Hamlin Wind Tower Committee ***Minutes***
Friday, July 20, 2007
6:00pm

The regular scheduled meeting of the Hamlin Wind Tower Committee was held in the Hamlin Town Hall located at 1658 Lake Road, Hamlin and was called to order by the Chairperson Linda DeRue at 6:00pm with the location of the exits and defibulator explained for those present.

Present: Jerry Borkholder, Tom Jensen, Dave Lukas, Stan Lyons, Linda Morey, Andy Simpson, Lester Wilson and Linda DeRue.

Absent: Mark Reeves

Also present: Conservation Board member Tom Breslawski, residents Dorothy and Paul Lapinski, Tricia Nesbitt, Kathy Habgood, Wendell and Diane Grimm and Ann Yockel.

CHAIRPERSON'S COMMENTARY
Chair Linda DeRue thanked Kathy Habgood for her presentation on birds and bats.

MINUTES
A motion was made by Andy Simpson, seconded by Linda Morey to approve the minutes from the July 3, 2007 meeting as presented. Members polled, Borkholder aye, Jensen aye, Lukas abstain, Morey abstain, Lyons aye, Wilson aye, Simpson aye, DeRue aye. Motion carried, minutes approved.

Some discussion took place on the moratorium.

Jerry Borkholder read correspondence as the Community Relations Representative.

Some discussion took place on the urgency to have regulations in place.

OLD BUSINESS
Discussion on Birds and Bats continued.

A motion was made by Tom Jensen, seconded by Linda Morey to adopt a policy that the Bird and Bat Study pre siting for the Wind Towers be conducted by the US Fish and Wildlife Service or their designee or by an independent firm following the standards per US Fish and Wildlife guidelines paid for by the Wind Tower Company. Members polled, Borkholder aye, Jensen aye, Lukas aye, Lyons aye, Morey aye, Simpson aye, Wilson aye, DeRue aye.

Regulations:

1. Noise

There are three sources of noise associated with commercial wind turbines:

1. Audible mechanical noise from bearings and gears in the turbine nacelle
2. Low frequency/infrasonic noise from turbine blades passing turbine towers
3. Audible aerodynamic noise from turbine blades passing through the air

In addition to the noise source, there are many other factors that affect noise and the perception of noise including the number of turbines, distance, wind characteristics, terrain characteristics and background noise (1).

Noise can, among others, disturb sleep, cause cardiovascular and psycho-physiological effects, reduce performance and provoke annoyance responses and changes in social behavior (2). These problems are not specific for wind turbines, but for noise in general.

The World Health Organization (WHO) has recommendations for allowable noise levels (3) that should be used to establish noise limits.

1. Audible Mechanical Noise

Mechanical noise originates from the generator or transmission gear located in the turbine nacelle at the top of the turbine tower. Little discussion regarding this type of noise was found as the sound originating from this source has decreased in level in the past decades (4). It is not expected that this type of noise will be problematic, but the sound level from this source should be monitored as part of routine maintenance to ensure that noise levels are within recommended limits.

2. Low Frequency/Infrasonic Noise

Low frequency and infrasonic (frequencies below human hearing) noise are generated when a turbine blade passes the stationary turbine tower. There is conflicting information on this topic.

The level of low frequency or infrasonic noise from wind turbines can be determined by different approaches. There are two ways that have been used to measure sound associated with wind turbines: 'A' weighting and 'C' weighting. The 'A' weighting de-emphasizes low and infrasonic frequencies and is meant to mimic the range and sensitivity of human hearing. The 'C' weighting does not de-emphasize low and infrasonic frequencies. The use of 'C' weighted measurements will yield higher noise levels in the low and infrasonic frequency range.

Though low frequency and infrasonic noise are generated by modern commercial wind turbines, there is disagreement on the significance of the noise since humans typically are less sensitive to sound at these frequencies. There is also disagreement on how noise levels should be determined, with 'A' or with 'C' weighting.

