting
USGS	United States Geological Survey
W	watts

1 Introduction

Somerset Solar, LLC, (the Applicant), a subsidiary of The AES Corporation, Inc. (AES), is proposing the construction and operation of the 125-megawatt (MW) alternating current (AC) Somerset Solar Facility (Facility) in the Town of Somerset, Niagara County, New York. As a major solar electric generating facility the Applicant is submitting this application under Section (§) 94-c of the New York State (NYS) Executive Law (the Application) for review by the Office of Renewable Energy Siting (ORES) for a Siting Permit. A detailed acoustic assessment was completed to determine the potential for adverse noise impacts associated with construction and operation of the proposed Facility, in accordance with the requirements of 19 New York Codes, Rules and Regulations (NYCRR) §900-2.8 Exhibit 7: Noise and Vibration.

In February and March of 2021, baseline noise monitoring programs were conducted within the vicinity of the proposed Facility to document existing ambient sound levels. Ambient sound level data was collected in accordance with §900-2.8(i) and American National Standards Institute/American Standards Association (ANSI/ASA) S3/SC 1.100-2014-ANSI/ASA S12.100-2014 American National Standard entitled Methods to Define and Measure the Residual Sound in Protected Natural and Quiet Residential Areas.

Tetra Tech, Inc. also completed a detailed acoustic modeling analysis of the Facility, including its construction and operational impacts. Modeled sound levels from Facility operation were evaluated against the design goals and regulations outlined in §900-2.8 Exhibit 7: Noise and Vibration, as well as any other applicable NYS and local regulations. Due to ORES and Town of Somerset Noise Ordinance exceedances, mitigation is required for the Somerset Collector Substation (Facility Substation) and at the eastern property line of Area 5 for two of the Sungrow 3600 inverters located south of NYS Route 18/Lake Road (Appendix 5-A, Sheet PV-C.02.05 [Area 5 sound walls] and Appendix 5-B, Sheets HV-P.01.01 and HV-P.02.01 [Facility Substation sound wall]).

The overall objectives of this assessment were to: 1) identify Facility sound sources and estimate sound propagation characteristics; 2) computer-simulate sound levels using internationally accepted calculation standards; and 3) confirm that the Facility will operate in compliance with all applicable noise regulations and guidelines.

2 Acoustic Concepts and Terminology

This section outlines some of the relevant concepts in acoustics to help the non-specialist reader best understand the modeling assessment and results as presented in this assessment.

Airborne sound is described as a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure creating a sound wave. Sound energy is characterized by the properties of sound waves, which include frequency, wavelength, amplitude, and velocity. A sound source is defined by a sound power level (L_W), which is independent of any external factors. By definition, sound power is the rate at which acoustical energy is radiated outward and is expressed in units of watts (W). Sound energy propagates through a medium where it is sensed and then interpreted by a receiver. A sound pressure level (L_P) is a measure of this fluctuation at a given receiver location and can be obtained through the use of a microphone or calculated from information about the source L_W and the surrounding environment. Sound power, however, cannot be measured directly. It is calculated from measurements of sound intensity or sound pressure at a given distance from the source.

While the concept of sound is defined by the laws of physics, the term “noise” has further qualities of being excessive or loud. The perception of sound as noise is influenced by several technical factors such as loudness, sound quality, tonality, duration, and the existing background levels. Sound levels are presented on a logarithmic scale to account for the large range of acoustic pressures that the human ear is exposed to and is expressed in units of decibels (dB). A decibel is defined as the ratio between a measured value and a reference value usually corresponding to the lower threshold of human hearing defined as 20 micropascals. Conversely, sound power is referenced to 1 picowatt.

Broadband sound includes sound energy summed across the frequency spectrum. In addition to broadband sound pressure, analysis of the various frequency components of the sound spectrum is completed to determine tonal characteristics. The unit of frequency is Hertz (Hz), measuring the cycles per second of the sound pressure waves and typically the frequency analysis examines nine octave bands from 32 Hz to 8,000 Hz. Since the human ear does not perceive individual frequencies with equal loudness, spectrally varying sounds are often adjusted with a weighting filter. The A-weighted filter is applied to compensate for the frequency response of the human auditory system, and sound exposure in acoustic assessments is designated in A-weighted decibels (dBA). Unweighted sound levels are referred to as linear. Linear decibels (dBL) are used to determine a sound’s tonality and to engineer solutions to reduce or control sound as techniques are different for low and high frequency noise. Typical sound pressure levels associated with various activities and environments are presented in Table 1.

Table 1: Sound Pressure Levels (L_P) of Typical In-Air Sound Sources and Acoustic Environments

Sound Source or Activity	Sound Level (dBA)	Subjective Impression
Loud rock concert near stage Jet takeoff (200 feet [ft])	120	Uncomfortably loud
Float plane takeoff (100 ft)	110	
Jet takeoff (2,000 ft)	100	Very loud
Heavy truck or motorcycle (25 ft)	90	
Garbage disposal Food blender (2 ft) Pneumatic drill (50 ft)	80	Loud
Vacuum cleaner (10 ft)	70	Moderate
Passenger car at 65 miles per hour (25 ft)	65	
Large store air-conditioning unit (20 ft)	60	
Light auto traffic (100 ft)	50	Quiet
Quiet rural residential area with no activity	45	
Bedroom or quiet living room Bird calls	40	Faint
Typical wilderness area	35	
Quiet library, soft whisper (15 ft)	30	Very quiet
Wilderness with no wind or animal activity	25	Extremely quiet
High-quality recording studio	20	
Acoustic test chamber	10	Just audible
	0	Threshold of hearing

dBA - A-weighted decibels

To take into account sound fluctuations, environmental sound is commonly described in terms of equivalent continuous sound level (L_{eq}). The L_{eq} value is the energy-averaged sound level over a given measurement period. It is further defined as the steady, continuous sound level, over a specified time that has the same acoustic energy as the actual varying sound levels. Levels of many sounds change from moment to moment. Some sharp impulses last 1 second or less, while others rise and fall over much longer periods of time. There are various measures of sound pressure designed for different purposes. To describe the background ambient sound level, the L_{90} percentile metric, representing the quietest 10 percent of any time period. Conversely, the L_{10} is the sound level exceeded 10 percent of the time and is a measurement of intrusive noises, such as such as vehicular traffic or aircraft overflights, while the L_{50} metric is the sound level exceeded 50 percent of the time.

3 Regulatory Criteria

Applicable policies and regulations for the Facility include regulations at the federal, NYS and municipal level. These requirements, which help assure that facilities (such as the Facility) do not create adverse or nuisance impacts on the community, are discussed below.

3.1 Federal Noise Requirements

There are no federal community noise regulations applicable to the Facility; however, the federal government has long recognized the potential hazards caused by noise to the health and safety of humans. Facility noise during construction and operations are regulated, in a sense, through the Occupational Health and Safety Act of 1970 (OSHA). This regulation establishes standards for permissible sound exposure in the workplace to guard against the risk of hearing loss with sound exposure level of workers regulated at 90 dBA, over an 8-hour work shift. Facility construction contractors will readily provide workers with OSHA approved hearing protection devices, and identify high noise areas and activities when hearing protection will be required (e.g. areas in close proximity to pile driving operations) to further ensure that personnel and the general public are adequately protected from potential noise hazards and extended exposure to high noise levels.

3.2 State Noise Requirements

The Facility is evaluated by NYS under §94-c, and noise is evaluated specifically under Part 900-2.8, Exhibit 7: Noise and Vibration. The requirements for solar facilities, as specified in §900-2.8(b)(2), are as follows:

i. A maximum noise limit of forty-five (45) dBA L_{eq} (8-hour), at the outside of any existing non-participating residence, and fifty-five (55) dBA L_{eq} (8-hour) at the outside of any existing participating residence;

ii. A maximum noise limit of forty (40) dBA L_{eq} (1-hour) at the outside of any existing non-participating residence from the collector substation equipment;

iii. Prominent tones are as defined by using the constant level differences listed under ANSI/ASA S12.9-2005/Part 4 Annex C (sounds with tonal content) (see §900-15.1(a)(1)(iii) of this Part), at the outside of any existing non- participating residence. Should a prominent tone occur, the broadband overall (dBA) noise level at the evaluated non-participating position shall be increased by 5 dBA for evaluation of compliance with subparagraphs (i) and (ii) of this paragraph; and

iv. A maximum noise limit of fifty-five (55) dBA L_{eq} (8-hour), short-term equivalent continuous average sound level from the facility across any portion of a non-participating property except for portions delineated as NYS-regulated wetlands pursuant to §900-1.3(e) of this Part and utility ROW to be demonstrated with modeled sound contours drawings and discrete sound levels at worst-case locations. No penalties for prominent tones will be added to this assessment.

A radius of evaluation, modeling standards, input parameters, and assumptions are also given in the regulations, as well as evaluation procedures for prominent tones, ambient pre-construction baseline conditions, modeling of future noise levels, and reasonable noise abatement measures for operational and construction activities.

3.3 Local Noise Requirements

The Town of Somerset regulates noise through its Codes, specifically Chapter 131 Noise. This chapter states that no person shall cause or permit to be caused by any means:

A. Sound which causes the sound level to exceed 80 dBA between the hours of 7:00 a.m. and 11:00 p.m., nor 50 dBA between the hours of 11:00 p.m. and 7:00 a.m. on any property being used for residential purposes (other than the premises from which the sound emanates), including both the residence and the real property outside of the residence and forming a part of the residential property.

B. The use of any sound-emitting device inside or outside or a structure whereby the sound emitted from such device is audible on property being used for residential purposes at a point more than 100 feet from the real property boundary line of the property from which said sound emanates.

C. The use or operation of any sound-producing device, or the production of sound by any other means, within 500 feet of any school, church, synagogue, mosque, temple or courthouse while the same is in session, or within 500 feet of any hospital, nursing home or medical facility at any time, when such sound would disturb a reasonable person of normal auditory sensitivities present in such structure or facility, provided that conspicuous signs are displayed indicating the location of such facility.

D. The outdoor use or operation of any powered tool or equipment, including but not limited to saws, sanders, drills, grinders, lawn mowers or tractors, leaf blowers, or any other garden tools or equipment, audible on property being used for residential purposes between the hours of 11:00 p.m. and 7:00 a.m. of the following day, so as to disturb the quiet, comfort or repose of a reasonable person of normal auditory sensitivities.

E. The operation of any motor vehicle with a gross vehicle weight rating in excess of 10,000 pounds, or any auxiliary equipment attached to such motor vehicle, for a period longer than 15 minutes in any hour while the vehicle is stationary for reasons other than traffic congestion, so that the sound emanated therefrom is audible on property being used for residential purposes between the hours of 11:00 p.m. and 7:00 a.m. of the following day.

I. The conduct of any construction activities, including but not limited to the erection, demolition, assembling, altering, installing or equipping of buildings, public or private roadways, roads, parks, utility lines or other property, including related activities such as land clearing, grading, earthmoving, excavating, blasting, filling or landscaping, so as to project a noise therefrom so as to disturb the quiet comfort or repose of a reasonable person of normal auditory sensitivities on property being used for residential purposes between the hours of 11:00 p.m. and 7:00 a.m. of the following day.

Section 131-3 shall not apply to sounds caused by normal vehicular, railroad, boat or air traffic (excluding noise by horns, radios or other noise-emitting devices) or by emergency vehicles, emergency activities, or public warning devices. Exception is also given to sound caused by a vehicular horn or warning device when used in an emergency or warning situation and sound produced by construction activity between the hours of 7:00 a.m. and 11:00 p.m. Lastly exception is given to sound caused by lawnmowers, leaf blowers, chainsaws, and other maintenance equipment when muffled in accordance with manufacturers' specifications, and while being used for property maintenance purposes between the hours of 7:00 a.m. and 11:00 p.m., or snowblowers when used at any time.

The Town Code also specifically regulates noise from solar operations in Section 205-110 (Solar Law). Permitting Requirements for Tier 3 Solar Energy Systems. Section 205-110(3)(h) states:

> Noise. The project shall be shown to not have adverse or unreasonable noise impacts on surrounding homes or other sensitive receptors. The one-hour average noise generated from the solar energy system's components and associated ancillary equipment shall not exceed a noise level, as measured at the outside wall of **any non-participating**

residence or occupied community building, based on current (45 dBA) or future recommendations from World Health Organization. Applicants may submit equipment and component manufacturers' noise ratings to demonstrate compliance. The applicant may be required to provide operating sound pressure level measurements from a reasonable number of sampled locations at the perimeter of the solar energy system to demonstrate compliance with this standard.

In summary, the Town of Somerset presents noise requirements that are relevant to Facility construction and operation; however, regarding operations, the §94-c requirements would be considered the most stringent, controlling criteria when assessing compliance.

4 Existing Ambient Conditions

The area surrounding the Project Site (defined as the approximately 1,396-acre study area included in this assessment) primarily consists of agricultural, residential, and industrial land uses. Small commercial operations such as farms, autobody shops, and restaurants are located close to the Project Site. Per §900-2.8(c)(2) of the §94-c regulations, for the purposes of potential cumulative noise analysis, it is stated that any existing noise sensitive areas (NSAs) should be identified within the greatest of either a 3,000-foot radius of any facility noise source or within the 30 dBA sound contour. In accordance with the regulations, 172 potential NSAs were identified within 3,000 feet of the Project Site, which also includes all NSAs within the 30 dBA operational noise contour. The surrounding ambient acoustic environment consists of car and truck traffic along NYS Route 18/Lake Road, operation of the existing Kintigh Substation (located on the Project Site), agricultural operations, and train noise. Historically, the area's soundscape has also been dominated by operations activities associated with the former 675-MW coal-fired power plant, Somerset Station; which includes portions of a railroad track which was used to transport coal to the plant. A map showing all noise sensitive receptors with Parcel Tax-ID information can be found in Attachment 2.

To analyze the existing ambient acoustic environment in the Facility Site, a baseline noise monitoring program was conducted. Ambient measurements were undertaken in February 2021 to capture leaf-off conditions, while leaf-on conditions were captured in March 2021. The ambient sound study was prepared with the purpose of quantifying the ambient environment within the vicinity of the Facility in accordance with Chapter XVIII, Title 19 of NYCRR, Part 900-2.8(i), which states the following:

(i) An evaluation of ambient pre-construction baseline noise conditions by using the L_{90} statistical and the L_{eq} energy-based noise descriptors, and by following the recommendations included in ANSI/ASA S3/SC 1.100-2014-ANSI/ASA S12.100-2014 American National Standard entitled Methods to Define and Measure the Residual Sound in Protected Natural and Quiet Residential Areas (see §900-15.1(a)(1)(iv) of this Part). Sound surveys shall be conducted for, at a minimum, a seven (7) day-long period for wind facilities and a four (4) day-long period for solar facilities.

4.1 Measurement Methodology

Measurements were made to capture the duration of a four-day period at a total of six locations during leaf-on and leaf-off conditions. The equipment, measurement settings, and data collected for the ambient measurements were consistent with ANSI/ASA S3/SC 1.100-2014-ANSI/ASA S12.100-2014 American National Standard entitled Methods to Define and Measure residual Sound in Protected Natural and Quiet Residential Areas.

4.1.1 Instrumentation

All measurements were taken with a Larson Davis 831 or Larson Davis 831-C real-time sound level analyzer equipped with a PCB model 377B02 ½-inch precision condenser microphone. This instrument has an operating range of 18 decibels (dB) to 140 dB, and an overall frequency range of 8 to 20,000 Hz, which meets or exceeds all requirements set forth in the American National Standards Institute (ANSI) standards for Type 1 sound level meters for quality and accuracy (precision). All instrumentation components, including microphones, preamplifiers and field calibrators, have current laboratory certified calibrations traceable to the National Institute of Standards and Technology. Meters are always in-situ field calibrated prior to each measurement period. Table 2 provides a summary of the measurement equipment.

Table 2: Ambient Sound Measurement Equipment Used

Description	Manufacturer	Type
Signal Analyzer	Larson Davis	831, 831C
Microphone	PCB	377B02
Windscreen	ACO Pacific	7-inch
Calibrator	Larson Davis	CAL200

The monitoring stations were designed as long-term environmental sound level data-logger measuring devices. Each sound level analyzer was enclosed in a weatherproof case and equipped with a self-contained microphone tripod. The microphone and windscreen were tripod-mounted at an approximate height of 1.5 to 1.7 meters (4.9 to 5.6 feet) above grade. When sound measurements are attempted in the presence of elevated wind speeds, extraneous noise can be self-generated across the microphone and is often referred to a pseudo noise. Air blowing over a microphone diaphragm creates a pressure differential and turbulence. All sound level analyzer microphones are protected from wind-induced pseudo noise by a foam windscreen made of specially prepared open-pored polyurethane. By using this microphone protection, the pressure gradient and turbulence are effectively moved farther away from the microphone, minimizing self-generated wind-induced noise.

4.1.2 ***Data Collection***

Six outdoor monitoring locations (ML) were chosen to be representative of house and yard accommodations characterizing the immediate Facility area. At each ML, the sound level analyzer was set up, field-calibrated, and programmed to log the data continuously during daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) periods. During both measurement periods, weather was generally calm with few instances of rain and high winds. The average temperature during the leaf-off measurements was approximately 30 degrees Fahrenheit, while the average temperature was approximately 70 degrees Fahrenheit during the leaf-on measurements. Weather events were not excluded from the dataset.

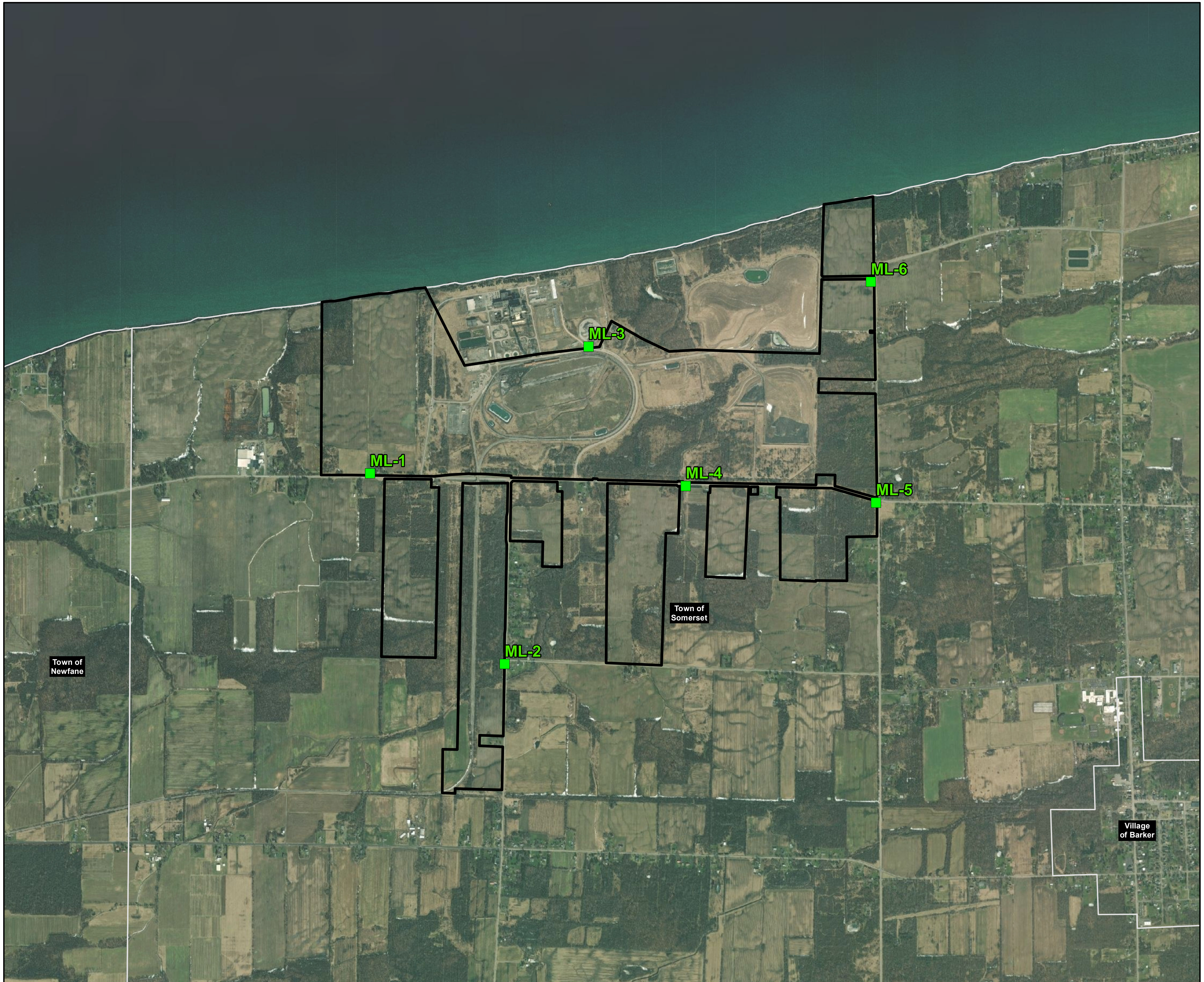
Each sound analyzer was programmed to measure and log broadband A-weighted L_P in 1-minute time and 1-second time intervals, as well as a number of statistical sound levels (L_n). The L_n provide the sound level exceeded for that percentage of time over the given measurement period. For example, the L_{90} level is the sound level that is exceeded for 90 percent of the measurement period. Data was collected in 1/1 and 1/3 octave bands spanning the frequency range of 8 Hz to 20 kilohertz.

