ORDINANCE NUMBER 4-5-2010
THE TOWN OF HOLLAND WIND ENERGY CONVERSION SYSTEM (WECS) ORDINANCE

(1) No WECS greater than 110 feet in height shall be constructed, operated, or maintained in the Town of Holland without a license issued by the Town of Holland Town Board. Each application for a license to erect a WECS greater than 110 feet in height shall be reviewed on a case-by-case basis by the Town Plan Commission and the Town Board before issuing a license. The license fee for each WECS greater than 110 feet in height shall be calculated at the rate of $2,500.00 per wind turbine proposed in each WECS.

(2) No WECS of 110 feet or less in height, and less than 100 kilowatts shall be constructed, operated, or maintained in the Town of Holland without a conditional use permit issued by the Town of Holland Plan commission. Each application for a license to erect a WECS of 110 feet or less in height and less than 100 kilowatts, shall be reviewed on a case-by-case basis by the Town Plan Commission and the Town Board before issuing a conditional use permit. The conditional use permit fee for each WECS of 110 feet or less in height and less than 100 kilowatts shall be calculated at the rate of $100.00 per wind turbine proposed in each WECS.

(3) The Town of Holland has established standards for purposes of licensing and issuance of conditional use permits applicable to a WECS. These standards are to be used as guidelines for determining whether or not each proposed WECS satisfies reasonable conditions or restrictions, to the extent allowed by the state law, taking into account the health, safety, and general welfare of the public, prior to issuing such licenses or permits. Each applicant shall present arguments and information why the Standards, Guidelines and Rules should or should not apply for the purposes of health, safety, or general welfare of the Town and the immediate locality where the WECS is proposed to be erected.

(4) This ordinance repeals and replaces Article XXII Ordinance #2-2008 of the Town of Holland, Brown County, Wisconsin, Zoning Ordinance relating to regulations of large and small wind energy facilities.

(5) This ordinance shall take effect upon passage and posting or publication as provided by law.

This ordinance was passed and adopted by the Town of Holland on this _____ day of _____, 2010.

TOWN OF HOLLAND

_____ _____

Town Chairman Town Supervisor

_____ _____

Attest: Town Clerk Town Supervisor

Published and posted this _____ day of _____, 2010

TOWN OF HOLLAND

WIND ENERGY LICENSING STANDARDS, GUIDELINES AND RULES

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TOWN OF HOLLAND
WIND ENERGY LICENSING STANDARDS, GUIDELINES AND RULES

RECITALS

WHEREAS, the Town of Holland adopted a temporary stay concerning the construction of wind energy systems to give the Town time to research and develop an appropriate ordinance.

WHEREAS, the Town of Holland appointed a Wind Turbine Study Committee to study wind energy conversion systems (hereinafter "wind turbines" or "wind energy conversion systems" or "WECS") and make written recommendations to the Plan Commission on Standards, Guidelines and Rules to adopt.

WHEREAS, the committee held meetings to review and research health and safety effects of wind turbines.

WHEREAS, the committee prepared a Recommendation Report and proposed Standards, Guidelines and Rules (hereinafter "Standards, Guidelines and Rules") that was presented to the Plan Commission.

WHEREAS, the Wind Turbine Study Committee requested the Town legal counsel conduct a preliminary review of the draft and provide comments to the Town Board and Plan Commission. Legal counsel provided such comments to the Plan Commission and Town Board.

WHEREAS, the Plan Commission and Town Board held public meetings concerning the Standards, Guidelines and Rules for Wind Energy Systems (WES).

WHEREAS, reputable studies and research projects have been conducted regarding wind turbines.

WHEREAS, the Plan Commission, Town Board and the Wind Turbine Study Committee researched and reviewed many documents, reports, studies, and testimonials related to the siting of wind turbines which were determined by the Town Board to be reasonably accurate, reliable and relevant to the health and safety effects of wind turbines.

WHEREAS, the Wisconsin Legislature has enacted 2009 Wisconsin Act 40 which created a Wind Siting Council to advise the Public Service Commission of standards to promulgate rules that specify the restrictions a political subdivision may impose on the installation of a WES, but no standards have been set to date by the Commission.

NOW THEREFORE, based on the information concerning the health and safety effects of large wind turbines on the community presented in the public hearings and in the reports and documents reviewed and referenced herein, and the lack of rules promulgated by the Public Service Commission, and based upon the recommendation of the Town Plan Commission, the Town Board finds and adopts as follows:

I. PURPOSES AND INTENT

The purposes and intent of these Standards, Guidelines and Rules are to protect the public health and safety of the residents and property owners of the Town of Holland who may be affected by the development and operation of a WECS. Such purposes and intent shall be accomplished by regulating noise, protecting emergency communications, regulating shadow flicker, ensuring adequate fire protection, establishing adequate setbacks, to provide reasonable protection from any health effects, protecting water quality, preventing soil erosion, regulating visual obstructions, preventing conflicts between incompatible land uses, ensuring proper installation of a WECS, and ensuring safe and complete decommissioning of a WECS.

II. FINDINGS

(a) General Findings:

1. Wind energy is a potential renewable and non-polluting energy resource of the Town of Holland, and its conversion to electricity may reduce dependence on non-renewable, conventional energy sources and decrease the pollution that results there from. However, wind energy facilities should be sited in a way that protects the health and safety needs of the Town of Holland residents residing near the wind turbines, as well as the general public.

2. The regulation of the siting and installation of wind turbines is necessary to protect the health and safety of the residents of the Town of Holland and the general public. Adverse health and safety issues are likely to arise if appropriate setbacks are not adhered to in the siting and installation of wind turbines.

3. It is appropriate to consider as relevant recommended standards for wind turbines from international organizations that have more experience with the use, siting and installation of wind turbines than the United States.

4. Wind turbine accidents have occurred involving ice throws, blade disintegration, fire and tower failure. According to the Caithness Wind Farm Information Forum, Scotland, from 1999 through June 2008 there were over 500 accidents around the world, including North America, involving ice throws, blade disintegration, fire, and tower failure from large wind turbines.

5. If improperly sited, wind energy systems produce electro-magnetic radiation that can interfere with broadcast communications and signals.

6. Heavy equipment used for the construction of wind turbines can damage local roads.

(b) Findings Regarding Wind Turbine Noise Impacts:

The Town of Holland concludes that a) the sound pressure level ("SPL") of 50 dBA set forth in the State of Wisconsin 2007 Draft Model Wind Ordinance does not adequately protect town residents from the adverse health effects associated with large wind turbine noise; and b) a maximum outside audible SPL of 35 dBA or 5 dBA over ambient, whichever is lower, in the Town of Holland is necessary to protect residents from the adverse health effects associated with large wind turbine noise, based on the following findings:

1. Large wind turbines are significant sources of noise, which, if improperly sited, can negatively impact the health of residents, particularly in areas of low ambient noise levels.

2. Large wind turbines emit two types of noise: 1) Aerodynamic noise from the blades passing through the air, which can generate broadband noise, tonal noise and low frequency noise; and 2) Mechanical noise from the interaction of the turbine components. A dBA scale is commonly used to measure audible wind turbine noise. Low frequency noise from large wind turbines is not adequately measured with a DBA weighting. For a better assessment of the health effects from low frequency noise, the World Health Organization ("WHO") suggests using a dBC weighting. (See Rogers 1/2006; Alberts 11/20/2005; WHO 1999)

3. Noise is an annoyance that can negatively impact health, producing negative effects such as sleep disturbance and deprivation, stress, anxiety and fatigue. WHO defined annoyance as a feeling of displeasure associated with any agent or condition believed by an individual to adversely affect him or her. According to WHO, health should be regarded as a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity. Under this definition, noise has a significant impact on the quality of life and noise is an adverse health effect. (See WHO 1999, Ch. 3.7; Dr. Harry 2/2000; Pederson and Waye 2/27/08)

4. Large wind turbines create a noise annoyance that can hinder physical and mental feeling and can cause adverse health effects associated with sleep disturbance and deprivation, psychological distress, stress, anxiety, depression, headaches, fatigue, tinnitus and hypertension. Wind turbine noise can affect each person differently. Some people are unaffected by wind turbine noise, while others may develop adverse health effects from the same noise. At low frequencies, wind turbine noise may not be heard but rather is felt as a vibration. Medical research reported complaints from people who felt the noise from large wind turbines, similar to symptoms that can be associated with vibroacoustic disease. (See Pederson et al 3/1/2007, 8/2003, 1/11/2008 and 6/3/2008; Pederson 2007; Mariana Alves-Pereira and Nuno Castelo Branco 9/20/2007; WHO 1999; Kamperman & James; reports by Dr. Pierpont, Dr. Harry and Dr. Leventhal)

5. The risk for adverse health effects resulting from noise annoyance such as headaches, stress, anxiety, fatigue, depression, pain and stiffness, and decreased cognitive ability associated with sleep deprivation from wind turbine noise increases with increasing A-weighted sound pressure levels. According to wind turbine noise studies, few respondents were disturbed in their sleep by wind turbine noise at SPL less than 35 dBA; however, at SPL greater than 35 dBA respondents were increasingly disturbed in their sleep by wind turbine noise. (See Pedersen et al 6/3/2008 and 8/2003)

6. Wind turbine noise greater than 5 dB over ambient increases the risk for adverse health effects because a change of 5 dB is clearly noticeable. (See Kamperman and James)

7. Studies show that prolonged exposure to wind turbine noise resulted in adverse health effects at SPLs below those from other sources of community noise, such as road traffic noise. Sound generated by a wind turbine has particular characteristics and creates a different type of noise having different health impacts than compared to urban, industrial or commercial use. (See Pedersen et al 6/3/2008 and 8/2003; Soysal 2007)

8. Living in a rural environment, in comparison with a suburban area, increases the risk of residents being impacted by noise from nearby large wind turbines because of the low ambient SPL and rural environments. (See Pedersen and Waye, 3/1/2007, p. 485)

9. The International Standards Organizations recommended community noise limits for rural areas be set at a SPL of 35 dBA during the day, 30 dBA during the evening and 25 dBA at night. (See Table 9: ISO 1996-1971 recommendations for community noise limits as cited by Acoustic Ecology Institute and Daniel Alberts of Lawrence Technological University)

10. Eye-witnesses living near newly-constructed large wind turbines in the Town of Byron, Fond du Lac County, Wisconsin testified at the joint legislative hearing held in Madison, Wisconsin that they currently experience adverse health effects from the wind turbine noise such as sleep deprivation and disturbance, headaches, nausea and dizziness. The SPL from the wind turbines in the Town of Byron is greater than 45 dBA at their residences and can be heard inside of their houses and outside in their yards.