Information was found dismissing low frequency sound and infrasound as being problematic for commercial wind turbines (4,5). These studies used 'A' weighted measurements. Information was also found claiming this as a problematic characteristic of commercial wind turbines (6). These studies used 'C' weighted measurements.

3. Audible Aerodynamic Noise

Audible aerodynamic noise is the "whoosh, whoosh" sound most commonly associated with commercial wind turbines. The noise is generated as the blades pass through the air. This type of noise is readily heard by humans and measured using 'A' weighting. Control of audible aerodynamic noise is typically done with

suitable setbacks, as the noise level will decrease as distance from the wind turbine increases.

The dynamics of the audible noise from wind turbines is very complex and is dependent upon many factors including turbine size, number of turbines, layout of multiple turbines, wind velocity and dynamics, terrain characteristics and atmospheric conditions (1).

Additionally, the perception of noise can change based on the level of background noise. For example, as background noise (automobiles, farm machinery, birds, etc.) diminishes at nighttime, the noise from a turbine may sound louder because other sounds are not present to mask it. There are additional changes in noise based on seasonal changes. These changes are based on the presence or lack of vegetation as well as actual snow conditions which may either reflect or absorbs noise.

Furthermore, more recent studies on wind noise have shown that actual noise levels can exceed predicted levels when the impact of changes and extremes in wind dynamics aren't properly accounted for (4).

Because of the complicated nature of wind turbine noise and the difficulty in predicting noise levels, setback distances cannot be recommended. Instead, noise limits based on WHO guidelines will be recommended.

A full four season - four times per day ambient sound analysis performed by an independent sound analysis firm needs to be performed before any permit can be issued for the wind tower construction. The analysis should be performed at the property lines of the adjoining residences as well as several various locations within a 2-mile radius.

If commercial wind turbines are placed in the Town of Hamlin, it is recommended that restrictions for noise sourced from commercial wind turbines be established consistent with the National Academy of Science guidelines. The noise level should not exceed 45 dBA at the property line of non-participating landowners and shall not exceed the average ambient level by more than 4 dB (A) for more than 5 minutes out of any one-hour period or exceed 45dB(A) for any time period at the property line.

It is also recommended that to ensure this requirement is met prior to installation, an assessment of any wind project proposals, inclusive of turbine type and location, be performed by an independent qualified engineering firm with an expertise in the evaluation of the acoustics of commercial wind turbines. Verification of noise levels after installation should be performed on a twice/year basis as part of routine maintenance. All costs associated with sound assessments should be at the expense of the wind project owner.

A motion was made by Dave Lukas, seconded by Linda Morey to approve. Members polled, all ayes.

2. Enforcement

Upon receiving a complaint or report of defective equipment, authorized personnel will verify the problem and immediately notify appropriate representatives of the wind tower company.

Any failure to repair problems or shut down defective equipment will result in a fine as set by the Town of Hamlin until repairs are made or equipment is shut down. We recommend a fine of $2500.00 per day.

In the event of an emergency, authorized local personnel will shut down equipment to protect the public and the defective equipment.

Any wind tower that is not repaired within 90 days will be removed or replaced.

Failure to properly maintain or repair equipment/wind tower will result

in non-renewal or revocation of Special Use Permit. We strongly recommend a SUP for each tower renewable annually upon proof of proper maintenance and any necessary repairs as needed.

An authorized representative will be available at all times to respond within 30 minutes for any and all problems, concerns or emergencies.

A motion was made by Stan Lyons, seconded by Dave Lukas to approve. Members polled, all ayes.

3. Ice Throw

Ice throw can occur when ice that has built up on wind turbine blades is released as the blades rotate. The rotation of the blades can cause the ice to be thrown, rather than simply fall from the blades.

A simplified explanation and calculation for determining the potential distance ice can be thrown from a wind turbine was obtained from a professor at Rutgers University (1). The characteristics of wind turbines that can impact the potential ice throw distance are the turbine tower height, the blade length and the rotation speed. The characteristics of the turbines used in the calculation, which are similar to those proposed for the Town of Hamlin, were as follows:

Tower Height: 300 feet
Blade Length: 100 feet
Rotation Speed: 20 RPM

This yields a potential ice throw distance (ignoring aerodynamics and friction) of about 1700 feet. An increase in any of the above characteristics will yield an increase in potential ice throw distance.

