SOUND LEVEL MODELING REPORT

South Hill Road Wind Project
Town of Villenova, New York

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TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF FIGURES

1.0 EXECUTIVE SUMMARY

The South Hill Road Wind Project (the Project) is a proposed wind power generation facility expected to consist of three wind turbines in the Town of Villenova, Chautauqua County, New York. The Project is being developed by New Leaf Energy, Inc. (New Leaf). Epsilon Associates Inc. (Epsilon) has been retained by New Leaf to conduct a sound level modeling study for this Project. This report presents results of the sound level modeling from the proposed wind turbines.

This sound level assessment includes computer modeling to predict worst-case future L_{10} sound levels from the Project, and a comparison of operational sound levels to regulatory limits. The analysis was conducted for two different scenarios: three Vestas V163-4.5 wind turbines; and three GE 3.4-140 wind turbines. The Project is required to comply with the sound level requirements of the Wind Energy Facilities Law of the Town of Villenova which are presented in Section 4 of this report. The local laws limit sound produced by a wind energy conversion system (WECS) to 50 dBA at any residence.

The worst-case L_{10} sound levels produced by the Project were predicted through modeling. The highest predicted worst-case Project Only L_{10} sound level at a modeling receptor is 44 dBA for the Vestas V163-4.5 wind turbine option. The highest predicted worst-case Project Only L_{10} sound level at a modeling receptor is 43 dBA for the GE 3.4-140 wind turbine option. Therefore, with either the Vestas or GE wind turbine option, the Project complies with the sound limits of the Town of Villenova Wind Energy Facilities Law.

2.0 INTRODUCTION

The proposed Project will consist of three wind turbines. New Leaf is considering two different wind turbines: a Vestas V163-4.5 unit with a hub height of 98 meters, or a GE 3.4-140 unit with a hub height of 98 meters. Figure 2-1 shows the location of the wind turbines in Chautauqua County over aerial imagery.

A detailed discussion of sound from wind turbines is presented in a white paper prepared by the Renewable Energy Research Laboratory.[1] A few points are repeated herein. Wind turbine sound can originate from two different sources: mechanical sound from the interaction of turbine components, and aerodynamic sound produced by the flow of air over the rotor blades. Prior to the 1990's, both were significant contributors to wind turbine sound. However, recent advances in wind turbine design have greatly reduced the contribution of mechanical sound. Aerodynamic sound has also been reduced from modern wind turbines due to slower rotational speeds and changes in materials of construction. Aerodynamic sound, in general, is broadband (has contributions from a wide range of frequencies). It originates from encounters of the wind turbine blades with localized airflow inhomogeneities and wakes from other turbine blades and from airflow across the surface of the blades, particularly the front and trailing edges. Aerodynamic sound generally increases with increasing wind speed up to a certain point, then typically remains constant, even with higher wind speeds. However, sound levels in general also increase with increasing wind speed with or without the presence of wind turbines.

This report presents the findings of a sound level modeling analysis for the Project. The Project wind turbine was modeled in CadnaA using sound data from Vestas and GE technical reports. The results of this analysis are found within this report.

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[1] Renewable Energy Research Laboratory, Department of Mechanical and Industrial Engineering, University of Massachusetts at Amherst, Wind Turbine Acoustic Noise, June 2002, amended January 2006.

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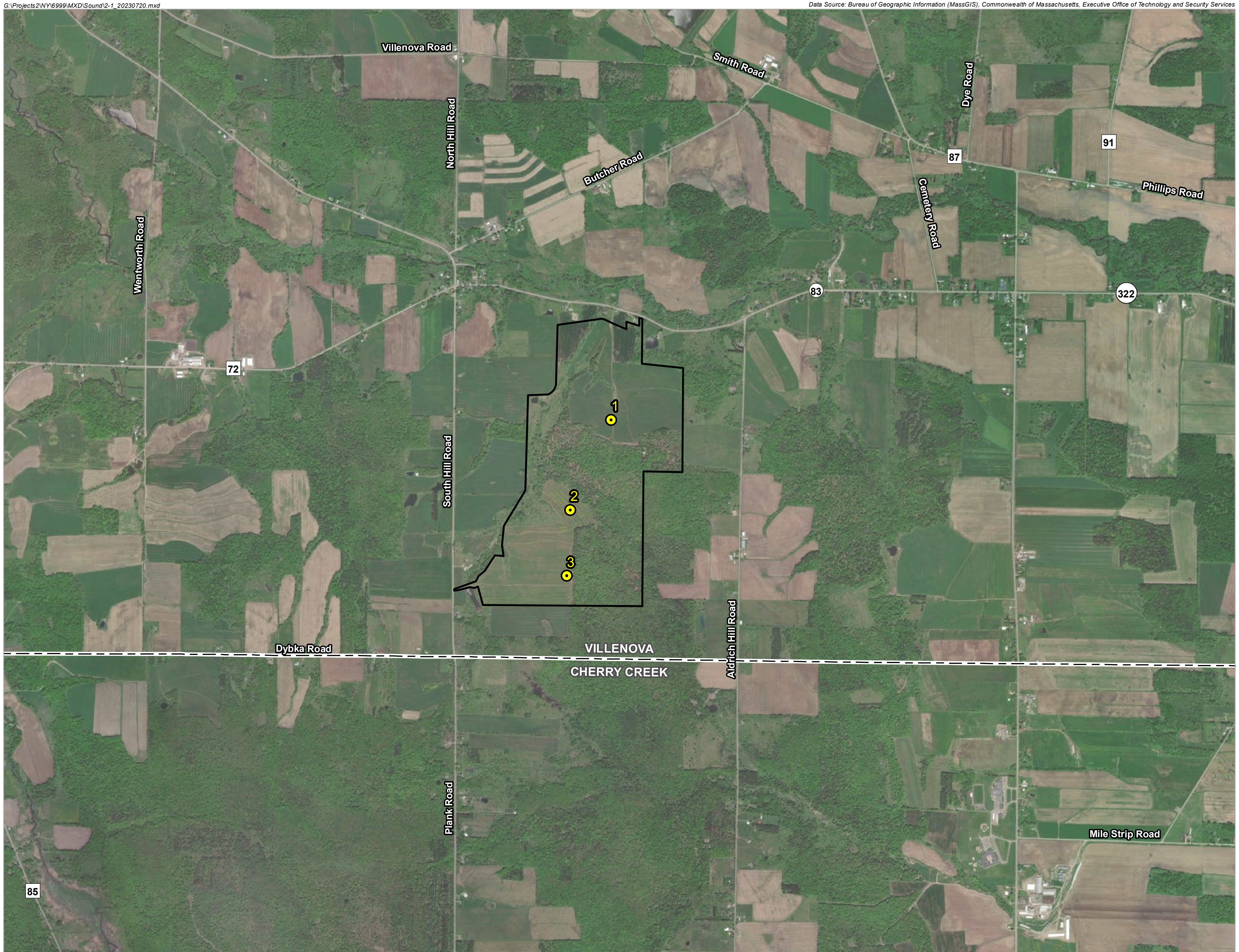

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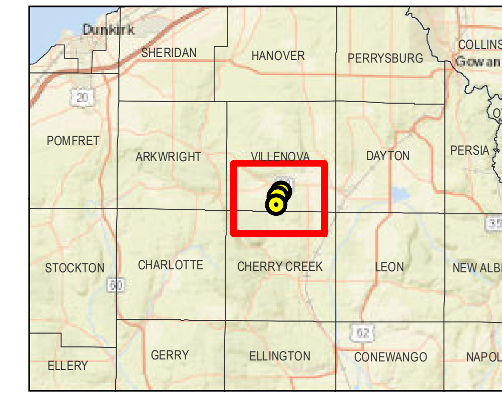

SCALE

1:24,000
1 inch = 2,000 feet

0 1,000 2,000 Feet

N

LEGEND

Proposed Wind Turbine

Project Boundary

Figure 2-1

Aerial Locus

3.0 SOUND TERMINOLOGY

There are several ways in which sound levels are measured and quantified. All of them use the logarithmic decibel (dB) scale. The following information defines the sound level terminology used in this analysis.