11. Two Town of Union, Rock County, WI Plan Commissioners visited the newly constructed wind turbines in the Town of Byron, Fond du Lac County, WI in June 2008 and confirmed that the wind turbines were a significant source of noise. Commissioner Doug Zweizig went to Gerry Meyer's home that was approximately 1500 feet from the wind turbines and noted that the turbines sounded like a jet airplane when describing the quality and intensity of the sound. Commissioner Dave Pestor spoke with residents, farmers and a sheriff's deputy in the area who all stated that the turbines were noisy. Mr. Pestor also visited Gerry Meyer's home and took sound measurements from the wind turbines. The sound measured between 57 to 67 dBA on June 6-7, 2008. Mr. Pestor took sound measurements from several wind turbines in the area. The lowest sound

measurement was 48 dBA and the highest was 69 dBA. Wind committee members, Jim and Cathy Bembinster visited the Montfort, WI wind turbines in August 2007 and measured the sound levels to be between 48 to 53 dBA and 62 to 73 dBC. They also found two pieces of broken blades, with the tip of the blade being as big as the hood of a truck. The Bembinsters visited Montfort again in November and measured the sound above 50 dBA and 65 dBC.

However, experiences vary. Town of Union Plan Commissioner Kim Gruebling visited wind turbine sites in Byron Township, Lincoln Township and Montfort and found that overall people were satisfied with the turbines. Two issues that Mr. Gruebling noted were 1) tensions between land owners profiting from the wind turbines and those land owners who did not, and 2) the poor conditions of roads following the installation of the turbines. Town of Union Plan Commissioner Doug Lee visited wind farms in Iowa. Mr. Lee estimates that approximately 60% of the people he spoke with had positive opinions of the wind turbines and approximately 40% of the people he spoke with had negative opinions of the wind turbines. Commissioner Eric Larsen, Town of Union, went to a wind farm south of Rockford, IL. No one was available to talk to so he walked around the area. It was a nice day and windy. Mr. Larsen noticed that the windows in the home surrounding the site were all closed and no one was outside. He stated the noise was similar to a plane going overhead. He stood under a tower and did not feel any unease.

12. Town of Forest, being located adjacent to two WECSs has first-hand experience with the health and safety issues engendered by improper siting of wind turbines. Town of Forest residents, including members of the Wind Energy Ordinance Research Committee, have experienced and witnessed shadow flicker, excessive noise and fluid leakage. Several committee members visited an "open house" at the WE Energy Center at Johnsburg, Wisconsin and encountered a distinct lack of concern from WE for stated problems and concerns.

13. In order to reduce the risk of negative health impacts from large wind turbine noise, acoustical engineers George Kamperman and Richard James recommend a) audible sound based on pre-existing background sound levels plus a 5dB allowance for wind turbine noise or b) SPL not to exceed 35 dBA within 100 feet of any occupied structure, whichever is lower; and c) a dBC limit not to exceed 20dB above ambient background levels. These sound levels are in line with numerous published guidelines such as the sound limits proposed by the United Kingdom Business Enterprise Regulatory Reform Department, which suggest for quiet, rural areas and low noise environments, the outside levels of the L A90, 10 min. of wind fan noise should be limited to an absolute level of 35-40 dBA. (See Kamperman & James; United Kingdom Business Enterprise & Regulatory Reform Department document "Onshore Wind: Noise" 7/17/2008)

14. Two members of the Holland Wind Turbine Study Committee visited a farm in Fond Du Lac County, WI south of Oakfield located amongst the wind turbines. The farmland owner and his wife reported the noise was audible and problematic both outside and within their home from the three turbines that surround them on neighboring properties. They said they felt the vibration from the turbines through the bedroom walls.

He also reported that his diary cows used to lay in the pasture along the fence line that now has a turbine in close proximity. The cows now stay close to the barn which is the farthest from the turbine. Wild turkey and white tail deer that previously inhabited the 40 acre wooded parcel his family had hunted for years are no longer there. The farmland owner has developed health issues since the turbines were erected that has affected his farming and recreational routines. He also described the affect it has had on his community. Neighbors and lifelong friends are no longer talking.

(c) Findings Regarding Setback Distances from Wind Turbines:

The Town of Holland concludes that a) the setbacks set forth in the State of Wisconsin 2007 Draft Model Wind Ordinance are not based on empirical evidence relating to health effects and do not adequately protect town residents from the impacts of large wind turbines; and b) a setback of 2,640 feet (1/2 mile) from large wind turbines to the nearest residence or occupied structure is necessary to protect the health and safety of Town of Holland residents, based on the following findings:

1. Minimum setbacks from occupied structures are necessary to mitigate noise impacts not predicted with sound models. Pre-construction sound models fail to accurately predict wind turbine noise impacts due to factors such as atmospheric conditions, temperature inversions, wind layers, geography and low frequency noise which travels further with less loss of intensity than higher frequency noise. In addition, at night when air stabilizes, wind turbine noise can travel further than expected and can be 5-15 db(A) louder than predicted. (See Kamperman & James; Acoustic Ecology Special Report: Wind Energy Noise Impacts 2008)

2. A dBC requirement is need to minimize adverse health effects from low frequency noise. A dBC requirement will likely result in setbacks between large wind turbines and nearby dwellings of 1 km (.62 miles) or greater for 1.5 to 3 MW wind turbines if wind turbines are located in rural areas where L90A background levels are 30 dBA or lower. (See Kamperman & James; WHO 1999; Bajdek Noise-Con 2007; Pedersen and Waye 1/11/2008)

3. Noise diminishes with distance. According to a sound propagation formula in the Wind Turbine Acoustic Noise White Paper by the University of Massachusetts Renewable Energy Research Lab, a SPL of 35 dBA is reached at approximately ½ mile from a wind turbine based on a sound power at 102 dBA at hub height as applied to a 1.5-3 MW wind turbine. Therefore, at a distance of less than a ½ mile, a wind turbine will create a SPL that exceeds safe levels. (See Rogers pg. 18 Figure 11; Burton 2001) While this model of sound propagation is descriptive of the noise generated by the machinery at the hub, the noise produced by the turbine blades is not accounted for in this model and has been found to travel further, which is verified by existing wind turbines. Therefore, this ordinance requires siting based on not only on set-backs, but also on sound studies.

<u>Wind Turbine Sound Propagation at the example of 102 dBA sound power at hub</u>

Distance in Feet	*dBA reduction -6 per doubling of distance*
1	102 dBA
2	96 dBA
4	90 dBA
8	84 dBA
16	78 dBA
32	72 dBA
64	66 dBA
128	60 dBA
256	54 dBA
512	48 dBA
1024	42 dBA
2048	36 dBA
4096	30 dBA
8192	24 dBA
16384	18 dBA
32768	12 dBA
65536	6 dBA
131072	0 dBA

4. The closer people live to wind turbines the more likely they will experience noise annoyance or develop adverse health effects from wind turbine noise. Further, the degree of difficulties resulting from the sound of wind turbines seems clearly related to the distance from the turbines, though the literature has studied a variety of turbine sizes in a variety of locations. A setback of 2640 feet from dwellings would eliminate most noise complaints. Research conducted by Christopher Bajdek showed that at approximately 0.8 km (1/2 mile) from wind turbines, 44% of the population would be considered highly annoyed from wind turbine noise. At a distance of approximately 1.62 km (1 mile) from wind turbines, the percent of highly annoyed people is expected to drop to 4%. George Kamperman and Richard James reviewed several studies to determine the impact of wind turbine noise on nearby residents. Their review showed that some residents living as far as 2 miles complained of sleep disturbance from wind turbine noise and many residents living 1000 feet from wind turbines experienced major sleep disruption and other health problems from nighttime wind turbine noise. G.P. Van den Berg studied a wind farm in northwestern Germany and discovered that residents living 500 m (1640 feet) from the wind turbines reacted strongly to turbine noise and residents up to 1900 m (1.18 miles) distance expressed annoyance. A survey conducted by Pedersen and Waye revealed that less than 10% of the respondents experienced sleep disturbance at distances of 1,984 feet to 3,325 feet and found that the sound from wind was of greater concern in rural environments because of the lower ambient noise. (Bajdek, Noise-Con 2007; Van den Berg 2004; Pedersen & Waye 2/27/08; Kamperman & James)

5. Eye-witnesses from the Town of Byron, Fond du Lac County, who testified at the public hearing held by the joint legislative committee in Madison, WI live 1,100 feet to ¾

mile from large wind turbines and they currently experience adverse health effects from wind turbine noise such as insomnia, headaches, nausea, and dizziness. (See Gerry Meyer's daily log)

6. Documents reviewed recommend wind turbines should be located between ½ mile to over 1 mile from dwellings. To avoid adverse noise impacts, the Western Australia Planning Commission Bulletin recommends that wind energy systems include sufficient buffers or setbacks to dwellings of 1 km (.62 mile). The National Wind Collaborating Committee stated that an appropriate setback distance may be up to ½ mile. The National Research Council stated noise produced by wind turbines generally is not a major concern for humans beyond ½ mile or so because various measures to reduce noise have been implemented in the design of modern turbines. The Wisconsin towns of Union, Woodville, Clay Banks, Magnolia, Wilton and Ridgeville among many others have adopted large wind turbine ordinances with setbacks of 1/2 mile from dwellings. Noise heard at distances exceeding 1 mile from neighboring townships prompted the Town of Forest in Fond Du Lac County to set their setback at 1 mile. The French National Academy of Medicine and UK Noise Association suggest a 1.5 km (approximately 1 mile) distance between large wind turbines and dwellings. Dr. Amanda Harry, Dr. Nina Pierpont, and Frey and Hadden recommend a setback greater than 1 mile. (See UK Noise Association 6/2006; French National academy of Medicine 3/14/2006; reports by Dr. Harry, Dr. Pierpont, Frey and Hadden; NWCC 1998, NRC report 5/2007)

7. Adverse health effects from wind turbine noise can be exacerbated by the rotating blades and shadows from the wind turbines. As wind turbine blades rotate in sunny conditions, they cast strobe-like shadows on the windows of nearby homes and buildings causing shadow flicker that cannot be avoided by occupants. Shadow flicker can cause some people to become dizzy, nauseated or lose their balance when they see the movement of the shadow. Shadow flicker from wind turbines at greater than 3 Hz poses a potential of inducing photosensitive seizures. Therefore, wind turbines should be sited such that shadows from wind turbine blades do not fall upon the windows of nearby dwellings or within 100 feet of dwellings for any considerable period. The Wind Energy Handbook recommends a setback of 10 rotor diameters to avoid shadow flicker on occupied structures, however, shadow flicker has been witnessed at distances well over one mile. (See Acoustic Ecology Institute special report 2008; Burton 2001; UK Noise Association 6/2006, Graham Harding 2008 and Dr. Nina Pierpont 3/2/2006 and 8/11/2006)

8. If placed too close to a road, the movement of the wind turbine blades and resulting shadow flicker can distract drivers and lead to accidents. (See NRC May 2007 report, pg. 263)

9. Wind turbines have been known to throw ice and debris from the turbine blades. According to Professor Terry Matilsky from the Department of Physics and Astronomy at Rutgers University, ice throws from large wind turbines can reach up to a distance of 1750 feet and blade throws can reach 2500 feet.

