

September 1, 2021

Subject: Zoning Board of Appeals Variance Request: Information for Abutters
Solar Array Development – Freeman Hill

Dear Landowner:

Acorn Engineering, Inc. has been retained by Green Lantern Solar, an established renewable energy leader in New England, to provide civil engineering and permitting services for a proposed solar array development on a landlocked parcel (Tax Map 21, Lot #3) located off Roosevelt Trail (Route 302). You are the owner of at least one property that abuts this lot, per Town records.

An application for a variance was submitted to the Zoning Board of Appeals (the Board) on July 15, 2021 to accommodate the lot's challenge to provide 150 feet of public road frontage in the Commercial 2 (C-2) zoning district.

The Board intends to take up this application at the meeting recently rescheduled for September 16, 2021.

An abutter to the proposed project requested additional information about it, and Town of Windham Code Enforcement Officer Chris Hanson requested that Acorn send a copy of that information to other abutters. You will find that information attached.

Additional or follow-up questions can be referred to Green Lantern Solar's Director of Development, Geoff Sparrow, PE, at (207) 939-8615 or geoffs@greenlansolar.com.

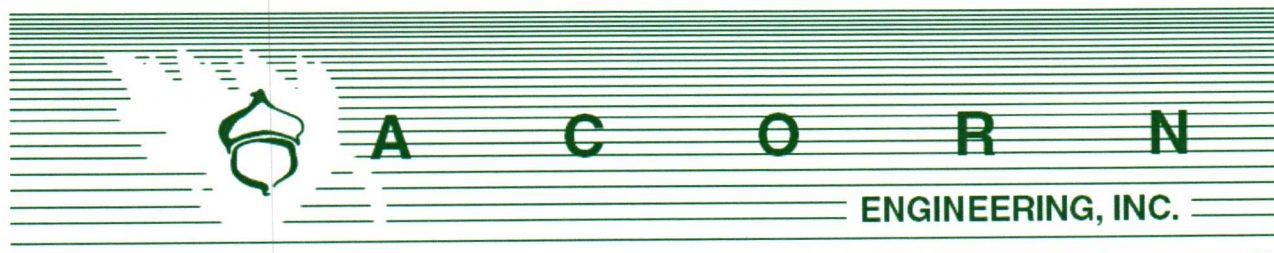
Sincerely,

Aubrey L. Strause, P.E.
Municipal Services Coordinator
Acorn Engineering, Inc.

William H. Savage, P.E.
Principal
Acorn Engineering, Inc.

Copy: Geoff Sparrow, PE (Director of Development, Green Lantern Solar)
Chris Hanson (Code Enforcement Officer, Town of Windham)

Attachment: August 24, 2021 letter to Town of Windham Zoning Board of Appeals



Town of Windham
Zoning Board of Appeals
8 School Road
Windham, ME04062

August 24, 2021

Subject: Zoning Board of Appeals Variance Request: Additional Information
Solar Array Development – Freeman Hill

Dear Members of the Zoning Board of Appeals:

Acorn Engineering, Inc. has been retained by Green Lantern Solar, an established renewable energy leader in New England, to provide civil engineering and permitting services for a proposed solar array development on a landlocked parcel (Tax Map 21, Lot #3) located off Roosevelt Trail (Route 302).

An application for a variance was submitted to the Zoning Board of Appeals (the Board) on July 15, 2021 to accommodate the lot's challenge to provide 150 feet of public road frontage in the Commercial 2 (C-2) zoning district. The Board intends to take up this application at the meeting recently rescheduled for September 16, 2021.

On August 13, 2021, Acorn received a call from an abutter on the west side of the project (Tax Map 21, Lot #5-8), Mr. Paul Donovan. Mr. Donovan stated that he'd received a letter from the Town of Windham that included information about the Variance Request Application to the Zoning Board of Appeals. Town representatives suggested that he contact Acorn for answers to these questions.

Below are Mr. Donovan's questions/comments in bold/underline, followed by the response or explanation.

1. **What is meant by the "peak particle velocity", stated as 2.0 at the closest protected structure? Are there calculations to back this up? Please provide a copy of the Ordinance.** The ZBA Application package included a response to Conditional Use questions. These questions are posed in paragraph H ("Review Criteria") in Section 516 ("Conditional Use") of the Town of Windham's Land Use Ordinance (Chapter 14). The Land Use Ordinance is available at <https://www.windhammaine.us/476/Land-Use-Ordinance-Chapter-140>

Peak particle velocity (PPV, with units in inches per second [in/s]) is used to measure different types of waves as they move through the ground, causing vibration that may be felt at the source of the vibration, decreasing with distance from the source. PPV is typically discussed when blasting of bedrock will be required.

Campbell Associates, a consultant that specializes in vibration monitoring, provides an example of a vehicle passing over a speed bump as generating a PPV in the range of 0.004 - 0.08 in/s, measured at the speed bump. They provide further context that vibration that might be noticeable in a residential environment is a PPV of 0.012 in/s.

The Maine Department of Environmental Protection (Maine DEP) requires peak particle velocity calculations for projects that will use blasting (see 38 MRSA §490-Z; <https://www.mainelegislature.org/legis/statutes/38/title38sec490-Z.html>), as measured at the base of the structure. The proposed project will not include blasting or any other potential source of vibration of that magnitude.