The decibel scale is logarithmic to accommodate the wide range of sound intensities found in the environment. A property of the decibel scale is that the sound pressure levels of two or more separate sounds are not directly additive. For example, if a sound of 50 dB is added to another sound of 50 dB, the total is only a 3-decibel increase (53 dB), which is equal to doubling in sound energy, but not equal to a doubling in decibel quantity (100 dB). Thus, every 3-dB change in sound level represents a doubling or halving of sound energy. The human ear does not perceive changes in the sound pressure level as equal changes in loudness. Scientific research demonstrates that the following general relationships hold between sound level and human perception for two sound levels with the same or very similar frequency characteristics[2]:

- 3 dBA increase or decrease results in a change in sound that is just perceptible to the average person,
- 5 dBA increase or decrease is described as a clearly noticeable change in sound level, and
- 10 dBA increase or decrease is described as twice or half as loud.

Another mathematical property of decibels is that if one source of sound is at least 10 dB louder than another source, then the total sound level is simply the sound level of the higher-level source. For example, a sound source at 60 dB plus another sound source at 47 dB is equal to 60 dB.

A sound level meter (SLM) that is used to measure sound is a standardized instrument.[3] It contains "weighting networks" (e.g., A-, C-, Z-weightings) to adjust the frequency response of the instrument. Frequencies, reported in Hertz (Hz), are detailed characterizations of sounds, often addressed in musical terms as "pitch" or "tone". The most commonly used weighting network is the A-weighting because it most closely approximates how the human ear responds to sound at various frequencies. The A-weighting network is the accepted scale used for community sound level measurements; therefore, sounds are frequently reported as detected with a sound level meter using this weighting. A-weighted sound levels emphasize middle frequency sounds (i.e., middle pitched – around 1,000 Hz), and de-emphasize low and high frequency sounds. These sound levels are reported in decibels designated as "dBA". The C-weighting network has a nearly flat response for frequencies between 63 Hz and 4,000 Hz and is noted as dBC. Z-weighted sound levels are measured sound levels without any weighting curve and are otherwise referred

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2 Bies, David, and Colin Hansen. 2009. *Engineering Noise Control: Theory and Practice*, 4th Edition. New York: Taylor and Francis.

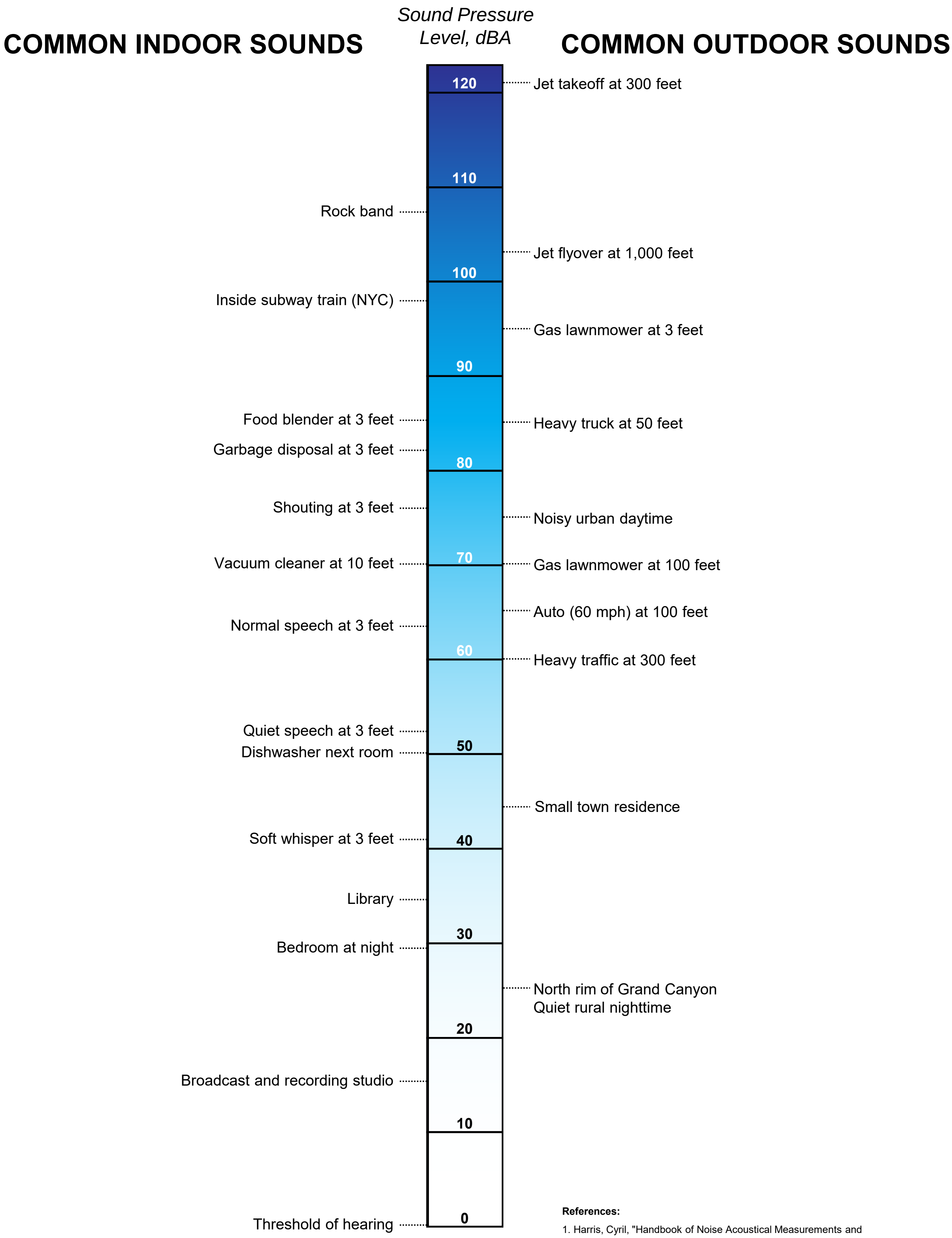
3 *American National Standard Specification for Sound Level Meters*, ANSI S1.4-1983 (R2006), published by the Standards Secretariat of the Acoustical Society of America, Melville, NY.

to as “unweighted”. Sound pressure levels for some common indoor and outdoor environments are shown in Figure 3-1.

Because the sounds in our environment vary with time they cannot simply be described with a single number. Two methods are used for describing variable sounds. These are exceedance levels and the equivalent level, both of which are derived from some number of moment-to-moment A-weighted sound level measurements. Exceedance levels are values from the cumulative amplitude distribution of all of the sound levels observed during a measurement period. Exceedance levels are designated L_n, where n can have a value between 0 and 100 in terms of percentage. Some sound level metrics that are commonly reported in community sound level monitoring are described below.

- L_{10} is the sound level exceeded only 10 percent of the time. It is close to the maximum level observed during the measurement period. The L_{10} is sometimes called the intrusive sound level because it is caused by occasional louder sounds like those from passing motor vehicles.

- L_{eq}, the equivalent level, is the level of a hypothetical steady sound that would have the same energy (*i.e.,* the same time-averaged mean square sound pressure) as the actual fluctuating sound observed. The equivalent level is designated L_{eq} and is typically A-weighted. The equivalent level represents the time average of the fluctuating sound pressure, but because sound is represented on a logarithmic scale and the averaging is done with linear mean square sound pressure values, the L_{eq} is mostly determined by loud sounds if there are fluctuating sound levels.



