



January 8, 2026

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Subject: *Pallme Farm Solar - Noise Assessment
Kane County, Illinois*

Executive Summary

The purpose of this technical memorandum is to evaluate potential noise levels associated with the operational equipment to be located at the proposed Pallme Farm Solar Site in Kane County, IL. The proposed solar photovoltaic project site is located just east of Huntley, approximately 1 mile west of Gilberts, approximately 2 miles northeast of Pingree Grove, and approximately 2.5 miles east of Hampshire.

The proposed Pallme Farm Solar Site will be developed on nearly 23 acres of an approximately 36-acre parcel of agricultural land in an unincorporated portion of Kane County, IL, with Powers Road to the north, Ridgefield Boulevard to the east, Freeman Road to the south, and IL-47 to the west, as well as other residential streets north, east, and south of the project site. Additionally, Union Pacific (UP) railroad tracks are located approximately 1 mile east of the site. The site will consist of solar arrays throughout the project area, twenty (20) string inverters towards the central portion of the site, and two (2) transformers located on two (2) equipment pads towards the central portion of the site.

Noise Regulations

Chapter 25, Article V, Section 25-5-4-9 of the Kane County, IL Code of Ordinance states that "Noise levels from Commercial Solar Energy Facilities shall be in compliance with applicable Illinois Pollution Control Board (IPCB) regulations."

The IPCB noise regulations are based on allowable octave band sound pressure levels during daytime and nighttime hours. According to Title 35 (Environmental Protection), Subtitle H (Noise), Chapter I (Pollution Control Board), Part 901 (Sound Emission Standards and Limitations for Property Line-Noise Sources), a facility operating in an agricultural field (Class C Land) cannot cause an exceedance of sound levels at any point within a residential land use (Class A Land) during daytime hours as shown in **Table 1**.

Table 1: Maximum Allowable Sound Emitted to Class A Land During Daytime Hours

Octave Band Center Frequency (Hertz)	Allowable Octave Band Sound Pressure Levels (dB) of Sound Emitted to any Receiving Class A Land from		
	Class C Land	Class B Land	Class A Land
31.5	75	72	72
63	74	71	71
125	69	65	65
250	64	57	57
500	58	51	51
1000	52	45	45
2000	47	39	39
4000	43	34	34
8000	40	32	32

Since the solar array does not generate power at night, the equipment will not operate at night and will comply with the IPCB nighttime hour limits.

Noise Assessment

Noise levels from anticipated operational equipment likely to be installed at the proposed Pallme Farm Solar Site were evaluated to assist with determining a conservative distance that the equipment should be located from the closest Class A land use.

Inverters

Photovoltaic (PV) inverter equipment can generate steady, unvarying noise that may create issues when located near noise-sensitive uses. Based on noise emission levels for CPS SCH100/125KTL-DO/US-600 string inverter equipment, a reference sound level of approximately 65 dB(A) at 1 meter (i.e., 3 feet) for a string inverter was used. **Table 2** shows the octave band emission levels for the CPS SCH100/125KTL-DO/US-600 string inverter used for reference. The sound emissions from the operation of the string inverters were calculated using SoundPLAN.

Table 2: Sound Emissions for String Inverter

Octave Band Center Frequency	31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Frequency Sound Level	28	46	65	70	72	72	71	72	63

Transformers

Transformer equipment can also generate steady, unvarying noise that may create issues when located near noise-sensitive uses. It was assumed that two (2) 2,500 kilo-volt-ampere (kVA) transformers would be located in the central portion of the proposed solar site. Based on the National Electrical Manufacturers Association (NEMA) average decibel ratings for a 2,500 kVA transformer, a

reference sound pressure level of 62 dB(A) at 1 meter for the transformers were used. **Table 3** shows the octave band emission levels for the proposed transformers. The sound from the operation of the transformers was calculated using SoundPLAN.

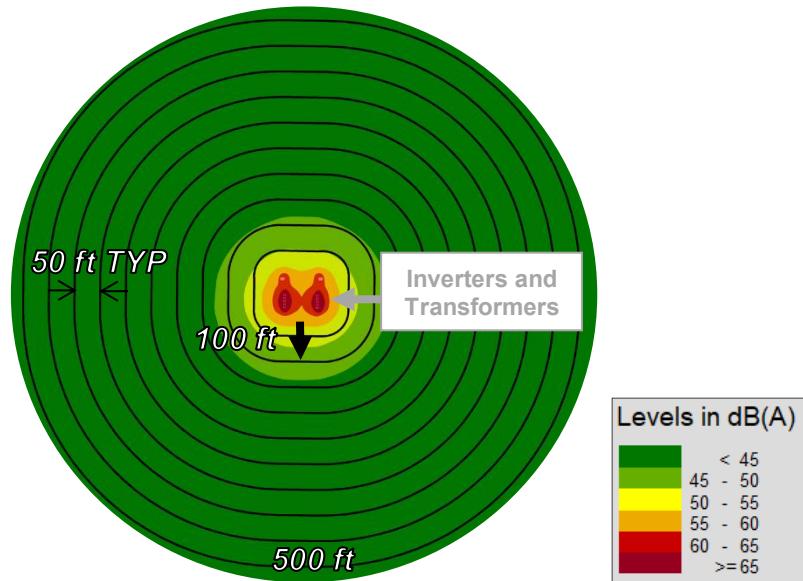
Table 3: Sound Emissions for a 2,500 kVA Transformer

Octave Band Center Frequency	31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Frequency Sound Level	38	57	69	72	77	74	70	65	56

Sound generated by the transformers is not anticipated to significantly contribute to the existing environmental sound levels surrounding the site.

The anticipated noise level contours from the operation of inverter and transformer equipment are shown in **Figure 1**.

Figure 1: Anticipated Noise Level Contours for Inverter Operations



Recommendations and Conclusion

Based on the analysis of this memo, if the inverter and transformer equipment are located approximately 100 feet or greater from the closest Class A land use, then operational noise levels are anticipated to be in compliance with the IPCB noise regulations. See **Table 4** below for the SoundPLAN-predicted octave band noise levels at a distance of approximately 100 feet from the inverter and transformer equipment.

Table 4: Predicted Octave Band Sound Emissions for Inverter and Transformer Operations at 100 feet

Octave Band Center Frequency	31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Maximum Octave Band SPLs from Inverters	4.0	22.6	35.3	32.7	37.5	41.3	40.6	41.0	28.2

The inverter equipment at the Pallme Farm Solar Site is located just over 600 feet from the closest Class A land use; therefore, noise emission levels from the inverter and transformer equipment are anticipated to comply with the applicable IPCB allowable octave band sound pressure level limits shown in **Table 1** at the Class A land uses surrounding the site. Noise mitigation measures are not recommended at this time.