

September 14, 2021

Ms. Tanowa Troupe, Secretary
Ohio Power Siting Board
Docketing Division
180 East Broad Street, 11th Floor
Columbus, Ohio 43215-3797

Re: Case No. 20-417-EL-BGN -In the Matter of the Application of Grover Hill Wind, LLC for a Certificate of Environmental Compatibility and Public Need to Construct a Wind-Powered Electric Generation Facility in Paulding County, Ohio.

Response to Seventh Data Request from Staff of the Ohio Power Siting Board

Dear Ms. Troupe:

Attached please find Grover Hill Wind, LLC's ("Applicant") Response to the Seventh Data Request from the staff of the Ohio Power Siting Board ("OPSB Staff"). The Applicant provided this response to OPSB Staff on September 13, 2021.

We are available, at your convenience, to answer any questions you may have.

Respectfully submitted,

/s/ Christine M.T. Pirik

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CERTIFICATE OF SERVICE

The Ohio Power Siting Board's e-filing system will electronically serve notice of the filing of this document on the parties referenced in the service list of the docket card who have electronically subscribed to these cases. In addition, the undersigned certifies that a copy of the foregoing document is also being served upon the persons below this 14th day of September, 2021.

/s/ Christine M.T. Pirik

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4841-8298-3163 v1 [73809-23]

**BEFORE
THE OHIO POWER SITING BOARD**

In the Matter of the Application of Grover Hill Wind,)
LLC for a Certificate of Environmental Compatibility)
and Public Need to Construct a Wind-Powered) Case No: 20-417-EL-BGN
Electric Generation Facility in Paulding County, Ohio.)

**GROVER HILL WIND, LLC 'S
RESPONSE TO THE SEVENTH DATA REQUEST
FROM THE STAFF OF THE OHIO POWER SITING BOARD**

On May 3, 2021, as supplemented on June 7, 2021, Grover Hill Wind, LLC (“Applicant”) filed an application (“Application”) with the Ohio Power Siting Board (“OPSB”) proposing to construct a wind-powered electric generation facility in Paulding County, Ohio (“Project”).

On August 27, 2021, the Staff of the OPSB (“OPSB Staff”) provided the Applicant with OPSB Staff’s Seventh Data Request. Now comes the Applicant providing the following response to the Seventh Data Request from the OPSB Staff.

Noise

- 1. Staff reiterates its recommendation that the applicant redo the ambient study. The operational noise model should comply with ISO 9613-2. The ambient noise study should comply with ANSI S12.100-2014 Methods to define and measure the residual sound in protected natural and quiet residential areas and with ANSI S12.9-1992 Quantities and procedures for description and measurement of environmental sound: Part 2 Measurement of long term, wide-area sound.**
- 2. ANSI S12.100-2014 “Methods to define and measure the residual sound in protected natural and quiet residential areas” defines “Quiet residential areas” as locations where the 90th percentile for A-weighted sound levels that are defined in this standard are less than 30 dB for at least two hours a day. we’ve ask for and have not received L90 levels for the noise study submitted in this case. But an adjacent wind farm, Northwest Ohio 13-0197-EL-BGN, has nighttime L90 levels of 26, 26, 21, 24 with an average of 24.3 dBA.**
- 3. Previously, Question 18 asked why were each of ambient locations chosen. Please explain the rationale for choosing location 1, please explain the rationale for choosing location 2, please explain the rationale for choosing location 3, please explain the**

rationale for choosing location 4, please explain the rationale for choosing location 5, and please explain the rationale for choosing location 6.

4. For each of the ambient locations please provide photos of the placement of the meter in their measurement location at the time of the measurement.
5. How far from the road were each of the meters placed?
6. In response to question 19, “Were high frequency natural sounds filtered out of the resulting ambient levels?” The response was, “No natural sounds were found to be occurring at a high enough frequency to impact the overall averages. None were filtered out.”
7. High frequency natural sounds are not natural sounds are occur often. High frequency natural sounds are sounds that have a high frequency in hertz. ANSI S12.100-2014 defines “high frequency natural sounds” as natural sounds that contain significant spectral energy above 1 kHz octave band, such as sounds produced by many insect, frog, and bird species.
8. The reason it may necessary to filter out high frequency natural sounds is that it’s possible for high frequency natural sounds to inflate ambient levels because the insect, frog, and bird species are not prevalent all year long. Unless the ambient study is done during the winter high frequency natural sounds should be filtered out.
9. What were the dates the ambient noise study was conducted?
10. Question 20 asked, “Provide a table showing Leq, L90, L50, and L10 for each monitoring locations including day/night levels, day levels and night levels. Provide temperature and precipitation data for the location and time and date of the measurements.”
11. Please provide the requested table.
12. Please provide the requested temperature and precipitation data for the location and time and date of the measurements.”
13. Exhibit J “Ambient Sound Level Measurements” states “It is unlikely that local winds created these high levels, although no meteorological data are available for the monitoring period.” But the data request response to question 20, states, “Weather data was collected with a Kestrel 5500 weather meter at 10-minute increments for the duration of the Project.” Please explain this discrepancy.
14. There are two noise standards that we have used. Leq and L90. Leq is the less conservative standard and when using it other conservative methods should be used like adhering to ANSI S12.100-2014 Methods to define and measure the residual sound in protected natural and quiet residential areas and with ANSI S12.9-1992 Quantities and procedures for description and measurement of environmental sound:

Part 2 Measurement of long term, wide-area sound, and filtering out high frequency (Hz) natural sounds, anomalous sounds, high wind/storm events. In lieu of a noise report conforming to these standards, we will be recommending a noise limit for the project based on L90 levels. The best data we have available for L90 levels for the project area comes from the sound study for the adjacent wind project Northwest Ohio 13-0197-EL-BGN, which reported nighttime L90 levels of 26, 26, 21, 24 with an average of 24.3 dBA. So the recommended noise limit would be 24.3 dBA plus 5 dBA = 29.3 dBA

Response: Attached please find Attachment 1, which is the Ambient Noise Conditions Assessment prepared by Westwood dated September 7, 2021. Also attached as Attachment 2 is the Noise Impact Assessment conducted by Westwood dated September 13, 2021.

Respectfully submitted,

/s/ Christine M.T. Pirik

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(Counsel agrees to receive service by email.)

Attorneys for Grover Hill Wind, LLC

Attachment 1

Ambient Noise Conditions Assessment Westwood September 7, 2021



AMBIENT NOISE CONDITIONS ASSESSMENT

Grover Hill Wind

SEPTEMBER 7, 2021

PREPARED BY: **Westwood**

September 7, 2021

Re: Grover Hill Wind Ambient Noise Study

This memo describes and summarizes ambient sound level data collected over three days at 6 locations in Paulding County, Ohio. This was done to determine an area nighttime ambient noise level and establish an impact threshold based on Ohio State Rule 4906-4-09. This memo contains the methodology, 1-minute Leq values, measurement locations, and average ambient noise levels for the project. Field sheets, photographs, and notes are attached. Calibration certificates are available upon request.

Methodology

This survey was done to establish a baseline ambient level as laid out in Ohio State Rule 4906-4-09:

(2) The facility shall be operated so that the facility noise contribution does not result in noise levels at any non-participating sensitive receptor within one mile of the project boundary that exceed the project area ambient nighttime average sound level (Leq) by five A-weighted decibels (dBA). During daytime operation only (seven a.m. to ten p.m.), the facility may operate at the greater of: the project area ambient nighttime Leq plus five dBA; or the validly measured ambient Leq plus five dBA at the location of the sensitive receptor. After commencement of commercial operation, the applicant shall conduct further review of the impact and possible mitigation of all project-related noise complaints through its complaint resolution process. Non-participating, as used in this context, refers to a property for which the owner has not signed a waiver or otherwise agreed to be subject to a higher noise level.

This ambient study sought to determine the project area nighttime ambient Leq.

Measurements were taken at six locations throughout the project area (Figure 1). These locations were selected to cover the project area, conform with ANSI/ASA S12.9 siting requirements, and capture the variety of existing ambient conditions within the project area. Site selection and photographs are included in the next section.

Sound level readings were taken using NTI XL2 sound level meters, which meet Class I specifications as laid out in ANSI/ASA S1.4. Each meter was within its annual lab calibration window. Additionally, each meter was field calibrated before and after the measurement period with a CAL 200 Class I calibrator. This instrumentation also complies to ANSI/ASA S12.9 Part 2 instrumentation requirements (Section 6.2). Meters were equipped with NTI WP30 weather protection systems. Field notes, site diagrams, and calibration levels were recorded on field sheets that are attached to this memo. Photos of the meters as deployed are also attached.

As the dominant noise sources in the area were expected to be rural traffic and agricultural activity, little variance in background levels is expected from day to day. Measurements were conducted during summer, to best match the modelled conditions.

Meters were deployed at LT-1, LT-2, and LT-3 on were deployed the morning of July 21st and retrieved on July 22nd. Meters were then deployed at LT-4, LT-5, and LT-6 midday July 22nd, and retrieved the morning of July 23rd as storms moved through the area. Minute A-weighted Leq readings were recorded at all sites. Unweighted 1-minute 1/3 octave band data was also collected.

