Blossom Solar, LLC

Blossom Solar

Exhibit L

Sound Report

Case No. 22-0151-EL-BGN

Environmental Sound Study
Blossom Solar Project

Blossom Solar, LLC

Blossom Solar Project
Project No. 132219

Revision 0
5/9/2022

Environmental Sound Study
Blossom Solar Project

prepared for

Blossom Solar, LLC

Blossom Solar Project
Morrow County, Ohio

Project No. 132219

Revision 0
5/9/2022

prepared by

Burns & McDonnell

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LIST OF ABBREVIATIONS

Abbreviation	**Term/Phrase/Name**
ANSI	American National Standards Institute
CadnaA	Computer Aided Noise Abatement
dB	decibels
dBA	A-weighted decibels
Developer	Blossom Solar, LLC
Hz	Hertz
IEEE	Institute of Electrical and Electronics Engineers
ISO	International Organization of Standardization
kV	kilovolt
L_{ANS}	ANS-weighted metric
L_{eq}	equivalent sound level
LT	Long term
MVA	megavolt-ampere
NEMA	National Electrical Manufacturers Association
OPSB	Ohio Power Siting Board
Project	Blossom Solar Project
PV	photovoltaic
Res	residential receiver

1.0 EXECUTIVE SUMMARY

Burns & McDonnell conducted an environmental sound study for the Blossom Solar Project located in Morrow County, Ohio (Project). The Project is being developed by Blossom Solar, LLC (Developer), who plans to install a new solar energy plant consisting of multiple arrays of photovoltaic (PV) panels, inverters, transformers, switchgear, and associated equipment. The Project is estimated to provide up to 144 megawatts of power to the grid.

The objectives of this study were to:

- Identify state and local sound level regulations that are applicable to the Project;
- Collect sound level measurements to quantify the existing ambient environment;
- Develop a noise model to estimate Project-generated sound levels in the surrounding community; and
- Establish whether the Project will meet the identified noise requirements.

This environmental sound study has been designed based on requirements identified in the Ohio Power Siting Board's (OPSB) regulations for Certificate Applications for Electric Generation Facilities. The study includes a sound monitoring program to determine existing ambient sound levels in the Project area, and noise modeling to predict future sound levels with the Project in operation. The study also includes a discussion of expected sound level impacts due to construction.

There are no state or local sound level limits applicable to the Project. Although not a requirement, predicted sound levels from the operation of the Project were compared to a design goal of five (5) A-weighted decibels (dBA) above the existing average daytime ambient levels. For this analysis, receptors within one mile of the proposed solar arrays were included in the model and compared to the design goal of 5-dBA over the measured existing average daytime sound levels.

The Project layout is designed such that inverters are located at least 500 feet from non-participating residences. The sound modeling results show the Project-generated sound levels would not exceed the existing measured ambient sound levels by more than 5 dBA at any identified residential structure. No adverse noise impacts are anticipated from construction activities. This study provides information on noise from the construction and operation of the Project, as required by the OPSB. The following sections discuss the sound study methodology and modeling results in further detail.

2.0 ACOUSTICAL TERMINOLOGY

The terms “noise level” and “sound level” are often used interchangeably to describe two different sound characteristics called sound power and sound pressure. Every source that produces sound has a sound power level. The sound power level is the acoustical energy emitted by a sound source and is an absolute number that is not affected by the environment. The acoustical energy produced by a source propagates through the air as air pressure fluctuations. These pressure fluctuations, also called sound pressure, are what human ears hear and microphones measure.

Sound energy is physically characterized by amplitude and frequency. Sound amplitude is measured in decibels (dB) as the logarithmic ratio of a sound pressure to a reference sound pressure (20 microPascals). The reference sound pressure corresponds to the typical threshold of human hearing. A 3-dB change in a continuous broadband sound level is generally considered “just barely perceptible” to the average listener. A 5-dB change is generally considered “clearly noticeable,” and a 10-dB change is generally considered a doubling (or halving, if the sound is decreasing) of the apparent loudness.

Frequency is measured in Hertz (Hz), which is the number of cycles per second. The typical human ear can hear frequencies ranging from approximately 20 to 20,000 Hz. Normally, the human ear is most sensitive to sounds in the middle frequencies (1,000 to 8,000 Hz) and is less sensitive to sounds in the low and high frequencies. As such, the A-weighted scale was developed to simulate the frequency response of the human ear to sounds at typical environmental levels. The A-weighted scale emphasizes sounds in the middle frequencies and de-emphasizes sounds in the low and high frequencies. Any sound level to which the A-weighted scale has been applied is expressed in dBA. For reference, the sound pressure level and subjective loudness associated with some common sound sources are listed in Table 2-1.

Sound in the environment is constantly fluctuating, for example, when a car drives by, a dog barks, or a plane passes overhead. Although an instantaneous sound level measured in dBA may indicate the level of noise experienced by an observer at that point in time, environmental noise levels vary continuously. Most ambient environmental noise includes a mixture of noise from some identifiable sources plus a relatively steady background noise where no particular source is identifiable. A single descriptor called the equivalent sound level (L_{eq}) is used to describe sound that is constant or changing in level. The L_{eq} is the average sound level for a specific time period and is the most common metric used to describe sound. The exceedance sound level, L_x, is the sound level exceeded during “x” percent of the sampling period and is referred to as a statistical sound level.

Table 2-1: Typical Sound Pressure Levels Associated with Common Sound Sources

Sound Pressure Level (dBA)	Subjective Evaluation	Environment	
		Outdoor	**Indoor**
140	Deafening	Jet aircraft at 75 feet	--
130	Threshold of pain	Jet aircraft during takeoff at a distance of 300 feet	--
120	Threshold of feeling	Elevated train	Hard rock band
110	--	Jet flyover at 1,000 feet	Inside propeller plane
100	Very loud	Power mower, motorcycle at 25 feet, auto horn at 10 feet, crowd sound at football game	--
90	--	Propeller plane flyover at 1,000 feet, noisy urban street	Full symphony or band, food blender, noisy factory
80	Moderately loud	Diesel truck (40 mph) at 50 feet	Inside auto at high speed, garbage disposal, dishwasher
70	Loud	B-757 cabin during flight	Close conversation, vacuum cleaner
60	Moderate	Air-conditioner condenser at 15 feet, near highway traffic	General office
50	Quiet	--	Private office
40	--	Farm field with light breeze, birdcalls	Soft stereo music in residence
30	Very quiet	Quiet residential neighborhood	Inside average residence (without TV and stereo)
20	--	Rustling leaves	Quiet theater, whisper
10	Just audible	--	Human breathing
0	Threshold of hearing	--	--

Source: Adapted from *Architectural Acoustics*, M. David Egan, 1988, and *Architectural Graphic Standards*, Ramsey and Sleeper, 1994.

Additional sound level metrics have been developed to help establish the capacity of residual sounds to "mask," or inhibit perception of a noise source. High frequency natural sounds above the 1000-Hz octave band, such as insect noise, are generally above the primary frequencies of industrial and utility noise sources. The A-weighted, noise-compensated (ANS-weighted metric, "L_{ANS}") metric is used in some cases to filter out sounds above the 1,000 Hz octave band to characterize an environment's residual sound levels with respect to anthropogenic noise.

3.0 APPLICABLE REGULATIONS AND GUIDANCE

Burns & McDonnell reviewed Federal, State, and municipal level ordinance documentation to determine the noise requirements applicable to the Project.

3.1 Federal

The Noise Control Act of 1972 mandated a national policy "to promote an environment for all Americans free from noise that jeopardizes their health or welfare, to establish a means for effective coordination of federal research activities in noise control, to authorize the establishment of federal noise emission standards for products distributed in commerce, and to provide information to the public respecting the noise emission and noise reduction characteristics of such products." As required by the Act, the Environmental Protection Agency (EPA) published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* in 1974. EPA phased out the Office of Noise Abatement and Control in 1982, transferring the primary responsibility of regulating noise to state and local governments. As a result, there are no applicable Federal sound level limits.

3.2 State of Ohio

There are no State of Ohio statues or State-wide noise limits applicable to this Project. The Project is applying for a certificate from the OPSB, which requires a sound study be completed as described in Ohio Administrative Code Rule 4906-4-08 Health and Safety, Land Use and Ecological Information[1]. The sound study requirements are detailed in Section A, Part 3, Noise, and summarized below:

The applicant shall provide information on noise from the construction and operation of the facility.

> *(a) Describe the construction noise levels expected at the nearest property boundary. The description shall address:*
>
> > *(i) Blasting activities.*
> > *(ii) Operation of earth moving equipment.*
> > *(iii) Driving of piles, rock breaking or hammering, and horizontal directional drilling.*
> > *(iv) Erection of structures.*
> > *(v) Truck traffic.*
> > *(vi) Installation of equipment.*

[1] https://codes.ohio.gov/ohio-administrative-code/rule-4906-4-08

> *(b) Describe the operational noise levels expected at the nearest property boundary. The description shall address:*
>
> > *(i) Operational noise from generation equipment.*
> >
> > *(ii) Processing equipment.*
> >
> > *(iii) Associated road traffic.*
>
> *(c) Indicate the location of any noise-sensitive areas within one mile of the facility, and the operational noise level at each habitable residence, school, church, and other noise-sensitive receptors, under both day and nighttime operations. Sensitive receptor, for the purposes of this rule, refers to any occupied building.*
>
> *(d) Describe equipment and procedures to mitigate the effects of noise emissions from the proposed facility during construction and operation, including limits on the time of day at which construction activities may occur.*
>
> *(e) Submit a preconstruction background noise study of the project area that includes measurements taken under both day and nighttime conditions.*

Although there are no noise limits applicable to the Project, similar solar energy projects in Ohio have established a self-imposed design goal for their projects to not exceed the measured daytime ambient L_{eq} by 5 dBA at any nearby non-participating noise sensitive receptors. This study uses the 5-dBA benchmark to assess sound level impacts from the operation of the Project.

3.3 Local Ordinances

The Project is located in Washington Township, Morrow County, Ohio. A regulatory review was completed for Township and County ordinances. There were no noise ordinances identified as applicable to the Project.

3.4 Regulatory Summary

The Project is located in Washington Township, Morrow County, Ohio, and no numerical noise limits were identified as applicable to the Project. As a design goal, Project-generated sound levels will be evaluated to determine if they are expected to exceed the existing average daytime L_{eq} by more than 5 dBA at any noise-sensitive receptors. Limiting the Project to not exceed the daytime ambient L_{eq} sound level by 5 dBA is consistent with other OPSB solar projects that were reviewed.

4.0 AMBIENT SOUND SURVEY

The land uses near the Project are generally agricultural and residential. Burns & McDonnell personnel conducted an ambient sound survey to quantify existing sound levels in the area of the Project. The sound survey consisted of continuous ambient measurements during daytime and nighttime hours at various measurement locations in proximity to the Project.

Measurements were taken using American National Standards Institute (ANSI) S1.4 type 1 sound level meters (Larson Davis Model 831), calibrated by an outside service within the last year. The sound level meters were field calibrated with a precision microphone calibrator (CAL 200) at the beginning and end of each set of measurements. None of the calibration level changes exceeded ± 0.5 dBA. A windscreen was used at all times on the microphones, and the meters were mounted on tripods. The microphones were located approximately 5 feet above ground level. Measurements were taken when meteorological conditions were favorable for conducting sound level measurements.

There are no defined requirements for ambient measurements provided by the OPSB, other than to provide measurements during daytime and nighttime conditions. Therefore, the ambient measurement protocol for the Project was developed based on common measurement standards provided in ANSI S12.9-Part 2, Quantities and Procedures for Description and Measurement of Environmental Sound – Part 2: Measurement of long term, wide-area sound. ANSI S12.9 provides standards for measuring outdoor environmental sound as it may affect people in and around dwellings.

A common concern when establishing the background sound level for an area is the capacity of residual sounds to "mask," or inhibit perception of a noise source. High frequency natural sounds above the 1000-Hz octave band, such as insect noise, are generally above the primary frequencies of the noise source. ANSI S12.100-2014 defines the A-weighted, noise-compensated (ANS-weighted metric, “L_{ANS}”), which is the standard A-weighting filtered to exclude sounds above the 1000-Hz octave band. The measured ANS-weighted metric sound levels are provided for informational purposes.

4.1 Sound Environment

The ambient sound level survey was conducted to characterize the current acoustical environment in the community surrounding and within the Project Area. Sounds observed at the measurement locations included insects, wildlife, vegetation rustle, local and highway traffic noise, and the general soundscape associated with agriculture and farming environments.

4.2 Continuous Ambient Sound Level Measurements

Continuous ambient measurements were collected at four long-term (LT) locations during daytime and nighttime periods over a five-day span from June 23 to 28, 2021. The locations are labeled LT1 to LT4, as shown in the Figure A-1 of Appendix A. The sound level meters were placed in locations that were accessible, where equipment could be secured, and where no reflective or shielding structures were located nearby. The selected locations were set back from roadways and were representative of existing ambient sound levels near noise-sensitive receptors.

The measurement locations are in rural areas with nearby residences. Local traffic noise and distant highway traffic noise was audible to an extent at each location. LT1, LT2, and LT4 are located along rural roadways, and LT3 is located just off Highway 309. ANSI 12.9 recommends that measurement locations be set back 50 feet from roadway centerlines. However, LT1 and LT4, could only be secured at distances of 30 feet and 40 feet from the roadways, respectively. At both measurement locations, traffic along the local roadway was infrequent and distant highway noise was audible. Measured values were logged by the sound level meter at each measurement point. The average daytime and nighttime A-weighted L_{eq} and L_{ANS} sound levels measured at each point are shown below in Table 4-1. Daytime hours are from 7 AM to 10 PM and nighttime hours are from 10 PM to 7 AM.

