

Kane County Petition 4616 Opposition: VOTE NO

Donna Riggs

My name is Donna Riggs. I am also known as Mrs. Dieter Griesinger. I'm an engineer for Caterpillar and previously I was the Quality and Lean Manager for General Electric Co. My family lives at 1N605 Meredith Rd. My late husband bought the land in 1993 and built the home in which we currently live. The area consists of residential homes and farmland. There are no industrial buildings, no industrial traffic, no industrial power lines, no industrial background noise, no industrial noise at all. To be perfectly clear, there is no continuous noise in the area.

If this petition is approved, we will be prevented from using our land as intended and as it was zoned

Issue One: The Kleckner Family has farmed our land for 40 years; 30 years under our direct ownership. Our agricultural fields will no longer be accessible to be farmed and Gala Argent will go into more detail on this issue shortly. This will impact revenue that our land produces and negatively impact us financially. I will also suffer land value loss to subsidize this unwanted industrial solar farm.

Secondly, if this petition is approved, I will lose the use of my land – the land on which my home sits; the noise pollution created by this industrial project on farmland will create such a level of noise pollution that our property will not be able to be used in a normal fashion. It is a known fact that electrical equipment makes noise. There are two issues with noise pollution impeding land use. The first being that construction and industrial equipment that will be 10 decibels or more above the background noise. Broadband noise WILL BE an issue. However, even worse than this is the continuous tone, the high pitched humming that the inverters create that will be constantly present. The solar panels produce direct current (DC) electrical power which is typically stored in batteries. In order to transfer this electrical power to the local grid, the DC power must be converted to

alternating-current (AC) power. This conversion process is done by an “Inverter”. The process of converting DC into AC power requires very fast switches which change the polarity (or direction of electrical flow). Since AC power cycles 60 times per second (or 60 hertz), the switches must activate twice per electrical cycle. This process produces tonal sound at twice electrical line frequency (120 hertz) and its harmonics (240, 360, 480 hertz and higher). What I have just explained is that there will be a constant high pitched hum that will continuously be present. The industrial solar farm will have 40 inverters that create this high pitched hum. 40. An important factor to remember here is that noise is not just measured in decibels but also the frequency. A constant high pitched hum (tonal noise) is a type of noise pollution that cannot be imposed on the residents.

The World Health Organization states that solar farms should not be built within 1.5 miles of residential areas. The Meredith location clearly has residential areas surrounding it with homes along Meredith, Route 38 and an entire subdivision in the SW corner of the fields. The homes are on wells and depend on the Aquifers in the fields. Use of or spills of chemicals at solar facilities (for example, dust suppressants, dielectric fluids) could result in contamination of surface or groundwater. There is a precedent of Clean Water Act violations by solar farm construction as exemplified by the recent EPA cases. Additionally, the Kaneville Fire Departments and surrounding Departments are not equipped to handle an industrial solar farm fire. In the event of such a fire, only grass fire suppression would occur while the electrified industrial solar farm burns releasing its heavy metals into the air, soil and water.

These issues are shared by other residents. We all share these risks to which you are subjecting us.

As the zoning review committee, it is not responsible nor ethical to agree to place your residents and constituents in these risks and undo financial hardship. You have no choice but to ethically vote to reject petition 4616.

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Solar Power Noise and Dust: For the Record

By Robert Bradley Jr. -- March 8, 2022

"While quiet transformers and inverters exist [to reduce pure-tone transformer noise], due to premium cost, it is generally not a specification point the solar facility designers are willing to consider.... There is a real need for acoustic evaluation and noise control with respect to nighttime operations of solar energy components."

"Clark County regulators have substantiated 37 of the 49 complaints they have received about the project from the public. 'Can't breathe from all the dust coming off the solar field!!!!!!,' one person wrote to the county on Sept. 15. 'Someone need to take care of this it happens way to often.'"

Anti-fossil-fuel environmentalists, when pressed, will state that *all* energy choices have environmental drawbacks and tradeoffs. But they do not take this seriously when it comes to wind and solar power, which have infrastructure requirements (including land and power lines) that are a multiple of other choices on a per kWh basis.

Solar "farms" cause a variety of problems, one project near where I now currently live involving flooding issues (<https://www.masterresource.org/solar-power-issues/solar-farms-bad-neighbors-kerrville/>). Here are two more in the news: one concerning noise and the other with dust.