III. DEFINITONS

The following terms have the meanings indicated:

(a) Aerodynamic Sound: Means a noise that is caused by the flow of air over and past the blades of a WES.

(b) Ambient Sound: Ambient noise encompasses all sound present in a given environment, being usually a composite of sounds from many sources near and far. It includes intermittent noise events, such as, from aircraft flying over, dogs barking, wind gusts, mobile farm or construction machinery, and the occasional vehicle traveling along a nearby road. The ambient also includes insect and other nearby sounds from birds and animals or people. The near-by and transient events are all part of the background sound. If present, a different time or location should be selected for determining the L90 background sound levels.

(c) Ampere: The basic unit measuring the quantity of electricity.

(d) Anemometer: Means a device for measuring the speed and direction of the wind.

(e) Applicant: Means the person, firm, corporation, company, limited liability corporation or other entity which applies for approval under the ordinance, as well as the applicant's successor(s), assign(s) and/or transferee(s) as to any approved WECS or testing facility. An applicant must have the legal authority to represent and bind the landowner or lessee who will construct, own, and operate the WECS or testing facility shall be with the owner of the WECS or testing facility, and jointly and severally with the owner and operator or lessee of the WECS or testing facility. Also known as owner or operator.

(f) A-Weighted Sound Level (dBA): A measure of over-all sound pressure level designed to reflect the response of the human ear, which does not respond equally to all frequencies. It is used to describe sound in a manner representative of the human ear's response. It reduces the effects of the low with respect to the frequencies centered around 1000 Hz. The resultant sound level is said to be A-weighted and the units are dBA. Sound level meters have an A-weighting network for measuring A-weighted sound levels (dBA) meeting the characteristics and weighting specified in ANSI Specifications for Integrating Averaging Sound Level Meters, S1.43-1997 for Type 1 instruments and be capable of accurate readings. (corrections for internal noise and microphone response permitted) at 20 dBA or lower.

(g) Background Sound (L90) refers to the sounds that would normally be present at least 90% of the time. Background sounds are those heard during lulls in the ambient sound environment. That is, when transient sounds from flora, fauna, and wind are not present. Background sound levels vary during different times of the day and night. Because a WECS operates 24/7, the background sound levels of interest are those during

the quieter periods which are often the evening and night. Sounds from near-by birds and animals or people must be excluded from the background sound test data.

Background sound level (dBA and dBC (as L90)) is the sound level present for at least 90% of the time during a period of observation that is representative of the quiet time for the soundscape under evaluation and with duration of ten (10) continuous minutes. Several contiguous ten (10) minute tests may be performed in one hour to determine the statistical stability of the sound environment. Longer term tests, such as 24 hours or multiple days are not appropriate since the purpose is to define the quiet time background sound level. It is defined by the L90A and L90C descriptors. It may be considered to be the quietest one (1) minute during a ten (10) minute test. L90A results are valid only when L10A results are no more than 10 dBA above L90A for the same time period. L10C less L90C should not exceed 15 dBC to be valid.

Measurement periods such as at dusk when bird and insect activity is high or the early morning hours when the 'dawn chorus' is present are not acceptable measurement times. Further, background L90 sound levels documenting the pre-construction baseline conditions should be determined when the ten minute average wind speed is 2 meters per second (4.5 mph) or less at the ground level/microphone location.

(h) Blade Glint: Means the intermittent reflection of the sun off the surface of the blades of a single or multiple WECS.

(i) Blade Passage Frequency (BPF): Means the frequency at which the blades of a turbine pass a particular point during each revolution (e.g. lowest point or highest point in rotation) in terms of events per second. A three bladed turbine rotating at 28 rpm would have a BPF of 1.4 Hz [E.g. ((3 blades times 28 rpm)/60 seconds per minute = 1.4 Hz BPF)]

(j) Board: Means the Town Board for the Town of Holland, Brown County, Wisconsin.

(k) Broadband Noise: Means the "swishing" or "whooshing" sound emitted as a function of a WECS(s) operation.

(l) C-Weighted Sound Level (dBC): Similar in concept to the A-Weighted Sound Level (dBA) but C-weighting does not de-emphasize the frequencies below 1k Hz as A-weighting does. It is used for measurements that must include the contribution of low frequencies in a single number representing the entire frequency spectrum. Sound level meters have a C-weighting network for measuring C-weighted sound levels (dBC) meeting the characteristics and weighting specified in ANSI S1.43-1997 Specifications for Integrating Averaging Sound Level Meters for Type 1 instruments.

(m) Decibel (dB): A dimensionless unit which denotes the ratio between two quantities that are proportional to power, energy or intensity. One of these quantities is a designated reference by which all other quantities of identical units are divided. The sound pressure level (Lp) in decibels is equal to 10 times the logarithm (to the base 10) of

the ratio between the pressure squared divided by the reference pressure squared. The reference pressure used in acoustics is 20 MicroPascals.

(n) Distance attenuation: Means the reduction of a sound or attenuation by distance. The effect of distance attenuation depends on the type of sound sources. Most sounds or noises we encounter in daily life are from sources which can be characterized as either point or line sources. If a sound source produces spherical spreading of sound in all directions, it is a point source. For a point source, the noise level decreases by 6 dB per doubling of distance from the source. If the sound source produces cylindrical spreading of sound such as a stream of motor vehicles on a busy road at a distance, it may be considered as a line source. For a line source, the noise level decreases by 3 dB per doubling of distance from the source.

(o) Employee: Means any and all Persons, including but not limited to "operators" who work in or at, or render any services directly related to operation of Wind Energy Conversion Systems.

(p) FAA: Means Federal Aviation Administration.

(q) Frequency: Means the number of oscillations or cycles per unit of time. Acoustical frequency is usually expressed in units of Hertz (Hz) where one Hz is equal to one cycle per second.

(r) Good Utility Practice: Means any of the practices, methods and acts with respect to the safe operation of a WECS engaged in or approved by a significant portion of the electric utility industry and, in particular, those portions of the industry with experience in the construction, operation and maintenance of wind turbines during the relevant time period; or any of the practices, methods and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision is made, could be expected to accomplish the desired results at a reasonable cost consistent with good business practices, reliability, safety and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method or act to the exclusion of all others, but rather to be acceptable practices, methods or acts generally accepted in the region.

(s) Health: Means a state of complete physical and mental well being, not merely the absence of disease or infirmity. This definition was adapted from the World Health Organization definition of health in "Guidelines for Community Noise", pages 19 and 20.

(t) Height: Means the total distance measured from the grade of the property as existed prior to the construction of the wind energy system, facility, tower, or related facility at the base to its highest point.

(u) Hertz (Hz): Frequency of sound expressed by cycles per second.

(v) High Voltage Electrical Termination: Means connecting of conductors to a device or system where the voltage exceeds 600 volts.

(w) HUB Height: Means the distance to the center of the wind turbine hub as measured from ground level.

(x) Impulsive Sound refers to short-term acoustical impulses typically lasting less than one second each. It may be the only sound emitted from a noise source or it may be a component of a more complex sound. For evaluation of wind turbines, impulsive sound includes swishing or thumping sounds.

(y) INCE: Means Institute of Noise Control Engineers. The Institute of Noise Control Engineering of the USA ("INCE/USA") is a non-profit professional organization incorporated in Washington, DC. A primary purpose of the INCE/USA is to promote engineering solutions to environmental, product, machinery, industrial and other noise problems. INCE/USA is a Member of the Society of the International Institute of Noise Control Engineering, an international consortium of organizations with interest in acoustics and noise control.

(z) Infra-Sound: Means sound with energy in the frequency range of 20 Hz and below is considered to be infrasound and is normally considered to not be audible unless in relatively high amplitude. The most significant exterior noise-induced dwelling vibration occurs in the frequency range between 5 Hz and 50 Hz. Moreover, even levels below the threshold of audibility can still cause measurable resonances inside dwelling interiors. Conditions that support or magnify resonance may also exist in human body cavities and organs under certain conditions, although no specific test for infrasound is provided in this document, its presence will be accounted for in the comparison of dBA and dBC sound levels for the complaint test provided later in this document. See low-frequency sound (LFN) for more information.

(aa) Inoperable: A WECU shall be determined inoperable if it has not generated power within the preceding two calendar quarters equal to at least 60% of the expected production.

(bb) Livestock Facility: Means a confinement area designed specifically for raising, controlling, feeding, and providing care for livestock. This may include but is not limited to: dairy barns, pastures, feedlots, free stall barns, calf hutches, horse barns, veal barns, feed storage areas, brooder and laying barns, farrowing and finishing barns, place for veterinary care.

(cc) Low Frequency Sound (LFN) refers to sounds with energy in the lower frequency range of 20 to 200 Hz. LFN is deemed to be excessive when the difference between a C-weighted sound pressure level and an A-weighted sound pressure level is greater than 20 decibels at any measurement point outside or inside a noise sensitive receptor site, residence, or other occupied structure. E.G. C-A>20 dB.

(dd) Measurement Point (MP): Means location where sound and/or vibration measurements are taken such that no significant obstruction blocks sound and vibration

from the site. The Measurement Point should be located so as to not be near large objects such as buildings and in the line-of-sight to the nearest turbines. Proximity to large buildings or other structures should be twice the largest dimension of the structure, if possible.