Table 4-1: Average Ambient Sound Level

Measurement Point	Coordinates		Daytime Average[a]		Nighttime Average[a]	
	Easting (m)	Northing (m)	L_{eq} (dBA)	L_{ANS} (dBA)	L_{eq} (dBA)	L_{ANS} (dBA)
LT1	343,601	4,505,300	49	48	43	42
LT2	344,140	4,506,389	53	51	47	44
LT3	346,046	4,504,907	63	62	58	56
LT4	346,894	4,506,834	57	56	51	50

(a) Daytime hours are from 7 AM to 10 PM and nighttime hours are from 10 PM to 7 AM.

Weather conditions for the Project area were collected from the John Glen Columbus International Airport Station (KOHCOLUM352)[2], for the duration of the study. Temperature, humidity, dew point, wind speed, and times of precipitation were reviewed to determine if any time periods should be excluded due to weather conditions that may have adversely affected the measured sound levels. Average winds were at acceptable levels, and no periods of significant rainfall occurred during the study period. Therefore, all measured data was included in the analysis.

[2] https://www.wunderground.com/history/daily/us/oh/columbus/KCMH

Sound levels varied at each measurement point due to extraneous sounds that occurred during the measurement. A qualitative assessment of each measurement location was completed during meter setup and teardown. Graphs of the sound levels measured at each location from June 23 to June 28 are provided in Appendix B. The graphs include the 1-minute and 1-hour L_{eq} and the 1/3-otave-band spectrographs showing the frequency distribution of the noise measured. The measured sound levels in tabular form are also included in Appendix B.

5.0 CONSTRUCTION NOISE

Project construction will generate noise that may periodically be audible offsite. Construction of the proposed Project is expected to involve limited site clearing and solar panel erection, which each use various types of construction equipment. Although construction will intermittently generate the types and levels of sound common at large construction sites, it will not feature many of the most significant sound-generating activities common during construction of other facilities. The Project will not involve extensive excavation or other earth-moving work or, with the exception of the Substation, construction of large foundations. A solar plant only involves the installation of the mounting posts for the panel racks. Driving the mounting posts is essentially a small-scale pile driving operation that produces a repetitive, metallic pounding noise, may be audible offsite. The primary sources of construction noise will be associated with heavy-duty equipment operation.

Although numerous piles will be driven, they likely will be only to a depth of about 10 feet and the activity will be relatively brief at any particular location. This activity is short-lived and would proceed fairly quickly, only occurring for a period of days or a couple weeks at any one location. HDD is expected to be used for the Project, but only in a limited number of locations. HDD operations would also be short-lived at any one location. Blasting is not expected based on geotechnical investigations showing bedrock well below any construction activity. Any rock-breaking activities using conventional construction equipment are expected to be limited. In any event, such activities would be very limited in any particular location and of limited duration.

Pile-driving will be avoided during early and late hours and will involve smaller machines that repeatedly "tap" galvanized steel I-beams through about 10 feet of soil and earth. These are not the large pile drivers associated with major construction projects such as bridges and high-rise buildings that "drive" or "pound" large pilings, typically made of iron, deeply through earth and rock. The erection of structures and components will require almost exclusively standard construction vehicles and hand tools.

Noise levels resulting from construction equipment are dependent on several factors, including the number and type of equipment operating, the level of operation, and the distance between sources and receptors. The impacts that various construction-related activities might have will vary considerably based on the proximity to the Project boundary. Construction noise levels associated with the Project could be greater than ambient conditions for some receptors close to the Project.

During a typical day, equipment would not be operated continuously at peak levels. While the average noise levels would represent a noticeable temporary increase over the ambient noise levels near the construction sites, the noise would attenuate with increasing distance, fading into ambient noise background levels at greater distances from the loudest equipment. Generic sound data ranges are available for various types of equipment at certain distances. Table 5-1 lists generic activities and their minimum and maximum instantaneous sound levels at 50 feet as provided in the Federal Highway Administration (FHWA), Highway Construction Noise handbook and the Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment Manual. It should be noted that the FHWA and FTA describe noise from large pile drivers that are significantly louder than the smaller pile drivers used for this project. The Project pile drivers are expected to operate at or below the provided minimum noise level at 50 feet, for pile drivers provided in the table.

Table 5-1: Range of Typical Construction Equipment Noise Levels

Generic Construction Equipment	Minimum Noise at 50 feet (dBA)	Maximum Noise at 50 feet (dBA)
Backhoes	74	92
Concrete Mixers	76	88
Cranes (movable)	70	94
Front Loaders	77	96
Graders	72	91
Pile Driver[a]	96	101
Scrapers	76	95
Trucks	83	96

Source: Values taken from FHWA Highway Construction Noise handbook and the Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, 2006
(a) Pile driver sound levels provided are associated with larger pile drivers than those typically used in solar panel erection.

Sound levels are expected to be lower in areas where activities are occurring at distances greater than 50 feet from the construction zone. The types of equipment listed in the table above may be used at various times and for various periods of time. Typically, construction equipment has a usage factor ranging between 15 and 50 percent of the day, according to the FHWA roadway construction noise handbook. However, the actual amount of use for each type of equipment would vary day to day.

5.1 Construction Noise Mitigation

Noise from construction equipment will be temporary during construction of the Project. The construction contractor selected is expected to implement, where appropriate, construction methods that limit construction noise levels to the extent practicable. Construction is anticipated to occur during typical work hours. There may be times that work needs to be accomplished in part outside of typical working hours. Such work generally consists of activities that must occur continuously once begun (e.g., a concrete pour or transformer oil filling). Construction activities that do not generate significant noise above background levels offsite can occur at any time.

Additionally, most construction activities will not occur simultaneously at any location. Construction noise will mostly be audible near the construction activities. Construction noise mitigation measures that could be implemented include the following actions:

1. Limit construction activities to 7:00 a.m. to 7:00 p.m., or until dusk when sunset occurs after 7:00 p.m.;
2. Maintain construction-related vehicles in proper working condition;
3. Utilize construction equipment with proper mufflers;
4. Turn off idling equipment when not in use; and
5. Work with the local community to advise residents of those periods when sustained construction activity is expected to take place in relatively close proximity to their homes.

The construction phase of a solar energy facility is fairly short and the activities that generate any significant noise are few. Due to the temporary nature of the construction activities, and best practices with regards to controlling construction noise in the directions of noise sensitive areas, no adverse impacts with respect to construction noise are anticipated.

6.0 PREDICTIVE NOISE MODELING

The Project consists of noise emitting equipment in the form of inverters and transformers. To estimate future Project sound levels, the sound sources were input into a predictive model and sound levels created by the Project were projected out to the property line and surrounding community.

6.1 Methodology

Noise modeling was performed using the industry-accepted sound modeling software Computer Aided Noise Abatement (CadnaA), version 2021. The software is a scaled, three-dimensional program, which considers air absorption, terrain, ground absorption, and reflections and shielding for each piece of noise-emitting equipment and predicts sound pressure levels. The model calculates sound propagation based on International Organization of Standardization (ISO) 9613-2:1996, General Method of Calculation. ISO 9613-2 assesses the sound level propagation based on the octave band center-frequency range from 31.5 to 8,000 Hz.

The ISO standard considers sound propagation and directivity. The software calculates sound propagation using omnidirectional, downwind sound propagation and worst-case directivity factors. In other words, the model assumes that each piece of equipment propagates its maximum sound level in all directions at all times. Empirical studies accepted within the industry have demonstrated that modeling may over-predict sound levels in certain directions, and as a result, modeling results generally are considered a conservative measure of the Project’s actual sound level.

The modeled atmospheric conditions were assumed to be calm, and the temperature and relative humidity were left at the program’s default values. Reflections and shielding were considered for sound waves encountering physical structures. Farm fields are generally considered soft, absorptive ground, and would have a high ground absorption factor. To be conservative, only half the available absorption was considered, and the model’s ground absorption factor was set to 0.5 for the Project and surrounding areas. Foliage is tall and dense in some areas surrounding the Project. As a conservative measure, foliage was excluded from the model. The sound modeling parameters used in the model are provided in Table 6-1.

Table 6-1: Sound Modeling Parameters

Model Input	Parameter Value
Ground Absorption	0.5
Number of Reflections	2
Foliage	None
Receptor Height	5 feet above grade
Temperature	50 °F
Humidity	70%

6.2 Model Inputs

Project transformers and inverters are the major sound sources associated with the Project. The Project's transformer sound level was derived from the 200-megavolt-ampere (MVA) transformer specification data and the National Electrical Manufacturers Association (NEMA) TR 1-2013: Transformers, Step Voltage Regulators and Reactors. According to NEMA, a 200-MVA transformer with a high-side voltage rating of 138-kilovolt (kV) has a maximum 2nd stage of cooling average sound pressure level of 84 dBA. This sound pressure level, according to Institute of Electrical and Electronics Engineers (IEEE) Standard C57.12.90, is an average of measurements along the equipment envelope, 6 feet from the cooling fans and 1 foot from the tank. NEMA sound levels are considered conservative. Specific vendor data may demonstrate a transformer of the same specification that is considerably quieter (i.e., this analysis provides conservative modeling predictions).

The Project inverters, SMA Sunny Central 4000 - 4600 UP-US, are specified to meet a sound level of 67 dBA at a distance of 10 meter with fans in operation based on the vendor specifications. This is approximately equal to 83 dBA at 1 meter. The medium voltage transformer, located on the power conversion system skid, is considerably quieter than the inverter. However, because the transformer also makes noise, its sound levels were added to the model. It is estimated that the medium voltage transformer operates at 65 dBA at a distance of 1 meter, based on similarly sized units. The frequency spectrums of the modeled transformers and inverter sources were developed from historical data of projects with similarly sized units. The modeled sound levels for the noise emitting equipment included in the Project are listed below in Table 6-2.

Table 6-2: Project Equipment Sound Levels

Source	Number of Sources	Sound Pressure Level per Source (dBA)	Sound Power Level per Source[a] (dBA)
Inverter	40	67 dBA at 10 Meters	101 dBA
Medium Voltage Transformer	40	65 dBA at 1 Meter	81 dBA
Substation Transformer	1	84 dBA per NEMA[b]	103 dBA

* dBA – A-weighted decibels, NEMA - National Electrical Manufacturers Association
(a) Sound power level estimated based on the provided sound pressure level and dimensions of the unit.
(b) NEMA Rating is an average sound pressure level measured around the unit in accordance with the IEEE C57 standard

6.3 Model Results

The Project design goal is to not exceed 5 dBA over the measured daytime ambient at the identified neighboring noise sensitive residential receivers, schools, and churches (Res). Project sound levels were modeled at the nearest noise-sensitive receivers in the surrounding community for the Project. Model receptors were placed at the identified residential structures. Transformers and inverters were modeled based on general arrangement drawings provided by the Developer. The Project layout and receptor locations are shown in Figure A-2 of Appendix A.

In order to determine the applicable sound level design goal at each noise sensitive receiver, the nearest measurement point to each respective receiver was assumed to represent the existing ambient environment. The average daytime ambient L_{eq} sound level measured during the sound survey was used to establish the baseline for the design goal. The design goal for each residential receiver is the measured average daytime ambient L_{eq} plus 5 dBA.

The Project was modeled based on the general arrangement provided in Appendix A. The Project, as modeled, includes 40 inverters, 40 medium voltage transformers, and one (1) substation transformer. This is preliminary and subject to change with final design. The modeled sound levels for each noise sensitive residential receiver along with the respective sound level design goal are provided in Appendix C.

The noise modeling results show that the Project, as designed, would not exceed the design goal of 5 dBA over the existing measured daytime L_{eq} at any of the noise sensitive receivers near the Project. Therefore, no noise mitigation is required to meet the design goal.

The maximum Project-generated sound level at a residential receiver (Res002) is 40 dBA during the Project's loudest sound level operations (i.e., daytime hours). The measured average daytime L_{eq} at the closest long-term measurement point to Res002 (LT1) was 49 dBA. The Project-generated sound level impacts at all residences are predicted to be below the measured daytime average L_{eq} sound level at the associated long-term measurement locations. A graphical representation of the model layout and sound level contours generated by the Project during the loudest operating scenario are provided in Figure A-3 of Appendix A. The contours are shown in 5-dB sound level increments in the figure and represent the Project-generated sound levels only. Figure A-4 shows the Project-generated sound level contours zoomed in to show the sound level impacts at the Project boundaries.

During nighttime hours, when the sun is no longer shining and the Project is not generating power, sound levels would be significantly less than those shown in the figures in Appendix A and the tables in Appendix C. There may be some trace amounts of noise generated from the medium voltage transformers, as they would remain energized even when the Project is not generating power. However, the trace amount of noise generated by these sources would quickly dissipate as one moves farther from the source and would be far less than the noise generated during power-generating, daytime hours. The substation transformer would also remain energized during nighttime hours, but sound levels would be less than those emitted during power generation.

6.4 Noise Mitigation

The Project's maximum predicted sound levels at all nearby receptors fall below the design goal of 5 dBA over the existing daytime ambient sound level. The Project will produce maximum sound levels during daytime hours when the sun is shining and power is generated at full load. This is also when background sound levels are at their highest. Additional mitigation measures are not required to meet the design goal.

