

Ref: Town of Huron Zoning Board of Appeals
Application 869-16SP – John Crane

To: Wayne County Planning Board, Lyons, NY

**From: Don Thompson, seasonal resident at 8175 Dutch Street Rd, Town of Huron
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814-466-7690 (home), 814-470-6579 (cell)]**

**Re: Request for Special Use Permit for a wind turbine tower to exceed the 100' zoning limit in
the Town of Huron**

Date: August 23, 2016

Below I provide comments and pose questions related to the proposal for a Special Permit to allow construction of a 153' wind turbine to the South of Wright Rd. in the Town of Huron. I understand that this will be an agenda item for your August 31 meeting. Although I hope and plan to be attendance at the August 31 meeting, I am sending these comments before the meeting 1) for the convenience of the Board members, and 2) since I will be traveling from out of state to attend that meeting, I wanted to be sure that my comments could be considered in the event I am unable to attend at the last minute.

I have organized my comments into two parts.

Part I. In my opinion the information presently available in the file is insufficient (with respect to noise and bird life) to warrant approval of a 100' tower by the zoning officer in the context of the Town Zoning Law.

Part II. Furthermore, there is no argument presented in support of why a Special Use Permit should be granted in this particular case. Further concerns relate to insufficient information about noise and bird life, a lack of consistency with town planning documents, and establishment of an unwise precedent.

Conclusion regarding the application for a Special Use Permit.

I see no reason that time would be of the essence in consideration of this request for a Special Use Permit. I believe the current request does not justify approval at this time. I believe it is incumbent on the Huron Zoning Board of Appeals to move cautiously, considering this important precedent-setting decision. I believe it should only consider this request after being presented with the information that is currently lacking. Approval of a Special Use Permit should be given only after carefully and judiciously determining that its possible adverse effects, and that the ramifications with respect to town planning and the establishment of precedent, are outweighed by the interest of the applicant.

The rationale for these comments is provided on the following pages.

I. Should a 100' wind turbine project be approved by the Zoning Officer?

I.A. Concerning noise levels*

In my opinion there are insufficient data presented in the file to provide confidence that either the letter of the zoning law or the intent of the zoning law will be met in this project. There is no estimate of the noise at any property boundary. Who would pay for evaluating the noise after the project is constructed in order to verify that the law is being met? Additionally, what is the recourse if the completed project turns out not to meet these requirements of the law?

Further details of my concerns with noise follow:

In the Zoning Law the figure of 50 dBA is employed as a maximum at a property boundary. One assumes it was chosen as an estimate of the sound level that would result in a negative experience for persons on adjacent properties. However, this number does not address the question of what sound level will be negatively experienced by a listener. To evaluate the problem of turbine noise one needs to consider the turbine sound relative to the background, or baseline, sound.** The proposal implicitly recognizes that the noise issue must be understood relative to background in the description of the calculations presented (see the file document "Acoustic Characteristics of the Bergey Excel-S 10kW Wind Turbine," dated July 14, 2010). The turbine noise was measured for a 100' tower at an unspecified time and location. The wind speed was determined at 10 m (30'), meaning neither at the ground nor at the tower top. (The background sound was determined six years earlier at an undescribed location. In this 2016 application material there is no indication that the as-of-2010-expected updated background measurement to allow a more valid calculation has been done.) The figure plots turbine noise and background sound as a function of wind speed. The text states (without citing a reference) a magnitude of the difference (3 dBA) required for the turbine noise to be "perceived." Also implicit in this figure is the idea that turbine sound greater than 50 dBA can be expected under some circumstances. They claim that for a "typical" average site wind speed of 5 m/s, the wind speed will be below 11 m/s (25 mph) 95% of the time. The company neglects the 5% of the time that the wind blows most strongly, and for which (from the graph) the dBA is measured to be approximately 65 dBA or greater, against a background estimated at 52 dBA. Because the dBA scale is logarithmic, not linear (see <http://www.explainthatstuff.com/soundlevelmeters.html> or <http://www.noisehelp.com/decibel-scale.html> for a very brief tutorial), *this means that the turbine sound would be more than 10 times as powerful and sound to the ear more than twice as loud than the howling wind.* Even in their preferred range below 25 mph, they state that the difference can be as much as 6 dBA, well above the level for perception. The way they make this statement can be misleading to a novice: they state that the turbine "will add just 1-6 dBA." Because the dBA scale is logarithmic, "added" does not mean arithmetically added: instead, the increase is a multiple (an increase of 10 dBA represents *a 10-fold increase in intensity and a doubling of experienced sound*). 6 dBA would be a very large difference, above and beyond the background sound.