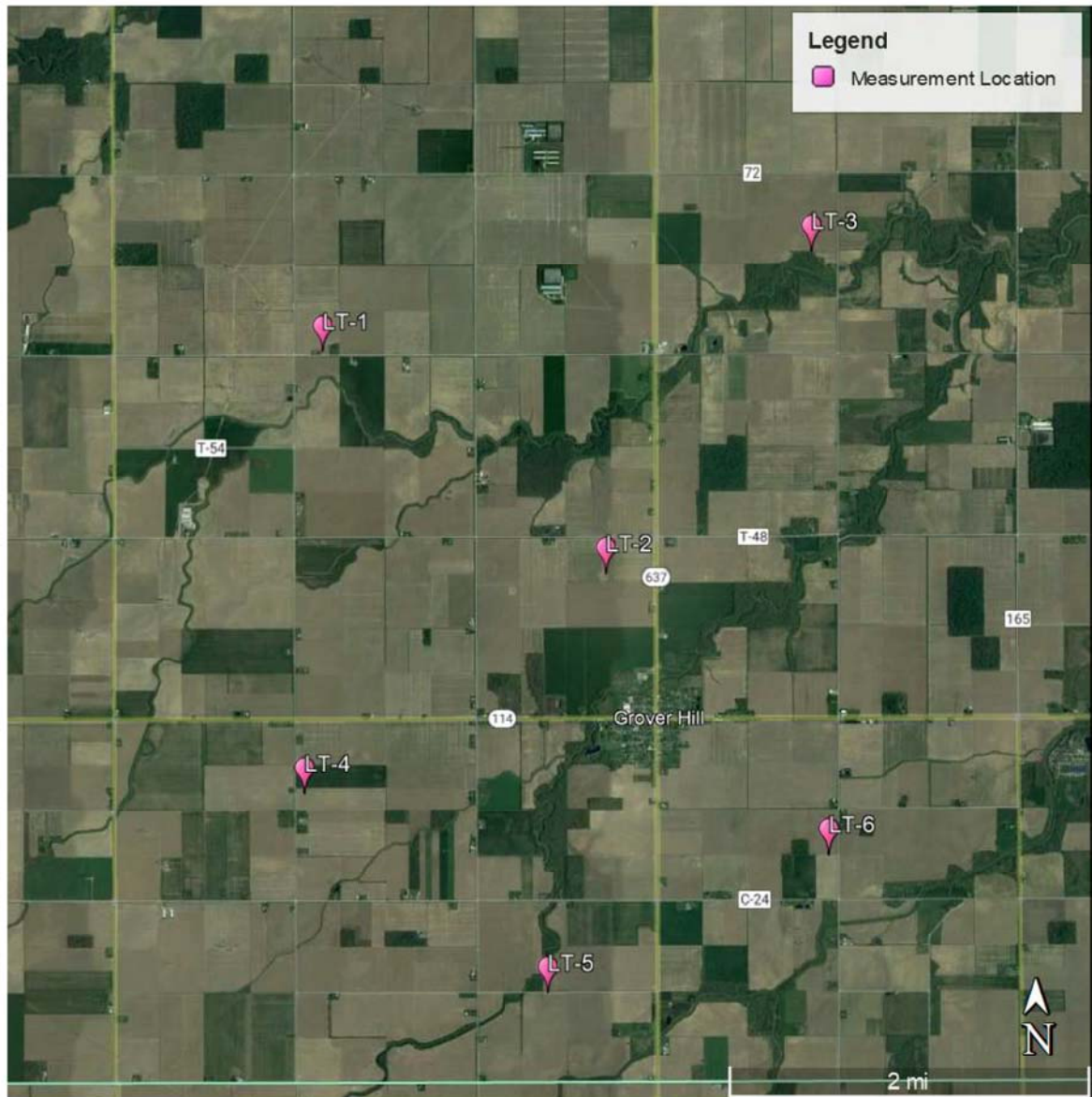






FIGURE 1 MEASUREMENT LOCATIONS

Measurement Site Selection

Six sites were selected for noise monitoring. They were selected to best cover the whole project area, represent the varying acoustic conditions, and accommodate land access restrictions. Each site is listed with rationale for its location, a photograph, and aerial map detail.

LT-1	
	
LT-1 Facing South	
<p>LT-1 was located at the Northwest corner of the project area. The meter was placed ~150 feet away from the nearby residence, at a setback from County Road 60 roughly equal to that of the home. The distance from the home should mitigate any noise from human activity, while representing receptor locations near roadways in the project area.</p>	

LT-2	
	
LT-2 Facing East	
<p>LT-2 was in the central area of the project, just North of Grover Hill. The meter was placed in a clearing in the middle of a corn field. The nearest roadway was ~1,000 feet away. This location was selected to represent receptors far removed from road noise.</p>	

LT-3



LT-2 Facing East

LT-3 was in the Northeast corner of the project. Located ~700 feet away from a roadway, near a cornfield and natural area. This site also best approximates homes that are located far away from roadway noise.

LT-4



LT-3 Facing West

LT-3 was in the Northeast corner of the project. Located ~700 feet away from a roadway, near a cornfield and natural area. This site also best approximates homes that are located far away from roadway noise.

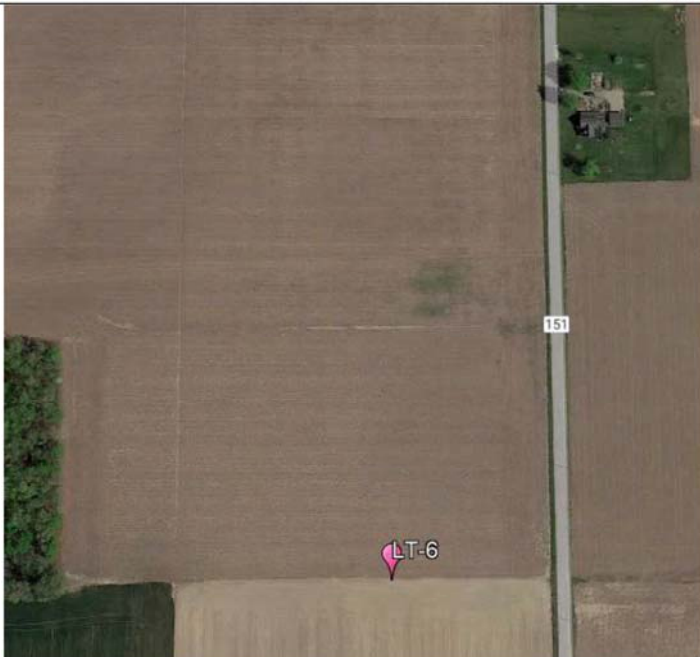
LT-5



LT-5 Facing West

LT-5 was located near the South boundary of the project, on a permanently closed road between two fields. This measurement site was placed very far away from active roadways and other potential noise sources (~2000 ft to the nearest road). It best represents receptors well removed from area roadways.

LT-6



LT-5 Facing North (Field photos from LT-6 are missing due to cloud storage issues. The equipment and deployment were equivalent to the other measurements.)

LT-6 was located on the Western boundary of the project, located on the ditch between two soybean fields. Set back approximately ~250 feet from the nearest roadway, this location best represents nearby homes within the influence of roadway noise.

Weather and Anomalous Event Filtering

Weather data was collected in 10-minute increments with a Kestrel 5500 weather meter, deployed at sites LT-1 and LT-4. Wind speeds ranged from 0 to 9 mph, and temperatures ranged from 68°F to 86°F. Both metrics stayed within the operable range of the Sound Level Meters and were within the expected range of conditions for the project area. A thunderstorm entered the vicinity on Friday morning, July 23rd, around 9 AM. Data collected after 9 AM on Friday was discarded.

Sound Level Meters were deployed with audio event logging, with the trigger threshold set to 70 dB. Several events were recorded, and all recordings were analyzed after the conclusion of the measurement. The recordings consisted of bird calls and vehicle pass-bys. The average duration of these events was less than 6 seconds and are not noticeable in the 1-minute Leq data, nor the longer time averages. Thus, no events were filtered out due to event recording.

Measurement Results

For the purposes of this study, only nighttime ambient A-weighted Leq levels are discussed and reported, as stipulated by Ohio State Rule 4906-4-09. 1-minute A-weighted Leq levels were logarithmically averaged for nighttime hours between 10 PM and 7 AM at each location. These nighttime averages were analyzed and checked against field notes. Observations from the field noted that the areas near LT-1 and LT-3 had a high amount of natural noise from insects and birds at these locations. ANS filtering was then applied to the 1/3-octave band data, and ANS weighted nighttime levels were calculated. The A weighted and ANS filtered levels are reported in Table 1.

TABLE 1

	LT-1	LT-2	LT-3	LT-4	LT-5	LT-6	Range	Average
A-Weighted Leq Nighttime Ambient	44.9	35.6	38.5	38.8	37.1	40.4	36-45	40
ANS Filtered Leq Nighttime Ambient	37.9	33.6	28.6	38.0	34.6	40.1	27-40	37

ANS filtering resulted in a significant decrease in measured sound levels across the project area. The most drastic changes being a decrease of 7 dB and 10 dB at LT-1 and LT-3 respectively. However, there is still a 13 dB range of noise levels between the six measurement sites.

The driving noise source, even during the quiet nighttime hours, is traffic on roadways in the area. This can be seen clearly when the measurement sites are grouped into those near roads (within 250 feet of a roadway) and those placed away from roads (those further than 250 from a roadway) (Table 2).

TABLE 2

	Near Roadways			Away from Roadways		
	LT-1	LT-4	LT-6	LT-2	LT-3	LT-5
ANS Filtered Leq Nighttime Ambient	37.9	38.0	40.1	33.6	28.6	34.6

	Range: 38-40 dBA ANS Weighted Average: 39 dBA ANS Weighted	Range: 29-35 dBA ANS Weighted Average: 33 dBA ANS Weighted
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The average difference between sites near roadways and away is 6 dBA, which is readily noticeable. With this result, Westwood recommends splitting the project into regions determined by proximity to the nearest roadway. Residences and sensitive receptors within 250 feet of a roadway should be held to the average ambient level of monitoring sites LT-1, 4, and 6. While residences and sensitive receptors beyond 250 feet should be held to the average ambient level of monitoring sites LT-2, 3 and 5. The ambient levels and sound level limit are listed in Table 3.

TABLE 3

	Nighttime Ambient Level (ANS Filtered dBA)	Sound Level Limit (Nighttime Ambient plus 5 dBA)
Receptors within 250 feet of a roadway	39 dBA	44 dBA
Receptors beyond 250 feet of a roadway	33 dBA	38 dBA

These ambient levels and recommended sound level limits are in line with previous ambient noise studies of the area.