1. Solar Noise

I recently came across an article from the acoustical company ACENTECH (<https://www.acentech.com/about/about-us/>) (June 2020), titled "Yes, Solar Farms Can Produce Noise! (<https://www.acentech.com/resources/2020/06/yes-solar-farms-can-produce-noise/?fbclid=IwAR3CGCYqhDCKIAk5oDwhh2A9cOW2QMmMadL-xBu7jLphYgfRB2QsIga8aPY>)". Excerpts follow:

At first look, one would think that a solar [Photovoltaic (PV)] facility generates NO sound. There are no large moving parts like the large blades of a wind turbine and no explosive processes like gas combustion.

The most visible part of the solar facility is the large solar panels and these indeed produce NO sound. However, there is noise-generating equipment at solar facilities and they are inconspicuously sited on small concrete pads.

Like any other energy-generating or industrial facility, the solar farm must be designed and operated to be compliant with state and municipal noise codes. Noise limits have various formulations, but those here in the Commonwealth of Massachusetts, are a good example of limits that at the same time, can be both routine and challenging to achieve by a solar facility.

The Mass noise code includes two elements. The first is that no source of sound shall be 10 dB greater than the existing background sound levels. The second is that no source of sound shall create a "Pure Tone (<https://www.acentech.com/resources/2019/05/the-commonwealths-pure-tone-requirement/>)".

The first part of the Mass noise code referred to as the "broadband noise limit" will be easy to achieve by a properly designed solar energy facility. In other States or municipalities this limit may be relative (as Massachusetts) or absolute limit as it is for most municipalities.

The relative-type limit may be more restrictive if the solar facility components operate through the night. In this case, the noise limit will be based on background noise during the quietest period of the night, typically 3:00 am. For example, a solar farm operating in a quiet rural town can have a background sound level as low as 25 to 30 dBA. In Massachusetts, the sound level limit may then be 35 to 40 dBA. Achieving 35 dBA sound limit will have some challenges.

How is this tonal sound produced? Let's start at the solar panels (also called PV modules). They produce direct current (DC) electrical power which is good when storing energy within a DC battery. However, in order to transfer this electrical power to the local grid, the DC power must be converted to alternating-current (AC) power. This conversion process is done by an "Inverter". The process of converting DC into AC power requires very fast switches which change the polarity (or direction of electrical flow).

Since AC power cycles 60 times per second (or 60 hertz), the switches must activate twice per electrical cycle. This process produces tonal sound at twice electrical line frequency (120 hertz) and its harmonics (240, 360, 480 hertz and higher). The transformers in the solar facility are used to step-up the voltage for easier transmission into the local electrical grid. There are three sources of noise from within the transformer: (1) core noise, (2) coil noise, and (3) fan noise.

The core and coil noise are caused by electromagnetic forces which occur two times for every cycle of AC power. Like the inverters, this results in 120 hertz primary sound source, along with harmonics as noted above. The third source of sound is a cooling fan(s) mounted outside the transformer and usually directed across the fins of a heat

sink. While the cooling fans can be the most significant source of overall broadband A-weighted sound, a warning from a 1977 BBN report is worth echoing here:

"...it is almost always the pure-tone transformer noise and not the broadband fan noise that is objectionable. Therefore, fan noise is unimportant if human response to transformer noise is the only concern. However, if the installation must meet objective noise limits at the property line, which may be stated in the form of maximum permissible octave band sound pressure level or maximum A-weighted values, fan noise must be considered." ...

While quiet transformers and inverters exist, due to premium cost, it is generally not a specification point the solar facility designers are willing to consider. Therefore, the second line of noise control would be noise barriers.

One important matter to be aware of when using a noise barrier is that the primary sound from inverters and transformers is low frequency which results in sound with a longer wavelength. Noise barriers are less effective for longer wavelengths and then require a larger wall than might normally be expected.

The most aggressive sound control treatment for transformers and inverters is a full enclosure or even a building. Due to the heat generated by both devices, a forced-air ventilation system is almost always needed. The fans used in these cooling systems may be louder on an A-weighted basis than the electrical side of the hardware. This is something to keep in mind during concept design.

One thing in favor of solar facilities is that most of them only operate during the day. Some facilities with battery storage components could result in transformer and inverter operation during the night and that changes everything.

There is a real need for acoustic evaluation and noise control with respect to nighttime operations of solar energy components. However, even then, I am confident that a solar facility can be designed to be compliant with municipal and State noise codes. More importantly, taking siting and noise control together, I believe that solar energy facilities can be designed to be inaudible, but this will not happen by accident.