(ee) Measurement of Wind Speed: For measurements conducted to establish the background sound pressure levels (dBA, dBC, L90 10 min, and etc.) the wind speed at the microphone's Measurement Point shall average 2 m/s (4.5 mph) or less for valid background measurements. For valid measurements conducted to establish the post-construction sound level the wind speed at the microphone's Measurement Point shall not exceed 4 m/s (9 mph) average and the wind speed at the WECS blade height shall not be at or above the nominal rated wind speed. For purposes of enforcement, the wind speed and direction at the WECS blade height shall be selected to reproduce the conditions leading to the enforcement action while also restricting wind speeds at the microphone to 4 m/s (9 mph).

(ff) Mechanical Noise: Means sound produced as a byproduct of the operation of the mechanical components of a WECS(s) such as the gearbox, generator and transformers.

(gg) Meteorological Tower: Means a tower used for the measurement of wind speed and direction, also known as a MET tower or wind test tower.

(hh) NFPA: Means the National Fire Protection Association.

(ii) Noise: Means any unwanted sound. Not all noise needs to be excessively loud to represent an annoyance or interference.

(jj) Non-Participating Parcel: Means a parcel of real estate that is neither a Project Parcel nor a Participating Parcel.

(kk) Occupied Structure: Means a building in which people live, work or frequent.

(ll) Operator: Means the person who is designated on the license application to be the person in charge of daily operation of the premises and who is to be the Wind Energy Conversion System contact person for the Town.

(mm) Participating Parcel: Means a parcel of real estate that is not a Project Parcel, but is subject to an agreement between the owner and applicant allowing the construction of all or part of a WECS closer to a Participating Parcel property line or structure on the Participating Parcel than would be permitted under the Ordinance in the absence of such an agreement. To qualify as a Participating Parcel, the agreement between the owner and the applicant must be approved by the Town Board under the Ordinance.

(nn) Person: Means an individual, proprietorship, corporation, association, limited liability entity, or other legal entity.

(oo) Project Boundary: Means the boundaries of the WECS as shown on the site plan submitted to and approved by the Town in accordance with the Ordinance.

(pp) Project Parcel or Project Parcels: Means the parcel or parcels of real estate on which all or any part of a WECS will be constructed.

(qq) Property Line: Means the recognized and mapped property parcel boundary line.

(rr) Pure Tone: A sound for which the sound pressure is a simple sinusoidal function of the time, and characterized by its singleness of pitch. Pure tones can be part of a more complex sound wave that has other characteristics.

(ss) Qualified Independent Acoustical Consultant: Qualifications for persons conducting baseline and other measurements and reviews related to the application for a WECS or for enforcement actions against an operating WECS include, at a minimum, demonstration of competence in the specialty of community noise testing and Full Membership in the Institute of Noise Control Engineers (INCE). Certifications such as Professional Engineer (P.E.) do not test for competence in acoustical principles and measurement and are thus not, without further qualification, appropriate for work under this Ordinance. The Independent Qualified Acoustical Consultant can have no direct or indirect financial or other relationship to an Application.

(tt) Related Equipment: Means transformers, tower, electrical conductors, termination points, switches, fences, substations, and any other related equipment necessary to operate a WECS.

(uu) Residences & Other Buildings: Means all private residences and businesses located 2640 feet (1/2 mile), measured from the foundation of an existing residence or business to the outermost edge of the closest of the circular path of the wind turbine rotor blade of a WECS, further providing for a non-participating land owner who has applied for a building permit on or before a full and complete application is submitted to the Town Board per Section V of the ordinance's Standards, Guidelines and Rules.

(vv) Sensitive Environmental Area: Means an identified habitat for threatened or endangered species, or another designated environmentally significant area as identified by Town, county, state or federal officials.

(ww) Sensitive Receptor: Means places or structures intended for human habitation or occupied structures, whether inhabited or not, public parks, state and federal wildlife areas, the manicured areas of recreational establishments designed for public use, including but not limited to golf courses, camp grounds and other state or federal licensed businesses. These areas are more likely to be sensitive to the exposure of the noise, vibration, shadow or flicker, etc. generated by a WECS or WESF. These areas include, but are not limited to: schools, daycare centers, elder care facilities, hospitals, places of seated assemblage, and other businesses and residences. Any parcel of land having a valid building or sanitary permit on file on the date of the issue of the Wind Energy

Conversion system permit, as well as vacant land zoned residential, shall be treated the same as any existing sensitive receptor.

(xx) Shadow Flicker: Means the effect when the blades of an operating wind energy conversion unit pass between the sun and an observer, casting a readily observable, moving shadow on the observer and his/her immediate environment.

(yy) Small Wind Energy System: 110 feet total height, and less than 100 kilowatts.

(zz) Sound.: A fluctuation of air pressure which is propagated as a wave through air.

(aaa) Sound Power: The total sound energy radiated by a source per unit time. The unit of measurement is the watt. Abbreviated as Lw. This information is determined for the WECS manufacturer under laboratory conditions specified by IEC 61400-11 and provided to the local developer for use in computer model construction. It cannot be assumed that these values represent the highest sound output for any operating condition. They reflect the operating conditions required to meet the IEC 61400-11 requirements. The lowest frequency is 50 Hz for acoustic power (Lw) requirement in IEC 61400-11. The ordinance's Standards, Guidelines and Rules requires wind turbine certified acoustic power (Lw) levels at rated load for the total frequency range from 6.3 Hz to 10k Hz in one-third octave frequency bands tabulated to the nearest 0.1 dB. The frequency range of 6.3 Hz to 10k Hz shall be used throughout this Ordinance for all sound levels modeling, measuring and reporting.

(bbb) Sound Pressure: The instantaneous difference between the actual pressure produced by a sound wave and the average or barometric pressure at a given point in space.

(ccc) Sound Pressure Level (SPL): 20 times the logarithm, to the base 10, of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micro-newtons per square meter. In equation form, sound pressure level in units of decibels is expressed as SPL (dB) = 20 log p/pr.

(ddd) Spectrum: The description of a sound wave's resolution into its components of frequency and amplitude. The WECS manufacturer is required to supply a one-third octave band frequency spectrum of the wind turbine sound emission at 90% of rated power. The published sound spectrum is often presented as A-weighted values. This information is used to project the wind systems sound levels at all locations of interest. Confirmation of the projected sound spectrum can be determined with a small portable one-third octave and frequency (spectrum) analyzer. The frequency range of interest for wind turbine noise is approximately 10 Hz to 10k Hz.

(eee) Statistical Noise Levels: Sounds that vary in level over time, such as road traffic noise and most community noise, are commonly described in terms of the statistical exceedance levels LAN, where LAN is the A-weighted sound pressure level exceeded for N% of a given measurement period. For example, L10 is the noise level exceeded for

10% of the time. Of particular relevance, are: LA10 and LC10 the noise level exceeded for 10% of the ten (10) minute interval. This is commonly referred to as the average maximum noise level. LA90 and LC90 is the noise level exceeded for 90% of the ten (10) minute sample period. The L90 noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level. Leq is the frequency-weighted equivalent noise level (basically the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

(fff) Stray Voltage (Ground Current): Means neutral-to-earth voltage measured from the electrical system neutral and/or any structure bonded to this neutral to earth that adversely affects humans or animals.

(ggg) Structures: Means residences, livestock facilities, communication towers, commercial businesses, and all sensitive receptors.

(hhh) Tonal Sound (sometimes referred to as Pure Tone): A sound for which the sound pressure is a simple sinusoidal function of the time, and characterized by its singleness of pitch. Tonal sound can be simple or complex.

(iii) Total Height: Means the distance between the ground at normal grade and the highest point of the installed WECS (being the tip of the blade when the blade is in the full vertical position).

(jjj) Wind Energy Conversion System (WECS): Means all WECUs, related transformers, electrical conductors substations, and connection points to transmission or distribution lines.

(kkk) Wind Energy Conversion System Facility or Facility: Means all of the land and equipment used by the wind energy conversion system and its support facilities including the wind turbine, tower, access roads, control facilities, meteorological towers, maintenance and all power collection and transmission systems.

(lll) Wind Energy Conversion Unit (WECU): Means a wind driven machine with an output rating greater than 100 kilowatts (kW) and with a total height of greater than 110 feet that converts wind energy into electrical power for the primary purpose of sale, resale, or off-site use. The WECU includes the tower, turbine, footings, and all equipment associated with individual units including the land beneath encompassing the equivalent area of the circumference of the rotors. Also known as a Wind Turbine.

(mmm) Wind Energy Systems (WES): Means equipment that converts and then transfers energy from the wind into usable forms of energy on a large, industrial scale for commercial or utility purposes.

(nnn) Wind Energy Conversion System Facility or Facility or WESF: Means all of the land and equipment used by the Wind Energy System and its support facilities including

the wind turbine, tower, access roads, control facilities, meteorological towers, maintenance and all power collection and transmission systems.

(ooo) Wind Energy Systems Facility License or WESF License: Means a license to construct and operate a Wind Energy System issued by the Town of Holland in accordance with the Ordinance.

(ppp) Windmill: Means a wind-driven machine that does not produce electricity.

(qqq) Wind Test Tower: Means the tower on which meteorological equipment is located to measure wind speed, direction, strength, etc., for the purpose of evaluating a potential for WECS siting.

(rrr) Wind Turbine or Turbine (WTi): Means a mechanical device which captures the kinetic energy of the wind and converts it into electricity. The primary components of a wind turbine are the blade assembly, electrical generator and tower.

(sss) WDNR: Means the Wisconsin Department of Natural Resources.

IV. LICENSE OR PERMIT REQUIRED

A. (1) No WECS greater than 110 feet in height shall be constructed, operated, or maintained in the Town of Holland without a license issued by the Town of Holland Town Board. Each application for a license to erect a WECS greater than 110 feet in height shall be reviewed on a case-by-case basis by the Town and the Town Board before issuing a license. The license fee for each WECS greater than 110 feet in height shall be calculated at the rate of $2,500.00 per wind turbine proposed in each WECS.

(2) No WECS of 110 feet in height or less, and less than 100 kilowatts shall be constructed, operated, or maintained in the Town of Holland without a conditional use permit issued by the Town of Holland Plan Commission. Each application for a license to erect a WECS of 110 feet in height or less and less than 100 kilowatts, shall be reviewed on a case-by-case basis by the Town Plan Commission and the Town Board before issuing a conditional use permit. The conditional use permit fee for each WECS of 110 feet in height or less or less and less than 100 kilowatts shall be calculated at the rate of $100.00 per wind turbine proposed in each WECS.