Andrew Schad

Andrew Schad
Noise Specialist

Field Sheets

Acoustic Measurement Field Sheet

Project Name: <u>Grover Hill Wind</u>		Project #:	Date: <u>7-21-21</u>	Page <u> </u> of <u> </u>
Measurement Location: <u>LT-1</u>		Analyst: <u>Schad</u>		
Sound Level Meter Model #: <u>N11 XL2-TA</u> Serial #: <u>19382-EO</u> Weighting: <u>(A) C / Flat</u> Response: <u>Slow / Fast / Impl</u> Windscreen: <u>Yes / No (explain)</u> Topo: <u>Flat / Hilly</u> Terrain: <u>Hard / Soft / Mixed / Agg / Snow</u>		Field Calibration Model #: <u>CAL200</u> Serial #: <u>18893</u> Calibration Level (dB): <u>94.714</u> Pre-Test: <u>115.2</u> dBA Post-Test: <u>113.8</u> dBA GPS Coordinates (at SLM location):		Meteorological Data Model #: <u>K5500</u> Serial #: <u>2620664</u> Time Obs/Meas: <u>10:23</u> Precipitation: Yes (explain) / <u>No</u> Wind: <u>Steady / Gusty / Calm</u> Avg Wind Speed/Direction: <u>Check (m/s) / MPH</u> Temp (°F): <u>75.6</u> RH (%): <u>68.0</u> Bar Prs (Hg): <u>29.34</u> Cloud Cover (%): <u>70%</u>
Photos Taken? <u>Yes / No</u>		Noise Sources (circle all that apply): distant aircraft • roadway traffic • rail ops • landscaping • rustling leaves • children playing • dogs barking/birds • vocalizing insects/mechanical		
Loc. ID	Start Time (hh:mm)	Stop Time (hh:mm)	Notes/Events	
LT-1	10:15		start at 10:15. Distant Ag ops to North	
			Turbines barely audible to East	
	10:29		distant train horn	
	10:27		Weather meter deployed	
	20:00		check meter, not running. Restarted on USB power	
	20:02		Convo with resident, contact info for Brad	
7-22	10:25		Meter stopped, saved, pulled	
Notes/Misc		Site Diagram		
Nearest turbine barely audible & blue skies! no other noise Turbine very low speed 7-22 AM		<p>The diagram shows a rectangular house with a chimney, a gate to its right, and a field beyond. A weather meter is indicated in the field. A north arrow points towards the top-left of the diagram.</p>		

Additional Notes and Sketches on Reverse or Indicated Separate Sheet(s)

[illegible]

Acoustic Measurement Field Sheet

[illegible]

Acoustic Measurement Field Sheet

[illegible]

[illegible]

Acoustic Measurement Field Sheet

[illegible]

Attachment 2

Noise Impact Assessment Westwood September 13, 2021



Grover Hill Wind Farm

Noise Impact Assessment

Paulding County, OH

September 13, 2021

Prepared By:

Westwood

Prepared For:

Starwood Energy Group

Grover Hill Wind Farm

Noise Impact Assessment

Paulding County, OH

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Project Number: R0015695.00

Date: September 13, 2021

TABLE OF CONTENTS

1.0 INTRODUCTION	1
2.0 SOUND BACKGROUND	1
3.0 METHODOLOGY.....	3
4.0 RESULTS AND DISCUSSION	4
5.0 APPENDIX A	15

TABLES

Table 1: Project Sound Level Limits	2
Table 2: Modelled Turbines	2
Table 3: Predicted Sound Level Summary	5
Table 4: Detailed Noise Prediction Results	5

1.0 INTRODUCTION

Westwood Professional Services (Westwood) was contracted by Starwood Energy Group (Project Developer) to support the construction of the Grover Hill Wind Farm Project by completing a noise and shadow flicker assessment. The site consists of 23 turbines with a nameplate capacity of 150 megawatts (MW). The noise model assumes the Vestas V162-6.0 with a rotor diameter of 162m and a hub height of 119m. Turbine locations were provided to Westwood by the Project Developer.

The Project Developer provided a KMZ of the participating and non-participating noise and shadow flicker receptors within 1 mile of a wind turbine. Receptors consist of 320 occupied and unoccupied residential dwellings and 784 land parcel boundaries.

The Project Area is in Paulding County in central Ohio near the town of Grover Hill. The Subject Property is located at an approximate elevation of 700 to 735 feet above mean sea level (amsl) and is relatively flat. The Project Area is located within an agricultural and residential area.

2.0 Sound Background

To determine the turbine array existing at Grover Hill Wind Farm is within compliance with the sound allowance levels, Westwood analyzed the site specifics through a model built in WindPRO. The model assumed the turbines were operating at the loudest sound emission level. An additional uncertainty margin of 2 dBA was added to the noise emission levels. These assumptions were made to ensure a "worst case" scenario was analyzed to produce a model more conservative than realistic operational conditions.

There are no state or local statutes or regulations that establish quantitative noise standards which are applicable to this project. However, there are precedents set by the Ohio Power Siting Board (OPSB) for other wind power projects within the state. Ohio State Rule 4906-4-09 dictates:

"The facility shall be operated so that the facility noise contribution does not result in noise levels at any non-participating sensitive receptor within one mile of the project boundary that exceed the project area ambient nighttime average sound level (Leq) by five A-weighted decibels (dBA). During daytime operation only (seven a.m. to ten p.m.), the facility may operate at the greater of: the project area ambient nighttime Leq plus five dBA; or the validly measured ambient Leq plus five dBA at the location of the sensitive receptor. After measured ambient Leq plus five dBA at the location of the sensitive receptor. After commencement of commercial operation, the applicant shall conduct further review of the impact and possible mitigation of all project-related noise Grover Hill Wind Farm – Noise and Shadow Impact Assessment 4 complaints through its complaint resolution process. Non-participating, as used in this context,

refers to a property for which the owner has not signed a waiver or otherwise agreed to be subject to a higher noise level.”

Ambient sound monitoring was done at six locations throughout the project area. Details of this ambient study can be found in the Ambient Noise Conditions Assessment memo. Nighttime average ambient levels varied across the project area, with the leading noise source being nighttime car traffic on area roadways. After consulting with OPSB personnel, it was decided to set two different area ambient levels based on proximity to local roadways. Areas within 250 feet of roadways were found to have an average nighttime ambient level of 39 dBA, and those beyond 250 feet of the nearest roadway were found to have a nighttime ambient level of 33 dBA. Using the nighttime ambient plus 5 dBA precedents in Ohio State Rule 4906-4-09, the following Sound Level Limits are used:

Table 1: Project Sound Level Limits

	Nighttime Ambient Level (Leq dBA)	Sound Level Limit (Nighttime Ambient plus 5 dBA)
Receptors within 250 feet of a roadway	39 dBA	44 dBA
Receptors beyond 250 feet of a roadway	33 dBA	38 dBA

According to the Vestas noise emission documentation reviewed by Westwood, the loudest normal operational sound pressure level emission from a standard blade edge is 107.1 dBA at 10 m/s hub height wind speeds at 119m above ground level.

Sound levels are calculated at noise sensitive receivers such as habitable residences, schools, churches, and other noise sensitive areas within 1 mile of proposed project turbines. Sound levels at property boundaries within 1 mile of the project boundary are also calculated. Sound levels were calculated both with and without contribution of nearby existing wind projects, Blue Creek and Northwest Ohio Wind Farms. Both levels are presented in the results table.

Table 2: Modelled Turbines

Manufacturer	Model	Hub Height (m)	Rotor Diameter	Cut-in Wind Speed (m/s)	Cut-out Wind Speed (m/s)	Max Sound Power Level (dBA)	Project
Vestas	V162	119	162	3	25	107.1	Grover Hill
Siemens Gamesa	G90	100	90	3	25	106.4	Blue Creek
GE	2.5-116	90	116	3	31	107	Northwest Ohio Wind

3.0 Methodology

This noise analysis was performed utilizing windPRO, a sophisticated wind modeling software program. windPRO calculates detailed noise maps across an entire area of interest or at site-specific locations using noise sensitive receptors. The analysis assumed the ISO 9613-2 General noise calculation model with General ground attenuation and an attenuation factor of 0.5, which represents typical mixed vegetation and crop cover. A safety margin of +2 dBA was added onto the turbine manufacturer's noise emission data and results are compared to the Sound Level Limits presented in Table 1. Using these assumptions, predicted sound pressure levels were calculated at 1.5 m AGL at the potential occupied structures.

The inputs for the windPRO noise calculation include the following:

- Turbine Coordinates
- Turbine Specifications
- Wind Turbine Noise Emission Data
- Noise Receptor Coordinates
- USGS Digital Elevation Model
- Uncertainty Factor
- Meteorological Conditions
- Ground Attenuation
- Existing Wind Turbines

A description of each input variable and how they affect the shadow flicker calculation are included below.

Turbine Coordinates: The location of a wind turbine in relation to a noise receptor is one of the most important factors in determining noise impacts. Noise levels drop as they travel farther from the source of emission. The attenuation comes from atmospheric absorption as well as from absorption by the ground cover between the turbine and the receptor. The sound pressure waves can also be reflected by hard or smooth surfaces such as ice or water. Noise is also absorbed by trees and reflected by structures such as buildings or walls, although these effects (trees and buildings) are ignored in the model. Turbine coordinates can be found in Appendix A.

Turbine Specifications: Wind turbine specifications from the manufacturer were supplied to Westwood by the Project Developer. Wind turbine specifications included in the model were the power curves, blade types (standard non LNTE), hub heights, and operational rotational speed of the rotor.

Turbine Noise Emission Data: Noise emission data including 1/3rd octave data supplied by the manufacturer is used assuming the loudest noise levels are being emitted at the hub height of

the turbine. A safety margin of 2 dBA was added to the wind turbine noise emission profiles for the analysis to produce more conservative results, meaning that the model will predict higher sound pressure levels.

Noise Receptor Coordinates: As with the wind turbine coordinates, the elevation, and distance of a noise receptor in relation to the wind turbines are the main factors in determining the noise impacts. Westwood was provided with coordinates by the Project Developer for all existing occupied structures found to be within 1 mile of the 23 proposed wind turbine locations.

Uncertainty Factor: No uncertainty factor was provided by the wind turbine manufacturer. In this situation, it is common practice based on experience and studies to add 2 dBA to the noise emission levels of each wind turbine. For this analysis, the 2 dBA were added to all wind turbine noise emission profiles.

Meteorological Conditions: A temperature of 10°C (50° F) and a relative humidity of 70% were assumed for the analysis. These conditions represent an atmospheric “worst case” scenario where sound waves will travel farther with less atmospheric absorption. This will lead to more conservative (higher predicted sound pressure levels) results. All wind turbines are assumed to be operating simultaneously at maximum noise output levels. All turbines are assumed to be downwind of all receptors, which is another conservative (higher predicted sound pressure levels) assumption.

Ground Attenuation: A ground attenuation factor of 0.5 was assumed for this analysis. It represents “mixed ground” consisting of half hard and half soft (porous) ground. No other sources of noise attenuation such as trees, air turbulence or wind shadow effects were assumed in the analysis.

Existing Wind Turbines: There are several existing wind turbines within the vicinity of the Northern Wind Project. Maximum sound pressure levels both with and without existing wind turbine contributions. Both levels are presented in the results tables. A table of the existing turbines can be found in Appendix A.

4.0 Results and Discussion

The sound assessment determined that predicted noise levels will range from 32 to 49 dBA including existing wind farms, and 29 to 49 dBA excluding existing turbines at noise sensitive receptors. In both analyzed cases, several noise levels at sensitive receptors exceed the sound level limits presented in Table 1. 125 of 320 receptors were found to exceed limits based on project sound contributions, and 102 receptors were found to exceed limits when nearby project contribution was not included. However, the average exceedance is just over one dBA, and all but 12 receptors are within two dBA of compliance. These exceedances will be addressed and eliminated when final turbine selection is done. This study assumed full power, non-serrated trailing edges at each location to determine a worst-case scenario. Mitigation plans will be developed and implemented to ensure full compliance with Ohio State Rule 4906-4-08. A

summary of predicted levels is presented in Table 3, and full results are in Table 4. Additionally, noise maps of the project area, with iso-lines of predicted noise levels (including adjacent windfarms) is attached as Appendix A.

