ATTACHMENT D – Pre-Construction Sound Analysis (Option B)

SOUND LEVEL ASSESSMENT REPORT

Buffalo Ridge Wind Project
Lincoln County, Minnesota

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1.0 EXECUTIVE SUMMARY

The Buffalo Ridge Wind Project (the Project) is a proposed wind power generation facility proposed to consist of 39 wind turbines in Lincoln County, Minnesota. The Project is being developed by Buffalo Ridge Wind, LLC (Buffalo Ridge Wind), an indirect, wholly-owned subsidiary of NextEra Energy Resources, LLC (NEER). Atwell, LLC (Atwell), retained to assist in the permitting of the Project, has retained Epsilon Associates, Inc. (Epsilon) to conduct a pre-construction sound level assessment for the proposed wind turbines for this Project. This report supersedes the previously prepared Sound Level Assessment reports that were filed with the Minnesota Public Utilities Commission dated February 20, 2020 and June 3, 2020, respectively.

The sound level assessment included a sound monitoring program to determine existing sound levels in the vicinity of the Project, computer modeling to predict cumulative worst-case future L_{50} sound levels from the Project and existing wind turbines, and a comparison of operational sound levels to regulatory limits. The assessment accounted for various factors in the Project vicinity including other existing wind turbines (Ruthton Wind Turbines)[1] not associated with the Project and other newly constructed wind turbines associated with the Lake Benton Wind II project. The analysis includes a total of 44 Project-related wind turbines (39[2] proposed + 5 alternates) of which five (5) are proposed to be GE 2.32-116 wind turbines and 39 are proposed to be GE 2.82-127 wind turbines. Select GE 2.82-127 wind turbines (#8, 13, 17, 19, 20, 21, 29, 33, 36, 38, and Alt5) are proposed to run under a noise reduction operation (NRO).[3] All wind turbines will have Low Noise Trailing Edge (LNTE) blades. Previously, the analysis included a total of 45 wind turbines (40 proposed + 5 alternates) of which six (6) were proposed to be GE 2.52-116 wind turbines and 39 were proposed to be GE 2.82-127 wind turbines. This Project is required to comply with Minnesota Pollution Control Agency (MPCA) State Noise Ordinance Standards, which are set forth in Section 4 of this report. For this analysis, all receptors with land use considered as Noise Area Classification 1 (NAC 1) were included in the modeling and evaluated as per Minn. Rule 7030.0040. The most restrictive of the noise limit is the nighttime L_{50} sound level for NAC 1 of 50 dBA.

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[1] Existing Vestas V47-660's that may be owned by separate LLCs but are generally referred herein as "Ruthton Wind Turbines" or "Ruthton".

[2] At the time of this analysis, the turbine array showed 39 primary turbines and 5 alternative turbines because Turbine 31 was dropped; however, the Project will construct a total of 40 turbines. Since completion of this analysis, it has been determined that alternative site turbine location Alt 3 will replace Turbine 31, leaving 4 remaining alternative turbines. The analysis in this report was conducted for all 44 turbines (primary and alternate site locations) that are currently proposed to provide conservative results supporting the construction of any of the alternative site locations if a primary is dropped due to constructability issues.

[3] NRO is described in further detail in Section 6.

The sound levels due to existing and newly constructed non-Project wind turbines in the vicinity of the Project Area were combined with sound levels from the Project through modeling. These modeled wind turbine L_{50} sound levels do not represent a total sound level (i.e., they are not inclusive of ambient sound), but are each below 50 dBA with the exception of one (1) modeling location. The modeled sound level at this location is 52 dBA and is primarily attributable to the Ruthton Wind Turbines. The modeled sound from only these wind turbines (51 dBA) exceeds the MPCA limit of 50 dBA. While the modeling of the existing facility shows an exceedance, it is based on limited data available from third parties; actual sound levels may be less. The next highest modeled L_{50} sound level is 48 dBA and occurs at one (1) location (non-participating).

Under conditions resulting in non-wind-turbine ambient sound levels of 46 dBA or less, total sound levels (Project + existing and newly constructed non-Project wind turbines in the vicinity of the Project Area + non-wind-turbine ambient) will meet the MPCA limit of 50 dBA.[4] Measured non-wind-turbine ambient nighttime sound levels in the Project Area[5] were above 46 dBA during one hour, as they ranged from 28 to 49 dBA when ground-level wind speeds were at or below 11 mph and winds at hub height corresponded to conditions in the modeling. Non-wind-turbine ambient sound levels in the Project Area fluctuate due to sound sources such as ground-level winds, vehicular traffic, birds, and vegetation rustle, all of which have the potential to cause non-wind-turbine ambient sound levels to exceed the MPCA L_{50} nighttime limit of 50 dBA although L_{50} levels above 50 dBA were not recorded at the two locations under the specific criteria during the measurement program. Moreover, the highest predicted worst-case Project Only L_{50} sound level at a modeling receptor is 47 dBA.

In addition, combining representative nighttime L_{50} ambient sound levels with modeled wind turbine sound levels (Project + Ruthton + Lake Benton Wind II L_{50}) results in total nighttime L_{50} sound levels below the MPCA L_{50} nighttime total sound level limit of 50 dBA at all five measurement locations. However, non-wind-turbine ambient sound levels in the Project Area fluctuate due to sound sources such as ground-level winds, vehicular traffic, birds, and vegetation rustle, all of which have the potential to cause total sound levels to exceed the limit at times. As Project Only sound levels at all modeling locations are 47 dBA or less, any increases to ambient broadband sound levels will be minimal to non-existent when ambient sound levels are at or above 50 dBA.

[4] Except at the one location above 50 dBA based on modeling of Ruthton Wind Turbines.

[5] Measurement Locations 2 and 4

2.0 INTRODUCTION

Project infrastructure is proposed in Lincoln County, Minnesota and while no infrastructure is planned in Pipestone County, a small portion of the Project area extends into Pipestone County, Minnesota. The Project is proposed to consist of 39 wind turbines. The proposed wind turbines are a combination of GE 2.82 megawatt (MW) and GE 2.32 MW units. The GE 2.82 wind turbines have a rotor diameter of 127 meters and a hub height of 89 meters. The GE 2.32 wind turbines have a rotor diameter of 116 meters and a hub height of 80 meters. Eleven (11) GE 2.82-127 wind turbines are proposed to run under a noise reduction operation (NRO). All 39 wind turbines will have Low Noise Trailing Edge (LNTE) blades. A collector substation is proposed for the Project with a 125 megavolt-ampere (MVA) transformer. Figure 2-1 shows the locations of the 39 proposed and five (5) alternate wind turbines in Lincoln 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.[6] 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 an ambient measurement program and a sound level modeling analysis for the Project. The Project wind turbines were modeled in Cadna/A using sound data from GE technical reports. Existing and newly constructed non-Project wind turbines were also included in the analysis. The results of this analysis are found within this report.

[6] 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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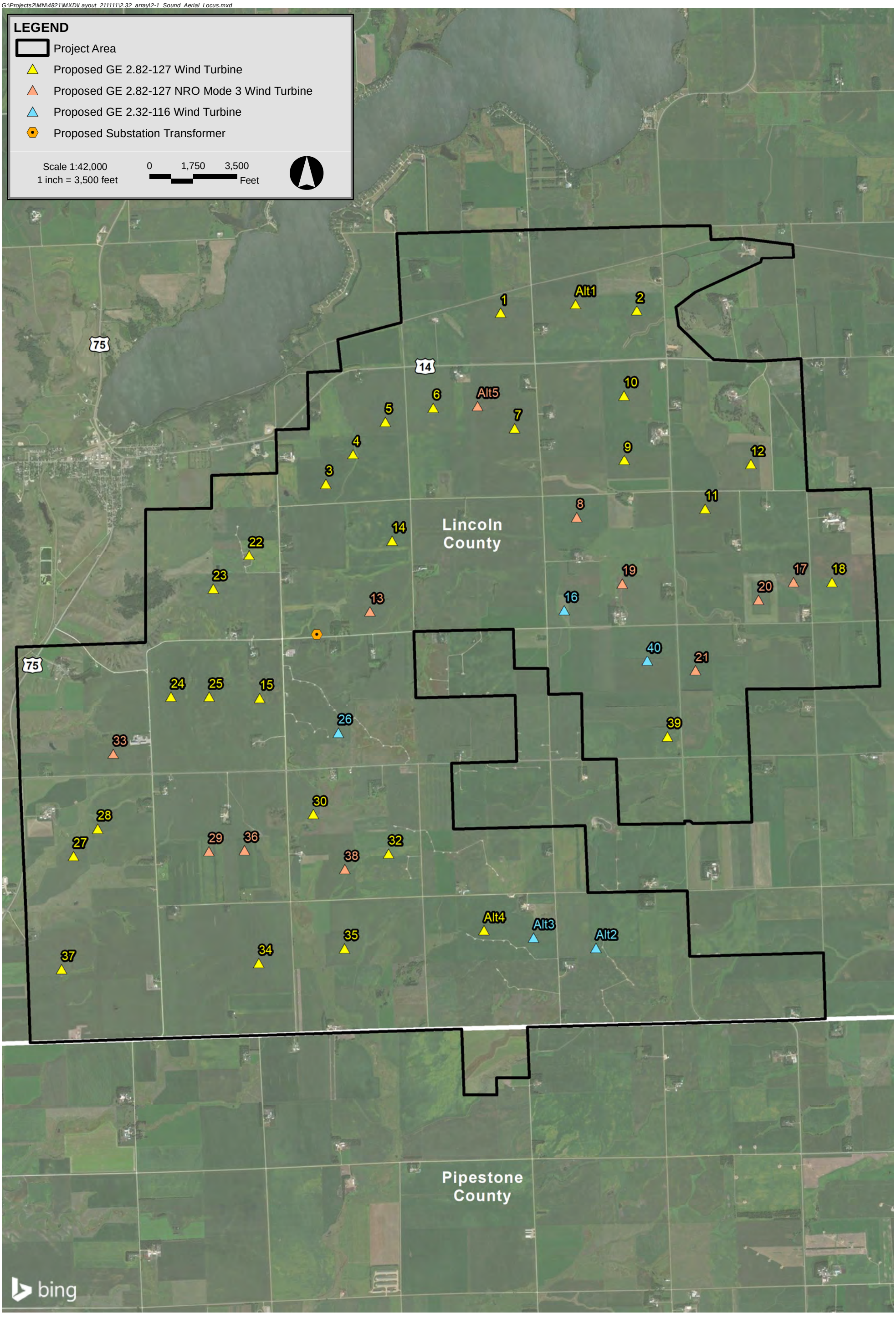

Buffalo Ridge Wind Project **Lincoln County, Minnesota**

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Figure 2-1
Aerial Locus

3.0 SOUND METRICS

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. Relative to this characteristic, a change in sound levels of less than 3 dB is imperceptible to the human ear.

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.[7] 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". Z-weighted sound levels are measured sound levels without any weighting curve and are otherwise referred 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 a large 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

[7] *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.

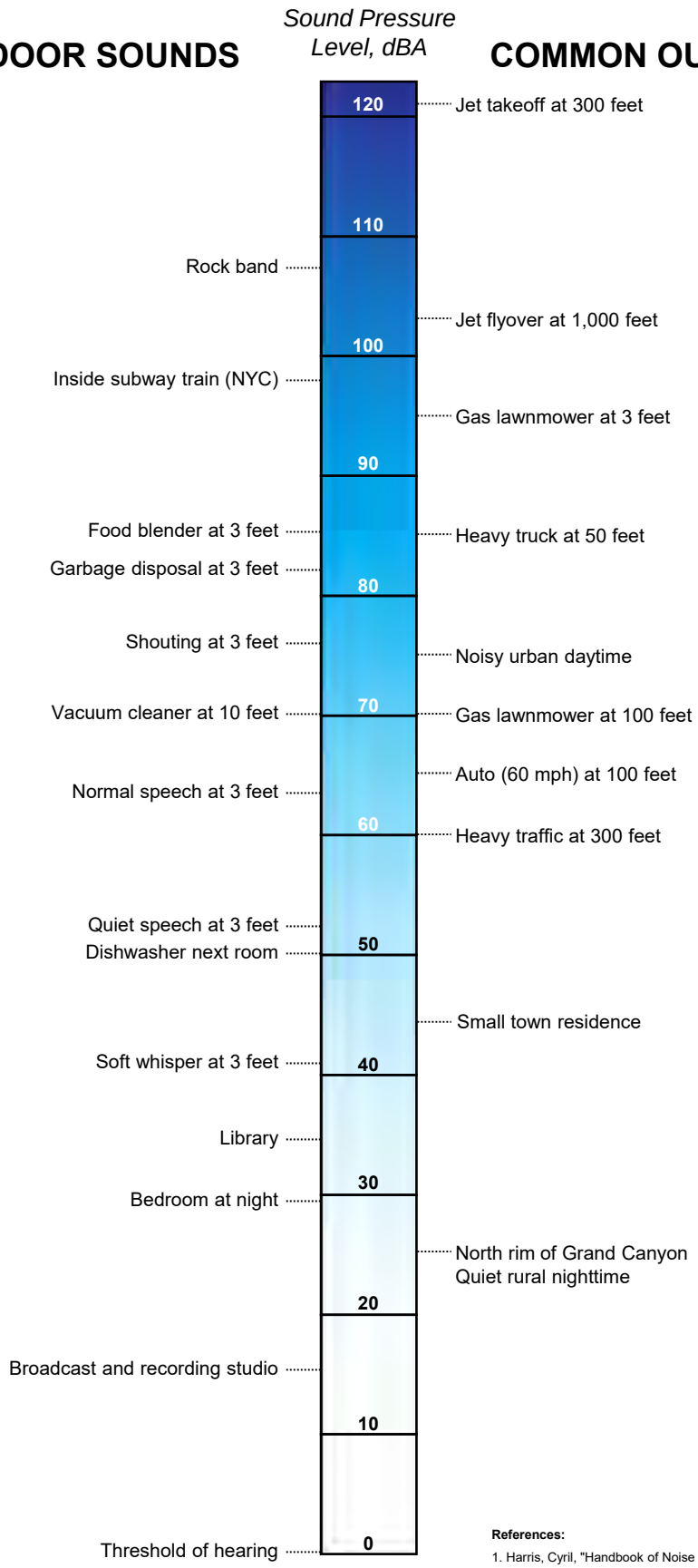
period. Exceedance levels are designated L_n, where n can have a value between 0 and 100 in terms of percentage. Several sound level metrics that are reported in community sound monitoring are described below.

- 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_{50} is the sound level exceeded 50 percent of the time. It is the median level observed during the measurement period. The L_{50} is affected by occasional louder sounds like those from passing motor vehicles; however, it is often found comparable to the equivalent sound level under relatively steady sound level conditions.

- L_{90} is the sound level exceeded 90 percent of the time during the measurement period. The L_{90} is close to the lowest sound level observed. It is essentially the same as the residual sound level, which is the sound level observed when there are no obvious nearby intermittent sound sources.

- 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 NOISE REGULATIONS

4.1 Federal Regulations

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

4.2 Minnesota State Regulations

The proposed Buffalo Ridge Wind Project within Lincoln County and Pipestone County, MN is required to comply with MPCA's 7030.0040 sound standard, which states:

> **Subpart 1. Scope**. These standards describe the limiting levels of sound established on the basis of present knowledge for the preservation of public health and welfare. These standards are consistent with speech, sleep, annoyance, and hearing conservation requirements for receivers within areas grouped according to land activities by the noise area classification (NAC) system established in part 7030.0050. However, these standards do not, by themselves, identify the limiting levels of impulsive noise needed for the preservation of public health and welfare. Noise standards in subpart 2 apply to all sources.
>
> **Subpart 2. Noise Standards.**

Noise Area Classification	Daytime		Nighttime	
	L_{50}	L_{10}	L_{50}	L_{10}
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

Minn. Rule 7030.0020 defines daytime hours as 7:00AM to 10:00PM and nighttime hours from 10:00PM to 7:00AM. All daytime and nighttime limits are expressed in A-weighted decibels (dBA) and are applicable over the duration of an hour. These are to be measured using the fast response characteristic of the measurement instrumentation per Minn. Rule 7030.0060.

Noise is defined by the State of Minnesota[8] as "any sound not occurring in the natural environment, including, but not limited to, sounds emanating from aircraft and highways, and industrial, commercial, and residential sources."

[8] Minnesota Statutes 2017 Section 116.06

NAC 1[9] receptors are protected by the lowest sound level limits of the MPCA. Since wind turbines can operate under conditions resulting in maximum sound power during both the day and at night, the Project would need to comply during the period with more stringent limits, nighttime. Furthermore, because wind turbine sound is generally steady during a relatively constant wind speed there would be minimal difference, i.e. < 5 dBA, between the L_{50} and L_{10} sound levels due to a wind turbine. As the L_{50} and L_{10} noise limits differ by 5 decibels, the L_{50} limit is more restrictive for a wind energy facility. Therefore, NAC 1 receptors have been evaluated against the L_{50} sound level limit of 50 dBA in this analysis.

[9] NAC 1 is defined per Rule 7030.0050 as household units (including farm houses); hotels, motels or other overnight lodging; mobile home parks or courts; other residential units; motion picture production; medical and other health services; correctional institutions; educational services; religious activities; cultural activities and nature exhibitions; entertainment assembly; camping and picnicking areas (designated); resorts and group camps; other cultural, entertainment, and recreational activities.

5.0 EXISTING SOUND LEVELS

5.1 Overview

The Project is to be located in the southern region of Lincoln County, Minnesota, to the east of US Highway 75 and south of US Highway 14. The Project is proposed to have 39 GE wind turbines, which will be a combination of 2.32 MW units and 2.82 MW units.

The region is currently home to an existing operational wind energy facility. The wind turbines are not owned or operated by Buffalo Ridge Wind, and it is assumed that these wind turbines will remain operational. These wind turbines may be owned by separate LLCs but will be referred to throughout this report as "Ruthton Wind Turbines" or "Ruthton". At the time of the measurement program, wind turbines also existed outside the Project Area to the southeast. These wind turbines were associated with Lake Benton Wind II. They were out of operation during the sound level measurement program. They have now been decommissioned and replaced with a new wind energy project. Ruthton Wind Turbine locations within the vicinity of the Project Area are shown in Figure 5-1 as an aerial locus. The decommissioned Lake Benton Wind II wind turbines are not included on the figure.

5.2 Sound Level Environment

An ambient sound level survey was conducted to characterize the current acoustical environment in the community surrounding and within the Project Area. Existing sound sources include: wind, Ruthton Wind Turbines, rustling vegetation, some vehicles, animals including: birds, dogs, and cows, and occasional distant aircraft.

5.3 Sound Level Measurement Locations

Sound level measurement locations were selected based on the Large Wind Energy Conversion System, Noise Study Protocol and Report (LWECS Guidance) published by the Minnesota Department of Commerce, Energy Facility Permitting, dated October 8, 2012[10] which requires at least seven (7) days of measurements ("long-term"). The document specifies that measurements be performed within the Project Area at no fewer than three locations including the "worst-case" receptor predicted by the sound level model. The worst-case modeling receptors are monitoring Locations 1 and 4 as determined by modeling results (Project Only) using a preliminary wind turbine layout. Under the current modeling, Locations 2 and 4 have a modeled Project Only broadband sound level equal to the worst-case modeled sound level at a residence. The preliminary layout is documented in a draft pre-construction sound level measurement protocol

[10] The Minnesota Department of Commerce updated their guidance document in July 2019; however, the earlier version was utilized at the time of the ambient measurement program and the original reports for the Buffalo Ridge Wind Project.

(the Protocol) dated April 19, 2019 that was submitted to the MN DOC. The layout is shown on Figure 1 of the Protocol which is provided as Appendix A of this report. The measurement locations are spatially representative of the Project Area and captured sound levels with and without contribution from the Ruthton Wind Turbines.

Since this was a pre-construction program for the Project and Epsilon interprets subsections #1 and #2 in the LWECS Guidance to pertain to a post-construction evaluation, no off-site long-term monitoring locations were selected.

The selection of the sound monitoring locations was intended to be representative of on-site receptors per the requirements of the LWECS Guidance document. Figure 5-2 shows the actual long-term measurement locations overlaid upon an aerial photograph of the surrounding area. Included on this figure are the Ruthton Wind Turbines. Each measurement location is described below. The coordinates for the five locations were obtained by Epsilon staff using Global Positioning System (GPS) instrumentation or satellite imagery and are presented in UTM NAD83 Zone 14N in Table 5-1. All distances are shown in miles or are rounded to the nearest 10 feet. Photographs of the five locations are included in Figures 5-3 through 5-7, respectively.

- Sound Level Measurement Location 1 – Modeling Receptor #244
  - Approximately 1,710 feet to the closest proposed wind turbine (#22) and 1.3 miles to the closest Ruthton Wind Turbine. This on-site location is representative of residences in the northwestern part of the Project Area in the vicinity of proposed GE 2.82-127 wind turbines.

- Sound Level Measurement Location 2 – Modeling Receptor #85
  - Approximately 1,640 feet to the closest proposed wind turbine (#9) and 1.8 miles to the closest Ruthton Wind Turbine. This on-site location is representative of the residences in the northern part of the Project Area in the vicinity of proposed GE 2.82-127 wind turbines and of a worst-case Project Only modeled receptor.

- Sound Level Measurement Location 3 – Participating Parcel Near Modeling Receptor #28
  - Approximately 3,080 feet to the closest proposed wind turbine (#Alt2) and 1,430 feet to the closest Ruthton Wind Turbine. This on-site location is representative of the residences within the Project Area near the Ruthton Wind Turbines.

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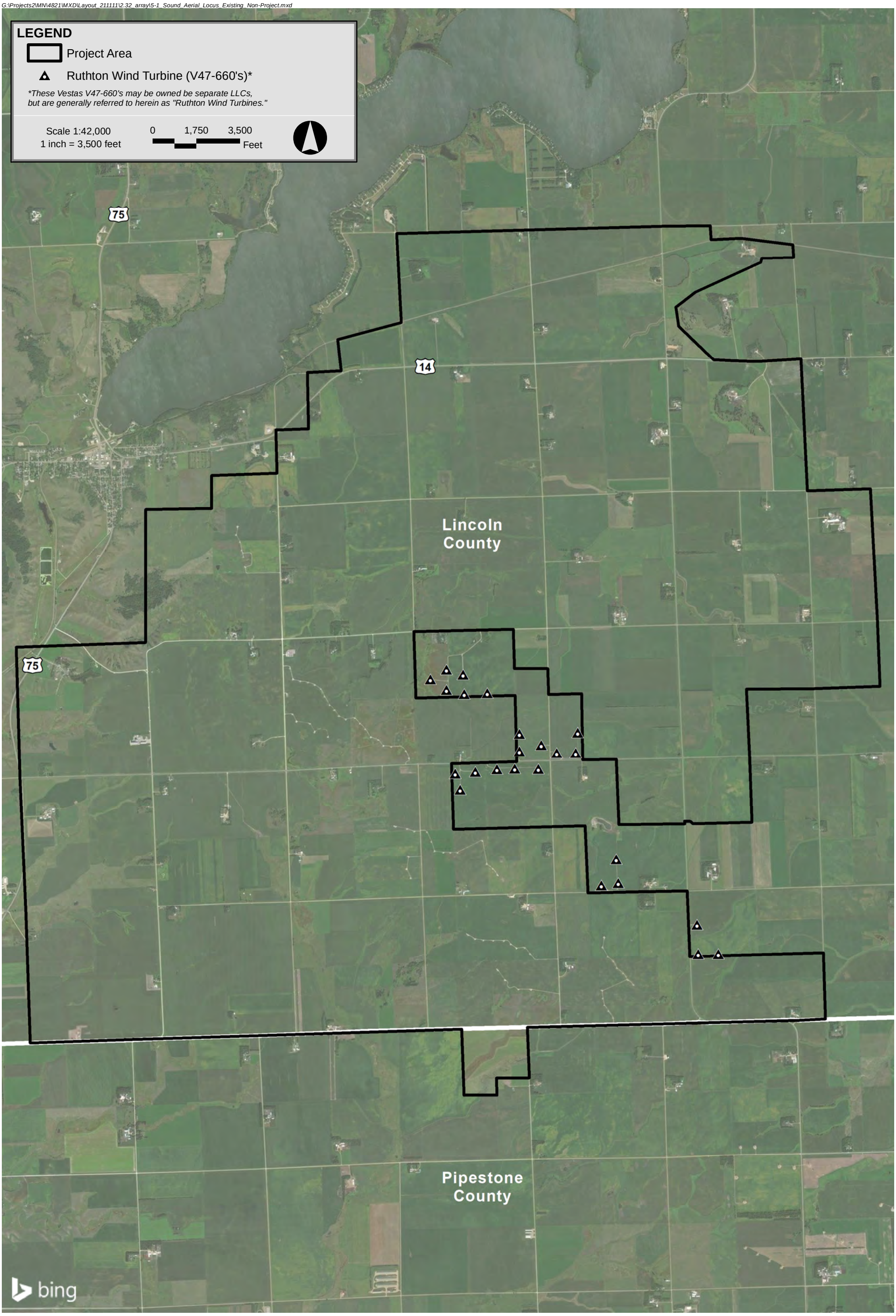

Buffalo Ridge Wind Project **Lincoln County, Minnesota**

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Figure 5-1
Aerial Locus - Ruthton

- Sound Level Measurement Location 4 – Modeling Receptor #841
  - Approximately 1,310 feet to the closest proposed wind turbine (#36) and 1.8 miles to the closest Ruthton Wind Turbine. This on-site location is representative of a worst-case Project Only modeled receptor.

- Sound Level Measurement Location 5 – Modeling Receptor #26
  - Approximately 1,230 feet to the closest proposed wind turbine (#Alt2) and 0.6 miles to the closest Ruthton Wind Turbine. This on-site location is representative of the residences in the southern part of the Project Area in the vicinity of proposed GE 2.32-116 wind turbines.

Table 5-1 GPS Coordinates – Sound Level Measurement Locations

Location	Coordinates UTM NAD83 Zone 14N	
	X (m)	Y (m)
1	718763.37	4902988.54
2	722994.08	4903965.11
3	723396.93	4898953.59
4	718073.77	4900036.45
5	722241.58	4898328.64

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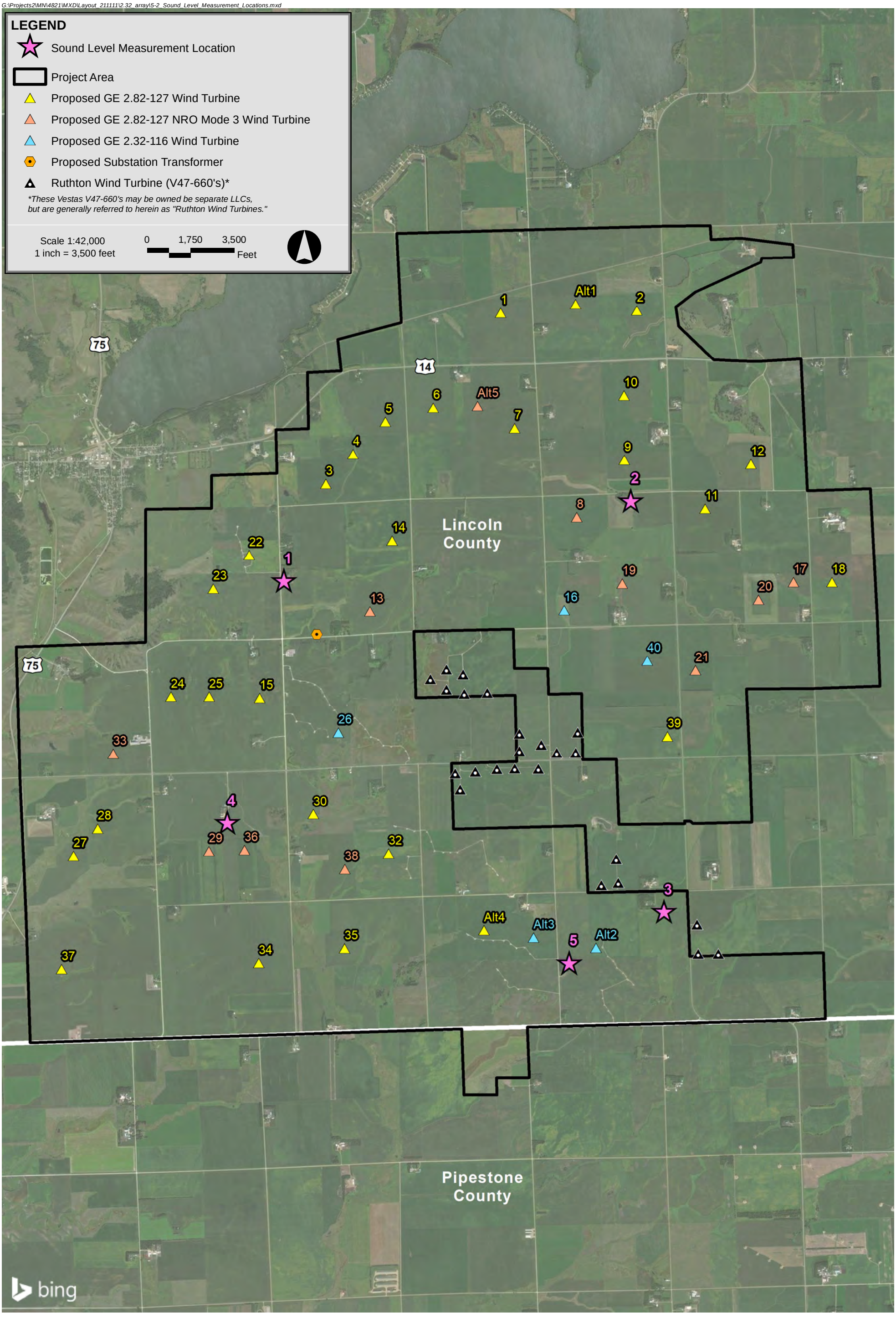
LEGEND

- Sound Level Measurement Location
- Project Area
- Proposed GE 2.82-127 Wind Turbine
- Proposed GE 2.82-127 NRO Mode 3 Wind Turbine
- Proposed GE 2.32-116 Wind Turbine
- Proposed Substation Transformer
- Ruthton Wind Turbine (V47-660's)*

**These Vestas V47-660's may be owned be separate LLCs, but are generally referred to herein as "Ruthton Wind Turbines."*

Scale 1:42,000
1 inch = 3,500 feet

0 1,750 3,500 Feet



Buffalo Ridge Wind Project **Lincoln County, Minnesota**

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Figure 5-2
Sound Level Measurement Locations

Figure 5-3 Photo of Sound Level Measurement Location 1 (facing west)

Figure 5-4 Photo of Sound Level Measurement Location 2 (facing north)

Figure 5-5 Photo of Sound Level Measurement Location 3 (facing east)

Figure 5-6 Photo of Sound Level Measurement Location 4 (facing east)

Figure 5-7 Photo of Sound Level Measurement Location 5 (facing east)

5.4 Sound Measurement Methodology

Continuous programmable unattended sound level meters were placed at on-site Locations 1, 2, 3, 4, and 5. These monitors continuously measured sound levels from as early as Monday, April 29, 2019 to Thursday, May 9, 2019. Sound levels were measured at a height of approximately five feet above the ground at locations where there were no large reflective surfaces to affect the measured levels.

In addition to the collection of sound level data, ground-level wind speeds were continuously measured and logged at each location. Precipitation was also logged at one location and used to determine hourly precipitation periods during the measurement program. A meteorological tower, owned by a NextEra Energy Resources, LLC affiliate, located approximately 7.8 miles southeast from proposed wind turbine #Alt2 also measured and logged wind speeds during the sound level measurement period. Meteorological data collected during the measurement period at the Brookings Regional Airport National Weather Service (NWS) station in Brookings, SD were also archived from the National Centers for Environmental Information (NCEI). These data are included in Appendix B and were used to determine hourly precipitation periods during the measurement program.

At Location 1, a continuous programmable unattended sound level meter was placed on the property at 1342 County Rd 108 in Lake Benton. This measurement location is an on-site participating residence that is representative of the residences in the vicinity of proposed GE 2.82-

127 wind turbines. The sound level meter continuously measured and stored A-weighted broadband and Z-weighted one-third octave-band sound level statistics from 7:00 PM Monday, April 29 until 9:00 AM Thursday, May 9 for a total of 229 hours.

At Location 2, a continuous programmable unattended sound level meter was placed on the property at 2269 140th St in Lake Benton. This measurement location is an on-site participating residence and is representative of is representative of the residences in the northern part of the Project Area in the vicinity of proposed GE 2.82-127 wind turbines and is representative of the worst-case Project Only modeled receptors. The sound level meter continuously measured and stored A-weighted broadband and Z-weighted one-third octave-band sound level statistics from 6:00 PM Tuesday, April 30 until 9:00 AM Thursday, May 9 for a total of 207 hours.

At Location 3, a continuous programmable unattended sound level meter was placed on the property at the southwest corner of County Rd 117 and County Rd 6 in Lake Benton. This measurement location is an on-site participating parcel and is representative of the residences within the Project Area near the Ruthton Wind Turbines. The sound level meter continuously measured and stored A-weighted broadband and Z-weighted one-third octave-band sound level statistics from 4:00 PM Tuesday, April 30 until 11:00 AM Thursday, May 9 for a total of 211 hours.

At Location 4, a continuous programmable unattended sound level meter was placed on the property at 1955 County Rd 9 in Lake Benton. This is an on-site participating residence and is representative of the worst-case Project Only modeled receptors. The sound level meter continuously measured and stored A-weighted broadband and Z-weighted one-third octave-band sound level statistics from 8:00 PM Monday, April 29 until 12:00 PM Thursday, May 9 for a total of 232 hours.

At Location 5, a continuous programmable unattended sound level meter was placed on the property at 1040 220th Ave in Lake Benton. This is an on-site participating residence and is representative of the residences in the southern part of the Project Area in the vicinity of proposed GE 2.32-116 wind turbines. The sound level meter continuously measured and stored A-weighted broadband and Z-weighted one-third octave-band sound level statistics from 5:00 PM Tuesday, April 30 until 1:00 PM Thursday, May 9 for a total of 211 hours.

In addition to A-weighted and Z-weighted sound levels, broadband equivalent C-weighted sound level data (LC_{eq}) were also collected at each location. Sound observations were made during daytime hours (9:30 AM - 12:00 PM) on May 1, nighttime hours (2:30 AM - 4:00 AM) on May 2, and daytime hours (9:00 AM - 1:30 PM) on May 9 at all five locations. An Epsilon engineer checked on the integrity of the monitoring equipment during the daytime observations on May 1.

5.5 Measurement Equipment

5.5.1 Sound Level Equipment

Five Larson Davis (LD) model 831 sound level meters, equipped with PCB Piezotronics Type 1 preamplifiers, PCB 377B20 or 377C20 half-inch microphones, and environmental protection kits were used to collect continuous broadband A-weighted (dBA), broadband C-weighted equivalent (LC_{eq}), and Z-weighted one-third octave-band sound pressure level data at Locations 1, 2, 3, 4, and 5. Each microphone was tripod-mounted at a height of five feet above ground with a 7-inch diameter windscreen. The meters utilized fast response and were set to log data every hour along with a one-minute time history for the following A-weighted parameters: L_1, L_{10}, L_{50}, L_{90}, L_{max}, L_{min}, and L_{eq}.

All meters meet Type 1 ANSI S1.4-2014 standards for sound level meters and were calibrated and certified as accurate to standards set by the National Institute of Standards and Technology. These calibrations were conducted by an independent laboratory within the prior 12 months of the measurement program. Additionally, all sound level measurement equipment was calibrated in the field before and after the surveys with the manufacturer's acoustical calibrator which meets the standards of IEC 942 Class 1L and ANSI/ASA S1.40-2006 (R2016).

5.5.2 Meteorological Equipment

Wind speed can have a strong influence on ambient sound levels. In order to understand how the existing sound levels are influenced by wind speed and as per the LWECS Guidance, continuous wind speed data were recorded at each measurement location by Epsilon. A HOBO H21-002 micro-weather station (manufactured by Onset Computer Corporation) was used to continuously measure the wind speed at four of the five locations. The wind sensors were mounted at a height of approximately five feet above ground level and data were logged every hour to be synced with the sound level measurements. This sensor has a measurement range of 0 to 45 m/s (100 mph) and an accuracy of ± 1.1 m/s (2.4 mph). The starting threshold is ≤ 1.0 m/s (2.2 mph). Wind speed, wind direction, temperature, and precipitation measurements were made at Location 4 using an ATMOS 41 weather station and EM60 data logger (manufactured by Meter Group, Inc.). The sensors were mounted at a height of approximately five feet above ground level and data were logged every hour. The weather station has a wind speed measurement range of 0 to 30 m/s (67 mph) and an accuracy of ±0.3 m/s (0.67 mph). The wind direction measurement range is 0 to 359 degrees with an accuracy of ±5 degrees. The air temperature measurement range is -50 to 60°C (-58 to 140°F) with an accuracy of ±1.0°C, and the precipitation measurement range is 0 to 400 mm/h with an accuracy of ±5% of the measurement from 0 to 50 mm/h.

In addition to Epsilon's portable weather stations, the NextEra Energy Resources, LLC affiliate's local meteorological tower measured and logged wind speeds at heights of 10.2 and 49.2 meters above ground level every 10 minutes. The data at these heights were used to determine shear factors for each 10-minute period and scale up wind speeds to a height of 89 meters, to represent

hub height wind speeds. The 10-minute data were averaged into hourly values to correspond with the sound data. Wind shear is the change of wind speed as a function of height above ground. This relationship is typically expressed as a power law of the form:

$$U_z=U_r(Z/Z_r)^p$$

Where: U_z = wind speed at height Z (in this case 89 meters)
U_r = wind speed at height Z_r (in this case 49.2 meters)
p = wind shear coefficient

The location of the meteorological tower is approximately 7.8 miles southeast from proposed wind turbine #Alt2.

Meteorological data collected during the measurement period at the Brookings Regional Airport National Weather Service (NWS) station in Brookings, SD were also archived from the National Centers for Environmental Information (NCEI) and are included in Appendix B.

5.6 Measured and Calculated Sound Levels

A brief summary of the measured (A-weighted) and measured/calculated (C-weighted) sound levels and sound sources at each location is provided in this section. Several weather events were notable during the approximately 9-day measurement program, including 70 hours of precipitation, as determined from the on-site measurement data and the NCEI data. Some snow cover was present at two locations upon equipment retrieval. The precipitation periods were excluded from the analysis as per the LWECS Guidance but included in the graphical presentations in this section. Although there are currently wind turbines in the vicinity of the Project Area, this was a pre-construction program for the Project and Epsilon interprets subsection #29 in the LWECS Guidance to pertain to a post-construction evaluation; therefore, no comparison of measured sound levels to the Minnesota limits is provided in this report.

5.6.1 Location 1

Based on observations, sound levels at Location 1 were influenced by birds, distant vehicles, and some vegetation rustle. The range of A-weighted sound levels from the continuous measurements, neglecting periods of precipitation (31% of measurements) and 11 hours that exceeded 11 mph wind speeds (5% of measurements), are summarized below. A complete set of the measured sound levels and meteorological considerations are presented graphically in Figure 5-8 (A-weighted sound levels) and Figure 5-9 (C-weighted sound levels) as per the LWECS Guidance. The sound levels at this location are primarily controlled by wind conditions in the area and birds.

- The L_{10} A-weighted sound levels ranged from 25 to 70 dBA;
- The L_{50} A-weighted sound levels ranged from 20 to 59 dBA.

5.6.2 Location 2

Based on observations, sound levels at Location 2 were influenced by distant vehicles, birds, dog barks, occasional aircraft, and rustling vegetation. The range of A-weighted sound levels from the continuous measurements, neglecting periods of precipitation (34% of measurements) and 21 hours that exceeded 11 mph wind speeds (10% of measurements), are summarized below. A complete set of the measured sound levels and meteorological considerations are presented graphically in Figure 5-10 (A-weighted sound levels) and Figure 5-11 (C-weighted sound levels) as per the LWECS Guidance. The sound levels at this location are primarily controlled by wind conditions in the area and birds. The Ruthton Wind Turbines are a significant distance from this location and did not contribute to the measured sound levels.

- The L_{10} A-weighted sound levels ranged from 23 to 54 dBA;
- The L_{50} A-weighted sound levels ranged from 19 to 49 dBA.

5.6.3 Location 3

Based on observations, sound levels at Location 3 were influenced by the Ruthton Wind Turbines, birds, insects, some rustling vegetation, vehicles on local roads, occasional aircraft, and wind. The range of A-weighted sound levels from the continuous measurements, neglecting periods of precipitation (33% of measurements) and 63 hours that exceeded 11 mph wind speeds (24% of measurements)[11], are summarized below. A complete set of the measured sound levels and meteorological considerations are presented graphically in Figure 5-12 (A-weighted sound levels) and Figure 5-13 (C-weighted sound levels) as per the LWECS Guidance. The sound levels at this location are primarily controlled by wind conditions and Ruthton Wind Turbines.

- The L_{10} A-weighted sound levels ranged from 22 to 48 dBA;
- The L_{50} A-weighted sound levels ranged from 19 to 44 dBA.

5.6.4 Location 4

Based on observations, sound levels at Location 4 were influenced by birds, wind, wind through vegetation, insects, occasional vehicles, and occasional aircraft. The range of A-weighted sound levels from the continuous measurements, neglecting periods of precipitation (30% of measurements) and 12 hours that exceeded 11 mph wind speeds (5% of measurements), are summarized below. A complete set of the measured sound levels and meteorological considerations are presented graphically in Figure 5-14 (A-weighted sound levels) and Figure 5-15 (C-weighted sound levels) as per the LWECS Guidance. The Ruthton Wind Turbines are a significant distance from this location and did not contribute to the measured sound levels.

[11] This measurement location was located in a field with essentially no wind shielding from trees or structures.

- The L_{10} A-weighted sound levels ranged from 30 to 54 dBA;
- The L_{50} A-weighted sound levels ranged from 20 to 50 dBA.

In addition to broadband sound levels, one-third octave-band sound levels were collected at this off-site location and are presented in this report per the LWECS Guidance. One-third octave-band data from an hourly period during representative wind speed conditions, interpreted by Epsilon as low ground-level wind speed and high hub-height wind speed, are presented in Figure 5-16 for this location. Z-weighted, A-weighted, and C-weighted one-third octave-band frequency levels are included in the figure.

5.6.5 Location 5

Based on observations, sound levels at Location 5 were influenced by farming activity, cows, birds, dog barks, Ruthton Wind Turbines, wind through vegetation, and a residential fan. The range of A-weighted sound levels from the continuous measurements, neglecting periods of precipitation (33% of measurements) and 1 hour that exceeded 11 mph wind speeds (<1% of measurements), are summarized below. A complete set of the measured sound levels and meteorological considerations are presented graphically in Figure 5-17 (A-weighted sound levels) and Figure 5-18 (C-weighted sound levels) as per the LWECS Guidance. The sound levels at this location are primarily controlled by wind conditions in the area, farming activity, and Ruthton Wind Turbines.

- The L_{10} A-weighted sound levels ranged from 23 to 64 dBA;
- The L_{50} A-weighted sound levels ranged from 22 to 54 dBA.

5.6.6 Existing Sound Levels Summary

A-weighted L_{50} sound pressure levels measured during the program at all locations ranged from 19 to 59 dBA. The measurement locations that are a significant distance from the Ruthton Wind Turbines (Locations 2 and 4) experience ambient sound levels without contribution from wind turbines, i.e., non-wind-turbine ambient[12]. The non-wind-turbine ambient A-weighted L_{50} sound levels at these two locations ranged from 19 to 50 dBA. The non-wind-turbine sound levels measured during nighttime hours (10:00 PM – 7:00 AM) ranged from 19 to 50 dBA at these two locations. Furthermore, nighttime measurements showed non-wind-turbine ambient L_{50} sound levels range from 28 to 49 dBA when ground-level wind speeds were at or below 11 mph and winds at hub height corresponded to conditions in the modeling.