4.2 **Measurement Locations**

The land use relative to the Project Site is primarily rural residential with some agricultural uses, and industrial (brownfield). Tetra Tech, Inc. deployed six long-term noise monitoring stations to represent the Project Site and surrounding land uses. Table 3, below, summarizes the MLs including the coordinates and description. Figure 1 also presents the location of the MLs relative to the Project Site.

Table 3: Summary of Ambient Sound Measurement Locations (MLs)

ML	Site Name		Location	Season	Sound Level Meter and Serial Number
	Easting (m)	Northing (m)			
ML-1	693240	4802358	7449 Lake Rd	Leaf-off	Larson Davis 831, S/N 10747
				Leaf-on	Larson Davis 831-C, S/N 11445
ML-2	694145	4801151	Hosmer Rd and Haight Rd	Leaf-off	Larson Davis 831, S/N 10756
				Leaf-on	Larson Davis 831-C, S/N 11471
ML-3	694630	4803220	Within existing Project Site bounds	Leaf-off	Larson Davis 831, S/N 10463
				Leaf-on	Larson Davis 831-C, S/N 11467
ML-4	695284	4802336	7830 Lake Rd	Leaf-off	Larson Davis 831, S/N 10464
				Leaf-on	Larson Davis 831-C, S/N 10172
ML-5	696518	4802264	Lake Rd and Hartland Rd	Leaf-off	Larson Davis 831, S/N 10783
				Leaf-on	Larson Davis 831-C, S/N 11465
ML-6	696443	4803692	8398 Lower Lake Rd	Leaf-off	Larson Davis 831, S/N 10747
				Leaf-on	Larson Davis 831-C, S/N 11468



Legend

- Ambient Noise Monitoring Location
- Project Site Boundary
- Municipal Boundary

1:24,000

0 0.25 0.5 Miles

Figure 1

Ambient Sound Monitoring Locations

Somerset Solar
Niagara County, NY
March 2023

TETRA TECH

aes

Source: Aerial Imagery- ESRI 2017/2018; NYS GIS Civil Boundaries, Sept 2021

NOT FOR CONSTRUCTION

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4.3 Data Processing and Results

This ambient sound study includes two data sets. One data set consists of the measured monitoring data and the second data set consists applies ANS weighting as described in ANSI/ASA S3/SC 1.100-2014-ANSI/ASA S12.100-2014 American National Standard entitled Methods to Define and Measure residual Sound in Protected Natural and Quiet Residential Areas, which is the sound level that is calculated from sound that is filtered with the A-weighting network and with a low-pass filter having characteristics matching the upper band edge of the 1,000 Hz octave-band filter defined by ANS S1.11.

4.3.1 Measurement Location 1 (ML-1)

Sound monitoring occurred at ML-1 starting on February 25, 2021 through March 4, 2021 for leaf-off conditions, and June 8–12, 2021 for leaf-on conditions. This location serves as a representation of ambient levels on the western Project Site boundary and is shown below in Figure 2. The summary of levels for the entire measurement period are given in Table 4 and Table 5 below. The values indicate an overall average for the monitoring period, the daytime average, and the nighttime average. A summary of the average daily values is shown below in Figure 3 for the leaf-off time period and Figure 4 for the leaf-on time period.

Figure 2: ML-1 Monitoring Location

Table 4: ML-1 Summary levels, A-Weighting

Season	Average Overall L_{eq} (dBA)	Average Daytime L_{eq} (dBA)	Average Nighttime L_{eq} (dBA)	Average Overall L_{90} (dBA)	Average Daytime L_{90} (dBA)	Average Nighttime L_{90} (dBA)
Leaf-off	60	61	57	48	50	41
Leaf-on	59	61	54	38	42	27

Table 5: ML-1 Summary levels, ANS-Weighting

Season	Average Overall L_{eq} (dBA; ANS)	Average Daytime L_{eq} (dBA; ANS)	Average Nighttime L_{eq} (dBA; ANS)	Average Overall L_{90} (dBA; ANS)	Average Day-time L_{90} (dBA; ANS)	Average Nighttime L_{90} (dBA; ANS)
Leaf-off	57	59	55	46	49	41
Leaf-on	57	60	53	36	39	25

Figure 3: ML-1 Monitoring Summary, Leaf-off

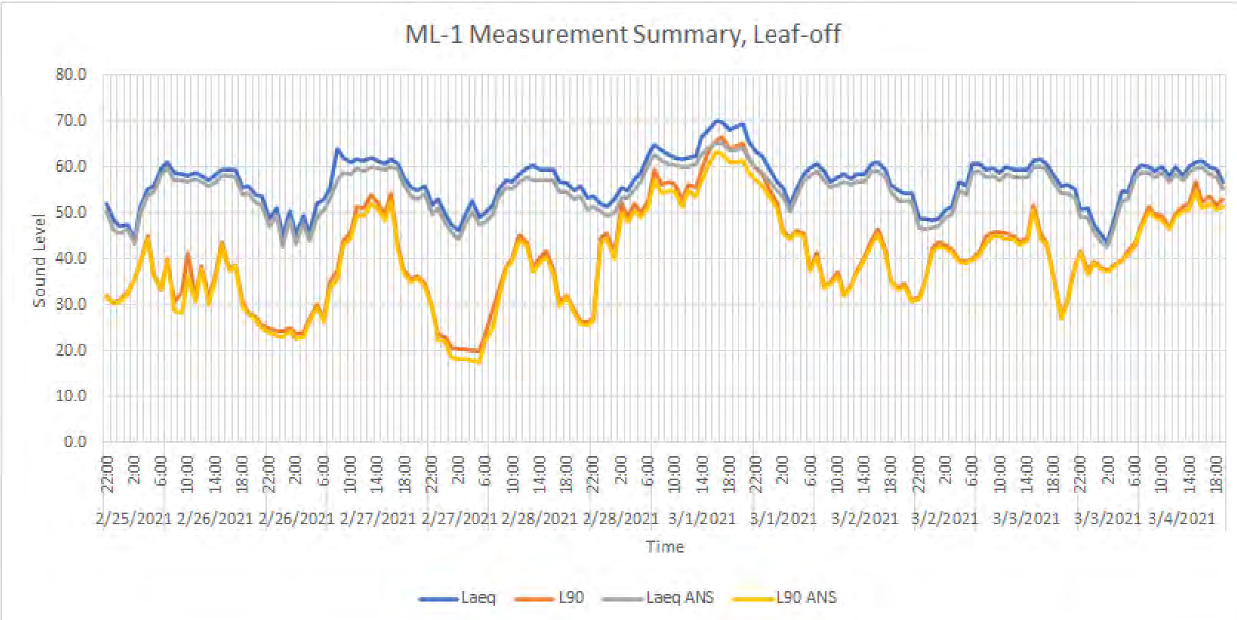
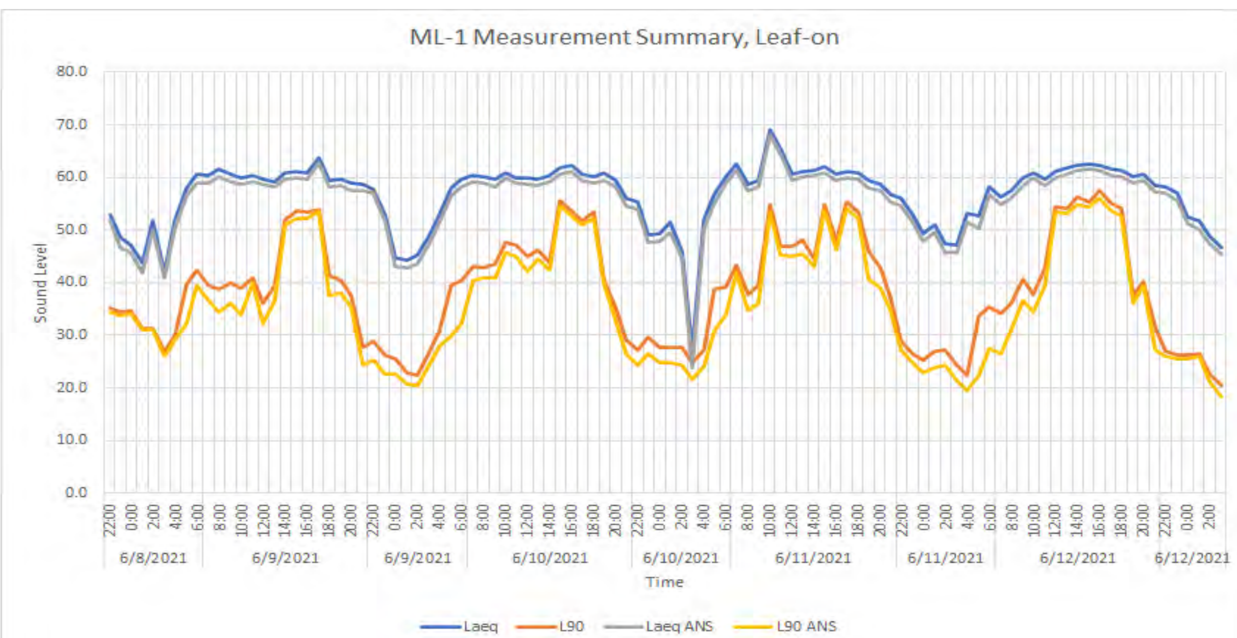


Figure 4: ML-1 Monitoring Summary, Leaf-on



4.3.2 ***Measurement Location 2 (ML-2)***

Sound monitoring occurred at ML-2 starting on February 25, 2021 through March 1, 2021 for leaf-off conditions, and June 8–12, 2021 for leaf-on conditions. This location serves as a representation of ambient levels on the southwestern Project Site boundary and is shown below in Figure 5. The summary of levels for the entire measurement period are given in Table 6 and Table 7 below. The values indicate an overall average for the monitoring period, the daytime average, and nighttime average. A summary of the average daily values is shown below in Figure 6 for the leaf-on time period.

Figure 5: ML-2 Monitoring Location

Table 6: ML-2 Summary levels, A-Weighting

Season	Average Overall L_{eq} (dBA)	Average Daytime L_{eq} (dBA)	Average Nighttime L_{eq} (dBA)	Average Overall L_{90} (dBA)	Average Day-time L_{90} (dBA)	Average Nighttime L_{90} (dBA)
Leaf-off*	--	--	--	--	--	--
Leaf-on	54	57	48	34	37	24

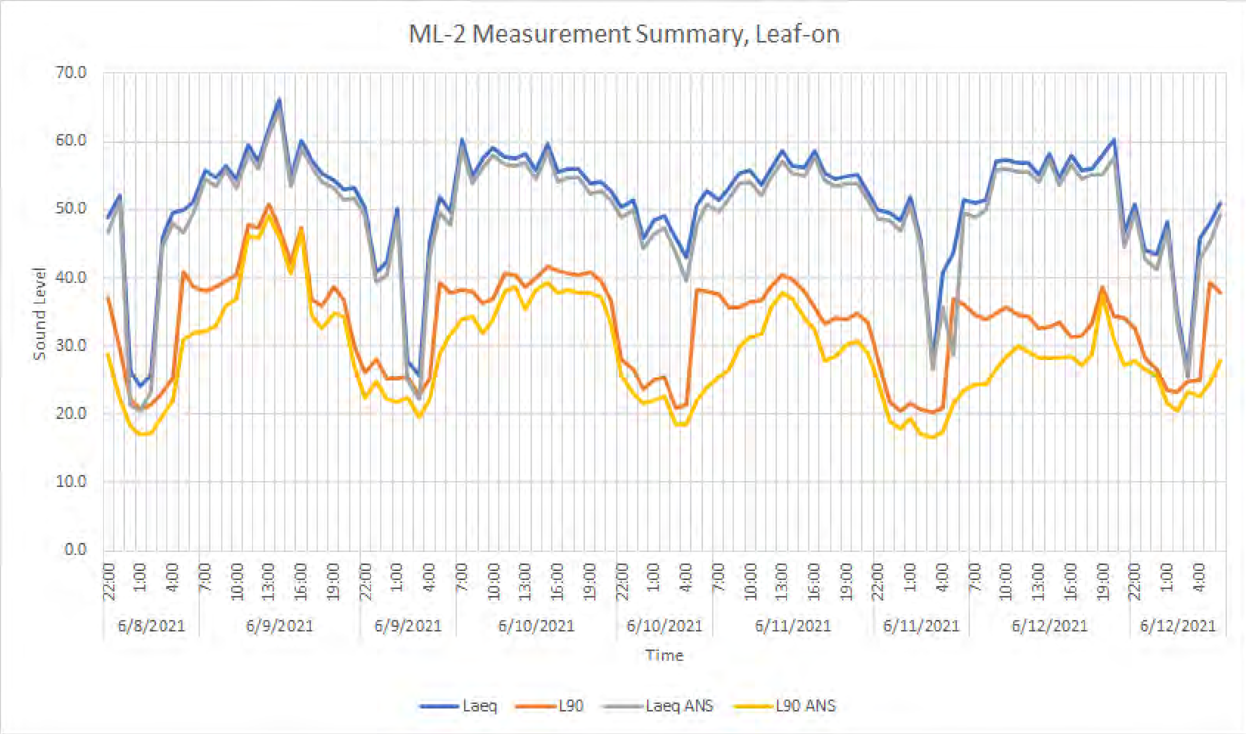
*Leaf-off measurements were not processed due to meter failure

Table 7: ML-2 Summary levels, ANS-Weighting

Season	Average Overall L_{eq} (dBA; ANS)	Average Daytime L_{eq} (dBA; ANS)	Average Nighttime L_{eq} (dBA; ANS)	Average Overall L_{90} (dBA; ANS)	Average Day-time L_{90} (dBA; ANS)	Average Nighttime L_{90} (dBA; ANS)
Leaf-off*	--	--	--	--	--	--
Leaf-on	53	56	47	29	33	21

*Leaf-off measurements were not processed due to meter failure

Figure 6: ML-2 Monitoring Summary, Leaf-on



4.3.3 ***Measurement Location 3 (ML-3)***

Sound monitoring occurred at ML-3 starting on February 25, 2021 through March 3, 2021 for leaf-off conditions, and June 8–13, 2021 for leaf-on conditions. This location serves as a representation of ambient levels within the current Project Site boundary and is shown below in Figure 7. The summary of levels for the entire measurement period are given in Table 8 and Table 9 below. The values indicate an overall average for the monitoring period, the daytime average, and the nighttime average. A summary of the average daily values is shown below in Figure 8 for the leaf-off time period and Figure 9 for the leaf-on time period.

Figure 7: ML-3 Monitoring Location

Table 8: ML-3 Summary levels, A-Weighting

Season	Average Overall L_{eq} (dBA)	Average Daytime L_{eq} (dBA)	Average Nighttime L_{eq} (dBA)	Average Overall L_{90} (dBA)	Average Day-time L_{90} (dBA)	Average Nighttime L_{90} (dBA)
Leaf-off	50	52	45	41	44	37
Leaf-on	50	53	41	36	39	31

Table 9: ML-3 Summary levels, ANS-Weighting

Season	Average Overall L_{eq} (dBA; ANS)	Average Daytime L_{eq} (dBA; ANS)	Average Nighttime L_{eq} (dBA; ANS)	Average Overall L_{90} (dBA; ANS)	Average Day-time L_{90} (dBA; ANS)	Average Nighttime L_{90} (dBA; ANS)
Leaf-off	49	51	44	41	43	37
Leaf-on	41	44	33	30	32	26