If any noise related issues arise during operation, there are practical and cost-effective means to reduce noise from inverters and transformers. Methods for limiting noise from the Project, post-energization, would typically involve sound walls or acoustically treated vent hoods installed on the inverter openings. These solutions can be installed as retrofits to help reduce noise from the Project, if needed.

7.0 CONCLUSION

Burns & McDonnell conducted an environmental sound study of the Blossom Solar Project proposed to be located in Morrow County, Ohio. The Project will consist of multiple arrays of PV panels, inverters, transformers, switchgear, and associated equipment. Construction noise was reviewed for the Project and is not expected to adversely impact the surrounding community. The proposed Project sound levels were modeled using industry-accepted sound modeling software to predict future sound levels at the property lines and in the surrounding community. Project transformers and inverters are expected to be the significant sound-emitting sources associated with the Project and were modeled based on Developer-provided general arrangement drawings. Modeling results show that the Project sound levels would not exceed the design goal of 5 dBA over the average measured daytime ambient L_{eq} sound level at any of the identified noise sensitive receptors.

8.0 REFERENCES

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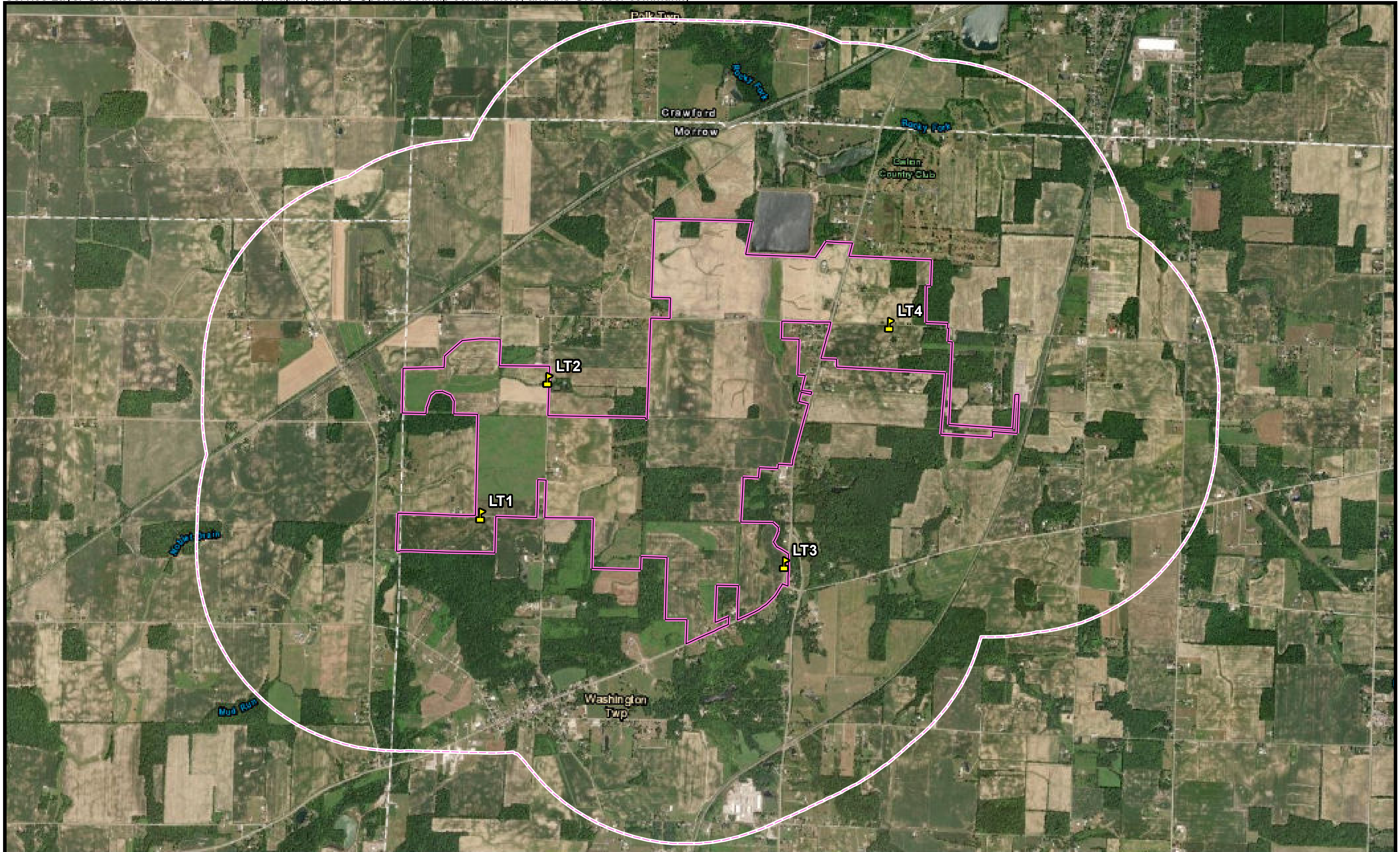
APPENDIX A - FIGURES

Path: Z:\Clients\ENS\BLOSSOMSOLAR\132219_BLOSSOMSLROPSB\Studies\Modeling\Noise\GIS\Figure A-1 Measurement Locations.mxd gweger 5/6/2022
Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community



Measurement Location

Project Boundary

1-Mile Project Buffer

NORTH

3,500 1,750 0 3,500

Scale in Feet

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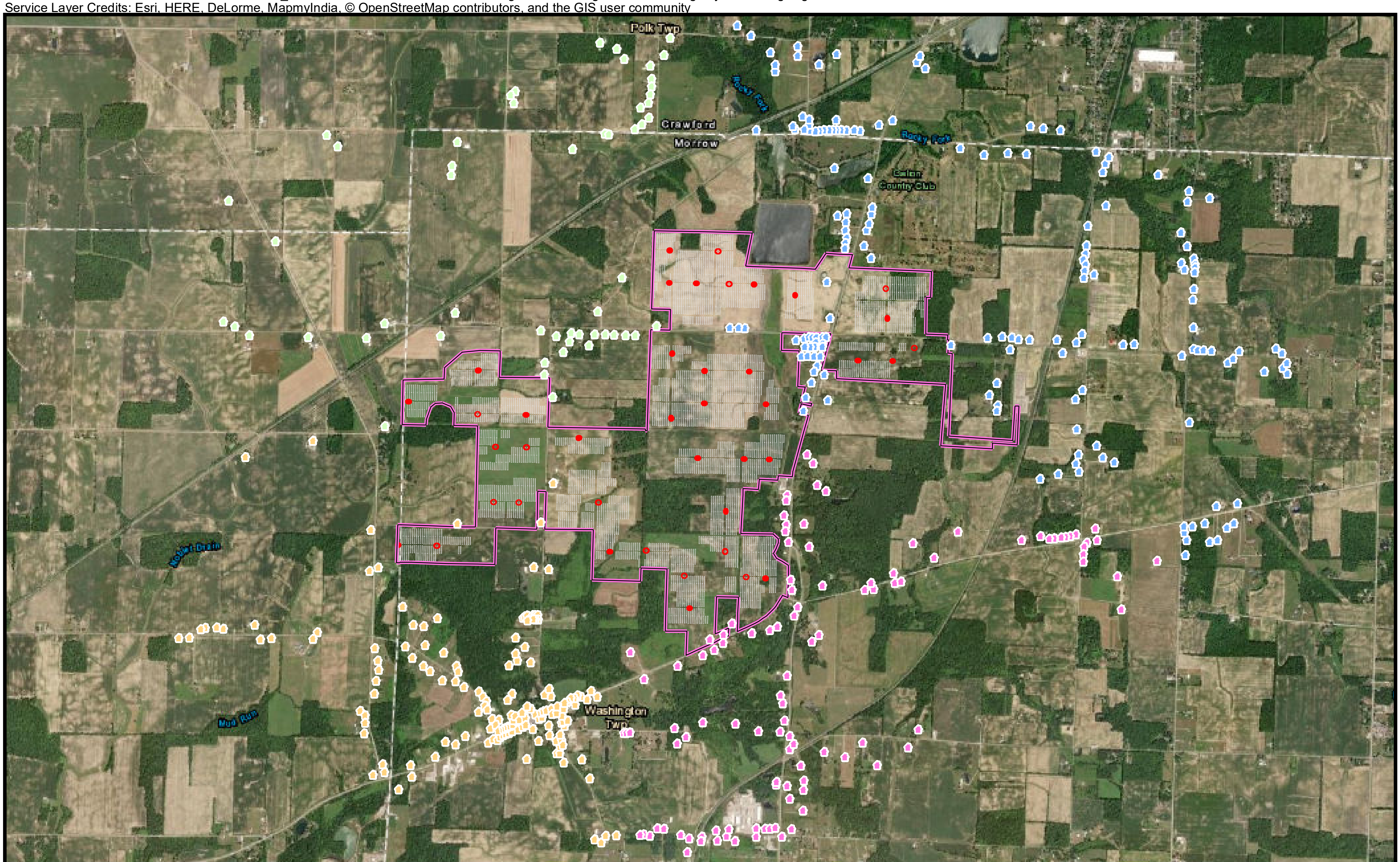
Figure A-1

Blossom Solar
Measurement Locations

Source: ESRI, Burns & McDonnell

Issued: 5/6/2022

Path: Z:\Clients\ENS\BLOSSOMSOLAR\132219_BLOSSOMSLROPSB\Studies\Modeling\Noise\GIS\Figure A-2 Modeling Layout.mxd gweger 5/6/2022
Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community



Residence (LT1)
Residence (LT2)
Residence (LT3)
Residence (LT4)
Inverter / Transformer
Project Layout
Project Boundary

NORTH

3,500 1,750 0 3,500
Scale in Feet

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Figure A-2

Blossom Solar
Modeling Layout

Source: ESRI, Burns & McDonnell

Issued: 5/6/2022

Path: Z:\Clients\ENS\BLOSSOMSOLAR\132219_BLOSSOMSLROPSB\Studies\Modeling\Noise\GIS\Figure A-3 Sound Level Contours.mxd gweger 5/6/2022
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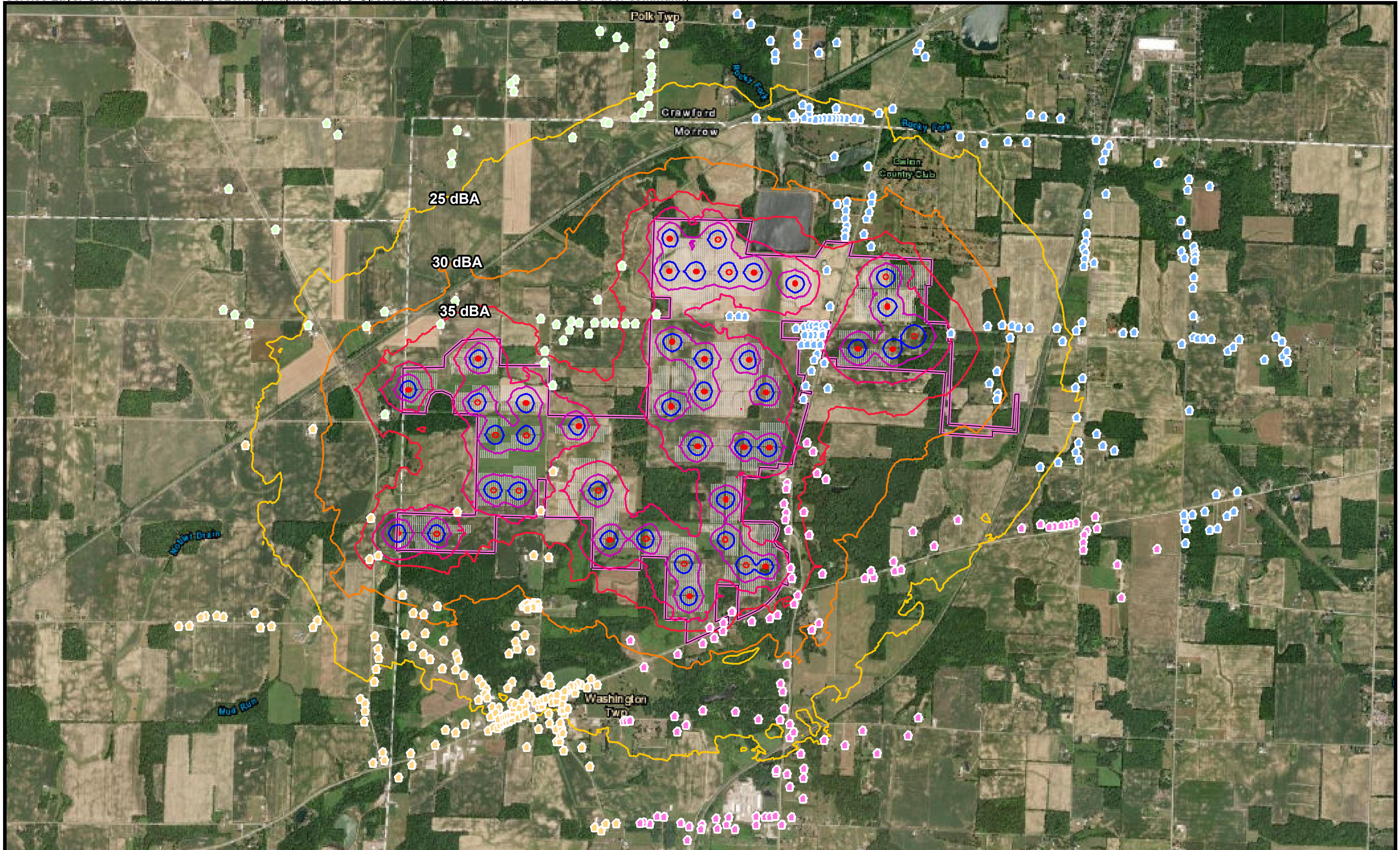