Table 3: Predicted Sound Level Summary

Scenario	Total Receptors	Range	Predicted exceedances	Predicted exceedances within 2 dBA
Predicted Levels including adjacent wind farms	320	32-49 dBA	125 receptors	111receptors
Predicted Levels excluding adjacent wind farms	320	29-49 dBA	102 receptors	90 receptors

Table 4: Detailed Noise Prediction Results

Receptor (P-Participant, NP-Non-Participant)	Easting (m)	Northing (m)	z (m)	Within 250 ft to a roadway	Noise Limit (dBA)	Predicted Noise Level (dBA) (Including Existing Turbines)	Compliant (Including Existing Turbines)	Predicted Noise Level Excluding Existing Turbines)	Compliant (Excluding Existing Turbines)
NSP-1-P	711421	4548741	220	Yes	44	36	Yes	31	Yes
NSP-5-NP	709417	4548672	221	Yes	44	43	Yes	33	Yes
NSP-7-P	709213	4548680	221	Yes	44	43	Yes	32	Yes
NSP-13-NP	708362	4548648	221	Yes	44	44	Yes	31	Yes
NSP-18-NP	713614	4548033	219	Yes	44	32	Yes	30	Yes
NSP-33-NP	712651	4547259	220	Yes	44	36	Yes	35	Yes
NSP-34-NP	712583	4547255	220	Yes	44	36	Yes	35	Yes
NSP-37-NP	712043	4547216	220	Yes	44	37	Yes	36	Yes
NSP-38-NP	712260	4547224	219	Yes	44	37	Yes	36	Yes
NSP-41-NP	709014	4547121	221	Yes	44	47	No	43	Yes
NSP-42-NP	707826	4547075	222	Yes	44	45	No	35	Yes
NSP-43-P	709342	4547065	221	Yes	44	47	No	46	No
NSP-45-NP	711976	4546977	219	No	38	39	No	38	Yes
NSP-55-NP	710488	4546863	221	Yes	44	43	Yes	42	Yes
NSP-57-P	709840	4547075	221	Yes	44	44	No	43	Yes
NSP-62-NP	712055	4546572	219	Yes	44	41	Yes	40	Yes

Receptor (P-Participant, NP-Non-Participant)	Easting (m)	Northing (m)	Z (m)	Within 250 ft to a roadway	Noise Limit (dBA)	Predicted Noise Level (dBA) (Including Existing Turbines)	Compliant (Including Existing Turbines)	Predicted Noise Level Excluding Existing Turbines)	Compliant (Excluding Existing Turbines)
NSP-67-P	712120	4546400	220	Yes	44	41	Yes	41	Yes
NSP-68-NP	710443	4546266	220	Yes	44	47	No	47	No
NSP-70-NP	713694	4546054	220	Yes	44	35	Yes	34	Yes
NSP-77-NP	712083	4546052	221	Yes	44	44	No	44	No
NSP-80-P	710537	4545952	220	Yes	44	49	No	48	No
NSP-82-P	709886	4545522	221	Yes	44	48	No	48	No
NSP-85-NP	707928	4545490	221	Yes	44	46	No	37	Yes
NSP-87-NP	708915	4545845	222	Yes	44	46	No	44	Yes
NSP-87-NP	708922	4545786	221	Yes	44	45	No	44	Yes
NSP-89-NP	712094	4545774	221	Yes	44	45	No	45	No
NSP-92-NP	708937	4545717	221	Yes	44	45	No	43	Yes
NSP-93-NP	713482	4545706	220	No	38	36	Yes	36	Yes
NSP-96-NP	712527	4545611	221	Yes	44	41	Yes	41	Yes
NSP-97-P	711294	4545570	221	Yes	44	49	No	49	No
NSP-98-NP	713256	4545570	220	Yes	44	37	Yes	37	Yes
NSP-99-NP	708914	4545493	222	Yes	44	45	No	43	Yes
NSP-100-NP	712950	4545565	220	Yes	44	39	Yes	38	Yes
NSP-101-NP	713027	4545563	220	Yes	44	38	Yes	38	Yes
NSP-102-NP	713662	4545617	219	Yes	44	36	Yes	35	Yes
NSP-103-NP	713604	4545568	218	Yes	44	36	Yes	35	Yes
NSP-106-P	712238	4545538	221	Yes	44	44	No	44	Yes
NSP-107-NP	708753	4545488	222	Yes	44	44	No	42	Yes
NSP-109-NP	711149	4545493	221	Yes	44	49	No	49	No
NSP-110-NP	708453	4545483	222	Yes	44	45	No	40	Yes
NSP-111-NP	708371	4545481	222	Yes	44	45	No	39	Yes
NSP-112-NP	708298	4545479	222	Yes	44	46	No	39	Yes
NSP-113-P	710271	4545476	221	Yes	44	48	No	48	No
NSP-118-NP	713653	4545430	220	No	38	36	Yes	36	Yes
NSP-121-NP	712171	4545200	221	Yes	44	45	No	45	No
NSP-123-NP	712168	4545145	221	Yes	44	45	No	45	No
NSP-124-NP	713717	4545217	220	Yes	44	36	Yes	36	Yes
NSP-131-NP	712118	4544910	221	Yes	44	46	No	46	No
NSP-136-NP	710494	4544685	221	Yes	44	45	No	44	No
NSP-137-P	712189	4544725	221	Yes	44	44	No	44	No
NSP-138-NP	708950	4544631	222	Yes	44	43	Yes	42	Yes
NSP-141-NP	712683	4544508	221	Yes	44	42	Yes	42	Yes
NSP-145-NP	708893	4544472	222	Yes	44	43	Yes	41	Yes

Receptor (P-Participant, NP-Non-Participant)	Easting (m)	Northing (m)	Z (m)	Within 250 ft to a roadway	Noise Limit (dBA)	Predicted Noise Level (dBA) (Including Existing Turbines)	Compliant (Including Existing Turbines)	Predicted Noise Level Excluding Existing Turbines)	Compliant (Excluding Existing Turbines)
NSP-157-NP	711111	4543951	221	Yes	44	44	Yes	43	Yes
NSP-159-NP	708972	4544296	222	Yes	44	43	Yes	41	Yes
NSP-173-NP	712510	4544212	221	Yes	44	43	Yes	43	Yes
NSP-175-NP	712486	4544195	221	Yes	44	43	Yes	43	Yes
NSP-176-NP	712455	4544215	221	Yes	44	43	Yes	43	Yes
NSP-179-NP	712404	4544210	221	Yes	44	43	Yes	43	Yes
NSP-180-NP	712359	4544218	221	Yes	44	43	Yes	43	Yes
NSP-181-NP	712334	4544193	221	Yes	44	43	Yes	43	Yes
NSP-182-NP	712141	4544175	221	Yes	44	44	Yes	43	Yes
NSP-183-NP	712316	4544199	221	Yes	44	43	Yes	43	Yes
NSP-184-NP	712290	4544195	221	Yes	44	43	Yes	43	Yes
NSP-185-NP	712259	4544201	221	Yes	44	43	Yes	43	Yes
NSP-186-NP	712233	4544190	221	Yes	44	43	Yes	43	Yes
NSP-187-NP	713727	4544165	221	Yes	44	39	Yes	39	Yes
NSP-188-NP	712354	4544157	221	Yes	44	43	Yes	43	Yes
NSP-189-NP	712296	4544156	221	Yes	44	43	Yes	43	Yes
NSP-190-NP	712247	4544153	221	Yes	44	43	Yes	43	Yes
NSP-193-NP	712450	4544159	221	Yes	44	43	Yes	43	Yes
NSP-193-NP	712432	4544154	221	Yes	44	43	Yes	43	Yes
NSP-194-NP	712146	4544153	221	Yes	44	44	Yes	43	Yes
NSP-197-NP	712395	4544152	221	Yes	44	43	Yes	43	Yes
NSP-199-NP	712042	4544143	221	Yes	44	44	Yes	44	Yes
NSP-200-NP	714400	4544064	221	Yes	44	36	Yes	36	Yes
NSP-202-NP	714247	4544062	221	Yes	44	37	Yes	37	Yes
NSP-204-NP	712498	4544133	222	Yes	44	44	Yes	43	Yes
NSP-205-NP	712356	4544135	221	Yes	44	43	Yes	43	Yes
NSP-208-NP	710807	4543983	222	Yes	44	44	Yes	43	Yes
NSP-209-NP	712254	4544134	221	Yes	44	43	Yes	43	Yes
NSP-213-NP	712148	4544131	221	Yes	44	44	Yes	43	Yes
NSP-215-NP	712092	4544134	221	Yes	44	44	Yes	43	Yes
NSP-216-NP	712039	4544120	221	Yes	44	44	Yes	44	Yes
NSP-219-NP	712395	4544111	221	Yes	44	44	Yes	43	Yes
NSP-220-NP	712366	4544113	221	Yes	44	44	Yes	43	Yes
NSP-221-NP	712295	4544116	221	Yes	44	43	Yes	43	Yes
NSP-224-NP	712259	4544111	221	Yes	44	43	Yes	43	Yes
NSP-225-NP	712189	4544107	221	Yes	44	44	Yes	43	Yes
NSP-226-NP	712903	4544035	221	Yes	44	45	No	45	No