Figure 8: ML-3 Monitoring Summary, Leaf-off

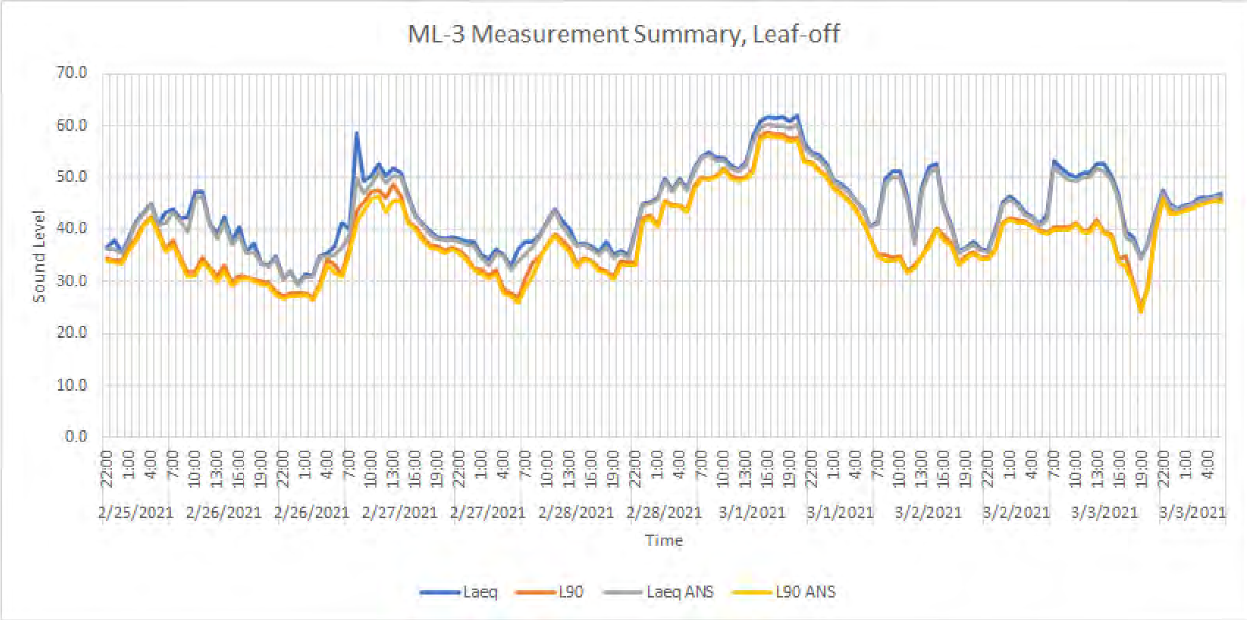
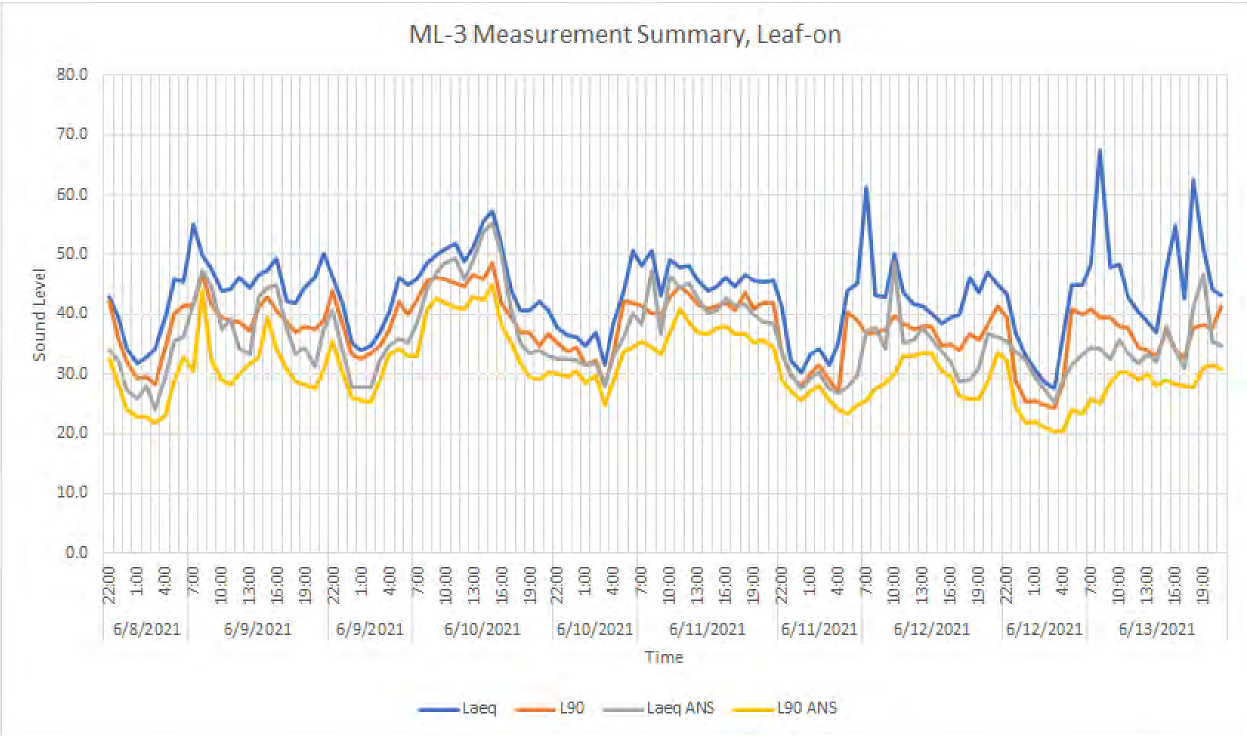


Figure 9: ML-3 Monitoring Summary, Leaf-on



4.3.4 ***Measurement Location 4 (ML-4)***

Sound monitoring occurred at ML-4 starting on February 25, 2021 through March 4, 2021 for leaf-off conditions, and June 8–13, 2021 for leaf-on conditions. This location serves as a representation of ambient levels in the center of the Facility along NYS Route 18/Lake Road, and is shown below in Figure 10. The summary of levels for the entire measurement period are given in Table 10 and Table 11 below. The values indicate an overall average for the monitoring period, the daytime average, and the nighttime average. A summary of the average daily values is shown below in Figure 11 for the leaf-off time period and Figure 12 for the leaf-on time period.

Figure 10: ML-4 Monitoring Location

Table 10: ML-4 Summary levels, A-Weighting

Season	Average Overall L_{eq} (dBA)	Average Daytime L_{eq} (dBA)	Average Nighttime L_{eq} (dBA)	Average Overall L_{90} (dBA)	Average Day-time L_{90} (dBA)	Average Nighttime L_{90} (dBA)
Leaf-off	64	66	61	41	42	38
Leaf-on	60	63	56	43	46	25

Table 11: ML-4 Summary levels, ANS-Weighting

Season	Average Overall L_{eq} (dBA; ANS)	Average Daytime L_{eq} (dBA; ANS)	Average Nighttime L_{eq} (dBA; ANS)	Average Overall L_{90} (dBA; ANS)	Average Day-time L_{90} (dBA; ANS)	Average Nighttime L_{90} (dBA; ANS)
Leaf-off	62	64	60	40	42	37
Leaf-on	59	62	55	40	44	22

Figure 11: ML-4 Monitoring Summary, Leaf-off

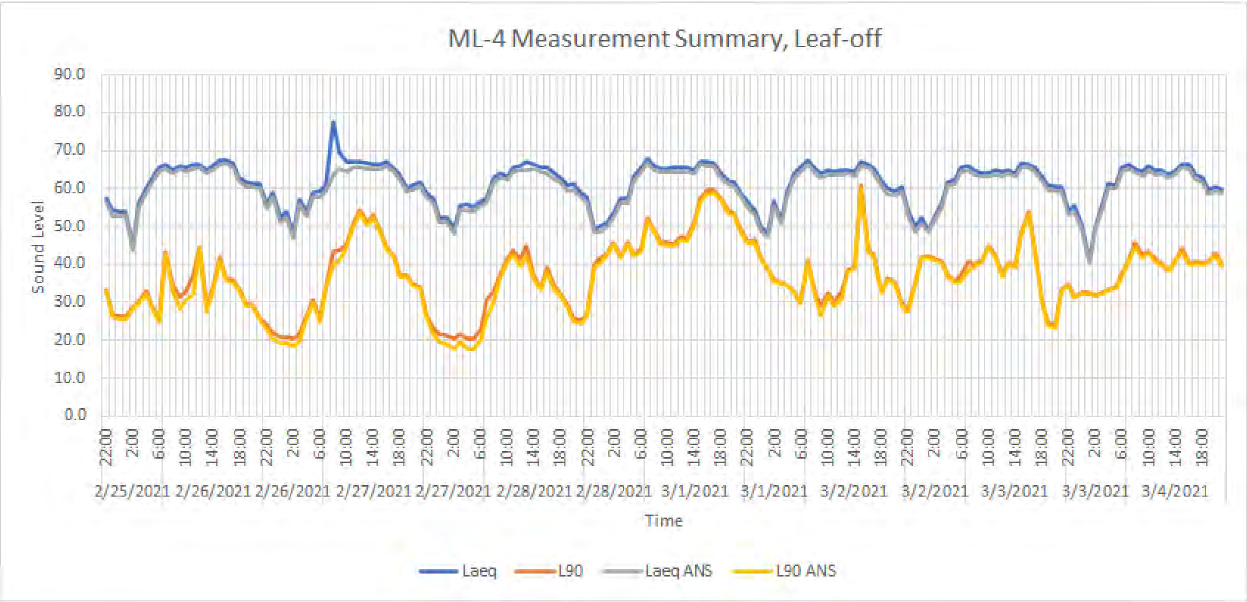
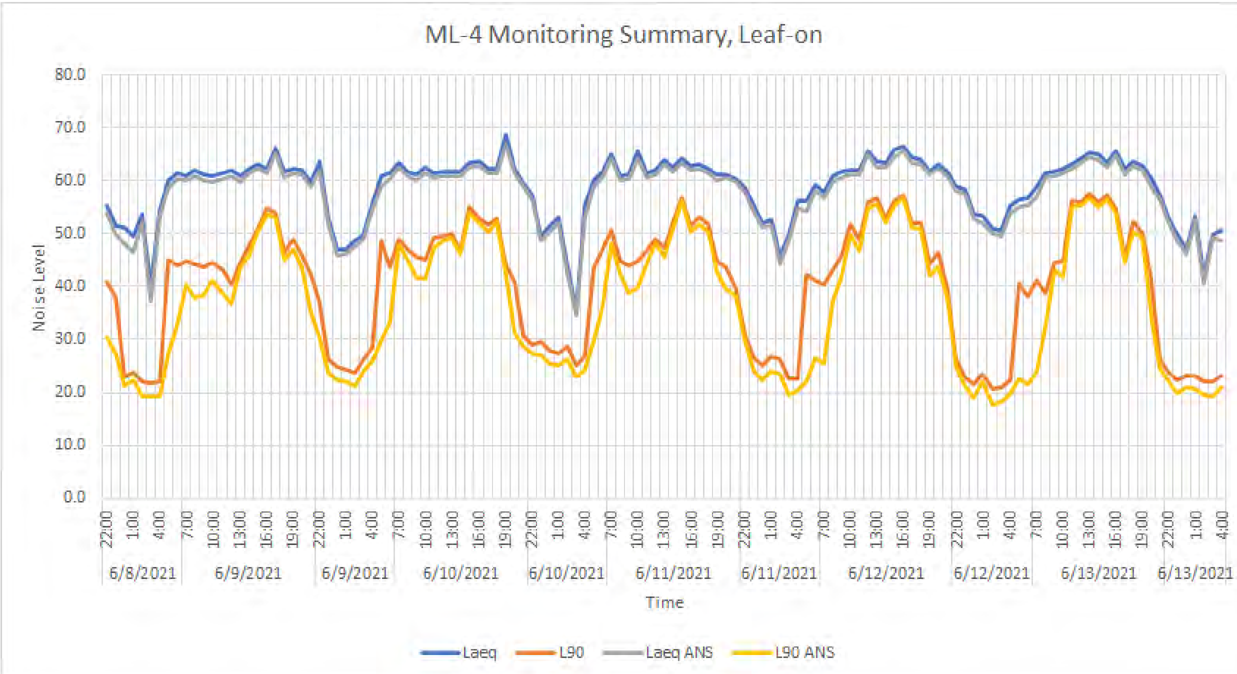


Figure 12: ML-4 Monitoring Summary, Leaf-on



4.3.5 ***Measurement Location 5 (ML-5)***

Sound monitoring occurred at ML-5 starting on February 25, 2021 through March 4, 2021 for leaf-off conditions, and June 8–13, 2021 for leaf-on conditions. This location serves as a representation of ambient levels towards the east of the Facility along NYS Route 18/Lake Road, and is shown below in Figure 13. The summary of levels for the entire measurement period are given in Table 12 and Table 13 below. The values indicate an overall average for the monitoring period, the daytime average, and the nighttime average. A summary of the average daily values is shown below in Figure 14 for the leaf-on time period. Data from the leaf-off period was not able to be processed due to meter error.

Figure 13: ML-5 Monitoring Location

Table 12: ML-5 Summary levels, A-Weighting

Season	Average Overall L_{eq} (dBA)	Average Daytime L_{eq} (dBA)	Average Nighttime L_{eq} (dBA)	Average Overall L_{90} (dBA)	Average Daytime L_{90} (dBA)	Average Nighttime L_{90} (dBA)
Leaf-off*	--	--	--	--	--	--
Leaf-on	64	66	59	43	46	28

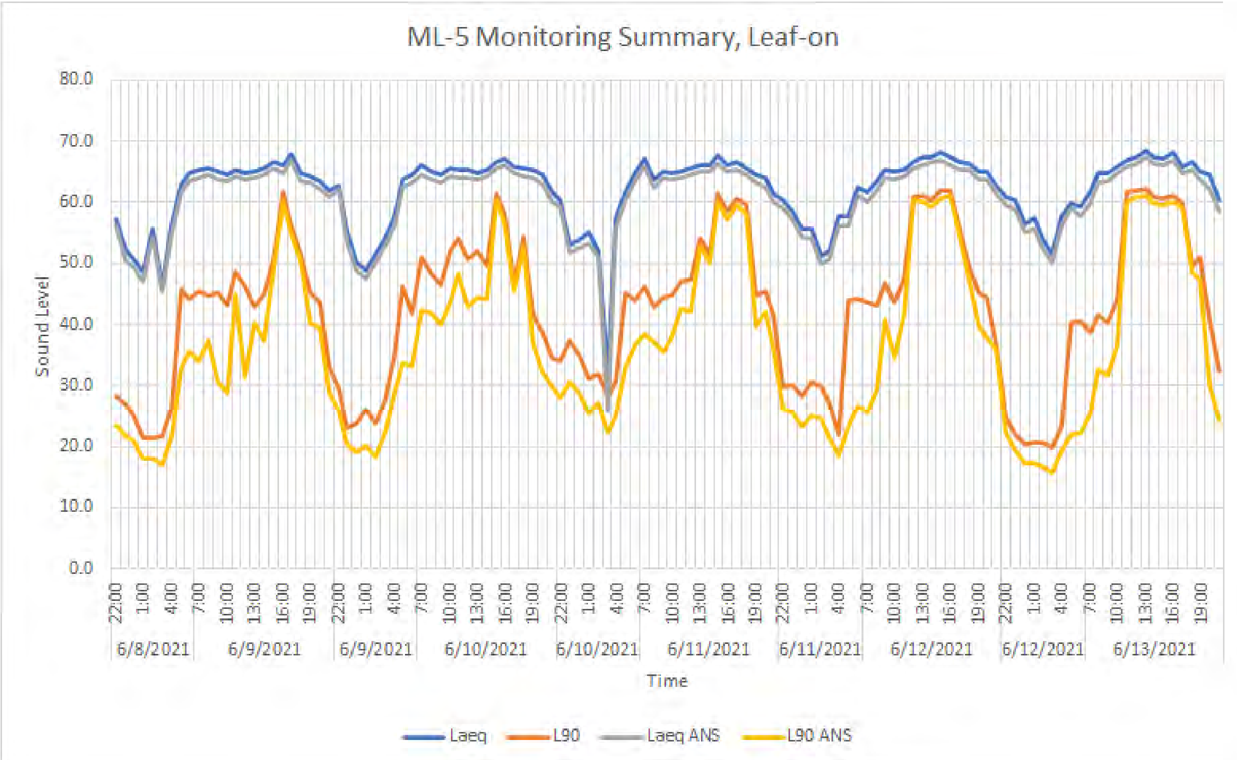
*Leaf-off measurements were not processed due to meter failure

Table 13: ML-5 Summary levels, ANS-Weighting

Season	Average Overall L_{eq} (dBA; ANS)	Average Daytime L_{eq} (dBA; ANS)	Average Nighttime L_{eq} (dBA; ANS)	Average Overall L_{90} (dBA; ANS)	Average Daytime L_{90} (dBA; ANS)	Average Nighttime L_{90} (dBA; ANS)
Leaf-off*	--	--	--	--	--	--
Leaf-on	62	65	58	37	40	22

*Leaf-off measurements were not processed due to meter failure

Figure 14: ML-5 Monitoring Summary, Leaf-on



*4.3.6 **Measurement Location 6 (ML-6)***

Sound monitoring occurred at ML-6 starting on February 25, 2021 through March 4, 2021 for leaf-off conditions, and June 8–11, 2021 for leaf-on conditions. This location serves as a representation of ambient levels in the northeast portion of the Project Site and is shown below in Figure 15. The summary of levels for the entire measurement period are given in Table 14 and Table 15 below. The values indicate an overall average for the monitoring period, the daytime average, and the nighttime average. A summary of the average daily values is shown below in Figure 16 for the leaf-off time period and Figure 17 for the leaf-on time period.

Figure 15: ML-6 Monitoring Location

Table 14: ML-6 Summary levels, A-Weighting

Season	Average Overall L_{eq} (dBA)	Average Daytime L_{eq} (dBA)	Average Nighttime L_{eq} (dBA)	Average Overall L_{90} (dBA)	Average Day-time L_{90} (dBA)	Average Nighttime L_{90} (dBA)
Leaf-off	75	77	70	53	50	55
Leaf-on	55	58	46	35	39	25

Table 15: ML-6 Summary levels, ANS-Weighting

Season	Average Overall L_{eq} (dBA; ANS)	Average Daytime L_{eq} (dBA; ANS)	Average Nighttime L_{eq} (dBA; ANS)	Average Overall L_{90} (dBA; ANS)	Average Daytime L_{90} (dBA; ANS)	Average Nighttime L_{90} (dBA; ANS)
Leaf-off	75	77	70	53	49	55
Leaf-on	54	57	45	33	37	23

Figure 16: ML-6 Monitoring Summary, Leaf-off

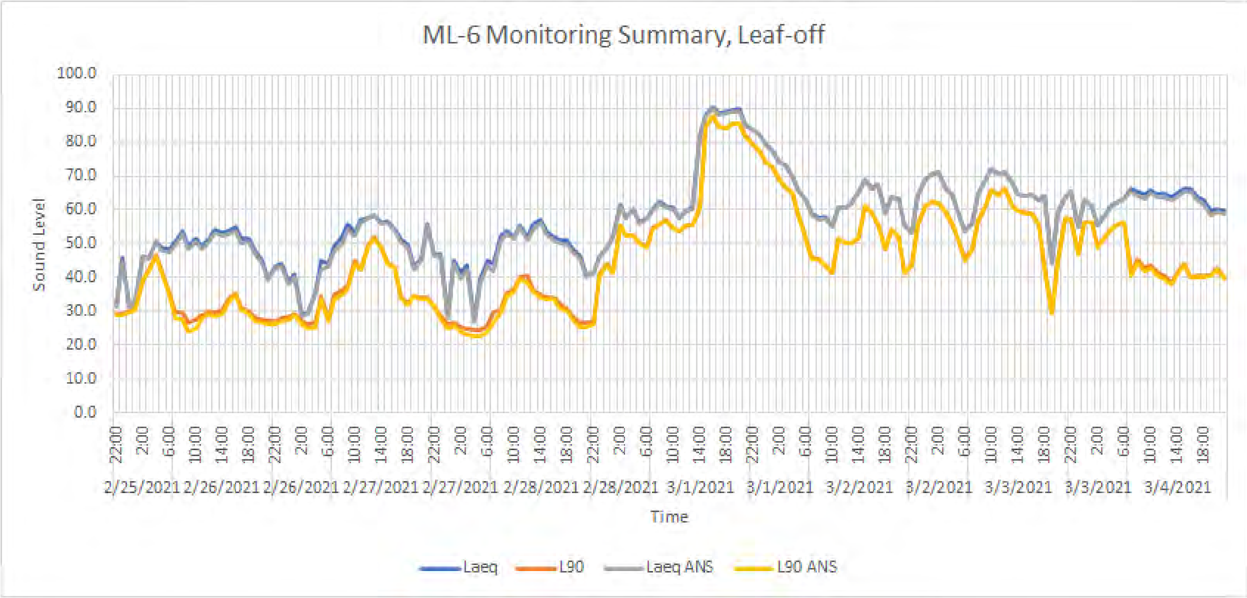
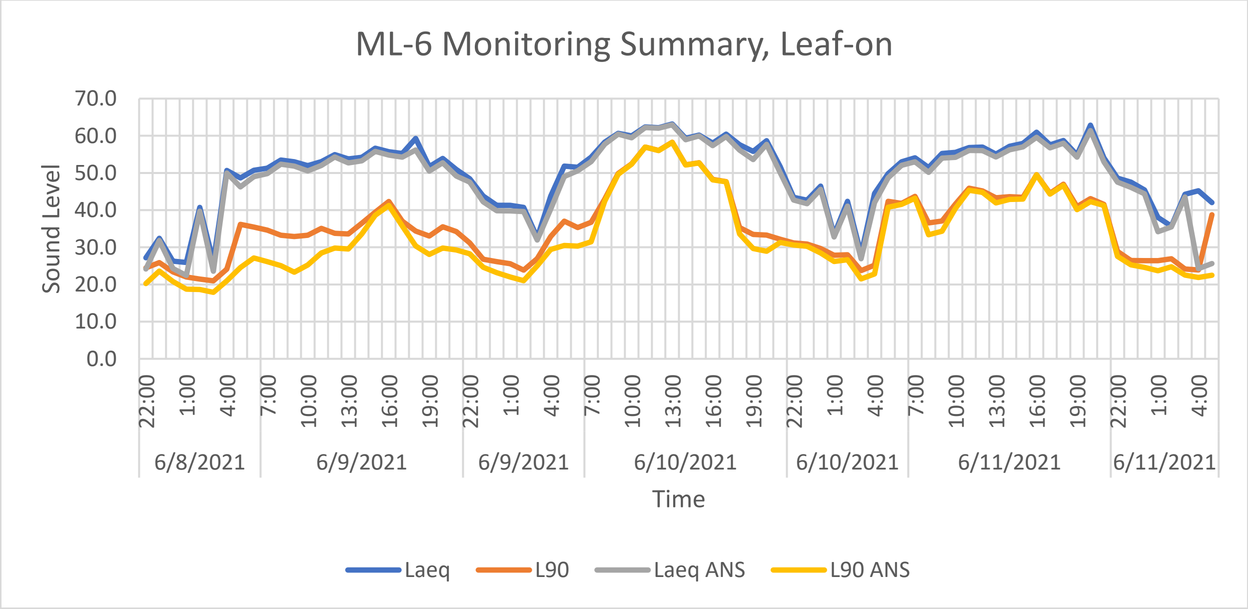


Figure 17: ML-6 Monitoring Summary, Leaf-on



In summary, the ambient sound levels at each ML are given in Table 16 and Table 17.