The noise data for the turbine include error bars. From the table we might assume these are standard deviations (SD) of the measurement. These SDs are highest in the region used for calculation (11 m/s), at about 5 dBA. This means that they are least certain about the turbine noise at this average wind speed. It is important to consider the meaning of both the SD and the mean in order to know the likelihood that the project would be consistent with the zoning requirements.

The rated value claimed is 52.1 dBA. This rating is relative to a different distance than for data in the figure shown (and we must assume that the tower is the same 100' height), so the figure does not shed light on the meaning of this rating. However, if that rated value is considered relative to the background sound at 5 m/s in the figure (a value unrelated to distance, presumably), a difference of greater than 10 dBA results (52.1 compared with just below 40 dBA). This would mean the power intensity is 10 times above background and the sound is twice as loud at that distance, according to these calculations for a "typical" installation.

I.B. Concerning bird life

The environmental assessment with respect to bird life is *insufficient to move forward at this time*. There is reason to think that there might be important environmental effects on large raptors in the coastal region.

Because the proposed site is very close to a state-owned marsh (zoned LC), and because this marsh provides habitat for large raptors, there is the potential for significant effect on these birds. Within the past week from my cottage near the E side the marsh at the lake I have visually observed both adult and juvenile bald eagles, as well as ospreys. In this same period I have heard various owl calls in the evening. We observed a successful eagle nest on the E side of the marsh this year, and in previous years the regular presence on the marsh edge of two adult eagles and a juvenile being fed by them suggests a nest was close by, likely in the proximity of the marsh. There is currently an occupied osprey nest on a utility pole on North Huron Road. Both the eagles and the osprey tend to fly from the lake upland over the marsh in the direction of the proposed site. I am unqualified to know the extent to which the proposed project would be problematic for these protected birds, but I would hope that a careful environmental impact would be determined (e.g., a DEC impact assessment). There is no evidence in the file that the project impact on these protected birds has been considered. In fact, for some reason which completely escapes me, there is a letter in the file stating that a turbine had little effect on swallows in Oklahoma. The inclusion of this letter, which suggests the company sees a meaningful analogy between large coastal raptors and small inland songbirds, in totally different habitats, indicates to me that environmental consideration has not yet been seriously addressed.

I.C. Conclusion

In my opinion the information presently available in the file is insufficient (with respect to noise and bird life) to warrant approval of a 100' tower by the zoning officer in the context of the Town Zoning Law.

II. Should a Special Use Permit be approved for a 153' wind turbine, exceeding the 100' limit?

IIA. There is insufficient information presented in the application to justify a Special Use Permit

II.A.1. What is the argument for approval of a Special Use Permit?

The application does not include a compelling argument for a Special Use Permit. The logic of having zoning at all is to balance the good of individual landowners and the good of the larger community. Absent a compelling argument for a Special Use Permit, awarding of a Special Use Permit would weaken the relative concern for the larger community inherent in the Zoning Law.

Because there is nothing in the Zoning Law per se that pertains specifically to the rationale for considering special permits, but there is such information available for use variances and area variances, I take these rationales as a guide.

Award of a use variance (p 69) is said to require "unnecessary hardship," related to the deprivation of "all economic use or benefit of the property." It is difficult to see how this standard would be met in the present case. It would appear that a primary motivation would be saving money in construction (due to a State of NY subsidy) and ongoing electrical expenses.

Award of an area variance is based on the judgment of balancing the interests of the applicant and the neighboring community. The applicant is said (p 70) to attempt to remedy an "alleged difficulty." Consideration is to be given to "whether the proposed variance will have an adverse effect on the physical or environmental conditions in the neighborhood or district." In my opinion, physical conditions (the viewshed) would definitely be affected, and it is unclear the extent to which environmental conditions (sound, impact on wildlife) would be affected. Furthermore, contrary interests of the district are described below with respect to the Town of Huron Master Plan (item 4) and LWMP (item 5).

What is the rationale for the extra 53'? The tower height requested appears to be based on the company's calculation of the height needed to *guarantee* generation at least 10 kW with this particular turbine (a nominally 10 kW turbine, according to the company literature online). The 10 kW target is important to the company because it would allow a state subsidy for the construction of the tower. It would be ironic that the prospect of state subsidy money to a landowner (or would it go to the company building and owning the installation?) would justify a project at cross-purposes to the town itself (see items II.B.1 and II.B.2 below). Because the company has a strong economic interest to ensure the 10 kW rating is achieved, we might reasonably expect that the height would include a considerable margin for error in the height calculation, to ensure that a measured 10 kW would result. That margin for error might account for a considerable portion of the excess height. Has a similar margin for error been incorporated into meeting the limits on the sound generated or in considering the environmental impact?