Receptor (P-Participant, NP-Non-Participant)	Easting (m)	Northing (m)	Z (m)	Within 250 ft to a roadway	Noise Limit (dBA)	Predicted Noise Level (dBA) (Including Existing Turbines)	Compliant (Including Existing Turbines)	Predicted Noise Level Excluding Existing Turbines)	Compliant (Excluding Existing Turbines)
NSP-229-NP	712149	4544107	221	Yes	44	44	Yes	43	Yes
NSP-231-NP	712043	4544103	221	Yes	44	44	Yes	44	Yes
NSP-237-NP	712395	4544090	221	Yes	44	44	Yes	44	Yes
NSP-238-NP	712355	4544090	221	Yes	44	44	Yes	43	Yes
NSP-239-NP	712298	4544090	221	Yes	44	44	Yes	43	Yes
NSP-240-NP	712257	4544082	220	Yes	44	44	Yes	43	Yes
NSP-241-NP	712193	4544086	221	Yes	44	44	Yes	43	Yes
NSP-243-NP	712140	4544086	221	Yes	44	44	Yes	43	Yes
NSP-245-NP	712081	4544086	221	Yes	44	44	Yes	43	Yes
NSP-246-NP	712042	4544077	221	Yes	44	44	Yes	43	Yes
NSP-247-NP	711978	4544078	221	Yes	44	44	Yes	44	Yes
NSP-247-NP	712001	4544075	221	Yes	44	44	Yes	44	Yes
NSP-250-NP	712500	4544078	222	Yes	44	44	Yes	44	Yes
NSP-256-NP	712367	4544051	221	Yes	44	44	Yes	44	Yes
NSP-257-NP	712296	4544048	221	Yes	44	44	Yes	44	Yes
NSP-258-NP	710526	4544021	221	Yes	44	44	Yes	44	Yes
NSP-261-NP	712454	4544052	221	Yes	44	44	Yes	44	Yes
NSP-263-NP	712139	4544041	221	Yes	44	44	Yes	43	Yes
NSP-265-NP	712424	4544049	221	Yes	44	44	Yes	44	Yes
NSP-267-NP	712086	4544041	221	Yes	44	44	Yes	43	Yes
NSP-269-NP	712047	4544039	221	Yes	44	44	Yes	43	Yes
NSP-273-NP	712354	4544029	221	Yes	44	44	Yes	44	Yes
NSP-274-NP	712296	4544026	221	Yes	44	44	Yes	44	Yes
NSP-275-P	711352	4543957	221	Yes	44	44	Yes	44	Yes
NSP-277-NP	712854	4544015	221	Yes	44	45	No	45	No
NSP-279-NP	712799	4543997	221	Yes	44	45	No	45	No
NSP-281-NP	712083	4544024	221	Yes	44	44	Yes	43	Yes
NSP-282-NP	712042	4544016	221	Yes	44	44	Yes	44	Yes
NSP-283-NP	712997	4544023	221	Yes	44	45	No	45	No
NSP-285-NP	712549	4543998	221	Yes	44	45	No	45	No
NSP-286-NP	712501	4543988	221	Yes	44	45	No	44	No
NSP-287-NP	712741	4544001	221	Yes	44	45	No	45	No
NSP-298-NP	712439	4543987	221	Yes	44	44	No	44	No
NSP-300-NP	712424	4543985	221	Yes	44	44	No	44	No
NSP-301-NP	712401	4544003	221	Yes	44	44	No	44	Yes
NSP-306-NP	712019	4543992	221	Yes	44	44	Yes	44	Yes
NSP-309-NP	711510	4543962	221	Yes	44	44	Yes	44	Yes

Receptor (P-Participant, NP-Non-Participant)	Easting (m)	Northing (m)	Z (m)	Within 250 ft to a roadway	Noise Limit (dBA)	Predicted Noise Level (dBA) (Including Existing Turbines)	Compliant (Including Existing Turbines)	Predicted Noise Level Excluding Existing Turbines)	Compliant (Excluding Existing Turbines)
NSP-310-NP	711848	4543978	221	Yes	44	44	Yes	44	Yes
NSP-311-NP	711804	4543978	221	Yes	44	44	Yes	44	Yes
NSP-314-NP	713417	4543977	221	Yes	44	42	Yes	42	Yes
NSP-315-NP	712365	4543999	221	Yes	44	44	Yes	44	Yes
NSP-317-NP	712322	4543982	221	Yes	44	44	Yes	44	Yes
NSP-318-NP	712301	4543981	221	Yes	44	44	Yes	44	Yes
NSP-320-NP	713960	4543989	221	Yes	44	39	Yes	39	Yes
NSP-323-NP	713841	4543975	222	Yes	44	40	Yes	39	Yes
NSP-324-NP	712109	4543976	221	Yes	44	44	Yes	44	Yes
NSP-331-NP	713074	4543965	221	Yes	44	45	No	45	No
NSP-333-NP	711762	4543962	221	Yes	44	44	Yes	44	Yes
NSP-336-NP	712902	4543959	222	Yes	44	46	No	46	No
NSP-339-NP	710602	4543937	221	Yes	44	44	Yes	44	Yes
NSP-340-NP	710876	4543954	221	Yes	44	44	Yes	43	Yes
NSP-346-NP	712613	4543942	221	Yes	44	46	No	45	No
NSP-349-NP	712538	4543953	221	Yes	44	45	No	45	No
NSP-349-NP	712463	4543947	221	Yes	44	45	No	45	No
NSP-349-NP	712404	4543930	221	Yes	44	45	No	45	No
NSP-349-NP	712482	4543930	221	Yes	44	45	No	45	No
NSP-381-NP	710102	4543907	222	Yes	44	46	No	45	No
NSP-383-NP	712092	4543911	222	Yes	44	44	Yes	44	Yes
NSP-390-NP	711379	4543906	221	Yes	44	44	Yes	43	Yes
NSP-397-NP	711818	4543927	221	Yes	44	44	Yes	44	Yes
NSP-398-NP	711763	4543911	221	Yes	44	44	Yes	44	Yes
NSP-398-NP	711727	4543899	221	Yes	44	44	Yes	44	Yes
NSP-400-NP	709598	4543900	222	Yes	44	46	No	45	No
NSP-401-NP	712421	4543901	221	Yes	44	45	No	45	No
NSP-403-NP	712310	4543901	221	Yes	44	44	No	44	No
NSP-405-NP	712404	4543900	221	Yes	44	45	No	45	No
NSP-408-NP	712094	4543893	222	Yes	44	44	Yes	44	Yes
NSP-414-NP	710914	4543891	221	Yes	44	44	Yes	43	Yes
NSP-416-NP	711882	4543884	221	Yes	44	44	Yes	44	Yes
NSP-417-NP	712453	4543897	221	Yes	44	45	No	45	No
NSP-418-NP	712370	4543881	221	Yes	44	45	No	45	No
NSP-419-NP	712307	4543874	221	Yes	44	45	No	44	No
NSP-420-N2	712251	4543872	221	Yes	44	44	No	44	No
NSP-420-NP	712257	4543891	221	Yes	44	44	No	44	No

Receptor (P-Participant, NP-Non-Participant)	Easting (m)	Northing (m)	Z (m)	Within 250 ft to a roadway	Noise Limit (dBA)	Predicted Noise Level (dBA) (Including Existing Turbines)	Compliant (Including Existing Turbines)	Predicted Noise Level Excluding Existing Turbines)	Compliant (Excluding Existing Turbines)
NSP-422-NP	711941	4543868	221	Yes	44	44	Yes	44	Yes
NSP-423-NP	712149	4543871	221	Yes	44	44	Yes	44	Yes
NSP-424-NP	708471	4543874	223	Yes	44	42	Yes	39	Yes
NSP-425-NP	712090	4543867	221	Yes	44	44	Yes	44	Yes
NSP-427-NP	711830	4543870	221	Yes	44	44	Yes	44	Yes
NSP-428-NP	712052	4543863	221	Yes	44	44	Yes	44	Yes
NSP-429-NP	710523	4543864	221	Yes	44	44	No	44	No
NSP-432-NP	711787	4543862	221	Yes	44	44	Yes	44	Yes
NSP-441-NP	712053	4543828	221	Yes	44	44	Yes	44	Yes
NSP-442-NP	711998	4543824	221	Yes	44	44	Yes	44	Yes
NSP-443-NP	711946	4543821	221	Yes	44	44	Yes	44	Yes
NSP-444-NP	711885	4543819	221	Yes	44	44	Yes	44	Yes
NSP-445-NP	712357	4543817	221	Yes	44	45	No	45	No
NSP-446-NP	711830	4543824	221	Yes	44	44	Yes	44	Yes
NSP-447-NP	712310	4543831	221	Yes	44	45	No	45	No
NSP-448-N2	712266	4543812	221	Yes	44	45	No	45	No
NSP-448-NP	712256	4543824	221	Yes	44	45	No	45	No
NSP-449-NP	708914	4543813	222	Yes	44	44	Yes	43	Yes
NSP-450-NP	712214	4543813	221	Yes	44	45	No	44	No
NSP-452-NP	712149	4543814	222	Yes	44	44	No	44	No
NSP-453-NP	711792	4543830	221	Yes	44	44	Yes	44	Yes
NSP-454-NP	712091	4543825	221	Yes	44	44	No	44	Yes
NSP-455-NP	708766	4543808	222	Yes	44	43	Yes	41	Yes
NSP-456-NP	712051	4543804	221	Yes	44	44	No	44	Yes
NSP-457-NP	711983	4543803	221	Yes	44	44	Yes	44	Yes
NSP-460-NP	711842	4543796	221	Yes	44	44	Yes	44	Yes
NSP-463-NP	712269	4543791	221	Yes	44	45	No	45	No
NSP-467-NP	712092	4543783	222	Yes	44	44	No	44	No
NSP-469-NP	711988	4543778	221	Yes	44	44	No	44	Yes
NSP-473-NP	712376	4543770	221	Yes	44	46	No	46	No
NSP-475-N2	712310	4543768	221	Yes	44	45	No	45	No
NSP-475-NP	712307	4543788	221	Yes	44	45	No	45	No
NSP-476-NP	712257	4543764	221	Yes	44	45	No	45	No
NSP-478-N2	712201	4543763	221	Yes	44	45	No	45	No
NSP-478-NP	712229	4543769	222	Yes	44	45	No	45	No
NSP-479-N2	712155	4543763	222	Yes	44	45	No	44	No
NSP-479-NP	712159	4543779	222	Yes	44	44	No	44	No