References:

1. Harris, Cyril, "Handbook of Noise Acoustical Measurements and Noise Control", p 1-10., 1998
2. "Controlling Noise", USAF, AFMC, AFDTC, Elgin AFB, Fact Sheet, August 1996
3. California Dept. of Trans., "Technical Noise Supplement", Oct, 1998

Figure 3-1

Common Indoor and Outdoor Sound Levels

4.0 REGULATIONS

4.1 Federal Regulations

There are no federal community noise regulations applicable to this Project.

4.2 New York State Regulations

There are no state community noise regulations applicable to this Project.

4.3 Township of Villenova Regulations

The Project is subject to the following sound level requirements the Wind Energy Facilities Law of the Town of Villenova:

> *The Statistical sound pressure level generated by a WECS shall not exceed L_{10} – 50 dBA measured at the closest exterior wall of any residence existing at the time of completing the SEQRA review of the application. If the ambient sound pressure level exceeds 50 dBA, the standard shall be ambient dBA plus 5 dBA. Independent certification shall be provided before and after construction demonstrating compliance with this requirement.*

Therefore, receptors have been evaluated against the L_{10} sound level limit of 50 dBA in this analysis.

5.0 MODELED SOUND LEVELS

5.1 Sound Sources

5.1.1 Project Wind Turbines

The sound level analysis for the Project includes three wind turbines. The Project will consist of either three Vestas V163-4.5 units with Serrated Trailing Edge (STE) blades or three GE 3.4-140 units with Low Noise Trailing Edge (LNTE) blades.

The V163-4.5 wind turbine has a rotor diameter of 163 meters. The wind turbine has a hub height of 98 meters. A technical report from Vestas[4] was provided to Epsilon which documented the expected sound power levels associated with the V163-4.5 under normal operation.

The GE 3.4-140 wind turbine has a rotor diameter of 140 meters. The wind turbine has a hub height of 98 meters. A technical report from GE[5] was provided to Epsilon which documented the expected sound power levels associated with the GE 3.4-140 under normal operation.

5.2 Modeling Methodology

The sound impacts associated with the proposed wind turbines were predicted using the CadnaA sound level calculation software developed by DataKustik GmbH. This software uses the ISO 9613-2 international standard for sound propagation.[6] The benefits of this software are a more refined set of computations due to the inclusion of topography, ground attenuation, multiple building reflections (if applicable), drop-off with distance, and atmospheric absorption. The CadnaA software allows for octave band calculation of sound from multiple sources as well as computation of diffraction.

Inputs and significant parameters employed in the model are described below.

- *Project Layout:* This analysis is for the wind turbine locations provided to Epsilon by New Leaf. The proposed Project layout is identified in Figure 5-1 and location coordinates are provided in Appendix A.
- *Modeling Receptor Locations:* Epsilon generated a modeling receptor dataset consisting of 105 receptors via desktop analysis. The dataset is representative of structures within the vicinity of the project. All modeling receptors were input as discrete points at a height of 1.5 meters above ground level to mimic the ears of a typical standing person.

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4 Restricted V163-4.5 MW Third Octave Noise Emission, 9-15-2022.

5 General Electric Company, Technical Documentation Wind Turbine Generator Systems Sierra 140 – 60 Hz Product Acoustic Specifications, 2022.

6 *Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation,* International Standard ISO 9613-2:1996 (International Organization for Standardization, Geneva, Switzerland, 1996).

- *Modeling Grid:* A modeling grid with 20-meter spacing was calculated for the entire Project Area and the surrounding region. The grid was modeled at a height of 1.5 meters above ground level for consistency with the discrete modeling points. This modeling grid allowed for the creation of sound level isolines.
- *Terrain Elevation:* Elevation contours for the modeling domain were directly imported into CadnaA which allowed for consideration of terrain shielding where appropriate. The terrain height contour elevations for the modeling domain were generated from elevation information derived from the National Elevation Dataset (NED) developed by the U.S. Geological Survey.
- *Source Sound Levels:* Sound power levels used in the modeling were described in Section 4.1. Documentation from Vestas or GE provided levels that represent "worst-case" operational sound level emissions for the Project's proposed wind turbine.
- *Meteorological Conditions:* A temperature of 10°C (50°F) and a relative humidity of 70% was assumed in the model.
- *Ground Attenuation:* Spectral ground absorption was calculated using a G-factor of 0 which corresponds to "hard ground" consisting of a hard ground surface. The model, consistent with the standard, allows inputs between 0 (hard ground) and 1 (porous ground). This is a conservative approach as the vast majority of the area is actually agricultural.

Octave band sound power levels corresponding to the highest available wind turbine broadband sound power level for the wind turbines were input into CadnaA to model wind turbine generated broadband sound pressure levels during conditions when worst-case sound power levels are expected. Sound pressure levels were modeled at 105 receptors within the vicinity of the Project. In addition to modeling at discrete points, sound levels were also modeled throughout a large grid of points, each spaced 20 meters apart to allow for the generation of sound level isolines.

Several modeling assumptions inherent in the ISO 9613-2 calculation methodology, or selected as conditional inputs by Epsilon, were implemented in the CadnaA model to ensure conservative results (i.e., higher sound levels), and are described below:

- All modeled sources were assumed to be operating simultaneously and at the design wind speed corresponding to the greatest sound level impacts.
- As per ISO 9613-2, the model assumed favorable conditions for sound propagation, corresponding to a moderate, well-developed ground-based temperature inversion, as might occur on a calm, clear night or equivalently downwind propagation.
- Meteorological conditions assumed in the model (T=10℃/RH=70%) were selected to minimize atmospheric attenuation in the 500 Hz and 1 kHz octave bands where the human ear is most sensitive.
- No additional attenuation due to tree shielding, air turbulence, or wind shadow effects was considered in the model.

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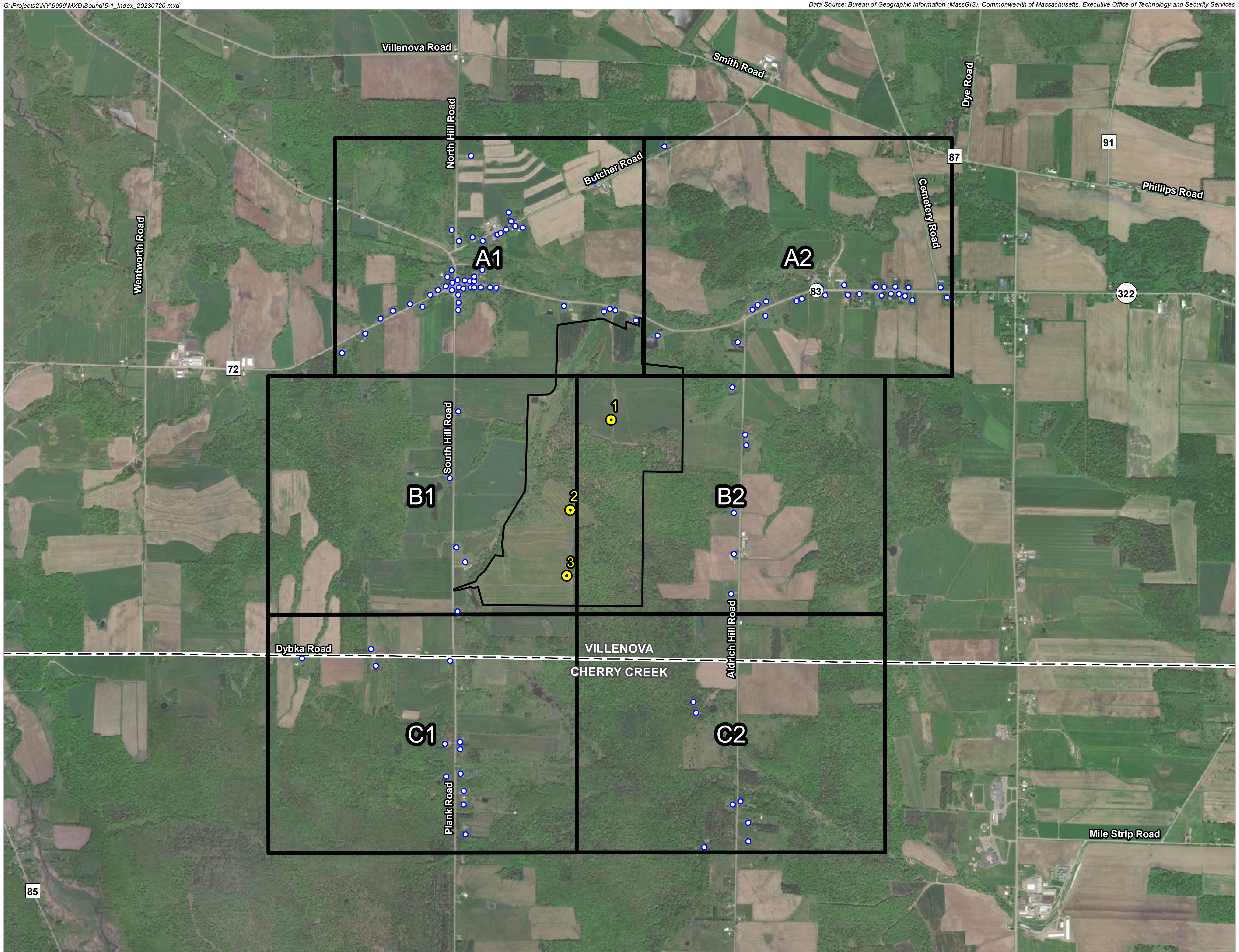