Table 16: Overall Preconstruction Monitoring Summary - "Smart" ANS-Weighted

Location	Sound Levels (dBA)											
	Overall				Day				Night			
	Leaf-off		Leaf-on		Leaf-off		Leaf-on		Leaf-off		Leaf-on	
	L_{eq}	L_{90}	L_{eq}	L_{90}	L_{eq}	L_{90}	L_{eq}	L_{90}	L_{eq}	L_{90}	L_{eq}	L_{90}
ML-1	57	46	57	36	59	49	60	39	55	41	53	25
ML-2	--	--	53	29	--	--	56	33	--	--	47	21
ML-3	49	41	41	30	51	43	44	32	44	37	33	26
ML-4	62	40	59	40	64	42	62	44	60	37	55	22
ML-5	--	--	62	37	--	--	65	40	--	--	58	22
ML-6	75	53	54	53	77	49	57	37	70	55	45	23

Table 17: Overall Preconstruction Monitoring Summary - A-Weighted

Location	Sound Levels (dBA)											
	Overall				Day				Night			
	Leaf-off		Leaf-on		Leaf-off		Leaf-on		Leaf-off		Leaf-on	
	L_{eq}	L_{90}	L_{eq}	L_{90}	L_{eq}	L_{90}	L_{eq}	L_{90}	L_{eq}	L_{90}	L_{eq}	L_{90}
ML-1	60	48	59	38	61	50	61	42	57	41	54	27
ML-2	--	--	54	34	--	--	57	37	--	--	48	24
ML-3	50	41	50	36	52	44	53	39	45	37	41	31
ML-4	64	41	60	43	66	42	63	46	61	38	56	25
ML-5	--	--	64	43	--	--	66	46	--	--	59	28
ML-6	75	53	55	35	77	50	58	39	70	55	46	25

5 Noise Modeling Methodology

The acoustic modeling for Facility construction and operation was conducted with the Cadna-A® sound model from DataKustik GmbH (2022). The outdoor noise propagation model is based on Organization for International Standardization (ISO) 9613, Part 1: "Calculation of the absorption of sound by the atmosphere," (1993) and Part 2: "General method of calculation," (1996). It is used by acoustic engineers to accurately describe sound emission and propagation from complex facilities and in most cases yields conservative results of operational sound levels in the surrounding community. Model predictions are accurate to within 1 dB of calculations based on the ISO 9613 standard.

ISO 9613 was used to calculate propagation and attenuation of sound energy with distance, surface and building reflection, and shielding effects by equipment, buildings, and ground topography. Offsite topography was determined using Unites States Geological Survey (USGS) digital elevation data. The sound model propagation calculation parameters are summarized in Table 18.

Table 18: Acoustic Model Setup Parameters

Model Input	Parameter Value
Standards	ISO 9613-2, Acoustics – Attenuation of sound during propagation outdoors.[1]
Engineering Design	Conceptual Facility Layout Design Drawing dated 03/06/2023
Reflection Loss	2 dB – indicates reduction in acoustic energy due to reflection
Grid Spacing	10 meters
Terrain Description	Per Facility Site grading plan and United States Geological Survey topography
Ground Absorption	0.5 (semi-reflective) and 0.0 (reflective) for waterbodies
Receiver Characteristics	1.52 meters (5 feet) above ground level
Meteorological Factors	Omnidirectional downwind propagation / mild to moderate atmospheric temperature inversion
Temperature	50° Fahrenheit
Relative Humidity	70%
Search radius	1 mile

[1] Propagation calculations under the ISO 9613 standard incorporate the effects of downwind propagation from facility to receptor) with wind speeds of 1 to 5 m per second (3.6 to 18 kilometers per hour) measured at a height of 3 to 11 m above the ground.

dB - decibels

The Facility's general arrangement was directly imported into the acoustic model so that onsite equipment could be easily identified, structures could be added, and sound emissions ratings could be assigned to sources as appropriate.

Cadna-A® allows for three basic types of sound sources to be introduced into the model: point, line, and area sources. Each noise-radiating element was modeled based on its noise emission pattern. Small dimension sources, which radiate sound hemispherically, were modeled as point sources. Larger dimensional sources, such as the transformer walls, or areas of construction activities, were modeled as area sources. The Facility Substation transformer and inverter skids were modeled as solid structures because diffracted paths around and over structures tend to reduce noise levels in certain directions. The interaction between sound sources and structures was also considered with reflection loss. The reflective characteristic of the structure is quantified by its reflection loss, which is typically defined as smooth façade from which the reflected sound energy is 2 dB less than the incident sound energy.

Ground absorption rates are described by a numerical coefficient. For pavement and water bodies, the absorption coefficient is defined as G = 0 to account for reduced sound attenuation and higher reflectivity. In contrast, ground covered in vegetation, including suburban lawns, are acoustically absorptive and aid in sound attenuation, i.e., G = 1.0. For the acoustic modeling analysis, a conservative semi-reflective value of G = 0.5 was used to represent the Facility Site. No credit was taken for tree cover and foliage effects, thereby assuming worst case wintertime defoliate conditions.

5.1 Construction Noise Source Information

Noise levels resulting from construction activities vary greatly depending on the type of equipment; the specific equipment model; the operations being performed; and the overall condition of the equipment. The Applicant has provided the construction phasing and equipment information (Epsilon, 2021), which has been summarized in Table 19. For the purposes of the acoustic modeling analysis, it was assumed that, at any given time, construction equipment would be distributed throughout the Facility Site.

Table 19: Summary of Solar Facility Construction Equipment by Phase

Phase No.	Construction Phase	Construction Equipment	Maximum L_{max} Equipment Noise Level at 50 feet (15 meters) dBA	Composite Maximum L_{max} Equipment Noise Level at 50 feet (15 meters) dBA
1	Site Preparation and Grading	(1) Grader (174 horsepower [hp]) (1) Rubber Tired Loader (164 hp) (1) Scraper (313 hp) (1) Water Truck (189 hp) (1) Generator Set	85 85 89 80 81	92

Phase No.	Construction Phase	Construction Equipment	Maximum L_{max} Equipment Noise Level at 50 feet (15 meters) dBA	Composite Maximum L_{max} Equipment Noise Level at 50 feet (15 meters) dBA
2	Trenching and Road Construction	(2) Excavator (168 hp) (1) Bar Trencher (600 hp) (1) Grader (174 hp) (1) Water Truck (189 hp) (1) Trencher (63 hp) (1) Rubber Tired Loader (164 hp) (1) Generator Set	85 89 85 80 83 85 81	94
3	Equipment Installation	(1) Crane (399 hp) (1) Crane (165 hp) (2) Forklift (145 hp) (2) Vermeer PD10 Pile Driver (6) Pickup Truck/All-Terrain Vehicle (2) Water Truck (189 hp) (2) Generator Set	83 83 85 84 55 80 81	93
4	Horizontal Directional Drilling Entry	(1) Excavator (168 hp) (1) Auger Drill Rig (1) Pickup Truck/All-Terrain Vehicle (ATV)	85 85 55	88
5	Commissioning	(2) Pickup Trucks/ATVs	55	58

dBA – A-weighted decibels

The Applicant also has indicated that horizontal directional drilling (HDD) technology will be used during construction phasing. At locations where an electrical collection line sensitive crossing, it is anticipated that a trenchless technology such as HDD will be used. This technique involves installing the conduit underground using boring equipment set up on either side of the crossing. No surface disturbance is required between the bore pits, and existing vegetation may remain in place.

In addition to noise, construction activities generate vibration, which can be interpreted as energy transmitted in waves through the soil mass. These energy waves generally dissipate with distance from the vibration source, due to spreading of the energy and frictional losses. The energy transmitted through the ground as vibration, if great enough, can result in structural damage. Typical outdoor sources of perceptible ground-borne vibration are construction equipment and traffic on rough (i.e., unpaved or uneven) roads. Construction activity can also result in varying degrees of ground-borne vibration, depending on the type of equipment, methods employed, distance between source and receptor, duration, number of perceived vibration events, and local geology. Ground-borne vibrations from typical construction activities do not often reach levels that can damage structures in proximity to construction, but their effects may manifest and be noticeable in buildings that are within 25 feet of construction activities. In addition to structural damage, the vibration of room surfaces affects people as human annoyance. Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. It is expected that construction activities planned for the Facility will be consistent to other solar facilities constructed in NYS and elsewhere and therefore it is not anticipated that adverse effects due to vibration will be experienced by NSAs.

5.2 Facility Noise Sources and Reference Sound Data

Sound sources considered in the Facility operational acoustic analysis include the inverter skids, consisting of an inverter and distribution transformer located throughout the photovoltaic module array areas, tracking motors associated with the modules that will track with the sun; heating, ventilation and air conditioning (HVAC) equipment associated with the Facility Substation control room; and one proposed Facility Substation transformer. A total of 24 SG3600UD-MV inverter skids, 16 SG3150U-MV inverter skids, 3112 DuraTrack tracking motors, 2 HVAC units, and 1 140-megavolt amperes Facility Substation transformer were used in this acoustical analysis.

Substations have switching, protection, and control equipment, as well as a transformer, which generate the sound generally described as a low humming. There are three main sound sources associated with a transformer: core noise, load noise, and noise generated by the operation of the cooling equipment. The core is the principal noise source and does not vary significantly with electrical load. The load noise is primarily caused by the load current in the transformer's conducting coils (or windings) and consequently the main frequency of this sound is twice the supply frequency: 120 Hz for 60 Hz transformers. The cooling equipment (fans and pumps) may also be an important noise component, depending on fan design. During air forced cooling methods, cooling fan noise is produced in addition to the core noise. The resulting audible sound is a combination of hum and the broadband fan noise. Breaker noise is a sound event of very short duration, expected to occur only a few times throughout the year. Just as horsepower ratings designate the power capacity of an electric motor, a transformer's megavolt amperes rating indicates its maximum power output capacity.

The Manufacturer, Sungrow Power, provided the inverter and distribution transformer equipment L_Ws for the SG3600UD-MV inverter skid (Acoustic Test Center, 2021) and for the entire SG3150U-MV inverter skid (RWDI, 2020) used in this acoustic analysis. L_Ws for the tracking motors are not available from the manufacturer at this time. A broadband L_W was derived for the tracking motors using the manufacturer specified output kilowatts and scientific literature (Kaliski et al., 2020). HVAC equipment for the Facility Substation control room has not been selected at this time. The broadband level from a similarly sized HVAC unit (BARD) was used in this acoustic analysis. The L_W for the Facility Substation 140 MV transformer were calculated using the methodology recommended by the Electric Power Plant Environmental Noise Guide (Volume 1, 2nd edition) (Edison Electric Institute 1983). The equipment L_Ws used in this acoustic analysis are summarized in Table 20. Equipment specification sheets can be found in Attachment 4.

Table 20: Summary of Solar Facility Operational Equipment

Sound Source	Model	Octave Band Sound Power Data (dBL)								Overall dBA	
		31.5	63	125	250	500	1000	2000	4000	8000	
Substation Transformer (ONAF)	140 megavolt amperes	102	108	110	105	105	99	94	89	82	105
Inverter	SG3600UD-MV	86	85	87	86	90	81	80	88	81	92
Distribution Transformer	SG3600UD-MV	68	61	70	72	64	56	43	34	29	66
Inverter Skid	SG3150U-MV	83	76	81	74	70	69	70	77	68	80
HVAC[1]	BARD W36AB	--	--	--	--	92	--	--	--	--	89
Tracking Motor[1]	DuraTrack HZ v3	--	--	--	--	65	--	--	--	--	65

[1]Octave band level sound power data are not available at this time

dBL – Linear decibels

L_W values were derived from a combination of manufacturer specifications and engineering guidelines. It is assumed that installed equipment will have similar sound power profiles as those used in the acoustic modeling analysis; however, it is possible that the final manufacturer warranty values may vary.

A tonal analysis of the equipment was conducted through the procedure in ANSI/ASA S12.9-2013 Part 3, Annex B, Section B.1. According to the standard, a prominent discrete tone is identified as present if the time-average L_P in the one-third octave band of interest exceeds the arithmetic average of the time-average L_P for the two adjacent one-third octave bands by any of the following constant level differences:

- 15 dB in low-frequency one-third-octave bands (from 25 up to 125 Hz);
- 8 dB in middle-frequency one-third-octave bands (from 160 up to 400 Hz); or,
- 5 dB in high-frequency one-third-octave bands (from 500 up to 10,000 Hz).

Octave band data for the Facility Substation transformer is not available at this time but was calculated using the methodology recommended by the Electric Power Plant Environmental Noise Guide (Volume 1, 2nd edition) (Edison Electric Institute 1983) and therefore is considered tonal. Octave band data for the HVAC equipment and tracking motors is not available and are also considered tonal. As shown in Table 21, the SG3600UD-MV inverter skid is considered tonal as it exceeds adjacent octave bands by more than 5 dB at 5,000 Hz, while the SG3150U-MV inverter skid is not considered tonal.

Table 21: Tonal Properties of Operational Equipment

Frequency (Hz)	SG3600UD-MV Inverter Skid			SG3150U-MV Inverter Skid (dB)
	Inverter (dB)	Distribution Transformer (dB)	Inverter and Distribution Transformer (dB)	
20	70.2	62.4	70.9	74.0
25	76.2	66.7	76.7	76.2
31.5	81.3	60.3	81.3	80.9
40	82.4	55.9	82.4	70.8
50	81.6	57.4	81.6	69.8
63	80.4	55.3	80.4	70.4
80	79.2	53.7	79.2	71.7
100	80.2	58.1	80.2	71.5
125	84.0	70.3	84.2	80.0
160	79.6	55.3	79.6	69.0

Frequency (Hz)	SG3600UD-MV Inverter Skid			SG3150U-MV Inverter Skid (dB)
	Inverter (dB)	Distribution Transformer (dB)	Inverter and Distribution Transformer (dB)	
200	77.5	57.1	77.5	66.6
250	80.8	72.1	81.3	69.3
315	83.4	56.7	83.4	70.7
400	87.0	59.6	87.0	62.9
500	85.6	58.9	85.6	64.4
630	80.6	55.7	80.6	66.8
800	78.2	54.2	78.2	64.2
1000	76.0	48.8	76.0	64.6
1250	74.2	45.2	74.2	64.9
1600	74.5	41.5	74.5	63.1
2000	75.0	37.6	75.0	64.6
2500	76.4	33.7	76.4	65.9
3150	74.9	30.9	74.9	73.1
4000	70.7	28.8	70.7	73.6
5000	87.6	27.6	87.6	65.4
6300	80.2	26.3	80.2	63.7
8000	73.9	23.9	73.9	65.4
10000	73.1	22.6	73.1	53.0

Note: Cells with red data indicate a tonal exceedance

6 Predicted Sound Levels

6.1 Construction Noise Impacts

Facility construction will result in a temporary increase in sound levels near the Facility Site. The construction process will require the use of equipment that could be audible from off-site locations at certain times. Facility construction will consist of site preparation and grading, trenching and road construction, equipment installation, and commissioning. Work on these phases may overlap. The construction schedule and timeframe are not available at this time.

Sound levels were calculated for each construction phase at the 10 closest receptors to the construction activity. This calculation conservatively assumes that all equipment would be operating concurrently onsite for the specified construction phase and that there would be no sound attenuation for ground absorption or onsite shielding by the existing buildings or structures. Table 22 provides the results of the construction analysis for the 10 most impacted receptors and Figures 18 through 21 show the resulting sound contour isopleths. Attachment 1, Table A-5 provides the results of the construction analysis for all NSAs.

In addition, there are 19 construction laydown planned throughout the Facility Site where construction vehicles and equipment will be operating and generating noise offsite at NSAs. Modeling was completed to consider those construction-related noise impacts and those results are presented in Table 23 for the 10 most impacted receptors. Figure 22 shows the resulting sound contour isopleths and Attachment 1, Table A-5 provides the results at each receptor.

Table 23: Summary of Construction Laydown Areas Acoustic Modeling Results

Receptor ID	Participant Status	UTM Coordinates (meters)		Distance to Nearest Laydown Area (feet)	Laydown Area (dBA)
		Easting	Northing		
163	Non-participating	695422	4802320	165	42
157	Non-participating	696524	4803758	230	41
148	Non-participating	694967	4801138	150	41
172	Non-participating	693659	4802311	180	40
170	Non-participating	694188	4801897	560	38
168	Non-participating	694465	4802311	790	37
164	Non-participating	694185	4801838	635	36
167	Non-participating	694630	4802264	275	36
166	Non-participating	694629	4802317	655	36
161	Non-participating	694222	4801768	580	35

dBA – A-weighted decibels

Table 22: Summary of Construction Acoustic Modeling Results

Receptor ID	Participant Status	UTM Coordinates (meters)		Distance to Const. (feet)	Site Prep. and Grading (dBA)	Trench. and Road Const. (dBA)	Equip. Install. (dBA)	Commissioning (dBA)
		Easting	Northing					
163	Non-	695422	4802320	70	79	81	80	45
169	Non-	695773	4802305	270	77	79	78	43
165	Non-	695828	4802293	243	76	78	77	42
168	Non-	694465	4802311	177	75	77	76	41
166	Non-	694629	4802317	148	72	74	73	38
167	Non-	694630	4802264	320	72	74	73	38
172	Non-	693659	4802311	75	71	73	72	37
170	Non-	694188	4801897	410	70	72	71	36
164	Non-	694185	4801838	615	68	70	69	34
161	Non-	694222	4801768	490	67	69	68	33

dBA – A-weighted decibels

Additionally, sound levels were calculated using the Cadna-A noise model at all receptors for all HDD construction occurring simultaneously. Table 24 provides the results of the HDD construction analysis for the most impacted NSAs, Attachment 1, Table A-5 provides the results for all NSAs, and Figures 23 shows the resulting sound contour isopleths. Assuming all HDD activities may occur simultaneously is conservative and presented for informational purposes only. As the Facility design has progressed it is anticipated that only four HDD locations would be active at any given time; therefore, actual noise impacts during HDD activities will likely be substantially lower than those reported in this document and Exhibit 7.