25 dBA
30 dBA
35 dBA
40 dBA
45 dBA
50 dBA
Residence (LT1)
Residence (LT2)
Residence (LT3)
Residence (LT4)
Inverter / Transformer
Project Layout
Project Boundary

NORTH

3,500 1,750 0 3,500
Scale in Feet

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Figure A-3

Blossom Solar
Sound Level Contours
(Daytime Operating Conditions)

Source: ESRI, Burns & McDonnell

Issued: 5/6/2022

Path: Z:\Clients\ENS\BLOSSOMSOLAR\132219_BLOSSOMSLROPSB\Studies\Modeling\Noise\GIS\Figure A-4 Sound Level Contours.mxd gweger 5/6/2022
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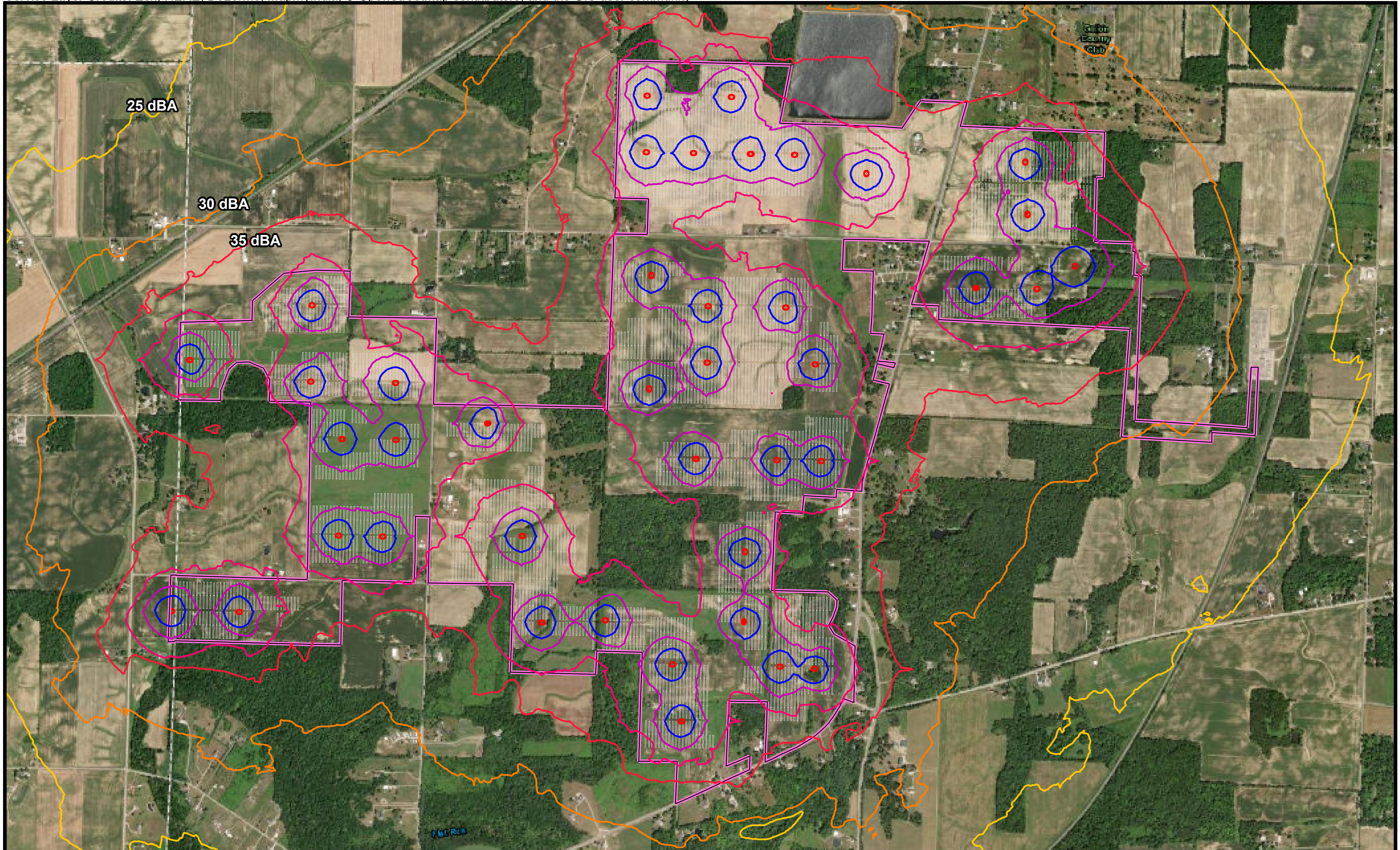

25 dBA	40 dBA	Inverter / Transformer
30 dBA	45 dBA	Project Layout
35 dBA	50 dBA	Project Boundary

NORTH

2,000 1,000 0 2,000
Scale in Feet

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Figure A-4

Blossom Solar
Sound Level Contours
(Daytime Operating Conditions)

Source: ESRI, Burns & McDonnell

Issued: 5/6/2022

APPENDIX B – MEASURED SOUND LEVELS

Appendix B

Noise Monitoring Summary

Table B-1 - Hourly Average and Daytime/Nighttime L_{eq} and L_{ANS} Sound Levels

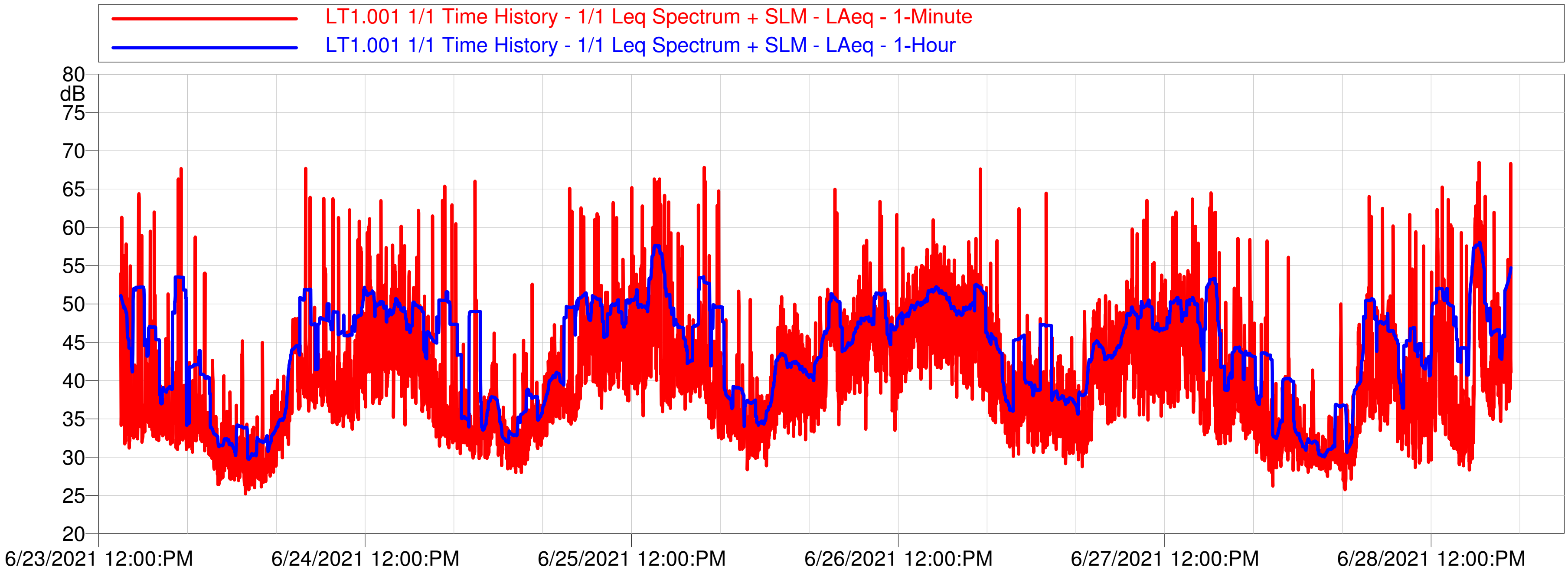
Time	LT1		LT2		LT3		LT4	
	L_{eq} [dBA]	L_{ANS} [dBA]	L_{eq} [dBA]	L_{ANS} [dBA]	L_{eq} [dBA]	L_{ANS} [dBA]	L_{eq} [dBA]	L_{ANS} [dBA]
7:00 AM	48	45	54	52	63	62	56	56
8:00 AM	48	47	52	50	63	62	58	57
9:00 AM	47	47	51	49	63	62	57	56
10:00 AM	49	49	52	49	63	62	57	56
11:00 AM	47	46	52	50	64	62	59	58
12:00 PM	51	50	54	52	64	62	58	57
1:00 PM	50	49	53	51	63	62	57	56
2:00 PM	52	50	54	51	64	61	58	57
3:00 PM	50	49	53	51	63	62	57	56
4:00 PM	53	51	56	52	64	62	59	58
5:00 PM	45	44	53	52	63	62	57	56
6:00 PM	49	48	52	50	62	61	58	57
7:00 PM	51	50	51	49	62	61	58	57
8:00 PM	42	42	51	48	62	61	56	55
9:00 PM	44	43	51	50	61	60	54	53
10:00 PM	40	38	46	45	59	57	55	55
11:00 PM	38	37	47	46	58	56	49	48
12:00 AM	36	35	41	39	56	55	50	49
1:00 AM	42	42	43	41	53	52	41	40
2:00 AM	38	38	42	39	54	53	44	43
3:00 AM	38	38	42	39	53	52	44	44
4:00 AM	38	38	44	42	57	56	46	45
5:00 AM	43	40	52	46	60	59	52	51
6:00 AM	50	49	51	49	62	60	55	54
Daytime Avg	**49**	**48**	**53**	**51**	**63**	**62**	**57**	**56**
Nighttime Avg	**43**	**42**	**47**	**44**	**58**	**56**	**51**	**50**

Notes:

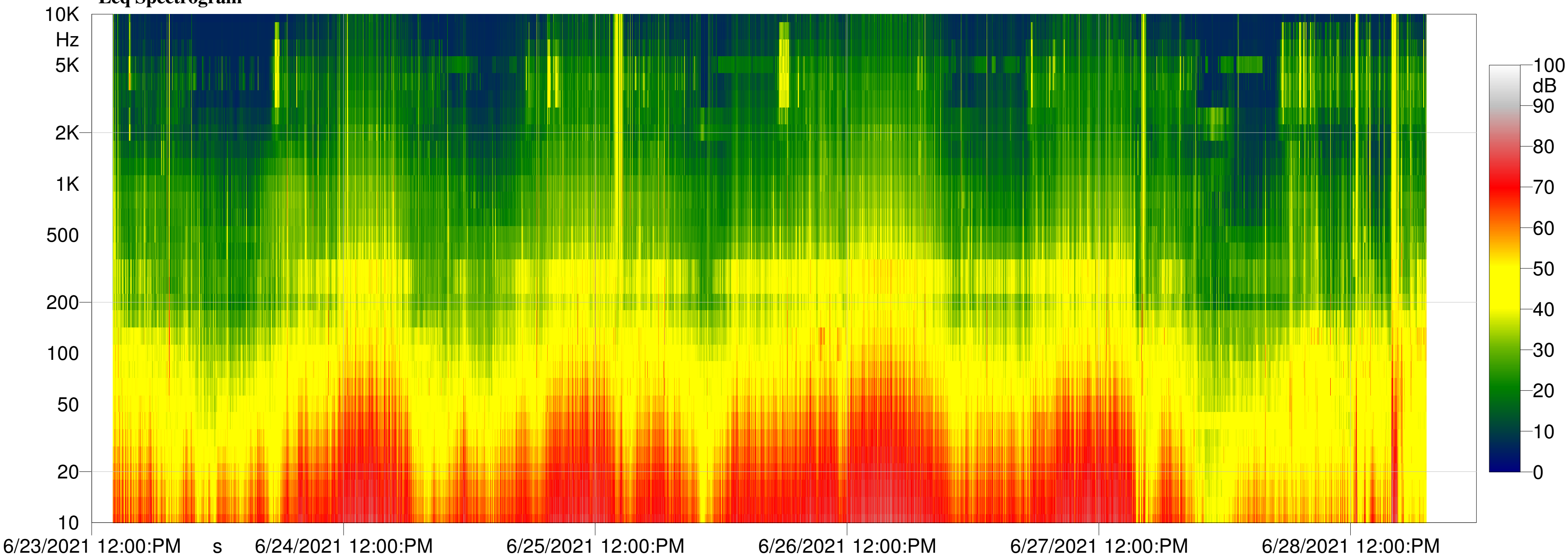
[1] Hourly average sound level for the hour following the time listed, averaged over the five day monitoring period

[2] Nightime sound level averaged from 10 PM to 7 AM, and Daytime sound level averaged from 7 AM to 10 PM