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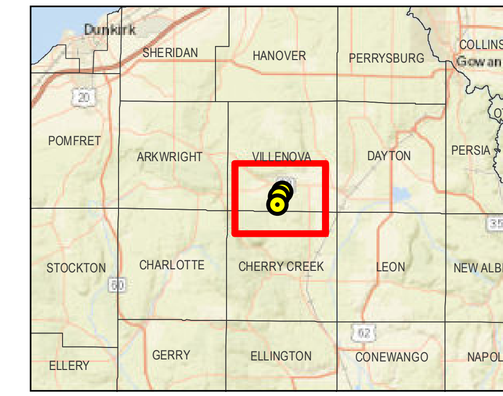

SCALE

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1 inch = 2,000 feet

0 1,000 2,000 Feet

N

LEGEND

Proposed Wind Turbine

Project Boundary

Modeling Location

Figure 5-1, Index Sheet

Sound Level Modeling Locations

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Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services

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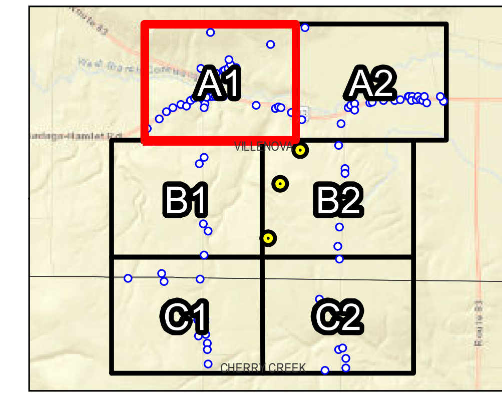

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1 inch = 500 feet

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LEGEND

- Proposed Wind Turbine
- Project Boundary
- Modeling Location

Figure 5-1, Map Sheet A1

Sound Level Modeling Locations

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Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services

South Hill Road Wind Project Villenova, New York

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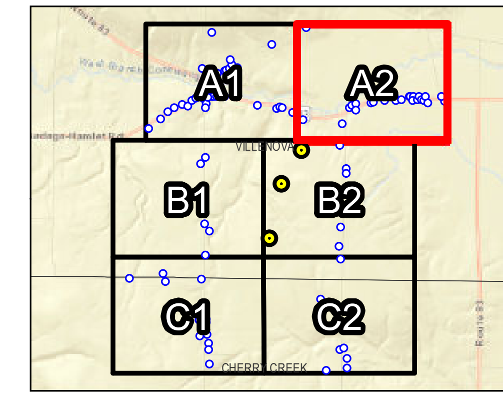

SCALE

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1 inch = 500 feet

0 250 500 Feet

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LEGEND

- Proposed Wind Turbine
- Project Boundary
- Modeling Location

Figure 5-1, Map Sheet A2

Sound Level Modeling Locations

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Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services

South Hill Road Wind Project Villenova, New York

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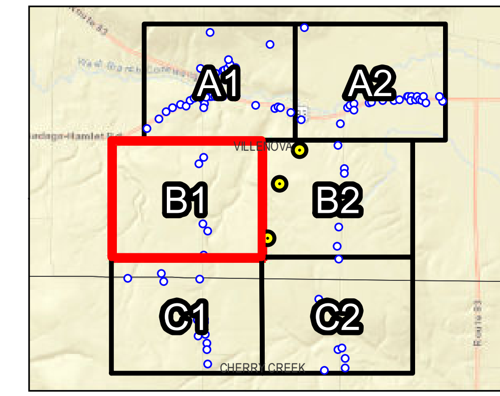

SCALE

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1 inch = 500 feet

0 250 500 Feet

N

LEGEND

- Proposed Wind Turbine
- Project Boundary
- Modeling Location

Figure 5-1, Map Sheet B1

Sound Level Modeling Locations

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Data Source: Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services

South Hill Road Wind Project Villenova, New York

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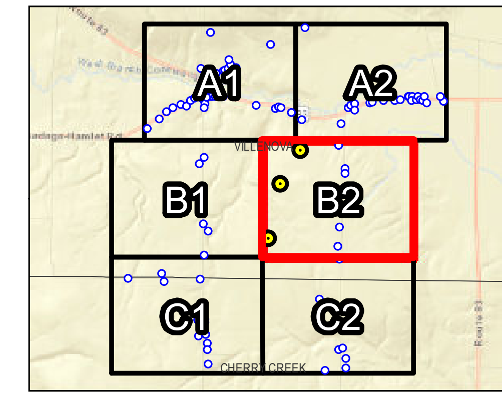