2. **The nearest house to the proposed equipment is less than 300 feet.** There is no requirement in the Land Use Ordinance for a separation of 300 feet between abutters and equipment areas. This reference in the ZBA application was an approximation from the center of the hammerhead to the closest residence, which is indeed approximately 300 feet. The site design is preliminary in nature, and the design team will explore ways to increase the distance between the proposed equipment and this residence.
3. **Provide the decibel rating for transformers and inverters that may be used on this project.** Section 812 ("Performance Standards and Approval Criteria") of the Windham Land Use Ordinance provides guidance on noise regulation that applies to this project. For an abutting residence, this ordinance allows for the sound equivalent (weighted) of 55 decibels, dB(A), between 7:00 AM and 10:00 PM, and a sound equivalent of 45 dB(A) 10:00 PM to 7:00 AM. This measurement, per Section 812.S, applies to a point at least four (4) feet above ground at the closest occupied structure not owned or under the control of the owner or operator of the proposed development or use.

Based on similar projects completed by this applicant, inverter model SCH100/125KTL-DO/US-600 manufactured by CPS is representative of what may be installed at this site. This inverter has a weighted sound equivalent of 60 dB(A) when operating, measured one meter (3.28 feet) away from the unit. The transformer to be used on site will be similar to model CA202003EN manufactured by Eaton, which has a weighted sound equivalent of 61 dB(A) when operating, measured one meter from the unit.

Sound intensity attenuation can be estimated using the sound attenuation formula (below)

$$I_2 = I_1 - 20 * \log (D_2 / D_1)$$

between Point 1 and Point 2, where:

- D_1 = the distance from the source to Point 1 = 3.28 feet
- D_2 = the distance from the source to Point 2 = 300 feet
- I_1 is equal to the weighted sound equivalent in dB(A) at a point 3.28 feet away
- I_2 is equal to the weighted sound equivalent in dB(A) at a point 300 feet away.

Using the weighted sound equivalents above for the proposed inverter and the proposed transformer and solving for sound I_2 , the sound of the inverter will be approximately 21 dB(A) and the sound of the transformer will be 22 dB(A) at a point 300 feet away. These sound intensities satisfy Section 812 of the Windham Land Use Ordinance.

The existing residences will be located hundreds of feet away from the equipment pads, which achieves in substantial attenuation given that decibel levels are dependent on distance within a logarithmic equation. In other words, the equation is not linear and the further away the listener is, the greater the volume drops in an exponential fashion. This is further mitigated by the 50-foot wide proposed vegetated buffer along the northerly property line as required by the zoning ordinance.

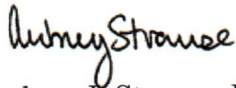
4. **A ZBA Conditional Use Question says “The proposed use will not depreciate the economic value of surrounding properties” Who determined this, and how?** Given the currently proposed vegetative buffer, there will be no visual impact to the surrounding properties. A solar project developed at this location will negate the risk of other types of projects being developed on the property that could otherwise potentially reduce property values (i.e., an office building or a retail/commercial development). The tax revenue generated from the proposed project will reduce the tax burden on other properties in Windham thus actually increasing the value of all properties in Windham.
5. **What happens if all the trees in the buffer die?** Green Lantern Solar will be responsible for maintaining the trees and vegetation in this buffer during and after construction. Green Lantern Solar has maintenance staff who are dedicated to performing this role at their other solar installations across New England. The trees in the buffer area will be undisturbed during construction. There is no history of buffer trees dying after construction. Due to increased sunlight on the interior edge of the buffer area, the understory of the forest canopy will grow in relatively quickly, further buffering the project from adjoining properties.
6. **The abutters will request a buffer “twice as wide” as the one shown.** The current proposed buffer is 50 feet wide, which is consistent with the Town of Windham requirements for buffers between commercial projects and residential properties. Green Lantern Solar is willing to discuss increasing the width of the buffer between panels and residential property lines.
7. **Did the Lutheran Church get any economic benefit beyond the financial cost of the easement? Anything to generate income?** The ROW that was purchased from the church was done prior to Green Lantern Solar’s involvement in the property. The Church is welcome to approach Green Lantern Solar directly with any request they have.
8. **Who are abutters to the project?** Acorn provided Mr. Donovan (via email on August 19, 2021) with a copy of the list of abutters that the Town provided to us the same date. However, today, we realized that the list of abutters provided by the Town had been compiled for the wrong parcel. The Town has requested that Acorn provide a copy of this letter to abutters, and we have requested an updated list of abutters from the Town. We will share that information with Mr. Donovan when we receive it.

The ZBA meeting has been re-scheduled a second time, to September 16, 2021. We will provide a copy of this letter to Mr. Donovan via email, and mail a hard copy to the other abutters (as requested by CEO Chris Hanson on August 19, 2021) so that they have the information prior to that meeting.

Additional or follow-up questions can be referred to Green Lantern Solar's Director of Development, Geoff Sparrow, PE, at (207) 939-8615 or geoffs@greenlansolar.com.

Finally, we understand that the Board intends to perform a Site Walk at the property at 7:00 AM on September 15, 2021. We will be in attendance to present the project and answer any questions.

Sincerely,



Aubrey L. Strause, P.E.
Municipal Services Coordinator
Acorn Engineering, Inc.



William H. Savage, P.E.
Principal
Acorn Engineering, Inc.

Copy: Geoff Sparrow, PE (Director of Development, Green Lantern Solar)
Chris Hanson (Code Enforcement Officer, Town of Windham)