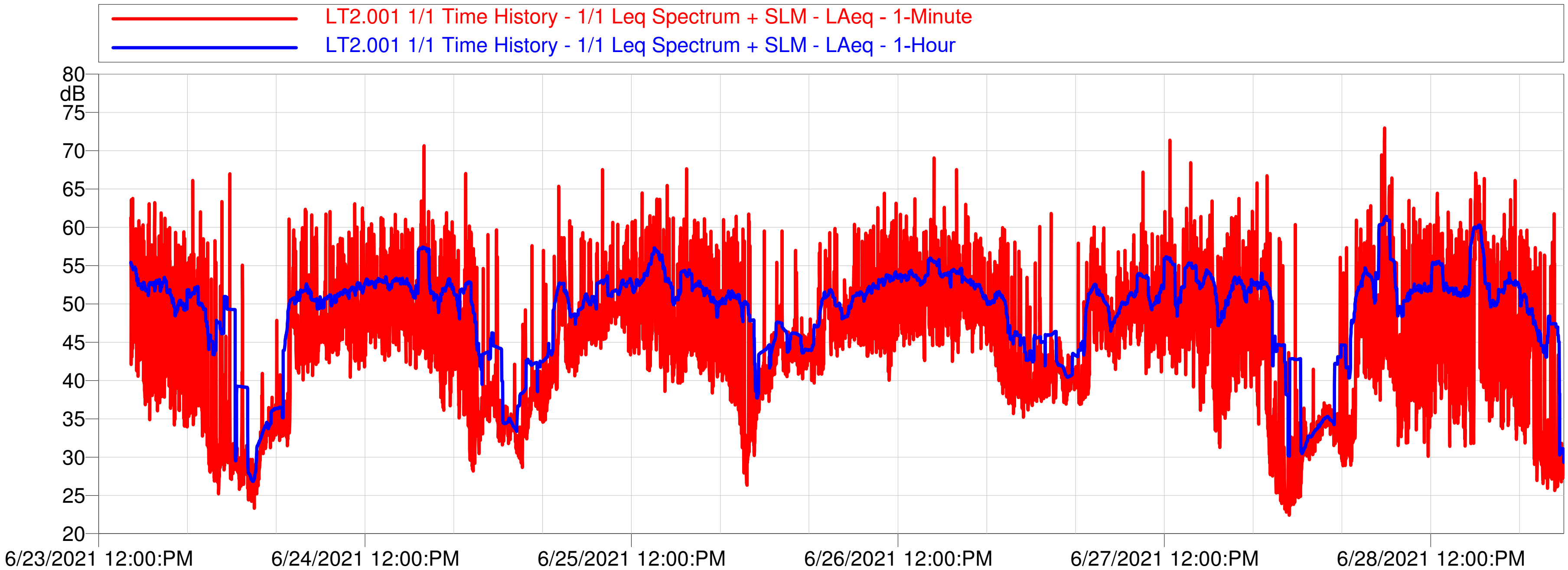
Measurement: Blossom Solar - Ambient
Location: LT01



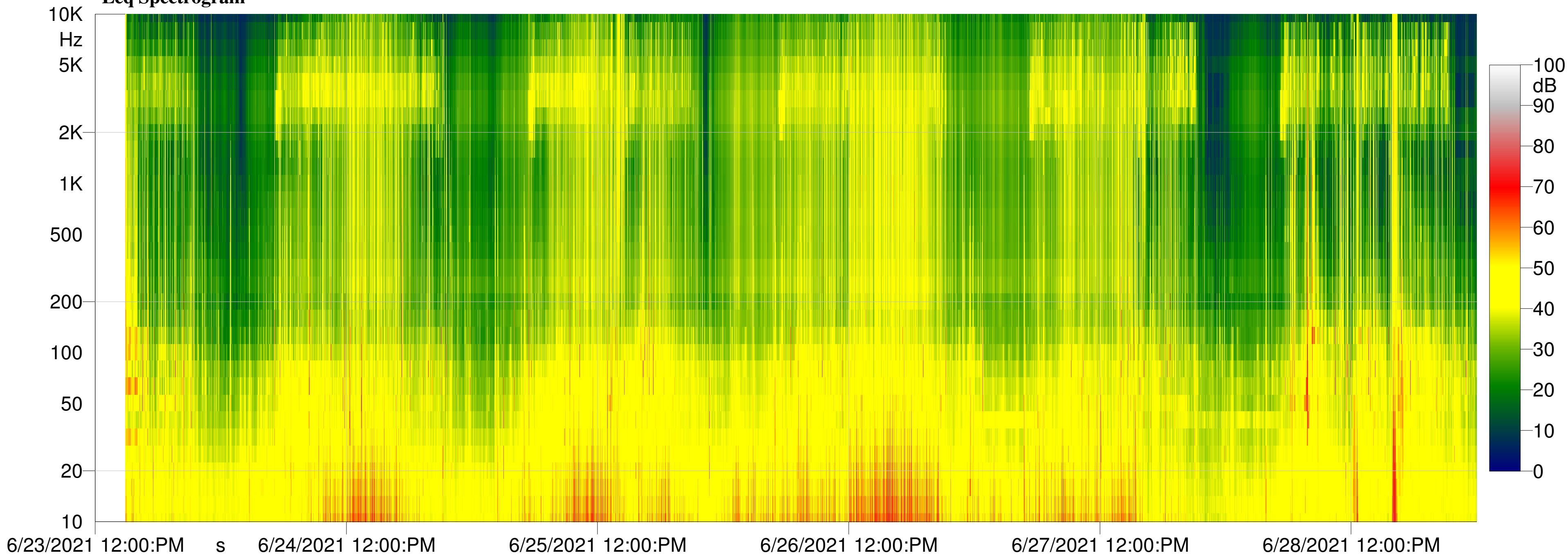
Leq Spectrogram



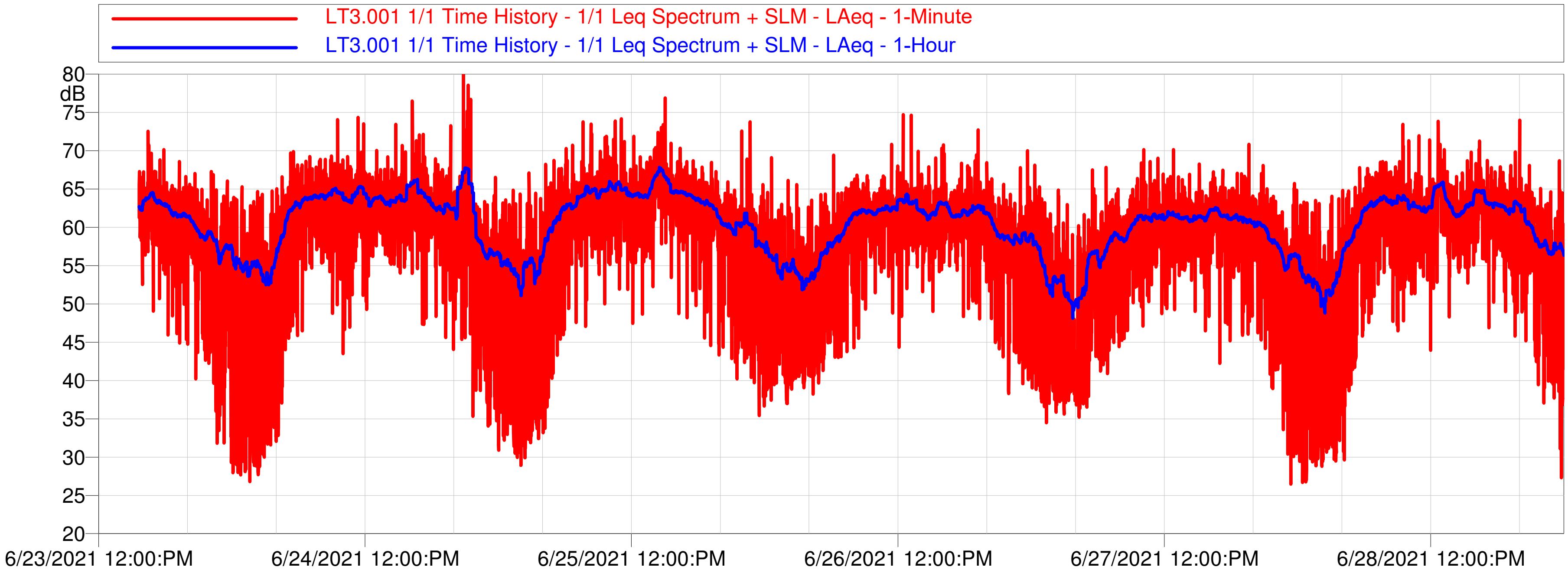
Measurement: Blossom Solar - Ambient
Location: LT02



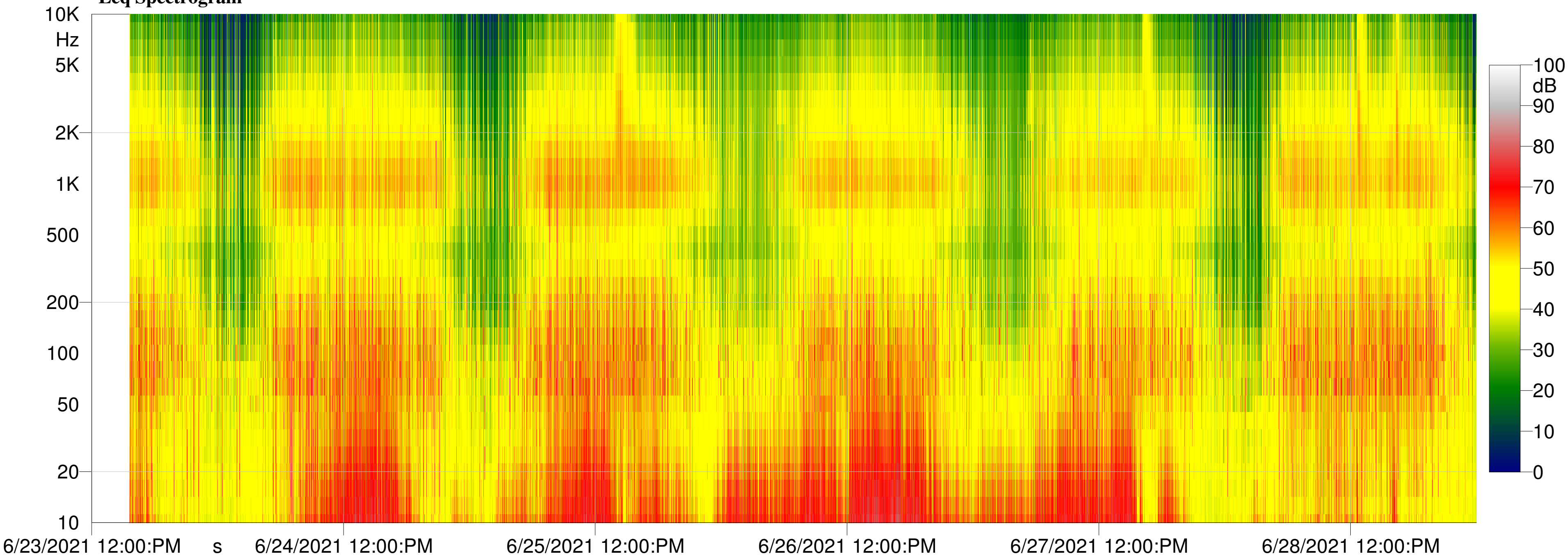
Leq Spectrogram



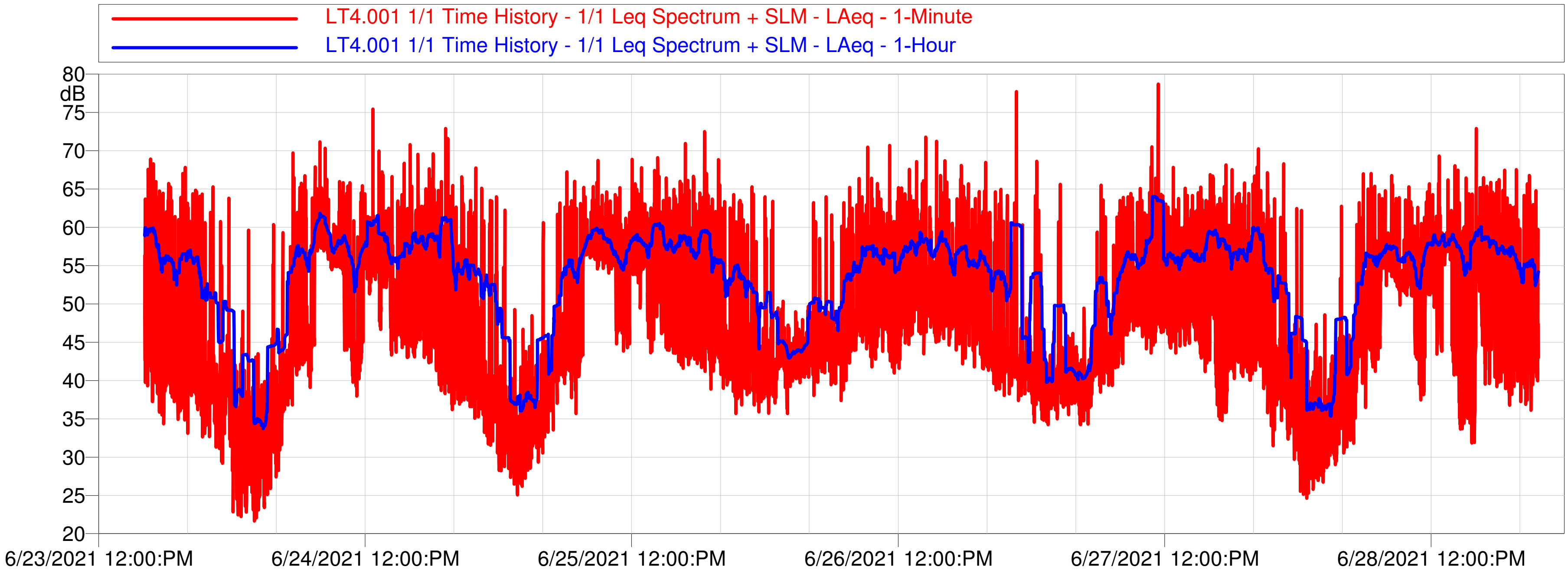
Measurement: Blossom Solar - Ambient
Location: LT03