In order to calculate 'total' sound levels (ambient + Project) at the five measurement locations, a single, representative L_{50} ambient nighttime sound level must be assigned to each location. Table

[12] 'Non-wind-turbine ambient' includes all natural and man-made sound sources exclusive of wind turbines. This differs from 'noise' as defined by the State of Minnesota provided in Section 4 of this report, because sounds occurring in the natural environment are exempt from 'noise'.

5-2 presents the median nighttime L_{50} sound pressure level measured at each location when ground-level wind speeds were at or below 11 mph and winds at hub height corresponded to conditions in the modeling (Section 6). These sound levels represent the ambient experienced during nighttime hours when the Project would be operating under worst-case sound level conditions. As these are the median sound levels, there will be times under comparable hub height wind speeds when the ambient sound levels at these locations will be lower and other times when the sound levels will be higher. The sound levels presented for Locations 1, 3, and 5 include contribution from existing wind turbines.

Table 5-2 Establishment of Ambient Sound Levels at Measurement Locations

Location	Representative (Median) Ambient Nighttime L_{50} Sound Level (dBA)
1	35[1]
2	39[2]
3	41[1]
4	37[2]
5	40[1]

Notes:
1. Includes contribution from existing wind turbines.
2. Non-wind-turbine ambient.

Figure 5-8: Measured Hourly A-weighted Sound Pressure Levels (dBA) versus Meteorological Data
Location 1

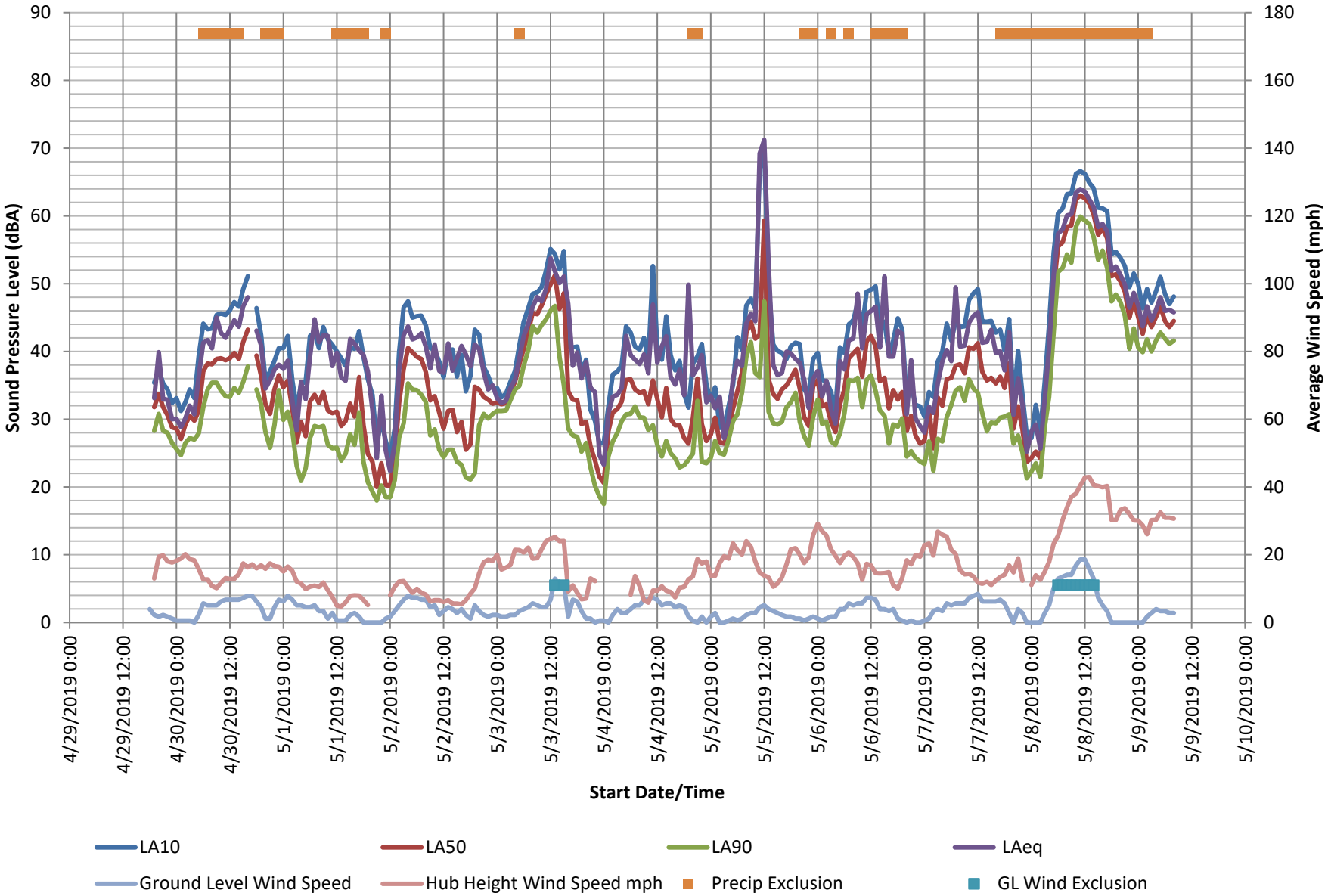


Figure 5-9: Measured/Calculated Hourly C-weighted Sound Pressure Levels (dBC) versus Meteorological Data
Location 1

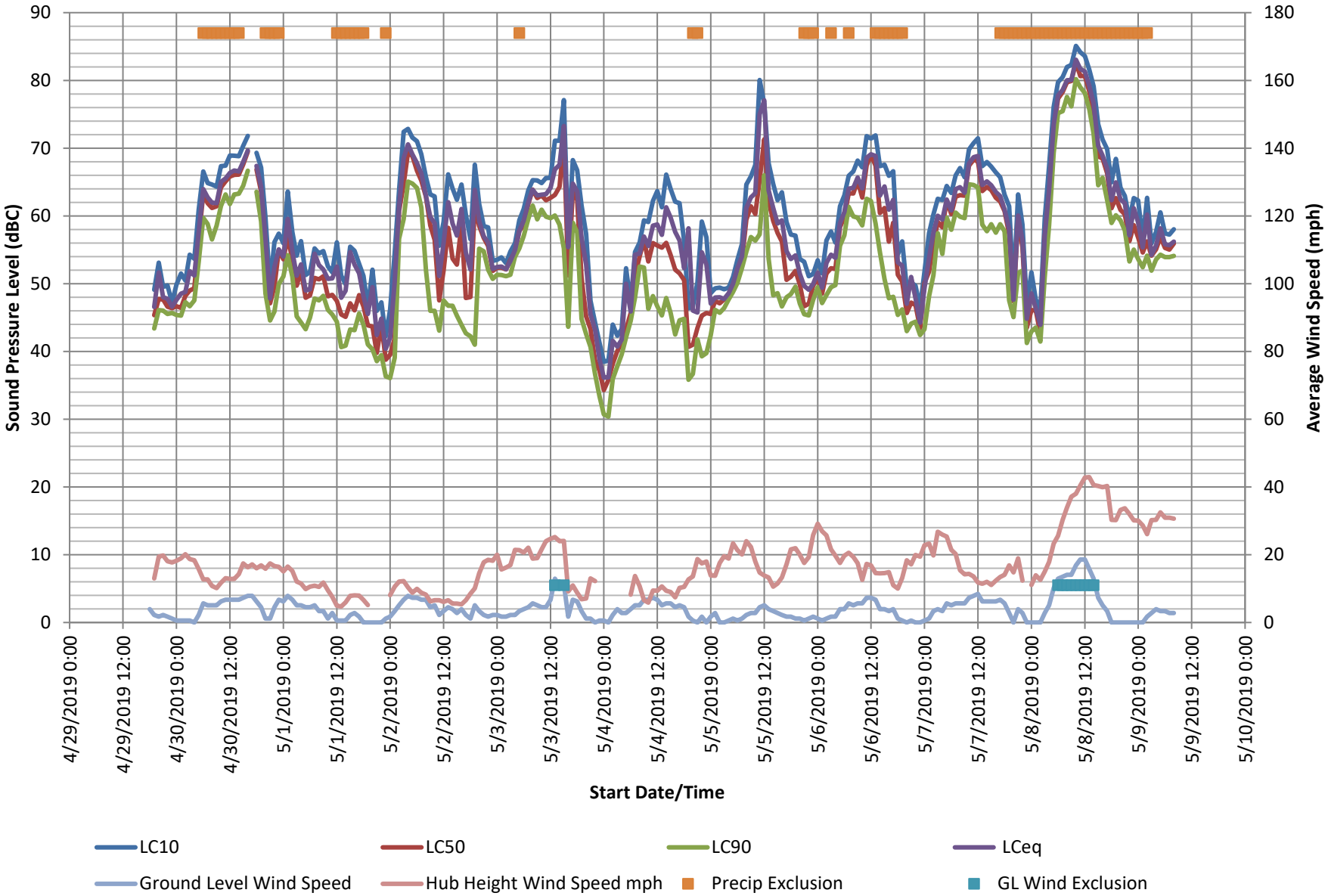


Figure 5-10: Measured Hourly A-weighted Sound Pressure Levels (dBA) versus Meteorological Data
Location 2

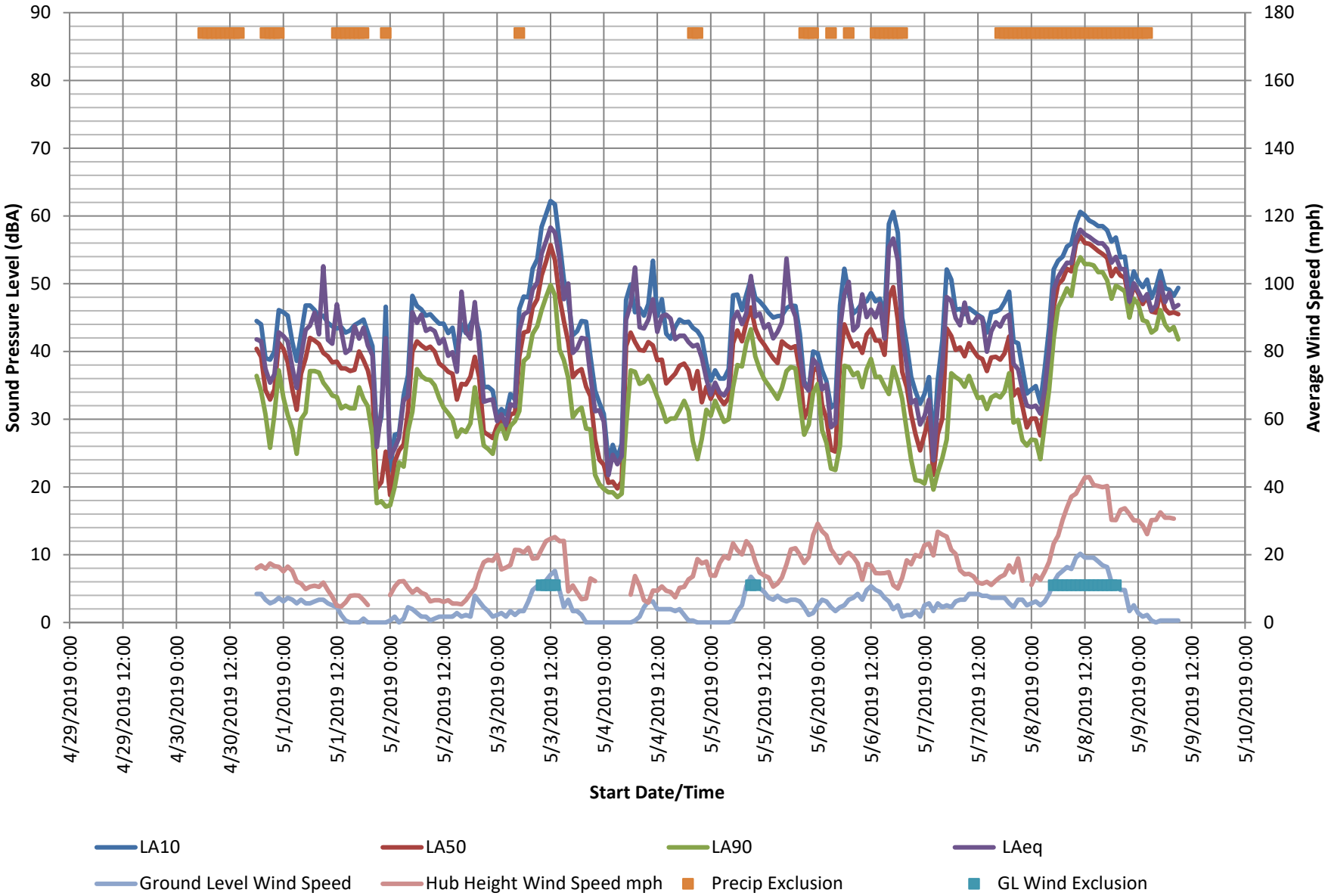


Figure 5-11: Measured/Calculated Hourly C-weighted Sound Pressure Levels (dBC) versus Meteorological Data
Location 2

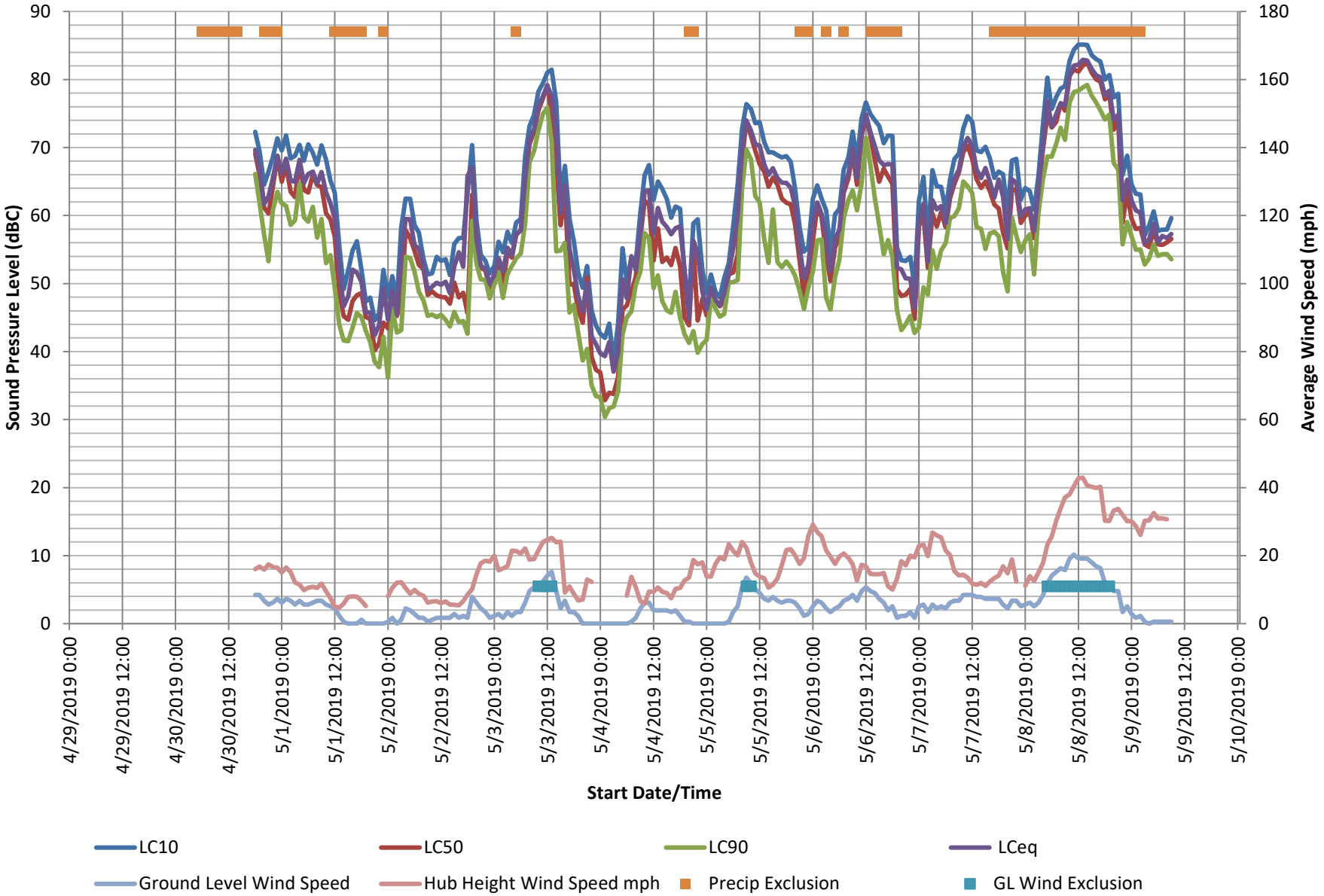


Figure 5-12: Measured Hourly A-weighted Sound Pressure Levels (dBA) versus Meteorological Data
Location 3

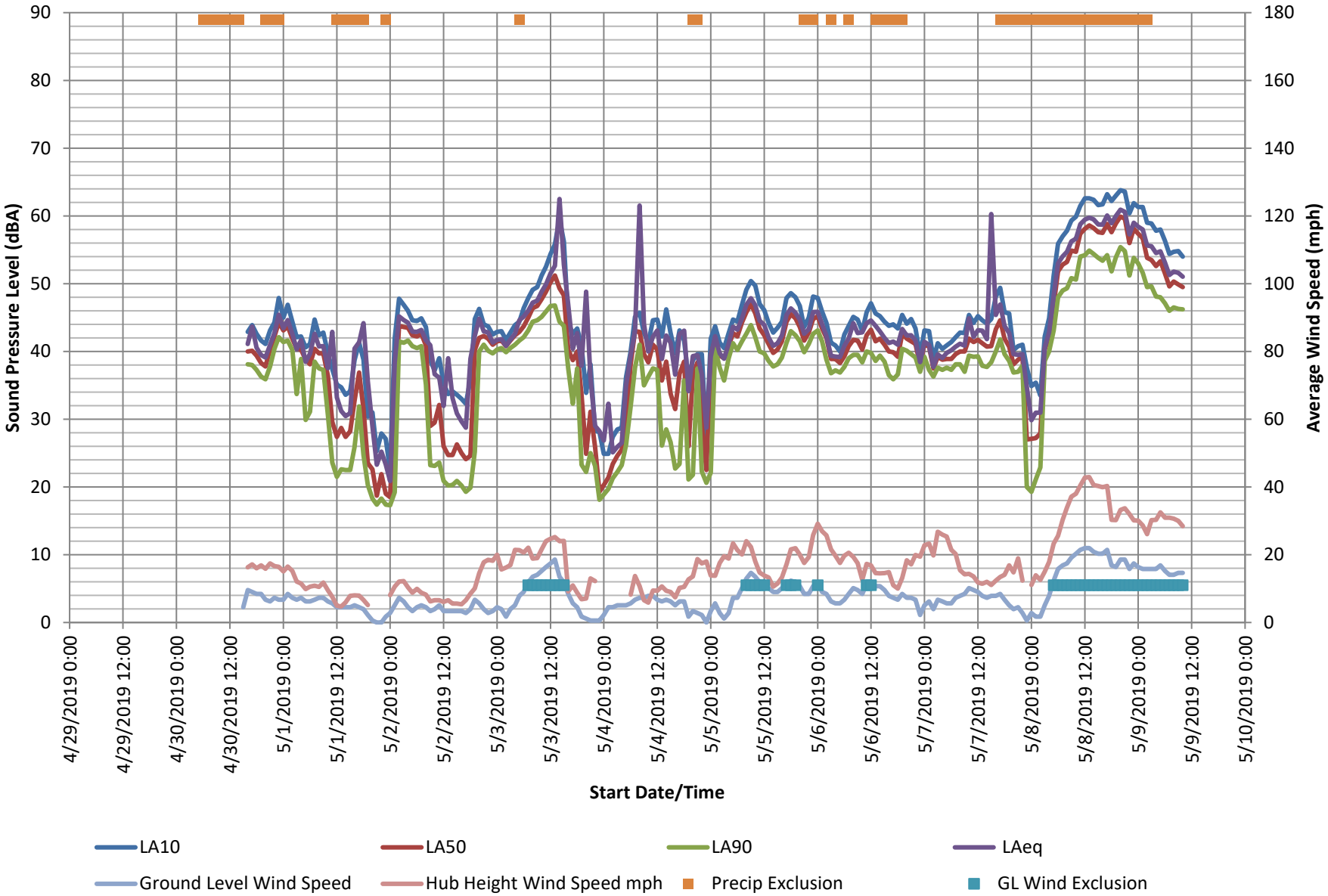


Figure 5-13: Measured/Calculated Hourly C-weighted Sound Pressure Levels (dBC) versus Meteorological Data
Location 3

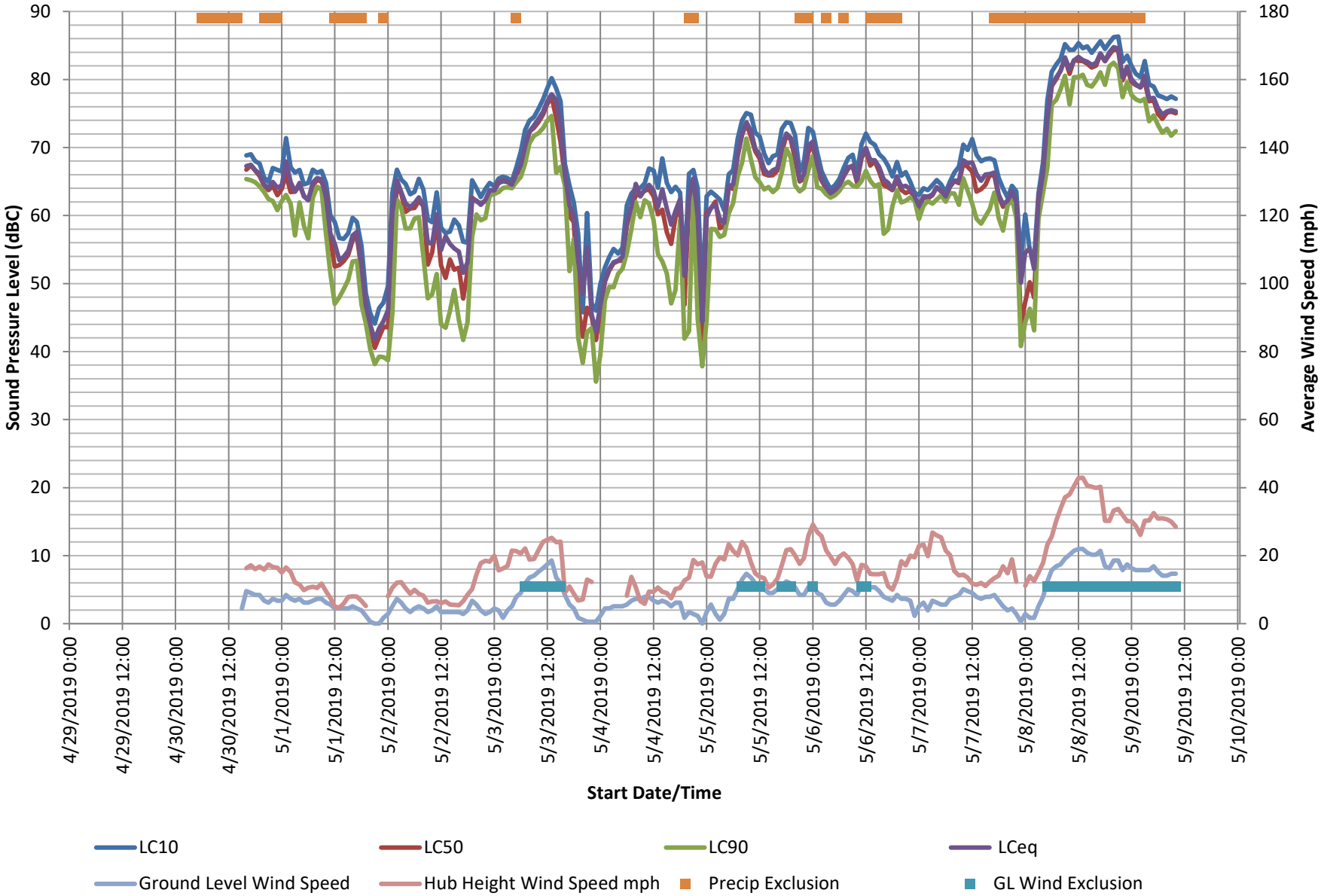


Figure 5-14: Measured Hourly A-weighted Sound Pressure Levels (dBA) versus Meteorological Data
Location 4

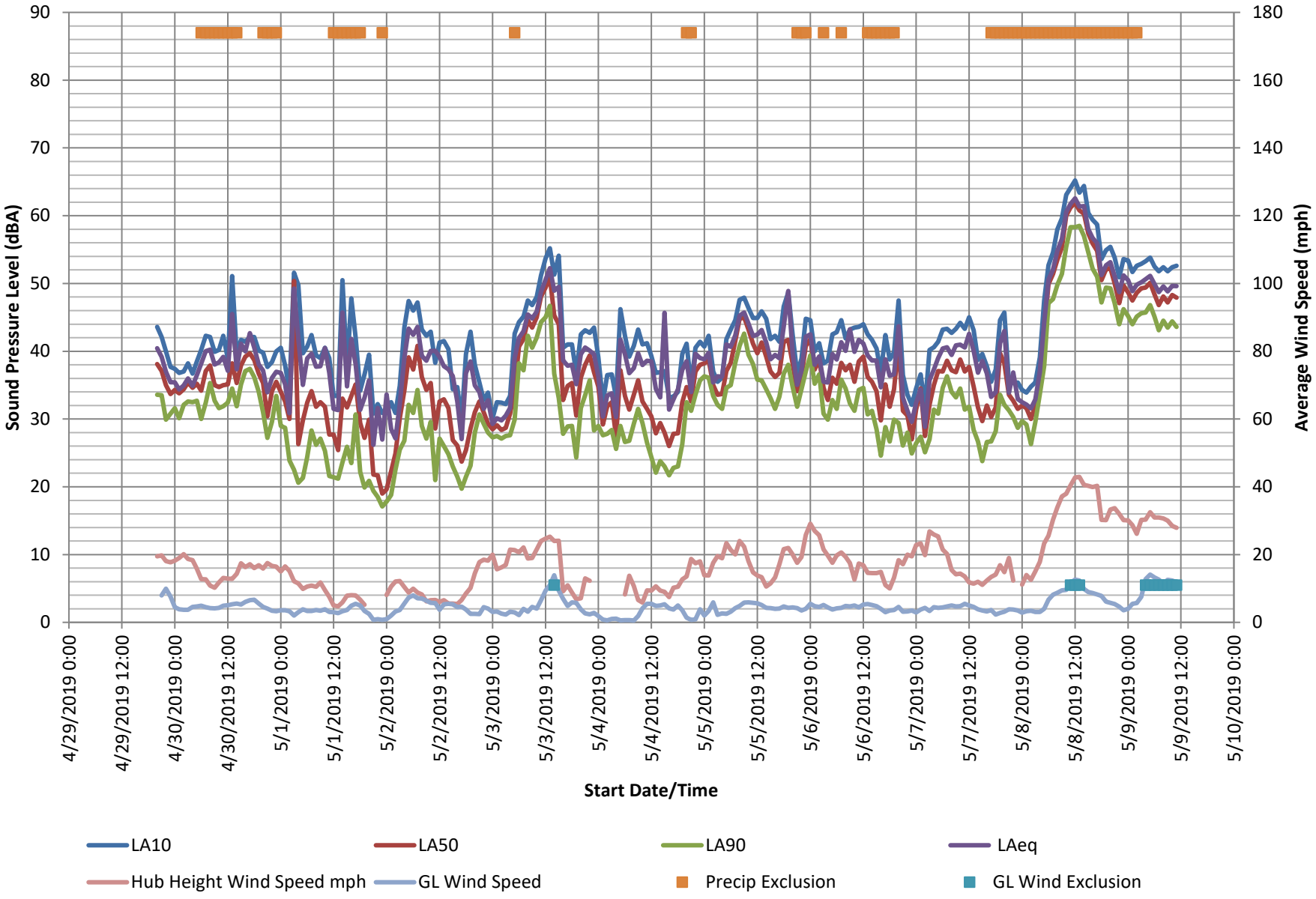


Figure 5-15: Measured/Calculated Hourly C-weighted Sound Pressure Levels (dBC) versus Meteorological Data
Location 4

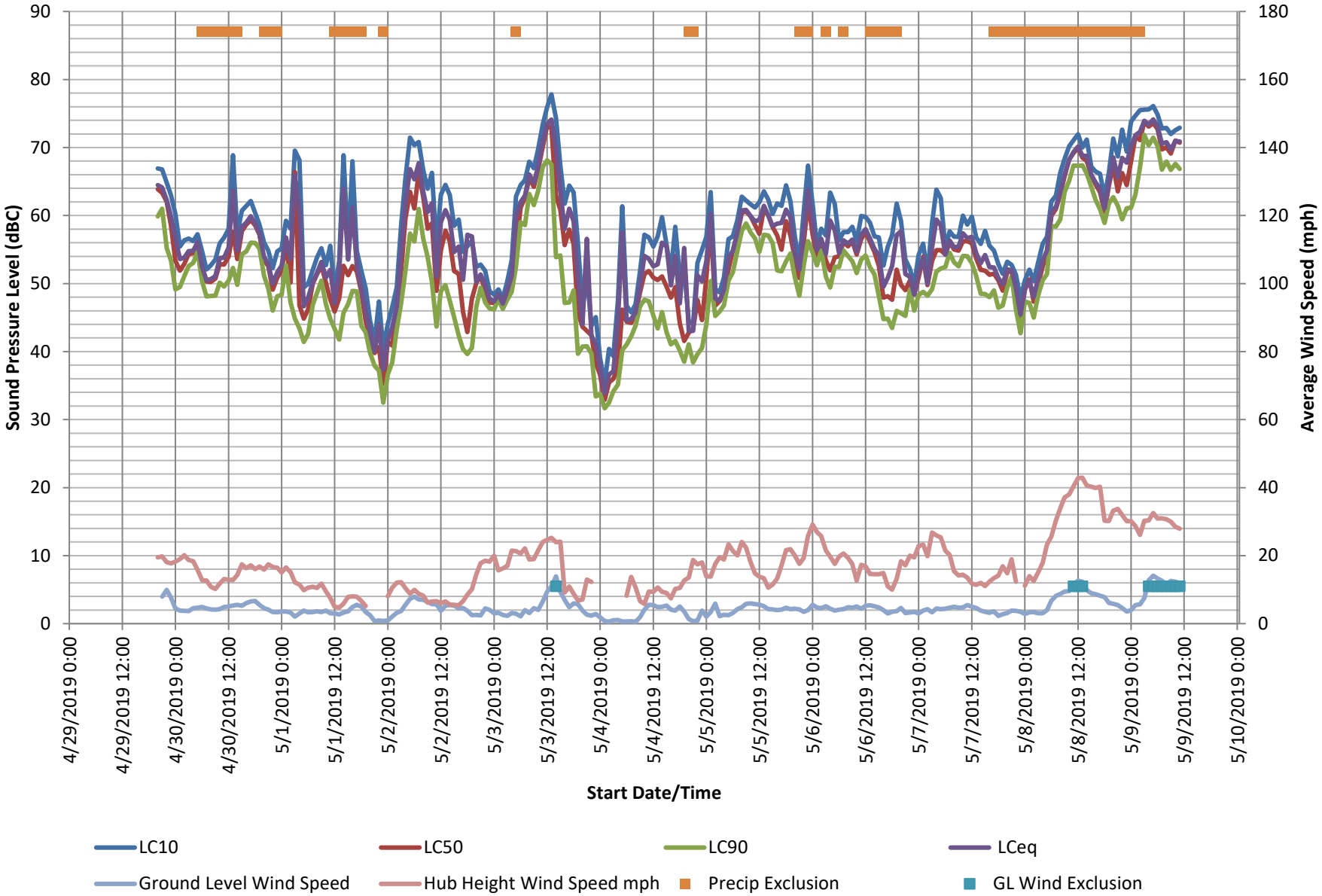


Figure 5-16: Measured One-Third Octave Band Sound Levels During a Representative Hub Height Wind Speed Period - Location 4

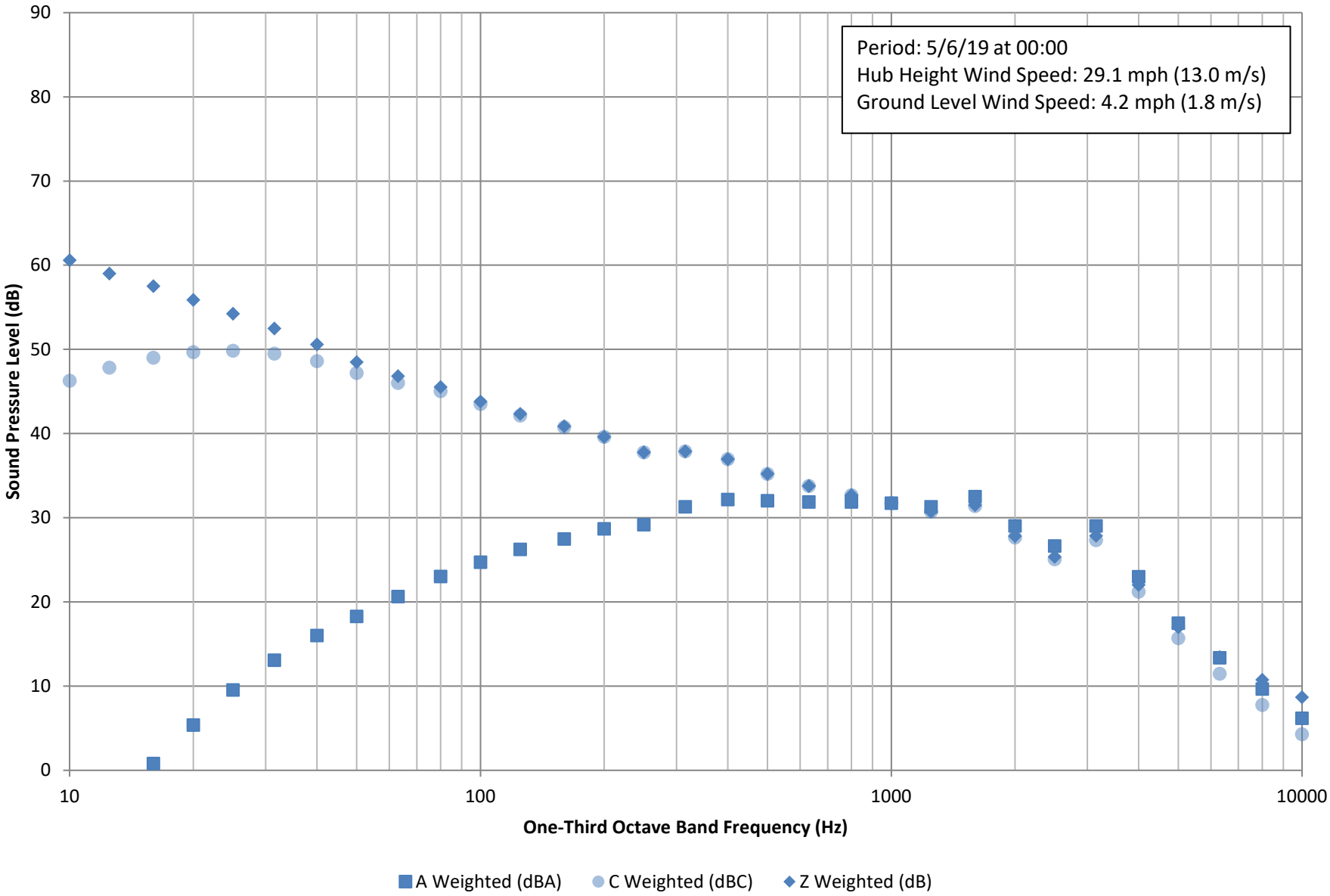


Figure 5-17: Measured Hourly A-weighted Sound Pressure Levels (dBA) versus Meteorological Data
Location 5

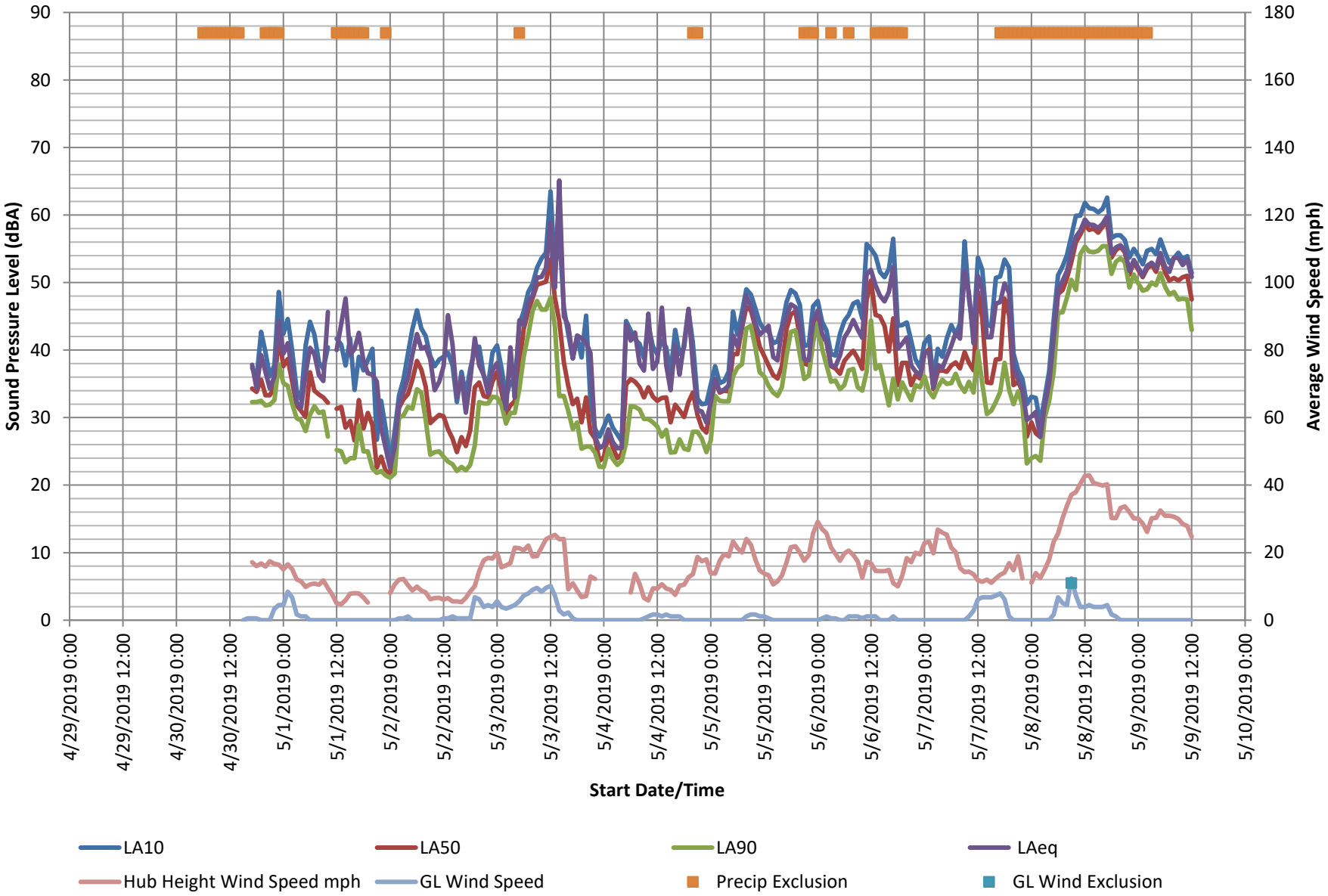
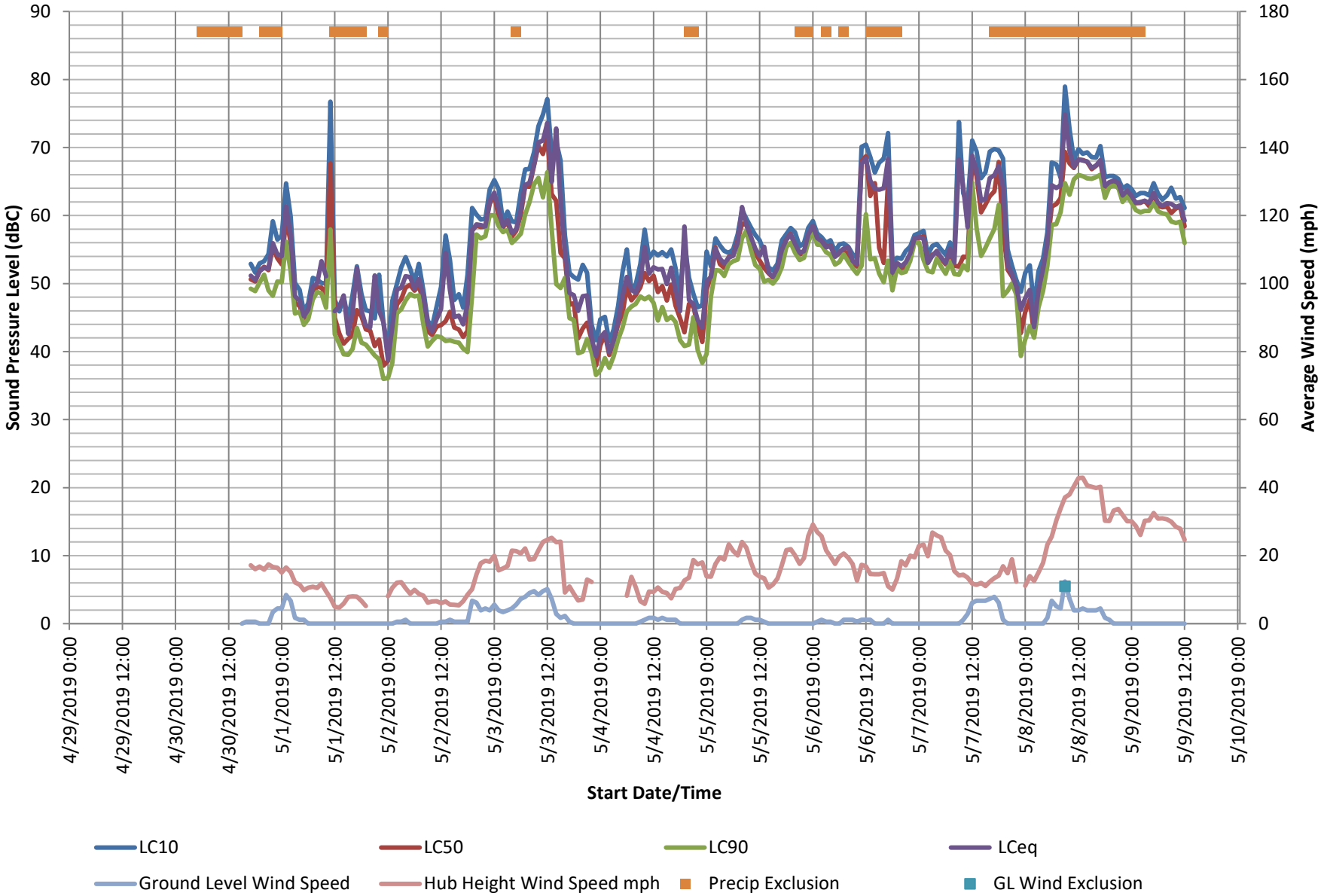


Figure 5-18: Measured/Calculated Hourly C-weighted Sound Pressure Levels (dBC) versus Meteorological Data
Location 5



6.0 MODELED SOUND LEVELS

6.1 Sound Sources

6.1.1 Project Wind Turbines

The sound level analysis for the Project conservatively includes 44 wind turbines, of which five (5) are considered alternate locations. Of these 44 wind turbines, 39 wind turbines are GE 2.82-127 units and five (5) are GE 2.32-116 units. All proposed wind turbines have LNTE blades. The GE 2.82-127 wind turbines have a hub height of 89 meters and a rotor diameter of 127 meters. A technical report from GE[13] was provided to Epsilon which documented the expected sound power levels associated with the GE 2.82-127 LNTE wind turbines. These sound power levels are defined as "calculated apparent" by the turbine manufacturer and therefore do not include any uncertainty factor.