Table 24: Summary of Horizontal Directional Drilling (HDD) Acoustic Modeling Results

Receptor ID	Participant Status	UTM Coordinates (meters)		Distance to Nearest HDD (feet)	Received Sound Levels (dBA)
		Easting	Northing		
166	Non-participating	694629	4802317	197	79
172	Non-participating	693659	4802311	148	79
167	Non-participating	694630	4802264	351	76
168	Non-participating	694465	4802311	328	75
169	Non-participating	695773	4802305	377	74
165	Non-participating	695828	4802293	427	73
163	Non-participating	695422	4802320	591	71
170	Non-participating	694188	4801897	873	68
164	Non-participating	694185	4801838	1050	67
171	Participating	693296	4802429	1020	67

dBA – A-weighted decibels

Table 22 shows the loudest impacts associated with general construction will occur during the trenching and road construction phase, with the highest calculated noise level being 81 dBA at receptor 163. Table 23 shows loudest impact during the laydown phase will be 42 dBA at receptor 163. As shown in Table 24, the loudest HDD impacts will be 79 dBA at receptor 166 and receptor 172.

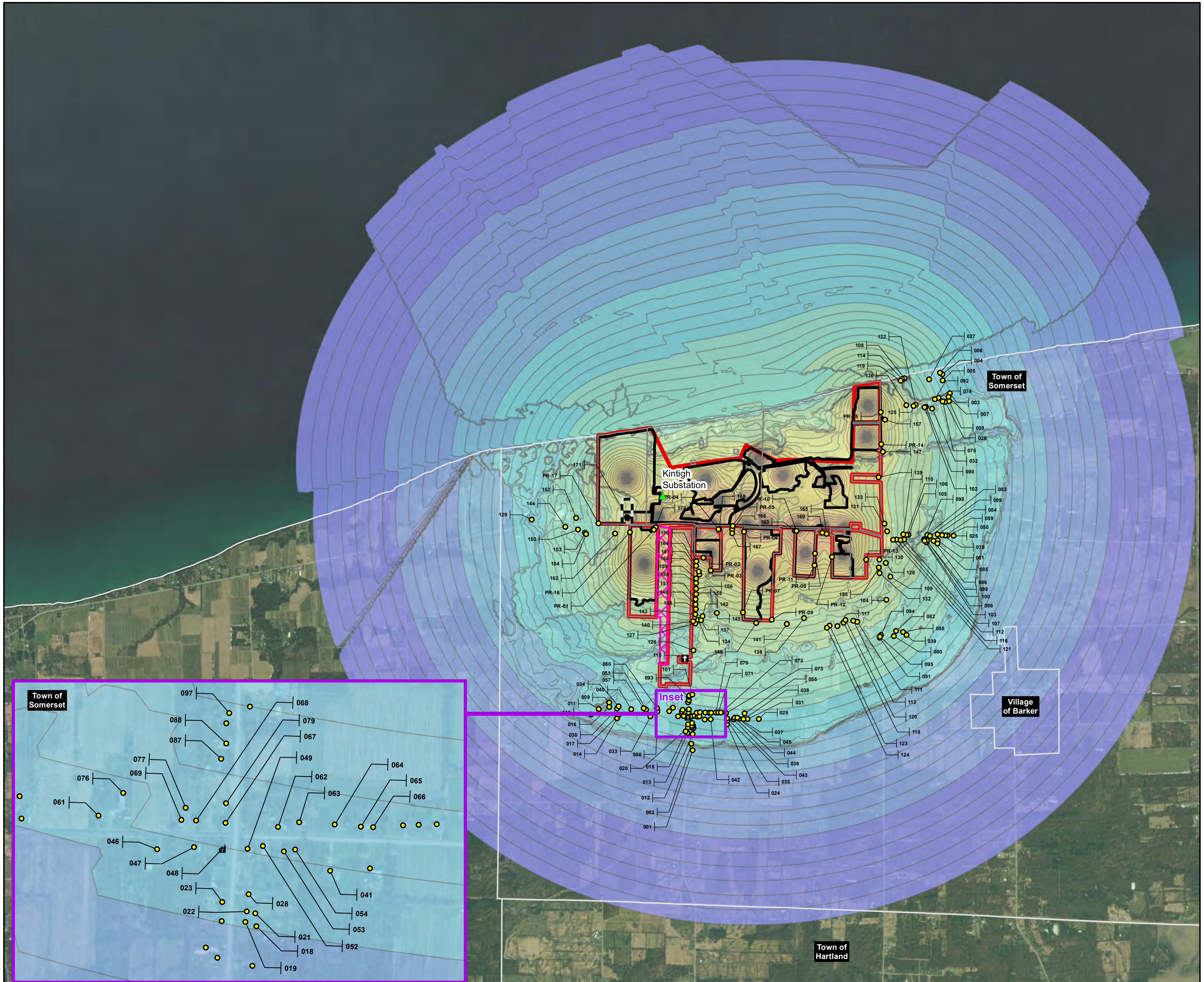
Construction noise will be temporary in nature and, as such, no long term or significant noise impacts due to construction are anticipated. Reasonable efforts will be made to minimize potential effects from construction noise. The following noise mitigation measures are planned:

- Construction equipment will be well-maintained and vehicles using internal combustion engines equipped with mufflers will be routinely checked to ensure they are in good working order;
- Portable noise barriers and enclosures will be used, when appropriate;
- Noisy equipment will be located as far from possible from sensitive areas; and
- A Complaint Management Plan will be developed and approved by ORES prior to initiating construction of the Facility, and this plan will include a hotline number that will be made available to address any noise-related issues.

6.2 Operational Noise Impacts

Operational sound levels were modeled at each NSA, using the methodology and inputs described previously. During daytime hours it was assumed that all equipment is operating at full load. During nighttime hours it is assumed that only the Facility Substation transformer and control building HVAC units will potentially be operating. In Attachment 1, Table A-1 shows the resulting sound levels from unmitigated full operations, Table A-2 shows the sound levels resulting from mitigated full operations, Table A-3 shows the resulting sound levels from unmitigated Facility Substation-only operations, and Table A-4 shows the resulting sound levels for mitigated Facility Substation-only operations. Modeling results are also presented visually in the form of sound contour plots. The sound contour plots displaying operational broadband (dBA) sound levels associated with the Facility are presented as color-coded isopleths in Figure 24 for unmitigated full operation, Figure 25 for mitigated full operation, Figure 26 for Facility Substation-only unmitigated operation, and Figure 27 for Facility Substation-only mitigated operation. Results from acoustic modeling are projected in 1-dBA steps with sound contours multiples of five (5) dBA on scaled USGS orthophoto maps. Results are independent of the existing acoustic environment, representative of Facility-generated sound levels only. The sound contour isopleths are plotted at a height of 1.52 m above ground level, about the height of the ears of a standing person.

Results in Attachment 1, Table A-1 and Figure 24 show the site will not be in compliance with the ORES §900-2.8(b)(2)(iv) property line limit of 55 dBA or the Town Code Chapter 131 Noise(A) 50 dBA nighttime property line limit. Attachment 1, Table A-3 and Figure 26 show the site will not be in compliance with the ORES §900-2.8(b)(2)(ii) 40 dBA limit, with the tonal 5 dBA penalty, for Facility Substation-only operations. For the site to be in compliance, a noise barrier that is 28 feet high and 43 feet in length will be constructed 10 feet south of the Facility Substation transformer.



Legend

Noise Sensitive Recepter (with NSR ID)

- Noise Sensitive Receptor (Non-participating)
- Noise Sensitive Receptor (Non-participating, Cemetery)
- Noise Sensitive Receptor (Non-participating, Church)
- Noise Sensitive Receptor (Participating, Museum)
- Project Parcel/Non-participating Property
- Project Parcel/Participating Property
- Facility Site/Construction Area
- Project Site Boundary
- Municipal Boundary
- Utility ROW
- Kintigh Substation

Received Sound Levels (dBA)

30 - 35	60 - 65
35 - 40	65 - 70
40 - 45	70 - 75
45 - 50	75 - 80
50 - 55	>80
55 - 60	

1:47,000

0 0.25 0.5 0.75 1 Miles

Figure 18

Site Preparation and Grading Construction Sound Levels, (dBA)

Somerset Solar
Niagara County, NY
March 2023

TETRA TECH

aes

Source: Aerial Imagery- ESRI 2017/2018; NYS GIS Civil Boundaries, Sept 2021

NOT FOR CONSTRUCTION

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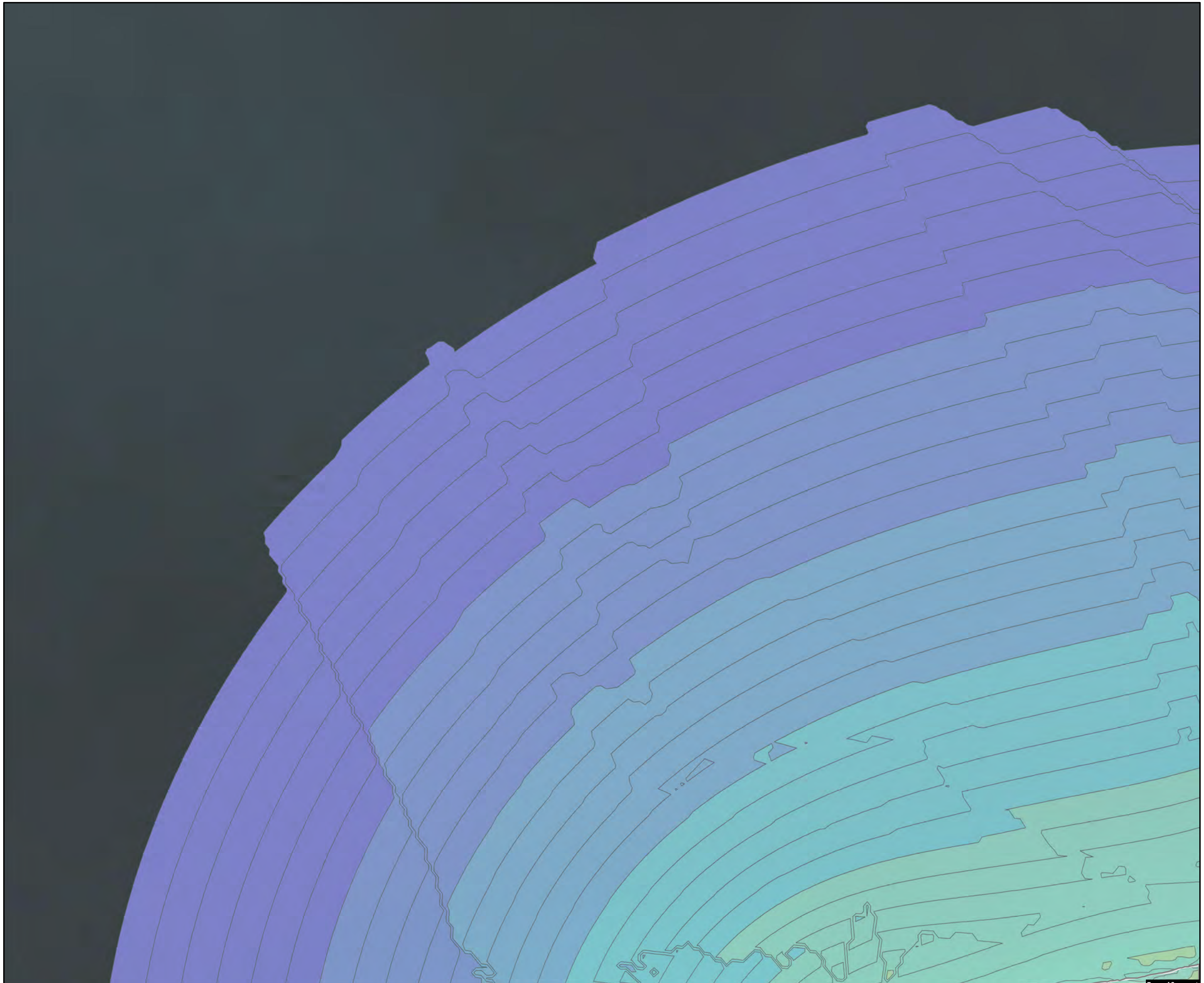

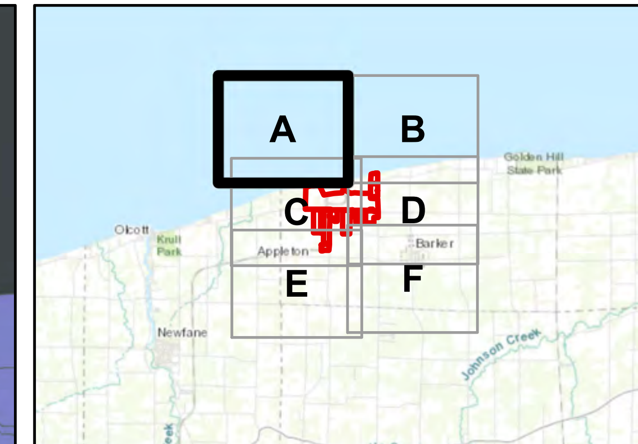

Legend

- Project Parcel/Non-participating Property
- Project Site Boundary
- Municipal Boundary

Received Sound Levels (dBA)

30 - 35	60 - 65
35 - 40	65 - 70
40 - 45	70 - 75
45 - 50	75 - 80
50 - 55	>80
55 - 60	

N

1:20,000

0 0.25 0.5 Miles

Figure 18A

Site Preparation and Grading Construction Sound Levels, (dBA)

Somerset Solar
Niagara County, NY
March 2023

TETRA TECH

aes

Source: Aerial Imagery- ESRI 2017/2018; NYS GIS Civil Boundaries, Sept 2021

NOT FOR CONSTRUCTION

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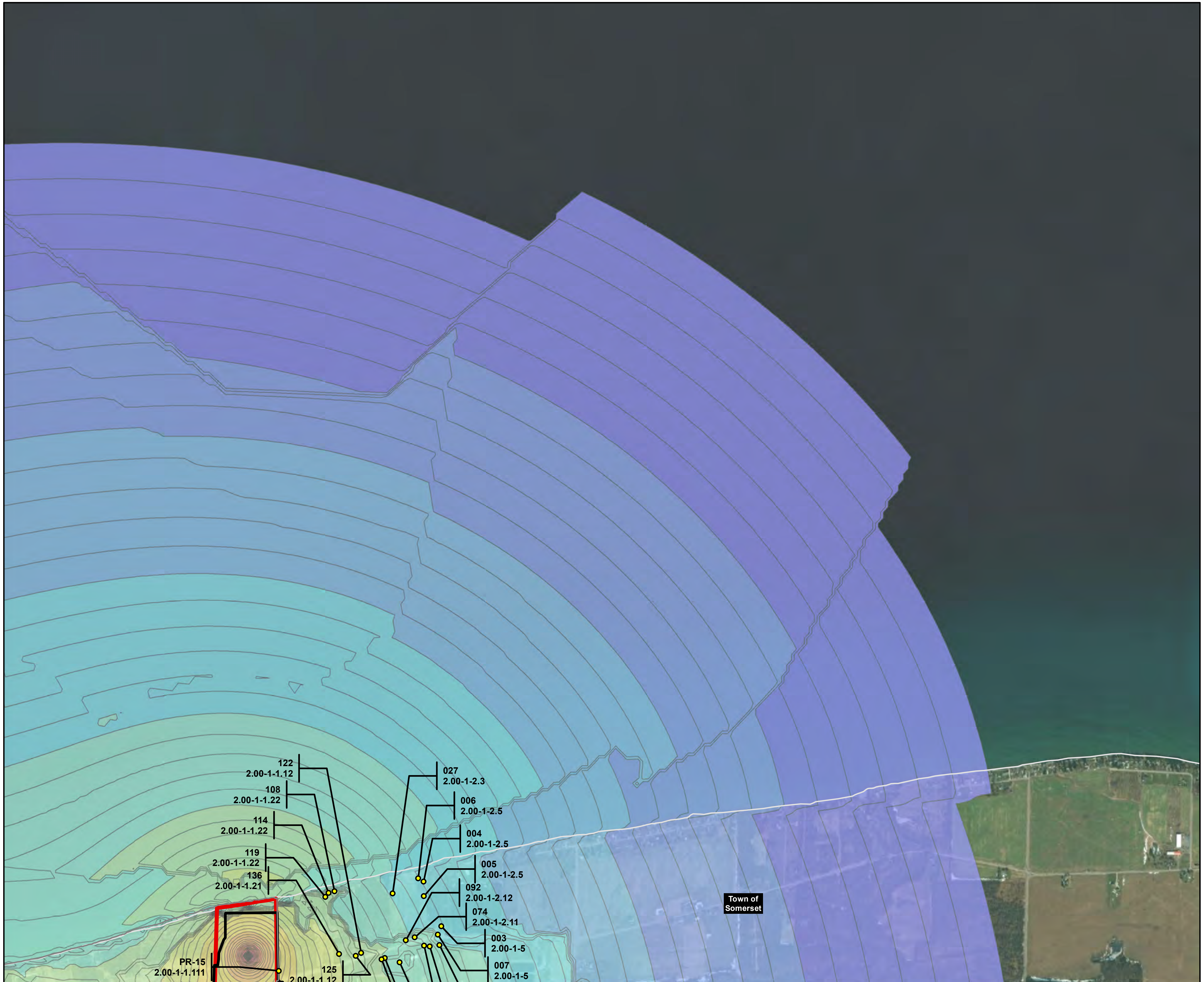
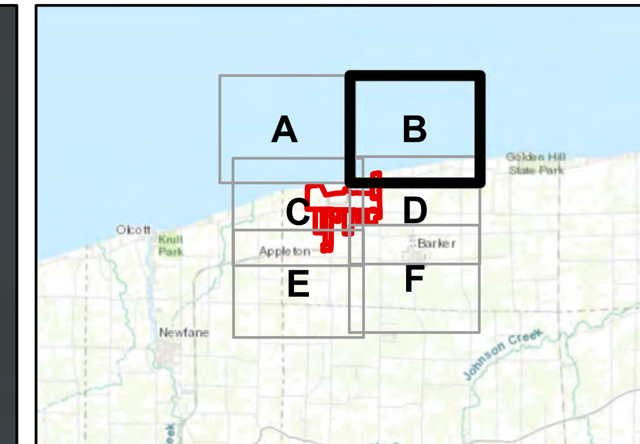




Legend

Noise Sensitive Receptor (with NSR ID and Tax ID)

- Noise Sensitive Receptor (Non-participating)
- Project Parcel/Non-participating Property
- Facility Site/Construction Area
- Project Site Boundary
- Municipal Boundary

Received Sound Levels (dBA)

30 - 35	60 - 65
35 - 40	65 - 70
40 - 45	70 - 75
45 - 50	75 - 80
50 - 55	>80
55 - 60	