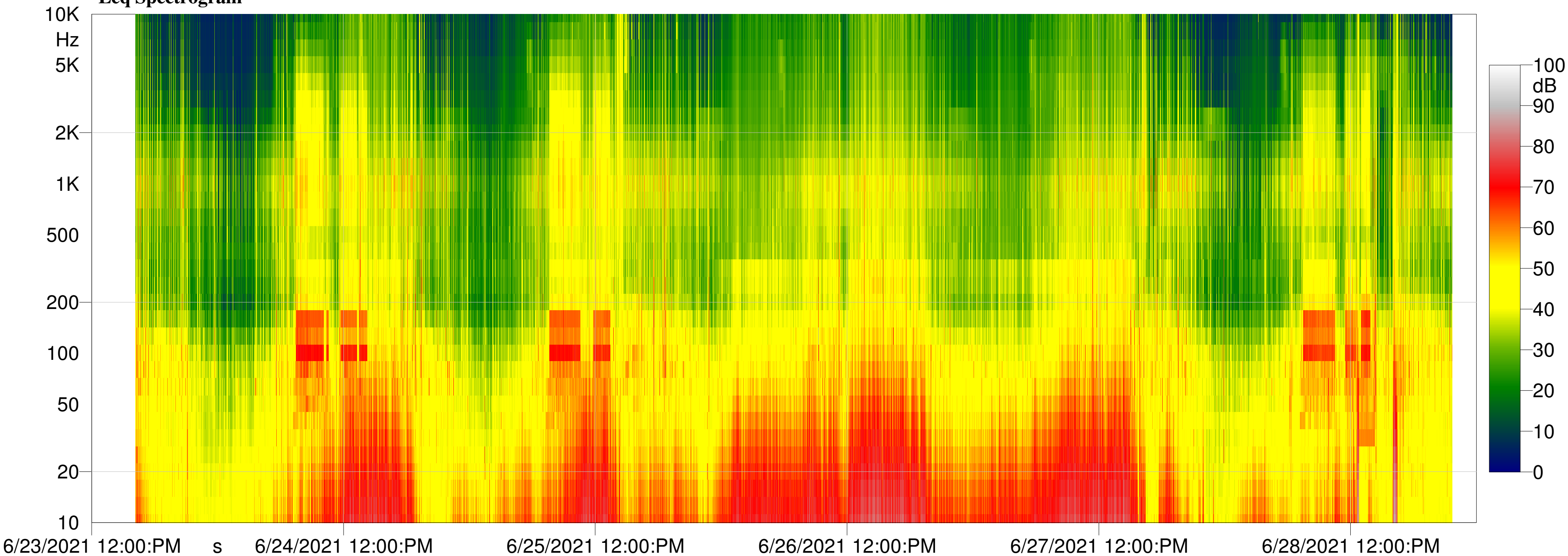
Leq Spectrogram



Measurement: Blossom Solar - Ambient
Location: LT04



Leq Spectrogram



APPENDIX C – MODEL SOUND LEVEL RESULTS

NOISE MODELING RESULTS

Receiver	Coordiantes[1] (UTM Meters Zone 17) Easting	Northing	Associated Measurement Point	Measured Daytime Ambient L_{eq}[2] (dBA)	Sound Level Limit (Ambient +5 dBA) (dBA)	Modeled Project (dBA)	Meets Design Goal?
Res001	342,250	4,505,991	LT1	49	54	29	Yes
Res002	343,411	4,505,323	LT1	49	54	40	Yes
Res003	342,715	4,505,273	LT1	49	54	35	Yes
Res004	342,776	4,504,972	LT1	49	54	39	Yes
Res005	342,706	4,504,944	LT1	49	54	36	Yes
Res006	342,286	4,504,450	LT1	49	54	25	Yes
Res007	342,251	4,504,396	LT1	49	54	24	Yes
Res008	342,747	4,504,322	LT1	49	54	27	Yes
Res009	342,772	4,504,223	LT1	49	54	26	Yes
Res010	342,971	4,504,654	LT1	49	54	31	Yes
Res011	343,056	4,504,509	LT1	49	54	30	Yes
Res012	343,141	4,504,500	LT1	49	54	31	Yes
Res013	343,251	4,504,561	LT1	49	54	30	Yes
Res014	343,152	4,504,347	LT1	49	54	28	Yes
Res015	343,303	4,504,286	LT1	49	54	29	Yes
Res016	343,404	4,504,179	LT1	49	54	27	Yes
Res017	343,140	4,504,180	LT1	49	54	26	Yes
Res018	343,050	4,504,244	LT1	49	54	27	Yes
Res019	342,993	4,504,335	LT1	49	54	27	Yes
Res020	344,001	4,504,207	LT1	49	54	27	Yes
Res021	343,894	4,504,223	LT1	49	54	27	Yes
Res022	343,827	4,504,184	LT1	49	54	27	Yes
Res023	343,882	4,504,278	LT1	49	54	28	Yes
Res024	343,955	4,504,332	LT1	49	54	28	Yes
Res025	343,881	4,504,406	LT1	49	54	29	Yes
Res026	343,943	4,504,566	LT1	49	54	30	Yes
Res027	343,957	4,504,575	LT1	49	54	30	Yes
Res028	343,975	4,504,584	LT1	49	54	30	Yes
Res029	344,020	4,504,587	LT1	49	54	30	Yes
Res030	344,039	4,504,589	LT1	49	54	30	Yes
Res031	344,060	4,504,589	LT1	49	54	30	Yes
Res032	344,062	4,504,551	LT1	49	54	30	Yes
Res033	344,042	4,504,553	LT1	49	54	30	Yes
Res034	344,023	4,504,555	LT1	49	54	30	Yes
Res035	343,979	4,504,543	LT1	49	54	29	Yes
Res036	344,027	4,504,974	LT1	49	54	33	Yes
Res037	344,150	4,504,958	LT1	49	54	33	Yes
Res038	344,082	4,505,334	LT1	49	54	40	Yes
Res039	344,182	4,505,650	LT1	49	54	39	Yes
Res040	344,489	4,503,975	LT1	49	54	27	Yes
Res041	344,541	4,503,928	LT1	49	54	27	Yes
Res042	341,704	4,505,862	LT1	49	54	23	Yes
Res043	341,915	4,504,401	LT1	49	54	22	Yes
Res044	341,827	4,504,391	LT1	49	54	22	Yes
Res045	341,780	4,504,510	LT1	49	54	22	Yes
Res046	341,529	4,504,478	LT1	49	54	21	Yes
Res047	341,475	4,504,489	LT1	49	54	20	Yes
Res048	341,382	4,504,486	LT1	49	54	20	Yes
Res049	341,344	4,504,475	LT1	49	54	19	Yes
Res050	341,253	4,504,405	LT1	49	54	19	Yes
Res051	341,168	4,504,404	LT1	49	54	18	Yes
Res052	342,779	4,504,147	LT1	49	54	25	Yes
Res053	342,759	4,504,056	LT1	49	54	25	Yes
Res054	342,744	4,503,954	LT1	49	54	24	Yes
Res055	342,628	4,503,817	LT1	49	54	24	Yes
Res056	342,669	4,503,779	LT1	49	54	24	Yes
Res057	342,667	4,503,718	LT1	49	54	24	Yes

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NOISE MODELING RESULTS

Receiver	Coordiantes[1] (UTM Meters Zone 17) Easting	Northing	Associated Measurement Point	Measured Daytime Ambient L_{eq}[2] (dBA)	Sound Level Limit (Ambient +5 dBA) (dBA)	Modeled Project (dBA)	Meets Design Goal?
Res058	342,661	4,503,635	LT1	49	54	23	Yes
Res059	342,813	4,503,385	LT1	49	54	21	Yes
Res060	342,825	4,503,322	LT1	49	54	21	Yes
Res061	342,734	4,503,301	LT1	49	54	20	Yes
Res062	342,937	4,503,183	LT1	49	54	21	Yes
Res063	343,047	4,503,284	LT1	49	54	22	Yes
Res064	343,034	4,503,378	LT1	49	54	22	Yes
Res065	343,233	4,503,448	LT1	49	54	23	Yes
Res066	343,315	4,503,568	LT1	49	54	24	Yes
Res067	343,396	4,503,546	LT1	49	54	23	Yes
Res068	343,477	4,503,612	LT1	49	54	24	Yes
Res069	343,660	4,503,560	LT1	49	54	24	Yes
Res070	343,699	4,503,588	LT1	49	54	25	Yes
Res071	343,734	4,503,581	LT1	49	54	25	Yes
Res072	343,757	4,503,608	LT1	49	54	25	Yes
Res073	343,780	4,503,621	LT1	49	54	25	Yes
Res074	343,803	4,503,631	LT1	49	54	25	Yes
Res075	343,828	4,503,640	LT1	49	54	25	Yes
Res076	343,854	4,503,653	LT1	49	54	25	Yes
Res077	343,679	4,503,673	LT1	49	54	25	Yes
Res078	343,584	4,503,809	LT1	49	54	26	Yes
Res079	343,467	4,504,007	LT1	49	54	26	Yes
Res080	343,399	4,504,054	LT1	49	54	26	Yes
Res081	343,291	4,504,061	LT1	49	54	27	Yes
Res082	343,191	4,504,136	LT1	49	54	26	Yes
Res083	343,586	4,503,974	LT1	49	54	26	Yes
Res084	343,617	4,503,928	LT1	49	54	26	Yes
Res085	343,645	4,503,895	LT1	49	54	26	Yes
Res086	343,633	4,503,858	LT1	49	54	26	Yes
Res087	343,655	4,503,828	LT1	49	54	26	Yes
Res088	343,695	4,503,752	LT1	49	54	26	Yes
Res089	343,747	4,503,743	LT1	49	54	26	Yes
Res090	343,418	4,504,133	LT1	49	54	27	Yes
Res091	343,722	4,503,707	LT1	49	54	25	Yes
Res092	343,743	4,503,655	LT1	49	54	25	Yes
Res093	343,781	4,503,670	LT1	49	54	25	Yes
Res094	343,798	4,503,676	LT1	49	54	25	Yes
Res095	343,819	4,503,687	LT1	49	54	25	Yes
Res096	343,838	4,503,696	LT1	49	54	25	Yes
Res097	343,861	4,503,707	LT1	49	54	25	Yes
Res098	343,894	4,503,736	LT1	49	54	25	Yes
Res099	343,884	4,503,751	LT1	49	54	25	Yes
Res100	343,863	4,503,741	LT1	49	54	25	Yes
Res101	343,847	4,503,783	LT1	49	54	26	Yes
Res102	343,879	4,503,773	LT1	49	54	26	Yes
Res103	343,913	4,503,744	LT1	49	54	25	Yes
Res104	343,959	4,503,759	LT1	49	54	26	Yes
Res105	343,935	4,503,803	LT1	49	54	26	Yes
Res106	344,041	4,503,787	LT1	49	54	26	Yes
Res107	344,003	4,503,832	LT1	49	54	26	Yes
Res108	343,975	4,503,850	LT1	49	54	26	Yes
Res109	343,904	4,503,667	LT1	49	54	25	Yes
Res110	343,939	4,503,686	LT1	49	54	25	Yes
Res111	343,962	4,503,703	LT1	49	54	25	Yes
Res112	344,070	4,503,751	LT1	49	54	25	Yes
Res113	344,095	4,503,763	LT1	49	54	25	Yes
Res114	344,082	4,503,800	LT1	49	54	26	Yes