As the dimensions of wind turbines are not established, calculations similar to those in Reference 1 would need to be employed to establish suitable setback distances for ice throw. Setbacks should be between a wind turbine and the following:

Roadways
Established snowmobile trails
Property lines of non-participating landowners
Parks and recreational areas

It should be noted that although there is the potential for ice throw, no instances of litigation were found to aid in assessing the risk level (2,3).

If commercial wind turbines are placed in the Town of Hamlin, it is recommended that, to mitigate the potential damage from ice throw, setback distances for wind turbines be established based on the calculation in Reference 1 that utilize the turbine tower height, blade length and maximum rotation speed as specified in any wind project proposal.

Example: Minimum setback of 1700 feet for a turbine with a tower height of 300 feet, blade length of 100 feet and a rotation speed of 20 RPM

A motion was made by Tom Jensen, seconded by Stan Lyons to approve. Members polled, all ayes.

4. Stray Voltage

Stray voltage is the term used to describe a special case of voltage developed on the grounded neutral system of a farm. If this voltage reaches sufficient levels, animals coming into contact with grounded devices may receive a mild electric shock that can cause a behavioral response. Behavioral response studies have focused primarily on dairy cows (1).

The problem of stray voltage is likely not caused nor worsened by wind generators (2). Never-the-less, potential problem areas, specifically existing dairy farms, should be considered as part of any wind project proposal.

If commercial wind turbines are placed in the Town of Hamlin, it is recommended that an assessment of stray voltage conditions in potentially problematic areas be carried out prior to the installation of, and after commencement of operation of, any wind farm project. Correction of stray voltage issues attributable to the operation of the wind farm should be carried out within 7 days of verification of the problem.
A motion was made by Tom Jensen, seconded by Stan Lyons to approve. Members polled, all ayes.

5. Radio and Television Interference (Electromagnetic Interference)

Consumer

Commercial wind turbines are recognized as being a potential source of electromagnetic interference, affecting primarily conventional broadcast television. Effects on radio and cell phones are also possible. Effects on satellite television are less likely (1).

If commercial wind turbines are placed in the Town of Hamlin, it is recommended that problems affecting television reception, radio reception, cell phone operation, or other, attributable to the installation or operation of commercial wind turbines be corrected within 10 days of recognition of the problem. Any extraordinary costs associated with the correction (cable television, satellite television and radio, etc,) will be at the project owner's expense for the lifetime of the project.

Commercial

Commercial wind turbines are a recognized source of interference to microwave links. As such, wind developers routinely consult with experts to avoid conflicts with microwave links (1).

If commercial wind turbines are placed in the Town of Hamlin it is recommended that verification of interference studies with existing microwave links (for example; cellular phone towers) be provided with any wind project proposal.

The applicant shall provide evidence in the form of test results or engineering studies that the wind power facilities proposed will not interfere with microwave, cellular or television/radio transmission/reception to or from existing primary structures and fixed broadcast, retransmission or reception antennas. If after construction the Owner or Operator receives a written complaint related to such interference, the Owner or Operator shall take reasonable steps, including provision of alternate communications, to respond to the complaint.

Aviation

Commercial wind turbines are a recognized source of interference to VOR (VHF Omni directional Ranging) Systems used for aircraft navigation. Existing FAA rules prevent a structure the size of a typical utility-scale wind turbine from being erected within 1 kilometer of a VOR station (1).
Table until next meeting.

