August 28, 2025

Mr. Tory Hanna
DHD Solar
105 Prospect Street
Greenwich CT 06830

SUBJECT: Proposed Solar Facility, Southbury, CT
Environmental Sound Study

Dear Mr. Hanna,

Cavanaugh Tocci Associates has evaluated the environmental sound impact associated with the proposed solar facility at 2225 River Road in Southbury, CT. The objectives of this evaluation were:

- To define acoustic design goals based on applicable noise regulations.
- To estimate and evaluate the acoustic impact of the proposed project in the surrounding community.

Results of the evaluation are summarized herein. Appendix A provides a glossary of acoustic terminology used in this report.

Environmental Noise Regulations

To the best of our knowledge, only state noise regulations apply to sound produced by the proposed project. A brief summary of these regulations follows:

State of Connecticut Noise Regulation

The State of Connecticut Noise Regulation (Section 22a-69-1 to 7.4) defines limits for environmental sound produced by this project. The sound level limits are based on both emitter and receptor land use classifications, and are listed below in Table 1:

Table 1: Connecticut Regulations for the Control of Noise Sound Level Limits (dBA)

Emitter Class	Receptor Class			
	C	B	A/Day	A/Night
C	70	66	61	51
B	62	62	55	45
A	62	55	55	45

Definitions

In the above table, day is defined as the time interval 7:00 a.m. to 10:00 p.m. Night is defined as the time interval 10:00 p.m. to 7:00 a.m. Noise Zone Classifications are based on the actual land use (not zoning). Where multiple land uses exist on the same property, the least restrictive limits apply.

A Class A noise zone is land generally designated for residential use or areas where serenity and tranquility are essential to the intended use.

A Class B noise zone includes land uses generally of a commercial nature.

A Class C noise zone includes uses generally of an industrial nature, including utilities.

Exceptions and Other Limit Provisions

Section 22a-69-3.3 Prominent Discrete Tones

To offset the undesirable nature of tonal sound in the environment, the regulation penalizes sources of prominent, audible discrete tones. If a facility produces such sounds, the applicable limits in Table 1 are reduced by 5 dBA. In its definitions (Section 22a-69-1.2), the regulation defines a method for identifying prominent discrete tones based on measuring one-third octave band sound levels.

Facility Acoustic Requirements

Our interpretation of the above referenced regulations follows:

- The Project is within a planned unit development (PUD) overlay zoning district (B-4 marine business) and includes a utility easement. The Project is considered a utility facility and would be the only use of the property other than existing utility operations. Therefore, due to land use we have evaluated the Project as a Class C emitter.

- Facility equipment may produce a prominent discrete tone, conservatively we recommend reducing the limits in Table 1 by 5 dB as required in Section 22a-69-3.3 of the regulation.

- The use of the property to the east of the facility is agricultural, which is considered a Class C receptor in the regulation. A sound level limit of 65 dBA applies at this location.

- The use of the property to the southeast of the facility is commercial, which is considered a Class B receptor. A sound level limit of 61 dBA applies.

- The facility will only produce sound during daytime hours. As such, the daytime limits apply at Class A receptors. A sound level limit of 56 dBA would apply at any property with residential use.

Facility Sound Analysis

Sound impacts that are associated with facility equipment have been calculated using CadnaA environmental sound modeling software (Version 2025 MR1 DataKustic GmbH). The CadnaA sound modeling software uses algorithms and procedures described in International Standard ISO 9613-2:1996 "Acoustics- Attenuation of sound during propagation outdoors – Part 2: General method of calculation". This standard and its associated methodology are the most universally accepted approach for environmental sound modeling of industrial and transit sound sources. The methodology described in this standard provides estimates of A-weighted sound levels for meteorological conditions that are favorable for the propagation of sound (downwind with a wind speed of 1-5 meters/sec). This methodology is also valid for sound propagation under well-developed moderate ground-based temperature profile inversions, which commonly occur on clear calm nights.

Significant sound sources associated with this project include sixteen 125-KVA inverter units (SMA model Sunny Highpower PEAK3-US 125), and a 2 MW transformer. The equipment was modeled operating at full capacity. The units were modeled at a height of six feet above grade. Locations are approximate as this has not been determined at the time of evaluation, but we understand that the inverter units will be located behind the east end of the PV panel rows.