Select GE 2.82-127 LNTE wind turbines are proposed to run under a NRO as identified in applicable figures within this section (wind turbine numbers 8, 13, 17, 19, 20, 21, 29, 33, 36, 38, and Alt5). As described in an acoustic document from GE[14], a wind turbine in NRO mode operates at a reduced rotor speed and with an optimized blade pitch angle, thus lowering the sound emitted by the wind turbine. The document from GE provides sound power levels for four (4) NRO modes. In this report, the modes are referred to as NRO Mode 1 through 4, with NRO Mode 4 being the quietest mode. Of the 39 GE 2.82-127 wind turbines, 28 will run in normal operation and 11 will run in NRO Mode 3. Wind turbines proposed to operate in NRO modes are identified as such on appropriate figures in this report.

All GE 2.32-116 wind turbines have a hub height of 80 meters and a rotor diameter of 116 meters. A similar technical report from GE[15] was provided to Epsilon that documented the expected sound power levels associated with the GE 2.32-116 LNTE wind turbine. These sound power levels are defined as "apparent" by the turbine manufacturer and therefore do not include any uncertainty factor.

6.1.2 Project Substation Transformer

In addition to the wind turbines, there will be a collector substation associated with the Project in Lincoln County. The substation is proposed to be located southwest of wind turbine #13 as shown in Figure 6-1. One 125 megavolt-ampere (MVA) transformer is proposed for the substation.

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[13] General Electric Company, Technical Documentation Wind Turbine Generator Systems 2.x-127 with LNTE – 60 Hz Product Acoustic Specifications, 2018.

[14] General Electric Company, Technical Documentation Wind Turbine Generator Systems 2.5-127 and 2.8-127 with LNTE 60 Hz Product Acoustic Specifications Noise Reduction Operation according to IEC, 2018.

[15] General Electric Company, Technical Documentation Wind Turbine Generator Systems 2.3-116 with LNTE 50 Hz and 60 Hz Product Acoustic Specifications, 2015.

Epsilon has estimated octave-band sound power levels using the MVA rating and sound level rating (75 dBA) provided by Atwell and techniques in the Electric Power Plant Environmental Noise Guide (Edison Electric Institute), Table 4.5 Sound Power Levels of Transformers. Table 6-1 summarizes the sound power level data used in the modeling.

Table 6-1 Modeled Substation Transformer Sound Power Levels

Maximum Rating	Broadband dBA	Sound Power Levels per Octave-Band Center Frequency [Hz] 31.5 dB	63 dB	125 dB	250 dB	500 dB	1k dB	2k dB	4k dB	8k dB
125 MVA	95	91	97	99	94	94	88	83	78	71

6.1.3 Ruthton Wind Turbines

As discussed in Section 5, Ruthton Wind Turbines are currently in the vicinity of the Project Area and are assumed to remain as operational. These wind turbines may be owned by separate LLCs but are generally referred herein as "Ruthton Wind Turbines" or "Ruthton". To predict the future wind turbine sound levels in the vicinity of the Project, a desktop cumulative modeling analysis was conducted which included the sound level contribution from these Ruthton Wind Turbines. Coordinates and descriptions for these turbines were based upon publicly available data from the USGS Wind Turbine Database[16]. According to the database, the Ruthton Wind Turbines make up a total of 24 non-Project wind turbines within the vicinity of the Project Area that were included in the modeling. Based on information indicated in the USGS Turbine Database, the wind turbines were modeled as Vestas V47-660 units. The V47-660 wind turbine model has a hub height of 65 meters and a rotor diameter of 47 meters. Sound power level data for this wind turbine type were available to Epsilon in the WindPRO WTG Catalog. WindPRO is a software suite developed by EMD International A/S and is used for assessing potential environmental impacts from wind turbines. Only broadband total sound power levels were available for the V47-660 unit in the WindPRO Catalog. The maximum available broadband sound power level for the Vestas unit indicated in the WindPRO Catalog is 102 dBA. The modeled sound level for these Ruthton Wind Turbines assumed a +2dB uncertainty factor, and therefore was 104 dBA.

6.1.4 Lake Benton Wind II Project Wind Turbines

Southeast of the Project Area, another wind energy facility, Lake Benton Wind II, has recently been constructed. The Lake Benton Wind II project replaced the decommissioned Lake Benton Wind II. This facility is not currently owned or operated by any NEER affiliate. Epsilon performed the pre-construction sound level assessment for the Lake Benton Wind II project, details of which

[16] USGS (2019). U.S. Wind Turbine Database. U.S. Wind Turbine Database View. [Online.] Available at https://eerscmap.usgs.gov/uswtdb/viewer/#10/44.2225/-96.2195

are provided in a report dated May 1, 2018.[17] To predict the future wind turbine sound levels near the Project, a cumulative modeling analysis was conducted which included the sound level contribution from these approved new turbines. Coordinates and descriptions for these turbines were utilized from the pre-construction modeling. Lake Benton Wind II is comprised of a total of 44 wind turbines southeast of the Project Area.[18] These wind turbines will be referred to throughout this report as "Lake Benton Wind II" wind turbines. Of the 44 wind turbines, 33 wind turbines are GE 2.3-116 units, six (6) are GE 2.3-116 LNTE units, two (2) are GE 2.1-116 units, and three (3) are GE 2.1-116 LNTE units. All GE 2.3-116 wind turbines have a hub height of 90 meters and a rotor diameter of 116 meters. All GE 2.1-116 wind turbines have a hub height of 80 meters and a rotor diameter of 116 meters. A technical report from GE[19] was provided to Epsilon which documented the expected sound power levels associated with the GE 2.3-116 wind turbine. Sound levels for the GE 2.3-116 wind turbines have been assumed for the GE 2.1-116 model in this analysis based on direction from NextEra Energy Resources, LLC. These sound power levels are defined as "calculated apparent" by the turbine manufacturer and therefore do not include any uncertainty factor.

6.1.5 All Wind Turbines within the Vicinity of the Project Area (Project + Ruthton + Lake Benton Wind II)

A sound level model was generated to predict future wind turbine related sound levels in the community produced by combining the proposed Project, Ruthton, and Lake Benton Wind II. This modeling scenario therefore included a total of 112 wind turbines (44 Project-related, 24 Ruthton, 44 Lake Benton Wind II) as described in the previous subsections.

6.2 Modeling Methodology

The sound impacts associated with the proposed wind turbines were predicted using the Cadna/A sound level calculation software developed by DataKustik GmbH. This software uses the ISO 9613-2 international standard for sound propagation (Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation). 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 Cadna/A software allows for octave band calculation of sound from multiple sources as well as computation of diffraction.

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[17] Epsilon Associates, Inc. Sound Level Assessment Report Lake Benton Wind II Project Pipestone County, Minnesota. Maynard, MA. May 1, 2018.

[18] It is Epsilon's understanding that the four (4) alternate wind turbines were not constructed and were therefore excluded from this modeling analysis.

[19] General Electric Company, Technical Documentation Wind Turbine Generator Systems 2.3-116 with LNTE 50 Hz and 60 Hz Product Acoustic Specifications, 2015.

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

- *Project Layout:* A Project layout dated November 11, 2021 was provided by Buffalo Ridge Wind. The 39 proposed wind turbines and 5 proposed alternates were conservatively input into the model. The layout included 10 GE 2.87-127 wind turbines in NRO mode; however, one additional wind turbine (Alt5) was changed to NRO following a later discussion with NEER. The Project will also have one 125 MVA transformer at a collector substation. The location of the substation transformer in the model was estimated based on plans received from Atwell on November 12, 2021. The proposed wind turbines are identified in Figure 6-1 and location coordinates are provided in Appendix C.

- *Ruthton Wind Turbine Locations:* A publicly available database was utilized for the coordinates for the Ruthton Wind Turbines within the vicinity of the Project Area. These wind turbines are shown in Figure 6-2.

- *Lake Benton Wind II Wind Turbine Locations:* Coordinate locations of the approved Lake Benton Wind II turbines in proximity to the Project Area were consistent with the Lake Benton Wind II pre-construction modeling identified in the May 1, 2018 report; however, four (4) wind turbines were excluded from the modeling in this assessment as it is Epsilon's understanding that the alternate wind turbines were not constructed. These wind turbines are shown in Figure 6-2.

- *Parcel Participation:* A dataset containing participation status information for property parcels in the proximity of the Project was provided by to Epsilon with the date of November 29, 2021. Parcels identified as leased within the dataset are participating and are indicated as such on Figure 6-1. All other parcels are considered non-participating. Participation status used throughout this analysis is shown in Figure 6-1.

- *Modeling Receptor Locations:* A modeling receptor dataset was provided by Atwell on March 12, 2019. Receptors identified as barn, shed, garage, or silo were excluded from modeling. Therefore, the remaining 411 receptors identified as mobile home, residential, and industrial were input into the sound level model. These receptors were modeled as discrete points at a height of 1.5 meters above ground level to mimic the ears of a typical standing person. Participation status for each modeling receptor was assigned based on the data presented in Figure 6-1. All modeling receptors are identified in Figure 6-3 and are distinguished as either participating or non-participating.

- *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 Cadna/A 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 6.1. Documentation from GE provided levels that represent "worst-case" operational sound level emissions for the Project's proposed wind turbines. The WindPRO software package provided sound levels for the Ruthton Wind Turbines to represent "worst-case" emissions. For Lake Benton Wind II, Epsilon used sound power level data from the pre-construction modeling described in the May 1, 2018 report.

- *Uncertainty factor:* No uncertainty factor was provided by the wind turbine manufacturers; however, based on experience with other wind turbine manufacturers and wind turbine sound modeling, an uncertainty factor of 2.0 dBA was assumed and conservatively added to the sound power level for each modeled wind turbine (Project, Ruthton, and Lake Benton Wind II).

- *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 0.5 which corresponds to "mixed ground" consisting of both hard and porous ground cover. This method yields more conservative results (i.e., higher sound levels) as the vast majority of the area is actually agricultural. An exception was made for a large body of water in the vicinity of the Project, Lake Benton, where a G-factor of 0 was used.

Octave band sound power levels corresponding to the highest available wind turbine broadband sound power level for each wind turbine type including uncertainty were input into Cadna/A[20] to model wind turbine generated L_{eq} sound pressure levels during conditions when worst-case sound power levels are expected. These calculations were performed for Project plus Ruthton plus Lake Benton Wind II, Project wind turbines only, and Ruthton Wind Turbines only. Sound pressure levels were modeled at 411 receptors within the vicinity of the Project Area. 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 in each modeling scenario.

[20] The one exception to this approach was for the Vestas wind turbine where only a broadband sound level was available.

Several modeling assumptions inherent in the ISO 9613-2 calculation methodology, or selected as conditional inputs by Epsilon, were implemented in the Cadna/A 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°C/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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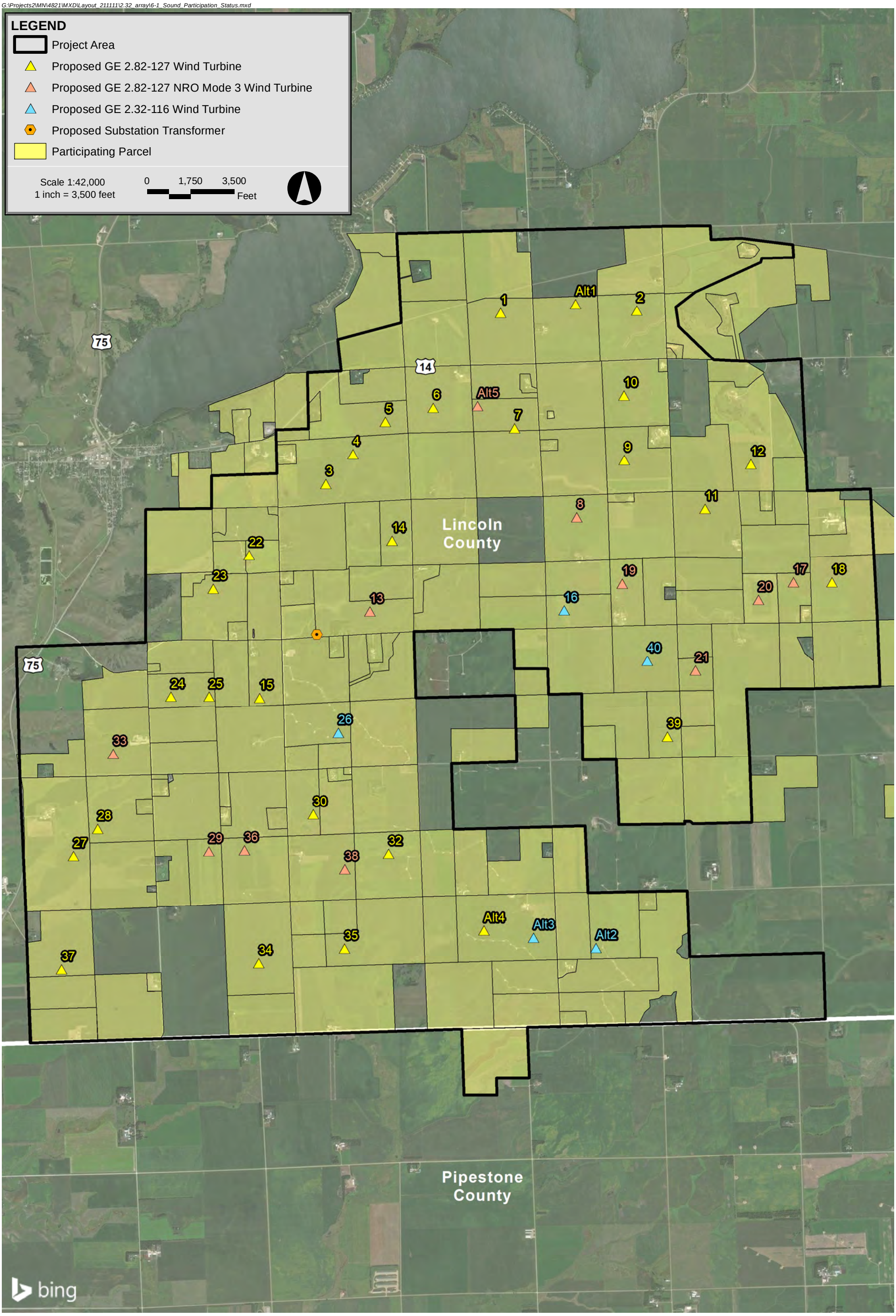

Buffalo Ridge Wind Project **Lincoln County, Minnesota**

Epsilon Associates Inc.

Figure 6-1
Participation Status

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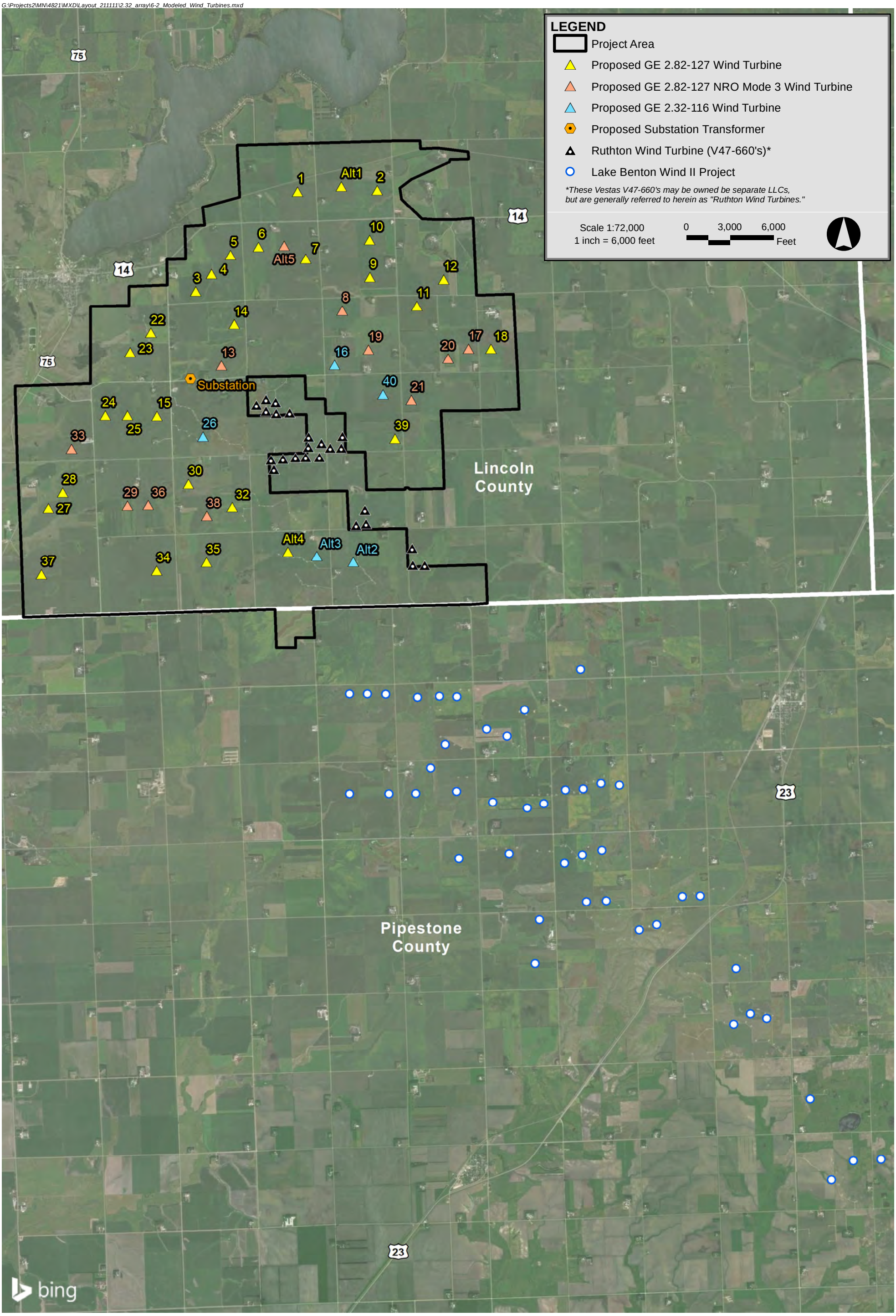

Buffalo Ridge Wind Project **Lincoln County, Minnesota**

Epsilon Associates Inc.

Figure 6-2

Modeled Wind Turbines and Substation

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LEGEND

- Project Area
- Proposed GE 2.82-127 Wind Turbine
- Proposed GE 2.82-127 NRO Mode 3 Wind Turbine
- Proposed GE 2.32-116 Wind Turbine
- Proposed Substation Transformer
- Ruthton Wind Turbine (V47-660's)*
- Lake Benton Wind II Project
- Participating Receptor
- Non-Participating Receptor
- Participating Parcel

*These Vestas V47-660's may be owned be separate LLCs, but are generally referred to herein as "Ruthton Wind Turbines."

Scale 1:60,000
1 inch = 5,000 feet

0 2,500 5,000 Feet

Lincoln County

Pipestone County

Sheet 2

Sheet 3

Sheet 4

bing

Buffalo Ridge Wind Project **Lincoln County, Minnesota**

Epsilon Associates Inc.

Figure 6-3, Sheet 1 of 4
Sound Level Modeling Locations

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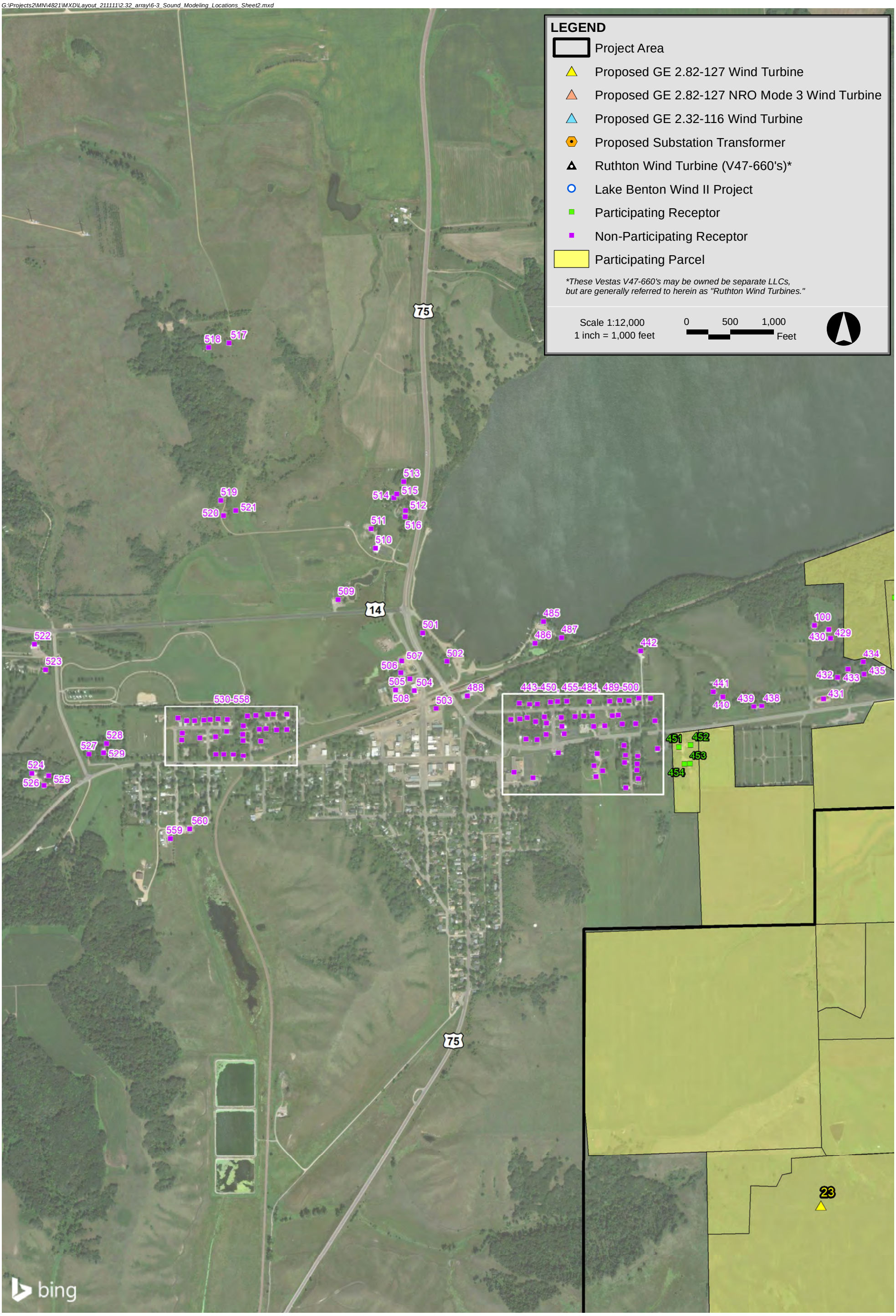

Buffalo Ridge Wind Project **Lincoln County, Minnesota**

Epsilon Associates Inc.

Figure 6-3, Sheet 2 of 4
Sound Level Modeling Locations

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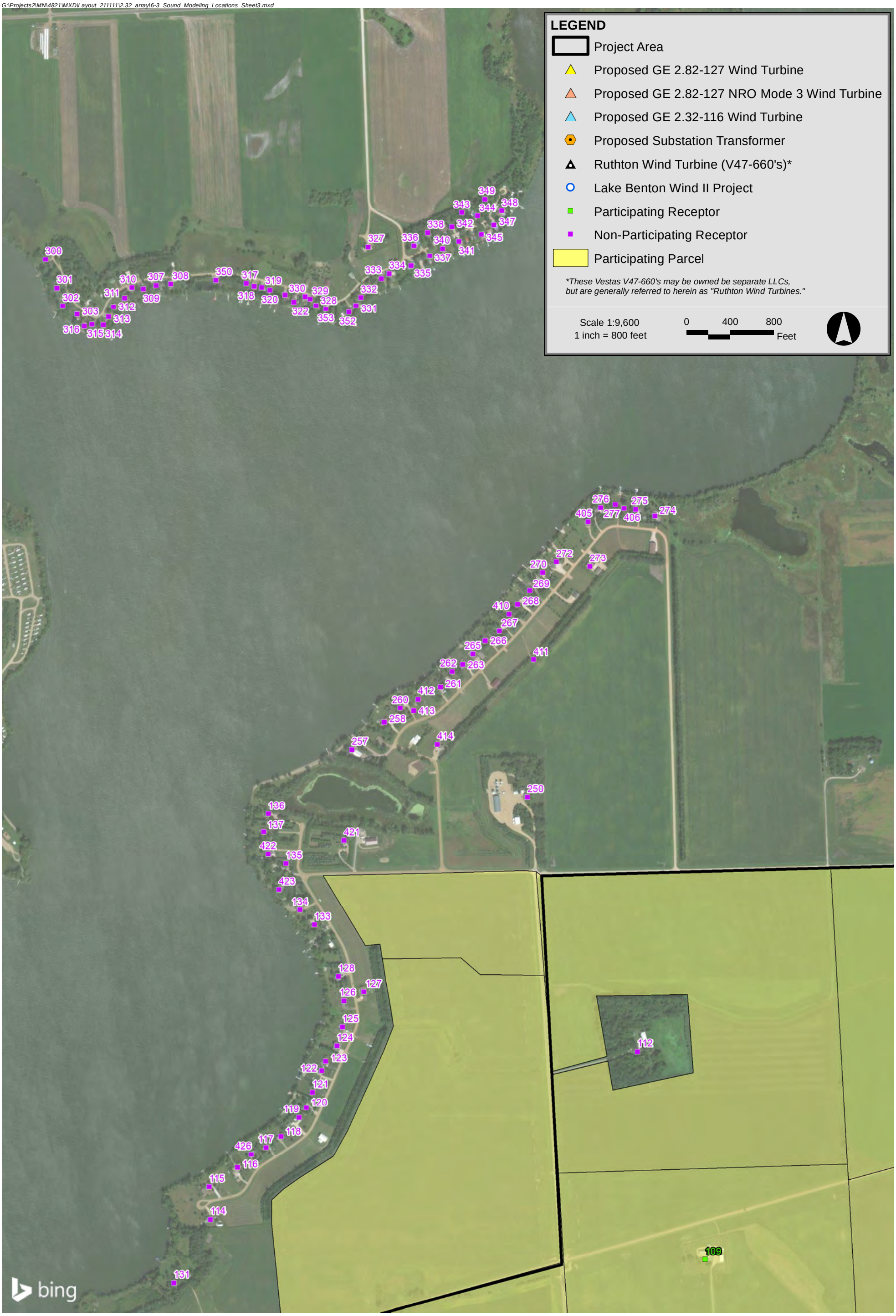

Buffalo Ridge Wind Project **Lincoln County, Minnesota**

Epsilon Associates Inc.

Figure 6-3, Sheet 3 of 4

Sound Level Modeling Locations

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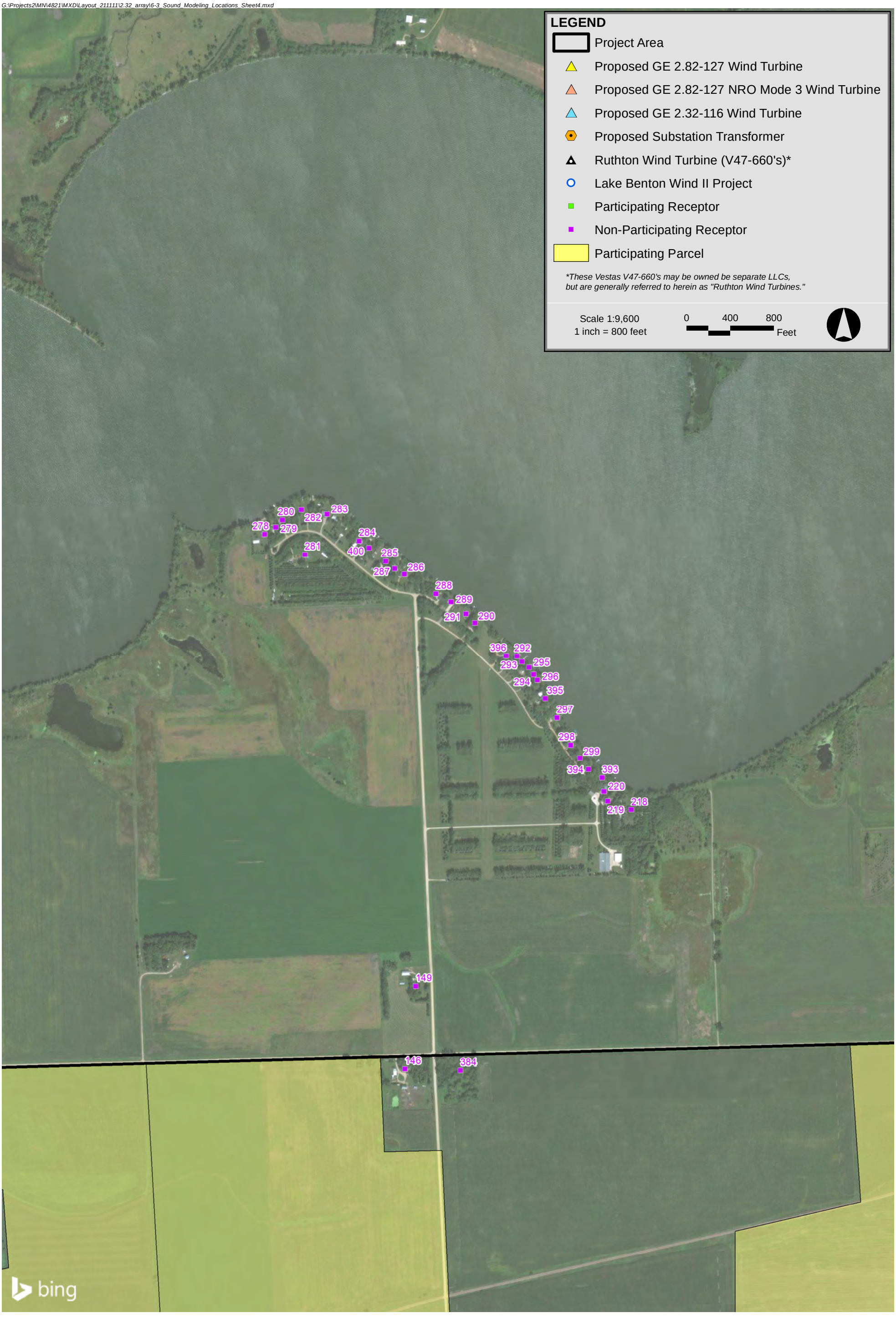

Buffalo Ridge Wind Project **Lincoln County, Minnesota**

Epsilon Associates Inc.

Figure 6-3, Sheet 4 of 4
Sound Level Modeling Locations

6.3 Sound Level Modeling Results

All modeled sound levels, as output from Cadna/A 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 equivalent sound level has been comparable to the median (L_{50}, dBA) sound level when the wind turbine sound was prevalent and steady under ideal wind and operational conditions.[21] Therefore, the modeled sound levels may be considered as L_{50} sound levels and directly compared to the Minnesota L_{50} limit.

6.3.1 Project + Ruthton + Lake Benton Wind II

Table D-1A in Appendix D shows the predicted "Project + Ruthton + Lake Benton Wind II" broadband (dBA) sound levels at the 411 Noise Area Classification 1 receptors modeled within proximity to the Project. Table D-1B in Appendix D presents these results sorted from high to low. These broadband L_{50} sound levels range from 27 to 52 dBA and represent the worst-case future L_{50} sound levels produced solely by wind turbines near the Project following the Project construction. The maximum modeled sound level of 52 dBA is at participating receptor #44. Receptor #44 is less than 600 feet from a Ruthton Wind Turbine. The second highest modeled sound level is 48 dBA, which occurs at non-participating receptor #42. In addition to the discrete modeling points, sound level isolines generated from the modeling grid are presented in Figure 6-4. The sound levels presented in the tables and in the figure do not include any contribution from other existing sound sources in the area.

6.3.2 Project Only Results

Table D-2A in Appendix D shows the predicted "Project Only" broadband (dBA) sound levels at the 411 Noise Area Classification 1 receptors modeled within proximity to the Project. These broadband L_{50} sound levels range from 27 to 47 dBA and represent the worst-case future L_{50} sound levels produced solely by the Project wind turbines. The maximum modeled sound level of 47 dBA occurs at 12 participating receptors (#138, 141, 85, 841, 93, 92, 89, 46, 71, 55, 151, and 91). In addition to the discrete modeling points, sound level isolines generated from the modeling grid are presented in Figure 6-5. The sound levels presented in the tables and in the figure do not include any contribution from other existing sound sources in the area.

6.3.3 Ruthton Only Results

Table D-3 in Appendix D shows the modeled "Ruthton" broadband (dBA) sound levels at the 411 Noise Area Classification 1 receptors within proximity to the Project. These broadband L_{50} modeled sound levels range from 0 to 51 dBA. The maximum L_{50} sound level of 51 dBA is predicted at participating receptor #44 which results from Ruthton Wind Turbines only. This sound level significantly contributes to the Project + Ruthton + Lake Benton Wind II wind turbine sound levels

[21] Within 0.4 decibels.

discussed in Section 6.3.1. In addition to discrete modeling points, sound level isolines generated from the modeling grid are presented in Figure 6-6. The sound levels presented in the tables and in the figure do not include any contribution from other existing sound sources in the area nor from the Project.

G:\Projects2\MN\4821\MXD\Layout_211111\2.32_array\6-4_Sound_Results_Sheet1.mxd

LEGEND

- Project Area
- Proposed GE 2.82-127 Wind Turbine
- Proposed GE 2.82-127 NRO Mode 3 Wind Turbine
- Proposed GE 2.32-116 Wind Turbine
- Proposed Substation Transformer
- Ruthton Wind Turbine (V47-660's)*
- Lake Benton Wind II Project
- Participating Receptor
- Non-Participating Receptor
- Participating Parcel

Project + Ruthton + Lake Benton Wind II
L_{50} Sound Level Modeling Results (dBA)

35 45 55
40 50

These Vestas V47-660's may be owned be separate LLCs, but are generally referred to herein as "Ruthton Wind Turbines."

Scale 1:60,000
1 inch = 5,000 feet

0 2,500 5,000 Feet

Sheet 2

Sheet 3

Sheet 4

Lincoln County

Pipestone County

bing

Buffalo Ridge Wind Project **Lincoln County, Minnesota**

Epsilon Associates Inc.

Figure 6-4, Sheet 1 of 4

Project + Ruthton + Lake Benton Wind II L_{50} Sound Level Modeling Results

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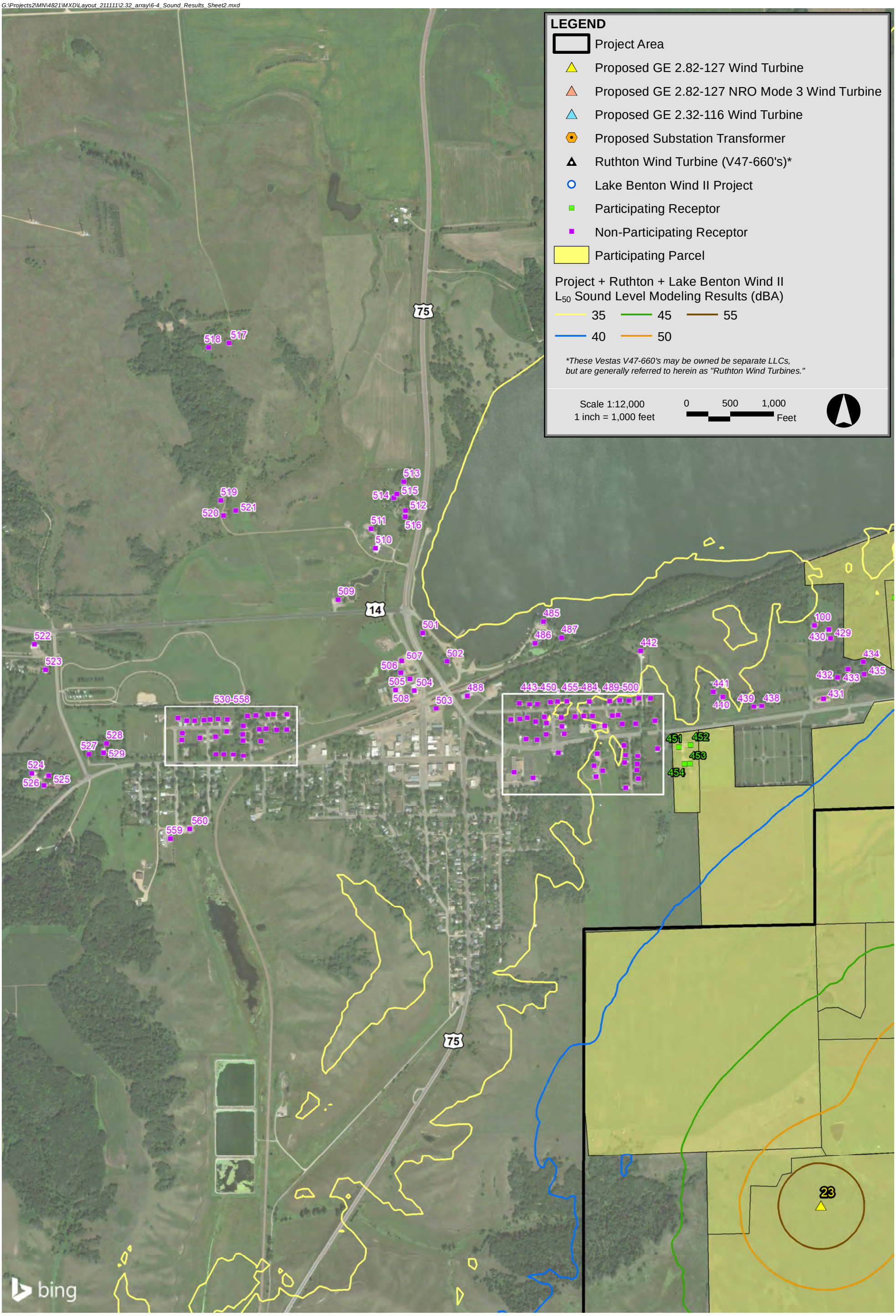

Buffalo Ridge Wind Project **Lincoln County, Minnesota**

Figure 6-4, Sheet 2 of 4

Project + Ruthton + Lake Benton Wind II L_{50} Sound Level Modeling Results

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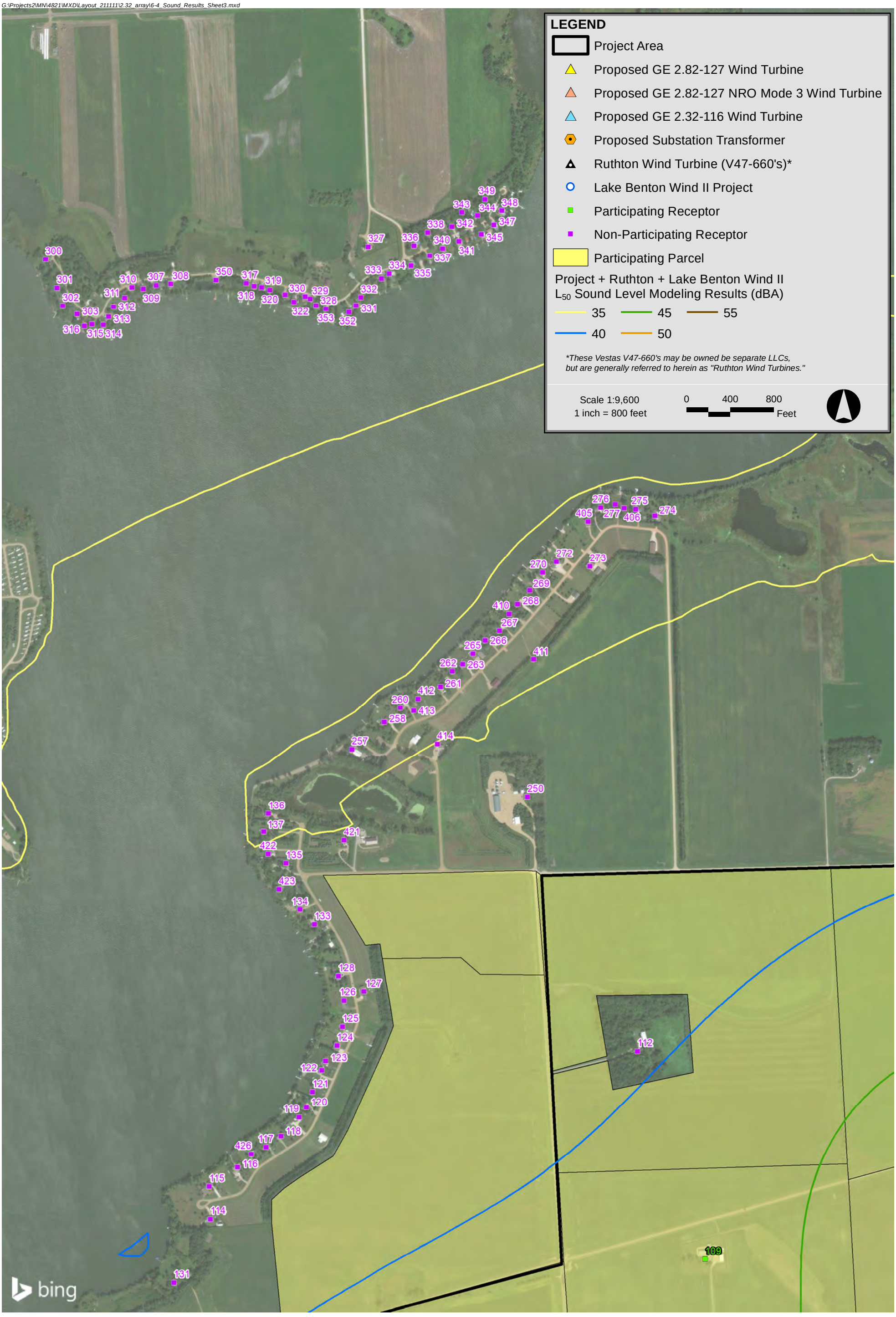

Buffalo Ridge Wind Project **Lincoln County, Minnesota**

Epsilon Associates Inc.