6. Removal and Restoration

Commercial wind turbines have an anticipated working lifetime of 20 years or more, and lease agreements may extend well beyond this period to allow for repowering of the project(1). After the working lifetime of the project, removal of hardware and restoration of affected land will be required. There are several aspects

to removal and restoration that must be considered and are outlined as follows:

1. Cost guarantees
2. Timing
3. Scope of restoration
4. Landowner liability

1. Cost guarantees

It is expected that the cost of removal of commercial wind turbines will be comparable to the cost of installation with the need to adjust for inflation over their working lifetime. This puts a tremendous financial liability on the project with timing that is most difficult to guarantee.

This difficulty is compounded by the possibility that the original project owner (wind turbine company) will not be the owner at the end of the working lifetime, and original agreements may not be transferred or be invalidated.

Therefore, financial guarantees to ensure that wind turbines, substations and ancillary equipment are removed, and affected land areas restored are essential. This can be done through a suitable bonding process or escrow account. A similar process is used to guarantee the restoration of quarries.

If commercial wind turbines are placed in the Town of Hamlin, it is recommended that a suitable cash bond issued be a AAA rated bonding company be put into a joint account to guarantee that finances are in place only for removal and restoration of the affected areas prior to commencement of any wind farm project in the Town of Hamlin.

The owner/operator shall provide the Town of Hamlin with proof of liability insurance, in the form of a duplicate insurance policy, at a level to be determined by the Town Board to cover any liability for bodily injury or property damage that might be encountered. The Town of Hamlin shall be held harmless for any and all claims resulting from this project.

2. Timing

As stated above, the anticipated working lifetime of commercial wind turbines is 20 years or more. Working lifetimes are based on expectations of profitability coupled with the expense of running and maintaining the turbines and may be shorter or longer than the 20 years expected.

Because of the variability of the length of operation for individual turbines (as well as an entire project or wind farm), a clear definition of when a wind turbine has reached the end of its working lifetime must be established, with the timeframe for subsequent removal also defined. It may be in the best interests of the wind farm operator to keep individual turbines “active” in order to minimize disruption of the entire project or delay removal of individual turbines in order to maximize efficiency by removing all the turbines in a project at the same time. In this same manner, the removal of wind turbines in the Town of Hamlin could be affected by turbines in other areas as part of the same project.

If commercial wind turbines are placed in the Town of Hamlin, it is recommended that a turbine be declared non-operational after 90 days of non-production or 90 days of production at a level less than 20% of the average production of the wind farm.

If commercial wind turbines are placed in the Town of Hamlin, it is recommended that removal of non-operational turbines be completed within a period of 6 months after being declared non-operational.

If commercial wind turbines are placed in the Town of Hamlin, it is recommended that financial penalties be imposed on the turbine owners after the 6-month interval for removal.

If the bonding, escrow or other funding sources available for the deconstruction and removal of the towers and restoration of the area in question is insufficient then the landowner will be required to remove the towers by any acceptable means in a timely manner with a maximum of 6 months.

3. Scope

The scope of the restoration must encompass the following:

Removal of wind turbines and associated ancillary equipment
Removal of buried cable if less than 4 feet in depth (2)

The following to be done to them satisfaction of the landowner:

Removal of substation(s) and associated ancillary equipment
Removal of concrete base of wind turbine to a depth of not less than 6 feet and restoration of affected land (2)
Removal of access roads and restoration of affected land
Restoration of roadways used during removal
Special considerations: Restoration of the land on the turbine site and the access roads would require additional resources, most notably topsoil, as these would have been removed from the sites or blended into the site during installation.

4. Landowner liability

In the event that the funding to remove the commercial wind turbines and associated equipment is not adequate or unavailable at the time removal is required, the responsibility of removal of the turbines and associated equipment should fall upon the landowner on whose land the equipment was placed. This requirement should be part of the zoning requirements.
Table until next meeting.

Population, property values and finance and economics will be discussed at the next meeting.

ADJOURNMENT

A motion was made by Linda Morey, seconded by Andy Simpson to adjourn tonight's meeting barring any further business. Members polled, all ayes. Meeting adjourned.

Minutes respectively submitted by:

Heather Norman
Clerk to the Support Boards

The next Committee meeting will be July 27, 2007 at 6:00pm.