B. Effect of Other Licenses. The fact that an applicant possesses any other valid license or permit required by law does not exempt the applicant from the requirement from obtaining a WECS license under the ordinance.

C. Non-Assignment. A license issued under the ordinance may not be assigned or transferred to any other Person than the Licensee, without the express prior written consent of the Town. Such consent shall not be unreasonably withheld within 1 year after issuance of a license, provided the Licensee and the Person who the license is

proposed to be assigned or transferred to shall both submit affidavits to the Town demonstrating the following:

1. The new person who will hold the license wholly owns the new entity.

2. The new entity is properly formed and authorized to do business in the state of Wisconsin.

3. The written assignment requires the new entity to assume all of the Licensee's rights, duties and obligations under the License including but not limited to the letter of credit requirements and the certificate of insurance requirements.

V. LICENSE APPLICATION PROCEDURE FOR WECS

A. Application. Any person desiring to secure a WECS license or WECS conditional use permit from the Town shall file a complete application, together with two additional copies, with the Town Clerk. The application shall be on a form approved by the Town Board and shall be provided to the applicant by the Town Clerk.

B. Required Information. The following information shall be required of each Applicant for a large WECS and shall be provided with the application. The Person(s) filing the application shall sign it under oath of affirmation as witnessed by a Notary Public:

1. Name, address, and phone number of Applicant(s).

2. If the Applicant is a corporation, partnership, limited liability company, limited liability partnership, or other entity recognized by law, the application shall include: the name of the business entity; the date of incorporation, registration of organization; the state in which the entity was incorporated, registered or organized; the name and address and home phone numbers of the registered agent(s) where applicable; the names and addresses of all officers and directors; operating or managing partners or general partners, managing members or managers, whichever is applicable for the particular form of business entity.

3. Name and address of any other current or past WECS developed or operated by the Applicant, whether in the State of Wisconsin or any other state or nation.

4. Name, address and phone number of the individual(s) responsible for the day-to-day operation of the proposed WECS, who will be deemed the Operator for purposes of this section, and who will be the contact Person for the Town.

5. Evidence that the applicant is the owner of the underlying real estate and other property necessary for the WECS project or that the Applicant has the written permission of the owner(s) of such real estate and other property to make such an Application.

6. A signed statement by the underlying landowner(s) acknowledging that the landowner(s) will be financially responsible if the owner/operator fails to reclaim the site as required, and that any removal and reclamation costs incurred by the Town shall become a lien on the real estate and other property and may be collected from the landowner(s) in the same manner as property taxes.

7. A statement that the Applicant is familiar with, and in compliance with, the provisions of the ordinance, including the responsibility to reimburse all reasonable costs and professional fees associated with the processing, examination and analysis of the application for a license and such further expenses associated with monitoring the WECS and enforcing the terms of the license.

8. Proof of continuous liability in the minimum amount of five million dollars (5,000,000.00) per occurrence shall be submitted to the Town of Holland indicating coverage for potential damages or injury to landowners, occupants, Town property and Town roads, and other third parties. The Town shall be named as an additional insured on the policy.

C. Additional Information. Each Application for a large WECS shall be accompanied by:

1. Detailed Site Plan. A site plan which meets all the requirements of this Section and applicable provisions of the County Zoning Code pertaining to Land Use Permits, as well as any additional site specific requirements of the Town in accordance with the technical requirements in the ordinance's Standards, Guidelines and Rules. Each application shall be accompanied by a site plan showing the location of the proposed WECS Tower Site(s), including:

a. Total acreage occupied by the facility.

b. A detailed map of the area showing parcel boundaries and individual Wind Turbine locations and their distances to existing structures;

c. Existing structures and proposed facilities;

d. Location of existing and proposed transmission lines, substations, driveways, access and maintenance roads, etc. All proposed electric transmission and distribution lines shall be shown and shall be placed underground;

e. Location of meteorological or wind testing towers; and the location of wells, abandoned and active, within a half mile radius of the project boundary.

2. Specific Information. The applicant shall provide specific information on WECS including:

a. The type, size, total installed height, rotor material, rated power output, performance history, safety history, and noise characteristics of each type of WECU, tower and electrical transmission equipment. Identify the length of service of the proposed components.

b. A structural safety certificate shall be provided by a professional engineer stating that the structure is of new construction and not refurbished or rebuilt and has been designed to operate in cold weather conditions and is safe.

c. Photographs or detailed drawings of each wind turbine model including the tower and foundation. Provide design and specifications for all proposed structures and foundations. (Foundation at and around the tower base shall be designed so that no surface water or runoff can access subsurface aquifer at any time during construction, operation or decommissioning.)

d. Detailed computer and photographic simulation(s) overlaid on the existing environment showing the proposed WECS project area fully developed with all proposed wind energy conversion units and related facilities. The format shall be subject to the approval of the Town.

3. Timeline. The applicant shall provide a proposed timeline showing all aspects of construction with a starting and final completion date.

4. Affected Property Owners. The applicant shall submit the name and address of property owners within WECS setback areas. Considering that development rights of adjacent property owners may be forfeited due to these setbacks as per this ordinance, a written agreement for non-development within the specified setback must be obtained and recorded on the affected properties' deeds. Copies of the agreements must be submitted with the application.

5. Impermissible Interference Notification. The applicant shall deliver by certified mail or by hand a notice to the owner of any property, which the applicant proposes to be restricted by the permit. The applicant shall submit to the Town of Holland a copy of a signed receipt for every notice delivered in addition to the following information:

a. The name and address of the applicant, and the address of the land upon which the WECU is or will be located.

b. That the applicant has filed an application.

c. That the permit, if granted, may affect the rights of the notified owner to develop his or her property and to plant vegetation.

d. That any person may request a hearing within 30 days after receipt of the notice, and the address and procedure for filing the request.

6. Wind Access Agreements. Evidence (a signed statement from the applicant and countersigned by the landowner) that the applicant has negotiated with adjacent landowners and has obtained written agreements with all landowners whose wind rights may be affected by the WECU or who could otherwise potentially interfere with the applicant's wind access.

7. Easements, Leases & Property Rights. The applicant shall submit copies of signed letters of intent to grant easements, long-term leases or other property rights from all involved landowners and any governmental units responsible for right-of-ways for access, construction, electric transmission and distribution lines, etc.

8. Notifications. The applicant shall notify the following agencies, via certified mail upon submitting an Application to the Town. Copies and proof of delivery shall be provided to the town:

a. Federal Aviation Administration;
b. Wisconsin Bureau of Aeronautics;
c. County Emergency Services Agencies;
d. Local Fire Departments;
e. County Planning & Zoning and Land Records Departments;
f. County Highway Department;
g. County Sheriff's Department;
h. Local School districts;
i. Local Utilities and Electric Cooperatives;
j. Public Service Commission of Wisconsin;
k. Wisconsin Department of Natural Resources; and
l. U.S. Department of Defense facilities located within 50 miles of the proposed WECS.
m. National Weather Service

9. Wind Study. A study documenting minimum, maximum, and average wind speeds and prevailing wind directions over the course of one year. Anemometers shall be calibrated regularly to ensure a measurement of error of 1% or less. All anemometers shall be placed at the expected hub height of the proposed wind turbines. Sufficient wind resources, as described by the U.S. Department of Energy, include areas with a wind power class 4 or higher. The Town shall retain the services of an independent, recognized expert to review the results of the wind resources study prior to acting on the application. Said study shall indicate the long-term commercial economic viability of the proposed WECS project.

10. Critical Communications. The applicant shall provide a critical communication study prepared by a registered professional engineer showing that the proposed WECS will not interfere with emergency (fire, police/sheriff, ambulance) radio two-way communications (base stations, mobile, and hand held radios, including digital), paging television, telephone (including cellular and digital), microwave, satellite (dish), navigational, weather forecasting facilities, internet or radio reception communications to and from neighboring areas. The applicant shall provide a signed affidavit stating that the

applicant shall be responsible for the full cost of any removal of WECS facilities and any other remediation necessary to correct any problems including relocation or removal of WECS facilities and any and all related electric transmission lines, transformer, and other components related thereto. The applicant shall maintain equivalent communications throughout the life of the WECS even as future technologies may change.

11. Sound Modeling, Sound Standards and Sound-related Enforcement Procedures.

a. *Applicant's Pre-licensing Sound Studies and Modeling.* An application for a WECS license shall include a sound prediction model that includes the information and meets the requirements in chapter V, and in the Appendix to this ordinance:

Information regarding the make and model of the turbines, sound Power levels (Lw) for each one-third octave band from 6.3 Hz up through 10,000 Hz, and a projection showing the expected dBA and dBC sound levels computed using the one-third octave band sound power levels (Lw) with appropriate corrections for modeling and measurement accuracy tolerances and directional patterns of the WTi for all areas within and to one (1) mile from the project boundary for the wind speed, direction and operating mode that would result in the worst case WTi sound emissions.

The prediction model shall assume that the winds at hub height are sufficient for the highest sound emission operating mode even though the enforcement test will be with ground level winds of 10 mph or less. This is to accommodate enforcement under weather conditions where there is significant difference in the wind speed between ground and hub heights. This condition often occurs during summer evenings when wind shear is affected by the reduction in solar heating of the earth's surface between sunset and sunrise.

The projection may be by means of computer model but shall show history of accuracy and include a description of all assumptions made in the model's construction and algorithms. If the model does not consider the effects of wind direction, geography of the terrain, and/or the effects of reinforcement from coherent sounds or tones from the turbines these should be identified and other means used to adjust the model's output to account for these factors. These results may be displayed as a contour map of the predicted levels, but should also include a table showing the predicted levels at noise-sensitive receptor sites and residences within the model's boundaries. The predicted values must include dBA and dBC values but shall also include un-weighted octave band sound pressure levels from 8 Hz to 10k Hz in data tables.