N

1:20,000

0 0.25 0.5 Miles

Figure 18B

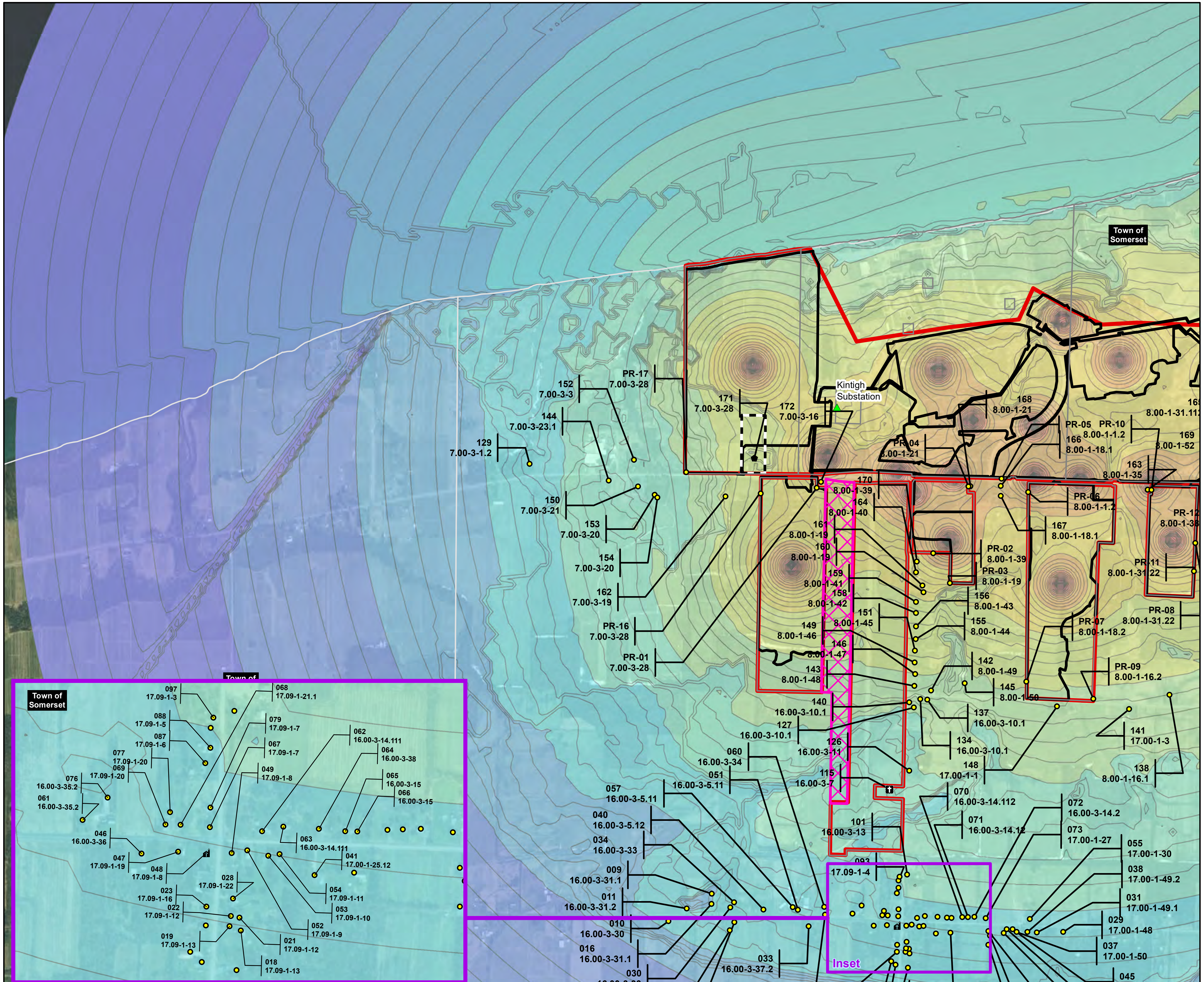
Site Preparation and Grading Construction Sound Levels, (dBA)

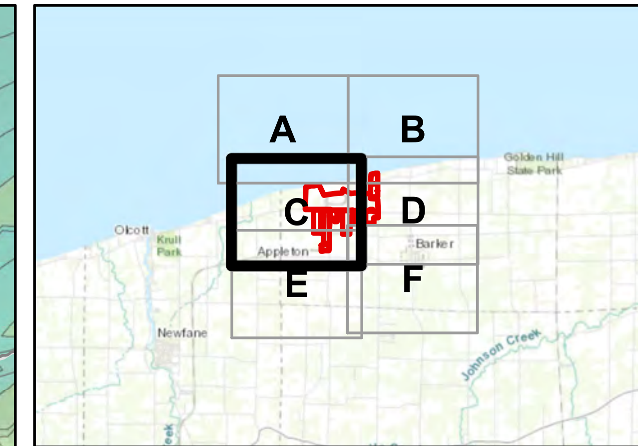
Somerset Solar
Niagara County, NY
March 2023

TETRA TECH

aes

Source: Aerial Imagery- ESRI 2017/2018; NYS GIS Civil Boundaries, Sept 2021





Legend

Noise Sensitive Receptor (with NSR ID and Tax ID)

- Noise Sensitive Receptor (Non-participating)
- Noise Sensitive Receptor (Non-participating, Cemetery)
- Noise Sensitive Receptor (Non-participating, Church)
- Noise Sensitive Receptor (Participating, Museum)
- Project Parcel/Non-participating Property
- Project Parcel/Participating Property
- Facility Site/Construction Area
- Project Site Boundary
- Municipal Boundary
- Utility ROW
- Kintigh Substation

Received Sound Levels (dBA)

30 - 35	60 - 65
35 - 40	65 - 70
40 - 45	70 - 75
45 - 50	75 - 80
50 - 55	>80
55 - 60	

1:20,000

0 0.25 0.5 Miles

Figure 18C

Site Preparation and Grading Construction Sound Levels, (dBA)

Somerset Solar
Niagara County, NY
March 2023

TETRA TECH

aes

Source: Aerial Imagery- ESRI 2017/2018; NYS GIS Civil Boundaries, Sept 2021

NOT FOR CONSTRUCTION

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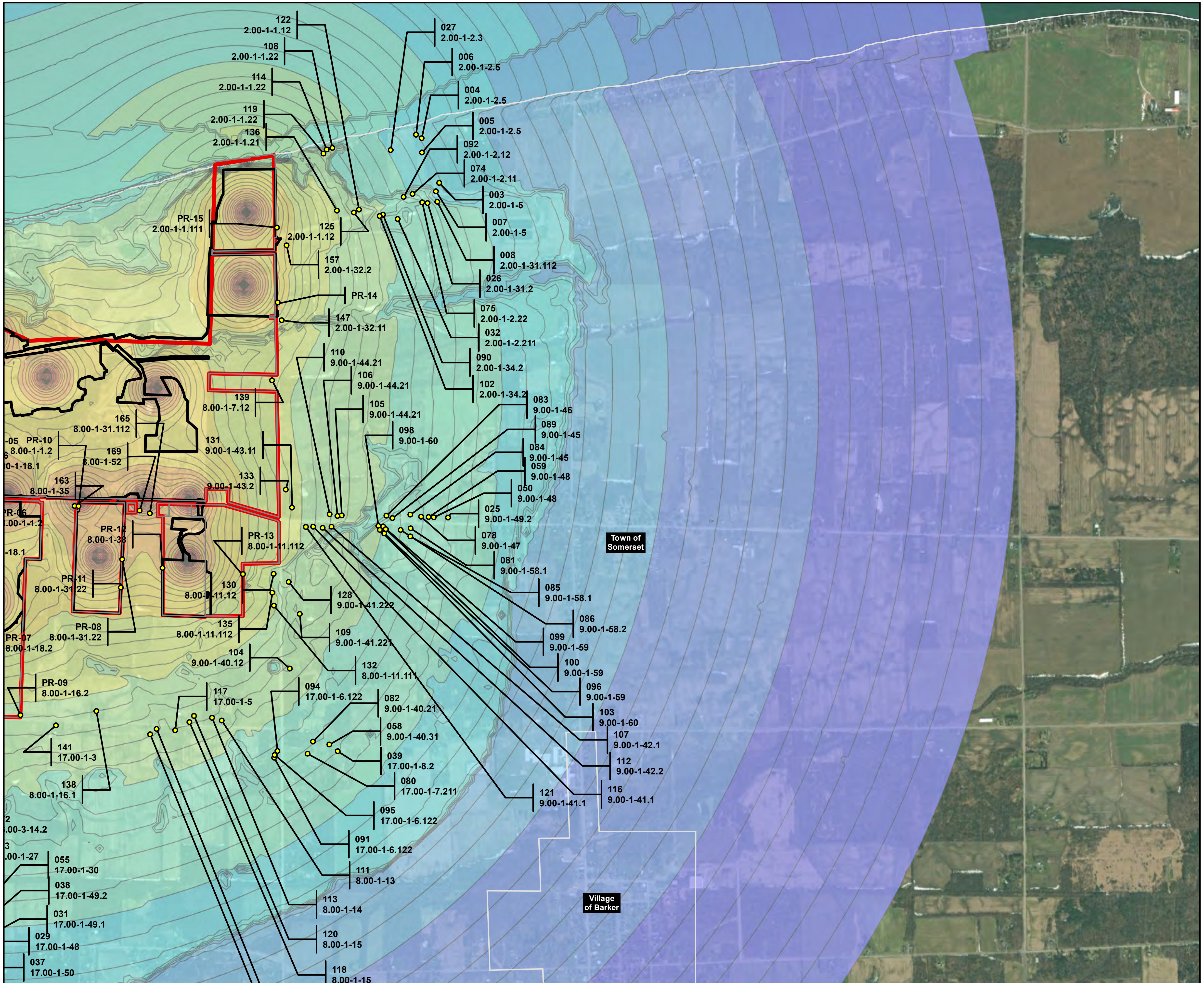

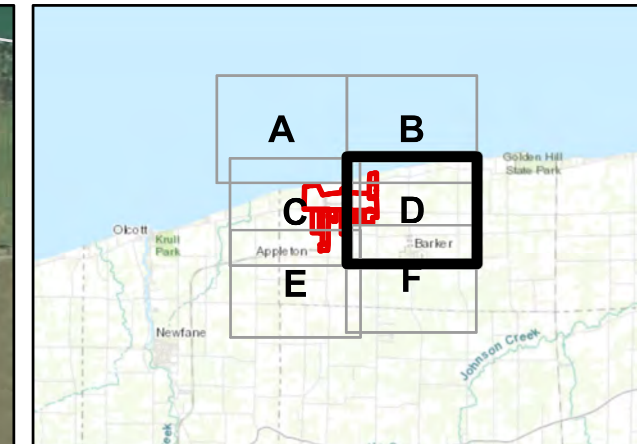

Legend

Noise Sensitive Receptor (with NSR ID and Tax ID)

- Noise Sensitive Receptor (Non-participating)
- Project Parcel/Non-participating Property
- Facility Site/Construction Area
- Project Site Boundary
- Municipal Boundary

Received Sound Levels (dBA)

30 - 35	60 - 65
35 - 40	65 - 70
40 - 45	70 - 75
45 - 50	75 - 80
50 - 55	>80
55 - 60	

N

1:20,000

0 0.25 0.5 Miles

Figure 18D

Site Preparation and Grading Construction Sound Levels, (dBA)

Somerset Solar
Niagara County, NY
March 2023

TETRA TECH

aes

Source: Aerial Imagery- ESRI 2017/2018; NYS GIS Civil Boundaries, Sept 2021

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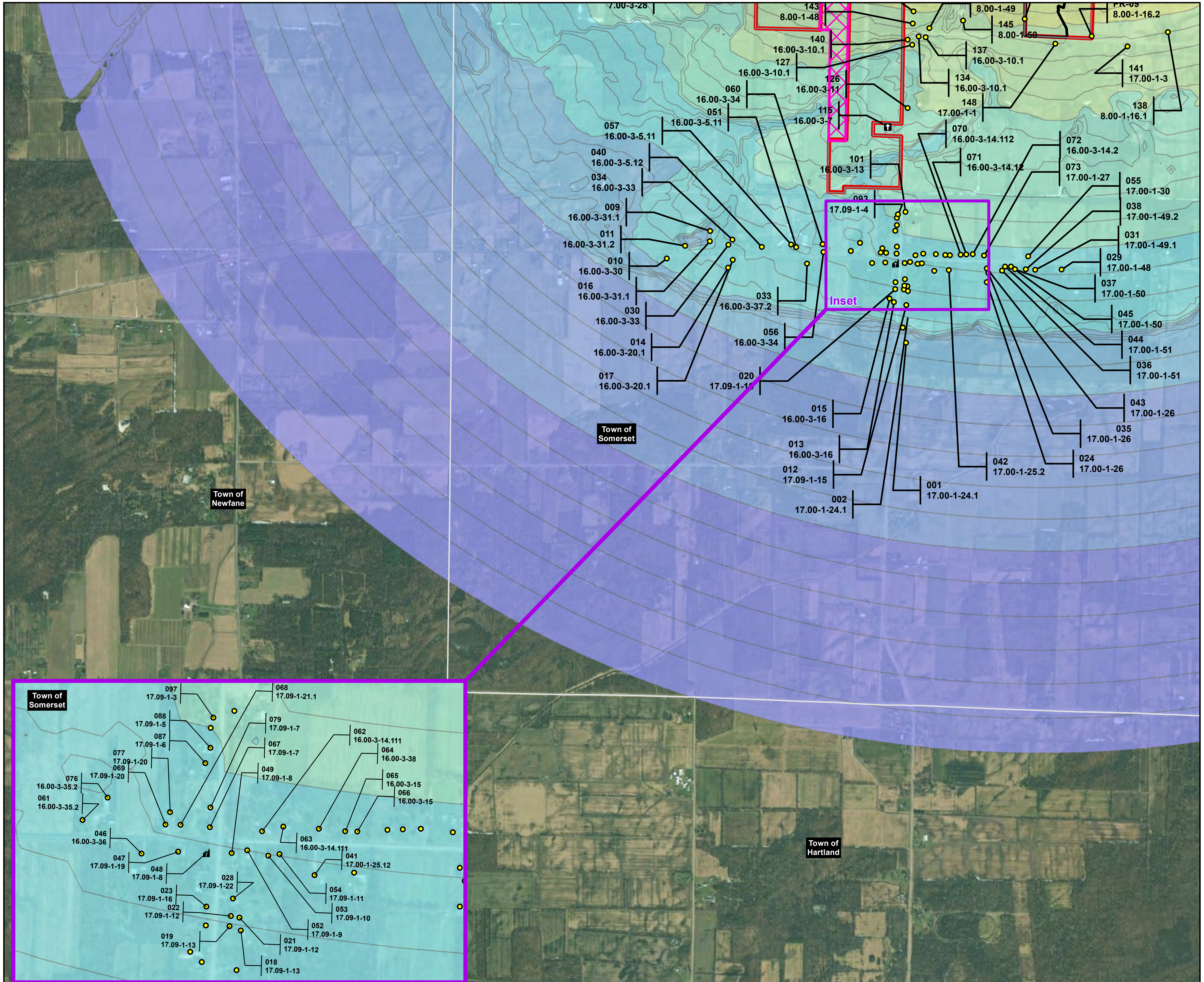

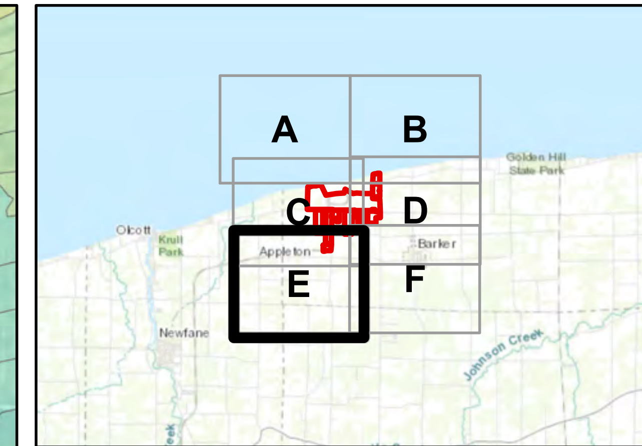

Legend

Noise Sensitive Receptor (with NSR ID and Tax ID)

- Noise Sensitive Receptor (Non-participating)
- Noise Sensitive Receptor (Non-participating, Cemetery)
- Noise Sensitive Receptor (Non-participating, Church)
- Project Parcel/Non-participating Property
- Facility Site/Construction Area
- Project Site Boundary
- Municipal Boundary
- Utility ROW

Received Sound Levels (dBA)

30 - 35	60 - 65
35 - 40	65 - 70
40 - 45	70 - 75
45 - 50	75 - 80
50 - 55	>80
55 - 60	

1:20,000

0 0.25 0.5 Miles

Figure 18E

Site Preparation and Grading Construction Sound Levels, (dBA)

Somerset Solar
Niagara County, NY
March 2023

TETRA TECH

aes

Source: Aerial Imagery- ESRI 2017/2018; NYS GIS Civil Boundaries, Sept 2021

NOT FOR CONSTRUCTION

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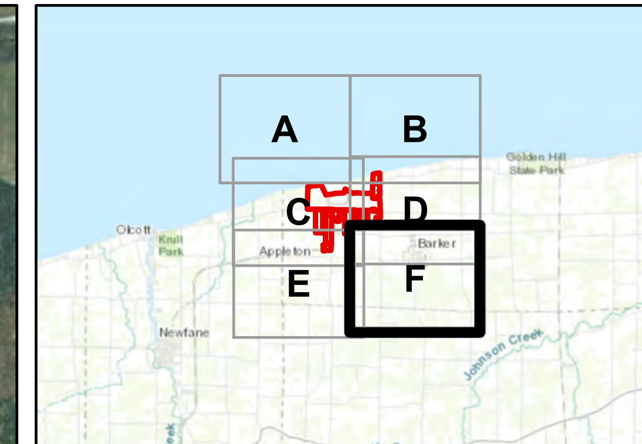

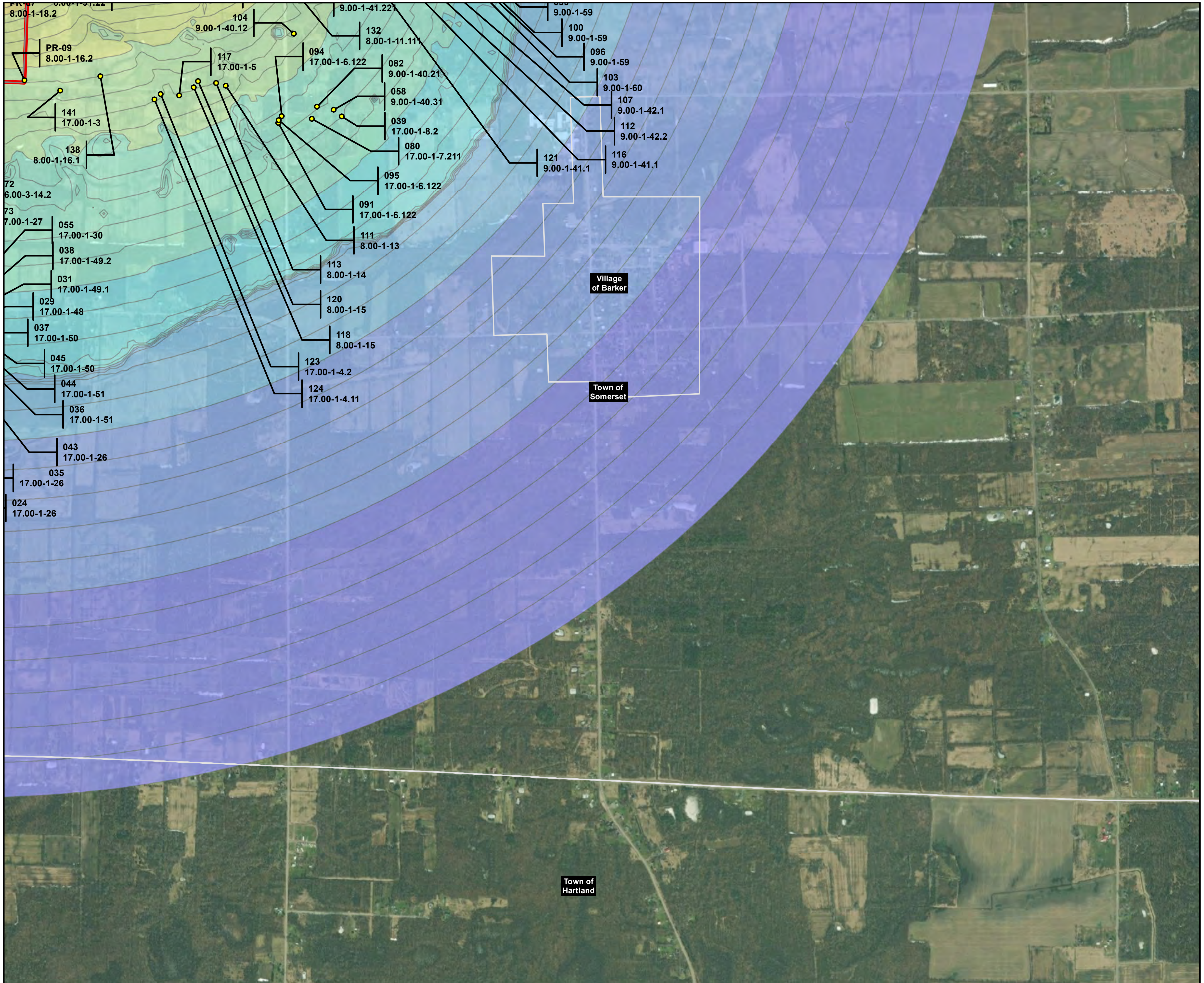

Legend

Noise Sensitive Receptor (with NSR ID and Tax ID)