It is unclear that the company's calculation takes into account the height of the drumlin above the lake, approximately 50', or that the tower would be above an orchard, and that there are no nearby obstructions. Is the calculation of required tower height based on a "typical" installation on flat land?

The device would be owned by the company and leased to the landowner. Indirectly, through the lease payments and corporate ownership of the unit, the company would also benefit financially in a way that is at cross-purposes to the town's interests. In my opinion, the corporate interests are distinct from the property owner's interests in this respect, and should definitely not form part of a justification for a Special Use Permit.

II.A. 2. What would the effect of a higher tower be on noise levels?

How would noise produced differ for a higher tower? *This question is not addressed in the proposal.*

The presented calculations (see "Acoustic Characteristics of the Bergey Excel-S 10kW Wind Turbine," dated July 14, 2010) of the effect of turbine noise and background noise were made for a 100' tower at an unspecified time and location. There are no data presented that pertain to a 153' tower for this turbine. The background sound data are from an unspecified location, in 2006. It

would be reasonable to expect that the noise would be projected more strongly from a 153' tower than from a 100' tower.

When the increased tower height is considered in the context of the particular topography, the prospect of more noise experienced by neighbors is enhanced. The hill proposed for the site is a small drumlin located between two larger drumlins along the lake shore to the East and West. Brush Marsh is located along the lake at the base of the small drumlin and between the two larger drumlins. The topography to the North of Wright Rd creates a bowl that could easily magnify noise produced. Based on geometrical considerations alone, one would expect the sound to be somewhat trapped in this bowl, rather than dissipated according to the inverse square law, as it might be on a flat terrain.

A taller tower generates more electricity because in general the wind is stronger at greater height. This differential in wind speed is important because at higher wind speed the turbine noise would increase (see the figure in "Acoustic Characteristics"), but the wind speed experienced at ground level would be lower, so the masking noise would not be comparable in the way the figure suggests: Ambient wind noise experienced at ground level would be lower, making the differential noise greater, magnifying the annoying noise effect.*** The wind speed in the topographical bowl would be expected to be even less than at the tower base, further exacerbating the problem of a sound differential, especially at night. From the figure provided, if the turbine-level wind was 20 mph and the base-level wind speed were 10 mph, a differential in sound experience of about 10 dBA is a reasonable estimate.

There is a need to establish measured baseline sound under quiet conditions in order to understand the effect of the turbine.** There is no evidence that any such measurements have been made. Without them, the opportunity to measure baseline sound will have been lost once the turbine is in operation (as the company points out in "Acoustic Characteristics").

To resolve some of the ambiguous sound-related issues presented in this application and to answer reasonable questions based on the information presented in support of a Special Use Permit, a much more explicit explanation is needed, one that connects the data provided to the particulars of this proposed project. Failing that, it would be important to engage the services of a trained expert who could provide an independent and objective opinion to the Zoning Board of Appeals.

II.A.3. What would the effect of a higher tower be on *bird life*?

I would suspect that the considerations noted above would be greater for a higher turbine, but I do not know this. The question should be part of an environmental assessment. *The proposal does not include an environmental assessment.*

II.B. Approval of a Special Use Permit would be inconsistent with current town planning documents

II.B.1. Town of Huron Master Plan

Before purchasing my property at 8175 Dutch Street Rd. I read what I could find about the area, including the draft version of the Town of Huron Master Plan. What I read contributed to what I saw as the value of the property in the context of its potential future surroundings. The very similar document available on the town website has been approved by the Town of Huron. My reading of this approved Master Plan is that decisions affecting the land designated "Resource Conservation" are to be consistent with the Master Plan absent some compelling argument. *Recommendation 1f (below) would argue against any variance or special permit concerning height of wind turbines.*

On p 36 of the Master Plan, recommendation 1g says to investigate policies for off shore/onshore commercial wind. *Recommendation 1f is to have wind technology conform to height standards.* On p 53 the Plan says to consider viewsheds, including those from the lake. Six scenic corridors are shown on map 8 (this map is not part of the document online. I found it elsewhere, and Brush Marsh/Port Bay constitute one of those six viewsheds). It also says to protect views from the roads (which would include Wright Rd.). On the map of proposed future land use (map 8) everything N of Wright Rd is designated "Resource Conservation."