The Town will refer the applicant's information and sound studies to an engineer designated by the Town (if qualified in acoustics) or a Qualified Independent Acoustical Consultant for review and a determination whether the proposed WECS will, based on pre-licensing studies and sound modeling, comply with the sound limits set forth in the Ordinance.

b. *Independent Pre-licensing Sound Modeling*. In any case in which a WECS is located within one mile of a sensitive receptor the Town shall, and in other cases the Town may, require the preparation of an independent preconstruction noise study for each proposed Wind Turbine location conducted by a Qualified Independent Acoustical Consultant, in accordance with the procedures provided in this section and in the Appendix showing background dBA and dBC sound levels (L90 (10 min)) over one or more valid ten (10) minute continuous measurement periods. The preconstruction baseline studies shall be conducted by an Independent Qualified Acoustical Consultant selected by the Town. The Qualified Independent Acoustical Consultant shall be selected and retained by the Town. The applicant shall be responsible for paying the Independent Qualified Acoustical Consultant's fees and all costs associated with conducting the study. The applicant shall provide financial security and reimburse the Town for the cost of the study in accordance with chapter XIII of the ordinance's Standards, Guidelines and Rules.

c. *Sound Study and Measurement Requirements*.

1. All instruments must meet ANSI or IEC type 1 Precision integrating sound level meter performance specifications.

2. Procedures must meet ANSI S12.9 Part 3 including the addendum in the Appendix to this document. Where there are differences between the procedures and definitions of this document and ANSI standards, the procedures and definitions of this document shall be applied. Where a standard's requirements may conflict with other standards the most stringent requirement shall apply.

3. Measurements for background sound levels shall be made when ground level winds are 2 m/s (4.5 mph) or less with wind speeds at the hub at or above nominal operating requirements and for other tests when ground level winds are 4 m/s (9 mph). Weather in the night often results in low ground level wind speed and nominal operating wind speeds at wind turbine hub heights.

4. IEC 61400-11 procedures are not suitable for enforcement of these requirements except for the presence of tones.

d. *Post-construction Sound Measurements.*

Within twelve months after the date when the project is fully operational, and within four weeks of the anniversary date of the pre-construction background noise measurements, the Licensee shall repeat the existing sound environment measurements taken before the project approval. Post-construction sound level measurements shall be taken both with all WECUs running and with all WECUs off. At the discretion of the Town, the preconstruction background sound level (L90A) can be substituted for the "all WECS off" tests if a random sampling of 10% of the pre-construction study sites shows that background L90A and C conditions have not changed more than +/- 5 dB (dBA and dBC) measured under the preconstruction nighttime meteorological conditions. The post-construction measurements shall be reported to the Town (and available for public

review) using the same format as used for the preconstruction sound studies. Post-construction noise studies shall be conducted by a firm chosen by the Town. Costs of these studies shall be reimbursed by the Licensee. The security required by chapter V shall include these costs. The Licensee's consultant may observe the Town's consultant. The WECS Licensee shall provide all technical information and wind system data required by the Independent Qualified Acoustical Consultant before, during and/or after any acoustical studies required by this document and for local area acoustical measurements.

12. Shadow Flicker and Blade Glint Assessment and Requirements. Shadow Flicker occurs when the blades of a Wind Turbine pass between the sun and an observer, casting a readily observable, moving shadow on the observer and his or her immediate environment. An application for a WECS license shall include a detailed shadow flicker and blade glint assessment model and plan containing the following information and meeting the following requirements.

a. The model shall be prepared by a registered professional regularly engaged in this type of work with not less than three years experience.

b. The model study area will examine areas where shadow flicker will occur within a one mile radius of the Project Parcels.

c. The model will be calculated using the following minimum inputs:

1. Turbine locations (proposed and existing)
2. Shadow flicker receptor locations
3. Existing topography (elevation contours and vegetation)
4. Rotor diameter and hub height
5. Joint wind speed and direction distribution (wind rose table)
6. Hours of sunshine (long term monthly references)

d. All existing occupied structures, structures permitted for construction and roadways shall be identified within the model as receptors. Each individual receptor that is a residential parcel shall be defined by the perimeter of the building plus an additional 100 foot boundary around the building. Schools, churches, and other public building receptors shall be defined by the entire outdoor area routinely utilized in their operation.

e. The model may be prepared by use of current aerial photography and topographical maps. A site visit by the preparer is required to identify receptors and verify the existing conditions.

f. The model shall calculate the locations and durations of shadow flicker caused by the proposed WECS within the study area. The model shall clearly indicate the duration of shadow flicker at each receptor and across the entire study area showing the total number of hours per year anticipated.

g. Problem zones where shadow flicker will interfere with existing and future receptors and which is not allowable under this section shall be identified, and measures to mitigate problems shall be described, including but not limited to siting changes, operational procedures, grading or landscaping.

h. Blade glint, defined as the intermittent reflection of the sun off the surface of the blades of a Wind Turbine, is prohibited. The applicant shall submit a paint sample that demonstrates the color, texture and gloss of the proposed surface coating. The applicant shall also submit a certification by the manufacturer stating that the proposed surface coating will not create a reflective surface conducive to blade glint.

13. Ice Throw Calculations. A report from a Wisconsin professional engineer that calculates the maximum distance that ice from the turbine blades could be thrown. The basis of the calculation and all assumptions must be disclosed. The report shall be prepared by a qualified person on behalf of the applicant, and shall be reviewed and approved by an independent consultant selected by the Town Board, at the applicant's expense, prior to review and approval of the Application.

14. Blade Throw Calculations. A report from a Wisconsin professional engineer that calculated the maximum distance pieces of the turbine blades could be thrown. The report shall be prepared by a qualified person on behalf of the applicant, and shall be reviewed and approved by an independent consultant selected by the Town Board, at the Applicant's expense, prior to review and approval of the Application.

15. Ground Water. An environmental study specifically indicating the impact the project will have on the groundwater beneath and in the vicinity of the proposed Wind Turbine sites. If a Wind Turbine foundation is proposed in a bedrock area, a baseline of all wells and certified public drinking sources in a half-mile radius shall be established and provided to the Town as part of the application. The study shall be prepared by a qualified person on behalf of the applicant, and shall be reviewed and approved by an independent consultant selected by the Town board, at the Applicant's expense, prior to review and approval of the Application.

16. Road Use and Risk Assessment Plan and Road Impact Requirements.

a. An application for a WECS License shall include a road use and risk assessment plan containing the following information and meeting the following requirements:

1. A description and map of all public roads in the Town to be used in connection with the construction of the WECS, including a description of how and when such roads will be used in connection with the construction of the WECS.

2. A description of the type and length of vehicles and type, weight and length of loads to be conveyed on all public roads in the Town.

3. A complete assessment of the proposed use of roads in the Town in connection with the construction of the WECS, including the adequacy of turning radii; the ability of the roads to sustain loads without damage; the need to remove (permanently or temporarily) signs, trees, utilities, or anything else; any reasonably foreseeable damage to roads or other property; any reasonably foreseeable costs the Town may incur in connection with the use of roads in the Town, including but not limited to costs relating to traffic control, public safety, or damage to roads or property. The pre-construction inventory of road conditions shall be performed by a Wisconsin certified professional engineer.

4. A traffic control and safety plan relating to the use of roads in the Town in connection with the construction of the WECS.

5. Any additional information the Town may request relating to the use of roads in the Town in connection with the WECS.

6. Applicant shall abide by all Town, county and state laws and ordinances that may affect travel and/or ingress or egress to the WECS facilities.

b. The Town will evaluate the road use and risk assessment plan with assistance from such consultants it deems appropriate. The Town may document the condition of all roads to be used in connection with the construction of the WECS in such a manner as it deems appropriate. The Town may require changes to the road use and risk assessment plan it deems appropriate to protect public safety, to protect Town roads, and to address anticipated costs to the Town associated with applicant's use of roads in the Town.

c. The Town may require the applicant to enter into an agreement relating to the use of roads in the Town. The Town may require the applicant to provide a deposit, joint escrow account, or surety bond in an amount the Town determines appropriate to secure any obligations under the agreement, including but not limited to any obligation relating to alterations or improvements to roads needed in connection with applicant's use of roads in the Town, and the reimbursement of the Town for any costs the road use and risk assessment indicates the Town may incur in connection with applicant's use of the roads in the Town.

17. Soils Report. A geotechnical report that shall at a minimum include the following:

a. Soils engineering and engineering geologic characteristics of the site based on on-site sampling and testing;

b. Slope stability analysis;

c. Grading criteria for ground preparation, cuts and fills, soil compaction; and

d. Certification from a registered geotechnical engineer that the soils can support a WECS.

18. Site Preparation & Erosion Control. The applicant shall submit the following:

a. A site preparation plan that has been approved by the County Land Conservation Department. The plan shall show planned storage and retention of topsoil, and all types of subsoil for later site restoration.

b. A construction site erosion plan and storm water runoff control plan that has been approved by the County Land Conservation Department. The plan shall comply with all state statutes and county ordinances. The plan shall be prepared so as to minimize the potential adverse impacts on sinkholes, wetlands, streams and the banks and vegetation along those streams and wetlands, and to minimize erosion or sedimentation.

19. Hazardous Waste. A plan shall be submitted showing compliance with all laws applicable to the generation, storage, clean up, transportation and disposal of hazardous wastes generated during any phase of the proposed WECS life.

20. Fire Prevention and Emergency Response Plan and Requirements. An application for a WESF License shall include a fire prevention and emergency response plan containing the information and meeting the requirements in this section. This plan shall identify potential fire, rescue, and hazardous materials scenarios over the life of the WECS. The plan shall describe the potential fire and emergency scenarios that may require a response from fire, emergency medical services, police or other emergency responders. The plan shall designate the specific agencies that would respond to potential fire or other emergencies, shall describe all emergency response training and equipment needed to respond to a fire or other emergency, shall include an assessment of the training and equipment available to the designated agencies, and shall provide for any special training or emergency response equipment that the designated agencies need to use in responding to a potential fire or other emergency at applicant's cost. The applicant shall submit a plan to outline preventative measures and to train and fund fire and rescue personnel to ensure readiness and appropriate response.

21. Stray Voltage Assessment and Requirements.

a. An application for a WECS License shall include reports of stray voltage analyses in accordance with this section. The applicant shall conduct and include a report of a preconstruction stray voltage test on all livestock facilities and occupied structures located within a one-mile radius of the Project Parcels. The tests shall be performed by a Wisconsin certified stray voltage investigator approved by the Town. The tests shall be performed according to PSCW Phase II Stray voltage Testing Protocol. A report of the tests shall be provided with the WECS License application and shall be provided to the owners of all property included in the study area. Applicant shall seek written permission from property owners prior to conducting testing on such owners' property. Applicant shall not be required to perform testing on property where the owners have refused to grant permission to conduct the testing.

b. Following construction of the WECS, the applicant shall conduct a post-construction stray voltage test on all livestock facilities located within a one-mile radius of the Project Parcels. The tests shall be performed by a Wisconsin certified stray voltage investigator approved by the Town. The tests shall be performed according to PSCW Phase II Stray Voltage Testing Protocol. A report of the tests shall be provided to the Town and to the owners of all property included in the study area. Applicant shall seek written permission from property owners prior to conducting testing on private property. Applicant shall not be required to perform testing on property where the owners have refused to grant permission to conduct the testing.