Figure 6-4, Sheet 3 of 4

Project + Ruthton + Lake Benton Wind II L_{50} Sound Level Modeling Results

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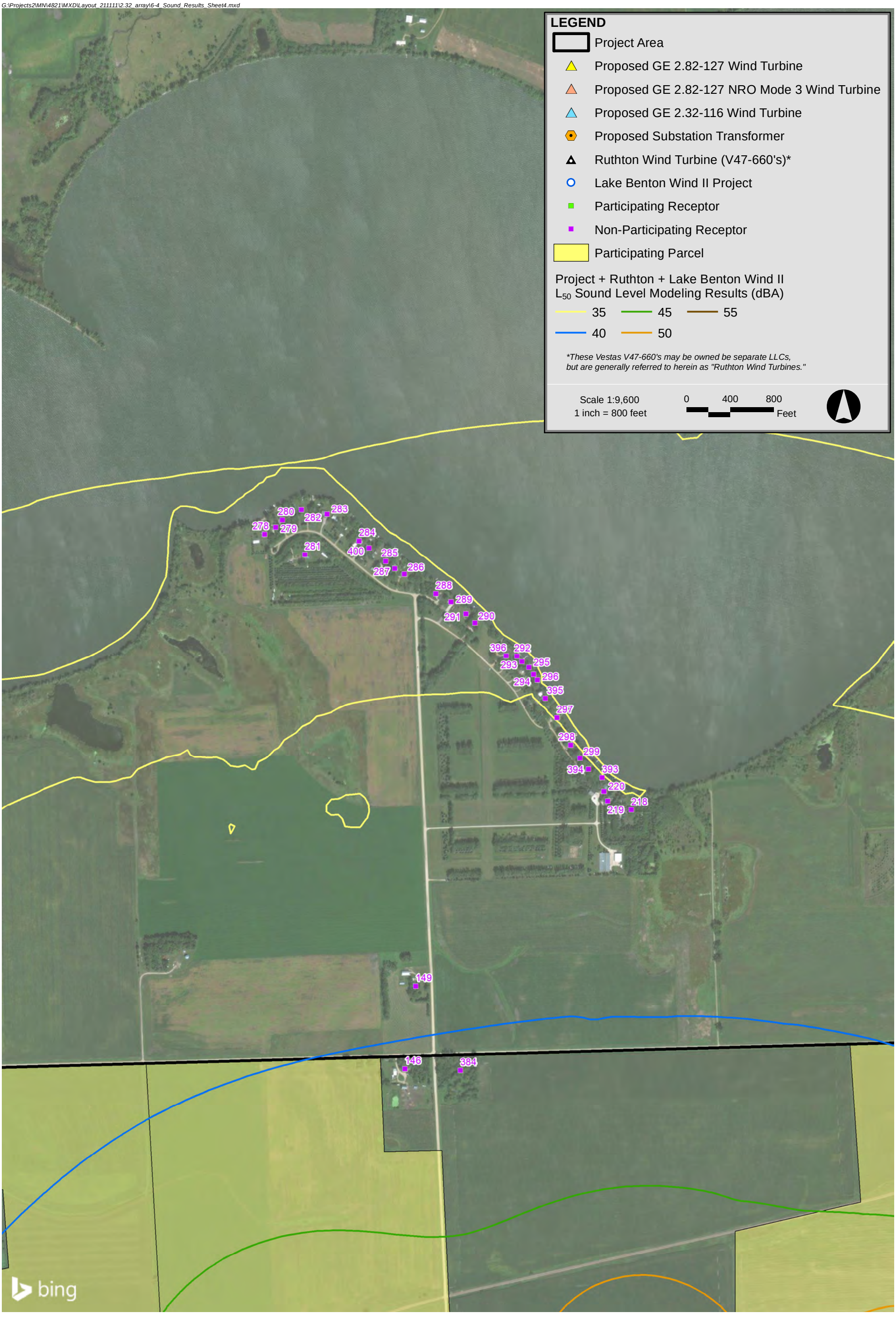

Buffalo Ridge Wind Project **Lincoln County, Minnesota**

Epsilon Associates Inc.

Figure 6-4, Sheet 4 of 4

Project + Ruthton + Lake Benton Wind II L_{50} Sound Level Modeling Results

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LEGEND

- Project Area
- Proposed GE 2.82-127 Wind Turbine
- Proposed GE 2.82-127 NRO Mode 3 Wind Turbine
- Proposed GE 2.32-116 Wind Turbine
- Proposed Substation Transformer
- Participating Receptor
- Non-Participating Receptor
- Participating Parcel

Project Only L_{50} Sound Level Modeling Results (dBA)

35 45 55
40 50

Scale 1:60,000
1 inch = 5,000 feet

0 2,500 5,000 Feet

Sheet 2
Sheet 3
Sheet 4

Lincoln County
Pipestone County

bing

Buffalo Ridge Wind Project **Lincoln County, Minnesota**

Epsilon Associates Inc.

Figure 6-5, Sheet 1 of 4
Project Only L_{50} Sound Level Modeling Results

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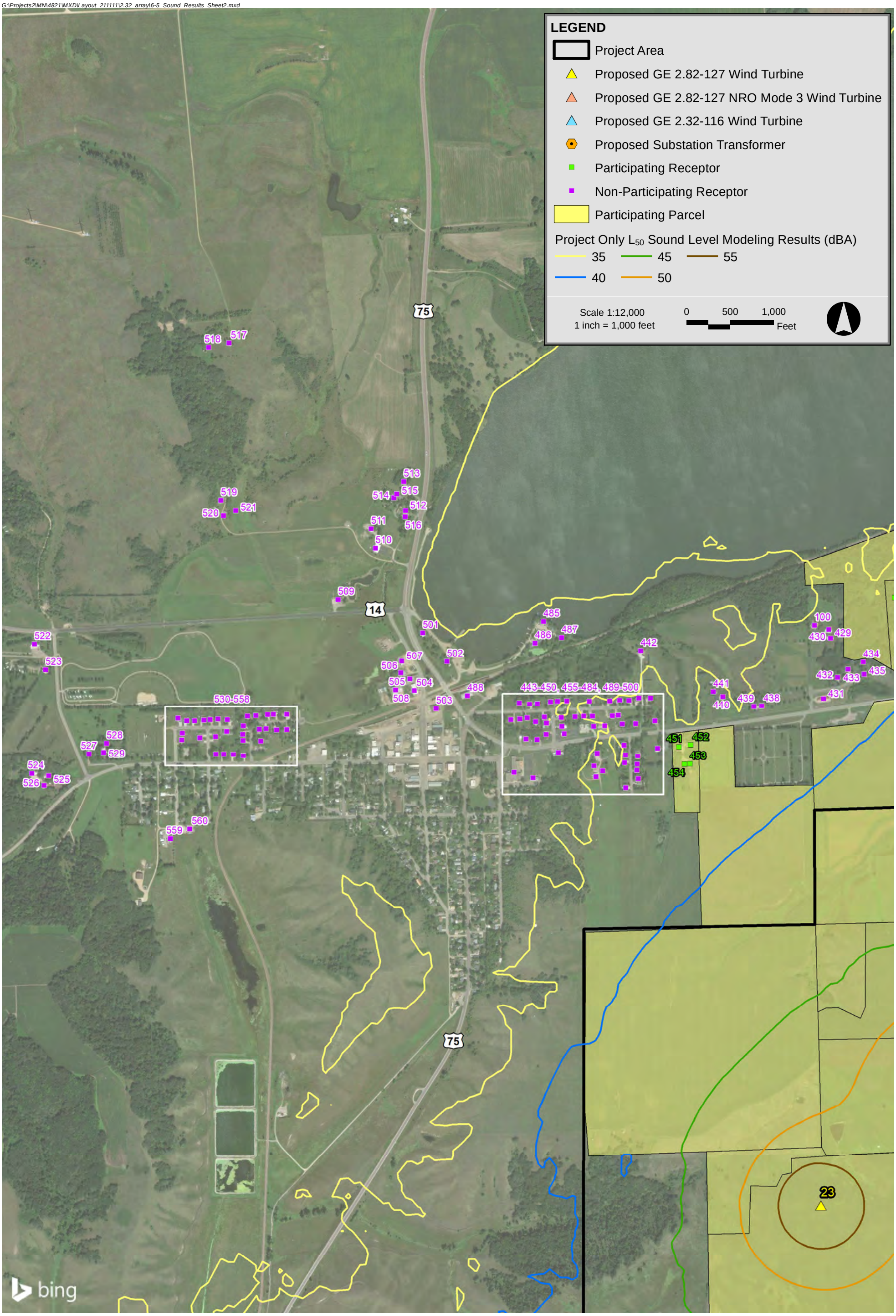

Buffalo Ridge Wind Project **Lincoln County, Minnesota**

Figure 6-5, Sheet 2 of 4

Project Only L_{50} Sound Level Modeling Results

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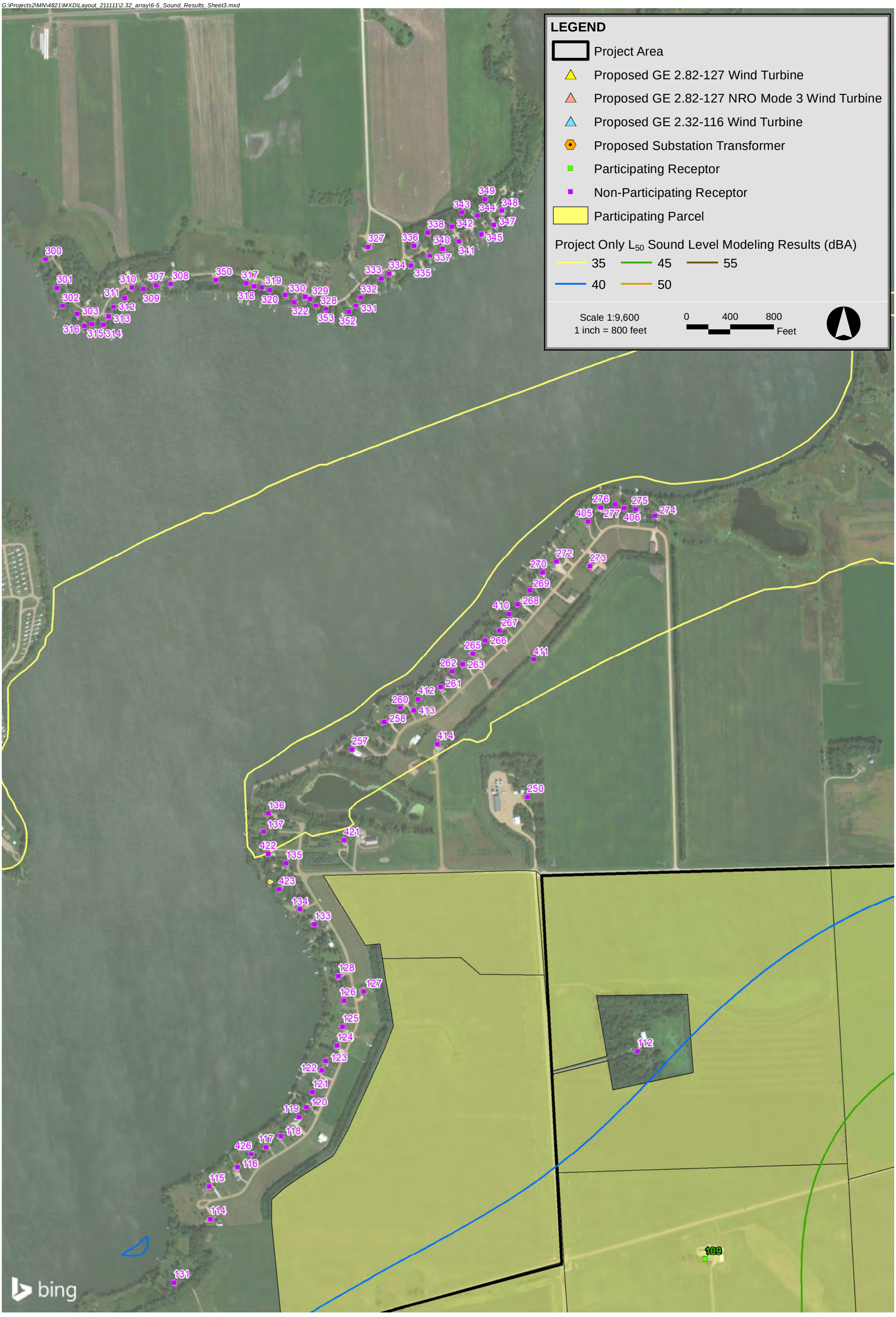

Buffalo Ridge Wind Project **Lincoln County, Minnesota**

Figure 6-5, Sheet 3 of 4

Project Only L_{50} Sound Level Modeling Results

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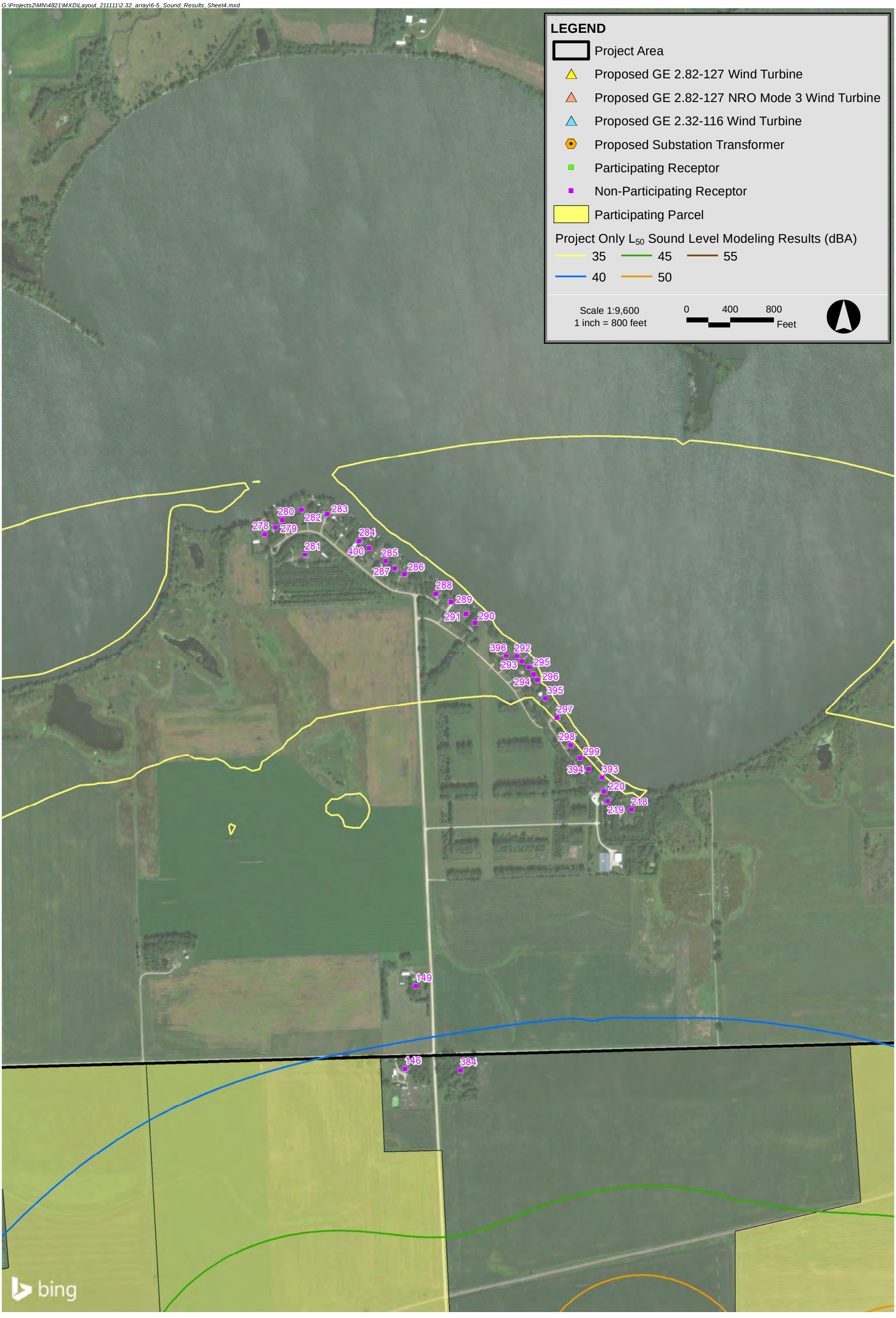

Buffalo Ridge Wind Project **Lincoln County, Minnesota**

Epsilon Associates Inc.

Figure 6-5, Sheet 4 of 4

Project Only L_{50} Sound Level Modeling Results

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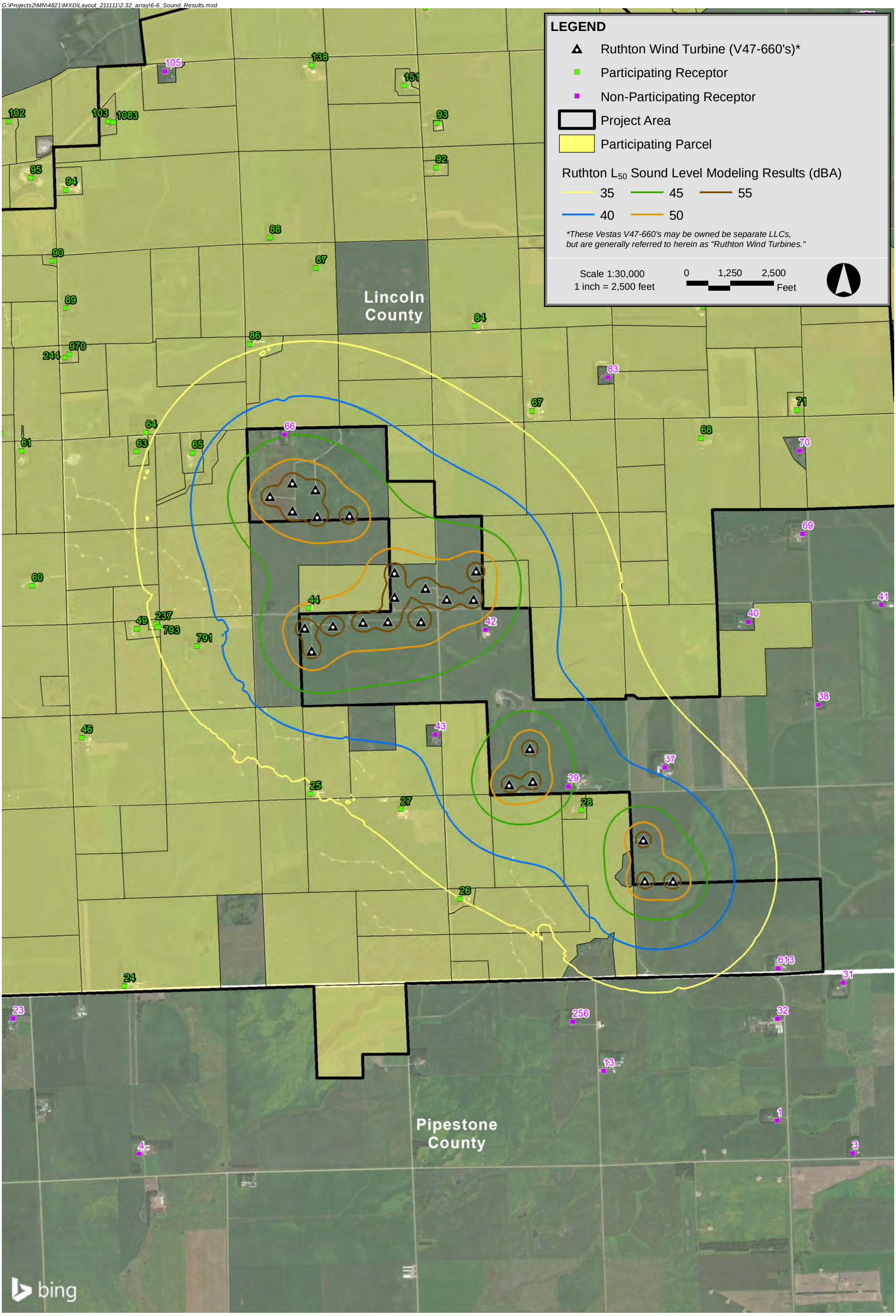

Buffalo Ridge Wind Project **Lincoln County, Minnesota**

Figure 6-6

Ruthton L_{50} Sound Level Modeling Results

7.0 EVALUATION OF SOUND LEVELS

The proposed Buffalo Ridge Wind Project within Lincoln County, MN is required to comply with the sound level requirements in Minn. R. Ch. 7030 for Noise Pollution Control. NAC 1 (primarily residential) receptors are protected by the lowest sound level limits of the MPCA. Since wind turbines can operate under conditions resulting in maximum sound power, during both the day and at night, the Project would need to comply during the period with more stringent limits, nighttime. Furthermore, because wind turbine sound is generally steady, the L_{50} (median) sound level is more likely to be affected by wind turbine sound than the L_{10} which is controlled more by unsteady sound. The L_{50} limit is also more restrictive than the L_{10} limit. Therefore, NAC 1 receptors have been evaluated against the L_{50} sound level limit of 50 dBA in this analysis. This is a total sound level limit which includes sound from the Project and existing sources.

7.1 Modeling Locations

The modeled worst-case sound level from the combination of the Project wind turbines, Ruthton, and Lake Benton Wind II (Project + Ruthton + Lake Benton Wind II) is below 50 dBA at all modeled NAC 1 receptors except for at one (1) receptor. A review of Table D-1B in Appendix D shows the highest Project + Ruthton + Lake Benton Wind II L_{50} sound level to be 52 dBA at receptor #44. This is a participating receptor that is less than 600 feet from a Ruthton Wind Turbine. As shown in Table D-3, the Ruthton Only sound level at receptor #44 is 51 dBA, which exceeds the MPCA limit. While the modeling of the existing facility shows an exceedance, it is based on limited data available from third parties; actual sound levels may be less as this level was not confirmed through measurements. The Project Only sound level at this receptor is 39 dBA, shown in Table D-2A. For additional reference purposes, Table D-2B in Appendix D provides the modeling results sorted by the Project Only sound level from high to low. It can be concluded that the Project contributes to the modeled Project + Ruthton + Lake Benton Wind II sound level at this receptor by no more than 1 dBA, which is an imperceptible change in the sound level.

The second highest modeled Project + Ruthton + Lake Benton Wind II sound level is 48 dBA, which occurs at non-participating receptor #42. Accordingly, total sound levels (Project + Ruthton + Lake Benton Wind II + non-wind-turbine ambient) will meet the Minnesota limit of 50 dBA when non-wind-turbine ambient sound levels are less than or equal to 46 dBA.[22,23] Measured non-wind-turbine ambient nighttime sound levels in the Project Area[24] were above 46 dBA during one hour, as they ranged from 28 to 49 dBA when ground-level wind speeds were at or below 11 mph and winds at hub height corresponded to conditions in the modeling. Non-wind-turbine ambient

[22] Except at the one location above 50 dBA based on modeling of Ruthton Wind Turbines.

[23] The maximum modeled Project + Ruthton + Lake Benton Wind II L_{50} sound level (excluding the one location above 50 dBA) is 48.2 dBA at receptor #42. When the 48.2 dBA at receptor #42 is combined with a hypothetical ambient sound level of 46.0 dBA, the resulting sound level is 50.2 dBA (48.2 dBA + 46.0 dBA = 50.2 dBA), where 50.2 dBA rounds to the whole decibel value of 50 dBA.

[24] Measurement Locations 2 and 4

sound levels in the Project Area fluctuate due to sound sources such as ground-level winds, vehicular traffic, birds, and vegetation rustle, all of which have the potential to cause non-wind-turbine ambient sound levels to exceed the MPCA L_{50} nighttime limit of 50 dBA although L_{50} levels above 50 dBA were not recorded at the two locations under the specific criteria during the measurement program.

As previously mentioned, the second highest modeled Project + Ruthton + Lake Benton Wind II sound level of 48 dBA occurs at receptor #42. The Project Only L_{50} sound levels at this receptor is 39 dBA. Moreover, the highest predicted worst-case Project Only L_{50} sound level at a modeling receptor is 47 dBA. This occurs at 12 receptors (all participating) as shown in Table D-2B in Appendix D. The highest modeled Project Only L_{50} sound level at a non-participant is 45 dBA (receptor #154).

7.2 Measurement Locations

Table 7-1 below presents an evaluation of total (wind turbine + ambient) sound levels at the five measurement locations. The median L_{50} ambient sound levels from Table 5-2 have been reproduced in the table. These sound levels represent the ambient experienced during nighttime hours when the Project would be operating under worst-case sound level conditions. As these are the median sound levels, there will be times under comparable hub height wind speeds when the ambient sound levels at these locations will be lower and other times when the sound levels will be higher. Modeled Project + Ruthton + Lake Benton Wind II L_{50} sound levels for the respective modeling receptor locations are provided in the table as cumulative wind-turbine-only sound levels. The ambient sound levels are added to the modeled wind-turbine-only sound levels to determine a representative total nighttime L_{50} sound level for each measurement location. The total sound levels presented for Locations 1, 3, and 5 are conservative in that they double count contribution from Ruthton Wind Turbines (i.e. measured and modeled contribution). The values in Table 7-1 demonstrate compliance with the MPCA L_{50} nighttime total sound level limit of 50 dBA. However, non-wind-turbine ambient sound levels in the Project Area fluctuate due to sound sources such as ground-level winds, vehicular traffic, birds, and vegetation rustle, all of which have the potential to cause total sound levels to exceed the limit at times.

Table 7-1 Evaluation of Total Sound Levels at Measurement Locations

Measurement Location ID	Representative (Median) Ambient Nighttime L_{50} Sound Level (dBA)	Modeled Project + Ruthton + Lake Benton Wind II L_{50} Sound Level (dBA)[3]	Total L_{50} Sound Level (dBA)[4]	Meets MPCA Nighttime L_{50} Limit?
1	35[1]	46	46[5]	YES
2	39[2]	47	48	YES
3	41[1]	45	46[5]	YES
4	37[2]	47	48	YES
5	40[1]	46	47[5]	YES

Notes:

1. Includes contribution from existing wind turbines. The modeled Ruthton Only sound levels are 27, 43, and 35 dBA at Locations 1, 3, and 5, respectively.
2. Non-wind-turbine ambient.
3. Modeled at receptors 244, 85, 28, 841, and 26 for Locations 1 through 5, respectively.
4. Sound pressure levels rounded to the nearest whole decibel are shown. Sound level addition was performed with greater precision.
5. Total sound level is conservative as it includes contribution from the Ruthton Wind Turbines in the measured sound level and in the modeled sound level (i.e. double counting).

8.0 LOW FREQUENCY AND INFRASOUND

An evaluation of low frequency (LF) and infrasound levels from a wind energy center at receptors is not required by the State of Minnesota. However, a discussion of LF and infrasound, as it pertains to wind turbines, is provided below for informational purposes.

Low frequency (LF) and infrasound are present in the environment due to other sources besides wind turbines. For example, refrigerators, air conditioners, and washing machines generate infrasound and low frequency sound as do natural sources such as ocean waves. The frequency range of low frequency sound is generally from 20 Hz to 200 Hz, and the range below 20 Hz is often described as "*infrasound*". However, audibility can extend to frequencies below 20 Hz if the energy is high enough. Since there is no sharp change in hearing at 20 Hz, the division between "low-frequency sound" and "infrasound" should only be considered "practical and conventional." The threshold of hearing is standardized for frequencies down to 20 Hz.[25] Based on extensive research and data, Watanabe and Moeller have proposed normal hearing thresholds for frequencies below 20 Hz.[26] These sound levels are so high that infrasound is generally considered inaudible. For example, the sound level at 8 Hz would need to be 100 dB to be audible.

A detailed infrasound and low frequency noise measurement program of wind turbines was conducted from 2013-2015 by the Ministry for the Environment, Climate and Energy of the Federal State of Baden-Wuerttemberg, Germany.[27] The conclusions of the German study were:

> *"Infrasound and low-frequency noise are an everyday part of our technical and natural environment. Compared with other technical and natural sources, the level of infrasound caused by wind turbines is low. Already at a distance of 150 m (~500 ft), it is well below the human limits of perception. Accordingly, it is even lower at the usual distances from residential areas. Effects on health caused by infrasound below the perception thresholds have not been scientifically proven. Together with the health authorities, we in Baden-Württemberg have come to the conclusion that adverse effects relating to infrasound from wind turbines cannot be expected on the basis of the evidence at hand."*

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[25] Acoustics - Normal equal-loudness-level contours, International Standard ISO 226:2003, International Organization for Standardization, Geneva, Switzerland, (2003).

[26] T. Watanabe, and H. Moeller, "Low Frequency Hearing Thresholds in Pressure Field and in Free Field", J. Low Frequency Noise and Vibration, 9(3), 106-115, (1990).

[27] Low frequency noise incl. infrasound from wind turbines and other sources, LUBW, Baden-Wuerttemberg, Germany, September 2016.

The Massachusetts Department of Environmental Protection (MA DEP) and the Massachusetts Department of Public Health commissioned an expert panel who found that: "Claims infrasound from wind turbines directly impacts the vestibular system have not been demonstrated scientifically. Available evidence shows that the infrasound levels near wind turbines cannot impact the vestibular system."[28]

Health Canada, in collaboration with Statistics Canada, conducted one of the most extensive studies to understand the impacts of wind turbine noise to-date.[29] A cross-section epidemiological study was carried out in 2013 in the provinces of Ontario and Prince Edward Island on randomly selected participants living near and far from operating wind turbines. Many peer-reviewed publications have been written based on the Health Canada research, including an analysis of low frequency and infrasound data. For example, Keith et al concluded that there was no advantage of using C-weighting to measure low frequency sound since the relationship between A-weighting and C-weighting are so highly correlated.[30] In other words, acceptable A-weighted limits also eliminate low frequency and infrasound impacts.

Low frequency and infrasound have also been studied extensively in Japan. Tachibana et al conducted extensive measurements of 34 wind farms nationwide and concluded that infrasound from wind turbines is not audible/sensible, and that wind turbine noise is not a problem in the infrasound region.[31]

As noted in the 2011 NARUC report, "the widespread belief that wind turbines produce elevated or even harmful levels of low frequency and infrasonic sound is utterly untrue as proven repeatedly and independently by numerous investigators."[32]

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28 *Wind Turbine Health Impact Study: Review of Independent Expert Panel,* Massachusetts Department of Environmental Protection and Massachusetts Department of Public Health, January 2012.

29 Health Canada website: http://www.hc-sc.gc.ca/ewh-semt/noise-bruit/turbine-eoliennes/summary-resume-eng.php

30 Wind *turbine sound pressure level calculations at dwellings,* S. E. Keith et al, J. Acoustical Society of America, 139(3), March 2016.

31 *Nationwide field measurements of wind turbine noise in Japan,* H. Tachibana et al, Noise Control Engineering Journal, 62(2), March-April 2014.

32 Assessing Sound Emissions from Proposed Wind Farms & Measuring the Performance of Completed Projects, NARUC, prepared by Hessler Associates, Inc., October 2011.

9.0 CONCLUSIONS

A comprehensive sound level modeling assessment was conducted for the Buffalo Ridge Wind Project. In addition, ambient sound levels were measured to characterize the existing background sound levels within the area. When Project sound levels are combined with modeled sound levels from existing and newly constructed non-Project wind turbines in the vicinity of the Project Area, sound levels are below the MPCA nighttime residential limit of 50 dBA at all but one location. The sound level at this location, 52 dBA, is primarily attributable to the Ruthton Wind Turbines. The modeled sound from only these wind turbines (51 dBA) exceeds the 50 dBA limit. While the modeling of the existing facility shows an exceedance, it is based on limited data available from third parties; actual sound levels may be less.

Post-construction sound level testing is required to determine compliance with the MPCA limit from total sound. Under conditions resulting in ambient sound levels of 46 dBA or less, total sound levels (Project + existing and newly constructed non-Project wind turbines in the vicinity of the Project Area + non-wind-turbine ambient) will meet the MPCA limit of 50 dBA.[33] Measured non-wind-turbine ambient nighttime sound levels in the Project Area[34] were above 46 dBA during one hour, as they ranged from 28 to 49 dBA when ground-level wind speeds were at or below 11 mph and winds at hub height corresponded to conditions in the modeling. Non-wind-turbine ambient sound levels in the Project Area fluctuate due to sound sources such as ground-level winds, vehicular traffic, birds, and vegetation rustle, all of which have the potential to cause non-wind-turbine ambient sound levels to exceed the MPCA L_{50} nighttime limit of 50 dBA although L_{50} levels above 50 dBA were not recorded at the two locations under the specific criteria during the measurement program. Moreover, the highest predicted worst-case Project Only L_{50} sound level at a modeling receptor is 47 dBA.

In addition, combining representative nighttime L_{50} ambient sound levels with modeled wind turbine sound levels (Project + Ruthton + Lake Benton Wind II L_{50}) results in total nighttime L_{50} sound levels below the MPCA L_{50} nighttime total sound level limit of 50 dBA at all five measurement locations. However, non-wind-turbine ambient sound levels in the Project Area fluctuate due to sound sources such as ground-level winds, vehicular traffic, birds, and vegetation rustle, all of which have the potential to cause total sound levels to exceed the limit at times. As Project Only sound levels at all modeling locations are 47 dBA or less, any increases to ambient broadband sound levels will be minimal to non-existent when ambient sound levels are at or above 50 dBA.

[33] Except at one location above 50 dBA based on modeling of Ruthton Wind Turbines.

[34] Measurement Locations 2 and 4

Appendix A

Draft Project Sound Level Measurement Protocol

Buffalo Ridge Wind Project
Lincoln County, MN

Sound Level Measurement Protocol

April 19, 2019

Introduction

This protocol describes the methodology involved in measuring the ambient (pre-construction) sound levels for the Buffalo Ridge Wind ("BRW") Project. BRW will be a wind power generation facility consisting of approximately 40 wind turbines located within Lincoln County, Minnesota. The locations of the proposed wind turbines are shown in Figure 1.[1,2] The proposed wind turbines will be a combination of GE 2.3-116, GE 2.52-127, and GE 2.82-127 units. The GE 2.3-116 wind turbines have a hub height of 80 meters and a rotor diameter of 116 meters. The GE 2.52-127 and GE 2.82-127 wind turbines have a hub height of 89 meters and a rotor diameter of 127 meters. Epsilon will conduct a sound level measurement program to document existing ambient sound levels in the vicinity of the BRW Project.

The purpose of this protocol is to describe the measurement methodology, identify measurement locations, identify acoustical and meteorological equipment proposed, and provide a brief description of the items to be included in the pre-construction sound level report. Procedures identified in the Guidance for Large Wind Energy Conversion System, Noise Study Protocol and Report ("LWECS Guidance") published by the Minnesota Department of Commerce ("DOC"), Energy Facility Permitting, dated October 8, 2012 were used in the development of this measurement protocol.

Sound Level Measurement Methodology

The LWECS Guidance advises measurements at a minimum of three (3) locations within the Project area where wind turbines are either not constructed or not operating to represent ambient sound level conditions. Broadband A-weighted (dBA) and one-third octave-band (dB) sound levels will be measured at five (5) locations in Lincoln County to collect pre-construction sound level data. Per the LWECS Guidance document, one (1) location has been selected to represent the receptor with the worst-case modeled sound level based on a preliminary modeling analysis. The document also advises sound level measurements at locations within the Project area when wind turbines are either not constructed or not operating to represent ambient sound level conditions. The BRW Project area (contained

[1] The wind turbine layout identified in the figure is dated April 10, 2019.

[2] This sound level measurement protocol has been designed and measurement locations have been selected based on the BRW wind turbine layout dated February 28, 2019. Changes between the wind turbine layout dated February 28, 2019 and the wind turbine layout dated April 10, 2019 are not anticipated to warrant any changes in the proposed measurement locations or the methodology outlined in this protocol.

within the Project Boundary shown in Figure 1) currently contains no wind turbines; however, a wind energy facility is located close to the Project boundary. This facility is not owned or operated by an affiliate of NextEra Energy Resources, LLC ("NEER") and is assumed to be currently operational. Figure 1 identifies the existing non-NEER wind turbines.[3] Sound levels produced by the existing facility will likely impact sound levels at receptors in the central and southeast region of the BRW Project. Furthermore, NEER is in the process of developing another wind energy facility to the southeast of BRW in Pipestone County. This facility, Lake Benton II Wind, is anticipated to be under construction in 2019. For reference purposes, the locations of the Lake Benton II Wind wind turbines are shown on Figure 1. Sound levels produced by the Lake Benton II Wind project could impact sound levels at receptors to the south of the BRW project.

The five (5) proposed measurement locations within the vicinity of the Project were selected based on LWECS Guidance, proximity to proposed wind turbines, other measurement locations, existing wind turbines, proposed wind turbine types, and modeled sound levels.

The five (5) proposed measurement locations and six (6) alternate locations in Lincoln County are shown in Figure 1 and are briefly described below. With the exception of one (1) alternate location (3Alt2), all monitoring locations are proposed to be at a residence (exterior) with some on participating and others on participating-assumed[4] or non-participating parcels. Participating-assumed or non-participating homeowners may be unwilling to grant permission at a particular location; if permission is not granted, measurements will be conducted at an alternate location when practical. In addition, the alternate location may be selected if site conditions realized during setup warrant relocation. At the time of this Protocol, permission has not been obtained at the measurement locations. Additional alternative locations may be selected and/or the number of measurement locations reduced if permission cannot be obtained prior to the commencement of the measurement program.

Primary

- **Location 1:** Participating-Assumed – Modeling Receptor #244
  - Highest modeled Project-Only sound level
  - Representative of receptor closest to any wind turbine in the layout
- **Location 2:** Participating – Modeling Receptor #85
- **Location 3:** Participating-Assumed – Modeling Receptor #28
  - Near existing wind turbines (non-NEER)
- **Location 4:** Participating – Modeling Receptor #841
  - Highest modeled Project-Only sound level
- **Location 5:** Participating – Modeling Receptor #26

[3] The locations of non-NEER wind turbines were provided by Atwell.

[4] Participating-assumed parcels are parcels that are not yet leased but would be required to be leased based on required setbacks.

Alternate

- **Location 1Alt1:** Participating-Assumed – Modeling Receptor #62
- **Location 1Alt2:** Participating – Modeling Receptor #61
- **Location 2Alt:** Non-Participating – Modeling Receptor #92
- **Location 3Alt1:** Non-Participating – Modeling Receptor #29
- **Location 3Alt2:** Participating Parcel – County PIN #08-0196-010
- **Location 4Alt:** Participating – Modeling Receptor #46

Measurement Equipment

The sound level measurements will be made using Larson Davis (LD) model 831 sound level meters (or equivalent). The model meets "Type 1 Precision" requirements set forth in American National Standards Institute (ANSI) S1.4-1983 standard for sound level meters. The meters will log values of various broadband A-weighted (dBA) sound level measurement parameters including the L_{eq}, L_{max}, L_{10}, L_{50}, and L_{90}, and will be programmed to log this statistical data on an hourly basis. The LWECS Guidance also requires C-weighted data collection. The sound level meters will collect C-weighted L_{eq} data and the additional C-weighted sound level parameters will be calculated through post-processing analysis. One-minute time history data will be collected by the meters. The microphones will be tripod-mounted at a height of 1.5 meters (5 feet) above ground. A 7-inch windscreen will be placed on all microphones.

The measurement equipment will be calibrated in the field before and after the survey with the manufacturer's acoustical calibrator which meets the standards of IEC 942 Class 1L and ANSI S1.40-1984. All calibrations will be within $\pm$1.0 dB from the most recent calibration otherwise the data collected during that period will be discarded. The meters are calibrated and certified as accurate to standards set by the National Institute of Standards and Technology by an independent laboratory within the past 12 months.

Since this is a wind turbine project, the wind speed during the sound level study is significant. The ground-level wind speed has a direct influence on the ambient sound levels. Ground-level wind speed data will be continuously measured at all sound level monitoring locations for the duration of the study per the LWECS Guidance. A HOBO H21-002 micro-weather station, or comparable instrumentation, with a tripod and data logger will be used at the monitoring locations. The wind sensors will be mounted at microphone height (1.5 meters) and log data every hour. This wind instrument has a measurement range of 0 to 45 m/s (100 mph) and an accuracy of $\pm$1.1 m/s (2.4 mph). The starting threshold is $\leq$1 m/s (2.2 mph).

Additional meteorological parameters, e.g. temperature, precipitation, etc. will either be collected through additional instrumentation deployed by Epsilon or will be downloaded from the closest National Weather Service station.

In order to allow for the characterization of background sound levels during different wind regimes which may be useful once the wind energy facility is operational it would be necessary to know the wind speeds at higher heights (hub height, if possible) during the pre-construction sound level measurement program. If these data are available during the program, they will be incorporated into the report.

Schedule

The sound level measurement program is planned to commence during the end of April or beginning of May 2019. Following the approach outlined in the LWECS Guidance, the sound level measurement program will run for at least one week. The equipment will not be staffed continuously; however, observations will be made three times during the program (see below). The field technician will leave the site either the same day or the day after all equipment is running and return in approximately one week. Continuous A-weighted measurements (24 hours/day) will be made concurrently at all monitoring locations over an approximately 7-day period. The program could be extended due to excess precipitation. The observation periods will be as follows:

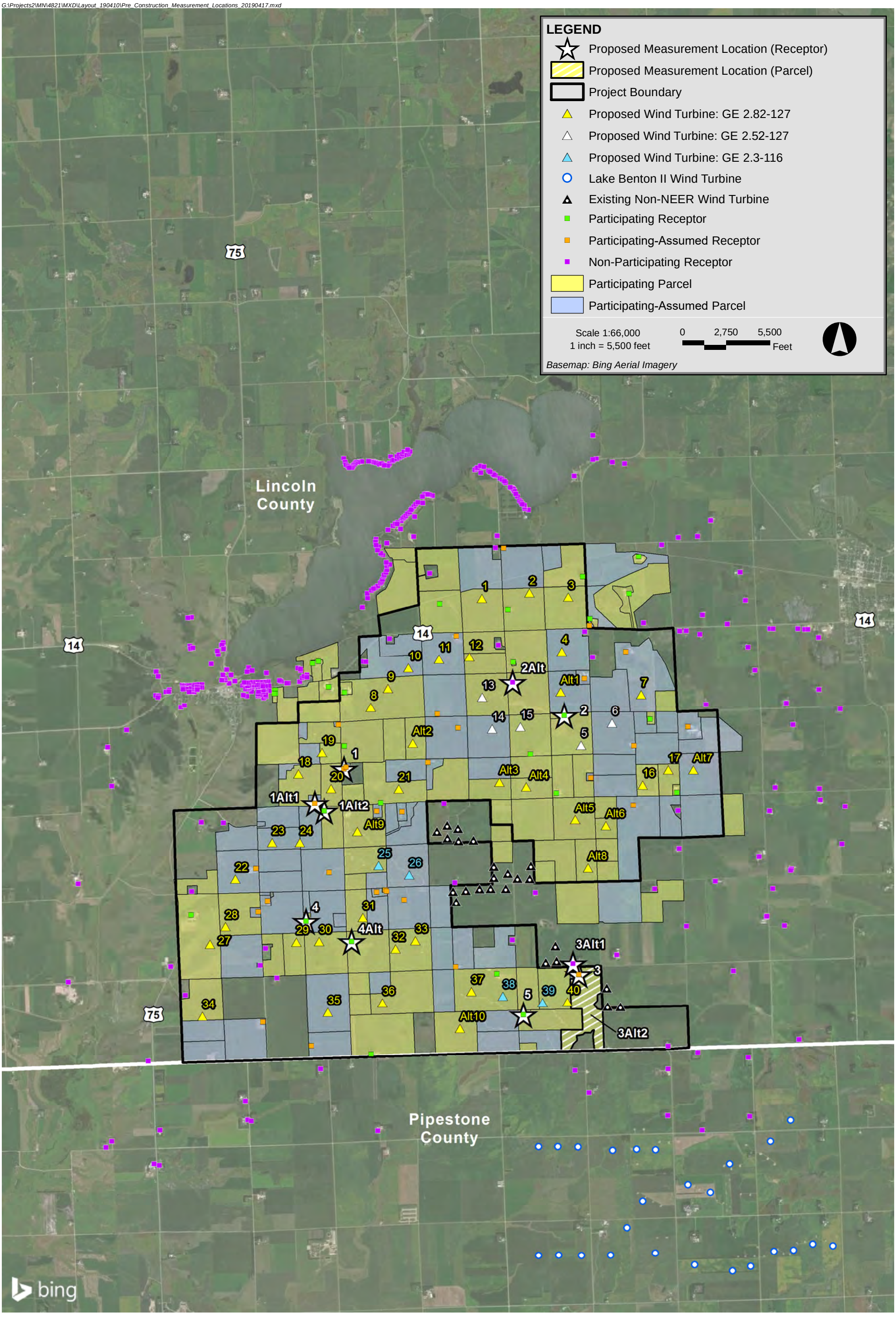
- Upon deployment (daytime),
- During the 1st night when all monitors are running (nighttime), and
- During the pick-up (daytime).