Figure 1 presents the results of acoustic modeling for the project. This figure demonstrates that the 30 dBA sound contour lies completely within facility property, and therefore any off-site location would experience sound levels no greater than 30 dBA. These results are significantly below applicable sound level limits and confirm that the Project will comply with the State of Connecticut Noise Regulation.

Conclusion

Based on our review of the data presented in Figure 1, it is our professional opinion that sound produced by the proposed solar facility on River Road in Southbury, Connecticut, will comply with the most stringent requirements of the state sound regulations at all surrounding properties. The nearest residences are approximately 2,500 feet from project equipment, and sound levels at this distance would be negligible. We therefore conclude that sound emitted by the project will not produce a noticeable impact on the acoustic environment and will not have an unreasonable adverse effect at any surrounding properties.

Sincerely,
CAVANAUGH TOCCI

Bradley M. Dunkin

Bradley M. Dunkin, *ASSOCIATE PRINCIPAL CONSULTANT*
25130/DHD Solar Southbury CT acoustic analysis.docx

FIGURES

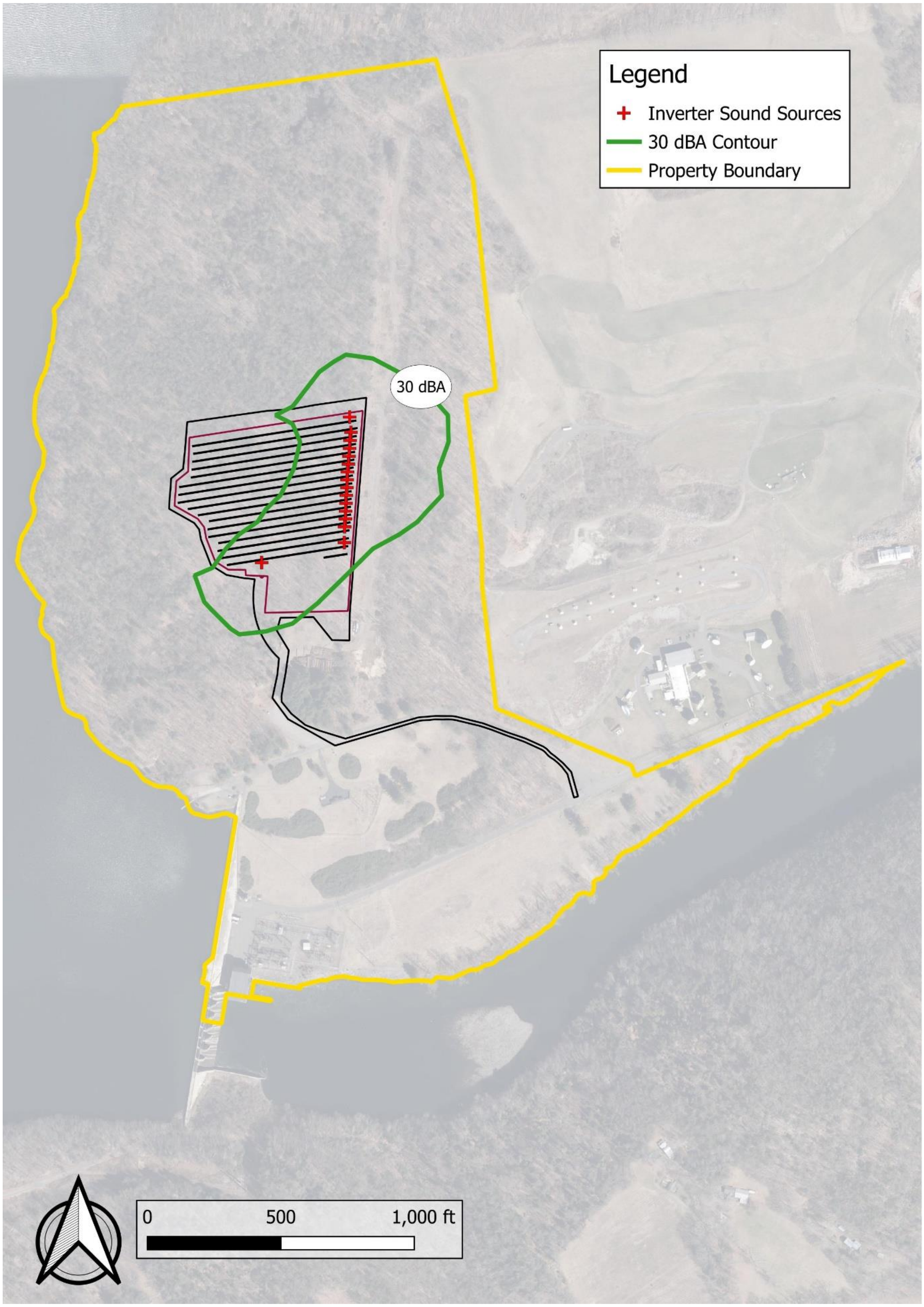
Legend
Inverter Sound Sources
30 dBA Contour
Property Boundary
30 dBA
0
500
1,000 ft