22. Lighting Plan. The applicant shall provide a plan showing lighting on and around all WECUs and related facilities. Lighting on WECUs shall be lit to FAA minimal standards only using red rather than white lights, if possible. Lighting shall be shielded from ground view to FAA maximum standards.

23. Avian and Bat Impact Study Plan. The applicant shall submit a plan for monitoring the avian and bat impact of the WECS to the Town for its review and approval. Such plan shall document and follow accepted scientific study procedures. In addition, the applicant shall submit a quarterly report to the Town which identifies the number of bird and bat fatalities found within 500 feet of all WECS facilities.

24. Abandonment, Removal and Site Restoration Plan. The applicant shall submit an abandonment, removal and site restoration plan, along with a cost estimate for removal and site restoration, to the Town with the application. The plan shall identify the specific properties it applies to and shall indicate the timeline and process to be used for removal of all materials above and below ground; road repair costs, if any; and all re-grading and re-vegetation necessary to return the subject property to the condition existing prior to establishment of the WECS. The plan shall reflect the site-specific character including topography, vegetation, drainage, and any unique environmental features at the site. The plan shall reflect any standards set forth in this ordinance and shall include a certified estimate of the total cost (by element) of implementing the removal and site restoration plan.

25. Application Fees & Security. The following fees and financial security guarantees shall be paid to the Town by the applicant:

a. Application, Legal and Consultant Fees. The applicant shall pay an application fee of $1,000 to the Town upon filing an application under the ordinance. In addition ,within (14) days of filing an application the applicant shall deposit in a joint escrow account with the Town the sum of $25,000, as partial payment for the appropriate Town expenses in hiring consultants and experts, as these authorities shall, at their discretion, deem desirable. At any time the balance of this fund shall fall below $15,000, the applicant shall submit an additional $15,000 so that the Town's full and actual expenses of examining and verifying the data presented by the applicant shall be paid in full by the applicant. If at any time the balance of this fund shall fall below $15,000 for a period of 30 days, the application shall be considered to have been withdrawn. The balance of the

escrow account, after all the Town's expenses have been paid, shall be returned to the owner/operator after the decommissioning process is complete.

b. Town Road Repair. An amount to be determined by the Town Board, to be used as security for Town road maintenance and repair, shall be deposited in a joint escrow account with the Town within (14) days of approval of a license under the ordinance. When determining the amount of such required security, the Town may require an annual escalator or increase based on current construction costs and/or the Federal Consumer Price Index. This security shall be kept in full force and effect during the entire time a WECS is in existence and shall be used to maintain roads during the construction, maintenance and decommissioning of the WECS facility. Such security shall be irrevocable or non-cancelable (except by written consent by both the Town Board and the owner of the WECS) for the life of the approved license. Failure to comply will subject the applicant to revocation of the license.

c. Site Reclamation. Advance payment for WECS site reclamation and restoration shall be placed in a joint escrow account or surety bond, the amount to be determined by the Town Board. Said amount shall be sufficient to fully remove the WECS and all components thereof. Such financial security shall be kept in full force and effect during the entire time while a WECS facility exists or is in place. This financial security shall be irrevocable and non- cancelable until such time as the Town Board certifies that reclamation and restoration are complete and release the obligation.

d. Decommissioning. An appropriate continuous renewal bond amount shall be established in an amount determined by the Town Board before construction starts for each Wind Turbine in a sum for the reasonable cost of decommissioning should the Owner/Operator fail to comply with the Ordinance requirements or if a Wind Turbine is inoperable for a period of six (6) consecutive months. The amount of the bond may be raised if at any time during the existence of the license it is determined by the Town Board the sum is insufficient for the cost of decommissioning. The owner will be given reasonable notice of any resolution to change before the change in bond is made.

VI. LICENSING PERMIT PROCEDURE

A. Notice & Procedure.

1. Upon receipt of an application for approval, the Town of Holland shall determine whether it is complete and, no later than 45 days after the application is filed, shall notify the applicant about the determination. As soon as possible after receiving the application for approval the Town of Holland shall publish a class 1 notice, under ch. 985, stating that an application for approval has been filed with the Town. If the Town of Holland determines that the application is incomplete, the notice shall state the reason for the determination. An applicant may supplement and refile an application that the Town has determined to be incomplete. There is no limit on the number of times that an applicant may refile an application for approval. If the Town of Holland fails to determine whether an application for approval is complete within 45 days after the application is

filed, the application shall be considered to be complete. A public hearing upon the application shall be held prior to the deliberation meeting. Within 90 days of determining the application is complete, the Town Board shall approve or disapprove the application unless extended under Paragraph 3 below. The deliberation meeting shall be noticed to the applicant and the public at least five (5) days prior to the deliberation meeting. The Town Board may have the assistance of legal counsel at the public hearing and the deliberation meeting.

2. On the same day that an applicant makes an application for approval under this section for a wind energy system, the applicant shall mail or deliver written notice of the application to the owners of land adjoining the site of the wind energy system. A list of these landowners and proof of written notice to each shall be provided to the Town Board.

3. The 45-day and 90-day deadlines may be extended in writing for up to 90 days. The Town Board may grant:

(a) An extension of up to 45 days if the Town Board needs additional information to determine whether to approve or deny the application for approval.

(b) An extension of up to 90 days if the applicant makes a material modification to the application for approval.

(c) An extension of up to 90 days for other good cause specified in writing by the Town Board.

B. **Decision on Application.** The Town Board shall approve an application and grant a WECS license if it determines that the requirements of the ordinance have been and shall be met by the applicant, and granting the license will not adversely affect public health and safety. The Town Board may include conditions in the license which go beyond the minimum regulations set forth herein, if the conditions are reasonably necessary to protect public health and safety; do not significantly increase the cost of the system or significantly decrease its efficiency; or allow for an alternative system of comparable cost and efficiency. In addition, the Town will review the application to ensure it conforms to the rules promulgated under 196.378(4g)(2) Wis. Stats. by the Public Service Commission despite the fact that this ordinance may be more restrictive than the rules of the Commission. In addition to other provisions and standards set forth in the ordinance, the Town Board may consider the following factors when establishing such conditions:

1. The proposed ingress and egress;

2. The proximity to transmission lines to link the system to the electric power grid;

3. The number of wind turbines and their proposed locations;

4. The nature of land use on adjacent and nearby properties;

5. The surrounding topography;

6. The proximity to residential structures, residential zoning districts, and areas identified for future residential use or a commercial development as shown on a map that is adopted as part of a comprehensive plan;

7. Design characteristics that may reduce or eliminate visual obtrusiveness and the distraction of motorists on nearby roads;

8. Possible adverse effects on migratory birds, raptors, and other animals and plants;

9. Possible adverse effects of stray voltage, interference with broadcast signals, weather forecasting facilities, shadow and flicker effects, and noise;

10. Impacts on the orderly development, property values, and aesthetic conditions of the Town as they may also relate to public health and safety and other factors under Wis. Stat. 66.0401;

11. Effects on public roads;

12. Recommendations from the town boards of adjacent towns, which may be affected by a WECS;

13. Any other factors which are relevant to the proposed WECS.

C. Request for Waiver of Standards by Applicant. If requested by an applicant, the Town Board may waive or reduce the burden on the applicant of one or more of the standards and requirements of the ordinance, if it concludes that the purpose of the ordinance will be met, that any requested waiver(s) by an applicant are justified based on credible evidence or information submitted to the Town Board by the applicant with the application, and that the requested waiver(s) will not adversely affect public health and safety. The installation and continued operation of a WECS is otherwise contingent on compliance with all standards of the ordinance and all conditions established by the Town Board relative to the approval or conditional approval of an application and licensing permit.

D. Recording & Notice of Decision. The Town Board shall make a record of its decision making on an application for approval, including a recording of any public hearing and copies [of relevant documents]. The Town Board shall base its decision on an application for approval on written findings of fact that are supported by the evidence in the record. This information shall be recorded in the Town Board's minutes. The Town Board and Town clerk shall issue a license to the applicant or inform the applicant that the application for a licensing permit has been denied within thirty (30) days of the Town Board's final action on the completed application .At the same time, the Town clerk shall publicly post a notice of the final decision of the Town Board at the Town hall.

VII. DEVELOPMENT & PERFORMANCE STANDARDS FOR LICENSING

A. Development & Performance Standards. All WECSs and testing structures shall comply with the Development & Performance Standards set forth in this section. It is recognized that the standards herein are neither exclusive, nor exhaustive. In instances where a health or safety concern is identified with regard to any application for a WECS, additional or more restrictive conditions may be included in the license to address such concerns. The town reserves the right to impose additional standards as circumstances warrant. Such additional and more restrictive standards may include, but are not limited to: a) longer setbacks from nearby property lines, roads, electric transmission and distribution lines, residences, businesses and other inhabited structures; b) more restrictive noise limitations, and c) more restrictive limitations to protect surface water and groundwater.

B. Design. Each Wind Turbine shall consist of a tower, generator(s), nacelle and blades. Each WECU site shall have access roads, underground transmission cabling to connect the generators to a local utility's electric distribution lines, and underground communication lines. The application shall disclose the nature, type, make and model of the proposed Wind Turbines. Detailed product literature, specifications, and safety guidance for maintenance of the turbines shall accompany the application. Each wind turbine shall also comply with the following design requirements:

1. Wind Turbines shall be painted a non-reflective, non-obtrusive color.

2. Each WECS site, the design of the buildings and related structures shall, to the extent reasonably possible, use materials, colors, textures, screening and landscaping that will blend the WECS to the natural setting and the existing environment.

3. Wind Turbines shall not be artificially lighted, except to the extent required by the FAA or other applicable authority; strobe or other intermittent lights are prohibited.

4. Wind Turbines shall not be used for displaying any advertising.

5. Wind turbines shall not display any name or logo.

6. Electrical controls and control wiring and power-lines must be wireless or not above ground, except where wind farm collector wiring is brought together for connection to the transmission or distribution network, adjacent to that network.