A report, which summarizes the measurement program that will include figures depicting the wind turbine and measurement locations and tabular results, will be submitted as part of the application.

Results/Report

The LWECS document will be used as a guide for sound level data processing, result summaries, and the report structure. No extraneous noise events will be excluded from the data. Hourly periods of recorded precipitation will be removed from the datasets. The percentage of the excluded data will be presented. Sound levels will be presented in graphical format as they were measured in relation to wind speed over the measurement duration. The report will include various figures and tables to effectively summarize the results of the measurement program.

G:\Projects2\MN\4821\MXD\Layout_190410\Pre_Construction_Measurement_Locations_20190417.mxd



Buffalo Ridge Wind **Lincoln County, Minnesota**

Epsilon Associates Inc.

Figure 1

Proposed Pre-Construction Measurement Locations

Appendix B

NCEI Meteorological Data: NWS Station – Brookings Regional Airport, Brookings, SD

Table B-1 NCEI Meteorological Data: NWS Station - Brookings Regional Airport, Brookings, SD

DATE & TIME	REPORTTPYE	HourlyAltimeterSetting	HourlyDewPointTemperature	HourlyDryBulbTemperature	HourlyPrecipitation	HourlyPresentWeatherType	HourlyPressureChange	HourlyPressureTendency	HourlyRelativeHumidity	HourlySeaLevelPressure	HourlySkyConditions	HourlyStationPressure	HourlyVisibility	HourlyWetBulbTemperature	HourlyWindDirection	HourlyWindGustSpeed	HourlyWindSpeed
2019-04-29T00:56:00	FM-15	29.86	38	40	0.01				93	29.93			10		140		11
2019-04-29T02:56:00	FM-15	29.88	38	41					89	29.95			10		0		0
2019-04-29T03:36:00	FM-16	29.88	37	39					93				10		0		0
2019-04-29T04:56:00	FM-15	29.9	38	41					89	29.96	BKN:07 13	28.16	10	40	250		6
2019-04-29T05:30:00	FM-15	29.91	39	41					93		SCT:04 13	28.17	10	40	280		13
2019-04-29T05:56:00	FM-15	29.93	39	41			-0.04	3	93	30	SCT:04 11	28.19	10	40	270		16
2019-04-29T06:03:00	FM-15	29.93	37	39					93		BKN:07 11	28.19	10	38	270		18
2019-04-29T06:13:00	FM-15	29.93	36	39					87		SCT:04 11	28.19	10	38	280		21
2019-04-29T06:56:00	FM-15	29.95	34	40					79	30.02			10		280		16
2019-04-29T07:56:00	FM-15	29.96	33	41					73	30.03			10		280		17
2019-04-29T08:56:00	FM-15	29.96	34	43					71	30.03			10		280		17
2019-04-29T09:56:00	FM-15	29.98	34	45					66	30.05	FEW:02 24 BKN:07 32	28.24	10	40	290		15
2019-04-29T10:56:00	FM-15	29.99	35	46					66	30.05	OVC:08 32	28.25	10	41	290	25	21
2019-04-29T11:56:00	FM-15	30.02	36	47			-0.05	3	66	30.09	OVC:08 32	28.27	10	42	300	25	17
2019-04-29T12:56:00	FM-15	30.02	37	47					69	30.09	BKN:07 29 OVC:08 34	28.27	10	42	310		22
2019-04-29T13:56:00	FM-15	30.04	36	47					66	30.11	BKN:07 25 OVC:08 32	28.3	10	42	310	25	17
2019-04-29T14:08:00	FM-15	30.05	36	46					66		FEW:02 25 OVC:08 32	28.3	10	41	310		18
2019-04-29T14:56:00	FM-15	30.05	36	50			-0.03	3	59	30.11	BKN:07 39	28.3	10	44	310		10
2019-04-29T15:56:00	FM-15	30.06	37	50					61	30.13	FEW:02 34 BKN:07 55	28.31	10	44	290		11
2019-04-29T16:56:00	FM-15	30.09	38	49					66	30.15	FEW:02 43 BKN:07 50 OVC:08 60	28.34	10	44	320		13
2019-04-29T17:56:00	FM-15	30.1	37	48					66	30.17			10		330		14
2019-04-29T18:56:00	FM-15	30.13	36	45					71	30.21	OVC:08 34	28.38	10	41	350		11
2019-04-29T19:56:00	FM-15	30.15	35	43					74	30.23	OVC:08 38	28.4	10	39	360		14
2019-04-29T20:56:00	FM-15	30.19	35	41			-0.08	3	79	30.26	OVC:08 50	28.44	10	38	360		9
2019-04-29T21:56:00	FM-15	30.18	34	39					82	30.26	CLR:00	28.43	10	37	20		7
2019-04-29T22:56:00	FM-15	30.19	34	38					86	30.27	FEW:02 50	28.44	10	36	10		7
2019-04-29T23:56:00	FM-15	30.2	34	38			-0.01	3	86	30.27	CLR:00	28.45	10	36	10		7
2019-04-30T00:56:00	FM-15	30.2	35	38					89	30.28	BKN:07 50	28.45	10	37	20		6
2019-04-30T01:17:00	FM-15	30.2	36	37					93		BKN:07 12 BKN:07 50	28.45	10	37	30		7
2019-04-30T01:56:00	FM-15	30.18	35	38					89	30.26	BKN:07 12	28.43	10	37	10		9
2019-04-30T02:09:00	FM-15	30.18	34	37					87		SCT:04 12	28.43	10	36	20		9
2019-04-30T02:27:00	FM-15	30.18	36	37					93		BKN:07 12	28.43	10	37	20		8
2019-04-30T02:56:00	FM-15	30.19	35	38			0.01	8	89	30.26	OVC:08 12	28.44	10	37	30		7
2019-04-30T03:56:00	FM-15	30.18	35	38					89	30.25	OVC:08 10	28.43	10	37	30		8
2019-04-30T04:16:00	FM-15	30.17	36	37					93		OVC:08 8	28.42	10	37	30		7
2019-04-30T04:56:00	FM-15	30.17	36	38					93	30.24	OVC:08 8	28.42	10	37	30		7
2019-04-30T05:56:00	FM-15	30.17	36	38			0.02	5	93	30.24	OVC:08 8	28.42	10	37	60		8
2019-04-30T06:56:00	FM-15	30.18	37	39	0.02	-RA:02 BR:1 |RA |RA			93	30.25	OVC:08 6	28.43	5	38	70		8
2019-04-30T07:56:00	FM-15	30.17	38	39	0.05	-RA:02 BR:1 |RA |RA			96	30.24	OVC:08 6	28.42	4	39	90		6
2019-04-30T08:48:00	FM-15	30.15	37	39	0.04	-RA:02 BR:1 |RA |RA			93		OVC:08 10	28.4	5	38	90		8
2019-04-30T08:56:00	FM-15	30.14	38	40	0.04	-RA:02 BR:1 |RA |RA	0.02	8	93	30.22	OVC:08 10	28.39	6	39	70		10
2019-04-30T09:56:00	FM-15	30.14	37	40	0.01	-RA:02 |RA |RA			89	30.22	BKN:07 8 OVC:08 11	28.39	10	39	80		9
2019-04-30T10:56:00	FM-15	30.12	38	40	0.01	-RA:02 |RA |RA			93	30.2	OVC:08 8	28.37	8	39	70		10
2019-04-30T11:56:00	FM-15	30.11	37	39	T	-RA:02 |RA |RA	0.03	8	93	30.19	OVC:08 8	28.36	10	38	60		9
2019-04-30T12:56:00	FM-15	30.12	37	39	T	-RA:02 |RA |RA			93	30.2	OVC:08 6	28.37	10	38	70		11
2019-04-30T13:56:00	FM-15	30.09	38	39	T	-RA:02 BR:1 |RA |RA			96	30.17	OVC:08 6	28.34	3	39	70		14
2019-04-30T14:56:00	FM-15	30.08	38	39	T	BR:1 ||	0.04	8	96	30.16	OVC:08 6	28.33	5	39	60		11
2019-04-30T15:56:00	FM-15	30.06	38	39					96	30.14	OVC:08 4	28.31	9	39	60		13
2019-04-30T16:56:00	FM-15	30.06	38	39					96	30.14			4		70		11
2019-04-30T17:31:00	FM-16	30.06	37	39					93				2.5		80		13
2019-04-30T17:56:00	FM-15	30.05	38	39					96	30.12			2.5		70	20	15
2019-04-30T18:16:00	FM-16	30.05	37	39					93				1.5		60		10
2019-04-30T18:56:00	FM-15	30.04	38	39					96	30.12			1.75		60		9
2019-04-30T19:03:00	FM-16	30.04	39	39					100				1.5		60		9
2019-04-30T19:33:00	FM-16	30.04	37	39					93				1		60		10
2019-04-30T19:40:00	FM-16	30.04	37	39		|FG |			93				0.5		60		10
2019-04-30T19:56:00	FM-15	30.04	39	39					100	30.12			0.75		60		8
2019-04-30T20:23:00	FM-16	30.04	39	39	T	|RA |			100				1		40		9
2019-04-30T20:30:00	FM-16	30.05	39	39	0.01	|RA |			100				1.5		40		6
2019-04-30T20:42:00	FM-16	30.05	39	39	0.01	|RA |			100				2.5		40		7
2019-04-30T20:52:00	FM-16	30.05	39	39	0.01	|RA |			100				4		40		7
2019-04-30T20:56:00	FM-15	30.06	39	39	0.01	|RA |			100	30.13			5		30		6
2019-04-30T21:27:00	FM-16	30.05	39	39	0.01	|RA |			100				6		40		7
2019-04-30T21:56:00	FM-15	30.05	39	39	0.01	|RA |			100	30.12			7		30		6
2019-04-30T22:07:00	FM-16	30.04	39	39	0.01	|RA |			100				9		30		7

DATE & TIME	REPORTTPYE	HourlyAltimeterSetting	HourlyDewPointTemperature	HourlyDryBulbTemperature	HourlyPrecipitation	HourlyPresentWeatherType	HourlyPressureChange	HourlyPressureTendency	HourlyRelativeHumidity	HourlySeaLevelPressure	HourlySkyConditions	HourlyStationPressure	HourlyVisibility	HourlyWetBulbTemperature	HourlyWindDirection	HourlyWindGustSpeed	HourlyWindSpeed
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2019-04-30T23:05:00	FM-16	30.04	39	39	T	|RA |			100				10		60		7
2019-04-30T23:56:00	FM-15	30.03	39	40	T		0.03	8	97	30.1	OVC:08 4	28.29	10	40	70		8
2019-04-30T23:59:00	SOD																
2019-05-01T00:56:00	FM-15	30.01	39	40					97	30.09	SCT:04 15 BKN:07 35 OVC:08 44	28.27	10	40	70		6
2019-05-01T01:38:00	FM-15	30	37	39					93		BKN:07 11 OVC:08 39	28.26	10	38	60		7
2019-05-01T01:56:00	FM-15	29.99	38	40					93	30.07	BKN:07 11 OVC:08 40	28.25	10	39	80		8
2019-05-01T02:35:00	FM-15	29.99	37	39					93		OVC:08 9	28.25	10	38	80		8
2019-05-01T03:56:00	FM-15	30.01	37	39					93	30.09	OVC:08 9	28.27	10	38	50		6
2019-05-01T04:56:00	FM-15	30	37	39					93	30.08	OVC:08 7	28.26	10	38	40		3
2019-05-01T05:34:00	FM-15	30	37	39		BR:1 ||			93		BKN:07 6 OVC:08 9	28.26	2	38	50		6
2019-05-01T05:44:00	FM-15	30.01	37	37		BR:1 ||			100		OVC:08 4	28.27	1.75	37	70		8
2019-05-01T05:56:00	FM-15	30.01	38	38		BR:1 ||	-0.02	1	100	30.09	OVC:08 4	28.27	2.5	38	60		7
2019-05-01T06:03:00	FM-15	30.01	37	37					100		OVC:08 4	28.27	7	37	50		7
2019-05-01T06:31:00	FM-15	30.02	37	37		BR:1 ||			100		OVC:08 4	28.27	2	37	60		7
2019-05-01T06:46:00	FM-15	30.03	37	37		BR:1 ||			100		OVC:08 4	28.29	3	37	40		6
2019-05-01T06:56:00	FM-15	30.03	38	38		BR:1 ||			100	30.11	OVC:08 4	28.29	3	38	40		8
2019-05-01T07:42:00	FM-15	30.02	37	39					93		OVC:08 6	28.27	10	38	70		8
2019-05-01T07:56:00	FM-15	30.02	38	40					93	30.09	OVC:08 6	28.27	10	39	40		8
2019-05-01T08:56:00	FM-15	30.03	37	40			-0.02	3	89	30.11	BKN:07 10 OVC:08 13	28.29	10	39	40		6
2019-05-01T09:56:00	FM-15	30.04	37	41					86	30.12	OVC:08 10	28.3	10	39	50		5
2019-05-01T11:56:00	FM-15	30.05	38	42			-0.01	1	85	30.13	OVC:08 14	28.3	10	40	360		6
2019-05-01T12:56:00	FM-15	30.05	38	43	0.01	-RA:02 |RA |RA			82	30.13	OVC:08 14	28.3	10	41	20		3
2019-05-01T13:16:00	FM-15	30.06	39	43	T	-RA:02 |RA |RA			87		OVC:08 16	28.31	10	41	350		3
2019-05-01T13:48:00	FM-15	30.06	39	43	0.01	-RA:02 |RA |RA			87		OVC:08 14	28.31	10	41	10		5
2019-05-01T13:56:00	FM-15	30.06	39	43	0.01	-RA:02 |RA |RA			86	30.14	BKN:07 11 OVC:08 16	28.31	10	41	350		6
2019-05-01T14:47:00	FM-15	30.06	39	43	T	-RA:02 |RA |RA			87		SCT:04 13 OVC:08 19	28.31	10	41	40		6
2019-05-01T14:56:00	FM-15	30.06	39	43	T	-RA:02 |RA |RA	-0.01	0	86	30.13	BKN:07 13 OVC:08 19	28.31	10	41	10		7
2019-05-01T15:11:00	FM-15	30.06	39	43	T	-RA:02 |RA |RA			87		SCT:04 13 OVC:08 21	28.31	10	41	10		7
2019-05-01T15:56:00	FM-15	30.06	39	42	0.03	RA:02 |RA |RA			89	30.14	FEW:02 13 BKN:07 25 OVC:08 30	28.31	10	41	30		7
2019-05-01T16:12:00	FM-15	30.06	37	43	0.01	-RA:02 |RA |RA			81		FEW:02 18 BKN:07 33 OVC:08 41	28.31	10	40	60		5
2019-05-01T16:35:00	FM-15	30.07	37	43	0.01	-RA:02 |RA |RA			81		FEW:02 16 BKN:07 21 OVC:08 43	28.32	10	40	30		3
2019-05-01T16:56:00	FM-15	30.07	38	42	0.02	-RA:02 |RA |RA			85	30.14	BKN:07 21 BKN:07 35 OVC:08 55	28.32	10	40	40		5
2019-05-01T17:37:00	FM-15	30.08	37	43	T	-RA:02 |RA |RA			81		BKN:07 24 OVC:08 42	28.33	10	40	0		0
2019-05-01T17:56:00	FM-15	30.08	38	42	T	-RA:02 |RA |RA	-0.02	3	85	30.15	OVC:08 22	28.33	10	40	0		0
2019-05-01T18:56:00	FM-15	30.08	38	43	T	-RA:02 |RA |RA			82	30.16	OVC:08 16	28.33	10	41	240		3
2019-05-01T20:56:00	FM-15	30.1	39	42			-0.03	3	89	30.18	OVC:08 18	28.35	10	41	220		3
2019-05-01T21:56:00	FM-15	30.1	40	42					92	30.18	OVC:08 26	28.35	10	41	220		3
2019-05-01T22:56:00	FM-15	30.1	40	42					92	30.17	BKN:07 13 OVC:08 20	28.35	10	41	220		5
2019-05-01T23:10:00	FM-15	30.1	41	43	T	-RA:02 BR:1 |RA |RA			93		SCT:04 6 BKN:07 11 OVC:08 20	28.35	3	42	250		13
2019-05-01T23:13:00	FM-15	30.1	41	43	0.01	-RA:02 BR:1 |RA |RA			93		BKN:07 6 OVC:08 11	28.35	2.5	42	260		11
2019-05-01T23:27:00	FM-15	30.11	39	41	0.01	-RA:02 BR:1 |RA |RA			93		BKN:07 6 BKN:07 11 OVC:08 19	28.36	5	40	280		10
2019-05-01T23:43:00	FM-15	30.12	39	41	0.01				93		SCT:04 4 BKN:07 19 OVC:08 38	28.37	10	40	270		8
2019-05-01T23:56:00	FM-15	30.12	40	41	0.01		-0.01	3	96	30.19	FEW:02 7 BKN:07 13 OVC:08 36	28.37	10	41	270		8
2019-05-01T23:59:00	SOD																
2019-05-02T00:08:00	FM-15	30.12	39	41					93		BKN:07 9 OVC:08 15	28.37	10	40	280		7
2019-05-02T00:16:00	FM-15	30.12	39	41					93		SCT:04 9 OVC:08 15	28.37	10	40	270		7
2019-05-02T00:56:00	FM-15	30.11	39	41					93	30.19	FEW:02 10 SCT:04 20 OVC:08 60	28.36	10	40	280		8
2019-05-02T01:21:00	FM-15	30.11	39	39					100		FEW:02 9 OVC:08 55	28.36	10	39	280		10
2019-05-02T01:56:00	FM-15	30.11	38	40					93	30.19	SCT:04 9 BKN:07 16 OVC:08 60	28.36	10	39	290		9
2019-05-02T02:56:00	FM-15	30.11	37	40			0.01	6	89	30.19	OVC:08 18	28.36	10	39	290		8
2019-05-02T03:25:00	FM-15	30.11	37	39					93		BKN:07 10 OVC:08 16	28.36	10	38	300		10
2019-05-02T03:44:00	FM-15	30.11	37	39					93		SCT:04 10 OVC:08 15	28.36	10	38	310		11
2019-05-02T03:52:00	FM-15	30.11	36	39					87		OVC:08 13	28.36	10	38	300		15
2019-05-02T03:56:00	FM-15	30.11	36	39					89	30.19	OVC:08 13	28.36	10	38	300		14
2019-05-02T05:30:00	FM-15	30.13	36	37					93		OVC:08 9	28.38	10	37	300		14
2019-05-02T05:56:00	FM-15	30.14	36	38			-0.03	3	93	30.22	OVC:08 7	28.39	10	37	310		13
2019-05-02T06:49:00	FM-15	30.15	36	37					93		OVC:08 11	28.4	10	37	300		13
2019-05-02T06:56:00	FM-15	30.16	36	38					93	30.24	OVC:08 11	28.41	10	37	300		10
2019-05-02T07:56:00	FM-15	30.17	35	40					83	30.24	OVC:08 13	28.42	10	38	330		10
2019-05-02T08:56:00	FM-15	30.17	36	40			-0.03	1	86	30.25	OVC:08 13	28.42	10	38	310		10
2019-05-02T09:56:00	FM-15	30.18	35	42					76	30.25	OVC:08 15	28.43	10	39	310		9
2019-05-02T10:53:00	FM-15	30.18	36	45					71		SCT:04 19 SCT:04 24	28.43	10	41			
2019-05-02T10:56:00	FM-15	30.18	36	45					71	30.25	SCT:04 21	28.43	10	41	320		6
2019-05-02T11:26:00	FM-15	30.17	36	45					71		BKN:07 25	28.42	10	41	VRB		5

Table B-1 NCEI Meteorological Data: NWS Station - Brookings Regional Airport, Brookings, SD

DATE & TIME	REPORTTPYE	HourlyAltimeterSetting	HourlyDewPointTemperature	HourlyDryBulbTemperature	HourlyPrecipitation	HourlyPresentWeatherType	HourlyPressureChange	HourlyPressureTendency	HourlyRelativeHumidity	HourlySeaLevelPressure	HourlySkyConditions	HourlyStationPressure	HourlyVisibility	HourlyWetBulbTemperature	HourlyWindDirection	HourlyWindGustSpeed	HourlyWindSpeed
2019-05-02T11:56:00	FM-15	30.17	36	48			0.01	8	63	30.24	BKN:07 27	28.42	10	43	320		5
2019-05-02T12:42:00	FM-15	30.16	36	48					62		SCT:04 29	28.41	10	43	250		6
2019-05-02T12:56:00	FM-15	30.15	37	49					64	30.22	FEW:02 29	28.4	10	43	320		7
2019-05-02T13:56:00	FM-15	30.13	36	51					56	30.19	CLR:00	28.38	10	44	260		6
2019-05-02T15:56:00	FM-15	30.08	33	53					47	30.14	CLR:00	28.33	10	44	VRB		5
2019-05-02T16:56:00	FM-15	30.08	32	54					43	30.14	CLR:00	28.33	10	44	260		7
2019-05-02T17:56:00	FM-15	30.07	31	53			0.03	6	43	30.14	CLR:00	28.32	10	43	0		0
2019-05-02T18:56:00	FM-15	30.06	32	52					47	30.13	CLR:00	28.31	10	43	140		6
2019-05-02T19:56:00	FM-15	30.07	34	49		HZ:7 |FU |HZ			56	30.14	CLR:00	28.32	6	42	140		7
2019-05-02T20:56:00	FM-15	30.08	35	46			-0.01	3	66	30.15	CLR:00	28.33	8	41	130		6
2019-05-02T21:56:00	FM-15	30.1	39	45					80	30.17	BKN:07 100	28.35	10	42	120		10
2019-05-02T22:56:00	FM-15	30.08	38	44					79	30.15	CLR:00	28.33	10	41	140		13
2019-05-02T23:56:00	FM-15	30.08	38	43			0	8	82	30.14	BKN:07 80	28.33	10	41	130		11
2019-05-02T23:59:00	SOD																
2019-05-03T00:56:00	FM-15	30.06	37	41					86	30.13	CLR:00	28.31	10	39	130		11
2019-05-03T01:56:00	FM-15	30.03	36	40					86	30.1	CLR:00	28.29	10	38	130		11
2019-05-03T02:56:00	FM-15	30.03	37	41			0.05	6	86	30.09	BKN:07 85	28.29	10	39	140		11
2019-05-03T03:56:00	FM-15	30.02	37	42					82	30.08	FEW:02 90 SCT:04 110	28.27	10	40	140		11
2019-05-03T04:56:00	FM-15	30.01	37	43					80	30.06	OVC:08 85	28.27	10	40	150		13
2019-05-03T05:56:00	FM-15	30.01	38	44	T	-RA:02 |RA |RA	0.02	6	79	30.06	FEW:02 55 OVC:08 75	28.27	10	41	160		15
2019-05-03T06:56:00	FM-15	30	37	44					76	30.06	BKN:07 85	28.26	10	41	150		16
2019-05-03T07:56:00	FM-15	29.99	39	45					80	30.05	BKN:07 90	28.25	10	42	150		15
2019-05-03T08:56:00	FM-15	29.96	41	51			0.04	8	69	30.02	FEW:02 65	28.22	10	46	170		18
2019-05-03T09:56:00	FM-15	29.94	43	56					62	30	FEW:02 70	28.2	10	49	180	23	20
2019-05-03T10:56:00	FM-15	29.95	44	60					56	30	FEW:02 38 BKN:07 75	28.21	10	52	210	26	21
2019-05-03T11:56:00	FM-15	29.94	46	58			0.01	6	65	30	OVC:08 38	28.2	10	52	220	28	20
2019-05-03T12:56:00	FM-15	29.94	46	58					65	30	OVC:08 42	28.2	10	52	230		15
2019-05-03T13:56:00	FM-15	29.92	47	62					58	29.98	SCT:04 41 BKN:07 110	28.18	10	54	230		13
2019-05-03T14:56:00	FM-15	29.91	44	60			0.03	8	56	29.97	FEW:02 41 OVC:08 90	28.17	10	52	310		15
2019-05-03T15:56:00	FM-15	29.9	42	60					52	29.96	CLR:00	28.16	10	51	310		7
2019-05-03T16:56:00	FM-15	29.91	41	62					46	29.96	CLR:00	28.17	10	51	270		13
2019-05-03T17:56:00	FM-15	29.92	42	59			-0.01	3	54	29.97	CLR:00	28.18	10	50	280		8
2019-05-03T18:56:00	FM-15	29.92	41	58					53	29.98	CLR:00	28.18	10	49	330		9
2019-05-03T20:56:00	FM-15	29.96	39	51			-0.04	3	64	30.01	CLR:00	28.22	10	45	0		0
2019-05-03T21:56:00	FM-15	29.97	39	49					69	30.01	CLR:00	28.23	10	44	0		0
2019-05-03T22:56:00	FM-15	29.97	38	44					79	30.02	CLR:00	28.23	10	41	240		3
2019-05-03T23:56:00	FM-15	29.96	39	43			0	0	86	30.02	CLR:00	28.22	10	41	0		0
2019-05-03T23:59:00	SOD																
2019-05-04T00:56:00	FM-15	29.96	40	44					85	30.01	CLR:00	28.22	10	42	0		0
2019-05-04T01:56:00	FM-15	29.96	37	39					93	30.01	CLR:00	28.22	10	38	0		0
2019-05-04T02:56:00	FM-15	29.95	38	40			0.01	8	93	30.01	CLR:00	28.21	10	39	130		5
2019-05-04T03:56:00	FM-15	29.95	38	39					96	30	CLR:00	28.21	10	39	140		3
2019-05-04T04:56:00	FM-15	29.95	38	39					96	30	CLR:00	28.21	10	39	0		0
2019-05-04T05:56:00	FM-15	29.95	37	38			0	3	97	30.01	CLR:00	28.21	10	38	130		7
2019-05-04T06:56:00	FM-15	29.97	41	43					93	30.02	CLR:00	28.23	10	42	120		3
2019-05-04T07:56:00	FM-15	29.97	46	53					77	30.02	CLR:00	28.23	10	49	190		5
2019-05-04T08:56:00	FM-15	29.96	46	60			0	0	60	30	CLR:00	28.22	10	53	200		9
2019-05-04T09:56:00	FM-15	29.94	36	62					38	29.99	CLR:00	28.2	10	49	210		8
2019-05-04T10:56:00	FM-15	29.92	36	64					35	29.97	CLR:00	28.18	10	50	210	17	13
2019-05-04T11:56:00	FM-15	29.91	38	66			0.05	8	36	29.95	CLR:00	28.17	10	52	230	16	11
2019-05-04T12:56:00	FM-15	29.89	35	67					31	29.93	CLR:00	28.15	10	51	VRB		8
2019-05-04T13:56:00	FM-15	29.86	34	68					28	29.91	CLR:00	28.12	10	51	200		8
2019-05-04T14:56:00	FM-15	29.83	34	68			0.07	8	28	29.88	CLR:00	28.09	10	51	VRB		6
2019-05-04T15:56:00	FM-15	29.82	35	68					30	29.86	CLR:00	28.09	10	51	240		7
2019-05-04T16:56:00	FM-15	29.81	38	67					35	29.85	BKN:07 85	28.08	10	52	240		7
2019-05-04T17:56:00	FM-15	29.8	39	67			0.04	6	36	29.84	CLR:00	28.07	10	53	230		6
2019-05-04T18:56:00	FM-15	29.79	42	65					43	29.83	CLR:00	28.06	10	53	170		5
2019-05-04T19:56:00	FM-15	29.79	39	63					41	29.83	BKN:07 90 BKN:07 100	28.06	10	51	180		3
2019-05-04T20:56:00	FM-15	29.82	46	57	T	-RA:02 |RA |RA	-0.03	3	67	29.86	OVC:08 80	28.09	10	51	350		8
2019-05-04T21:56:00	FM-15	29.82	45	56	T				67	29.85	CLR:00	28.09	10	50	110		6
2019-05-04T22:56:00	FM-15	29.82	45	54					72	29.86	CLR:00	28.09	10	49	60		10
2019-05-04T23:56:00	FM-15	29.85	41	48			-0.02	3	77	29.89	BKN:07 100	28.11	10	45	40		8
2019-05-04T23:59:00	SOD																
2019-05-05T00:56:00	FM-15	29.84	38	47					71	29.88	CLR:00	28.1	10	43	70		5
2019-05-05T01:56:00	FM-15	29.83	38	45					77	29.87	CLR:00	28.09	10	42	40		6

DATE & TIME	REPORTTPYE	HourlyAltimeterSetting	HourlyDewPointTemperature	HourlyDryBulbTemperature	HourlyPrecipitation	HourlyPresentWeatherType	HourlyPressureChange	HourlyPressureTendency	HourlyRelativeHumidity	HourlySeaLevelPressure	HourlySkyConditions	HourlyStationPressure	HourlyVisibility	HourlyWetBulbTemperature	HourlyWindDirection	HourlyWindGustSpeed	HourlyWindSpeed
2019-05-05T02:56:00	FM-15	29.84	38	43			0.01	5	82	29.88	CLR:00	28.1	10	41	360		3
2019-05-05T03:56:00	FM-15	29.85	39	43					86	29.89	OVC:08 30	28.11	10	41	340		5
2019-05-05T04:56:00	FM-15	29.85	36	42					79	29.89	FEW:02 120	28.11	10	39	20		6
2019-05-05T05:56:00	FM-15	29.87	36	40			-0.03	3	86	29.91	CLR:00	28.13	10	38	10		6
2019-05-05T06:56:00	FM-15	29.87	37	43					80	29.91	CLR:00	28.13	10	40	30		14
2019-05-05T07:56:00	FM-15	29.87	33	47					59	29.91	CLR:00	28.13	10	41	40	22	15
2019-05-05T08:56:00	FM-15		32	50					50		CLR:00		10		60		15
2019-05-05T09:56:00	FM-15	29.9	35	53					51	29.95	CLR:00	28.16	10	45	40		14
2019-05-05T10:56:00	FM-15	29.91	32	53					45	29.96	CLR:00	28.17	10	43	60		10
2019-05-05T11:56:00	FM-15	29.9	31	55					40	29.95	CLR:00	28.16	10	44	50		5
2019-05-05T12:56:00	FM-15	29.9	33	58					39	29.94	SCT:04 95	28.16	10	46	30		8
2019-05-05T13:56:00	FM-15	29.88	33	58					39	29.93	OVC:08 75	28.14	10	46	40	18	11
2019-05-05T14:56:00	FM-15	29.88	33	58			0.02	6	39	29.93	OVC:08 80	28.14	10	46	20		13
2019-05-05T15:56:00	FM-15	29.88	34	57					42	29.93	OVC:08 75	28.14	10	46	10		14
2019-05-05T16:56:00	FM-15	29.88	34	54					47	29.94	OVC:08 70	28.14	10	45	10		20
2019-05-05T17:56:00	FM-15	29.9	32	51			-0.02	3	48	29.96	OVC:08 75	28.16	10	42	30	20	13
2019-05-05T18:56:00	FM-15	29.9	30	50					46	29.96	OVC:08 70	28.16	10	41	20		13
2019-05-05T19:56:00	FM-15		34	47					61		FEW:02 70 BKN:07 90		10		10		10
2019-05-05T20:56:00	FM-15	29.98	34	47					61	30.03	OVC:08 70	28.24	10	41	10		7
2019-05-05T21:56:00	FM-15	30	34	46	T	-RA:02 |RA |RA			63	30.05	OVC:08 60	28.26	10	41	20		13
2019-05-05T22:56:00	FM-15	30.01	37	43	T	-RA:02 |RA |RA			80	30.07	OVC:08 65	28.27	10	40	10		13
2019-05-05T23:56:00	FM-15	30.01	36	43	T	-RA:02 |RA |RA	-0.03	0	76	30.07	OVC:08 70	28.27	10	40	10		11
2019-05-05T23:59:00	SOD																
2019-05-06T01:56:00	FM-15	30.02	34	43					71	30.08	OVC:08 80	28.27	10	39	40		6
2019-05-06T02:56:00	FM-15	30.05	34	43			-0.04	3	71	30.1	OVC:08 70	28.3	10	39	40		6
2019-05-06T03:56:00	FM-15	30.06	34	43	T				71	30.11	OVC:08 70	28.31	10	39	40		3
2019-05-06T04:56:00	FM-15	30.06	34	43					71	30.12	SCT:04 70 BKN:07 90 OVC:08 100	28.31	10	39	30		6
2019-05-06T05:56:00	FM-15	30.08	33	43			-0.04	3	68	30.15	BKN:07 55 OVC:08 90	28.33	10	39	30		7
2019-05-06T06:56:00	FM-15	30.1	33	43					68	30.16	OVC:08 55	28.35	10	39	40		8
2019-05-06T07:56:00	FM-15	30.12	33	44	0.04				65	30.19	OVC:08 50	28.37	10	39	30		8
2019-05-06T08:12:00	FM-15	30.12	34	43		|FU |			71				0.5		40		10
2019-05-06T08:23:00	FM-15	30.12	34	45		HZ:7 |FU |HZ			66		SCT:04 50 OVC:08 100	28.37	5	40	60		9
2019-05-06T08:56:00	FM-15	30.14	33	46		|FU |	0.06	9	61	30.21			1		40		9
2019-05-06T09:02:00	FM-15	30.14	32	45		|FU |			61				0.5		60		8
2019-05-06T09:09:00	FM-15	30.14	32	45					61						50		8
2019-05-06T09:56:00	FM-15	30.15	31	46					56	30.22	OVC:08 50	28.4	10	40	40		9
2019-05-06T10:56:00	FM-15	30.14	31	49					50	30.21	FEW:02 60 OVC:08 100	28.39	10	41	50	16	10
2019-05-06T11:56:00	FM-15	30.13	29	49			0.01	8	46	30.2	BKN:07 60 OVC:08 75	28.38	10	40	40		14
2019-05-06T12:56:00	FM-15	30.15	29	48					48	30.22	OVC:08 60	28.4	10	40	60		8
2019-05-06T13:56:00	FM-15	30.15	30	48	T	-RA:02 |RA |RA			50	30.21	OVC:08 60	28.4	10	40	40		9
2019-05-06T14:56:00	FM-15	30.15	31	48	T		-0.01	1	52	30.22	BKN:07 49 OVC:08 60	28.4	10	41	40	16	7
2019-05-06T15:56:00	FM-15	30.15	34	47	T	-RA:02 |RA |RA			61	30.22	BKN:07 45 OVC:08 60	28.4	10	41	30		10
2019-05-06T16:56:00	FM-15	30.19	35	46	T	-RA:02 |RA |RA			66	30.25	BKN:07 41 OVC:08 49	28.44	10	41	20		8
2019-05-06T17:40:00	FM-15	30.21	36	43	T	-RA:02 |RA |RA			76		BKN:07 29 BKN:07 37 OVC:08 45	28.46	10	40	20		10
2019-05-06T17:49:00	FM-15	30.22	36	43	T	-RA:02 |RA |RA			76		FEW:02 27 BKN:07 45 OVC:08 70	28.47	10	40	20		9
2019-05-06T17:56:00	FM-15	30.21	36	42	T	-RA:02 |RA |RA	-0.06	3	79	30.29	FEW:02 27 OVC:08 70	28.46	10	39	20		8
2019-05-06T18:56:00	FM-15	30.24	36	41	0.01	-RA:02 |RA |RA			82	30.31	BKN:07 43 OVC:08 50	28.48	10	39	30		9
2019-05-06T19:56:00	FM-15	30.24	37	41	T	-RA:02 |RA |RA			86	30.31	SCT:04 38 BKN:07 50 OVC:08 80	28.48	10	39	20		9
2019-05-06T22:56:00	FM-15	30.23	34	40					79	30.29	BKN:07 55 OVC:08 90	28.48	10	37	40		8
2019-05-06T23:56:00	FM-15	30.2	33	39			0.04	8	79	30.27	SCT:04 90	28.45	10	36	40		8
2019-05-06T23:59:00	SOD																
2019-05-07T00:56:00	FM-15	30.27	31	39					73	30.34	SCT:04 55 OVC:08 90	28.51	10	36	70		7
2019-05-07T01:56:00	FM-15	30.26	30	39					70	30.33	OVC:08 55	28.51	10	35	60		10
2019-05-07T02:56:00	FM-15	30.23	30	38			-0.02	0	73	30.3	SCT:04 55 OVC:08 80	28.48	10	35	40		10
2019-05-07T03:56:00	FM-15	30.25	29	38					70	30.33	BKN:07 75	28.49	10	34	50		6
2019-05-07T04:56:00	FM-15	30.26	28	38					68	30.33	OVC:08 70	28.51	10	34	40		6
2019-05-07T05:56:00	FM-15	30.27	28	38			-0.04	1	68	30.35	OVC:08 60	28.51	10	34	60		7
2019-05-07T06:56:00	FM-15	30.29	29	39					67	30.37	OVC:08 65	28.53	10	35	40		6
2019-05-07T07:56:00	FM-15	30.27	30	42					62	30.35	BKN:07 65	28.51	10	37	50		9
2019-05-07T08:56:00	FM-15	30.26	29	46			0.01	8	51	30.34	CLR:00	28.51	10	39	70		13
2019-05-07T09:56:00	FM-15	30.27	29	49					46	30.34	CLR:00	28.51	10	40	40		9
2019-05-07T10:56:00	FM-15	30.25	29	50					44	30.32	CLR:00	28.49	10	41	VRB		10
2019-05-07T11:56:00	FM-15	30.24	29	52			0.02	8	41	30.31	CLR:00	28.48	10	42	90		9
2019-05-07T12:56:00	FM-15	30.23	30	52					43	30.29	CLR:00	28.48	10	42	90		9
2019-05-07T13:56:00	FM-15	30.2	32	55					42	30.26	SCT:04 100	28.45	10	44	130	16	9

Table B-1 NCEI Meteorological Data: NWS Station - Brookings Regional Airport, Brookings, SD

DATE & TIME	REPORTTPYE	HourlyAltimeterSetting	HourlyDewPointTemperature	HourlyDryBulbTemperature	HourlyPrecipitation	HourlyPresentWeatherType	HourlyPressureChange	HourlyPressureTendency	HourlyRelativeHumidity	HourlySeaLevelPressure	HourlySkyConditions	HourlyStationPressure	HourlyVisibility	HourlyWetBulbTemperature	HourlyWindDirection	HourlyWindGustSpeed	HourlyWindSpeed
2019-05-07T14:56:00	FM-15	30.18	33	55			0.06	8	44	30.24	BKN:07 85	28.43	10	45	90		7
2019-05-07T15:56:00	FM-15	30.15	34	55					45	30.21	OVC:08 80	28.4	10	45	90		7
2019-05-07T16:56:00	FM-15	30.13	35	55					47	30.2	OVC:08 75	28.38	10	46	90		7
2019-05-07T17:56:00	FM-15	30.13	39	53	T	-RA:02 |RA |RA	0.04	6	59	30.19	OVC:08 70	28.38	10	46	140		6
2019-05-07T18:56:00	FM-15	30.11	43	49	0.05	-RA:02 |RA |RA			80	30.18	OVC:08 65	28.36	10	46	80		8
2019-05-07T19:56:00	FM-15	30.1	42	48	0.01				80	30.16	OVC:08 70	28.35	10	45	50		10
2019-05-07T20:56:00	FM-15	30.09	42	48	T	-RA:02 |RA |RA	0.04	6	80	30.16	OVC:08 55	28.34	10	45	40		10
2019-05-07T21:56:00	FM-15	30.09	42	47	T	-RA:02 |RA |RA			83	30.15	OVC:08 55	28.34	10	45	50		10
2019-05-07T22:56:00	FM-15	30.09	42	47	0.01	-RA:02 |RA |RA			83	30.14	BKN:07 30 BKN:07 35 OVC:08 43	28.34	10	45	60		10
2019-05-07T23:06:00	FM-15	30.09	43	46	T	-RA:02 |RA |RA			87		BKN:07 28 BKN:07 34 OVC:08 41	28.34	10	45	60		10
2019-05-07T23:51:00	FM-15	30.06	43	46	0.01	-RA:02 |RA |RA			87		FEW:02 27 OVC:08 42	28.31	10	45	50		13
2019-05-07T23:56:00	FM-15	30.06	43	46	0.01	-RA:02 |RA |RA	0.04	6	89	30.11	FEW:02 27 OVC:08 40	28.31	10	45	50		11
2019-05-07T23:59:00	SOD																
2019-05-08T00:35:00	FM-15	30.06	43	46	T	-RA:02 |RA |RA			87		BKN:07 27 OVC:08 38	28.31	10	45	50		10
2019-05-08T00:56:00	FM-15	30.05	43	46	0.01	-RA:02 BR:1 |RA |RA			89	30.11	SCT:04 25 OVC:08 36	28.3	5	45	50		13
2019-05-08T01:56:00	FM-15	30.04	44	45	0.03	-RA:02 BR:1 |RA |RA			97	30.09	SCT:04 25 BKN:07 29 OVC:08 44	28.3	6	45	50		13
2019-05-08T02:21:00	FM-15	30.03	45	45	0.01	-RA:02 |RA |RA			100		FEW:02 6 BKN:07 21 OVC:08 28	28.29	7	45	50		13
2019-05-08T02:56:00	FM-15	30.02	44	45	0.02	-RA:02 |RA |RA	0.04	8	97	30.07	SCT:04 20 BKN:07 31 OVC:08 48	28.27	9	45	60		13
2019-05-08T03:39:00	FM-15	30.01	45	45	0.02	-RA:02 BR:1 |RA |RA			100		FEW:02 6 BKN:07 43 OVC:08 49	28.27	6	45	60		10
2019-05-08T03:56:00	FM-15	29.99	44	45	0.03	-RA:02 |RA |RA			97	30.05	FEW:02 8 SCT:04 28 OVC:08 47	28.25	7	45	60		11
2019-05-08T04:38:00	FM-15	29.97	45	46	0.03	-RA:02 BR:1 |RA |RA			93		BKN:07 6 BKN:07 21 OVC:08 45	28.23	6	46	60		13
2019-05-08T04:56:00	FM-15	29.97	45	46	0.04	-RA:02 |RA |RA			96	30.02	BKN:07 6 BKN:07 12 OVC:08 41	28.23	7	46	70	20	14
2019-05-08T05:34:00	FM-15	29.97	45	46	0.03	-RA:02 BR:1 |RA |RA			93		SCT:04 8 SCT:04 14 OVC:08 41	28.23	5	46	80		16
2019-05-08T05:56:00	FM-15	29.96	44	46	0.06	-RA:02 BR:1 |RA |RA	0.06	6	93	30.01	FEW:02 10 SCT:04 14 OVC:08 41	28.22	4	45	80	26	20
2019-05-08T06:56:00	FM-15	29.93	43	45	0.08	-RA:02 BR:1 |RA |RA			93	29.99	SCT:04 12 OVC:08 45	28.19	5	44	80	26	21
2019-05-08T07:29:00	FM-15	29.92	43	45	0.04	-RA:02 |RA |RA			93		BKN:07 10 BKN:07 35 OVC:08 47	28.18	7	44	70	25	17
2019-05-08T07:56:00	FM-15	29.9	42	44	0.08	RA:02 BR:1 |RA |RA			93	29.96	BKN:07 10 OVC:08 38	28.16	4	43	70	28	18
2019-05-08T08:56:00	FM-15	29.88	42	44	0.05	-RA:02 BR:1 |RA |RA	0.07	7	93	29.94	OVC:08 10	28.14	5	43	60	28	20
2019-05-08T09:56:00	FM-15	29.86	41	43	0.08	RA:02 BR:1 |RA |RA			93	29.92	BKN:07 10 OVC:08 15	28.12	4	42	70	32	24
2019-05-08T10:56:00	FM-15	29.85	41	42	0.09	RA:02 BR:1 |RA |RA			96	29.91	BKN:07 12 OVC:08 30	28.11	5	42	70	30	17
2019-05-08T11:56:00	FM-15		40	42	0.13	RA:02 BR:1 |RA |RA			92		OVC:08 11		5		70	29	17
2019-05-08T12:56:00	FM-15	29.83	39	40	0.18	RA:02 BR:1 |RA |RA			97	29.9	OVC:08 10	28.09	6	40	50	26	20
2019-05-08T13:56:00	FM-15	29.83	37	40	0.12	-RA:02 |RA |RA			89	29.9	OVC:08 12	28.09	10	39	40	30	21
2019-05-08T14:56:00	FM-15	29.81	36	38	0.04	-RA:02 |RA |RA			93	29.88	OVC:08 10	28.08	10	37	40	32	17
2019-05-08T15:56:00	FM-15	29.81	35	37	0.04	RA:02 |RA |RA			93	29.88	OVC:08 10	28.08	10	36	30	29	22
2019-05-08T16:44:00	FM-15	29.83	34	36	0.06	-RA:02 |RA |RA			93		OVC:08 8	28.09	10	35	30	33	22
2019-05-08T16:56:00	FM-15	29.84	34	36	0.07	-RA:02 |RA |RA			93	29.91	OVC:08 8	28.1	10	35	30	32	20
2019-05-08T17:56:00	FM-15	29.87	33	35	0.06	UP:09 ||	-0.06	3	93	29.94	OVC:08 8	28.13	10	34	20	26	18
2019-05-08T18:56:00	FM-15	29.9	33	35	0.02	-RA:02 |RA |RA			93	29.98	OVC:08 8	28.16	10	34	20	26	17
2019-05-08T19:56:00	FM-15	29.92	34	35	0.01	-RA:02 |RA |RA			96	30	OVC:08 8	28.18	10	35	10	26	17
2019-05-08T20:56:00	FM-15	29.93	34	35	T	-RA:02 |RA |RA	-0.06	1	96	30.01	OVC:08 8	28.19	10	35	10	24	16
2019-05-08T21:56:00	FM-15	29.93	34	36	T	UP:09 ||			93	30.01	OVC:08 8	28.19	10	35	10	26	17
2019-05-08T23:56:00	FM-15	29.94	35	37	T	UP:09 ||	-0.01	3	93	30.02	OVC:08 8	28.2	7	36	360	23	18
2019-05-08T23:59:00	SOD																
2019-05-09T00:06:00	FM-15	29.95	36	37	T	UP:09 ||			93		OVC:08 10	28.21	9	37	10	26	17
2019-05-09T00:56:00	FM-15	29.94	35	37	T	UP:09 ||			93	30.02	OVC:08 10	28.2	10	36	20	21	17
2019-05-09T01:56:00	FM-15	29.95	36	38	T	-RA:02 |RA |RA			93	30.03	SCT:04 12 BKN:07 16 OVC:08 29	28.21	10	37	360	23	16
2019-05-09T02:10:00	FM-15		36	37	T	-RA:02 |RA |RA			93		BKN:07 10 BKN:07 17 OVC:08 22		10		350	23	17
2019-05-09T02:19:00	FM-15	29.95	36	37	T				93		SCT:04 12 BKN:07 19 OVC:08 27	28.21	10	37	360		15
2019-05-09T02:30:00	FM-15	29.96	36	37	T				93		OVC:08 14	28.22	10	37	360	24	15
2019-05-09T02:56:00	FM-15	29.95	35	39	T		-0.01	3	86	30.03	OVC:08 14	28.21	10	37	360	26	20
2019-05-09T03:12:00	FM-15	29.95	36	37					93		SCT:04 14 SCT:04 22 OVC:08 34	28.21	10	37	350		15
2019-05-09T03:31:00	FM-15	29.95	36	39					87		SCT:04 16 BKN:07 26 OVC:08 32	28.21	10	38	350	23	15
2019-05-09T03:56:00	FM-15	29.95	36	39					89	30.03	BKN:07 16 OVC:08 26	28.21	10	38	350		15
2019-05-09T04:56:00	FM-15	29.96	37	39					93	30.04	OVC:08 16	28.22	10	38	340		11
2019-05-09T05:56:00	FM-15	29.97	37	41			-0.02	3	86	30.06	BKN:07 16 OVC:08 23	28.23	10	39	350	22	17
2019-05-09T06:56:00	FM-15	30	36	40					86	30.08	BKN:07 14 OVC:08 22	28.26	10	38	10	29	20
2019-05-09T07:56:00	FM-15	30.01	37	41					86	30.09	OVC:08 14	28.27	10	39	360	31	24
2019-05-09T08:46:00	FM-15	30	37	43					81		SCT:04 14 BKN:07 21	28.26	10	40	10	26	21
2019-05-09T08:56:00	FM-15	30	37	43			-0.03	0	80	30.08	BKN:07 18	28.26	10	40	360	26	17
2019-05-09T09:22:00	FM-15	30.01	37	45					76		SCT:04 18	28.27	10	41	20		18
2019-05-09T09:31:00	FM-15	30.01	37	46					71		BKN:07 20 BKN:07 25	28.27	10	42	20	26	17
2019-05-09T09:56:00	FM-15	30.01	37	45					74	30.09	BKN:07 22	28.27	10	41	360	26	21
2019-05-09T10:56:00	FM-15	30.04	36	46					68	30.11	BKN:07 28	28.3	10	41	20	26	18
2019-05-09T11:45:00	FM-15	30.06	36	46					66		FEW:02 26 OVC:08 36	28.31	10	41	10		17