2. Solar Dust

I ran across this article in the *Las Vegas Review-Journal* (November 20, 2021), "Boulder City solar farm fined nearly \$220k for air quality violations (<https://www.reviewjournal.com/news/politics-and-government/clark-county/boulder-city-solar-farm-fined-nearly-220k-for-air-quality-violations-2483023/>)." Blake Apgar (bapgar@reviewjournal.com) tells the story:

A Boulder City solar farm construction site has racked up hundreds of thousands of dollars in fines this year for air quality violations, according to Clark County regulators.

Since April, the county has fined Rosendin Electric nearly \$220,000 for failing to control dust during construction of a roughly 1,000-acre solar farm off of Interstate 11. In all but one of the eight instances, Rosendin has not contested the fines.

The county says the company is putting its business interests ahead of complying with air-quality standards.

"Well, from our perspective, they responded by continuing to be out of compliance and making business decisions that are based on how quickly they can get the project done, as opposed to implementing the best practices that are required in our air quality regulations," said Marci Henson, director of Clark County's department of environment and sustainability.

Those dust control efforts include keeping the ground wet to prevent dust from blowing away.... Henson said her department estimates anywhere from 40 tons to 70 tons of excess dust has blown from the Townsite Solar Garden project. Dust clouds can cause breathing issues and are particularly challenging for people with existing respiratory conditions, Henson said....

The company said it uses multiple approaches to control dust clouds in the area. To date, Rosendin has spent \$3 million on dust control, including using six full-time employees to manage dust at the site, the company said....

Clark County regulators have substantiated 37 of the 49 complaints they have received about the project from the public.

"Can't breathe from all the dust coming off the solar field!!!!!!," one person wrote to the county on Sept. 15. "Someone need to take care of this it happens way to often." ... The most recent violations happened in September....

At the July hearing with the county, David Dean, a dust management program supervisor for the county, said the company has faced similar challenges with dust in the area, but the location of this project has garnered more attention.

He said the root of the problem is Rosendin's construction plan and process. If the company wanted to correct the problem, it wouldn't grade off more soil than it could control, he said.

"And that's their business model. They have a set time limit to finish this in and they're going to finish it," Dean said. "And if it means get environmental issues or fines, then they're going to do it, because it's the cost of doing business."

He said the company doesn't want to change how it does business, so the problems will continue.

Rick Shaffer, division manager for Rosendin Renewable Energy Group, said at the hearing that it's not the company's business plan that has caused problems. It's the rigid terms of the company's contract, which could cost Rosendin nearly \$150,000 per day if it were late, he said.

"We aren't afforded, unfortunately, the luxury and the time to construct it in the manner that you are suggesting, which is the right way to do it, but we can't because of our contract and our scheduling and our time," he said.

A spokesman for the county's department of environment and sustainability said officials are leaving all options on the table, including dust permit suspension if Rosendin continues to "neglect its duties" to control the dust and protect air quality.

One Comment for "Solar Power Noise and Dust: For the Record"

Diane Shaw () • February 17, 2023 at 10:23 am

Mr. Bradley,

Just read your article and I can tell you that the noise generated from solar farms is a real issue. I live in Northeast Florida in a pretty rural part of Clay County. Florida Power and Light (FPL) just completed a large solar farm installation which incorporates almost 500 acres on property that used to be owned by a paper company and was planted in pine trees. Now I have solar panels that stretch the entire length of my property. I can deal with that – it's far better than looking at a neighborhood, school or industrial buildings. But the noise it generates is unbelievable! It does not matter what time of day/night – if we're outside we hear it. It is a constant whining sound that is just unbearable. We don't open our windows any more, we are outside as little as possible. I have noticed a change in our horses – they are constantly jittery and on edge. We thought that after construction the wildlife would return but I am assuming that because of the noise it never will. FPL is a huge corporation and apparently wrote the book on how to give people with complaints the run around. We are at the point that for our health and that of our horses we are considering selling a place that we have loved for twenty two years and moving. I'm not really sure why I'm telling you all of this when all you needed to hear was that I read your article and found it interesting. Maybe I just wanted someone to hear my voice because FPL sure isn't listening – the noise is real.

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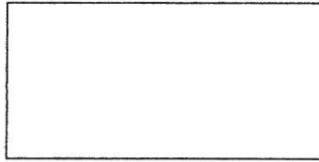
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