Figure 1

Appendix A

Sound Measurement Terminology

SOUND MEASUREMENT TERMINOLOGY

In order to quantify the amplitude, frequency, and temporal characteristics of sound, various acoustical descriptors are used. The following is an introduction to acoustic terminology that is used in this report.

Sound Level

Sound levels are typically quantified using a logarithmic decibel (dB) scale. The use of a logarithmic scale helps to compress the wide range of human sensitivity to sound amplitude into a scale that ranges from approximately 0 to 180 dB. Note however, that the use of the logarithmic scale prevents simple arithmetic operations when combining the cumulative impact of sources. For example, two sources of equal sound level operated simultaneously results in a combined sound level that is only 3 dB higher than if only one source was operated alone. An important feature of the human perception of continuous sound is that an increase or decrease in sound pressure level by 3 dB or less is barely perceptible, and an increase or decrease by 10 dB is perceived as a doubling or halving of noise level.

A-weighting

Generally, the sensitivity of human hearing is restricted to the frequency range of 20 Hz to 20,000 Hz. However, the human ear is most sensitive to sound in the 500 Hz to 5,000 Hz frequency range. Above and below this range, the ear becomes progressively less sensitive. To account for this feature of human hearing, sound level meters incorporate filtering of acoustic signals that corresponds to the varying sensitivity of the human ear to sound at different frequencies. This filtering is called A-weighting. Sound level measurements that are obtained using this filtering are referred to as A-weighted sound levels and are signified by the identifier, dBA. A-weighted sound levels are widely used for evaluating human exposure to environmental sounds. To help place A-weighted sound levels in perspective, Figure A-1 contains a scale showing typical sound levels for common interior and environmental sound sources.

Spectral Characteristics – Octave and 1/3 Octave Band Sound Levels

To characterize a sound, it is often necessary to evaluate the frequency distribution of the sound energy. As mentioned before, the frequencies of most interest where human exposure is concerned range between 20 Hz and 20,000 Hz. This frequency range is commonly divided into octave bands, where an octave band is a range of frequencies. Each octave band is referred to by its center frequency and has a bandwidth of one octave (a doubling of frequency). To cover the full range of human hearing, it is necessary to measure sound in 10 separate octave bands. Typically, the lowest frequency band measured has a center frequency of 31.5 Hz. The next frequency band has a center frequency of 63 Hz. This geometric series continues to the highest frequency band that has a center frequency of 16,000 Hz. A set of octave band sound levels to describe a particular sound is called an octave band spectrum. Covering the full range of hearing, an octave band spectrum would have 10 values, one for each band. Under certain circumstances, more frequency resolution in acoustical data is needed to identify the presence of tonal sounds. A 1/3 octave band spectrum uses filters that divide each octave band into 3 separate frequency bands. Note that octave band and 1/3 octave band sound levels are not usually A-weighted, with their units being dB.

Environmental Noise Descriptors

Sound levels in the environment are continuously fluctuating and it is difficult to quantify these time-varying levels with single number descriptors. Statistical approaches, which use *percentile sound levels* and *equivalent sound levels*, are often used to quantify the temporal characteristics of environmental sound.

