



c/o Palmer Management Corp.
13 Elm Street, Suite 200
Cohasset, MA 02025

January 27, 2021

Mr. James Boudreau
Town Administrator
Scituate Town Hall
600 Chief Justice Cushing Highway
Scituate, MA 02066

Dear Mr. Boudreau:

Our thanks to you and Messrs. Vegnani and Goodrich for reaching out to Scituate Wind LLC last week to express your continuing concerns about complaints from certain neighbors and to request various analyses from Scituate Wind regarding the possibility of curtailing operations to ameliorate some of those complaints.

During the meeting, Scituate Wind was asked to analyze the potential cost to the Town of Scituate for the following curtailment approaches:

1. Curtailment during all possible hours of flicker at 151 Driftway.
2. Curtailment between the hours of 11 pm and 6 am all nights throughout the year.
3. Curtailment between the hours of 11 pm and 6 am all nights from mid-May (May 16th) through mid-October (October 15th).
4. Curtailment between the hours of 11 pm and 6 am all nights throughout the year but only when the wind is coming from the westerly direction.
5. Curtailment between the hours of 11 pm and 6 am all nights from mid-May through mid-October but only when the wind is coming from the westerly direction.

In our discussion it was noted that the Town would have to cover both the lost income to Scituate Wind, which consists of power sales to the Town and the sale of Renewable Energy Certificates (RECs) to the Green Energy Consumers Alliance (GECA), and the increased costs to GECA to acquire replacement RECs which are more expensive in today's market than the ones under contract to GECA from Scituate Wind. In addition, the Town would no longer be receiving the Net Metering Credits (NMCs) for the lost production.

Scituate Wind also noted that any contract changes would require the consent of our lender (Cambridge Savings Bank) and GECA. Further, any penalty for underproduction in the contracts with the Town would have to be eliminated if Scituate Wind is voluntarily curtailing operation at the Town's request.

Finally, the Town asked about other possible methods that might be less costly to the Town to deal with flicker and noise.

This letter seeks to address each of those requests as follows.

1. Curtailment during all possible hours of flicker at 151 Driftway

Following our phone conversation, I emailed the flicker analysis commissioned by the Town and conducted by Atlantic Design Engineers LLC (the ADE Report) for the permitting of the wind turbine. As we discussed, it's possible to accurately forecast when flicker might occur as the location of the turbine is known as is the position of the sun at any time. Of course, it's not possible to forecast when flicker actually will occur since we cannot forecast wind direction, overcast sky, or ameliorating effects of vegetation existing prior to the construction of the wind turbine or the additional vegetation that Scituate Wind provided to 151 Driftway. Pages 41 & 42 of the ADE Report show that flicker occurs at 151 Driftway during the winter commencing October 18th and ending February 24. The total potential minutes are 10,180, or 169.67 hours. Given that winter is when the wind blows the hardest and most consistent, the total lost production could be $1500 \text{ kW} \times 169.67 \text{ hours} = 254,505 \text{ kilowatt hours (kWh)}$.

2. Curtailment between the hours of 11 pm and 6 am all nights throughout the year

Of course, we cannot predict with any certainty exactly how hard the wind will blow each night. However, as part of the financing for the project, a projection of wind speed and wind turbine output was conducted (the WindPro Report). As this WindPro Report served as the basis for financing, it is appropriate that it be used to determine potential lost production and hence lost revenue. Such an approach is straight-forward and more likely to be acceptable to our lender. By using the WindPro report, potential costs are determined upfront and set (subject to changes in the PPA and REC prices) which provides certainty to Scituate Wind, GECA, our lender and the Town. Finally, using previously published data means that the onerous (and expensive) task of daily reviews of wind and production data are avoided and there is no concern about interpretation of the data.

The WindPro report is being provided with this letter. Page 15 of the report provides the projected output from the turbine for each hour of each month. Adding up the projected output from the hours of 11 pm to 6 am, the projected lost production is 1296 megawatt hours (MWh) or 1,296,000 kWh.

3. Curtailment between the hours of 11 pm and 6 am all nights from mid-May (May 16th) through mid-October (October 15th)

The same information from the WindPro Report can be used to estimate the projected lost kWh for this scenario using only the specific months of curtailment and half of May and half of October. Adding up the projected output from the hours of 11 pm to 6 am for these months and the two half months, the projected lost production is 410 MWh or 410,000 kWh.

4. Curtailment between the hours of 11 pm and 6 am all nights throughout the year but only when the wind is coming from the westerly direction

The WindPro report also projected power production from different wind directions (see page 8). Adding up the projected output from the westerly directions and a pro rata portion from the north and south directions, one determines that 74.2% of the production from the turbine comes when the wind is from the westerly direction. Using this percentage compared to the full shutdown discussed in paragraph 2 above, we can project that $74.2\% \times 1,296,000 \text{ kWh} = 962,632 \text{ kWh}$ would be lost in this scenario. (Scituate Wind notes that likely a bit more would be lost if the wind were to shift at night to an easterly direction since it takes time for the turbine to start up and ramp up to full production.)

5. Curtailment between the hours of 11 pm and 6 am all nights from mid-May through mid-October but only when the wind is coming from the westerly direction

The same 74.2% can be applied to the projected lost production in paragraph 3 above to result in projected lost production of $74.2\% \times 410,000 \text{ kWh} = 304,220 \text{ kWh}$. (The same note applies about likely additional lost production due to start-up if the wind direction changes to an easterly.)