Table B-1 NCEI Meteorological Data: NWS Station - Brookings Regional Airport, Brookings, SD

DATE & TIME	REPORTTPYE	HourlyAltimeterSetting	HourlyDewPointTemperature	HourlyDryBulbTemperature	HourlyPrecipitation	HourlyPresentWeatherType	HourlyPressureChange	HourlyPressureTendency	HourlyRelativeHumidity	HourlySeaLevelPressure	HourlySkyConditions	HourlyStationPressure	HourlyVisibility	HourlyWetBulbTemperature	HourlyWindDirection	HourlyWindGustSpeed	HourlyWindSpeed
2019-05-09T11:56:00	FM-15	30.06	36	47			-0.06	3	66	30.14	OVC:08 36	28.31	10	42	20	23	16
2019-05-09T12:20:00	FM-15	30.08	37	46					71		BKN:07 29 OVC:08 36	28.33	10	42	10	21	14
2019-05-09T12:56:00	FM-15	30.08	37	48					66	30.15	BKN:07 29 OVC:08 38	28.33	10	43	350		16
2019-05-09T13:08:00	FM-15	30.08	36	46					66		FEW:02 29 OVC:08 38	28.33	10	41	360	24	17
2019-05-09T13:56:00	FM-15	30.07	37	49					64	30.14	FEW:02 38 BKN:07 49	28.32	10	43	10		15
2019-05-09T14:56:00	FM-15	30.06	34	49			0	8	56	30.13	SCT:04 39 BKN:07 49	28.31	10	42	350		17
2019-05-09T15:56:00	FM-15	30.07	36	50					59	30.14	FEW:02 41 OVC:08 55	28.32	10	44	360		11
2019-05-09T16:56:00	FM-15	30.06	33	52					49	30.12	BKN:07 55	28.31	10	43	330	21	17
2019-05-09T17:56:00	FM-15	30.05	32	52			0.01	8	47	30.11	BKN:07 55	28.3	10	43	350		16
2019-05-09T18:56:00	FM-15	30.06	29	49					46	30.13	SCT:04 55	28.31	10	40	330		15
2019-05-09T19:56:00	FM-15	30.07	32	45					61	30.14	CLR:00	28.32	10	39	330		8
2019-05-09T20:56:00	FM-15	30.1	31	43			-0.04	3	63	30.17	CLR:00	28.35	10	38	330		5
2019-05-09T21:56:00	FM-15	30.12	31	41					67	30.19	CLR:00	28.37	10	37	50		3
2019-05-09T22:56:00	FM-15	30.13	33	39					79	30.2	CLR:00	28.38	10	36	270		5
2019-05-09T23:56:00	FM-15	30.14	34	40			-0.04	1	79	30.21	CLR:00	28.39	10	37	270		3
2019-05-09T23:59:00	SOD																

Appendix C
Wind Turbine Coordinates

Table C-1: Wind Turbine Coordinates

Wind Turbine ID	Wind Turbine Type	Coordinates NAD83 UTM Zone 14N (meters)	
		X (Easting)	Y (Northing)
1	GE 2.82-127	721406.00	4906251.99
2	GE 2.82-127	723068.81	4906280.54
3	GE 2.82-127	719276.01	4904165.00
4	GE 2.82-127	719607.78	4904528.06
5	GE 2.82-127	720001.99	4904925.00
6	GE 2.82-127	720586.38	4905093.01
7	GE 2.82-127	721578.11	4904844.39
8	GE 2.82-127 NRO Mode 3	722336.10	4903761.76
9	GE 2.82-127	722917.01	4904458.99
10	GE 2.82-127	722912.57	4905241.90
11	GE 2.82-127	723901.99	4903863.01
12	GE 2.82-127	724459.03	4904409.00
13	GE 2.82-127 NRO Mode 3	719815.48	4902612.18
14	GE 2.82-127	720083.58	4903474.82
15	GE 2.82-127	718470.81	4901555.82
16	GE 2.32-116	722181.30	4902626.59
17	GE 2.82-127 NRO Mode 3	724979.00	4902967.00
18	GE 2.82-127	725447.87	4902966.52
19	GE 2.82-127 NRO Mode 3	722889.99	4902949.67
20	GE 2.82-127 NRO Mode 3	724552.48	4902755.78
21	GE 2.82-127 NRO Mode 3	723782.99	4901893.01
22	GE 2.82-127	718342.58	4903297.99
23	GE 2.82-127	717905.87	4902889.27
24	GE 2.82-127	717390.99	4901571.99
25	GE 2.82-127	717854.00	4901572.00
26	GE 2.32-116	719429.01	4901133.01
27	GE 2.82-127	716200.02	4899628.99
28	GE 2.82-127	716498.01	4899959.00
29	GE 2.82-127 NRO Mode 3	717852.51	4899685.55
30	GE 2.82-127	719125.98	4900137.01
32	GE 2.82-127	720043.23	4899657.22
33	GE 2.82-127 NRO Mode 3	716683.88	4900875.46
34	GE 2.82-127	718459.00	4898325.01
35	GE 2.82-127	719504.00	4898501.00
36	GE 2.82-127 NRO Mode 3	718287.02	4899699.07
37	GE 2.82-127	716056.00	4898247.98
38	GE 2.82-127 NRO Mode 3	719510.26	4899469.54
39	GE 2.82-127	723440.22	4901087.93
40	GE 2.32-116	723195.00	4902010.02
Alt1	GE 2.82-127	722320.99	4906361.01
Alt2	GE 2.32-116	722571.00	4898509.00
Alt3	GE 2.32-116	721808.01	4898632.01
Alt4	GE 2.82-127	721204.99	4898720.00
Alt5	GE 2.82-127 NRO Mode 3	721128.13	4905117.04

Appendix D

Sound Level Modeling Results - Tabular

Table D-1A: Project + Ruthton + Lake Benton Wind II Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project + Ruthton + Lake Benton Wind II Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
1	724967.32	4896341.13	Non-Participating	1	44
2	726537.89	4896321.29	Non-Participating	1	42
3	725625.32	4896059.58	Non-Participating	1	43
4	719410.70	4896051.41	Non-Participating	1	35
13	723456.49	4896774.78	Non-Participating	1	42
14	713480.83	4898900.44	Non-Participating	1	32
16	715723.31	4898648.13	Non-Participating	1	45
17	715447.24	4899194.95	Non-Participating	1	41
19	717211.44	4898135.31	Participating	1	40
20	717476.52	4898978.04	Non-Participating	1	42
22	718141.05	4897676.55	Participating	1	42
23	718315.29	4897230.65	Non-Participating	1	39
24	719282.97	4897515.15	Participating	1	40
25	720904.17	4899187.90	Participating	1	45
26	722203.20	4898274.38	Participating	1	46
27	721690.13	4899054.22	Participating	1	47
28	723264.12	4899043.61	Participating	1	45
29	723148.39	4899253.41	Non-Participating	1	47
31	725540.63	4897544.85	Non-Participating	1	38
32	724971.27	4897228.10	Non-Participating	1	39
36	726225.39	4899113.03	Non-Participating	1	35
37	723990.20	4899418.91	Non-Participating	1	41
38	725325.11	4899964.56	Non-Participating	1	36
40	724716.86	4900688.30	Non-Participating	1	39
41	725875.26	4900834.50	Non-Participating	1	36
42	722427.30	4900617.84	Non-Participating	1	48
43	721991.20	4899704.37	Non-Participating	1	44
44	720889.44	4900807.13	Participating	1	52
46	718911.99	4899677.74	Participating	1	47
49	719388.68	4900626.02	Participating	1	47
50	717161.40	4899221.14	Non-Participating	1	43
51	717258.54	4899542.38	Non-Participating	1	44
52	717119.07	4900238.72	Participating	1	45
53	717301.27	4900451.69	Participating	1	44
55	717076.39	4901073.99	Participating	1	47
56	715837.07	4900177.49	Participating	1	44
58	716032.82	4901955.98	Non-Participating	1	34
59	716453.80	4901946.72	Non-Participating	1	41
60	718480.21	4901000.12	Participating	1	46
61	718385.88	4902176.53	Participating	1	46
62	718203.16	4902322.57	Participating	1	46
63	719389.44	4902171.45	Participating	1	45
64	719470.78	4902334.95	Participating	1	46
65	719873.61	4902159.54	Participating	1	46
66	720678.38	4902318.70	Non-Participating	1	46
67	722830.76	4902522.74	Participating	1	47

Table D-1A: Project + Ruthton + Lake Benton Wind II Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project + Ruthton + Lake Benton Wind II Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
68	724305.46	4902285.98	Participating	1	45
69	725187.55	4901454.70	Non-Participating	1	39
70	725160.81	4902178.69	Non-Participating	1	43
71	725137.82	4902529.85	Participating	1	47
81	725352.22	4903786.97	Participating	1	43
82	725699.53	4904212.19	Non-Participating	1	39
83	723492.59	4902812.41	Non-Participating	1	44
84	722333.43	4903262.08	Participating	1	46
85	722982.06	4904008.09	Participating	1	47
86	720375.68	4903106.67	Participating	1	47
87	720951.07	4903766.63	Participating	1	43
88	720550.53	4904032.74	Participating	1	45
89	718770.32	4903420.97	Participating	1	47
90	718659.29	4903828.29	Participating	1	45
91	723368.88	4904718.11	Participating	1	47
92	721996.88	4904643.52	Participating	1	47
93	722006.38	4905029.65	Participating	1	47
94	718774.53	4904450.55	Participating	1	45
95	718467.45	4904553.41	Participating	1	42
98	716874.05	4896617.04	Non-Participating	1	35
100	717883.25	4904909.85	Non-Participating	1	38
101	718162.37	4905006.41	Participating	1	39
102	718274.26	4905044.01	Participating	1	39
103	719140.84	4905043.74	Participating	1	45
105	719636.02	4905481.91	Non-Participating	1	44
109	720594.55	4906146.96	Participating	1	43
112	720406.24	4906727.10	Non-Participating	1	40
114	719215.91	4906259.09	Non-Participating	1	38
115	719213.16	4906349.80	Non-Participating	1	38
116	719291.50	4906403.40	Non-Participating	1	38
117	719371.22	4906459.76	Non-Participating	1	38
118	719412.46	4906490.00	Non-Participating	1	38
119	719463.31	4906543.60	Non-Participating	1	38
120	719483.93	4906571.09	Non-Participating	1	38
121	719500.42	4906613.70	Non-Participating	1	37
122	719526.54	4906674.17	Non-Participating	1	37
123	719537.53	4906700.29	Non-Participating	1	37
124	719569.14	4906742.89	Non-Participating	1	37
125	719584.26	4906795.12	Non-Participating	1	37
126	719588.39	4906869.34	Non-Participating	1	37
127	719643.36	4906894.08	Non-Participating	1	37
128	719573.27	4906936.69	Non-Participating	1	36
131	719114.20	4906081.78	Non-Participating	1	38
133	719506.22	4907080.47	Non-Participating	1	36
134	719465.69	4907121.78	Non-Participating	1	36
135	719426.72	4907251.15	Non-Participating	1	35

Table D-1A: Project + Ruthton + Lake Benton Wind II Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project + Ruthton + Lake Benton Wind II Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
136	719377.63	4907389.09	Non-Participating	1	35
137	719365.16	4907339.21	Non-Participating	1	35
138	720913.33	4905533.52	Participating	1	47
141	721904.81	4906033.39	Participating	1	47
146	721666.16	4907223.36	Non-Participating	1	41
149	721695.97	4907454.30	Non-Participating	1	39
151	721719.87	4905358.34	Participating	1	47
154	723523.13	4905122.61	Non-Participating	1	45
161	724163.66	4905228.63	Participating	1	42
164	724320.81	4903427.17	Participating	1	46
169	723372.30	4905615.79	Participating	1	45
171	723461.82	4905731.71	Participating	1	45
172	724504.21	4905783.38	Non-Participating	1	39
174	724225.15	4906343.92	Participating	1	39
178	723334.67	4906665.95	Participating	1	46
179	725634.47	4905935.88	Non-Participating	1	35
182	725579.11	4905569.15	Non-Participating	1	36
184	725196.23	4905627.67	Non-Participating	1	37
185	725317.77	4905632.44	Non-Participating	1	37
189	724410.32	4907052.07	Participating	1	36
194	724847.86	4907280.34	Non-Participating	1	34
199	726107.97	4905764.29	Non-Participating	1	34
201	726503.06	4905320.15	Non-Participating	1	34
205	726919.36	4902176.15	Non-Participating	1	35
218	722296.75	4907945.00	Non-Participating	1	36
219	722230.87	4907970.76	Non-Participating	1	36
220	722220.68	4907997.11	Non-Participating	1	36
222	727482.24	4897801.59	Non-Participating	1	36
225	726508.78	4897454.26	Non-Participating	1	37
226	727202.86	4899979.73	Non-Participating	1	33
228	726976.25	4900694.01	Non-Participating	1	33
229	726718.52	4901305.38	Non-Participating	1	34
230	726456.05	4906213.42	Non-Participating	1	33
231	726354.15	4906752.29	Non-Participating	1	32
232	725787.65	4907743.68	Non-Participating	1	32
233	725536.82	4907446.28	Non-Participating	1	33
234	725169.65	4907420.70	Non-Participating	1	33
235	723475.42	4905860.10	Participating	1	45
236	723175.31	4908595.11	Non-Participating	1	34
237	719557.26	4900666.24	Participating	1	46
238	715848.85	4900637.11	Non-Participating	1	42
239	727874.48	4902603.59	Non-Participating	1	32
240	727888.73	4902392.04	Non-Participating	1	32
242	728301.58	4901544.64	Non-Participating	1	32
243	727336.17	4901068.97	Non-Participating	1	33
244	718764.15	4902985.61	Participating	1	46

Table D-1A: Project + Ruthton + Lake Benton Wind II Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project + Ruthton + Lake Benton Wind II Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
245	727235.63	4904241.24	Non-Participating	1	34
246	727363.29	4903829.96	Non-Participating	1	34
247	727860.69	4904504.97	Non-Participating	1	32
248	728267.58	4904129.52	Non-Participating	1	31
250	720099.79	4907436.08	Non-Participating	1	36
252	716921.70	4896257.62	Non-Participating	1	34
254	715238.72	4896061.92	Non-Participating	1	32
255	715015.61	4897377.20	Non-Participating	1	35
256	723187.80	4897202.59	Non-Participating	1	41
257	719610.00	4907569.00	Non-Participating	1	35
258	719700.93	4907644.54	Non-Participating	1	35
260	719745.33	4907684.29	Non-Participating	1	35
261	719857.46	4907742.57	Non-Participating	1	35
262	719890.34	4907786.12	Non-Participating	1	35
263	719919.46	4907805.15	Non-Participating	1	35
265	719947.43	4907836.01	Non-Participating	1	34
266	719982.04	4907873.21	Non-Participating	1	34
267	720021.83	4907900.02	Non-Participating	1	34
268	720072.19	4907973.95	Non-Participating	1	34
269	720106.25	4908011.80	Non-Participating	1	34
270	720141.70	4908061.35	Non-Participating	1	34
272	720179.89	4908091.98	Non-Participating	1	34
273	720273.48	4908078.90	Non-Participating	1	34
274	720454.78	4908220.05	Non-Participating	1	34
275	720401.45	4908238.23	Non-Participating	1	34
276	720304.09	4908243.08	Non-Participating	1	34
277	720344.49	4908251.56	Non-Participating	1	34
278	721275.07	4908713.80	Non-Participating	1	33
279	721305.81	4908733.71	Non-Participating	1	33
280	721324.42	4908753.63	Non-Participating	1	33
281	721387.20	4908657.52	Non-Participating	1	34
282	721377.24	4908782.63	Non-Participating	1	33
283	721448.68	4908770.08	Non-Participating	1	33
284	721538.73	4908695.61	Non-Participating	1	34
285	721612.76	4908638.90	Non-Participating	1	34
286	721664.28	4908602.97	Non-Participating	1	34
287	721637.87	4908618.55	Non-Participating	1	34
288	721751.99	4908548.40	Non-Participating	1	34
289	721794.46	4908525.50	Non-Participating	1	34
290	721861.07	4908467.22	Non-Participating	1	34
291	721835.68	4908492.61	Non-Participating	1	34
292	721978.07	4908374.37	Non-Participating	1	34
293	721992.22	4908358.55	Non-Participating	1	35
294	722024.70	4908323.58	Non-Participating	1	35
295	722011.37	4908342.31	Non-Participating	1	35
296	722035.11	4908307.34	Non-Participating	1	35

Table D-1A: Project + Ruthton + Lake Benton Wind II Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project + Ruthton + Lake Benton Wind II Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
297	722089.60	4908201.94	Non-Participating	1	35
298	722127.86	4908126.15	Non-Participating	1	36
299	722153.60	4908089.69	Non-Participating	1	36
300	718757.08	4908934.79	Non-Participating	1	31
301	718789.00	4908855.07	Non-Participating	1	31
302	718804.77	4908805.37	Non-Participating	1	32
303	718844.90	4908782.13	Non-Participating	1	32
307	719064.83	4908862.39	Non-Participating	1	32
308	719105.42	4908866.46	Non-Participating	1	32
309	719028.86	4908852.24	Non-Participating	1	32
310	718997.87	4908856.18	Non-Participating	1	32
311	718976.83	4908827.32	Non-Participating	1	32
312	718946.52	4908802.66	Non-Participating	1	32
313	718932.81	4908775.31	Non-Participating	1	32
314	718917.79	4908752.12	Non-Participating	1	32
315	718886.39	4908753.91	Non-Participating	1	32
316	718864.96	4908748.89	Non-Participating	1	32
317	719315.87	4908867.66	Non-Participating	1	32
318	719338.08	4908860.01	Non-Participating	1	32
319	719358.98	4908856.51	Non-Participating	1	32
320	719382.24	4908848.92	Non-Participating	1	32
321	719423.86	4908836.08	Non-Participating	1	32
322	719448.43	4908815.84	Non-Participating	1	32
327	719655.92	4908969.59	Non-Participating	1	32
328	719510.56	4908805.86	Non-Participating	1	32
329	719494.17	4908824.72	Non-Participating	1	32
330	719480.38	4908831.06	Non-Participating	1	32
331	719621.89	4908806.30	Non-Participating	1	32
332	719635.36	4908828.68	Non-Participating	1	32
333	719692.62	4908881.15	Non-Participating	1	32
334	719714.06	4908894.66	Non-Participating	1	32
335	719775.28	4908916.96	Non-Participating	1	32
336	719783.54	4908972.62	Non-Participating	1	32
337	719827.18	4908944.00	Non-Participating	1	32
338	719821.62	4909008.89	Non-Participating	1	32
340	719863.03	4908964.75	Non-Participating	1	32
341	719908.49	4908984.50	Non-Participating	1	32
342	719889.00	4909025.73	Non-Participating	1	32
343	719916.82	4909065.08	Non-Participating	1	32
344	719960.33	4909056.08	Non-Participating	1	32
345	719970.89	4909004.75	Non-Participating	1	32
347	720006.42	4909030.79	Non-Participating	1	32
348	720028.40	4909070.31	Non-Participating	1	32
349	719981.33	4909102.97	Non-Participating	1	32
350	719231.68	4908876.50	Non-Participating	1	32
352	719602.30	4908788.46	Non-Participating	1	32

Table D-1A: Project + Ruthton + Lake Benton Wind II Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project + Ruthton + Lake Benton Wind II Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
353	719538.13	4908797.13	Non-Participating	1	32
355	723529.44	4909379.33	Non-Participating	1	31
384	721820.17	4907219.46	Non-Participating	1	41
386	723908.08	4908855.30	Non-Participating	1	32
388	724139.90	4908828.11	Non-Participating	1	32
390	723596.89	4908931.73	Non-Participating	1	32
391	723532.73	4908905.53	Non-Participating	1	32
393	722215.45	4908035.25	Non-Participating	1	35
394	722177.41	4908058.91	Non-Participating	1	36
395	722056.64	4908256.22	Non-Participating	1	35
396	721948.07	4908375.27	Non-Participating	1	34
400	721565.91	4908675.92	Non-Participating	1	34
405	720268.50	4908203.65	Non-Participating	1	34
406	720369.09	4908241.09	Non-Participating	1	34
410	720048.78	4907946.28	Non-Participating	1	34
411	720116.92	4907819.45	Non-Participating	1	35
412	719794.95	4907709.10	Non-Participating	1	35
413	719782.62	4907676.53	Non-Participating	1	35
414	719848.76	4907583.53	Non-Participating	1	35
421	719588.35	4907315.19	Non-Participating	1	35
422	719376.99	4907276.82	Non-Participating	1	35
423	719406.83	4907178.95	Non-Participating	1	35
426	719330.01	4906440.32	Non-Participating	1	38
429	717938.68	4904865.30	Non-Participating	1	39
430	717932.82	4904896.09	Non-Participating	1	38
431	717915.15	4904653.73	Non-Participating	1	39
432	717963.00	4904727.58	Non-Participating	1	39
433	718000.35	4904756.38	Non-Participating	1	39
434	718053.13	4904782.14	Non-Participating	1	39
435	718055.75	4904739.22	Non-Participating	1	39
438	717699.27	4904628.61	Non-Participating	1	38
439	717671.57	4904626.25	Non-Participating	1	38
440	717564.02	4904661.44	Non-Participating	1	37
441	717530.49	4904678.61	Non-Participating	1	37
442	717277.82	4904821.59	Non-Participating	1	34
443	717311.81	4904655.97	Non-Participating	1	36
444	717272.02	4904656.19	Non-Participating	1	36
445	717237.39	4904648.11	Non-Participating	1	36
446	717204.21	4904648.73	Non-Participating	1	36
447	717169.91	4904645.97	Non-Participating	1	36
448	717099.04	4904644.95	Non-Participating	1	36
449	717327.26	4904576.71	Non-Participating	1	37
450	717260.30	4904565.99	Non-Participating	1	37
451	717411.00	4904486.37	Participating	1	36
452	717451.66	4904493.50	Participating	1	36
453	717449.05	4904427.71	Participating	1	37

Table D-1A: Project + Ruthton + Lake Benton Wind II Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project + Ruthton + Lake Benton Wind II Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
454	717429.94	4904425.88	Participating	1	37
455	717336.41	4904481.15	Non-Participating	1	36
456	717225.45	4904344.45	Non-Participating	1	37
457	717269.99	4904375.01	Non-Participating	1	37
458	717222.15	4904431.08	Non-Participating	1	37
459	717267.74	4904455.08	Non-Participating	1	37
460	717265.56	4904425.78	Non-Participating	1	37
461	717264.21	4904404.49	Non-Participating	1	37
462	717224.49	4904457.74	Non-Participating	1	36
463	717219.75	4904491.92	Non-Participating	1	36
464	717121.71	4904382.52	Non-Participating	1	37
465	717145.67	4904402.55	Non-Participating	1	37
466	717115.41	4904420.58	Non-Participating	1	37
467	717126.03	4904463.65	Non-Participating	1	36
468	717011.84	4904531.58	Non-Participating	1	33
469	717114.32	4904557.73	Non-Participating	1	35
470	717152.66	4904559.41	Non-Participating	1	35
471	717179.04	4904594.16	Non-Participating	1	36
472	717199.47	4904596.07	Non-Participating	1	36
473	717213.29	4904565.10	Non-Participating	1	37
474	717110.15	4904593.27	Non-Participating	1	36
475	717079.66	4904593.39	Non-Participating	1	35
476	717049.32	4904590.87	Non-Participating	1	35
477	717003.01	4904556.89	Non-Participating	1	33
478	717001.77	4904587.97	Non-Participating	1	35
479	717020.75	4904646.13	Non-Participating	1	35
480	716988.35	4904644.82	Non-Participating	1	35
481	716963.30	4904642.62	Non-Participating	1	34
482	716991.24	4904467.35	Non-Participating	1	32
483	716903.21	4904378.45	Non-Participating	1	32
484	716837.08	4904397.61	Non-Participating	1	31
485	716939.50	4904923.55	Non-Participating	1	31
486	716909.64	4904848.14	Non-Participating	1	31
487	717001.95	4904867.04	Non-Participating	1	31
488	716674.31	4904664.07	Non-Participating	1	30
489	716825.86	4904581.19	Non-Participating	1	35
490	716856.90	4904583.09	Non-Participating	1	34
491	716882.54	4904586.65	Non-Participating	1	35
492	716878.39	4904513.48	Non-Participating	1	33
493	716916.94	4904511.86	Non-Participating	1	33
494	716948.95	4904530.39	Non-Participating	1	34
495	716949.29	4904568.19	Non-Participating	1	35
496	716942.67	4904589.66	Non-Participating	1	35
497	716911.86	4904573.19	Non-Participating	1	35
498	716917.97	4904635.88	Non-Participating	1	35
499	716890.24	4904634.18	Non-Participating	1	35

Table D-1A: Project + Ruthton + Lake Benton Wind II Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project + Ruthton + Lake Benton Wind II Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
500	716854.83	4904638.65	Non-Participating	1	35
501	716518.40	4904883.23	Non-Participating	1	33
502	716602.70	4904783.65	Non-Participating	1	32
503	716565.00	4904619.61	Non-Participating	1	32
504	716489.56	4904682.61	Non-Participating	1	32
505	716473.85	4904722.74	Non-Participating	1	32
506	716442.68	4904744.70	Non-Participating	1	32
507	716445.50	4904785.31	Non-Participating	1	33
508	716424.48	4904684.60	Non-Participating	1	32
509	716223.64	4904999.11	Non-Participating	1	32
510	716354.23	4905179.04	Non-Participating	1	33
511	716338.97	4905246.51	Non-Participating	1	33
512	716459.20	4905309.54	Non-Participating	1	33
513	716453.10	4905409.39	Non-Participating	1	33
514	716418.30	4905353.97	Non-Participating	1	33
515	716427.83	4905367.28	Non-Participating	1	33
516	716458.13	4905288.00	Non-Participating	1	33
517	715843.66	4905893.14	Non-Participating	1	32
518	715773.02	4905877.69	Non-Participating	1	30
519	715815.13	4905344.94	Non-Participating	1	31
520	715824.71	4905292.24	Non-Participating	1	31
521	715867.43	4905309.16	Non-Participating	1	30
522	715166.41	4904844.74	Non-Participating	1	31
523	715205.36	4904754.06	Non-Participating	1	31
524	715157.37	4904393.98	Non-Participating	1	31
525	715215.94	4904385.63	Non-Participating	1	31
526	715199.70	4904352.03	Non-Participating	1	31
527	715356.05	4904461.80	Non-Participating	1	32
528	715417.46	4904498.17	Non-Participating	1	32
529	715407.47	4904466.54	Non-Participating	1	32
530	715666.65	4904585.78	Non-Participating	1	32
531	715696.65	4904576.48	Non-Participating	1	32
532	715724.48	4904576.59	Non-Participating	1	32
533	715756.97	4904578.58	Non-Participating	1	32
534	715778.32	4904580.68	Non-Participating	1	32
535	715805.26	4904582.32	Non-Participating	1	32
536	715837.95	4904581.14	Non-Participating	1	31
537	715835.66	4904540.43	Non-Participating	1	31
538	715797.01	4904522.16	Non-Participating	1	32
539	715742.38	4904518.03	Non-Participating	1	32
540	715681.73	4904534.21	Non-Participating	1	32
541	715679.22	4904510.19	Non-Participating	1	31
542	715894.13	4904455.71	Non-Participating	1	32
543	715859.67	4904459.97	Non-Participating	1	31
544	715826.19	4904461.11	Non-Participating	1	31
545	715798.36	4904461.00	Non-Participating	1	31

Table D-1A: Project + Ruthton + Lake Benton Wind II Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project + Ruthton + Lake Benton Wind II Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
546	715893.31	4904508.16	Non-Participating	1	32
547	715892.01	4904529.56	Non-Participating	1	32
548	715893.34	4904559.87	Non-Participating	1	31
549	715908.04	4904592.58	Non-Participating	1	31
550	715937.31	4904595.17	Non-Participating	1	32
551	715977.73	4904597.64	Non-Participating	1	32
552	715998.33	4904598.89	Non-Participating	1	32
553	716045.23	4904599.37	Non-Participating	1	32
554	716045.31	4904546.09	Non-Participating	1	32
555	716009.60	4904544.70	Non-Participating	1	32
556	715972.76	4904548.81	Non-Participating	1	32
557	715949.78	4904547.41	Non-Participating	1	32
558	715954.67	4904506.34	Non-Participating	1	32
559	715639.77	4904166.54	Non-Participating	1	30
560	715706.97	4904199.28	Non-Participating	1	30
568	715127.65	4895407.57	Non-Participating	1	30
578	715224.57	4895378.18	Non-Participating	1	30
613	724975.11	4897668.13	Non-Participating	1	38
669	716989.84	4896233.57	Non-Participating	1	34
692	714314.71	4895847.22	Non-Participating	1	30
698	714205.06	4895733.41	Non-Participating	1	27
745	726858.39	4900143.28	Participating	1	33
746	726865.43	4900158.30	Participating	1	33
791	719916.57	4900476.21	Participating	1	45
793	719578.52	4900642.43	Participating	1	46
841	718039.49	4900059.75	Participating	1	47
924	727022.24	4902627.29	Non-Participating	1	35
941	724623.73	4903937.11	Participating	1	46
970	718804.83	4903017.02	Participating	1	46
985	714318.77	4902656.83	Non-Participating	1	33
986	714237.97	4903398.65	Non-Participating	1	32
997	714603.77	4903727.73	Non-Participating	1	32
1053	726925.43	4905673.26	Non-Participating	1	33
1054	726986.94	4905673.30	Non-Participating	1	32
1055	727460.91	4905672.52	Non-Participating	1	32
1056	727588.03	4905661.99	Non-Participating	1	31
1057	727648.51	4905661.71	Non-Participating	1	31
1058	727857.79	4905504.27	Non-Participating	1	31
1072	727319.90	4901042.05	Non-Participating	1	33
1076	728362.36	4902262.86	Non-Participating	1	31
1081	713673.07	4900785.04	Non-Participating	1	32
1082	726638.58	4904876.28	Non-Participating	1	34
1083	719182.87	4905036.07	Participating	1	45

Table D-1B: Project + Ruthton + Lake Benton Wind II Results by Sound Level

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project + Ruthton + Lake Benton Wind II Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
44	720889.44	4900807.13	Participating	1	52
42	722427.30	4900617.84	Non-Participating	1	48
138	720913.33	4905533.52	Participating	1	47
85	722982.06	4904008.09	Participating	1	47
141	721904.81	4906033.39	Participating	1	47
841	718039.49	4900059.75	Participating	1	47
46	718911.99	4899677.74	Participating	1	47
89	718770.32	4903420.97	Participating	1	47
93	722006.38	4905029.65	Participating	1	47
92	721996.88	4904643.52	Participating	1	47
71	725137.82	4902529.85	Participating	1	47
55	717076.39	4901073.99	Participating	1	47
91	723368.88	4904718.11	Participating	1	47
151	721719.87	4905358.34	Participating	1	47
27	721690.13	4899054.22	Participating	1	47
49	719388.68	4900626.02	Participating	1	47
29	723148.39	4899253.41	Non-Participating	1	47
67	722830.76	4902522.74	Participating	1	47
86	720375.68	4903106.67	Participating	1	47
941	724623.73	4903937.11	Participating	1	46
66	720678.38	4902318.70	Non-Participating	1	46
60	718480.21	4901000.12	Participating	1	46
244	718764.15	4902985.61	Participating	1	46
237	719557.26	4900666.24	Participating	1	46
26	722203.20	4898274.38	Participating	1	46
61	718385.88	4902176.53	Participating	1	46
62	718203.16	4902322.57	Participating	1	46
970	718804.83	4903017.02	Participating	1	46
793	719578.52	4900642.43	Participating	1	46
84	722333.43	4903262.08	Participating	1	46
164	724320.81	4903427.17	Participating	1	46
64	719470.78	4902334.95	Participating	1	46
178	723334.67	4906665.95	Participating	1	46
65	719873.61	4902159.54	Participating	1	46
90	718659.29	4903828.29	Participating	1	45
169	723372.30	4905615.79	Participating	1	45
25	720904.17	4899187.90	Participating	1	45
94	718774.53	4904450.55	Participating	1	45
88	720550.53	4904032.74	Participating	1	45
154	723523.13	4905122.61	Non-Participating	1	45
68	724305.46	4902285.98	Participating	1	45
235	723475.42	4905860.10	Participating	1	45
1083	719182.87	4905036.07	Participating	1	45
791	719916.57	4900476.21	Participating	1	45
52	717119.07	4900238.72	Participating	1	45
28	723264.12	4899043.61	Participating	1	45

Table D-1B: Project + Ruthton + Lake Benton Wind II Results by Sound Level

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project + Ruthton + Lake Benton Wind II Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
171	723461.82	4905731.71	Participating	1	45
63	719389.44	4902171.45	Participating	1	45
16	715723.31	4898648.13	Non-Participating	1	45
103	719140.84	4905043.74	Participating	1	45
83	723492.59	4902812.41	Non-Participating	1	44
56	715837.07	4900177.49	Participating	1	44
105	719636.02	4905481.91	Non-Participating	1	44
53	717301.27	4900451.69	Participating	1	44
51	717258.54	4899542.38	Non-Participating	1	44
1	724967.32	4896341.13	Non-Participating	1	44
43	721991.20	4899704.37	Non-Participating	1	44
3	725625.32	4896059.58	Non-Participating	1	43
87	720951.07	4903766.63	Participating	1	43
109	720594.55	4906146.96	Participating	1	43
70	725160.81	4902178.69	Non-Participating	1	43
50	717161.40	4899221.14	Non-Participating	1	43
81	725352.22	4903786.97	Participating	1	43
20	717476.52	4898978.04	Non-Participating	1	42
2	726537.89	4896321.29	Non-Participating	1	42
161	724163.66	4905228.63	Participating	1	42
13	723456.49	4896774.78	Non-Participating	1	42
238	715848.85	4900637.11	Non-Participating	1	42
95	718467.45	4904553.41	Participating	1	42
22	718141.05	4897676.55	Participating	1	42
37	723990.20	4899418.91	Non-Participating	1	41
17	715447.24	4899194.95	Non-Participating	1	41
384	721820.17	4907219.46	Non-Participating	1	41
59	716453.80	4901946.72	Non-Participating	1	41
146	721666.16	4907223.36	Non-Participating	1	41
256	723187.80	4897202.59	Non-Participating	1	41
24	719282.97	4897515.15	Participating	1	40
19	717211.44	4898135.31	Participating	1	40
112	720406.24	4906727.10	Non-Participating	1	40
82	725699.53	4904212.19	Non-Participating	1	39
102	718274.26	4905044.01	Participating	1	39
435	718055.75	4904739.22	Non-Participating	1	39
434	718053.13	4904782.14	Non-Participating	1	39
431	717915.15	4904653.73	Non-Participating	1	39
433	718000.35	4904756.38	Non-Participating	1	39
32	724971.27	4897228.10	Non-Participating	1	39
149	721695.97	4907454.30	Non-Participating	1	39
432	717963.00	4904727.58	Non-Participating	1	39
172	724504.21	4905783.38	Non-Participating	1	39
174	724225.15	4906343.92	Participating	1	39
69	725187.55	4901454.70	Non-Participating	1	39
23	718315.29	4897230.65	Non-Participating	1	39

Table D-1B: Project + Ruthton + Lake Benton Wind II Results by Sound Level

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project + Ruthton + Lake Benton Wind II Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
40	724716.86	4900688.30	Non-Participating	1	39
101	718162.37	4905006.41	Participating	1	39
429	717938.68	4904865.30	Non-Participating	1	39
131	719114.20	4906081.78	Non-Participating	1	38
430	717932.82	4904896.09	Non-Participating	1	38
613	724975.11	4897668.13	Non-Participating	1	38
100	717883.25	4904909.85	Non-Participating	1	38
114	719215.91	4906259.09	Non-Participating	1	38
438	717699.27	4904628.61	Non-Participating	1	38
439	717671.57	4904626.25	Non-Participating	1	38
115	719213.16	4906349.80	Non-Participating	1	38
116	719291.50	4906403.40	Non-Participating	1	38
117	719371.22	4906459.76	Non-Participating	1	38
118	719412.46	4906490.00	Non-Participating	1	38
426	719330.01	4906440.32	Non-Participating	1	38
119	719463.31	4906543.60	Non-Participating	1	38
120	719483.93	4906571.09	Non-Participating	1	38
31	725540.63	4897544.85	Non-Participating	1	38
457	717269.99	4904375.01	Non-Participating	1	37
121	719500.42	4906613.70	Non-Participating	1	37
456	717225.45	4904344.45	Non-Participating	1	37
461	717264.21	4904404.49	Non-Participating	1	37
122	719526.54	4906674.17	Non-Participating	1	37
184	725196.23	4905627.67	Non-Participating	1	37
225	726508.78	4897454.26	Non-Participating	1	37
123	719537.53	4906700.29	Non-Participating	1	37
460	717265.56	4904425.78	Non-Participating	1	37
464	717121.71	4904382.52	Non-Participating	1	37
124	719569.14	4906742.89	Non-Participating	1	37
465	717145.67	4904402.55	Non-Participating	1	37
125	719584.26	4906795.12	Non-Participating	1	37
185	725317.77	4905632.44	Non-Participating	1	37
458	717222.15	4904431.08	Non-Participating	1	37
466	717115.41	4904420.58	Non-Participating	1	37
127	719643.36	4906894.08	Non-Participating	1	37
126	719588.39	4906869.34	Non-Participating	1	37
459	717267.74	4904455.08	Non-Participating	1	37
450	717260.30	4904565.99	Non-Participating	1	37
440	717564.02	4904661.44	Non-Participating	1	37
441	717530.49	4904678.61	Non-Participating	1	37
449	717327.26	4904576.71	Non-Participating	1	37
453	717449.05	4904427.71	Participating	1	37
454	717429.94	4904425.88	Participating	1	37
473	717213.29	4904565.10	Non-Participating	1	37
472	717199.47	4904596.07	Non-Participating	1	36
128	719573.27	4906936.69	Non-Participating	1	36