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NOISE MODELING RESULTS

Receiver	Coordiantes[1] (UTM Meters Zone 17) Easting	Northing	Associated Measurement Point	Measured Daytime Ambient L_{eq}[2] (dBA)	Sound Level Limit (Ambient +5 dBA) (dBA)	Modeled Project (dBA)	Meets Design Goal?
Res115	344,106	4,503,812	LT1	49	54	26	Yes
Res116	344,130	4,503,818	LT1	49	54	26	Yes
Res117	344,168	4,503,834	LT1	49	54	26	Yes
Res118	344,177	4,503,790	LT1	49	54	25	Yes
Res119	343,969	4,503,429	LT1	49	54	24	Yes
Res120	344,065	4,503,576	LT1	49	54	24	Yes
Res121	344,020	4,503,670	LT1	49	54	25	Yes
Res122	344,155	4,503,621	LT1	49	54	24	Yes
Res123	344,212	4,503,475	LT1	49	54	24	Yes
Res124	344,238	4,503,474	LT1	49	54	24	Yes
Res125	344,267	4,503,400	LT1	49	54	23	Yes
Res126	344,240	4,503,529	LT1	49	54	24	Yes
Res127	344,207	4,503,573	LT1	49	54	24	Yes
Res128	344,253	4,503,582	LT1	49	54	24	Yes
Res129	344,260	4,503,541	LT1	49	54	24	Yes
Res130	344,241	4,503,623	LT1	49	54	24	Yes
Res131	344,147	4,503,699	LT1	49	54	25	Yes
Res132	344,275	4,503,694	LT1	49	54	25	Yes
Res133	344,250	4,503,721	LT1	49	54	25	Yes
Res134	344,264	4,503,731	LT1	49	54	26	Yes
Res135	344,302	4,503,737	LT1	49	54	26	Yes
Res136	344,254	4,503,776	LT1	49	54	26	Yes
Res137	344,213	4,503,799	LT1	49	54	26	Yes
Res138	344,270	4,503,835	LT1	49	54	26	Yes
Res139	344,361	4,503,867	LT1	49	54	26	Yes
Res140	344,456	4,503,907	LT1	49	54	27	Yes
Res141	344,406	4,503,929	LT1	49	54	27	Yes
Res142	344,380	4,503,939	LT1	49	54	27	Yes
Res143	344,355	4,503,920	LT1	49	54	27	Yes
Res144	344,324	4,503,917	LT1	49	54	27	Yes
Res145	344,296	4,503,888	LT1	49	54	26	Yes
Res146	344,275	4,503,879	LT1	49	54	26	Yes
Res147	344,215	4,503,853	LT1	49	54	26	Yes
Res148	344,165	4,503,933	LT1	49	54	26	Yes
Res149	344,117	4,503,947	LT1	49	54	26	Yes
Res150	344,150	4,503,993	LT1	49	54	26	Yes
Res151	343,854	4,503,956	LT1	49	54	26	Yes
Res152	343,819	4,503,903	LT1	49	54	26	Yes
Res153	344,414	4,503,426	LT1	49	54	24	Yes
Res154	344,478	4,503,272	LT1	49	54	23	Yes
Res155	344,519	4,502,782	LT1	49	54	21	Yes
Res156	344,572	4,502,757	LT1	49	54	21	Yes
Res157	344,606	4,502,808	LT1	49	54	21	Yes
Res158	344,692	4,502,812	LT1	49	54	21	Yes
Res159	342,830	4,506,110	LT2	53	58	38	Yes
Res160	344,182	4,506,346	LT2	53	58	39	Yes
Res161	344,265	4,506,707	LT2	53	58	33	Yes
Res162	344,317	4,506,791	LT2	53	58	32	Yes
Res163	344,209	4,506,834	LT2	53	58	33	Yes
Res164	344,329	4,506,859	LT2	53	58	32	Yes
Res165	344,393	4,506,849	LT2	53	58	33	Yes
Res166	344,472	4,506,761	LT2	53	58	33	Yes
Res167	344,517	4,506,848	LT2	53	58	34	Yes
Res168	344,602	4,506,848	LT2	53	58	34	Yes
Res169	344,676	4,506,845	LT2	53	58	35	Yes
Res170	344,768	4,506,841	LT2	53	58	36	Yes
Res171	344,844	4,506,843	LT2	53	58	37	Yes

NOISE MODELING RESULTS

Receiver	Coordiantes[1] (UTM Meters Zone 17) Easting	Northing	Associated Measurement Point	Measured Daytime Ambient L_{eq}[2] (dBA)	Sound Level Limit (Ambient +5 dBA) (dBA)	Modeled Project (dBA)	Meets Design Goal?
Res172	344,543	4,507,033	LT2	53	58	33	Yes
Res173	344,737	4,507,307	LT2	53	58	37	Yes
Res174	344,341	4,508,342	LT2	53	58	26	Yes
Res175	344,598	4,508,468	LT2	53	58	26	Yes
Res176	344,633	4,508,459	LT2	53	58	26	Yes
Res177	345,016	4,506,918	LT2	53	58	40	Yes
Res178	342,210	4,506,826	LT2	53	58	27	Yes
Res179	342,680	4,506,822	LT2	53	58	29	Yes
Res180	342,826	4,506,937	LT2	53	58	29	Yes
Res181	343,277	4,506,839	LT2	53	58	35	Yes
Res182	343,395	4,507,022	LT2	53	58	33	Yes
Res183	344,083	4,506,883	LT2	53	58	33	Yes
Res184	344,117	4,506,622	LT2	53	58	34	Yes
Res185	344,114	4,506,527	LT2	53	58	38	Yes
Res186	343,413	4,508,401	LT2	53	58	23	Yes
Res187	343,371	4,508,209	LT2	53	58	24	Yes
Res188	343,362	4,508,132	LT2	53	58	24	Yes
Res189	342,450	4,508,362	LT2	53	58	20	Yes
Res190	342,359	4,508,457	LT2	53	58	19	Yes
Res191	341,946	4,507,599	LT2	53	58	22	Yes
Res192	341,570	4,507,928	LT2	53	58	19	Yes
Res193	341,737	4,506,841	LT2	53	58	22	Yes
Res194	341,618	4,506,913	LT2	53	58	21	Yes
Res195	341,527	4,506,954	LT2	53	58	20	Yes
Res196	345,075	4,509,100	LT2	53	58	23	Yes
Res197	344,965	4,509,016	LT2	53	58	23	Yes
Res198	344,977	4,508,907	LT2	53	58	24	Yes
Res199	344,975	4,508,846	LT2	53	58	24	Yes
Res200	344,967	4,508,784	LT2	53	58	25	Yes
Res201	344,953	4,508,718	LT2	53	58	25	Yes
Res202	344,889	4,508,675	LT2	53	58	25	Yes
Res203	344,955	4,508,596	LT2	53	58	26	Yes
Res204	344,899	4,508,541	LT2	53	58	26	Yes
Res205	344,841	4,508,502	LT2	53	58	26	Yes
Res206	344,756	4,509,067	LT2	53	58	23	Yes
Res207	344,695	4,509,151	LT2	53	58	22	Yes
Res208	344,562	4,509,199	LT2	53	58	22	Yes
Res209	343,879	4,508,809	LT2	53	58	23	Yes
Res210	343,842	4,508,775	LT2	53	58	23	Yes
Res211	343,867	4,508,714	LT2	53	58	23	Yes
Res212	345,126	4,509,239	LT2	53	58	22	Yes
Res213	346,067	4,505,553	LT3	63	68	36	Yes
Res214	346,059	4,505,512	LT3	63	68	36	Yes
Res215	346,045	4,505,390	LT3	63	68	36	Yes
Res216	346,062	4,505,317	LT3	63	68	36	Yes
Res217	346,054	4,505,262	LT3	63	68	36	Yes
Res218	346,078	4,505,177	LT3	63	68	37	Yes
Res219	345,623	4,504,521	LT3	63	68	36	Yes
Res220	345,557	4,504,431	LT3	63	68	36	Yes
Res221	345,444	4,504,390	LT3	63	68	36	Yes
Res222	344,806	4,504,287	LT3	63	68	31	Yes
Res223	344,753	4,503,639	LT3	63	68	27	Yes
Res224	344,774	4,503,638	LT3	63	68	27	Yes
Res225	344,802	4,503,642	LT3	63	68	27	Yes
Res226	345,184	4,503,554	LT3	63	68	26	Yes
Res227	345,254	4,503,607	LT3	63	68	26	Yes
Res228	345,160	4,503,678	LT3	63	68	27	Yes

NOISE MODELING RESULTS

Receiver	Coordiantes[1] (UTM Meters Zone 17) Easting	Northing	Associated Measurement Point	Measured Daytime Ambient L_{eq}[2] (dBA)	Sound Level Limit (Ambient +5 dBA) (dBA)	Modeled Project (dBA)	Meets Design Goal?
Res229	345,389	4,503,724	LT3	63	68	27	Yes
Res230	345,654	4,503,713	LT3	63	68	26	Yes
Res231	345,837	4,503,651	LT3	63	68	26	Yes
Res232	346,048	4,503,739	LT3	63	68	26	Yes
Res233	346,032	4,503,878	LT3	63	68	26	Yes
Res234	346,016	4,503,939	LT3	63	68	27	Yes
Res235	346,069	4,504,100	LT3	63	68	29	Yes
Res236	346,125	4,504,582	LT3	63	68	35	Yes
Res237	346,155	4,504,652	LT3	63	68	35	Yes
Res238	345,990	4,504,496	LT3	63	68	34	Yes
Res239	345,928	4,504,468	LT3	63	68	34	Yes
Res240	345,784	4,504,443	LT3	63	68	34	Yes
Res241	345,553	4,504,364	LT3	63	68	35	Yes
Res242	345,482	4,504,305	LT3	63	68	33	Yes
Res243	345,391	4,504,264	LT3	63	68	33	Yes
Res244	345,188	4,504,178	LT3	63	68	31	Yes
Res245	344,917	4,504,073	LT3	63	68	29	Yes
Res246	346,324	4,504,429	LT3	63	68	31	Yes
Res247	346,267	4,504,373	LT3	63	68	29	Yes
Res248	346,766	4,504,796	LT3	63	68	28	Yes
Res249	346,696	4,504,790	LT3	63	68	28	Yes
Res250	346,745	4,504,848	LT3	63	68	28	Yes
Res251	346,352	4,504,825	LT3	63	68	34	Yes
Res252	346,108	4,504,791	LT3	63	68	38	Yes
Res253	346,095	4,504,872	LT3	63	68	40	Yes
Res254	346,246	4,505,140	LT3	63	68	35	Yes
Res255	346,205	4,505,325	LT3	63	68	35	Yes
Res256	346,310	4,505,637	LT3	63	68	34	Yes
Res257	346,381	4,505,586	LT3	63	68	33	Yes
Res258	346,229	4,505,882	LT3	63	68	38	Yes
Res259	346,278	4,505,810	LT3	63	68	36	Yes
Res260	347,445	4,505,260	LT3	63	68	27	Yes
Res261	347,253	4,505,049	LT3	63	68	26	Yes
Res262	347,080	4,505,167	LT3	63	68	27	Yes
Res263	346,926	4,504,925	LT3	63	68	27	Yes
Res264	346,937	4,504,846	LT3	63	68	27	Yes
Res265	346,987	4,504,859	LT3	63	68	27	Yes
Res266	348,551	4,505,285	LT3	63	68	22	Yes
Res267	348,565	4,505,193	LT3	63	68	22	Yes
Res268	348,484	4,505,169	LT3	63	68	22	Yes
Res269	348,462	4,505,139	LT3	63	68	22	Yes
Res270	348,454	4,505,078	LT3	63	68	21	Yes
Res271	348,454	4,505,018	LT3	63	68	22	Yes
Res272	348,395	4,505,239	LT3	63	68	22	Yes
Res273	348,348	4,505,223	LT3	63	68	22	Yes
Res274	348,312	4,505,219	LT3	63	68	22	Yes
Res275	348,278	4,505,215	LT3	63	68	23	Yes
Res276	348,219	4,505,208	LT3	63	68	23	Yes
Res277	348,180	4,505,201	LT3	63	68	23	Yes
Res278	348,110	4,505,225	LT3	63	68	24	Yes
Res279	347,956	4,505,192	LT3	63	68	25	Yes
Res280	344,961	4,502,810	LT3	63	68	21	Yes
Res281	345,022	4,502,871	LT3	63	68	22	Yes
Res282	345,077	4,502,868	LT3	63	68	22	Yes
Res283	345,265	4,502,678	LT3	63	68	21	Yes
Res284	345,279	4,502,788	LT3	63	68	21	Yes
Res285	345,211	4,502,818	LT3	63	68	22	Yes

NOISE MODELING RESULTS

Receiver	Coordiantes[1] (UTM Meters Zone 17) Easting	Northing	Associated Measurement Point	Measured Daytime Ambient L_{eq}[2] (dBA)	Sound Level Limit (Ambient +5 dBA) (dBA)	Modeled Project (dBA)	Meets Design Goal?
Res286	345,383	4,502,804	LT3	63	68	22	Yes
Res287	345,376	4,502,766	LT3	63	68	22	Yes
Res288	345,508	4,502,772	LT3	63	68	22	Yes
Res289	345,495	4,502,851	LT3	63	68	22	Yes
Res290	345,580	4,502,805	LT3	63	68	22	Yes
Res291	345,648	4,502,768	LT3	63	68	21	Yes
Res292	345,600	4,502,863	LT3	63	68	22	Yes
Res293	345,819	4,502,802	LT3	63	68	21	Yes
Res294	345,820	4,502,869	LT3	63	68	23	Yes
Res295	345,891	4,502,865	LT3	63	68	22	Yes
Res296	345,931	4,502,866	LT3	63	68	22	Yes
Res297	345,973	4,502,874	LT3	63	68	22	Yes
Res298	346,103	4,502,862	LT3	63	68	21	Yes
Res299	346,027	4,502,802	LT3	63	68	21	Yes
Res300	346,196	4,503,011	LT3	63	68	22	Yes
Res301	346,090	4,503,107	LT3	63	68	23	Yes
Res302	346,201	4,503,181	LT3	63	68	23	Yes
Res303	346,204	4,503,255	LT3	63	68	24	Yes
Res304	346,068	4,503,212	LT3	63	68	23	Yes
Res305	345,978	4,503,222	LT3	63	68	23	Yes
Res306	345,984	4,503,244	LT3	63	68	24	Yes
Res307	346,178	4,503,375	LT3	63	68	25	Yes
Res308	346,090	4,503,508	LT3	63	68	26	Yes
Res309	346,123	4,503,549	LT3	63	68	26	Yes
Res310	346,089	4,503,614	LT3	63	68	26	Yes
Res311	346,011	4,503,649	LT3	63	68	26	Yes
Res312	346,367	4,503,487	LT3	63	68	25	Yes
Res313	346,533	4,503,441	LT3	63	68	22	Yes
Res314	346,676	4,503,562	LT3	63	68	22	Yes
Res315	346,794	4,503,379	LT3	63	68	21	Yes
Res316	347,125	4,503,665	LT3	63	68	22	Yes
Res317	347,043	4,503,521	LT3	63	68	21	Yes
Res318	348,758	4,504,632	LT3	63	68	19	Yes
Res319	348,728	4,504,899	LT3	63	68	21	Yes
Res320	349,049	4,505,024	LT3	63	68	19	Yes
Res321	344,911	4,502,821	LT3	63	68	21	Yes
Res322	344,884	4,502,815	LT3	63	68	21	Yes
Res323	348,415	4,505,883	LT4	57	62	25	Yes
Res324	348,393	4,505,806	LT4	57	62	24	Yes
Res325	348,611	4,505,858	LT4	57	62	23	Yes
Res326	348,705	4,505,819	LT4	57	62	23	Yes
Res327	348,419	4,505,742	LT4	57	62	24	Yes
Res328	348,252	4,505,725	LT4	57	62	25	Yes
Res329	348,107	4,505,687	LT4	57	62	25	Yes
Res330	349,275	4,505,072	LT4	57	62	18	Yes
Res331	349,286	4,505,192	LT4	57	62	19	Yes
Res332	349,269	4,505,251	LT4	57	62	19	Yes
Res333	349,265	4,505,302	LT4	57	62	19	Yes
Res334	349,333	4,505,303	LT4	57	62	18	Yes
Res335	349,433	4,505,327	LT4	57	62	18	Yes
Res336	349,470	4,505,179	LT4	57	62	17	Yes
Res337	349,536	4,505,192	LT4	57	62	16	Yes
Res338	349,612	4,505,292	LT4	57	62	15	Yes
Res339	349,666	4,505,327	LT4	57	62	15	Yes
Res340	349,694	4,505,489	LT4	57	62	14	Yes
Res341	349,525	4,505,467	LT4	57	62	18	Yes
Res342	345,820	4,508,495	LT4	57	62	27	Yes