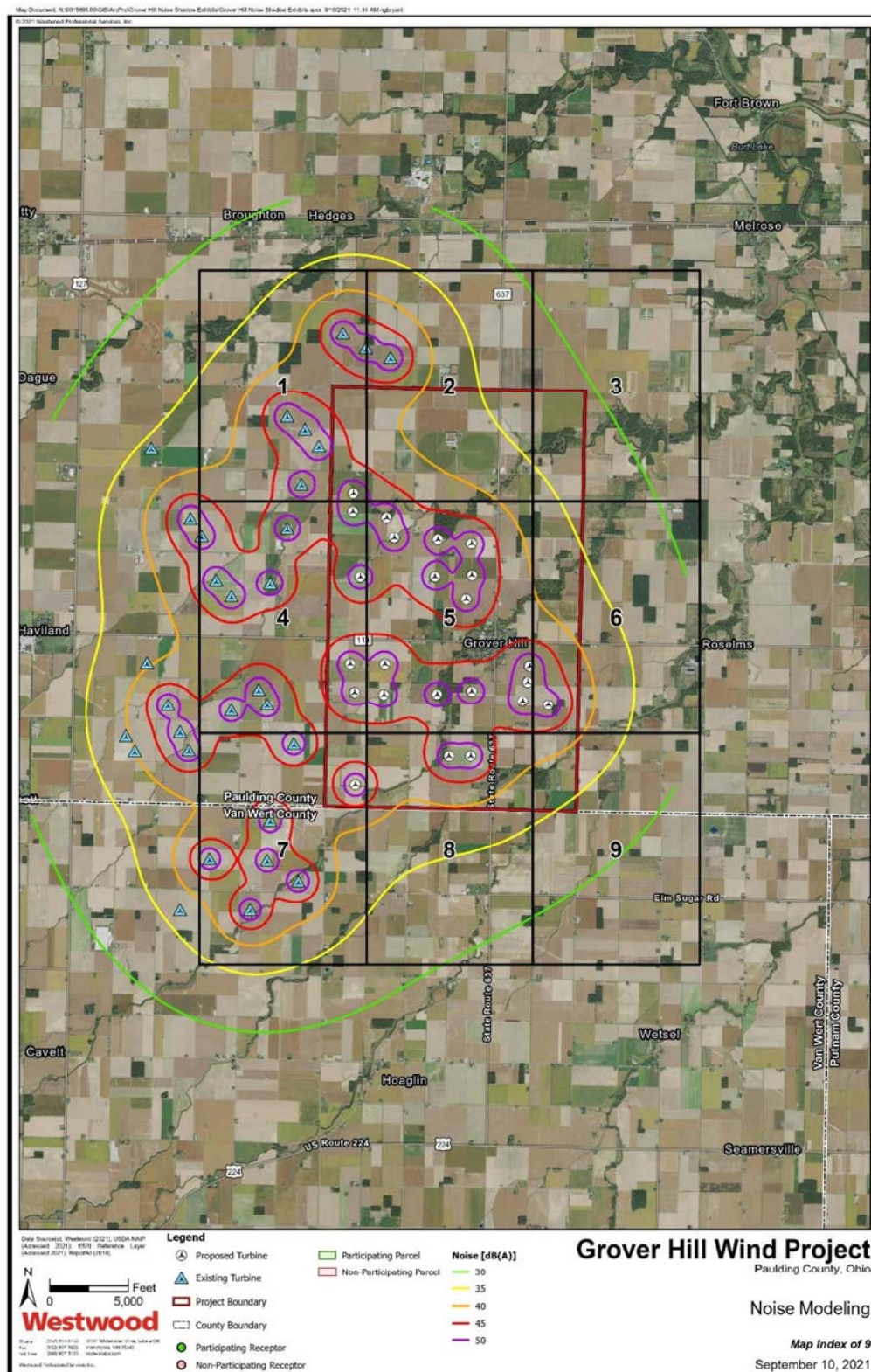
Receptor (P-Participant, NP-Non-Participant)	Easting (m)	Northing (m)	Z (m)	Within 250 ft to a roadway	Noise Limit (dBA)	Predicted Noise Level (dBA) (Including Existing Turbines)	Compliant (Including Existing Turbines)	Predicted Noise Level Excluding Existing Turbines)	Compliant (Excluding Existing Turbines)
NSP-480-NP	712097	4543758	221	Yes	44	44	No	44	No
NSP-482-N2	712047	4543758	221	Yes	44	44	No	44	No
NSP-482-NP	712054	4543778	221	Yes	44	44	No	44	Yes
NSP-484-NP	711934	4543774	221	Yes	44	44	Yes	44	Yes
NSP-486-NP	711851	4543753	221	Yes	44	44	Yes	44	Yes
NSP-487-NP	711784	4543753	221	Yes	44	44	Yes	44	Yes
NSP-489-NP	710531	4543732	222	Yes	44	45	No	45	No
NSP-490-NP	712407	4543740	221	Yes	44	46	No	46	No
NSP-491-P	712511	4543924	221	Yes	44	45	No	45	No
NSP-494-NP	712307	4543733	221	Yes	44	45	No	45	No
NSP-495-NP	712270	4543730	221	Yes	44	45	No	45	No
NSP-500-NP	712057	4543720	221	Yes	44	44	No	44	No
NSP-502-NP	712008	4543720	221	Yes	44	44	No	44	No
NSP-503-NP	712218	4543720	221	Yes	44	45	No	45	No
NSP-503-NP	712205	4543705	221	Yes	44	45	No	45	No
NSP-505-NP	712357	4543725	221	Yes	44	46	No	46	No
NSP-506-NP	712310	4543708	221	Yes	44	46	No	45	No
NSP-508-N2	712162	4543703	221	Yes	44	45	No	45	No
NSP-508-NP	712158	4543720	221	Yes	44	45	No	45	No
NSP-509-NP	711817	4543724	221	Yes	44	44	No	44	Yes
NSP-509-NP	711838	4543718	221	Yes	44	44	No	44	Yes
NSP-510-NP	712113	4543719	222	Yes	44	45	No	44	No
NSP-517-NP	712306	4543685	221	Yes	44	46	No	46	No
NSP-519-NP	712272	4543684	221	Yes	44	45	No	45	No
NSP-520-NP	712202	4543682	221	Yes	44	45	No	45	No
NSP-521-NP	711893	4543669	221	Yes	44	44	No	44	No
NSP-522-NP	712164	4543682	222	Yes	44	45	No	45	No
NSP-528-NP	711947	4543689	221	Yes	44	44	No	44	No
NSP-529-NP	708980	4543690	222	Yes	44	45	No	44	Yes
NSP-530-NP	712369	4543683	221	Yes	44	46	No	46	No
NSP-534-NP	712205	4543660	221	Yes	44	45	No	45	No
NSP-538-NP	712051	4543656	222	Yes	44	45	No	45	No
NSP-539-NP	711999	4543651	221	Yes	44	45	No	45	No
NSP-541-NP	711952	4543648	221	Yes	44	45	No	44	No
NSP-544-NP	711823	4543654	221	Yes	44	44	No	44	No
NSP-548-NP	712275	4543658	221	Yes	44	46	No	46	No
NSP-548-NP	712205	4543639	222	Yes	44	45	No	45	No

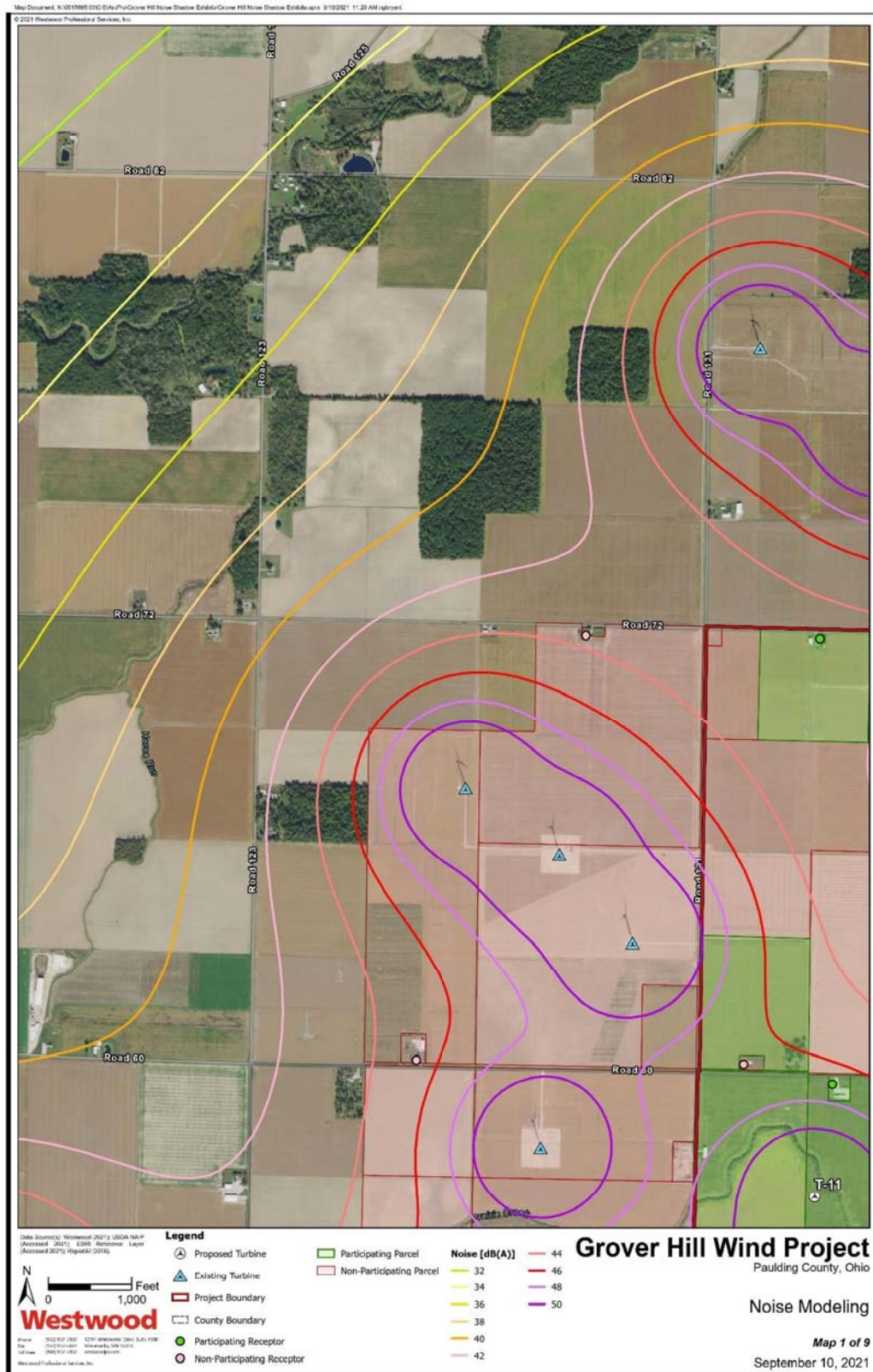
Receptor (P-Participant, NP-Non-Participant)	Easting (m)	Northing (m)	Z (m)	Within 250 ft to a roadway	Noise Limit (dBA)	Predicted Noise Level (dBA) (Including Existing Turbines)	Compliant (Including Existing Turbines)	Predicted Noise Level Excluding Existing Turbines)	Compliant (Excluding Existing Turbines)
NSP-548-NP	712205	4543614	221	Yes	44	45	No	45	No
NSP-554-NP	714384	4543262	221	Yes	44	38	Yes	38	Yes
NSP-555-NP	711995	4543617	222	Yes	44	45	No	45	No
NSP-558-NP	712309	4543660	221	Yes	44	46	No	46	No
NSP-561-NP	712058	4543613	221	Yes	44	45	No	45	No
NSP-564-NP	711953	4543609	221	Yes	44	45	No	45	No
NSP-565-NP	711899	4543601	222	Yes	44	45	No	45	No
NSP-567-NP	712206	4543589	221	Yes	44	46	No	45	No
NSP-567-NP	712206	4543569	221	Yes	44	46	No	46	No
NSP-568-NP	712164	4543594	221	Yes	44	45	No	45	No
NSP-572-NP	711795	4543570	221	Yes	44	45	No	45	No
NSP-577-NP	712162	4543574	221	Yes	44	45	No	45	No
NSP-580-NP	711997	4543567	221	Yes	44	45	No	45	No
NSP-581-NP	711952	4543568	221	Yes	44	45	No	45	No
NSP-584-NP	712208	4543544	222	Yes	44	46	No	46	No
NSP-586-NP	712163	4543537	221	Yes	44	46	No	46	No
NSP-586-NP	712168	4543520	222	Yes	44	46	No	46	No
NSP-589-NP	713846	4543506	221	Yes	44	41	Yes	41	Yes
NSP-593-NP	712235	4543495	221	Yes	44	46	No	46	No
NSP-594-NP	712165	4543471	221	Yes	44	46	No	46	No
NSP-595-NP	714926	4543270	221	Yes	44	35	Yes	34	Yes
NSP-596-NP	712165	4543413	222	Yes	44	46	No	46	No
NSP-600-P	711951	4543546	221	Yes	44	45	No	45	No
NSP-600-P	711826	4543521	221	Yes	44	45	No	45	No
NSP-603-NP	710605	4543299	222	Yes	44	46	No	46	No
NSP-606-NP	713780	4543223	221	Yes	44	43	Yes	43	Yes
NSP-607-NP	712178	4543216	222	Yes	44	47	No	47	No
NSP-608-NP	710550	4543202	221	Yes	44	47	No	47	No
NSP-611-NP	712223	4543174	222	Yes	44	47	No	47	No
NSP-612-NP	713865	4543167	221	Yes	44	42	Yes	42	Yes
NSP-616-NP	713848	4543042	221	Yes	44	43	Yes	43	Yes
NSP-618-NP	709002	4542983	223	Yes	44	46	No	45	No
NSP-622-NP	710617	4542990	221	Yes	44	47	No	47	No
NSP-628-NP	710557	4542796	222	Yes	44	47	No	47	No
NSP-633-NP	709036	4542681	223	Yes	44	46	No	45	No
NSP-638-NP	708556	4542262	223	Yes	44	45	No	39	Yes
NSP-649-NP	714559	4542540	221	No	38	37	Yes	36	Yes