Table D-1B: Project + Ruthton + Lake Benton Wind II Results by Sound Level

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project + Ruthton + Lake Benton Wind II Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
218	722296.75	4907945.00	Non-Participating	1	36
219	722230.87	4907970.76	Non-Participating	1	36
471	717179.04	4904594.16	Non-Participating	1	36
446	717204.21	4904648.73	Non-Participating	1	36
451	717411.00	4904486.37	Participating	1	36
455	717336.41	4904481.15	Non-Participating	1	36
462	717224.49	4904457.74	Non-Participating	1	36
445	717237.39	4904648.11	Non-Participating	1	36
447	717169.91	4904645.97	Non-Participating	1	36
189	724410.32	4907052.07	Participating	1	36
444	717272.02	4904656.19	Non-Participating	1	36
467	717126.03	4904463.65	Non-Participating	1	36
182	725579.11	4905569.15	Non-Participating	1	36
220	722220.68	4907997.11	Non-Participating	1	36
443	717311.81	4904655.97	Non-Participating	1	36
38	725325.11	4899964.56	Non-Participating	1	36
463	717219.75	4904491.92	Non-Participating	1	36
133	719506.22	4907080.47	Non-Participating	1	36
250	720099.79	4907436.08	Non-Participating	1	36
452	717451.66	4904493.50	Participating	1	36
134	719465.69	4907121.78	Non-Participating	1	36
448	717099.04	4904644.95	Non-Participating	1	36
394	722177.41	4908058.91	Non-Participating	1	36
474	717110.15	4904593.27	Non-Participating	1	36
41	725875.26	4900834.50	Non-Participating	1	36
222	727482.24	4897801.59	Non-Participating	1	36
298	722127.86	4908126.15	Non-Participating	1	36
299	722153.60	4908089.69	Non-Participating	1	36
393	722215.45	4908035.25	Non-Participating	1	35
423	719406.83	4907178.95	Non-Participating	1	35
421	719588.35	4907315.19	Non-Participating	1	35
470	717152.66	4904559.41	Non-Participating	1	35
135	719426.72	4907251.15	Non-Participating	1	35
475	717079.66	4904593.39	Non-Participating	1	35
255	715015.61	4897377.20	Non-Participating	1	35
924	727022.24	4902627.29	Non-Participating	1	35
479	717020.75	4904646.13	Non-Participating	1	35
205	726919.36	4902176.15	Non-Participating	1	35
422	719376.99	4907276.82	Non-Participating	1	35
179	725634.47	4905935.88	Non-Participating	1	35
414	719848.76	4907583.53	Non-Participating	1	35
137	719365.16	4907339.21	Non-Participating	1	35
478	717001.77	4904587.97	Non-Participating	1	35
136	719377.63	4907389.09	Non-Participating	1	35
495	716949.29	4904568.19	Non-Participating	1	35
496	716942.67	4904589.66	Non-Participating	1	35

Table D-1B: Project + Ruthton + Lake Benton Wind II Results by Sound Level

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project + Ruthton + Lake Benton Wind II Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
497	716911.86	4904573.19	Non-Participating	1	35
4	719410.70	4896051.41	Non-Participating	1	35
411	720116.92	4907819.45	Non-Participating	1	35
257	719610.00	4907569.00	Non-Participating	1	35
296	722035.11	4908307.34	Non-Participating	1	35
395	722056.64	4908256.22	Non-Participating	1	35
480	716988.35	4904644.82	Non-Participating	1	35
491	716882.54	4904586.65	Non-Participating	1	35
297	722089.60	4908201.94	Non-Participating	1	35
499	716890.24	4904634.18	Non-Participating	1	35
258	719700.93	4907644.54	Non-Participating	1	35
261	719857.46	4907742.57	Non-Participating	1	35
294	722024.70	4908323.58	Non-Participating	1	35
413	719782.62	4907676.53	Non-Participating	1	35
469	717114.32	4904557.73	Non-Participating	1	35
498	716917.97	4904635.88	Non-Participating	1	35
36	726225.39	4899113.03	Non-Participating	1	35
260	719745.33	4907684.29	Non-Participating	1	35
476	717049.32	4904590.87	Non-Participating	1	35
98	716874.05	4896617.04	Non-Participating	1	35
262	719890.34	4907786.12	Non-Participating	1	35
263	719919.46	4907805.15	Non-Participating	1	35
293	721992.22	4908358.55	Non-Participating	1	35
295	722011.37	4908342.31	Non-Participating	1	35
412	719794.95	4907709.10	Non-Participating	1	35
489	716825.86	4904581.19	Non-Participating	1	35
500	716854.83	4904638.65	Non-Participating	1	35
229	726718.52	4901305.38	Non-Participating	1	34
265	719947.43	4907836.01	Non-Participating	1	34
266	719982.04	4907873.21	Non-Participating	1	34
267	720021.83	4907900.02	Non-Participating	1	34
292	721978.07	4908374.37	Non-Participating	1	34
396	721948.07	4908375.27	Non-Participating	1	34
490	716856.90	4904583.09	Non-Participating	1	34
410	720048.78	4907946.28	Non-Participating	1	34
481	716963.30	4904642.62	Non-Participating	1	34
1082	726638.58	4904876.28	Non-Participating	1	34
194	724847.86	4907280.34	Non-Participating	1	34
268	720072.19	4907973.95	Non-Participating	1	34
199	726107.97	4905764.29	Non-Participating	1	34
269	720106.25	4908011.80	Non-Participating	1	34
273	720273.48	4908078.90	Non-Participating	1	34
290	721861.07	4908467.22	Non-Participating	1	34
291	721835.68	4908492.61	Non-Participating	1	34
270	720141.70	4908061.35	Non-Participating	1	34
272	720179.89	4908091.98	Non-Participating	1	34

Table D-1B: Project + Ruthton + Lake Benton Wind II Results by Sound Level

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project + Ruthton + Lake Benton Wind II Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
289	721794.46	4908525.50	Non-Participating	1	34
274	720454.78	4908220.05	Non-Participating	1	34
201	726503.06	4905320.15	Non-Participating	1	34
288	721751.99	4908548.40	Non-Participating	1	34
275	720401.45	4908238.23	Non-Participating	1	34
405	720268.50	4908203.65	Non-Participating	1	34
406	720369.09	4908241.09	Non-Participating	1	34
276	720304.09	4908243.08	Non-Participating	1	34
277	720344.49	4908251.56	Non-Participating	1	34
286	721664.28	4908602.97	Non-Participating	1	34
287	721637.87	4908618.55	Non-Participating	1	34
285	721612.76	4908638.90	Non-Participating	1	34
58	716032.82	4901955.98	Non-Participating	1	34
442	717277.82	4904821.59	Non-Participating	1	34
245	727235.63	4904241.24	Non-Participating	1	34
246	727363.29	4903829.96	Non-Participating	1	34
252	716921.70	4896257.62	Non-Participating	1	34
281	721387.20	4908657.52	Non-Participating	1	34
400	721565.91	4908675.92	Non-Participating	1	34
494	716948.95	4904530.39	Non-Participating	1	34
669	716989.84	4896233.57	Non-Participating	1	34
236	723175.31	4908595.11	Non-Participating	1	34
284	721538.73	4908695.61	Non-Participating	1	34
228	726976.25	4900694.01	Non-Participating	1	33
745	726858.39	4900143.28	Participating	1	33
746	726865.43	4900158.30	Participating	1	33
234	725169.65	4907420.70	Non-Participating	1	33
278	721275.07	4908713.80	Non-Participating	1	33
513	716453.10	4905409.39	Non-Participating	1	33
279	721305.81	4908733.71	Non-Participating	1	33
280	721324.42	4908753.63	Non-Participating	1	33
283	721448.68	4908770.08	Non-Participating	1	33
282	721377.24	4908782.63	Non-Participating	1	33
512	716459.20	4905309.54	Non-Participating	1	33
516	716458.13	4905288.00	Non-Participating	1	33
226	727202.86	4899979.73	Non-Participating	1	33
1072	727319.90	4901042.05	Non-Participating	1	33
514	716418.30	4905353.97	Non-Participating	1	33
515	716427.83	4905367.28	Non-Participating	1	33
243	727336.17	4901068.97	Non-Participating	1	33
510	716354.23	4905179.04	Non-Participating	1	33
492	716878.39	4904513.48	Non-Participating	1	33
501	716518.40	4904883.23	Non-Participating	1	33
511	716338.97	4905246.51	Non-Participating	1	33
230	726456.05	4906213.42	Non-Participating	1	33
468	717011.84	4904531.58	Non-Participating	1	33

Table D-1B: Project + Ruthton + Lake Benton Wind II Results by Sound Level

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project + Ruthton + Lake Benton Wind II Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
477	717003.01	4904556.89	Non-Participating	1	33
493	716916.94	4904511.86	Non-Participating	1	33
985	714318.77	4902656.83	Non-Participating	1	33
233	725536.82	4907446.28	Non-Participating	1	33
507	716445.50	4904785.31	Non-Participating	1	33
1053	726925.43	4905673.26	Non-Participating	1	33
239	727874.48	4902603.59	Non-Participating	1	32
1054	726986.94	4905673.30	Non-Participating	1	32
509	716223.64	4904999.11	Non-Participating	1	32
240	727888.73	4902392.04	Non-Participating	1	32
391	723532.73	4908905.53	Non-Participating	1	32
231	726354.15	4906752.29	Non-Participating	1	32
390	723596.89	4908931.73	Non-Participating	1	32
503	716565.00	4904619.61	Non-Participating	1	32
997	714603.77	4903727.73	Non-Participating	1	32
352	719602.30	4908788.46	Non-Participating	1	32
1081	713673.07	4900785.04	Non-Participating	1	32
331	719621.89	4908806.30	Non-Participating	1	32
386	723908.08	4908855.30	Non-Participating	1	32
328	719510.56	4908805.86	Non-Participating	1	32
332	719635.36	4908828.68	Non-Participating	1	32
333	719692.62	4908881.15	Non-Participating	1	32
353	719538.13	4908797.13	Non-Participating	1	32
504	716489.56	4904682.61	Non-Participating	1	32
334	719714.06	4908894.66	Non-Participating	1	32
335	719775.28	4908916.96	Non-Participating	1	32
337	719827.18	4908944.00	Non-Participating	1	32
322	719448.43	4908815.84	Non-Participating	1	32
329	719494.17	4908824.72	Non-Participating	1	32
330	719480.38	4908831.06	Non-Participating	1	32
340	719863.03	4908964.75	Non-Participating	1	32
341	719908.49	4908984.50	Non-Participating	1	32
345	719970.89	4909004.75	Non-Participating	1	32
347	720006.42	4909030.79	Non-Participating	1	32
388	724139.90	4908828.11	Non-Participating	1	32
502	716602.70	4904783.65	Non-Participating	1	32
321	719423.86	4908836.08	Non-Participating	1	32
336	719783.54	4908972.62	Non-Participating	1	32
319	719358.98	4908856.51	Non-Participating	1	32
320	719382.24	4908848.92	Non-Participating	1	32
338	719821.62	4909008.89	Non-Participating	1	32
342	719889.00	4909025.73	Non-Participating	1	32
344	719960.33	4909056.08	Non-Participating	1	32
348	720028.40	4909070.31	Non-Participating	1	32
517	715843.66	4905893.14	Non-Participating	1	32
531	715696.65	4904576.48	Non-Participating	1	32

Table D-1B: Project + Ruthton + Lake Benton Wind II Results by Sound Level

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project + Ruthton + Lake Benton Wind II Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
553	716045.23	4904599.37	Non-Participating	1	32
554	716045.31	4904546.09	Non-Participating	1	32
318	719338.08	4908860.01	Non-Participating	1	32
327	719655.92	4908969.59	Non-Participating	1	32
343	719916.82	4909065.08	Non-Participating	1	32
530	715666.65	4904585.78	Non-Participating	1	32
247	727860.69	4904504.97	Non-Participating	1	32
317	719315.87	4908867.66	Non-Participating	1	32
349	719981.33	4909102.97	Non-Participating	1	32
506	716442.68	4904744.70	Non-Participating	1	32
508	716424.48	4904684.60	Non-Participating	1	32
528	715417.46	4904498.17	Non-Participating	1	32
538	715797.01	4904522.16	Non-Participating	1	32
540	715681.73	4904534.21	Non-Participating	1	32
552	715998.33	4904598.89	Non-Participating	1	32
555	716009.60	4904544.70	Non-Participating	1	32
556	715972.76	4904548.81	Non-Participating	1	32
232	725787.65	4907743.68	Non-Participating	1	32
314	718917.79	4908752.12	Non-Participating	1	32
350	719231.68	4908876.50	Non-Participating	1	32
535	715805.26	4904582.32	Non-Participating	1	32
14	713480.83	4898900.44	Non-Participating	1	32
307	719064.83	4908862.39	Non-Participating	1	32
308	719105.42	4908866.46	Non-Participating	1	32
311	718976.83	4908827.32	Non-Participating	1	32
312	718946.52	4908802.66	Non-Participating	1	32
313	718932.81	4908775.31	Non-Participating	1	32
315	718886.39	4908753.91	Non-Participating	1	32
316	718864.96	4908748.89	Non-Participating	1	32
482	716991.24	4904467.35	Non-Participating	1	32
505	716473.85	4904722.74	Non-Participating	1	32
532	715724.48	4904576.59	Non-Participating	1	32
534	715778.32	4904580.68	Non-Participating	1	32
539	715742.38	4904518.03	Non-Participating	1	32
551	715977.73	4904597.64	Non-Participating	1	32
557	715949.78	4904547.41	Non-Participating	1	32
558	715954.67	4904506.34	Non-Participating	1	32
986	714237.97	4903398.65	Non-Participating	1	32
254	715238.72	4896061.92	Non-Participating	1	32
309	719028.86	4908852.24	Non-Participating	1	32
529	715407.47	4904466.54	Non-Participating	1	32
483	716903.21	4904378.45	Non-Participating	1	32
303	718844.90	4908782.13	Non-Participating	1	32
310	718997.87	4908856.18	Non-Participating	1	32
527	715356.05	4904461.80	Non-Participating	1	32
533	715756.97	4904578.58	Non-Participating	1	32

Table D-1B: Project + Ruthton + Lake Benton Wind II Results by Sound Level

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project + Ruthton + Lake Benton Wind II Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
542	715894.13	4904455.71	Non-Participating	1	32
546	715893.31	4904508.16	Non-Participating	1	32
547	715892.01	4904529.56	Non-Participating	1	32
550	715937.31	4904595.17	Non-Participating	1	32
1055	727460.91	4905672.52	Non-Participating	1	32
242	728301.58	4901544.64	Non-Participating	1	32
302	718804.77	4908805.37	Non-Participating	1	32
485	716939.50	4904923.55	Non-Participating	1	31
536	715837.95	4904581.14	Non-Participating	1	31
548	715893.34	4904559.87	Non-Participating	1	31
549	715908.04	4904592.58	Non-Participating	1	31
1076	728362.36	4902262.86	Non-Participating	1	31
355	723529.44	4909379.33	Non-Participating	1	31
524	715157.37	4904393.98	Non-Participating	1	31
301	718789.00	4908855.07	Non-Participating	1	31
484	716837.08	4904397.61	Non-Participating	1	31
523	715205.36	4904754.06	Non-Participating	1	31
525	715215.94	4904385.63	Non-Participating	1	31
537	715835.66	4904540.43	Non-Participating	1	31
1056	727588.03	4905661.99	Non-Participating	1	31
541	715679.22	4904510.19	Non-Participating	1	31
545	715798.36	4904461.00	Non-Participating	1	31
248	728267.58	4904129.52	Non-Participating	1	31
300	718757.08	4908934.79	Non-Participating	1	31
522	715166.41	4904844.74	Non-Participating	1	31
1057	727648.51	4905661.71	Non-Participating	1	31
520	715824.71	4905292.24	Non-Participating	1	31
1058	727857.79	4905504.27	Non-Participating	1	31
526	715199.70	4904352.03	Non-Participating	1	31
487	717001.95	4904867.04	Non-Participating	1	31
543	715859.67	4904459.97	Non-Participating	1	31
519	715815.13	4905344.94	Non-Participating	1	31
486	716909.64	4904848.14	Non-Participating	1	31
544	715826.19	4904461.11	Non-Participating	1	31
488	716674.31	4904664.07	Non-Participating	1	30
521	715867.43	4905309.16	Non-Participating	1	30
578	715224.57	4895378.18	Non-Participating	1	30
560	715706.97	4904199.28	Non-Participating	1	30
568	715127.65	4895407.57	Non-Participating	1	30
559	715639.77	4904166.54	Non-Participating	1	30
518	715773.02	4905877.69	Non-Participating	1	30
692	714314.71	4895847.22	Non-Participating	1	30
698	714205.06	4895733.41	Non-Participating	1	27

Table D-2A: Project Only Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
1	724967.32	4896341.13	Non-Participating	1	28
2	726537.89	4896321.29	Non-Participating	1	27
3	725625.32	4896059.58	Non-Participating	1	28
4	719410.70	4896051.41	Non-Participating	1	33
13	723456.49	4896774.78	Non-Participating	1	31
14	713480.83	4898900.44	Non-Participating	1	31
16	715723.31	4898648.13	Non-Participating	1	44
17	715447.24	4899194.95	Non-Participating	1	41
19	717211.44	4898135.31	Participating	1	40
20	717476.52	4898978.04	Non-Participating	1	42
22	718141.05	4897676.55	Participating	1	42
23	718315.29	4897230.65	Non-Participating	1	38
24	719282.97	4897515.15	Participating	1	40
25	720904.17	4899187.90	Participating	1	45
26	722203.20	4898274.38	Participating	1	46
27	721690.13	4899054.22	Participating	1	46
28	723264.12	4899043.61	Participating	1	39
29	723148.39	4899253.41	Non-Participating	1	38
31	725540.63	4897544.85	Non-Participating	1	30
32	724971.27	4897228.10	Non-Participating	1	29
36	726225.39	4899113.03	Non-Participating	1	31
37	723990.20	4899418.91	Non-Participating	1	36
38	725325.11	4899964.56	Non-Participating	1	34
40	724716.86	4900688.30	Non-Participating	1	38
41	725875.26	4900834.50	Non-Participating	1	35
42	722427.30	4900617.84	Non-Participating	1	39
43	721991.20	4899704.37	Non-Participating	1	40
44	720889.44	4900807.13	Participating	1	39
46	718911.99	4899677.74	Participating	1	47
49	719388.68	4900626.02	Participating	1	46
50	717161.40	4899221.14	Non-Participating	1	43
51	717258.54	4899542.38	Non-Participating	1	44
52	717119.07	4900238.72	Participating	1	45
53	717301.27	4900451.69	Participating	1	44
55	717076.39	4901073.99	Participating	1	47
56	715837.07	4900177.49	Participating	1	44
58	716032.82	4901955.98	Non-Participating	1	34
59	716453.80	4901946.72	Non-Participating	1	41
60	718480.21	4901000.12	Participating	1	46
61	718385.88	4902176.53	Participating	1	46
62	718203.16	4902322.57	Participating	1	46
63	719389.44	4902171.45	Participating	1	44
64	719470.78	4902334.95	Participating	1	45
65	719873.61	4902159.54	Participating	1	45
66	720678.38	4902318.70	Non-Participating	1	41
67	722830.76	4902522.74	Participating	1	46

Table D-2A: Project Only Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
68	724305.46	4902285.98	Participating	1	45
69	725187.55	4901454.70	Non-Participating	1	38
70	725160.81	4902178.69	Non-Participating	1	43
71	725137.82	4902529.85	Participating	1	47
81	725352.22	4903786.97	Participating	1	43
82	725699.53	4904212.19	Non-Participating	1	39
83	723492.59	4902812.41	Non-Participating	1	44
84	722333.43	4903262.08	Participating	1	46
85	722982.06	4904008.09	Participating	1	47
86	720375.68	4903106.67	Participating	1	46
87	720951.07	4903766.63	Participating	1	43
88	720550.53	4904032.74	Participating	1	45
89	718770.32	4903420.97	Participating	1	47
90	718659.29	4903828.29	Participating	1	45
91	723368.88	4904718.11	Participating	1	47
92	721996.88	4904643.52	Participating	1	47
93	722006.38	4905029.65	Participating	1	47
94	718774.53	4904450.55	Participating	1	45
95	718467.45	4904553.41	Participating	1	42
98	716874.05	4896617.04	Non-Participating	1	34
100	717883.25	4904909.85	Non-Participating	1	38
101	718162.37	4905006.41	Participating	1	39
102	718274.26	4905044.01	Participating	1	39
103	719140.84	4905043.74	Participating	1	45
105	719636.02	4905481.91	Non-Participating	1	44
109	720594.55	4906146.96	Participating	1	43
112	720406.24	4906727.10	Non-Participating	1	40
114	719215.91	4906259.09	Non-Participating	1	38
115	719213.16	4906349.80	Non-Participating	1	38
116	719291.50	4906403.40	Non-Participating	1	38
117	719371.22	4906459.76	Non-Participating	1	38
118	719412.46	4906490.00	Non-Participating	1	38
119	719463.31	4906543.60	Non-Participating	1	38
120	719483.93	4906571.09	Non-Participating	1	37
121	719500.42	4906613.70	Non-Participating	1	37
122	719526.54	4906674.17	Non-Participating	1	37
123	719537.53	4906700.29	Non-Participating	1	37
124	719569.14	4906742.89	Non-Participating	1	37
125	719584.26	4906795.12	Non-Participating	1	37
126	719588.39	4906869.34	Non-Participating	1	37
127	719643.36	4906894.08	Non-Participating	1	37
128	719573.27	4906936.69	Non-Participating	1	36
131	719114.20	4906081.78	Non-Participating	1	38
133	719506.22	4907080.47	Non-Participating	1	36
134	719465.69	4907121.78	Non-Participating	1	36
135	719426.72	4907251.15	Non-Participating	1	35

Table D-2A: Project Only Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
136	719377.63	4907389.09	Non-Participating	1	35
137	719365.16	4907339.21	Non-Participating	1	35
138	720913.33	4905533.52	Participating	1	47
141	721904.81	4906033.39	Participating	1	47
146	721666.16	4907223.36	Non-Participating	1	41
149	721695.97	4907454.30	Non-Participating	1	39
151	721719.87	4905358.34	Participating	1	47
154	723523.13	4905122.61	Non-Participating	1	45
161	724163.66	4905228.63	Participating	1	42
164	724320.81	4903427.17	Participating	1	46
169	723372.30	4905615.79	Participating	1	45
171	723461.82	4905731.71	Participating	1	45
172	724504.21	4905783.38	Non-Participating	1	39
174	724225.15	4906343.92	Participating	1	39
178	723334.67	4906665.95	Participating	1	46
179	725634.47	4905935.88	Non-Participating	1	35
182	725579.11	4905569.15	Non-Participating	1	36
184	725196.23	4905627.67	Non-Participating	1	37
185	725317.77	4905632.44	Non-Participating	1	37
189	724410.32	4907052.07	Participating	1	36
194	724847.86	4907280.34	Non-Participating	1	34
199	726107.97	4905764.29	Non-Participating	1	34
201	726503.06	4905320.15	Non-Participating	1	34
205	726919.36	4902176.15	Non-Participating	1	35
218	722296.75	4907945.00	Non-Participating	1	36
219	722230.87	4907970.76	Non-Participating	1	36
220	722220.68	4907997.11	Non-Participating	1	36
222	727482.24	4897801.59	Non-Participating	1	28
225	726508.78	4897454.26	Non-Participating	1	29
226	727202.86	4899979.73	Non-Participating	1	31
228	726976.25	4900694.01	Non-Participating	1	32
229	726718.52	4901305.38	Non-Participating	1	34
230	726456.05	4906213.42	Non-Participating	1	33
231	726354.15	4906752.29	Non-Participating	1	32
232	725787.65	4907743.68	Non-Participating	1	31
233	725536.82	4907446.28	Non-Participating	1	32
234	725169.65	4907420.70	Non-Participating	1	33
235	723475.42	4905860.10	Participating	1	45
236	723175.31	4908595.11	Non-Participating	1	33
237	719557.26	4900666.24	Participating	1	46
238	715848.85	4900637.11	Non-Participating	1	42
239	727874.48	4902603.59	Non-Participating	1	32
240	727888.73	4902392.04	Non-Participating	1	32
242	728301.58	4901544.64	Non-Participating	1	30
243	727336.17	4901068.97	Non-Participating	1	32
244	718764.15	4902985.61	Participating	1	46

Table D-2A: Project Only Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
245	727235.63	4904241.24	Non-Participating	1	33
246	727363.29	4903829.96	Non-Participating	1	33
247	727860.69	4904504.97	Non-Participating	1	31
248	728267.58	4904129.52	Non-Participating	1	31
250	720099.79	4907436.08	Non-Participating	1	36
252	716921.70	4896257.62	Non-Participating	1	33
254	715238.72	4896061.92	Non-Participating	1	31
255	715015.61	4897377.20	Non-Participating	1	35
256	723187.80	4897202.59	Non-Participating	1	35
257	719610.00	4907569.00	Non-Participating	1	35
258	719700.93	4907644.54	Non-Participating	1	35
260	719745.33	4907684.29	Non-Participating	1	35
261	719857.46	4907742.57	Non-Participating	1	35
262	719890.34	4907786.12	Non-Participating	1	34
263	719919.46	4907805.15	Non-Participating	1	34
265	719947.43	4907836.01	Non-Participating	1	34
266	719982.04	4907873.21	Non-Participating	1	34
267	720021.83	4907900.02	Non-Participating	1	34
268	720072.19	4907973.95	Non-Participating	1	34
269	720106.25	4908011.80	Non-Participating	1	34
270	720141.70	4908061.35	Non-Participating	1	34
272	720179.89	4908091.98	Non-Participating	1	34
273	720273.48	4908078.90	Non-Participating	1	34
274	720454.78	4908220.05	Non-Participating	1	34
275	720401.45	4908238.23	Non-Participating	1	34
276	720304.09	4908243.08	Non-Participating	1	34
277	720344.49	4908251.56	Non-Participating	1	34
278	721275.07	4908713.80	Non-Participating	1	33
279	721305.81	4908733.71	Non-Participating	1	33
280	721324.42	4908753.63	Non-Participating	1	33
281	721387.20	4908657.52	Non-Participating	1	33
282	721377.24	4908782.63	Non-Participating	1	33
283	721448.68	4908770.08	Non-Participating	1	33
284	721538.73	4908695.61	Non-Participating	1	33
285	721612.76	4908638.90	Non-Participating	1	34
286	721664.28	4908602.97	Non-Participating	1	34
287	721637.87	4908618.55	Non-Participating	1	34
288	721751.99	4908548.40	Non-Participating	1	34
289	721794.46	4908525.50	Non-Participating	1	34
290	721861.07	4908467.22	Non-Participating	1	34
291	721835.68	4908492.61	Non-Participating	1	34
292	721978.07	4908374.37	Non-Participating	1	34
293	721992.22	4908358.55	Non-Participating	1	35
294	722024.70	4908323.58	Non-Participating	1	35
295	722011.37	4908342.31	Non-Participating	1	35
296	722035.11	4908307.34	Non-Participating	1	35

Table D-2A: Project Only Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
297	722089.60	4908201.94	Non-Participating	1	35
298	722127.86	4908126.15	Non-Participating	1	36
299	722153.60	4908089.69	Non-Participating	1	36
300	718757.08	4908934.79	Non-Participating	1	31
301	718789.00	4908855.07	Non-Participating	1	31
302	718804.77	4908805.37	Non-Participating	1	31
303	718844.90	4908782.13	Non-Participating	1	31
307	719064.83	4908862.39	Non-Participating	1	31
308	719105.42	4908866.46	Non-Participating	1	31
309	719028.86	4908852.24	Non-Participating	1	31
310	718997.87	4908856.18	Non-Participating	1	31
311	718976.83	4908827.32	Non-Participating	1	31
312	718946.52	4908802.66	Non-Participating	1	31
313	718932.81	4908775.31	Non-Participating	1	32
314	718917.79	4908752.12	Non-Participating	1	32
315	718886.39	4908753.91	Non-Participating	1	32
316	718864.96	4908748.89	Non-Participating	1	31
317	719315.87	4908867.66	Non-Participating	1	32
318	719338.08	4908860.01	Non-Participating	1	32
319	719358.98	4908856.51	Non-Participating	1	32
320	719382.24	4908848.92	Non-Participating	1	32
321	719423.86	4908836.08	Non-Participating	1	32
322	719448.43	4908815.84	Non-Participating	1	32
327	719655.92	4908969.59	Non-Participating	1	32
328	719510.56	4908805.86	Non-Participating	1	32
329	719494.17	4908824.72	Non-Participating	1	32
330	719480.38	4908831.06	Non-Participating	1	32
331	719621.89	4908806.30	Non-Participating	1	32
332	719635.36	4908828.68	Non-Participating	1	32
333	719692.62	4908881.15	Non-Participating	1	32
334	719714.06	4908894.66	Non-Participating	1	32
335	719775.28	4908916.96	Non-Participating	1	32
336	719783.54	4908972.62	Non-Participating	1	32
337	719827.18	4908944.00	Non-Participating	1	32
338	719821.62	4909008.89	Non-Participating	1	32
340	719863.03	4908964.75	Non-Participating	1	32
341	719908.49	4908984.50	Non-Participating	1	32
342	719889.00	4909025.73	Non-Participating	1	32
343	719916.82	4909065.08	Non-Participating	1	32
344	719960.33	4909056.08	Non-Participating	1	32
345	719970.89	4909004.75	Non-Participating	1	32
347	720006.42	4909030.79	Non-Participating	1	32
348	720028.40	4909070.31	Non-Participating	1	32
349	719981.33	4909102.97	Non-Participating	1	32
350	719231.68	4908876.50	Non-Participating	1	32
352	719602.30	4908788.46	Non-Participating	1	32

Table D-2A: Project Only Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
353	719538.13	4908797.13	Non-Participating	1	32
355	723529.44	4909379.33	Non-Participating	1	31
384	721820.17	4907219.46	Non-Participating	1	41
386	723908.08	4908855.30	Non-Participating	1	32
388	724139.90	4908828.11	Non-Participating	1	32
390	723596.89	4908931.73	Non-Participating	1	32
391	723532.73	4908905.53	Non-Participating	1	32
393	722215.45	4908035.25	Non-Participating	1	35
394	722177.41	4908058.91	Non-Participating	1	36
395	722056.64	4908256.22	Non-Participating	1	35
396	721948.07	4908375.27	Non-Participating	1	34
400	721565.91	4908675.92	Non-Participating	1	33
405	720268.50	4908203.65	Non-Participating	1	34
406	720369.09	4908241.09	Non-Participating	1	34
410	720048.78	4907946.28	Non-Participating	1	34
411	720116.92	4907819.45	Non-Participating	1	35
412	719794.95	4907709.10	Non-Participating	1	35
413	719782.62	4907676.53	Non-Participating	1	35
414	719848.76	4907583.53	Non-Participating	1	35
421	719588.35	4907315.19	Non-Participating	1	35
422	719376.99	4907276.82	Non-Participating	1	35
423	719406.83	4907178.95	Non-Participating	1	35
426	719330.01	4906440.32	Non-Participating	1	38
429	717938.68	4904865.30	Non-Participating	1	38
430	717932.82	4904896.09	Non-Participating	1	38
431	717915.15	4904653.73	Non-Participating	1	39
432	717963.00	4904727.58	Non-Participating	1	39
433	718000.35	4904756.38	Non-Participating	1	39
434	718053.13	4904782.14	Non-Participating	1	39
435	718055.75	4904739.22	Non-Participating	1	39
438	717699.27	4904628.61	Non-Participating	1	38
439	717671.57	4904626.25	Non-Participating	1	38
440	717564.02	4904661.44	Non-Participating	1	37
441	717530.49	4904678.61	Non-Participating	1	37
442	717277.82	4904821.59	Non-Participating	1	34
443	717311.81	4904655.97	Non-Participating	1	36
444	717272.02	4904656.19	Non-Participating	1	36
445	717237.39	4904648.11	Non-Participating	1	36
446	717204.21	4904648.73	Non-Participating	1	36
447	717169.91	4904645.97	Non-Participating	1	36
448	717099.04	4904644.95	Non-Participating	1	36
449	717327.26	4904576.71	Non-Participating	1	37
450	717260.30	4904565.99	Non-Participating	1	37
451	717411.00	4904486.37	Participating	1	36
452	717451.66	4904493.50	Participating	1	36
453	717449.05	4904427.71	Participating	1	37

Table D-2A: Project Only Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
454	717429.94	4904425.88	Participating	1	37
455	717336.41	4904481.15	Non-Participating	1	36
456	717225.45	4904344.45	Non-Participating	1	37
457	717269.99	4904375.01	Non-Participating	1	37
458	717222.15	4904431.08	Non-Participating	1	37
459	717267.74	4904455.08	Non-Participating	1	37
460	717265.56	4904425.78	Non-Participating	1	37
461	717264.21	4904404.49	Non-Participating	1	37
462	717224.49	4904457.74	Non-Participating	1	36
463	717219.75	4904491.92	Non-Participating	1	36
464	717121.71	4904382.52	Non-Participating	1	37
465	717145.67	4904402.55	Non-Participating	1	37
466	717115.41	4904420.58	Non-Participating	1	37
467	717126.03	4904463.65	Non-Participating	1	36
468	717011.84	4904531.58	Non-Participating	1	33
469	717114.32	4904557.73	Non-Participating	1	35
470	717152.66	4904559.41	Non-Participating	1	35
471	717179.04	4904594.16	Non-Participating	1	36
472	717199.47	4904596.07	Non-Participating	1	36
473	717213.29	4904565.10	Non-Participating	1	37
474	717110.15	4904593.27	Non-Participating	1	36
475	717079.66	4904593.39	Non-Participating	1	35
476	717049.32	4904590.87	Non-Participating	1	35
477	717003.01	4904556.89	Non-Participating	1	33
478	717001.77	4904587.97	Non-Participating	1	35
479	717020.75	4904646.13	Non-Participating	1	35
480	716988.35	4904644.82	Non-Participating	1	35
481	716963.30	4904642.62	Non-Participating	1	34
482	716991.24	4904467.35	Non-Participating	1	32
483	716903.21	4904378.45	Non-Participating	1	32
484	716837.08	4904397.61	Non-Participating	1	31
485	716939.50	4904923.55	Non-Participating	1	31
486	716909.64	4904848.14	Non-Participating	1	31
487	717001.95	4904867.04	Non-Participating	1	31
488	716674.31	4904664.07	Non-Participating	1	30
489	716825.86	4904581.19	Non-Participating	1	35
490	716856.90	4904583.09	Non-Participating	1	34
491	716882.54	4904586.65	Non-Participating	1	35
492	716878.39	4904513.48	Non-Participating	1	33
493	716916.94	4904511.86	Non-Participating	1	33
494	716948.95	4904530.39	Non-Participating	1	34
495	716949.29	4904568.19	Non-Participating	1	35
496	716942.67	4904589.66	Non-Participating	1	35
497	716911.86	4904573.19	Non-Participating	1	35
498	716917.97	4904635.88	Non-Participating	1	35
499	716890.24	4904634.18	Non-Participating	1	35

Table D-2A: Project Only Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
500	716854.83	4904638.65	Non-Participating	1	34
501	716518.40	4904883.23	Non-Participating	1	33
502	716602.70	4904783.65	Non-Participating	1	32
503	716565.00	4904619.61	Non-Participating	1	32
504	716489.56	4904682.61	Non-Participating	1	32
505	716473.85	4904722.74	Non-Participating	1	32
506	716442.68	4904744.70	Non-Participating	1	32
507	716445.50	4904785.31	Non-Participating	1	32
508	716424.48	4904684.60	Non-Participating	1	32
509	716223.64	4904999.11	Non-Participating	1	32
510	716354.23	4905179.04	Non-Participating	1	33
511	716338.97	4905246.51	Non-Participating	1	33
512	716459.20	4905309.54	Non-Participating	1	33
513	716453.10	4905409.39	Non-Participating	1	33
514	716418.30	4905353.97	Non-Participating	1	33
515	716427.83	4905367.28	Non-Participating	1	33
516	716458.13	4905288.00	Non-Participating	1	33
517	715843.66	4905893.14	Non-Participating	1	32
518	715773.02	4905877.69	Non-Participating	1	30
519	715815.13	4905344.94	Non-Participating	1	31
520	715824.71	4905292.24	Non-Participating	1	31
521	715867.43	4905309.16	Non-Participating	1	30
522	715166.41	4904844.74	Non-Participating	1	31
523	715205.36	4904754.06	Non-Participating	1	31
524	715157.37	4904393.98	Non-Participating	1	31
525	715215.94	4904385.63	Non-Participating	1	31
526	715199.70	4904352.03	Non-Participating	1	31
527	715356.05	4904461.80	Non-Participating	1	32
528	715417.46	4904498.17	Non-Participating	1	32
529	715407.47	4904466.54	Non-Participating	1	32
530	715666.65	4904585.78	Non-Participating	1	32
531	715696.65	4904576.48	Non-Participating	1	32
532	715724.48	4904576.59	Non-Participating	1	32
533	715756.97	4904578.58	Non-Participating	1	32
534	715778.32	4904580.68	Non-Participating	1	32
535	715805.26	4904582.32	Non-Participating	1	32
536	715837.95	4904581.14	Non-Participating	1	31
537	715835.66	4904540.43	Non-Participating	1	31
538	715797.01	4904522.16	Non-Participating	1	32
539	715742.38	4904518.03	Non-Participating	1	32
540	715681.73	4904534.21	Non-Participating	1	32
541	715679.22	4904510.19	Non-Participating	1	31
542	715894.13	4904455.71	Non-Participating	1	31
543	715859.67	4904459.97	Non-Participating	1	31
544	715826.19	4904461.11	Non-Participating	1	31
545	715798.36	4904461.00	Non-Participating	1	31

Table D-2A: Project Only Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
546	715893.31	4904508.16	Non-Participating	1	32
547	715892.01	4904529.56	Non-Participating	1	31
548	715893.34	4904559.87	Non-Participating	1	31
549	715908.04	4904592.58	Non-Participating	1	31
550	715937.31	4904595.17	Non-Participating	1	32
551	715977.73	4904597.64	Non-Participating	1	32
552	715998.33	4904598.89	Non-Participating	1	32
553	716045.23	4904599.37	Non-Participating	1	32
554	716045.31	4904546.09	Non-Participating	1	32
555	716009.60	4904544.70	Non-Participating	1	32
556	715972.76	4904548.81	Non-Participating	1	32
557	715949.78	4904547.41	Non-Participating	1	32
558	715954.67	4904506.34	Non-Participating	1	32
559	715639.77	4904166.54	Non-Participating	1	30
560	715706.97	4904199.28	Non-Participating	1	30
568	715127.65	4895407.57	Non-Participating	1	29
578	715224.57	4895378.18	Non-Participating	1	29
613	724975.11	4897668.13	Non-Participating	1	31
669	716989.84	4896233.57	Non-Participating	1	33
692	714314.71	4895847.22	Non-Participating	1	29
698	714205.06	4895733.41	Non-Participating	1	27
745	726858.39	4900143.28	Participating	1	31
746	726865.43	4900158.30	Participating	1	31
791	719916.57	4900476.21	Participating	1	44
793	719578.52	4900642.43	Participating	1	46
841	718039.49	4900059.75	Participating	1	47
924	727022.24	4902627.29	Non-Participating	1	35
941	724623.73	4903937.11	Participating	1	46
970	718804.83	4903017.02	Participating	1	46
985	714318.77	4902656.83	Non-Participating	1	32
986	714237.97	4903398.65	Non-Participating	1	31
997	714603.77	4903727.73	Non-Participating	1	32
1053	726925.43	4905673.26	Non-Participating	1	32
1054	726986.94	4905673.30	Non-Participating	1	32
1055	727460.91	4905672.52	Non-Participating	1	31
1056	727588.03	4905661.99	Non-Participating	1	31
1057	727648.51	4905661.71	Non-Participating	1	31
1058	727857.79	4905504.27	Non-Participating	1	31
1072	727319.90	4901042.05	Non-Participating	1	32
1076	728362.36	4902262.86	Non-Participating	1	30
1081	713673.07	4900785.04	Non-Participating	1	32
1082	726638.58	4904876.28	Non-Participating	1	34
1083	719182.87	4905036.07	Participating	1	45

Table D-2B: Project Only Results by Sound Level

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
138	720913.33	4905533.52	Participating	1	47
85	722982.06	4904008.09	Participating	1	47
141	721904.81	4906033.39	Participating	1	47
841	718039.49	4900059.75	Participating	1	47
46	718911.99	4899677.74	Participating	1	47
89	718770.32	4903420.97	Participating	1	47
93	722006.38	4905029.65	Participating	1	47
92	721996.88	4904643.52	Participating	1	47
71	725137.82	4902529.85	Participating	1	47
55	717076.39	4901073.99	Participating	1	47
151	721719.87	4905358.34	Participating	1	47
91	723368.88	4904718.11	Participating	1	47
49	719388.68	4900626.02	Participating	1	46
67	722830.76	4902522.74	Participating	1	46
941	724623.73	4903937.11	Participating	1	46
86	720375.68	4903106.67	Participating	1	46
60	718480.21	4901000.12	Participating	1	46
27	721690.13	4899054.22	Participating	1	46
62	718203.16	4902322.57	Participating	1	46
244	718764.15	4902985.61	Participating	1	46
61	718385.88	4902176.53	Participating	1	46
970	718804.83	4903017.02	Participating	1	46
84	722333.43	4903262.08	Participating	1	46
237	719557.26	4900666.24	Participating	1	46
164	724320.81	4903427.17	Participating	1	46
178	723334.67	4906665.95	Participating	1	46
793	719578.52	4900642.43	Participating	1	46
26	722203.20	4898274.38	Participating	1	46
90	718659.29	4903828.29	Participating	1	45
169	723372.30	4905615.79	Participating	1	45
64	719470.78	4902334.95	Participating	1	45
94	718774.53	4904450.55	Participating	1	45
154	723523.13	4905122.61	Non-Participating	1	45
235	723475.42	4905860.10	Participating	1	45
1083	719182.87	4905036.07	Participating	1	45
88	720550.53	4904032.74	Participating	1	45
25	720904.17	4899187.90	Participating	1	45
68	724305.46	4902285.98	Participating	1	45
52	717119.07	4900238.72	Participating	1	45
171	723461.82	4905731.71	Participating	1	45
65	719873.61	4902159.54	Participating	1	45
103	719140.84	4905043.74	Participating	1	45
16	715723.31	4898648.13	Non-Participating	1	44
56	715837.07	4900177.49	Participating	1	44
105	719636.02	4905481.91	Non-Participating	1	44
83	723492.59	4902812.41	Non-Participating	1	44

Table D-2B: Project Only Results by Sound Level

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
51	717258.54	4899542.38	Non-Participating	1	44
63	719389.44	4902171.45	Participating	1	44
53	717301.27	4900451.69	Participating	1	44
791	719916.57	4900476.21	Participating	1	44
87	720951.07	4903766.63	Participating	1	43
109	720594.55	4906146.96	Participating	1	43
50	717161.40	4899221.14	Non-Participating	1	43
70	725160.81	4902178.69	Non-Participating	1	43
81	725352.22	4903786.97	Participating	1	43
20	717476.52	4898978.04	Non-Participating	1	42
161	724163.66	4905228.63	Participating	1	42
238	715848.85	4900637.11	Non-Participating	1	42
95	718467.45	4904553.41	Participating	1	42
22	718141.05	4897676.55	Participating	1	42
17	715447.24	4899194.95	Non-Participating	1	41
66	720678.38	4902318.70	Non-Participating	1	41
384	721820.17	4907219.46	Non-Participating	1	41
59	716453.80	4901946.72	Non-Participating	1	41
146	721666.16	4907223.36	Non-Participating	1	41
24	719282.97	4897515.15	Participating	1	40
19	717211.44	4898135.31	Participating	1	40
43	721991.20	4899704.37	Non-Participating	1	40
112	720406.24	4906727.10	Non-Participating	1	40
44	720889.44	4900807.13	Participating	1	39
42	722427.30	4900617.84	Non-Participating	1	39
435	718055.75	4904739.22	Non-Participating	1	39
82	725699.53	4904212.19	Non-Participating	1	39
102	718274.26	4905044.01	Participating	1	39
434	718053.13	4904782.14	Non-Participating	1	39
149	721695.97	4907454.30	Non-Participating	1	39
433	718000.35	4904756.38	Non-Participating	1	39
431	717915.15	4904653.73	Non-Participating	1	39
432	717963.00	4904727.58	Non-Participating	1	39
172	724504.21	4905783.38	Non-Participating	1	39
174	724225.15	4906343.92	Participating	1	39
28	723264.12	4899043.61	Participating	1	39
101	718162.37	4905006.41	Participating	1	39
131	719114.20	4906081.78	Non-Participating	1	38
429	717938.68	4904865.30	Non-Participating	1	38
430	717932.82	4904896.09	Non-Participating	1	38
29	723148.39	4899253.41	Non-Participating	1	38
69	725187.55	4901454.70	Non-Participating	1	38
23	718315.29	4897230.65	Non-Participating	1	38
100	717883.25	4904909.85	Non-Participating	1	38
114	719215.91	4906259.09	Non-Participating	1	38
438	717699.27	4904628.61	Non-Participating	1	38