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1 inch = 500 feet

0 250 500 Feet

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LEGEND

- Proposed Wind Turbine
- Project Boundary
- Modeling Location

Figure 5-1, Map Sheet B2

Sound Level Modeling Locations

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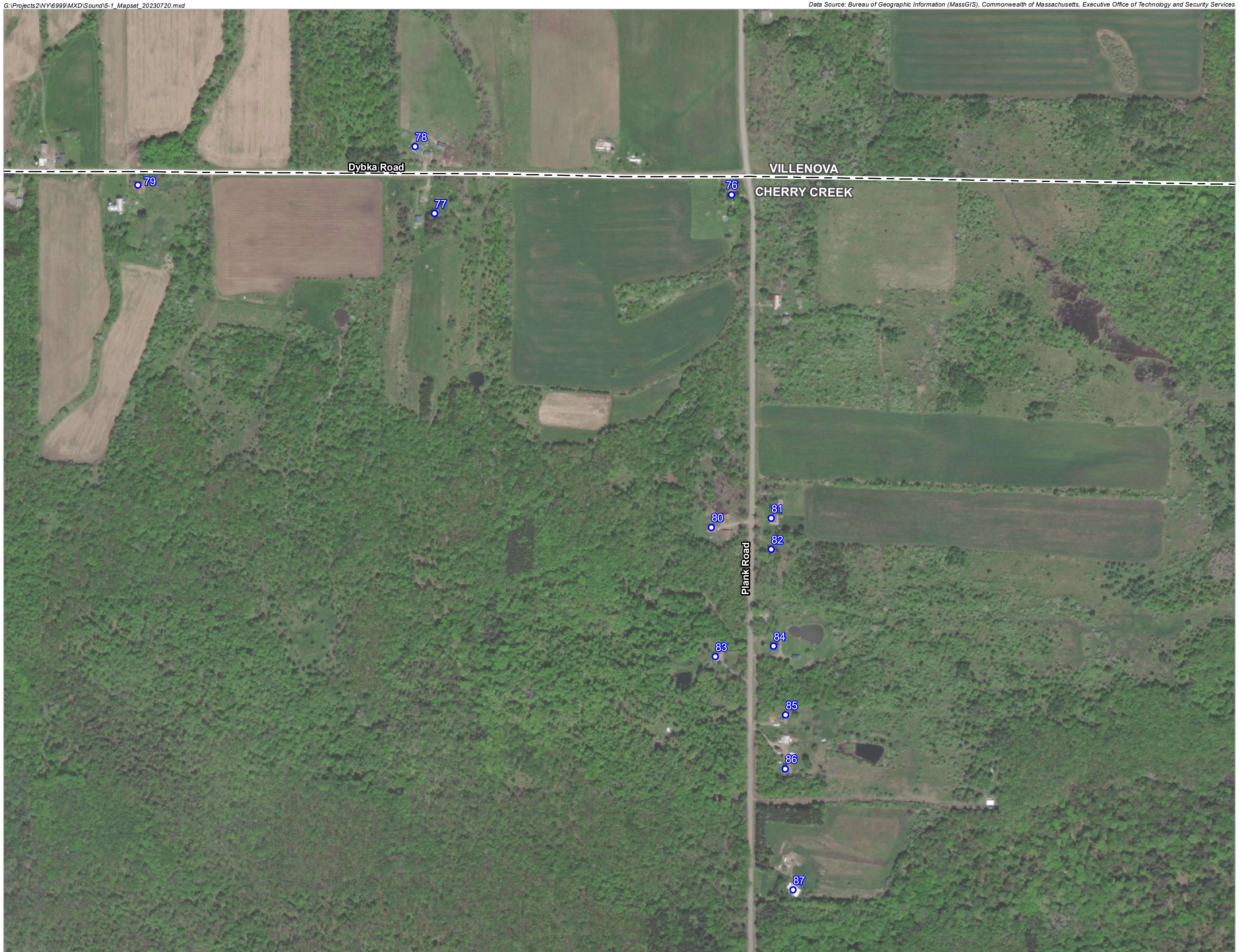

South Hill Road Wind Project Villenova, New York

Epsilon ASSOCIATES INC.

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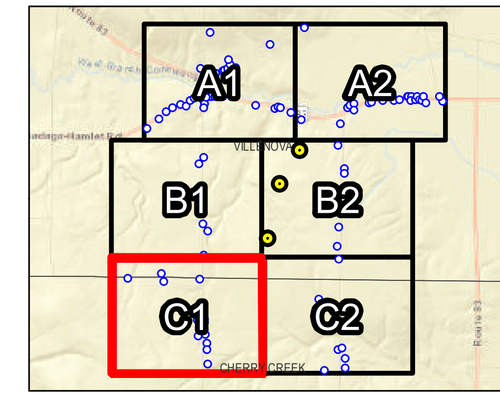

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1 inch = 500 feet

0 250 500 Feet

N

LEGEND

- Proposed Wind Turbine
- Project Boundary
- Modeling Location

Figure 5-1, Map Sheet C1

Sound Level Modeling Locations

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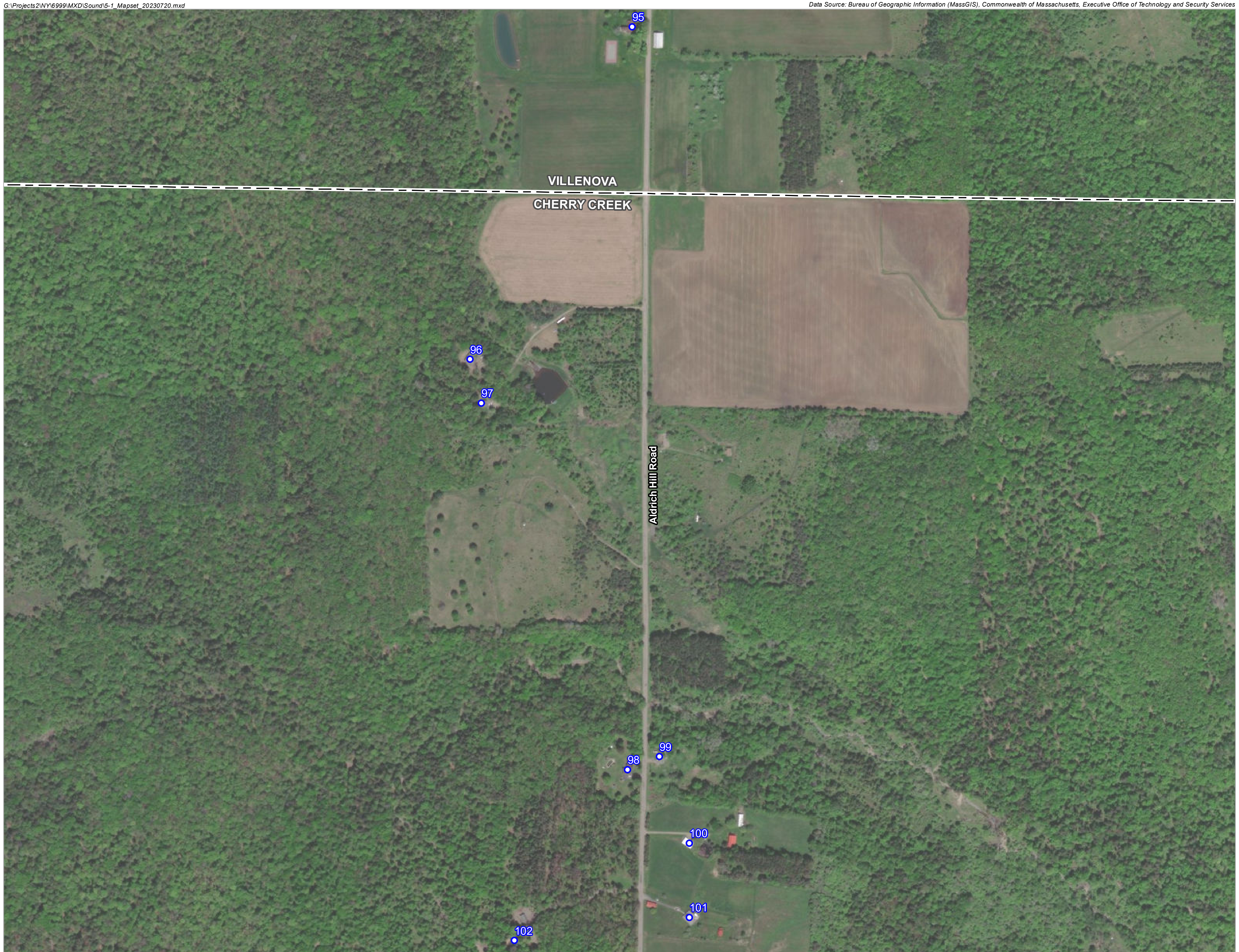

South Hill Road Wind Project Villenova, New York

Epsilon ASSOCIATES INC.

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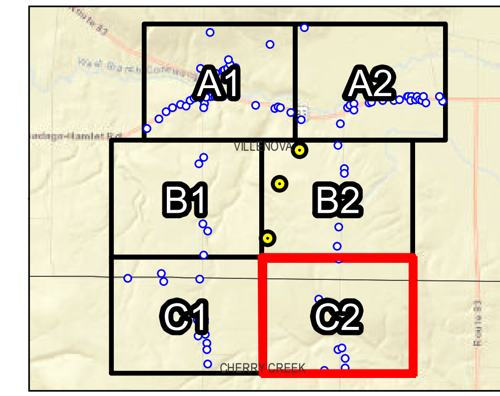

SCALE

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1 inch = 500 feet

0 250 500 Feet

N

LEGEND

- Proposed Wind Turbine
- Project Boundary
- Modeling Location

Figure 5-1, Map Sheet C2

Sound Level Modeling Locations

5.3 Sound Level Modeling Results

All modeled sound levels, as output from CadnaA are A-weighted equivalent sound levels (L_{eq}, dBA). Based on Epsilon's experience in conducting post-construction sound level measurement programs for wind energy facilities, the L_{10} sound level is approximately 1 dBA higher than the equivalent sound level (L_{eq}, dBA) when the wind turbine sound is prevalent and steady under ideal wind and operational conditions. Therefore, 1 dBA has been added to all modeled sound levels before comparison to the Town of Villenova's Local Law L_{10} limit. Calculations were conducted at the 105 receptors modeled within the project area. In addition to the discrete modeling points, sound level isolines were generated from the modeling grid.