NOISE MODELING RESULTS

Receiver	Coordiantes[1] (UTM Meters Zone 17) Easting	Northing	Associated Measurement Point	Measured Daytime Ambient L_{eq}[2] (dBA)	Sound Level Limit (Ambient +5 dBA) (dBA)	Modeled Project (dBA)	Meets Design Goal?
Res343	346,450	4,508,191	LT4	57	62	27	Yes
Res344	346,721	4,508,108	LT4	57	62	28	Yes
Res345	346,549	4,507,824	LT4	57	62	30	Yes
Res346	346,474	4,507,805	LT4	57	62	31	Yes
Res347	346,540	4,507,757	LT4	57	62	32	Yes
Res348	346,537	4,507,688	LT4	57	62	32	Yes
Res349	346,547	4,507,626	LT4	57	62	33	Yes
Res350	346,537	4,507,586	LT4	57	62	34	Yes
Res351	346,534	4,507,543	LT4	57	62	34	Yes
Res352	346,387	4,507,274	LT4	57	62	38	Yes
Res353	346,413	4,506,979	LT4	57	62	38	Yes
Res354	345,727	4,506,900	LT4	57	62	39	Yes
Res355	345,679	4,506,902	LT4	57	62	39	Yes
Res356	345,606	4,506,904	LT4	57	62	39	Yes
Res357	346,140	4,506,804	LT4	57	62	38	Yes
Res358	346,206	4,506,817	LT4	57	62	37	Yes
Res359	346,241	4,506,828	LT4	57	62	37	Yes
Res360	346,271	4,506,823	LT4	57	62	37	Yes
Res361	346,305	4,506,824	LT4	57	62	38	Yes
Res362	346,351	4,506,827	LT4	57	62	38	Yes
Res363	346,381	4,506,826	LT4	57	62	39	Yes
Res364	346,352	4,506,774	LT4	57	62	39	Yes
Res365	346,352	4,506,750	LT4	57	62	39	Yes
Res366	346,298	4,506,786	LT4	57	62	38	Yes
Res367	346,288	4,506,751	LT4	57	62	38	Yes
Res368	346,253	4,506,745	LT4	57	62	38	Yes
Res369	346,209	4,506,749	LT4	57	62	38	Yes
Res370	346,184	4,506,670	LT4	57	62	39	Yes
Res371	346,231	4,506,676	LT4	57	62	38	Yes
Res372	346,285	4,506,672	LT4	57	62	39	Yes
Res373	346,334	4,506,672	LT4	57	62	39	Yes
Res374	346,310	4,506,598	LT4	57	62	39	Yes
Res375	346,286	4,506,549	LT4	57	62	38	Yes
Res376	346,262	4,506,463	LT4	57	62	38	Yes
Res377	346,219	4,506,342	LT4	57	62	37	Yes
Res378	346,199	4,506,233	LT4	57	62	38	Yes
Res379	346,394	4,506,320	LT4	57	62	37	Yes
Res380	346,367	4,506,525	LT4	57	62	39	Yes
Res381	346,744	4,507,464	LT4	57	62	36	Yes
Res382	346,688	4,507,563	LT4	57	62	34	Yes
Res383	346,707	4,507,688	LT4	57	62	32	Yes
Res384	346,730	4,507,743	LT4	57	62	32	Yes
Res385	346,749	4,507,820	LT4	57	62	30	Yes
Res386	346,756	4,507,873	LT4	57	62	30	Yes
Res387	347,656	4,508,295	LT4	57	62	24	Yes
Res388	348,478	4,507,567	LT4	57	62	22	Yes
Res389	348,471	4,507,501	LT4	57	62	23	Yes
Res390	348,454	4,507,453	LT4	57	62	23	Yes
Res391	348,473	4,507,411	LT4	57	62	23	Yes
Res392	348,466	4,507,361	LT4	57	62	23	Yes
Res393	348,457	4,507,306	LT4	57	62	23	Yes
Res394	348,539	4,507,332	LT4	57	62	23	Yes
Res395	349,245	4,507,426	LT4	57	62	18	Yes
Res396	349,268	4,507,373	LT4	57	62	19	Yes
Res397	349,343	4,507,460	LT4	57	62	17	Yes
Res398	349,353	4,507,416	LT4	57	62	18	Yes
Res399	349,353	4,507,391	LT4	57	62	19	Yes

NOISE MODELING RESULTS

Receiver	Coordiantes[1] (UTM Meters Zone 17) Easting	Northing	Associated Measurement Point	Measured Daytime Ambient L_{eq}[2] (dBA)	Sound Level Limit (Ambient +5 dBA) (dBA)	Modeled Project (dBA)	Meets Design Goal?
Res400	349,352	4,507,351	LT4	57	62	19	Yes
Res401	349,344	4,507,215	LT4	57	62	19	Yes
Res402	349,337	4,507,131	LT4	57	62	19	Yes
Res403	349,339	4,506,906	LT4	57	62	20	Yes
Res404	349,340	4,506,732	LT4	57	62	21	Yes
Res405	349,248	4,506,679	LT4	57	62	20	Yes
Res406	348,862	4,506,769	LT4	57	62	22	Yes
Res407	348,776	4,506,767	LT4	57	62	22	Yes
Res408	348,444	4,506,852	LT4	57	62	24	Yes
Res409	348,397	4,506,784	LT4	57	62	25	Yes
Res410	348,288	4,506,698	LT4	57	62	25	Yes
Res411	348,242	4,506,806	LT4	57	62	26	Yes
Res412	348,022	4,506,807	LT4	57	62	28	Yes
Res413	347,931	4,506,811	LT4	57	62	29	Yes
Res414	347,877	4,506,825	LT4	57	62	29	Yes
Res415	347,802	4,506,832	LT4	57	62	30	Yes
Res416	347,683	4,506,821	LT4	57	62	32	Yes
Res417	347,388	4,506,763	LT4	57	62	40	Yes
Res418	347,697	4,506,363	LT4	57	62	32	Yes
Res419	347,863	4,506,728	LT4	57	62	30	Yes
Res420	347,757	4,506,460	LT4	57	62	31	Yes
Res421	347,766	4,506,278	LT4	57	62	31	Yes
Res422	347,757	4,506,235	LT4	57	62	31	Yes
Res423	348,446	4,506,402	LT4	57	62	24	Yes
Res424	348,389	4,506,327	LT4	57	62	25	Yes
Res425	348,402	4,506,084	LT4	57	62	25	Yes
Res426	348,560	4,505,952	LT4	57	62	24	Yes
Res427	349,307	4,506,141	LT4	57	62	19	Yes
Res428	349,376	4,506,721	LT4	57	62	20	Yes
Res429	349,423	4,506,721	LT4	57	62	19	Yes
Res430	349,484	4,506,718	LT4	57	62	20	Yes
Res431	349,618	4,506,622	LT4	57	62	18	Yes
Res432	349,659	4,506,654	LT4	57	62	18	Yes
Res433	349,711	4,506,714	LT4	57	62	18	Yes
Res434	349,911	4,506,550	LT4	57	62	16	Yes
Res435	350,003	4,506,736	LT4	57	62	16	Yes
Res436	350,053	4,506,697	LT4	57	62	15	Yes
Res437	350,063	4,506,579	LT4	57	62	15	Yes
Res438	350,094	4,506,619	LT4	57	62	15	Yes
Res439	350,096	4,506,533	LT4	57	62	14	Yes
Res440	349,290	4,507,561	LT4	57	62	18	Yes
Res441	349,241	4,507,670	LT4	57	62	18	Yes
Res442	349,471	4,507,949	LT4	57	62	16	Yes
Res443	349,295	4,507,920	LT4	57	62	17	Yes
Res444	349,303	4,508,003	LT4	57	62	17	Yes
Res445	349,054	4,508,138	LT4	57	62	18	Yes
Res446	348,636	4,507,887	LT4	57	62	21	Yes
Res447	348,488	4,507,723	LT4	57	62	22	Yes
Res448	348,612	4,508,158	LT4	57	62	20	Yes
Res449	348,631	4,508,227	LT4	57	62	20	Yes
Res450	348,661	4,508,280	LT4	57	62	20	Yes
Res451	348,557	4,508,320	LT4	57	62	20	Yes
Res452	348,268	4,508,496	LT4	57	62	21	Yes
Res453	348,029	4,508,528	LT4	57	62	21	Yes
Res454	348,132	4,508,510	LT4	57	62	21	Yes
Res455	347,996	4,508,305	LT4	57	62	22	Yes
Res456	347,846	4,508,312	LT4	57	62	22	Yes

NOISE MODELING RESULTS

Receiver	Coordiantes[1] (UTM Meters Zone 17)		Associated Measurement Point	Measured Daytime Ambient L_{eq}[2]	Sound Level Limit (Ambient +5 dBA)	Modeled Project	Meets Design Goal?
	Easting	Northing		(dBA)	(dBA)	(dBA)	
Res457	347,462	4,508,351	LT4	57	62	24	Yes
Res458	346,920	4,508,575	LT4	57	62	24	Yes
Res459	347,182	4,508,995	LT4	57	62	22	Yes
Res460	347,113	4,509,042	LT4	57	62	22	Yes
Res461	347,138	4,509,095	LT4	57	62	21	Yes
Res462	346,809	4,508,538	LT4	57	62	25	Yes
Res463	346,654	4,508,489	LT4	57	62	26	Yes
Res464	346,608	4,508,496	LT4	57	62	26	Yes
Res465	346,545	4,508,493	LT4	57	62	26	Yes
Res466	346,502	4,508,495	LT4	57	62	26	Yes
Res467	346,466	4,508,495	LT4	57	62	26	Yes
Res468	346,462	4,508,577	LT4	57	62	25	Yes
Res469	346,436	4,508,496	LT4	57	62	26	Yes
Res470	346,405	4,508,495	LT4	57	62	26	Yes
Res471	346,365	4,508,495	LT4	57	62	26	Yes
Res472	346,327	4,508,488	LT4	57	62	26	Yes
Res473	346,296	4,508,485	LT4	57	62	26	Yes
Res474	346,245	4,508,491	LT4	57	62	26	Yes
Res475	346,247	4,508,538	LT4	57	62	26	Yes
Res476	346,247	4,508,582	LT4	57	62	25	Yes
Res477	346,194	4,508,608	LT4	57	62	25	Yes
Res478	346,208	4,508,500	LT4	57	62	26	Yes
Res479	346,134	4,508,501	LT4	57	62	26	Yes
Res480	346,115	4,508,527	LT4	57	62	26	Yes
Res481	345,972	4,508,967	LT4	57	62	24	Yes
Res482	345,972	4,509,023	LT4	57	62	23	Yes
Res483	345,932	4,509,121	LT4	57	62	23	Yes
Res484	346,323	4,509,025	LT4	57	62	23	Yes
Res485	346,467	4,509,108	LT4	57	62	22	Yes
Res486	346,154	4,509,092	LT4	57	62	23	Yes
Res487	346,152	4,509,170	LT4	57	62	23	Yes
Res488	345,776	4,509,255	LT4	57	62	22	Yes
Res489	345,665	4,509,337	LT4	57	62	22	Yes

Notes:

[1] All coordinates presented in UTM NAD83 Zone 17N (meters)

[2] Measured daytime ambient Leq sound level at representative measurement location

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Case No(s). 22-0151-EL-BGN

Summary: Application Application Exhibit L (Sound Study) electronically filed by Mr. Michael J. Settineri on behalf of Blossom Solar, LLC