Noise Sensitive Receptor (Non-participating)

Project Parcel/Non-participating Property

Project Site Boundary

Municipal Boundary

Received Sound Levels (dBA)

30 - 35	60 - 65
35 - 40	65 - 70
40 - 45	70 - 75
45 - 50	75 - 80
50 - 55	>80
55 - 60	

N

1:20,000

0 0.25 0.5 Miles

Figure 18F

Site Preparation and Grading Construction Sound Levels, (dBA)

Somerset Solar
Niagara County, NY
March 2023

TETRA TECH

aes

Source: Aerial Imagery- ESRI 2017/2018; NYS GIS Civil Boundaries, Sept 2021

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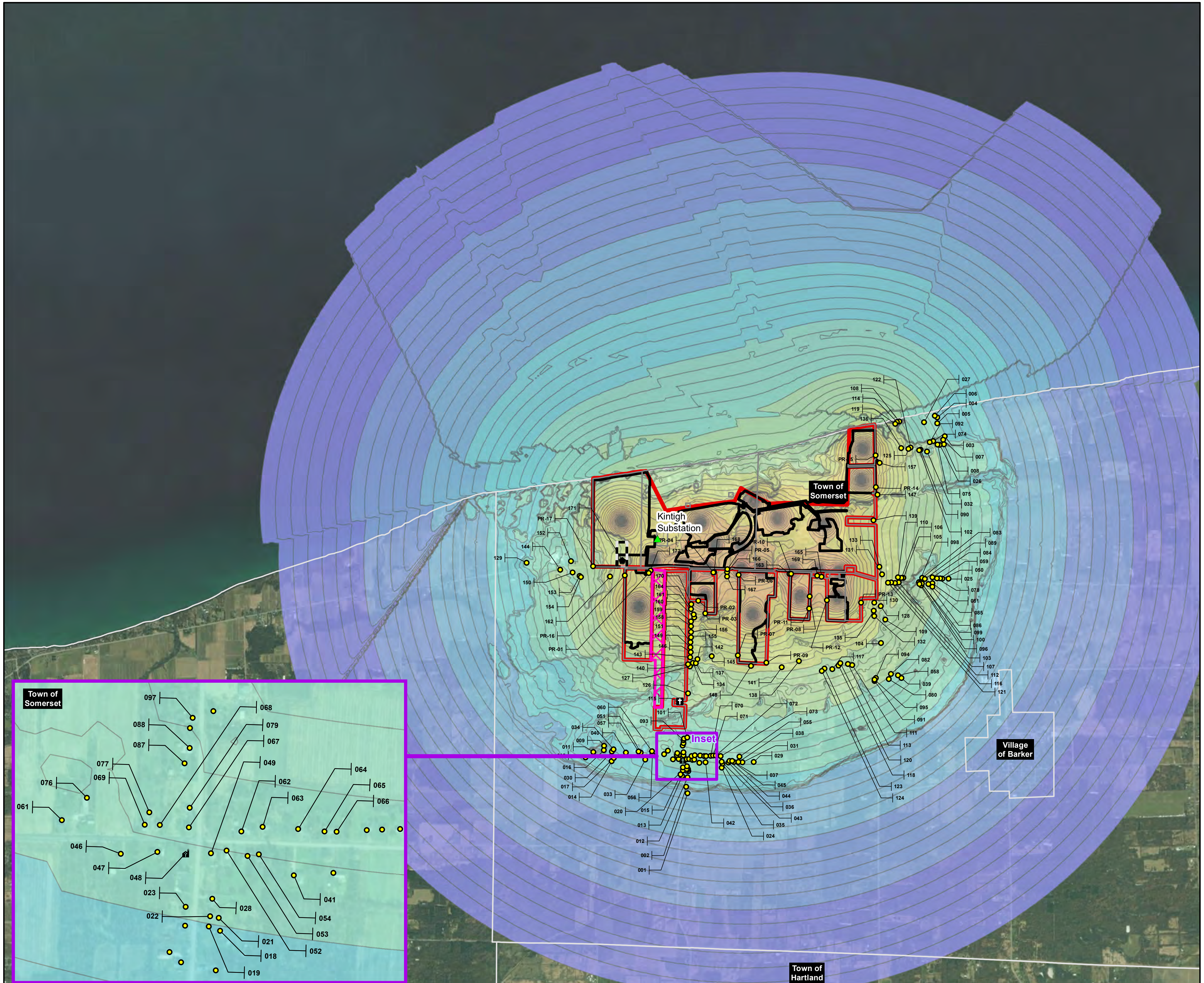

Legend

Noise Sensitive Receptor (with NSR ID)

- Noise Sensitive Receptor (Non-participating)
- Noise Sensitive Receptor (Non-participating, Cemetery)
- Noise Sensitive Receptor (Non-participating, Church)
- Noise Sensitive Receptor (Participating, Museum)
- Project Parcel/Non-participating Property
- Project Parcel/Participating Property
- Facility Site/Construction Area
- Project Site Boundary
- Municipal Boundary
- Utility ROW
- Kintigh Substation

Received Sound Levels (dBA)

30 - 35	60 - 65
35 - 40	65 - 70
40 - 45	70 - 75
45 - 50	75 - 80
50 - 55	>80
55 - 60	

1:47,000

0 0.25 0.5 0.75 1 Miles

Figure 19

Trenching and Road Construction Sound Levels, (dBA)

Somerset Solar
Niagara County, NY
March 2023

TETRA TECH

Source: Aerial Imagery- ESRI 2017/2018; NYS GIS Civil Boundaries, Sept 2021

NOT FOR CONSTRUCTION

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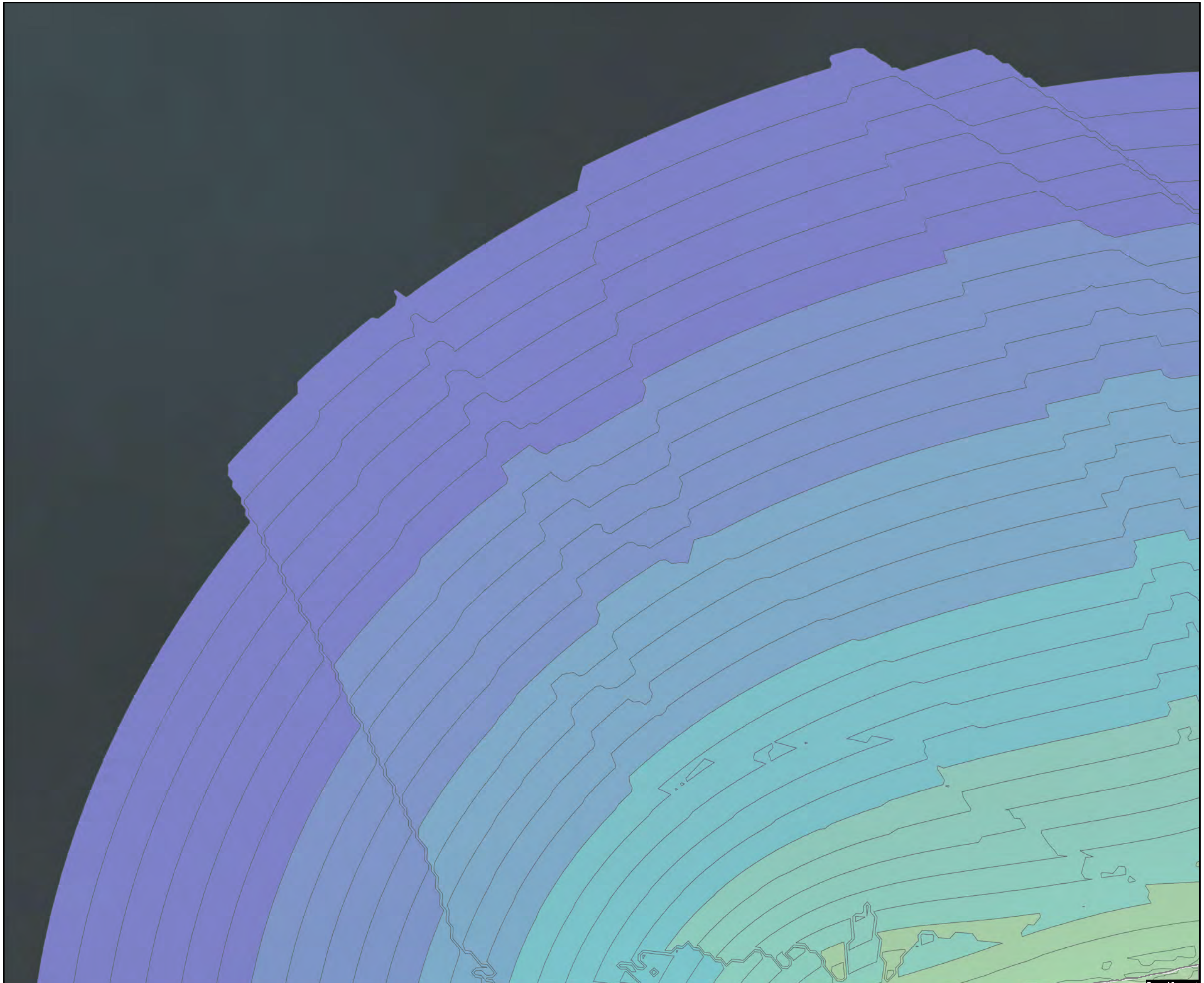

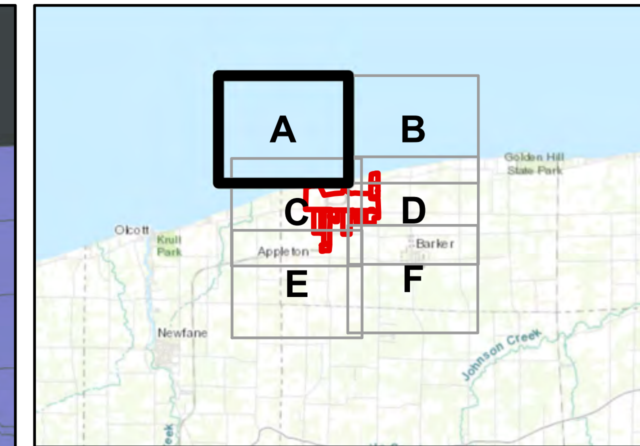

Legend

- Project Parcel/Non-participating Property
- Project Site Boundary
- Municipal Boundary

Received Sound Levels (dBA)

30 - 35	60 - 65
35 - 40	65 - 70
40 - 45	70 - 75
45 - 50	75 - 80
50 - 55	>80
55 - 60	

N

1:20,000

0 0.25 0.5 Miles

Figure 19A

Trenching and Road Construction Sound Levels, (dBA)

Somerset Solar
Niagara County, NY
March 2023

TETRA TECH

aes

Source: Aerial Imagery- ESRI 2017/2018; NYS GIS Civil Boundaries, Sept 2021

NOT FOR CONSTRUCTION

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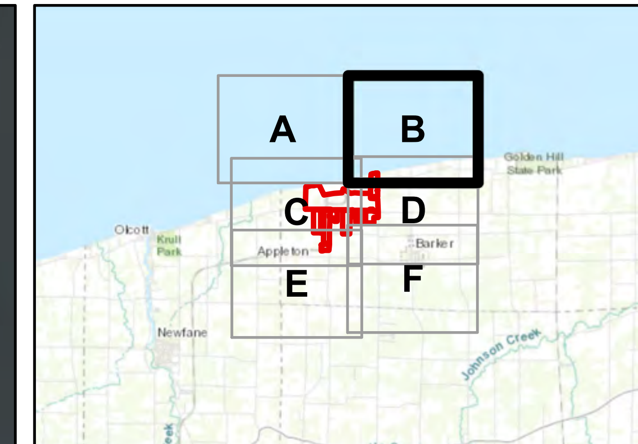


Legend

Noise Sensitive Receptor (with NSR ID and Tax ID)

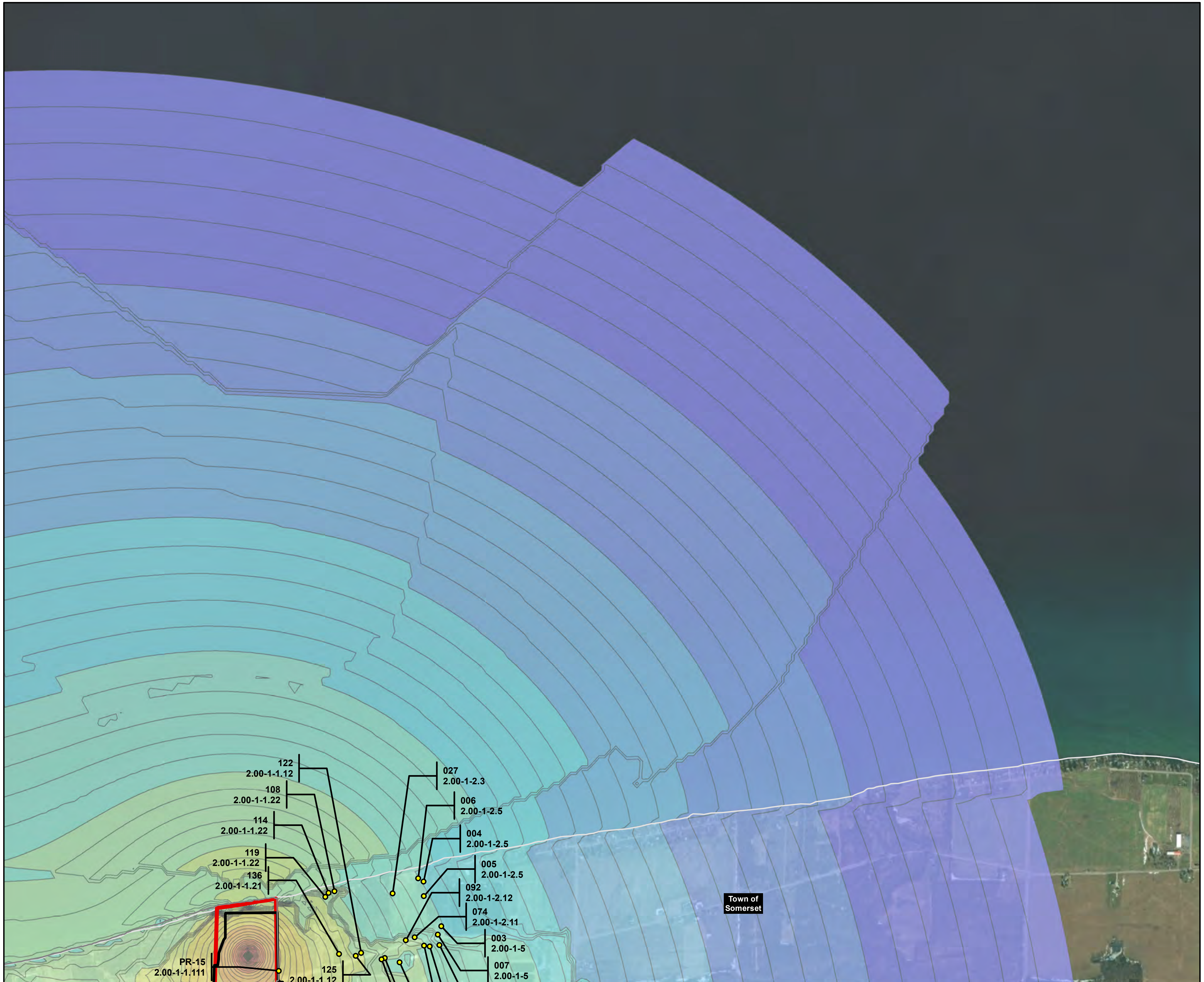
Noise Sensitive Receptor (Non-participating)

Project Parcel/Non-participating Property

Facility Site/Construction Area

Project Site Boundary

Municipal Boundary



Received Sound Levels (dBA)

30 - 35	60 - 65
35 - 40	65 - 70
40 - 45	70 - 75
45 - 50	75 - 80
50 - 55	>80
55 - 60	

N

1:20,000

0 0.25 0.5 Miles

Figure 19B

Trenching and Road Construction Sound Levels, (dBA)

Somerset Solar
Niagara County, NY
March 2023

TETRA TECH

Source: Aerial Imagery- ESRI 2017/2018; NYS GIS Civil Boundaries, Sept 2021

NOT FOR CONSTRUCTION

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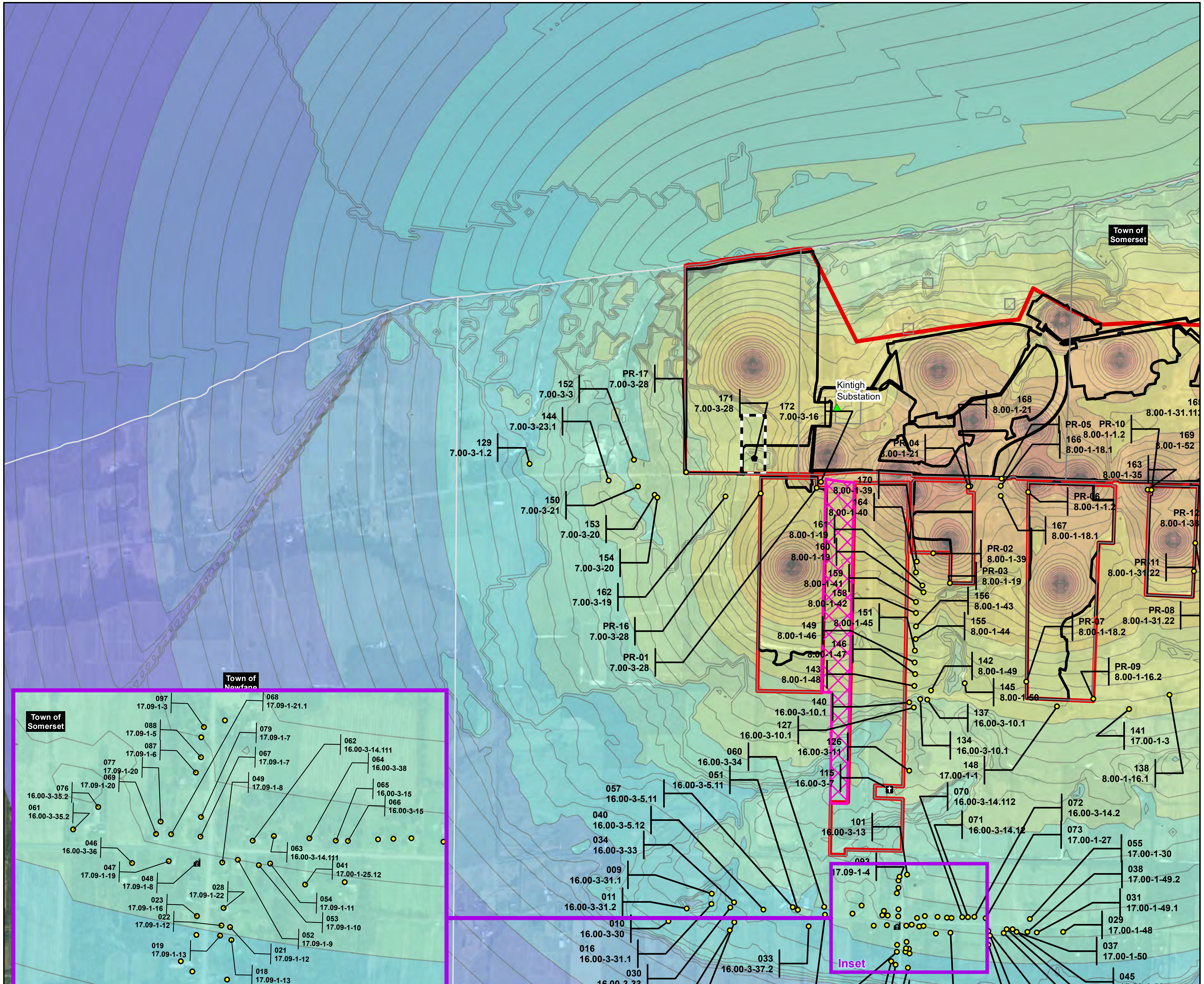