Table D-2B: Project Only Results by Sound Level

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
439	717671.57	4904626.25	Non-Participating	1	38
115	719213.16	4906349.80	Non-Participating	1	38
116	719291.50	4906403.40	Non-Participating	1	38
117	719371.22	4906459.76	Non-Participating	1	38
118	719412.46	4906490.00	Non-Participating	1	38
426	719330.01	4906440.32	Non-Participating	1	38
40	724716.86	4900688.30	Non-Participating	1	38
119	719463.31	4906543.60	Non-Participating	1	38
120	719483.93	4906571.09	Non-Participating	1	37
457	717269.99	4904375.01	Non-Participating	1	37
456	717225.45	4904344.45	Non-Participating	1	37
121	719500.42	4906613.70	Non-Participating	1	37
461	717264.21	4904404.49	Non-Participating	1	37
122	719526.54	4906674.17	Non-Participating	1	37
123	719537.53	4906700.29	Non-Participating	1	37
184	725196.23	4905627.67	Non-Participating	1	37
460	717265.56	4904425.78	Non-Participating	1	37
464	717121.71	4904382.52	Non-Participating	1	37
124	719569.14	4906742.89	Non-Participating	1	37
465	717145.67	4904402.55	Non-Participating	1	37
125	719584.26	4906795.12	Non-Participating	1	37
458	717222.15	4904431.08	Non-Participating	1	37
466	717115.41	4904420.58	Non-Participating	1	37
127	719643.36	4906894.08	Non-Participating	1	37
450	717260.30	4904565.99	Non-Participating	1	37
459	717267.74	4904455.08	Non-Participating	1	37
126	719588.39	4906869.34	Non-Participating	1	37
185	725317.77	4905632.44	Non-Participating	1	37
440	717564.02	4904661.44	Non-Participating	1	37
453	717449.05	4904427.71	Participating	1	37
441	717530.49	4904678.61	Non-Participating	1	37
449	717327.26	4904576.71	Non-Participating	1	37
454	717429.94	4904425.88	Participating	1	37
473	717213.29	4904565.10	Non-Participating	1	37
472	717199.47	4904596.07	Non-Participating	1	36
128	719573.27	4906936.69	Non-Participating	1	36
471	717179.04	4904594.16	Non-Participating	1	36
218	722296.75	4907945.00	Non-Participating	1	36
446	717204.21	4904648.73	Non-Participating	1	36
451	717411.00	4904486.37	Participating	1	36
455	717336.41	4904481.15	Non-Participating	1	36
219	722230.87	4907970.76	Non-Participating	1	36
462	717224.49	4904457.74	Non-Participating	1	36
445	717237.39	4904648.11	Non-Participating	1	36
447	717169.91	4904645.97	Non-Participating	1	36
443	717311.81	4904655.97	Non-Participating	1	36

Table D-2B: Project Only Results by Sound Level

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
444	717272.02	4904656.19	Non-Participating	1	36
467	717126.03	4904463.65	Non-Participating	1	36
220	722220.68	4907997.11	Non-Participating	1	36
189	724410.32	4907052.07	Participating	1	36
463	717219.75	4904491.92	Non-Participating	1	36
182	725579.11	4905569.15	Non-Participating	1	36
250	720099.79	4907436.08	Non-Participating	1	36
37	723990.20	4899418.91	Non-Participating	1	36
133	719506.22	4907080.47	Non-Participating	1	36
452	717451.66	4904493.50	Participating	1	36
394	722177.41	4908058.91	Non-Participating	1	36
448	717099.04	4904644.95	Non-Participating	1	36
134	719465.69	4907121.78	Non-Participating	1	36
474	717110.15	4904593.27	Non-Participating	1	36
299	722153.60	4908089.69	Non-Participating	1	36
298	722127.86	4908126.15	Non-Participating	1	36
393	722215.45	4908035.25	Non-Participating	1	35
423	719406.83	4907178.95	Non-Participating	1	35
470	717152.66	4904559.41	Non-Participating	1	35
421	719588.35	4907315.19	Non-Participating	1	35
135	719426.72	4907251.15	Non-Participating	1	35
475	717079.66	4904593.39	Non-Participating	1	35
479	717020.75	4904646.13	Non-Participating	1	35
255	715015.61	4897377.20	Non-Participating	1	35
422	719376.99	4907276.82	Non-Participating	1	35
179	725634.47	4905935.88	Non-Participating	1	35
414	719848.76	4907583.53	Non-Participating	1	35
478	717001.77	4904587.97	Non-Participating	1	35
137	719365.16	4907339.21	Non-Participating	1	35
495	716949.29	4904568.19	Non-Participating	1	35
496	716942.67	4904589.66	Non-Participating	1	35
497	716911.86	4904573.19	Non-Participating	1	35
136	719377.63	4907389.09	Non-Participating	1	35
296	722035.11	4908307.34	Non-Participating	1	35
395	722056.64	4908256.22	Non-Participating	1	35
491	716882.54	4904586.65	Non-Participating	1	35
924	727022.24	4902627.29	Non-Participating	1	35
297	722089.60	4908201.94	Non-Participating	1	35
411	720116.92	4907819.45	Non-Participating	1	35
480	716988.35	4904644.82	Non-Participating	1	35
294	722024.70	4908323.58	Non-Participating	1	35
469	717114.32	4904557.73	Non-Participating	1	35
498	716917.97	4904635.88	Non-Participating	1	35
499	716890.24	4904634.18	Non-Participating	1	35
257	719610.00	4907569.00	Non-Participating	1	35
256	723187.80	4897202.59	Non-Participating	1	35

Table D-2B: Project Only Results by Sound Level

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
205	726919.36	4902176.15	Non-Participating	1	35
41	725875.26	4900834.50	Non-Participating	1	35
258	719700.93	4907644.54	Non-Participating	1	35
261	719857.46	4907742.57	Non-Participating	1	35
293	721992.22	4908358.55	Non-Participating	1	35
295	722011.37	4908342.31	Non-Participating	1	35
413	719782.62	4907676.53	Non-Participating	1	35
476	717049.32	4904590.87	Non-Participating	1	35
260	719745.33	4907684.29	Non-Participating	1	35
412	719794.95	4907709.10	Non-Participating	1	35
489	716825.86	4904581.19	Non-Participating	1	35
262	719890.34	4907786.12	Non-Participating	1	34
263	719919.46	4907805.15	Non-Participating	1	34
292	721978.07	4908374.37	Non-Participating	1	34
396	721948.07	4908375.27	Non-Participating	1	34
500	716854.83	4904638.65	Non-Participating	1	34
265	719947.43	4907836.01	Non-Participating	1	34
266	719982.04	4907873.21	Non-Participating	1	34
267	720021.83	4907900.02	Non-Participating	1	34
481	716963.30	4904642.62	Non-Participating	1	34
490	716856.90	4904583.09	Non-Participating	1	34
410	720048.78	4907946.28	Non-Participating	1	34
268	720072.19	4907973.95	Non-Participating	1	34
290	721861.07	4908467.22	Non-Participating	1	34
194	724847.86	4907280.34	Non-Participating	1	34
269	720106.25	4908011.80	Non-Participating	1	34
273	720273.48	4908078.90	Non-Participating	1	34
291	721835.68	4908492.61	Non-Participating	1	34
98	716874.05	4896617.04	Non-Participating	1	34
199	726107.97	4905764.29	Non-Participating	1	34
270	720141.70	4908061.35	Non-Participating	1	34
1082	726638.58	4904876.28	Non-Participating	1	34
272	720179.89	4908091.98	Non-Participating	1	34
289	721794.46	4908525.50	Non-Participating	1	34
38	725325.11	4899964.56	Non-Participating	1	34
274	720454.78	4908220.05	Non-Participating	1	34
288	721751.99	4908548.40	Non-Participating	1	34
275	720401.45	4908238.23	Non-Participating	1	34
405	720268.50	4908203.65	Non-Participating	1	34
406	720369.09	4908241.09	Non-Participating	1	34
201	726503.06	4905320.15	Non-Participating	1	34
276	720304.09	4908243.08	Non-Participating	1	34
277	720344.49	4908251.56	Non-Participating	1	34
286	721664.28	4908602.97	Non-Participating	1	34
58	716032.82	4901955.98	Non-Participating	1	34
287	721637.87	4908618.55	Non-Participating	1	34

Table D-2B: Project Only Results by Sound Level

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
285	721612.76	4908638.90	Non-Participating	1	34
229	726718.52	4901305.38	Non-Participating	1	34
442	717277.82	4904821.59	Non-Participating	1	34
494	716948.95	4904530.39	Non-Participating	1	34
281	721387.20	4908657.52	Non-Participating	1	33
400	721565.91	4908675.92	Non-Participating	1	33
236	723175.31	4908595.11	Non-Participating	1	33
284	721538.73	4908695.61	Non-Participating	1	33
513	716453.10	4905409.39	Non-Participating	1	33
278	721275.07	4908713.80	Non-Participating	1	33
234	725169.65	4907420.70	Non-Participating	1	33
245	727235.63	4904241.24	Non-Participating	1	33
246	727363.29	4903829.96	Non-Participating	1	33
279	721305.81	4908733.71	Non-Participating	1	33
280	721324.42	4908753.63	Non-Participating	1	33
283	721448.68	4908770.08	Non-Participating	1	33
512	716459.20	4905309.54	Non-Participating	1	33
516	716458.13	4905288.00	Non-Participating	1	33
282	721377.24	4908782.63	Non-Participating	1	33
514	716418.30	4905353.97	Non-Participating	1	33
515	716427.83	4905367.28	Non-Participating	1	33
4	719410.70	4896051.41	Non-Participating	1	33
252	716921.70	4896257.62	Non-Participating	1	33
510	716354.23	4905179.04	Non-Participating	1	33
669	716989.84	4896233.57	Non-Participating	1	33
501	716518.40	4904883.23	Non-Participating	1	33
492	716878.39	4904513.48	Non-Participating	1	33
511	716338.97	4905246.51	Non-Participating	1	33
468	717011.84	4904531.58	Non-Participating	1	33
477	717003.01	4904556.89	Non-Participating	1	33
493	716916.94	4904511.86	Non-Participating	1	33
230	726456.05	4906213.42	Non-Participating	1	33
507	716445.50	4904785.31	Non-Participating	1	32
985	714318.77	4902656.83	Non-Participating	1	32
509	716223.64	4904999.11	Non-Participating	1	32
233	725536.82	4907446.28	Non-Participating	1	32
1053	726925.43	4905673.26	Non-Participating	1	32
391	723532.73	4908905.53	Non-Participating	1	32
503	716565.00	4904619.61	Non-Participating	1	32
1054	726986.94	4905673.30	Non-Participating	1	32
390	723596.89	4908931.73	Non-Participating	1	32
504	716489.56	4904682.61	Non-Participating	1	32
997	714603.77	4903727.73	Non-Participating	1	32
228	726976.25	4900694.01	Non-Participating	1	32
231	726354.15	4906752.29	Non-Participating	1	32
331	719621.89	4908806.30	Non-Participating	1	32

Table D-2B: Project Only Results by Sound Level

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
332	719635.36	4908828.68	Non-Participating	1	32
352	719602.30	4908788.46	Non-Participating	1	32
386	723908.08	4908855.30	Non-Participating	1	32
502	716602.70	4904783.65	Non-Participating	1	32
1081	713673.07	4900785.04	Non-Participating	1	32
353	719538.13	4908797.13	Non-Participating	1	32
328	719510.56	4908805.86	Non-Participating	1	32
329	719494.17	4908824.72	Non-Participating	1	32
333	719692.62	4908881.15	Non-Participating	1	32
334	719714.06	4908894.66	Non-Participating	1	32
335	719775.28	4908916.96	Non-Participating	1	32
337	719827.18	4908944.00	Non-Participating	1	32
340	719863.03	4908964.75	Non-Participating	1	32
531	715696.65	4904576.48	Non-Participating	1	32
322	719448.43	4908815.84	Non-Participating	1	32
341	719908.49	4908984.50	Non-Participating	1	32
345	719970.89	4909004.75	Non-Participating	1	32
330	719480.38	4908831.06	Non-Participating	1	32
553	716045.23	4904599.37	Non-Participating	1	32
321	719423.86	4908836.08	Non-Participating	1	32
336	719783.54	4908972.62	Non-Participating	1	32
347	720006.42	4909030.79	Non-Participating	1	32
388	724139.90	4908828.11	Non-Participating	1	32
506	716442.68	4904744.70	Non-Participating	1	32
528	715417.46	4904498.17	Non-Participating	1	32
530	715666.65	4904585.78	Non-Participating	1	32
538	715797.01	4904522.16	Non-Participating	1	32
540	715681.73	4904534.21	Non-Participating	1	32
554	716045.31	4904546.09	Non-Participating	1	32
320	719382.24	4908848.92	Non-Participating	1	32
342	719889.00	4909025.73	Non-Participating	1	32
344	719960.33	4909056.08	Non-Participating	1	32
348	720028.40	4909070.31	Non-Participating	1	32
338	719821.62	4909008.89	Non-Participating	1	32
239	727874.48	4902603.59	Non-Participating	1	32
243	727336.17	4901068.97	Non-Participating	1	32
317	719315.87	4908867.66	Non-Participating	1	32
318	719338.08	4908860.01	Non-Participating	1	32
319	719358.98	4908856.51	Non-Participating	1	32
327	719655.92	4908969.59	Non-Participating	1	32
343	719916.82	4909065.08	Non-Participating	1	32
508	716424.48	4904684.60	Non-Participating	1	32
517	715843.66	4905893.14	Non-Participating	1	32
535	715805.26	4904582.32	Non-Participating	1	32
551	715977.73	4904597.64	Non-Participating	1	32
552	715998.33	4904598.89	Non-Participating	1	32

Table D-2B: Project Only Results by Sound Level

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
555	716009.60	4904544.70	Non-Participating	1	32
556	715972.76	4904548.81	Non-Participating	1	32
1072	727319.90	4901042.05	Non-Participating	1	32
349	719981.33	4909102.97	Non-Participating	1	32
557	715949.78	4904547.41	Non-Participating	1	32
482	716991.24	4904467.35	Non-Participating	1	32
240	727888.73	4902392.04	Non-Participating	1	32
314	718917.79	4908752.12	Non-Participating	1	32
350	719231.68	4908876.50	Non-Participating	1	32
483	716903.21	4904378.45	Non-Participating	1	32
505	716473.85	4904722.74	Non-Participating	1	32
529	715407.47	4904466.54	Non-Participating	1	32
532	715724.48	4904576.59	Non-Participating	1	32
533	715756.97	4904578.58	Non-Participating	1	32
534	715778.32	4904580.68	Non-Participating	1	32
539	715742.38	4904518.03	Non-Participating	1	32
558	715954.67	4904506.34	Non-Participating	1	32
313	718932.81	4908775.31	Non-Participating	1	32
315	718886.39	4908753.91	Non-Participating	1	32
527	715356.05	4904461.80	Non-Participating	1	32
546	715893.31	4904508.16	Non-Participating	1	32
550	715937.31	4904595.17	Non-Participating	1	32
548	715893.34	4904559.87	Non-Participating	1	31
232	725787.65	4907743.68	Non-Participating	1	31
303	718844.90	4908782.13	Non-Participating	1	31
307	719064.83	4908862.39	Non-Participating	1	31
308	719105.42	4908866.46	Non-Participating	1	31
309	719028.86	4908852.24	Non-Participating	1	31
311	718976.83	4908827.32	Non-Participating	1	31
312	718946.52	4908802.66	Non-Participating	1	31
316	718864.96	4908748.89	Non-Participating	1	31
485	716939.50	4904923.55	Non-Participating	1	31
542	715894.13	4904455.71	Non-Participating	1	31
547	715892.01	4904529.56	Non-Participating	1	31
549	715908.04	4904592.58	Non-Participating	1	31
745	726858.39	4900143.28	Participating	1	31
746	726865.43	4900158.30	Participating	1	31
310	718997.87	4908856.18	Non-Participating	1	31
536	715837.95	4904581.14	Non-Participating	1	31
986	714237.97	4903398.65	Non-Participating	1	31
14	713480.83	4898900.44	Non-Participating	1	31
302	718804.77	4908805.37	Non-Participating	1	31
524	715157.37	4904393.98	Non-Participating	1	31
13	723456.49	4896774.78	Non-Participating	1	31
537	715835.66	4904540.43	Non-Participating	1	31
484	716837.08	4904397.61	Non-Participating	1	31

Table D-2B: Project Only Results by Sound Level

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Project Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
525	715215.94	4904385.63	Non-Participating	1	31
247	727860.69	4904504.97	Non-Participating	1	31
301	718789.00	4908855.07	Non-Participating	1	31
522	715166.41	4904844.74	Non-Participating	1	31
523	715205.36	4904754.06	Non-Participating	1	31
541	715679.22	4904510.19	Non-Participating	1	31
545	715798.36	4904461.00	Non-Participating	1	31
355	723529.44	4909379.33	Non-Participating	1	31
36	726225.39	4899113.03	Non-Participating	1	31
1055	727460.91	4905672.52	Non-Participating	1	31
520	715824.71	4905292.24	Non-Participating	1	31
300	718757.08	4908934.79	Non-Participating	1	31
613	724975.11	4897668.13	Non-Participating	1	31
254	715238.72	4896061.92	Non-Participating	1	31
526	715199.70	4904352.03	Non-Participating	1	31
1056	727588.03	4905661.99	Non-Participating	1	31
487	717001.95	4904867.04	Non-Participating	1	31
519	715815.13	4905344.94	Non-Participating	1	31
543	715859.67	4904459.97	Non-Participating	1	31
1057	727648.51	4905661.71	Non-Participating	1	31
486	716909.64	4904848.14	Non-Participating	1	31
226	727202.86	4899979.73	Non-Participating	1	31
544	715826.19	4904461.11	Non-Participating	1	31
248	728267.58	4904129.52	Non-Participating	1	31
1058	727857.79	4905504.27	Non-Participating	1	31
1076	728362.36	4902262.86	Non-Participating	1	30
488	716674.31	4904664.07	Non-Participating	1	30
521	715867.43	4905309.16	Non-Participating	1	30
242	728301.58	4901544.64	Non-Participating	1	30
560	715706.97	4904199.28	Non-Participating	1	30
559	715639.77	4904166.54	Non-Participating	1	30
31	725540.63	4897544.85	Non-Participating	1	30
518	715773.02	4905877.69	Non-Participating	1	30
578	715224.57	4895378.18	Non-Participating	1	29
568	715127.65	4895407.57	Non-Participating	1	29
692	714314.71	4895847.22	Non-Participating	1	29
32	724971.27	4897228.10	Non-Participating	1	29
225	726508.78	4897454.26	Non-Participating	1	29
1	724967.32	4896341.13	Non-Participating	1	28
222	727482.24	4897801.59	Non-Participating	1	28
3	725625.32	4896059.58	Non-Participating	1	28
2	726537.89	4896321.29	Non-Participating	1	27
698	714205.06	4895733.41	Non-Participating	1	27

Table D-3: Ruthton Only Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Ruthton Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
1	724967.32	4896341.13	Non-Participating	1	24
2	726537.89	4896321.29	Non-Participating	1	17
3	725625.32	4896059.58	Non-Participating	1	20
4	719410.70	4896051.41	Non-Participating	1	16
13	723456.49	4896774.78	Non-Participating	1	23
14	713480.83	4898900.44	Non-Participating	1	0
16	715723.31	4898648.13	Non-Participating	1	9
17	715447.24	4899194.95	Non-Participating	1	7
19	717211.44	4898135.31	Participating	1	16
20	717476.52	4898978.04	Non-Participating	1	19
22	718141.05	4897676.55	Participating	1	18
23	718315.29	4897230.65	Non-Participating	1	17
24	719282.97	4897515.15	Participating	1	21
25	720904.17	4899187.90	Participating	1	34
26	722203.20	4898274.38	Participating	1	35
27	721690.13	4899054.22	Participating	1	37
28	723264.12	4899043.61	Participating	1	43
29	723148.39	4899253.41	Non-Participating	1	46
31	725540.63	4897544.85	Non-Participating	1	27
32	724971.27	4897228.10	Non-Participating	1	29
36	726225.39	4899113.03	Non-Participating	1	24
37	723990.20	4899418.91	Non-Participating	1	39
38	725325.11	4899964.56	Non-Participating	1	28
40	724716.86	4900688.30	Non-Participating	1	29
41	725875.26	4900834.50	Non-Participating	1	23
42	722427.30	4900617.84	Non-Participating	1	48
43	721991.20	4899704.37	Non-Participating	1	41
44	720889.44	4900807.13	Participating	1	51
46	718911.99	4899677.74	Participating	1	28
49	719388.68	4900626.02	Participating	1	34
50	717161.40	4899221.14	Non-Participating	1	17
51	717258.54	4899542.38	Non-Participating	1	19
52	717119.07	4900238.72	Participating	1	20
53	717301.27	4900451.69	Participating	1	21
55	717076.39	4901073.99	Participating	1	20
56	715837.07	4900177.49	Participating	1	11
58	716032.82	4901955.98	Non-Participating	1	7
59	716453.80	4901946.72	Non-Participating	1	15
60	718480.21	4901000.12	Participating	1	28
61	718385.88	4902176.53	Participating	1	27
62	718203.16	4902322.57	Participating	1	26
63	719389.44	4902171.45	Participating	1	34
64	719470.78	4902334.95	Participating	1	34
65	719873.61	4902159.54	Participating	1	39
66	720678.38	4902318.70	Non-Participating	1	45
67	722830.76	4902522.74	Participating	1	34

Table D-3: Ruthton Only Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Ruthton Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
68	724305.46	4902285.98	Participating	1	27
69	725187.55	4901454.70	Non-Participating	1	25
70	725160.81	4902178.69	Non-Participating	1	23
71	725137.82	4902529.85	Participating	1	23
81	725352.22	4903786.97	Participating	1	18
82	725699.53	4904212.19	Non-Participating	1	15
83	723492.59	4902812.41	Non-Participating	1	29
84	722333.43	4903262.08	Participating	1	31
85	722982.06	4904008.09	Participating	1	25
86	720375.68	4903106.67	Participating	1	35
87	720951.07	4903766.63	Participating	1	30
88	720550.53	4904032.74	Participating	1	28
89	718770.32	4903420.97	Participating	1	26
90	718659.29	4903828.29	Participating	1	17
91	723368.88	4904718.11	Participating	1	21
92	721996.88	4904643.52	Participating	1	24
93	722006.38	4905029.65	Participating	1	22
94	718774.53	4904450.55	Participating	1	14
95	718467.45	4904553.41	Participating	1	13
98	716874.05	4896617.04	Non-Participating	1	8
100	717883.25	4904909.85	Non-Participating	1	16
101	718162.37	4905006.41	Participating	1	16
102	718274.26	4905044.01	Participating	1	17
103	719140.84	4905043.74	Participating	1	19
105	719636.02	4905481.91	Non-Participating	1	18
109	720594.55	4906146.96	Participating	1	16
112	720406.24	4906727.10	Non-Participating	1	13
114	719215.91	4906259.09	Non-Participating	1	13
115	719213.16	4906349.80	Non-Participating	1	13
116	719291.50	4906403.40	Non-Participating	1	13
117	719371.22	4906459.76	Non-Participating	1	13
118	719412.46	4906490.00	Non-Participating	1	13
119	719463.31	4906543.60	Non-Participating	1	13
120	719483.93	4906571.09	Non-Participating	1	12
121	719500.42	4906613.70	Non-Participating	1	12
122	719526.54	4906674.17	Non-Participating	1	12
123	719537.53	4906700.29	Non-Participating	1	12
124	719569.14	4906742.89	Non-Participating	1	12
125	719584.26	4906795.12	Non-Participating	1	11
126	719588.39	4906869.34	Non-Participating	1	11
127	719643.36	4906894.08	Non-Participating	1	11
128	719573.27	4906936.69	Non-Participating	1	11
131	719114.20	4906081.78	Non-Participating	1	14
133	719506.22	4907080.47	Non-Participating	1	10
134	719465.69	4907121.78	Non-Participating	1	10
135	719426.72	4907251.15	Non-Participating	1	9

Table D-3: Ruthton Only Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Ruthton Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
136	719377.63	4907389.09	Non-Participating	1	8
137	719365.16	4907339.21	Non-Participating	1	9
138	720913.33	4905533.52	Participating	1	19
141	721904.81	4906033.39	Participating	1	16
146	721666.16	4907223.36	Non-Participating	1	10
149	721695.97	4907454.30	Non-Participating	1	9
151	721719.87	4905358.34	Participating	1	20
154	723523.13	4905122.61	Non-Participating	1	18
161	724163.66	4905228.63	Participating	1	16
164	724320.81	4903427.17	Participating	1	23
169	723372.30	4905615.79	Participating	1	16
171	723461.82	4905731.71	Participating	1	15
172	724504.21	4905783.38	Non-Participating	1	13
174	724225.15	4906343.92	Participating	1	11
178	723334.67	4906665.95	Participating	1	11
179	725634.47	4905935.88	Non-Participating	1	9
182	725579.11	4905569.15	Non-Participating	1	10
184	725196.23	4905627.67	Non-Participating	1	11
185	725317.77	4905632.44	Non-Participating	1	11
189	724410.32	4907052.07	Participating	1	7
194	724847.86	4907280.34	Non-Participating	1	5
199	726107.97	4905764.29	Non-Participating	1	8
201	726503.06	4905320.15	Non-Participating	1	8
205	726919.36	4902176.15	Non-Participating	1	15
218	722296.75	4907945.00	Non-Participating	1	6
219	722230.87	4907970.76	Non-Participating	1	6
220	722220.68	4907997.11	Non-Participating	1	5
222	727482.24	4897801.59	Non-Participating	1	16
225	726508.78	4897454.26	Non-Participating	1	21
226	727202.86	4899979.73	Non-Participating	1	18
228	726976.25	4900694.01	Non-Participating	1	18
229	726718.52	4901305.38	Non-Participating	1	18
230	726456.05	4906213.42	Non-Participating	1	5
231	726354.15	4906752.29	Non-Participating	1	4
232	725787.65	4907743.68	Non-Participating	1	1
233	725536.82	4907446.28	Non-Participating	1	3
234	725169.65	4907420.70	Non-Participating	1	4
235	723475.42	4905860.10	Participating	1	8
236	723175.31	4908595.11	Non-Participating	1	3
237	719557.26	4900666.24	Participating	1	35
238	715848.85	4900637.11	Non-Participating	1	10
239	727874.48	4902603.59	Non-Participating	1	10
240	727888.73	4902392.04	Non-Participating	1	10
242	728301.58	4901544.64	Non-Participating	1	10
243	727336.17	4901068.97	Non-Participating	1	15
244	718764.15	4902985.61	Participating	1	27

Table D-3: Ruthton Only Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Ruthton Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
245	727235.63	4904241.24	Non-Participating	1	9
246	727363.29	4903829.96	Non-Participating	1	9
247	727860.69	4904504.97	Non-Participating	1	6
248	728267.58	4904129.52	Non-Participating	1	5
250	720099.79	4907436.08	Non-Participating	1	9
252	716921.70	4896257.62	Non-Participating	1	8
254	715238.72	4896061.92	Non-Participating	1	2
255	715015.61	4897377.20	Non-Participating	1	0
256	723187.80	4897202.59	Non-Participating	1	31
257	719610.00	4907569.00	Non-Participating	1	8
258	719700.93	4907644.54	Non-Participating	1	7
260	719745.33	4907684.29	Non-Participating	1	7
261	719857.46	4907742.57	Non-Participating	1	7
262	719890.34	4907786.12	Non-Participating	1	7
263	719919.46	4907805.15	Non-Participating	1	7
265	719947.43	4907836.01	Non-Participating	1	7
266	719982.04	4907873.21	Non-Participating	1	7
267	720021.83	4907900.02	Non-Participating	1	7
268	720072.19	4907973.95	Non-Participating	1	6
269	720106.25	4908011.80	Non-Participating	1	6
270	720141.70	4908061.35	Non-Participating	1	6
272	720179.89	4908091.98	Non-Participating	1	6
273	720273.48	4908078.90	Non-Participating	1	6
274	720454.78	4908220.05	Non-Participating	1	5
275	720401.45	4908238.23	Non-Participating	1	5
276	720304.09	4908243.08	Non-Participating	1	5
277	720344.49	4908251.56	Non-Participating	1	5
278	721275.07	4908713.80	Non-Participating	1	3
279	721305.81	4908733.71	Non-Participating	1	3
280	721324.42	4908753.63	Non-Participating	1	3
281	721387.20	4908657.52	Non-Participating	1	3
282	721377.24	4908782.63	Non-Participating	1	3
283	721448.68	4908770.08	Non-Participating	1	3
284	721538.73	4908695.61	Non-Participating	1	3
285	721612.76	4908638.90	Non-Participating	1	3
286	721664.28	4908602.97	Non-Participating	1	4
287	721637.87	4908618.55	Non-Participating	1	4
288	721751.99	4908548.40	Non-Participating	1	4
289	721794.46	4908525.50	Non-Participating	1	4
290	721861.07	4908467.22	Non-Participating	1	3
291	721835.68	4908492.61	Non-Participating	1	4
292	721978.07	4908374.37	Non-Participating	1	1
293	721992.22	4908358.55	Non-Participating	1	3
294	722024.70	4908323.58	Non-Participating	1	3
295	722011.37	4908342.31	Non-Participating	1	2
296	722035.11	4908307.34	Non-Participating	1	3

Table D-3: Ruthton Only Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Ruthton Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
297	722089.60	4908201.94	Non-Participating	1	0
298	722127.86	4908126.15	Non-Participating	1	0
299	722153.60	4908089.69	Non-Participating	1	0
300	718757.08	4908934.79	Non-Participating	1	1
301	718789.00	4908855.07	Non-Participating	1	1
302	718804.77	4908805.37	Non-Participating	1	1
303	718844.90	4908782.13	Non-Participating	1	1
307	719064.83	4908862.39	Non-Participating	1	1
308	719105.42	4908866.46	Non-Participating	1	1
309	719028.86	4908852.24	Non-Participating	1	1
310	718997.87	4908856.18	Non-Participating	1	1
311	718976.83	4908827.32	Non-Participating	1	1
312	718946.52	4908802.66	Non-Participating	1	1
313	718932.81	4908775.31	Non-Participating	1	2
314	718917.79	4908752.12	Non-Participating	1	2
315	718886.39	4908753.91	Non-Participating	1	2
316	718864.96	4908748.89	Non-Participating	1	2
317	719315.87	4908867.66	Non-Participating	1	2
318	719338.08	4908860.01	Non-Participating	1	2
319	719358.98	4908856.51	Non-Participating	1	2
320	719382.24	4908848.92	Non-Participating	1	2
321	719423.86	4908836.08	Non-Participating	1	2
322	719448.43	4908815.84	Non-Participating	1	2
327	719655.92	4908969.59	Non-Participating	1	1
328	719510.56	4908805.86	Non-Participating	1	2
329	719494.17	4908824.72	Non-Participating	1	2
330	719480.38	4908831.06	Non-Participating	1	2
331	719621.89	4908806.30	Non-Participating	1	2
332	719635.36	4908828.68	Non-Participating	1	2
333	719692.62	4908881.15	Non-Participating	1	2
334	719714.06	4908894.66	Non-Participating	1	2
335	719775.28	4908916.96	Non-Participating	1	2
336	719783.54	4908972.62	Non-Participating	1	1
337	719827.18	4908944.00	Non-Participating	1	2
338	719821.62	4909008.89	Non-Participating	1	1
340	719863.03	4908964.75	Non-Participating	1	2
341	719908.49	4908984.50	Non-Participating	1	1
342	719889.00	4909025.73	Non-Participating	1	1
343	719916.82	4909065.08	Non-Participating	1	1
344	719960.33	4909056.08	Non-Participating	1	1
345	719970.89	4909004.75	Non-Participating	1	1
347	720006.42	4909030.79	Non-Participating	1	1
348	720028.40	4909070.31	Non-Participating	1	1
349	719981.33	4909102.97	Non-Participating	1	1
350	719231.68	4908876.50	Non-Participating	1	1
352	719602.30	4908788.46	Non-Participating	1	2

Table D-3: Ruthton Only Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Ruthton Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
353	719538.13	4908797.13	Non-Participating	1	2
355	723529.44	4909379.33	Non-Participating	1	0
384	721820.17	4907219.46	Non-Participating	1	10
386	723908.08	4908855.30	Non-Participating	1	0
388	724139.90	4908828.11	Non-Participating	1	0
390	723596.89	4908931.73	Non-Participating	1	0
391	723532.73	4908905.53	Non-Participating	1	1
393	722215.45	4908035.25	Non-Participating	1	0
394	722177.41	4908058.91	Non-Participating	1	0
395	722056.64	4908256.22	Non-Participating	1	0
396	721948.07	4908375.27	Non-Participating	1	0
400	721565.91	4908675.92	Non-Participating	1	3
405	720268.50	4908203.65	Non-Participating	1	5
406	720369.09	4908241.09	Non-Participating	1	5
410	720048.78	4907946.28	Non-Participating	1	6
411	720116.92	4907819.45	Non-Participating	1	7
412	719794.95	4907709.10	Non-Participating	1	7
413	719782.62	4907676.53	Non-Participating	1	7
414	719848.76	4907583.53	Non-Participating	1	8
421	719588.35	4907315.19	Non-Participating	1	9
422	719376.99	4907276.82	Non-Participating	1	9
423	719406.83	4907178.95	Non-Participating	1	9
426	719330.01	4906440.32	Non-Participating	1	13
429	717938.68	4904865.30	Non-Participating	1	16
430	717932.82	4904896.09	Non-Participating	1	16
431	717915.15	4904653.73	Non-Participating	1	17
432	717963.00	4904727.58	Non-Participating	1	17
433	718000.35	4904756.38	Non-Participating	1	17
434	718053.13	4904782.14	Non-Participating	1	17
435	718055.75	4904739.22	Non-Participating	1	17
438	717699.27	4904628.61	Non-Participating	1	16
439	717671.57	4904626.25	Non-Participating	1	11
440	717564.02	4904661.44	Non-Participating	1	9
441	717530.49	4904678.61	Non-Participating	1	9
442	717277.82	4904821.59	Non-Participating	1	7
443	717311.81	4904655.97	Non-Participating	1	8
444	717272.02	4904656.19	Non-Participating	1	8
445	717237.39	4904648.11	Non-Participating	1	8
446	717204.21	4904648.73	Non-Participating	1	7
447	717169.91	4904645.97	Non-Participating	1	7
448	717099.04	4904644.95	Non-Participating	1	7
449	717327.26	4904576.71	Non-Participating	1	8
450	717260.30	4904565.99	Non-Participating	1	8
451	717411.00	4904486.37	Participating	1	9
452	717451.66	4904493.50	Participating	1	9
453	717449.05	4904427.71	Participating	1	9

Table D-3: Ruthton Only Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Ruthton Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
454	717429.94	4904425.88	Participating	1	9
455	717336.41	4904481.15	Non-Participating	1	9
456	717225.45	4904344.45	Non-Participating	1	9
457	717269.99	4904375.01	Non-Participating	1	9
458	717222.15	4904431.08	Non-Participating	1	8
459	717267.74	4904455.08	Non-Participating	1	8
460	717265.56	4904425.78	Non-Participating	1	8
461	717264.21	4904404.49	Non-Participating	1	9
462	717224.49	4904457.74	Non-Participating	1	8
463	717219.75	4904491.92	Non-Participating	1	8
464	717121.71	4904382.52	Non-Participating	1	14
465	717145.67	4904402.55	Non-Participating	1	14
466	717115.41	4904420.58	Non-Participating	1	14
467	717126.03	4904463.65	Non-Participating	1	8
468	717011.84	4904531.58	Non-Participating	1	7
469	717114.32	4904557.73	Non-Participating	1	7
470	717152.66	4904559.41	Non-Participating	1	8
471	717179.04	4904594.16	Non-Participating	1	8
472	717199.47	4904596.07	Non-Participating	1	8
473	717213.29	4904565.10	Non-Participating	1	8
474	717110.15	4904593.27	Non-Participating	1	7
475	717079.66	4904593.39	Non-Participating	1	7
476	717049.32	4904590.87	Non-Participating	1	7
477	717003.01	4904556.89	Non-Participating	1	7
478	717001.77	4904587.97	Non-Participating	1	7
479	717020.75	4904646.13	Non-Participating	1	7
480	716988.35	4904644.82	Non-Participating	1	7
481	716963.30	4904642.62	Non-Participating	1	6
482	716991.24	4904467.35	Non-Participating	1	7
483	716903.21	4904378.45	Non-Participating	1	7
484	716837.08	4904397.61	Non-Participating	1	7
485	716939.50	4904923.55	Non-Participating	1	5
486	716909.64	4904848.14	Non-Participating	1	6
487	717001.95	4904867.04	Non-Participating	1	6
488	716674.31	4904664.07	Non-Participating	1	5
489	716825.86	4904581.19	Non-Participating	1	6
490	716856.90	4904583.09	Non-Participating	1	6
491	716882.54	4904586.65	Non-Participating	1	6
492	716878.39	4904513.48	Non-Participating	1	6
493	716916.94	4904511.86	Non-Participating	1	7
494	716948.95	4904530.39	Non-Participating	1	7
495	716949.29	4904568.19	Non-Participating	1	7
496	716942.67	4904589.66	Non-Participating	1	7
497	716911.86	4904573.19	Non-Participating	1	6
498	716917.97	4904635.88	Non-Participating	1	6
499	716890.24	4904634.18	Non-Participating	1	6

Table D-3: Ruthton Only Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Ruthton Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
500	716854.83	4904638.65	Non-Participating	1	6
501	716518.40	4904883.23	Non-Participating	1	4
502	716602.70	4904783.65	Non-Participating	1	4
503	716565.00	4904619.61	Non-Participating	1	5
504	716489.56	4904682.61	Non-Participating	1	4
505	716473.85	4904722.74	Non-Participating	1	4
506	716442.68	4904744.70	Non-Participating	1	4
507	716445.50	4904785.31	Non-Participating	1	4
508	716424.48	4904684.60	Non-Participating	1	4
509	716223.64	4904999.11	Non-Participating	1	2
510	716354.23	4905179.04	Non-Participating	1	2
511	716338.97	4905246.51	Non-Participating	1	2
512	716459.20	4905309.54	Non-Participating	1	2
513	716453.10	4905409.39	Non-Participating	1	7
514	716418.30	4905353.97	Non-Participating	1	2
515	716427.83	4905367.28	Non-Participating	1	2
516	716458.13	4905288.00	Non-Participating	1	2
517	715843.66	4905893.14	Non-Participating	1	5
518	715773.02	4905877.69	Non-Participating	1	0
519	715815.13	4905344.94	Non-Participating	1	4
520	715824.71	4905292.24	Non-Participating	1	0
521	715867.43	4905309.16	Non-Participating	1	0
522	715166.41	4904844.74	Non-Participating	1	0
523	715205.36	4904754.06	Non-Participating	1	0
524	715157.37	4904393.98	Non-Participating	1	0
525	715215.94	4904385.63	Non-Participating	1	0
526	715199.70	4904352.03	Non-Participating	1	0
527	715356.05	4904461.80	Non-Participating	1	0
528	715417.46	4904498.17	Non-Participating	1	0
529	715407.47	4904466.54	Non-Participating	1	0
530	715666.65	4904585.78	Non-Participating	1	1
531	715696.65	4904576.48	Non-Participating	1	1
532	715724.48	4904576.59	Non-Participating	1	1
533	715756.97	4904578.58	Non-Participating	1	1
534	715778.32	4904580.68	Non-Participating	1	2
535	715805.26	4904582.32	Non-Participating	1	2
536	715837.95	4904581.14	Non-Participating	1	2
537	715835.66	4904540.43	Non-Participating	1	2
538	715797.01	4904522.16	Non-Participating	1	2
539	715742.38	4904518.03	Non-Participating	1	2
540	715681.73	4904534.21	Non-Participating	1	1
541	715679.22	4904510.19	Non-Participating	1	1
542	715894.13	4904455.71	Non-Participating	1	2
543	715859.67	4904459.97	Non-Participating	1	2
544	715826.19	4904461.11	Non-Participating	1	2
545	715798.36	4904461.00	Non-Participating	1	2

Table D-3: Ruthton Only Results

Receptor ID	Coordinates UTM NAD83 Zone 14N		Participation Status	Noise Area Class.	Ruthton Only Broadband L_{50} Sound Level (dBA)
	X (m)	Y (m)			
546	715893.31	4904508.16	Non-Participating	1	2
547	715892.01	4904529.56	Non-Participating	1	2
548	715893.34	4904559.87	Non-Participating	1	2
549	715908.04	4904592.58	Non-Participating	1	2
550	715937.31	4904595.17	Non-Participating	1	2
551	715977.73	4904597.64	Non-Participating	1	2
552	715998.33	4904598.89	Non-Participating	1	2
553	716045.23	4904599.37	Non-Participating	1	3
554	716045.31	4904546.09	Non-Participating	1	3
555	716009.60	4904544.70	Non-Participating	1	3
556	715972.76	4904548.81	Non-Participating	1	2
557	715949.78	4904547.41	Non-Participating	1	2
558	715954.67	4904506.34	Non-Participating	1	3
559	715639.77	4904166.54	Non-Participating	1	2
560	715706.97	4904199.28	Non-Participating	1	2
568	715127.65	4895407.57	Non-Participating	1	0
578	715224.57	4895378.18	Non-Participating	1	0
613	724975.11	4897668.13	Non-Participating	1	32
669	716989.84	4896233.57	Non-Participating	1	8
692	714314.71	4895847.22	Non-Participating	1	0
698	714205.06	4895733.41	Non-Participating	1	0
745	726858.39	4900143.28	Participating	1	19
746	726865.43	4900158.30	Participating	1	19
791	719916.57	4900476.21	Participating	1	38
793	719578.52	4900642.43	Participating	1	36
841	718039.49	4900059.75	Participating	1	24
924	727022.24	4902627.29	Non-Participating	1	14
941	724623.73	4903937.11	Participating	1	20
970	718804.83	4903017.02	Participating	1	27
985	714318.77	4902656.83	Non-Participating	1	5
986	714237.97	4903398.65	Non-Participating	1	4
997	714603.77	4903727.73	Non-Participating	1	5
1053	726925.43	4905673.26	Non-Participating	1	6
1054	726986.94	4905673.30	Non-Participating	1	5
1055	727460.91	4905672.52	Non-Participating	1	4
1056	727588.03	4905661.99	Non-Participating	1	3
1057	727648.51	4905661.71	Non-Participating	1	3
1058	727857.79	4905504.27	Non-Participating	1	3
1072	727319.90	4901042.05	Non-Participating	1	16
1076	728362.36	4902262.86	Non-Participating	1	9
1081	713673.07	4900785.04	Non-Participating	1	2
1082	726638.58	4904876.28	Non-Participating	1	9
1083	719182.87	4905036.07	Participating	1	19