Percentile sound levels (L_n) are the A-weighted sound levels that are exceeded for specific percentages of time within a noise measurement interval. For example if a measurement interval is one hour long, the 50th percentile sound level (L_{50}) is the A-weighted sound level that is exceeded for 30 minutes of that interval.

- L_{90} is the sound level in dBA exceeded 90 percent of the time during the measurement period. The 90th percentile sound level represents the nominally lowest level reached during the monitoring interval and is typically influenced by sound of relatively low level, but nearly constant duration, such as distant traffic or continuously operating industrial equipment. The L_{90} is often used in standards to quantify the existing background or residual sound level.

- L_{50} is the median sound level: the sound level in dBA exceeded 50 percent of the time during the measurement period.

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

By using percentile sound levels, it is possible to characterize the sound environment in terms of the steady-state background sound (L_{90}) and occasional transient sound (L_{10}).

The equivalent sound level (L_{eq}) is the energy average of the A weighted sound level for the measurement interval. Sounds of low level and long duration, as well as sounds of high level and short duration influence this sound level descriptor.

Noise levels at night generally produce greater annoyance than do the same levels which occur during the day. It is generally agreed that a given level of environmental noise during the day would appear to be 10 dBA louder at night – at least in terms of potential for causing community concern. The day night average sound level (Ldn) is a 24 hour average A-weighted sound level where a 10 dB "penalty" is applied to sound occurring between the hours of 10:00 p.m. and 7:00 a.m. The 10 dB penalty accounts for the heightened sensitivity of a community to noise occurring at night.

When a steady continuous sound is measured, the L_{10}, L_{50}, L_{90} and L_{eq} are all equal. For a constant sound level, such as from a power plant operating continuously for a 24-hour period, the L_{dn} is approximately 6 dBA higher than the directly measured sound level.

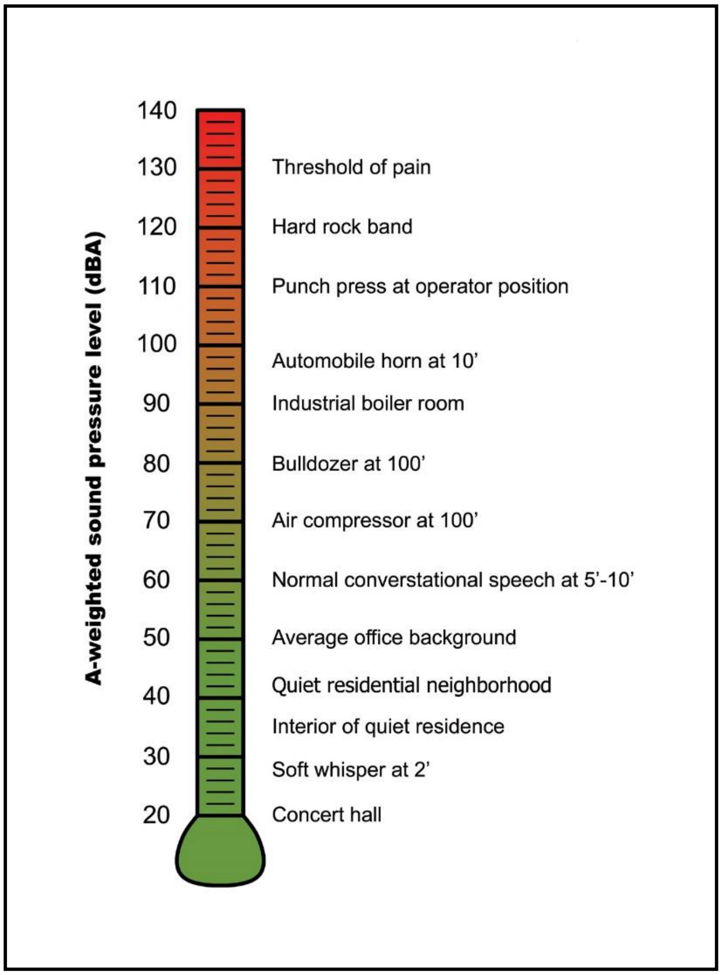

Figure A-1
Typical Sound Levels for Common Interior and Environmental Sources