5.3.1 Project Only Results – V163-4.5

Table B-1 in Appendix B shows the predicted "Project Only" broadband (L_{10}, dBA) sound levels at the 105 receptors modeled in the vicinity of the Project. These broadband sound levels range from 30 to 44 dBA and represent the worst-case sound levels produced solely by the Project. The highest predicted sound level of 44 dBA occurs at receptor 74. In addition to the discrete modeling points, sound level isolines generated from the modeling grid are presented in Figure 5-2.

5.3.2 Project Only Results – GE 3.4-140

Table B-2 in Appendix B shows the predicted "Project Only" broadband (L_{10}, dBA) sound levels at the 105 receptors modeled in the vicinity of the Project. These broadband sound levels range from 28 to 43 dBA and represent the worst-case sound levels produced solely by the Project. The highest predicted sound level of 43 dBA occurs at receptor 74. In addition to the discrete modeling points, sound level isolines generated from the modeling grid are presented in Figure 5-3.

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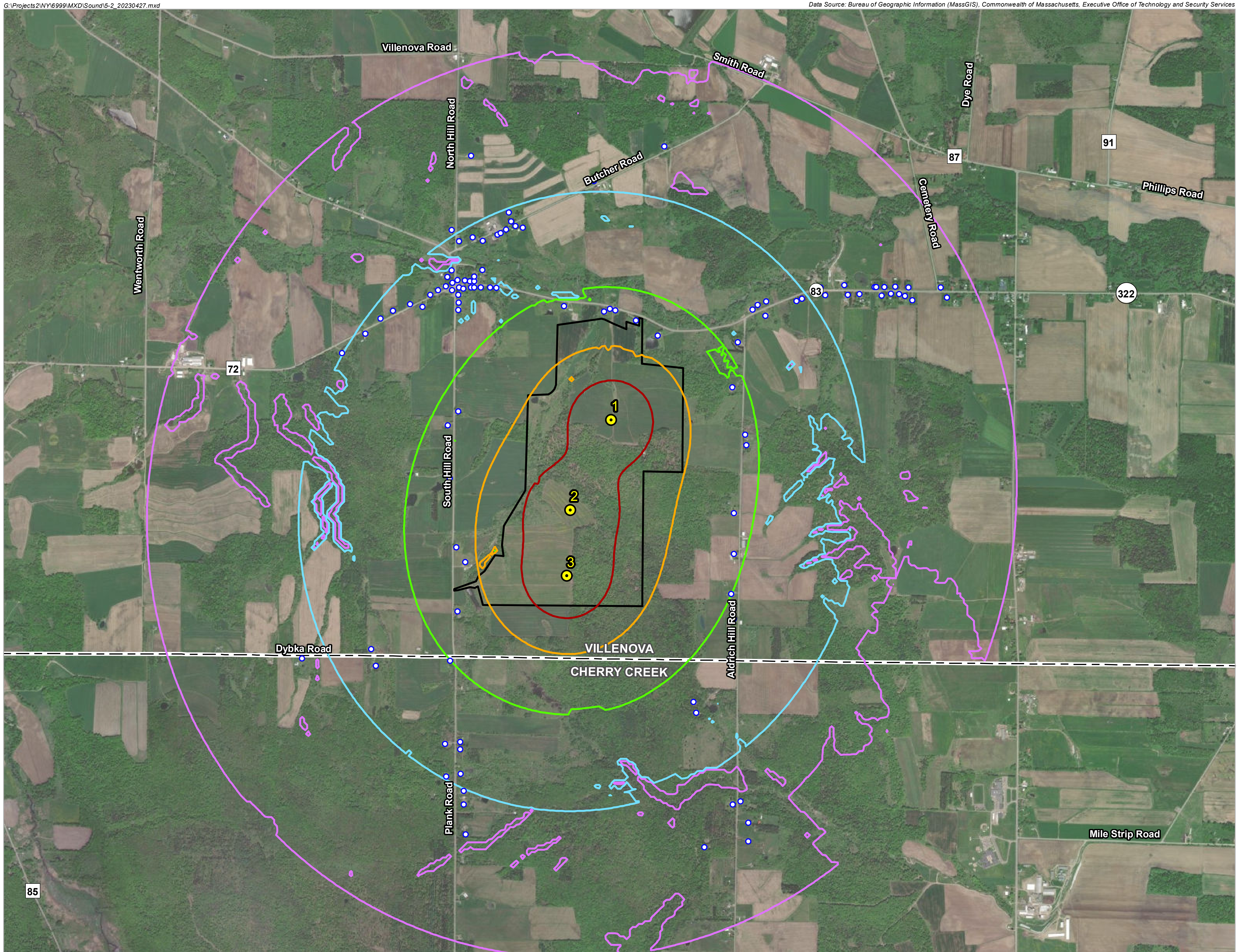

South Hill Road Wind Project Villenova, New York

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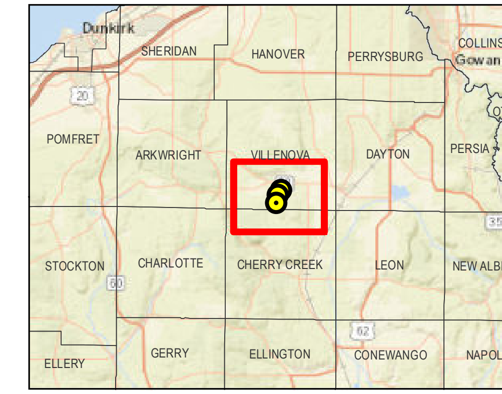

SCALE

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1 inch = 2,000 feet

0 1,000 2,000 Feet

N

LEGEND

- Proposed Vestas V163-4.5 98m HH Wind Turbine
- Project Boundary
- Modeling Location

Project Only Sound Level Modeling Results – Vestas V163-4.5

(dBA)