Potential Economic Impact

Currently, the Town pays Scituate Wind 9.9 cts/kWh for all power produced. However, that rate will rise to 10.4 cts/kWh when we enter the 10th year of the contract in April. (The PPA rate will increase to 10.9 cts/kWh in April 2024 for the final three years of the initial 15-year term of the contract.) In addition, Scituate Wind receives 2.5 cts/kWh for the sale of RECs to GECA. Therefore the total lost income to Scituate Wind due to voluntary curtailment will be 12.9 cts/kWh as of April 2021.

As mentioned above, the current REC market is more expensive than that in our contract with GECA. We asked GECA to provide us their current assessment and received the following response: “REC prices have been \$41 for the last 30 days. So to replace the RECs we would buy from you, we would have to pay a differential of \$16 plus possible brokers fees.” (Note that a REC = 1000 kWh, so $\$16/\text{REC} = \0.016 per kWh.) Therefore, to cover Scituate Wind’s lost income and GECA’s extra costs for replacement RECs (without including the brokerage fee which is expected to be 1-2%), the Town of Scituate would incur 14.5 cts/kWh based on the projected curtailment. It’s important to note that the replacement REC price and associated fees could increase or decrease in the future.

Via the Town’s purchase of power from Scituate Wind, the Town is allocated NMCs. The value of the NMCs vary with energy costs and are currently ~ 19.4 cts/kWh. That’s revenue that the Town will not see due to voluntary curtailment. It’s Scituate Wind’s understanding that the

revenue from NMCs may be pledged to another account which is another issue. However, it's important to note that the full NMC is not additive to the Town's loss, only the net between the PPA price and the NMC amount, or 19.4 – 10.4 or currently 9 cts/kWh.

With these assumptions and the above projected lost production, the potential annual economic impact on the Town of Scituate for the various curtailment options are as per below.

<u>Option #</u>	<u>Description</u>	<u>Lost kWh</u>	<u>Direct Pay \$ Impact</u>	<u>NMC Lost \$ Impact</u>	<u>Total \$ Impact</u>
1	Flicker	254,505	\$ 36,903.23	\$ 22,905.45	\$ 59,808.68
2	Year Round - 11-6	1,296,000	\$ 187,920.00	\$ 116,640.00	\$ 304,560.00
3	Summer 11-6	410,000	\$ 59,450.00	\$ 36,900.00	\$ 96,350.00
4	Year Round Westerly	962,632	\$ 139,581.64	\$ 86,636.88	\$ 226,218.52
5	Summer Westerly	304,220	\$ 44,111.90	\$ 27,379.80	\$ 71,491.70

In addition to these costs, there may be some initial programming costs for a particular scenario which should be a 1-time upfront cost.

Other Options to Deal with Flicker and Sound

Needless to say, there are less expensive approaches for ameliorating the impact of flicker and sound. The key questions are what would be acceptable to those who are bothered by the wind turbine and would any action that the Town might take to satisfy those who are complaining only result in more people complaining so that they too can obtain such benefits.

One option that was mentioned in the phone call is allowing impacted people to participate in some of the benefits to the Town. Generally, it's been shown that parties who participate in the benefits from a wind project are less likely to complain. This may not be acceptable to all parties and may not fully ameliorate complaints. (For example, payment was made and additional plantings were paid for by Scituate Wind to 151 Driftway.)

To lessen the impact of flicker, one can seek to block or at least significantly curtail impact through the use of vegetation. As discussed above, this has been somewhat attempted but apparently not to the full satisfaction of 151 Driftway. One would have to spend some time observing during flicker hours to determine if additional plantings could have a substantial impact. Given that the flicker at 151 Driftway occurs during winter months, evergreen plantings would be required similar to what were planted as required under the Special Permit.

It's also possible to block flicker by having room darkening shades or drapes on any window facing the wind turbine. This could result in the room being too dark to be appealing to the occupants. Even windows not directly facing the wind turbine could have some internal effect from reflections or just the shadow occurring across the lawn. Heavy drapes across windows

facing the turbine or just generally throughout the house could also have a noise dampening effect at night so would serve two purposes.

Other ways to deal with noise include better, thicker windows – double or triple paned and/or with an additional layer of a storm window. An engineer may be able to evaluate the house to see if better insulation in the walls could also help.

If people are sleeping with their windows open to cool off at night, a window air conditioner could be an option. The air conditioner also acts like a white noise machine providing a blowing sound that helps to mask any sound from the outside. Scituate Wind understands that some of the complaints are from people who simply prefer sleeping with their windows open. In that case, a fan could provide a masking sound as well as help with air circulation. A white noise machine is also a low cost (<\$50¹) option used by many people with or without wind turbines in their neighborhood.

Scituate Wind hopes that the above analyses and discussions are helpful to the Town of Scituate as it determines the best options for the Town going forward under the current contracts. (Scituate Wind notes that there are options to extend the contracts for up to 10 years.) We are available to answer questions on these analyses or provide further input as requested.

Please note that I am not copying anyone else in the Town on this response, letting you distribute it when and as you see fit.

Sincerely,

SCITUATE WIND LLC

By its manager, Palmer Management Corporation



Gordon L. Deane
President

cc: Lindsay Deane-Mayer, Palmer
Sumul Shah, Solaya

¹ <https://nymag.com/strategist/article/best-sound-machines-noise-machines.html>