II.B.2. Local Waterfront Revitalization Program (LWRP)

A second document that I read in draft form before my 2012 purchase was what is now approved, and titled the Local Waterfront Revitalization Program (LWRP). This document added further to my interest in the property in the context of the planned use of property in the local area. I note below the parts of this program (available on the town website) that are inconsistent with awarding a Special Use Permit.

P 4, in section I, states that Wright Rd forms the S boundary of the "Coastal Area Boundary" for this part of the Town of Huron. This boundary area is of special concern to the town. The scenic value is noted. On p 1, section III, Policy 3 says to "Enhance visual quality and protect scenic resources throughout the waterfront area." Approval of the proposed Special Use Permit would be inconsistent with this point. On p 18, section IV says to "Maintain and enhance views of the waterfront. Scenic views and the beauty of the waterfront are the most appreciated aspects of the waterfront, according to respondents to the public survey. Views are important from public areas as well as from private properties." *Again, awarding the Special Use Permit would be inconsistent with this statement. In particular, Project 20 states "Designate key scenic viewpoints and corridors and incorporate guidelines into local land use regulations protect views from public and private properties when buildings are constructed or reconstructed."* [In the Master Plan the site of the proposed project is within one of the six viewsheds identified.] On p 1 of section V, reference is made to the need for zoning changes. While these have not yet been made, *it would be inconsistent to award a Special Use Permit that was not in accord with the LWRP.* On p 3, section V, the point is made that actions by the town are to be consistent with the LWRP.

II.C. Approval of a Special Use Permit would establish undesirable precedents

II.C.1. Precedent re future similar projects

Approval of a special permit would contribute to the prospect of additional wind turbines exceeding the height limit, when the merit of the request for a special permit appears to be solely economic cost recovery. Thus it is important to carefully consider this initial request, as the decision would establish a precedent.

II.C.2. Larger concerns about precedent

Approval of a Special Use Permit for a tall, highly visible tower from both onshore and offshore perspectives (e.g., the proposed tower) would make it more difficult for the town to keep future proposed plans for industrial-scale wind energy onshore and offshore along the lake within acceptable limits. If the town were to approve a Special Use Permit allowing increased height based solely on economic benefit to the landowner and at the expense of its own approved planning principles in the Master Plan, the ability to respond to future proposed larger-scale projects that would severely reduce the quality of life for those living and recreating along the lake shore would be severely compromised. This might constitute the strongest reason of all to exercise caution about approving the present request for a Special Use Permit.

II.D. Conclusion concerning the application for a Special Use Permit

I see no reason that time would be of the essence in consideration of this request for a Special Use Permit. I believe the current request does not justify approval at this time. I believe it is incumbent on the Huron Zoning Board of Appeals to move cautiously, considering this important precedent-setting decision. I believe it should only consider this request after being presented with the information that is currently lacking. Approval of a Special Use Permit should be given only after carefully and judiciously determining that its possible adverse effects, and that the ramifications with respect to town planning and the establishment of precedent, are outweighed by the interest of the applicant.

Footnotes

* My Qualifications and Background: I make the above technical comments about noise and sound as a retired professional researcher who has for much of his active career performed research by making physical measurements, interpreting them, and publishing the results. I make no special claim to expertise in acoustics. However, I do claim experience in the making and interpretation of physical measurements, and I have attempted to learn enough about the practicalities of the current situation to make what I believe to be pertinent comments and ask pertinent questions.

Most of my professional life has been as a member of the College of Agricultural Sciences at Penn State University. Thus I am supportive of the concerns of production agriculture. I would hope that my comments above would not in any way be construed otherwise.

** The importance of determining background (baseline) sound, and the challenge of making meaningful measurements of it, is stressed by Hessler and Hessler, 2006, writing in *Sound and Vibration*, November, 2006, pages 10-13.

*** Moller and Pedersen, 2011 (writing in *The Journal of the Acoustical Society of America*, 129(6):3727-3744) state that "In a stable atmosphere, which often exists at night, variations [in wind speed] with height can be much larger than assumed, with high speed wind at turbine height and little wind at ground. ... The normal swishing turns into a more annoying, "thumping" impulsive sound... The effect is usually not reflected in noise measurements, which are normally carried out in the daytime, when the logarithmic [wind] profile is more common." (p 3742)