Receptor (P-Participant, NP-Non-Participant)	Easting (m)	Northing (m)	Z (m)	Within 250 ft to a roadway	Noise Limit (dBA)	Predicted Noise Level (dBA) (Including Existing Turbines)	Compliant (Including Existing Turbines)	Predicted Noise Level Excluding Existing Turbines)	Compliant (Excluding Existing Turbines)
NSP-650-NP	715006	4542454	221	Yes	44	34	Yes	34	Yes
NSP-652-P	711234	4542330	222	Yes	44	46	No	46	No
NSP-656-NP	714497	4542489	221	Yes	44	37	Yes	37	Yes
NSP-664-NP	714266	4542429	221	Yes	44	38	Yes	38	Yes
NSP-667-NP	712677	4542385	222	Yes	44	46	No	46	No
NSP-672-NP	713404	4542356	221	Yes	44	45	No	45	No
NSP-673-P	709593	4542282	223	Yes	44	45	No	45	No
NSP-674-NP	710945	4542322	222	Yes	44	45	No	45	No
NSP-675-NP	713550	4542353	221	Yes	44	44	Yes	44	Yes
NSP-677-NP	710047	4542309	223	Yes	44	45	No	45	No
NSP-678-NP	709351	4542290	223	Yes	44	45	No	44	Yes
NSP-679-NP	712975	4542315	221	Yes	44	46	No	46	No
NSP-680-NP	709957	4542288	222	Yes	44	45	No	45	No
NSP-681-NP	714847	4542354	220	Yes	44	35	Yes	34	Yes
NSP-682-NP	713801	4542330	221	Yes	44	41	Yes	41	Yes
NSP-683-NP	713743	4542351	221	Yes	44	42	Yes	42	Yes
NSP-684-NP	710396	4542243	223	Yes	44	44	No	44	Yes
NSP-687-NP	708734	4542202	223	Yes	44	45	No	40	Yes
NSP-689-NP	708964	4542167	223	Yes	44	44	Yes	41	Yes
NSP-692-NP	712560	4542301	222	Yes	44	45	No	45	No
NSP-693-NP	713807	4542011	221	Yes	44	39	Yes	39	Yes
NSP-698-NP	713886	4542063	221	Yes	44	39	Yes	39	Yes
NSP-704-NP	714599	4541961	221	Yes	44	35	Yes	35	Yes
NSP-716-NP	710595	4541590	223	Yes	44	42	Yes	42	Yes
NSP-717-NP	713837	4541642	221	Yes	44	37	Yes	37	Yes
NSP-720-NP	714375	4541572	222	Yes	44	35	Yes	35	Yes
NSP-723-NP	710599	4541455	223	Yes	44	42	Yes	42	Yes
NSP-724-P	709357	4541404	223	Yes	44	45	No	45	No
NSP-728-NP	713902	4541353	222	Yes	44	36	Yes	36	Yes
NSP-729-NP	713552	4541273	221	No	38	37	Yes	36	Yes
NSP-731-P	712317	4541338	222	Yes	44	42	Yes	42	Yes
NSP-733-NP	710579	4541289	223	Yes	44	42	Yes	41	Yes
NSP-737-NP	711919	4541156	223	No	38	43	No	43	No
NSP-741-NP	710683	4541073	222	Yes	44	41	Yes	40	Yes
NSP-742-NP	708503	4540641	224	Yes	44	43	Yes	35	Yes
NSP-745-NP	712290	4541028	222	Yes	44	40	Yes	40	Yes
NSP-751-P	712250	4540747	222	Yes	44	39	Yes	38	Yes

Receptor (P-Participant, NP-Non-Participant)	Easting (m)	Northing (m)	Z (m)	Within 250 ft to a roadway	Noise Limit (dBA)	Predicted Noise Level (dBA) (Including Existing Turbines)	Compliant (Including Existing Turbines)	Predicted Noise Level Excluding Existing Turbines)	Compliant (Excluding Existing Turbines)
NSP-752-NP	712884	4540716	222	Yes	44	37	Yes	36	Yes
NSP-753-NP	710696	4540700	223	Yes	44	39	Yes	39	Yes
NSP-754-NP	708280	4540622	224	Yes	44	45	No	34	Yes
NSP-755-NP	710172	4540632	223	Yes	44	41	Yes	40	Yes
NSP-758-NP	712284	4540538	222	Yes	44	37	Yes	37	Yes
NSP-774-NP	709105	4540086	224	Yes	44	41	Yes	36	Yes
NSP-779-NP	709060	4540009	224	Yes	44	41	Yes	35	Yes
NSP-784-NP	709078	4539446	224	Yes	44	43	Yes	32	Yes