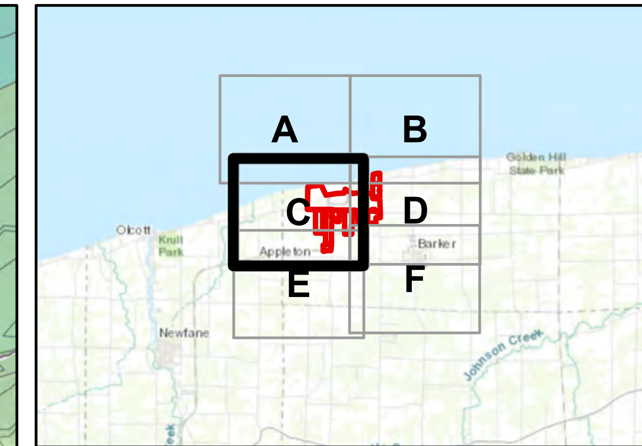

Legend

Noise Sensitive Receptor (with NSR ID and Tax ID)

- Noise Sensitive Receptor (Non-participating)
- Noise Sensitive Receptor (Non-participating, Cemetery)
- Noise Sensitive Receptor (Non-participating, Church)
- Noise Sensitive Receptor (Participating, Museum)
- Project Parcel/Non-participating Property
- Project Parcel/Participating Property
- Facility Site/Construction Area
- Project Site Boundary
- Municipal Boundary
- Utility ROW
- Kintigh Substation

Received Sound Levels (dBA)

30 - 35	60 - 65
35 - 40	65 - 70
40 - 45	70 - 75
45 - 50	75 - 80
50 - 55	>80
55 - 60	

1:20,000

0 0.25 0.5 Miles

Figure 19C

Trenching and Road Construction Sound Levels, (dBA)

Somerset Solar
Niagara County, NY
March 2023

TETRA TECH

aes

Source: Aerial Imagery- ESRI 2017/2018; NYS GIS Civil Boundaries, Sept 2021

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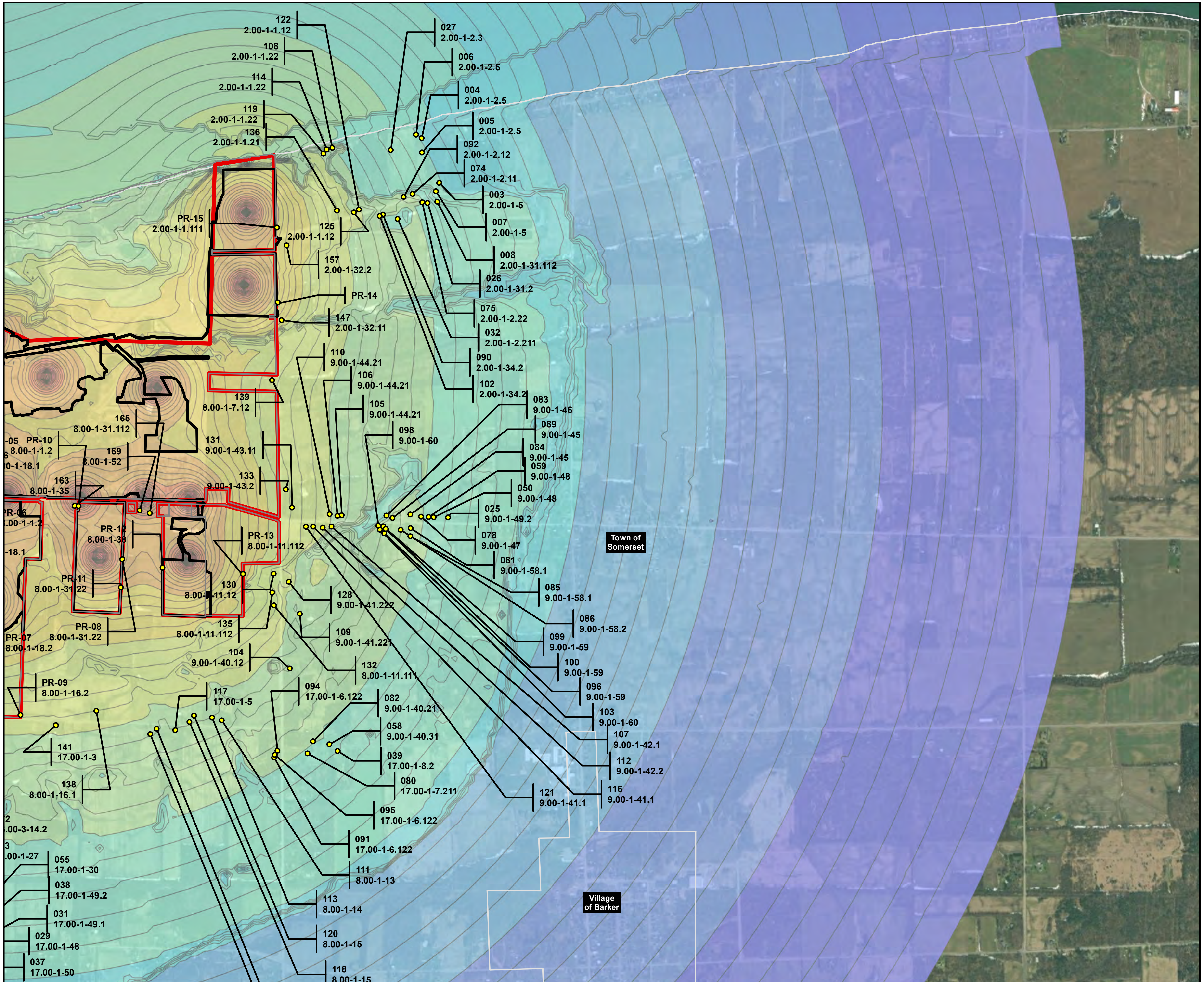

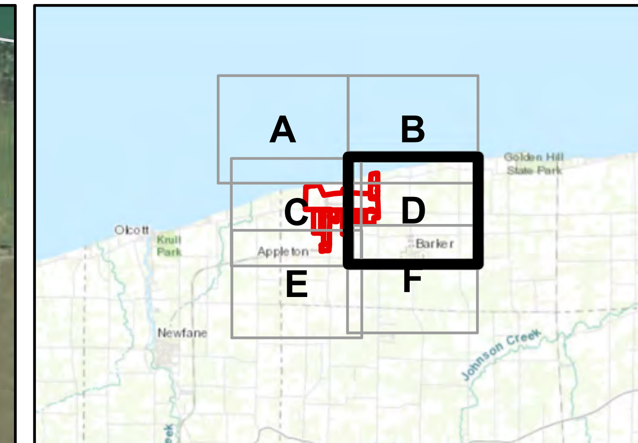

Legend

Noise Sensitive Receptor (with NSR ID and Tax ID)

- Noise Sensitive Receptor (Non-participating)
- Project Parcel/Non-participating Property
- Facility Site/Construction Area
- Project Site Boundary
- Municipal Boundary

Received Sound Levels (dBA)

30 - 35	60 - 65
35 - 40	65 - 70
40 - 45	70 - 75
45 - 50	75 - 80
50 - 55	>80
55 - 60	

N

1:20,000

0 0.25 0.5 Miles

Figure 19D

Trenching and Road Construction Sound Levels, (dBA)

Somerset Solar
Niagara County, NY
March 2023

TETRA TECH

aes

Source: Aerial Imagery- ESRI 2017/2018; NYS GIS Civil Boundaries, Sept 2021

NOT FOR CONSTRUCTION

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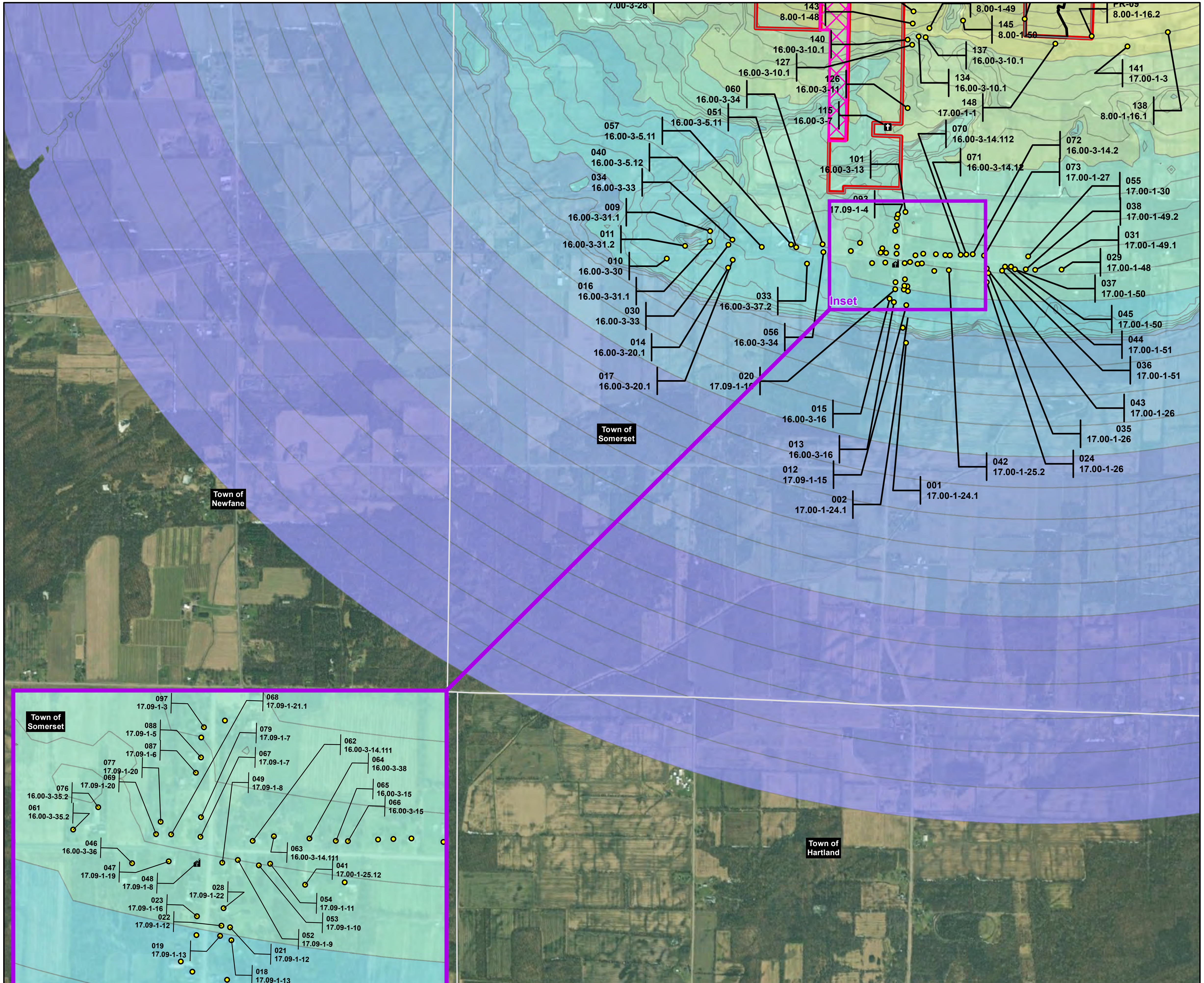

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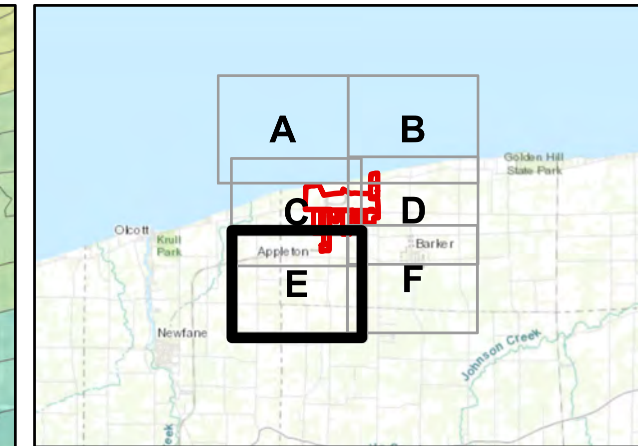

Legend

Noise Sensitive Receptor (with NSR ID and Tax ID)

- Noise Sensitive Receptor (Non-participating)
- Noise Sensitive Receptor (Non-participating, Cemetery)
- Noise Sensitive Receptor (Non-participating, Church)
- Project Parcel/Non-participating Property
- Facility Site/Construction Area
- Project Site Boundary
- Municipal Boundary
- Utility ROW

Received Sound Levels (dBA)

30 - 35	60 - 65
35 - 40	65 - 70
40 - 45	70 - 75
45 - 50	75 - 80
50 - 55	>80
55 - 60	

N

1:20,000

0 0.25 0.5 Miles

Figure 19E

Trenching and Road Construction Sound Levels, (dBA)

Somerset Solar
Niagara County, NY
March 2023

TETRA TECH

Source: Aerial Imagery- ESRI 2017/2018; NYS GIS Civil Boundaries, Sept 2021

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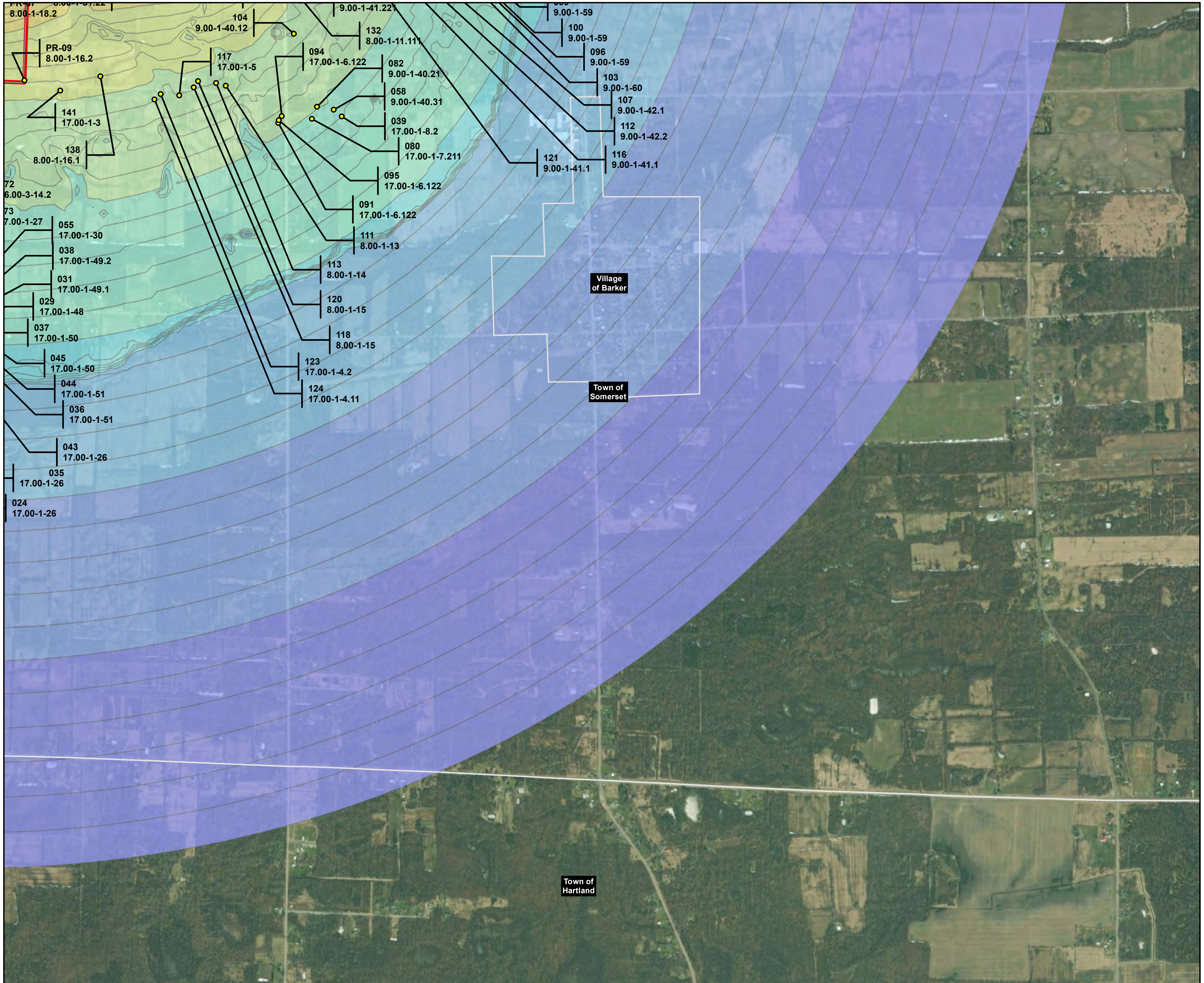

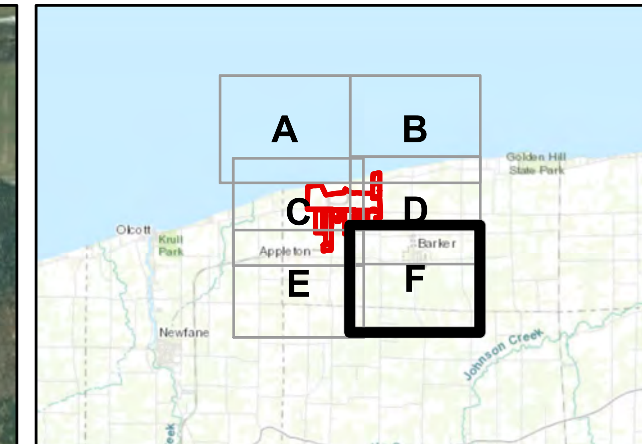

Legend

Noise Sensitive Receptor (with NSR ID and Tax ID)

Noise Sensitive Receptor (Non-participating)

Project Parcel/Non-participating Property

Project Site Boundary

Municipal Boundary

Received Sound Levels (dBA)

30 - 35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
>80

1:20,000

0 0.25 0.5 Miles

Figure 19F

Trenching and Road Construction Sound Levels, (dBA)

Somerset Solar
Niagara County, NY
March 2023

TETRA TECH

aes

Source: Aerial Imagery- ESRI 2017/2018; NYS GIS Civil Boundaries, Sept 2021

NOT FOR CONSTRUCTION

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