- 30
- 35
- 40
- 45
- 50

Figure 5-2

Project Only Sound Level Modeling Results Vestas V163-4.5

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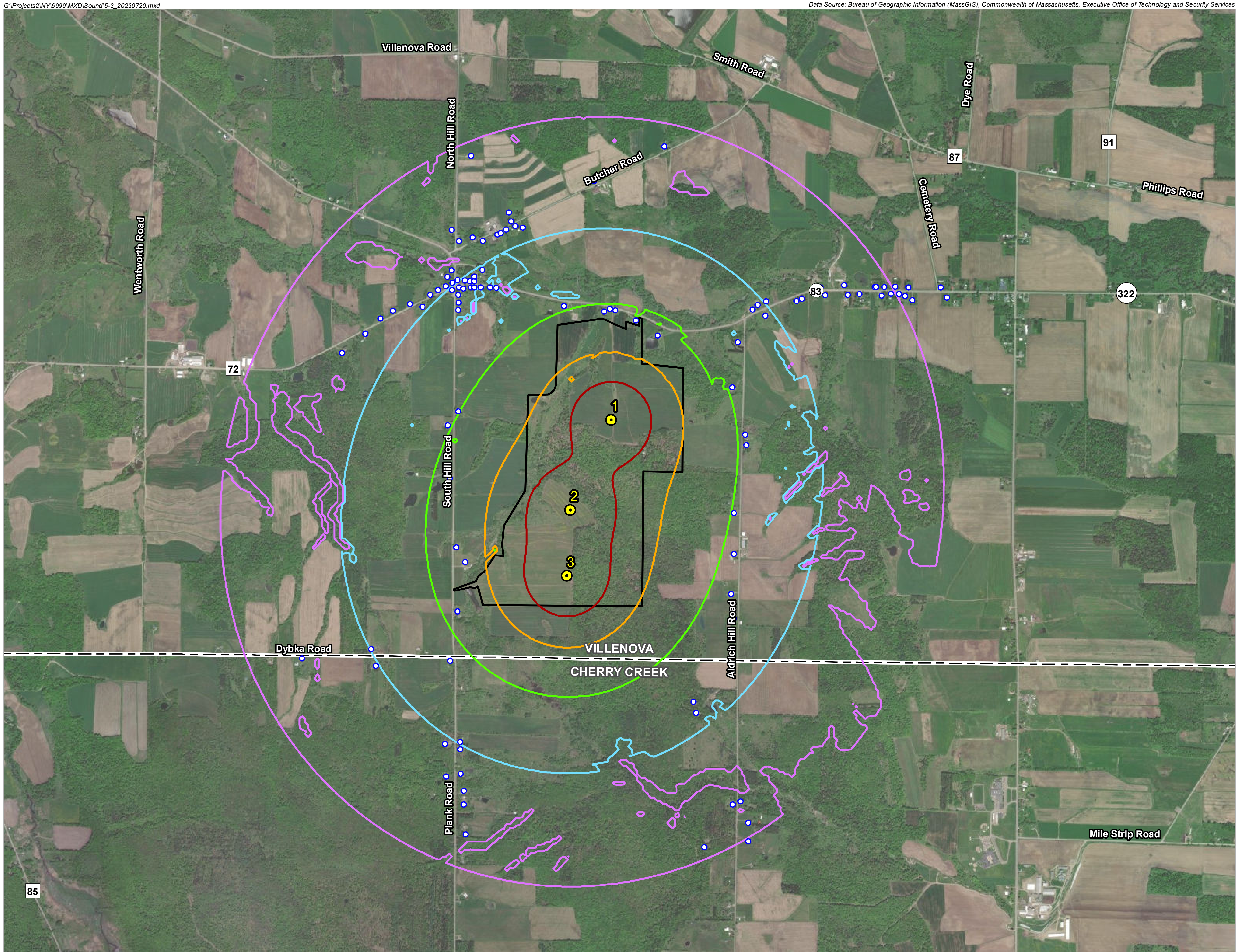

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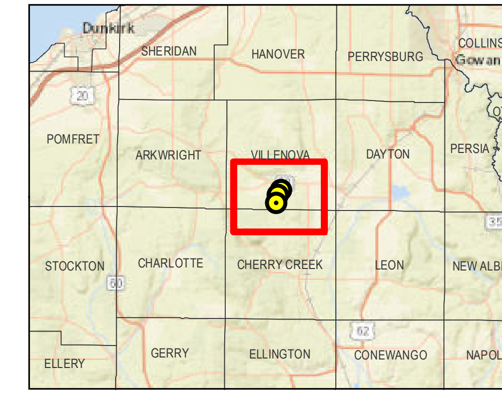

SCALE

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1 inch = 2,000 feet
0 1,000 2,000 Feet
N

LEGEND

- Proposed GE 3.4-140 98m HH Wind Turbine
- Project Boundary
- Modeling Location

Project Only Sound Level Modeling Results – GE 3.4-140

(dBA)

- 30
- 35
- 40
- 45
- 50

Figure 5-3

Project Only Sound Level Modeling Results GE 3.4-140

6.0 EVALUATION

The Project is subject to the requirements contained in the Local Law of the Township of Villenova Regulations. The Local Law limits sound levels from wind turbines to an L_{10} of 50 dBA at any residence. Therefore, receptors within the Town of Villenova have been evaluated against the sound level limit of 50 dBA in this analysis.

All modeled sound levels, as output from CadnaA, are A-weighted equivalent sound levels (L_{eq}, dBA). Based on Epsilon's experience in conducting post-construction sound level measurement programs for wind energy facilities, the L_{10} sound level is approximately 1 dBA higher than the equivalent sound level (L_{eq}, dBA) when the wind turbine sound is prevalent and steady under ideal wind and operational conditions. Therefore, 1 dBA has been added to all modeled sound levels before comparison to the Town of Villenova's Local Law L_{10} limit. These levels may be used in evaluating measured sound pressure levels over typical averaging durations, (i.e., 10 minutes or 1 hour). The highest predicted worst-case Project Only L_{10} sound level at a modeling receptor is 44 dBA for the Vestas V163-4.5 wind turbines. The highest predicted worst-case Project Only L_{10} sound level at a modeling receptor is 43 dBA for the GE 3.4-140 wind turbines. This occurs at receptor 74 for both modeling scenarios. All predicted worst-case Project Only L_{10} sound levels are below 50 dBA; therefore, the Project meets the requirements with respect to sound in the Local Law.

7.0 CONCLUSIONS

A comprehensive sound level modeling assessment was conducted for the South Hill Road Wind Project within the Town of Villenova, Chautauqua County, New York. A total of three wind turbines are included for the Project with two different scenarios. Sound levels resulting from the operation of these two scenarios were calculated at 105 modeling receptors, and isolines were generated from a grid encompassing the area surrounding the wind turbines. The predicted sound levels at receptors in the Town of Villenova ranged from 30 to 44 dBA assuming Vestas V163-4.5 wind turbines, and 28 to 43 dBA assuming GE 3.4-140 wind turbines. Therefore, the Project meets the requirements with respect to sound in the Town of Villenova Local Law.

Appendix A

Wind Turbine Coordinates

Table A-1.1: Wind Turbine Coordinates - V163-4.5

Wind Turbine ID	Wind Turbine Type	Hub Height (m)	Coordinates NAD 1983 State Plane New York West FIPS 3103 (meters)	
			X (Easting)	Y (Northing)
1	Vestas V163-4.5	98	305581.03	262453.88
2	Vestas V163-4.5	98	305313.12	261864.27
3	Vestas V163-4.5	98	305289.59	261433.74

Table A-1.2: Wind Turbine Coordinates - GE 3.4-140

Wind Turbine ID	Wind Turbine Type	Hub Height (m)	Coordinates NAD 1983 State Plane New York West FIPS 3103 (meters)	
			X (Easting)	Y (Northing)
1	GE 3.4-140	98	305581.03	262453.88
2	GE 3.4-140	98	305313.12	261864.27
3	GE 3.4-140	98	305289.59	261433.74

Appendix B

Project Only Sound Level Modeling Results at Discrete Points

Table B-1: Sound Level Modeling Results Sorted by Receptor ID - V163

Receptor ID	Coordinates NAD 1983 State Plane New York West FIPS 3103 (Meters)		Source Only L_{10} Broadband Sound Level (dBA)
	X (m)	Y (m)	
1	303821.18	262889.71	35
2	303974.92	263016.68	35
3	304072.83	263115.35	35
4	304155.43	263166.98	35
5	304266.34	263211.34	36
6	304347.04	263193.75	36
7	304399.43	263272.15	36
8	304448.76	263301.60	36
9	304540.93	263302.75	36
10	304499.76	263326.04	36
11	304542.36	263351.04	36
12	304511.75	263388.94	36
13	304539.57	263432.13	36
14	304539.44	263694.69	34
15	304587.41	263621.94	35
16	304665.31	264179.70	32
17	304675.11	263647.22	35
18	304742.87	263625.29	35
19	304839.04	263666.15	35
20	304858.97	263675.12	35
21	304894.34	263698.04	35
22	304955.63	263720.96	35
23	304926.23	263751.85	35
24	304910.79	263810.15	35
25	305002.96	263710.00	36
26	304623.62	263365.78	36
27	304657.46	263359.84	37
28	304684.89	263361.21	37
29	304685.80	263389.56	37
30	304739.30	263432.99	37
31	304664.77	263319.15	37
32	304686.81	263320.70	37
33	304729.94	263320.17	37
34	304791.06	263318.85	37
35	304829.69	263317.53	38
36	305469.23	264014.92	34
37	305927.33	264242.77	33
38	305271.96	263198.33	40
39	305534.65	263161.45	41
40	305572.54	263180.15	41
41	305607.91	263168.53	41