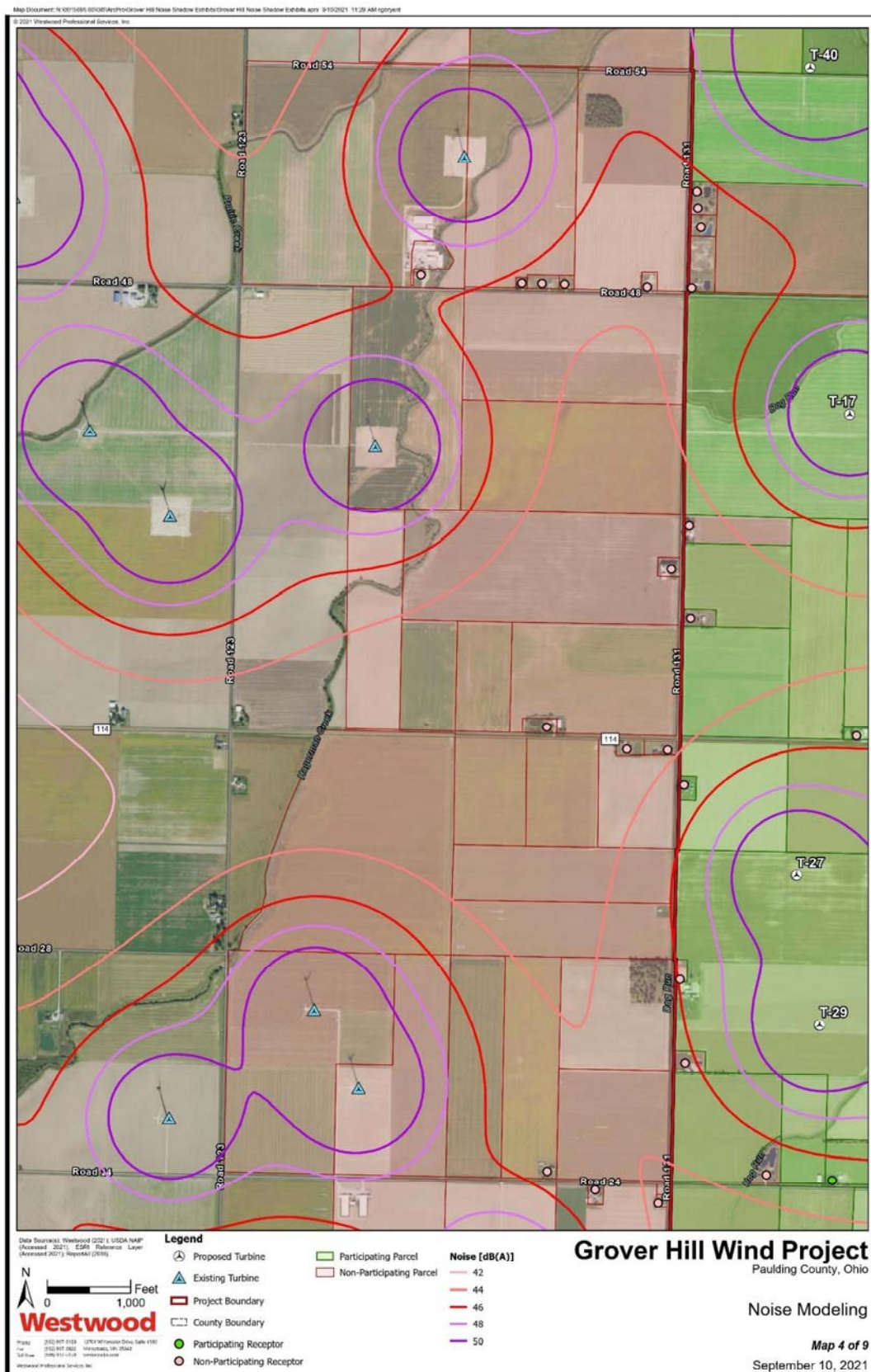
5.0 Appendix A

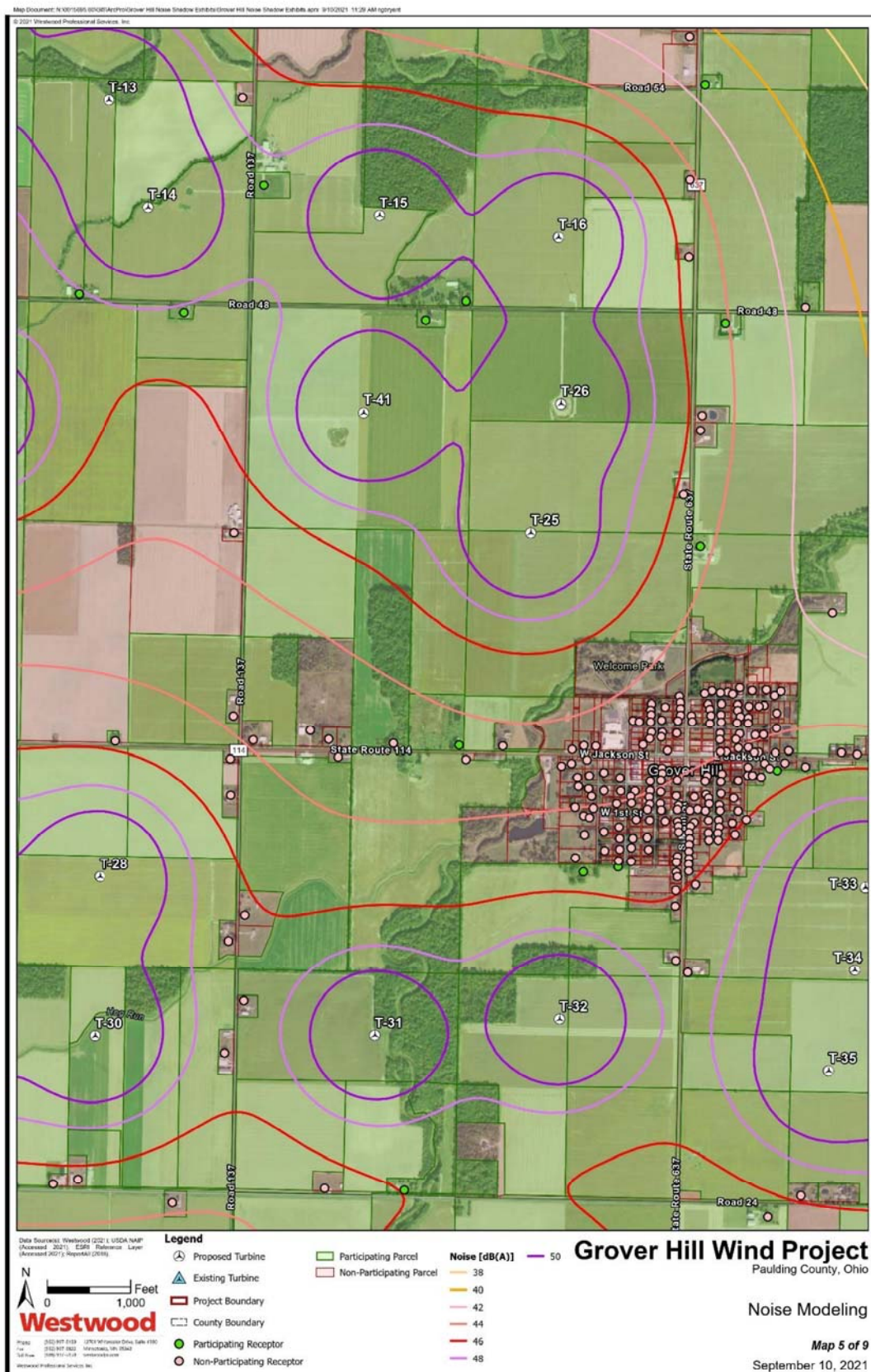






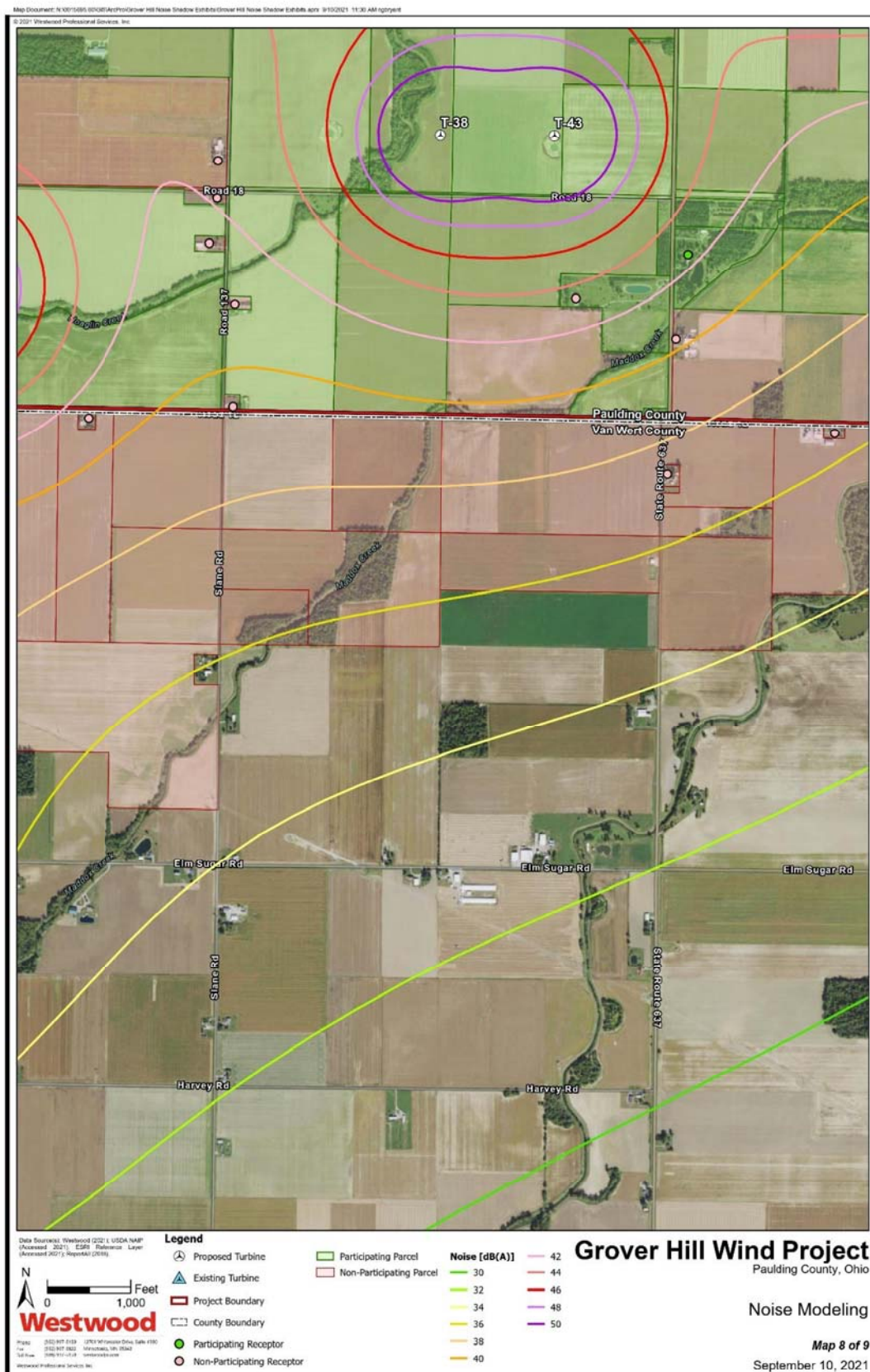














Blue Creek Turbines Included in Model

Turbine ID	UTM Zone 16N, NAD83 Meters	
	Easting	Northing
BCE-25_BC	707734	4538572
BCE-28(E28)_BC	708625	4539167
E27_BC	708008	4539535
BCE-24_BC	706905	4539508
E26_BC	708027	4540303
T162_BC	706397	4541578
T167_BC	708405	4541807
T161_BC	706216	4541919
T164_BC	707173	4542385
T159_BC	705959	4542420
T166_BC	707854	4542528
T165_BC	707679	4542805

North West Ohio Wind Turbines Included in Model

Turbine ID	UTM Zone 16N, NAD83 Meters	
	Easting	Northing
T-40_NW	707064	4544570
T-46_NW	707794	4544862
T-39_NW	706754	4544865
T-37_NW	706434	4545698
T-45_NW	708065	4545930
T-36_NW	706204	4546022
T-44_NW	708294	4546778
T-43_NW	708589	4547541
T-42_NW	708307	4547849
T-41_NW	707955	4548071
T-50_NW	709872	4549300
T-49_NW	709392	4549461
T-48_NW	708940	4549725

Grover Hill Proposed Turbines

Turbine ID	UTM Zone 16N, NAD83 Meters	
	Easting	Northing
T11	709299	4546653
T13	709959	4546233
T14	710122	4545851
T15	710962	4545865
T16	711617	4545819
T17	709513	4545067
T25	711572	4544740
T26	711657	4545215
T27	709406	4543383
T28	710071	4543413
T29	709518	4542845
T30	710081	4542833
T34	712830	4543215
T35	712754	4542844
T36	713246	4542796
T37	709624	4541073
T38	711397	4541724
T40	709304	4546318
T41	710941	4545147
T43	711811	4541743
T33	712853	4543517
T31	711098	4542888
T32	711767	4542982

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Case No(s). 20-0417-EL-BGN

Summary: Response to Seventh Data Request from Staff of the Ohio Power Siting Board
electronically filed by Christine M.T. Pirik on behalf of Grover Hill Wind, LLC