Table B-1: Sound Level Modeling Results Sorted by Receptor ID - V163

Receptor ID	Coordinates NAD 1983 State Plane New York West FIPS 3103 (Meters)		Source Only L_{10} Broadband Sound Level (dBA)
	X (m)	Y (m)	
42	305743.29	263104.37	42
43	305885.75	263004.85	42
44	306504.09	263175.09	37
45	306536.43	263205.40	37
46	306594.02	263229.15	36
47	306588.46	263134.17	37
48	306791.04	263229.65	35
49	306826.90	263244.81	35
50	306948.15	263320.08	34
51	306979.47	263269.56	34
52	307103.74	263335.74	33
53	307126.98	263270.07	33
54	307203.26	263275.12	33
55	307302.28	263323.11	32
56	307313.39	263322.10	32
57	307364.92	263322.61	32
58	307348.25	263266.03	32
59	307408.37	263277.65	32
60	307436.66	263323.62	32
61	307462.93	263277.14	32
62	307499.30	263263.00	31
63	307522.03	263318.57	31
64	307548.81	263235.72	31
65	307773.32	263253.65	30
66	307733.11	263319.30	30
67	304582.44	263270.29	37
68	304584.15	263220.41	37
69	304582.78	263171.22	37
70	304582.62	262509.63	41
71	304512.24	262417.02	41
72	304524.94	262072.54	42
73	304568.34	261619.04	43
74	304627.60	261524.32	44
75	304575.74	261202.05	42
76	304529.18	260877.68	40
77	304044.30	260846.78	36
78	304012.79	260955.95	36
79	303559.52	260893.34	34
80	304496.12	260334.14	36
81	304594.06	260348.86	36
82	304594.06	260298.29	36

Table B-1: Sound Level Modeling Results Sorted by Receptor ID - V163

Receptor ID	Coordinates NAD 1983 State Plane New York West FIPS 3103 (Meters)		Source Only L_{10} Broadband Sound Level (dBA)
	X (m)	Y (m)	
83	304502.52	260122.89	35
84	304597.90	260140.17	35
85	304617.75	260027.50	34
86	304617.11	259939.80	34
87	304629.91	259741.99	33
88	306407.26	262961.23	39
89	306371.65	262667.85	40
90	306457.43	262355.87	40
91	306462.69	262287.88	40
92	306381.76	261844.79	41
93	306382.98	261577.31	40
94	306365.98	261315.50	40
95	306382.17	261152.42	39
96	306117.93	260609.38	38
97	306136.14	260537.75	37
98	306375.08	259938.90	33
99	306426.67	259960.33	33
100	306475.89	259819.04	32
101	306475.89	259697.59	32
102	306190.08	259660.11	32
103	304576.63	263367.41	36
104	304585.58	263319.13	37
105	304615.14	263311.53	37

Table B-2: Sound Level Modeling Results Sorted by Receptor ID - GE 3.4-140

Receptor ID	Coordinates NAD 1983 State Plane New York West FIPS 3103 (Meters)		Source Only L_{10} Broadband Sound Level (dBA)
	X (m)	Y (m)	
1	303821.18	262889.71	33
2	303974.92	263016.68	33
3	304072.83	263115.35	33
4	304155.43	263166.98	33
5	304266.34	263211.34	34
6	304347.04	263193.75	34
7	304399.43	263272.15	34
8	304448.76	263301.60	34
9	304540.93	263302.75	35
10	304499.76	263326.04	34
11	304542.36	263351.04	34
12	304511.75	263388.94	34
13	304539.57	263432.13	34
14	304539.44	263694.69	32
15	304587.41	263621.94	33
16	304665.31	264179.70	30
17	304675.11	263647.22	33
18	304742.87	263625.29	34
19	304839.04	263666.15	34
20	304858.97	263675.12	34
21	304894.34	263698.04	34
22	304955.63	263720.96	34
23	304926.23	263751.85	33
24	304910.79	263810.15	33
25	305002.96	263710.00	34
26	304623.62	263365.78	35
27	304657.46	263359.84	35
28	304684.89	263361.21	35
29	304685.80	263389.56	35
30	304739.30	263432.99	35
31	304664.77	263319.15	35
32	304686.81	263320.70	35
33	304729.94	263320.17	36
34	304791.06	263318.85	36
35	304829.69	263317.53	36
36	305469.23	264014.92	32
37	305927.33	264242.77	30
38	305271.96	263198.33	39
39	305534.65	263161.45	40
40	305572.54	263180.15	40
41	305607.91	263168.53	40

Table B-2: Sound Level Modeling Results Sorted by Receptor ID - GE 3.4-140

Receptor ID	Coordinates NAD 1983 State Plane New York West FIPS 3103 (Meters)		Source Only L_{10} Broadband Sound Level (dBA)
	X (m)	Y (m)	
42	305743.29	263104.37	41
43	305885.75	263004.85	41
44	306504.09	263175.09	35
45	306536.43	263205.40	35
46	306594.02	263229.15	34
47	306588.46	263134.17	35
48	306791.04	263229.65	33
49	306826.90	263244.81	33
50	306948.15	263320.08	32
51	306979.47	263269.56	32
52	307103.74	263335.74	31
53	307126.98	263270.07	31
54	307203.26	263275.12	31
55	307302.28	263323.11	30
56	307313.39	263322.10	30
57	307364.92	263322.61	30
58	307348.25	263266.03	30
59	307408.37	263277.65	30
60	307436.66	263323.62	29
61	307462.93	263277.14	29
62	307499.30	263263.00	29
63	307522.03	263318.57	29
64	307548.81	263235.72	29
65	307773.32	263253.65	28
66	307733.11	263319.30	28
67	304582.44	263270.29	35
68	304584.15	263220.41	35
69	304582.78	263171.22	36
70	304582.62	262509.63	39
71	304512.24	262417.02	39
72	304524.94	262072.54	41
73	304568.34	261619.04	42
74	304627.60	261524.32	43
75	304575.74	261202.05	41
76	304529.18	260877.68	38
77	304044.30	260846.78	34
78	304012.79	260955.95	35
79	303559.52	260893.34	32
80	304496.12	260334.14	34
81	304594.06	260348.86	35
82	304594.06	260298.29	34

Table B-2: Sound Level Modeling Results Sorted by Receptor ID - GE 3.4-140

Receptor ID	**Coordinates NAD 1983 State Plane New York West FIPS 3103 (Meters)**		**Source Only L_{10} Broadband Sound Level (dBA)**
	X (m)	**Y (m)**	
83	304502.52	260122.89	33
84	304597.90	260140.17	33
85	304617.75	260027.50	33
86	304617.11	259939.80	32
87	304629.91	259741.99	31
88	306407.26	262961.23	37
89	306371.65	262667.85	39
90	306457.43	262355.87	39
91	306462.69	262287.88	39
92	306381.76	261844.79	39
93	306382.98	261577.31	39
94	306365.98	261315.50	38
95	306382.17	261152.42	37
96	306117.93	260609.38	36
97	306136.14	260537.75	35
98	306375.08	259938.90	31
99	306426.67	259960.33	31
100	306475.89	259819.04	30
101	306475.89	259697.59	29
102	306190.08	259660.11	30
103	304576.63	263367.41	34
104	304585.58	263319.13	35
105	304615.14	263311.53	35