7. The clearance between the ground and the Wind Turbine blades shall be not less than 75 feet.

8. Wind Turbine height shall not exceed 400' above grade.

C. Aircraft protection. The wind turbine generator towers shall be marked as required by the Federal Aviation Administration (FAA). There shall be no lights on the outside of the tower other than as required by the FAA or other applicable authority, or as otherwise agreed in connection with the issuance of the license. Notwithstanding the foregoing, this restriction shall not apply to infrared heating devices used to protect the monitoring equipment. The tower shall be connected to an uninterruptible back-up power source to ensure continuous compliance with FAA regulations. To the extent consistent with FAA regulations, shrouding for the lights shall direct reflection of light up. Aircraft safety and protection, as defined by Aviation experts operating in or near the township, shall also be accomplished by establishing sufficient setbacks between all Wind Turbines and adjoining properties in order to allow for safe crop-dusting of agricultural fields, forestry applications and safe emergency medical aircraft landings on all adjoining properties.

D. Blasting. Licensee shall not undertake any blasting in connection with the construction of the WECS unless Applicant shall have notified the Town and submitted a blasting plan consistent with applicable laws and regulations. The plan must be submitted by the Licensee, reviewed and approved by the Town board, before any blasting may take place. The plan shall, at a minimum, provide that:

l. Blasts must comply with the State ground vibration limitations.

2. Fly-rock traveling in the air or along the ground must remain in the controlled blasting area site owned or controlled by the applicant.

3. All blasting must be performed by or under the direct supervision of a Sate-licensed blaster.

4. A blasting log for each blast will be kept on-site at the WECS office for not less than 5 years, and copies of the required blasting log will be promptly submitted to the Town upon its request.

5. A resident call list must be established for the purpose of notifying neighbors at homes in the vicinity of the WECS of eminent blasting activity. This call list must be maintained and utilized on a "request basis only" for all residents in the vicinity of the WECS who asked to be notified prior to any blast.

6. The storage of explosives will be in accordance with Wisconsin law.

E. Communications Interference. WECSs shall be sited and operated so that they do not interfere with emergency (fire, police/sheriff, ambulance) radio two way communications (base stations, mobile, and hand held radios, including digital) and/or paging, television, telephone (including cellular and digital), microwave, satellite (dish), navigational, internet or radio reception to neighboring areas. The applicant and/or operator to the facility shall be responsible for the full cost of any remediation necessary to provide equivalent alternate service or correct any problems; including relocation or removal of the facility caused or exacerbated by the operation of such equipment and any

and all related transmission lines, transformers, and other components related thereto. The applicant shall maintain equivalent communications throughout the life of the WECS even as future technologies may change.

1. The owner/operator of the WECS shall respond within five business days to any request for communications interference investigation by property owner within the project boundary and a three-mile radius beyond the project boundary. Testing will commence within ten working days of the request. The owner/ operator is responsible for mitigating within ten working days from the determination of interference cause attributed to the operation o f the WECS.

2. The owner/operator of the WECS shall respond within one business day to any request for communications interference investigation by any emergency agency (fire, police/sheriff, ambulance). Testing will commence within two working days of the request. The owner/operator is responsible for mitigating within two business days from the determination of interference cause attributed to the operation of the WECS.

F. Electromagnetic Interference. WECSs shall be sited and operated so that they do not interfere with telephone (including cellular and digital), microwave, satellite (dish), navigational, weather forecasting facilities, or radio reception to neighboring areas. The applicant and/or operator of the facility shall be responsible for the full cost of any remediation necessary to provide equivalent alternate service or correct any problems, including relocation or removal of the facility, caused or exacerbated by the operation of such equipment and any and all related transmission lines, transformers, and other components related thereto. The owner/operator of the WECS shall respond within five business days to any request for a communications interference investigation by a property owner within the project boundary and a three-mile radius beyond the project boundary. Testing shall commence within ten working days of the request. Owner/operator is responsible for mitigating within ten working days from determination of interference cause attributed to the operation of the WECS.

G. Karst Features and Groundwater Protection.

1. The Town of Holland recognizes how susceptible the Town's water supply is due to karst features located in the Town. At the request of the Town, the owner/operator of the WECS may be required to run water tests on wells where the wind turbine will be located, both prior and after construction of the turbine.

2. If a Wind Turbine foundation is proposed in a bedrock area, a baseline of all wells and certified public drinking sources in a half-mile radius shall be established and permanent remedies and the cost thereof shall be the responsibility of the developer if contamination occurs.

3. Licensee shall construct and operate the Facility so as not to cause groundwater contamination in violation of applicable law. Nothing contained in the license is intended

to authorize or permit any degradation of the quantity or quality of the groundwater in connection with the WECS.

4. No excavations deeper than nine (9) feet below the surface of the soil shall be allowed in the construction of a Wind Energy Facility or Wind Turbine unless the applicant submits evidence of increased cost or design necessity based on actual foundation designs. Any change in foundation design shall maintain the water quality standards of this ordinance.

5. Wells shall not be drilled within the boundaries of a WECS site.

6. The applicant shall complete a plan for managing surface water runoff to prevent pollution of groundwater through sinkholes, wetlands and infiltration through the soil and underlying bedrock within a 1,000-foot radius of each Wind Turbine site and along all access roads and driveways leading to Wind Turbine sites. The plan shall provide for surface water management so that the water flows away from the Wind Turbine sites and known sinkholes rather than toward them.

7. The owner of the WECS will be financially responsible for any costs associated with the testing of wells. The Town Board will determine how large the test area needs to be based on factors such as where bedrock is located. The owner/operator of the WECS will be financially responsible for any contamination to wells, which tested acceptable prior to construction but are not acceptable after construction. The Town Board will determine the time period when the testing will take place.

H. Sound Limits. No license shall be issued unless the pre-licensing information and sound modeling shows that the proposed WECS will comply with the following sound limits and requirements.

1. Audible Sound Limit.

a. No WTI or WECS shall be located so as to cause an exceedance of the preconstruction/operation background sound levels by more than 5 dBA. The background sound levels shall be the L90A sound descriptor measured during a preconstruction noise study during the quietest time of night (10 pm until 4 am). All data sampling shall be one or more contiguous ten (10) minute measurements. L90A results are valid when L10A results are no more than 10dBA above L90A for the same period and L10C less L90C is no more than 15 dBC. Noise sensitive sites are to be selected based on wind development's predicted worst-case sound emissions (in LeqA and LeqC) which are to be provided by applicant.

b. Test sites are to be located along the property line(s) of the receiving nonparticipating parcels.

c. A 5 dB penalty is applied for tones as defined in IEC 61400-11.

2. **Low Frequency Sound Limit**. The LeqC and L90C sound levels from the wind turbine at the receiving property shall not exceed the lower of either:

a. LeqC-L90A greater than 20 dB outside any occupied structure, or

b. A maximum not-to-exceed sound level of 50 dBC (L90C) from the wind turbines without contribution from other ambient sounds for properties located one mile or more away from state highways or other major roads or 55 dBC (L90C) for properties closer than one mile from a state highway or other major road.

These limits shall be assessed using the same nighttime and wind-weather conditions required in Ch. 7 H 1.a. Turbine operating sound emissions shall represent worst case sound emissions for stable nighttime conditions with low winds at ground level and winds sufficient for full operating capacity at the hub.

c .General Standard. Not to exceed 35 dBA (Leq 10 min) within 100 feet of any occupied structure.

I. Fire Protection .The applicant shall prepare a plan in consultation with the fire department having jurisdiction over the area prior to construction. The plan shall address all activities at the WECS and site from the start of construction through the end of power generation and the final removal and restoration of the site, and shall result in a response plan to address all identified potential fire, rescue, and hazardous materials scenarios.

1. The owner/operator shall assure that the WECS and site comply with the following control and prevention measures and incurs associated costs of the following.

a. Fire proof or fire resistant building materials and buffers or fire retardant landscaping.

b. Incorporation of a self contained fire protection system to address nacelle fires and approved by NFPA or comparable underwriter.

c. Maintain firebreak areas cleared of vegetation and maintained as a fire/fuel break as long as the WECU is in operation. Firebreaks shall be 30 feet in width around the periphery of the proposed WECU site, 10 feet in width around all transformers, and 30 feet in width around all buildings.

d. Any WECS Fire fighting and rescue services training programs and costs associated with equipment, for local fire protection and rescue personnel.

e. Any additional fire fighting or rescue personnel, services, materials, and/or vehicles as may be required to address any call related to the WECS or site that is beyond the capabilities of local fire fighting and/or rescue services.

f. The owner/operator shall be responsible for compliance with all laws applicable to the generation, storage, clean up, transportation and disposal of hazardous wastes generated during any phase of the project's life.

J. Public Roads. Licensee shall, prior to the initiation of construction and use of haul roads, consult with the Town Board, County Highway Commissioner, the Wisconsin State Police and the County Sheriff's Office for load paths and restrictions on their respective roads or bridges. At Licensee's expense:

1. Licensee shall provide the Town Board, a preconstruction evaluation and identification of road surface materials stating the type and amount of surface cover, PASER ratings, and photographic or video documentation of predetermined designated traffic route, performed by a Wisconsin certified professional engineer mutually agreed upon by applicant and municipality.

2. Licensee shall contract with qualified contractors, approved by the town, to repair any damage to the haul roads due to transportation of equipment and Facility components ('Road Repair Obligations').

3. In the event a hazardous road condition exists that is not immediately corrected by Licensee, the Town board may order emergency road repairs be performed by qualified contractors. Licensee shall promptly reimburse the Town for reasonable emergency road repair costs.

4. Licensee shall assure funding of the Road Repair Obligations by a joint escrow account or surety bond of an amount to be determined by the Town Board prior to initiation of any construction.

5. Weather permitting, the final Road Repair Obligations shall be completed to the reasonable satisfaction of the Town Board as soon as weather conditions permit or within six (6) months after completion of construction of the Facility.

K. Shadow Flicker or Blade Glint. WECS shall be designed such that shadow flicker or blade glint will not fall on or in any existing occupied structure or sensitive receptor. Shadow flicker or blade glint expected to fall on a roadway or a portion of a residential parcel may be acceptable under the following circumstances:

1. The flicker or glint will not exceed 10 hours per year.

2. The flicker or glint will fall more than 100 feet from an existing residence.

3. The traffic volumes are less than 500 vehicles per day on the roadway.

4. The flicker or glint shall not fall onto an intersection.

5. If shadow flicker or blade glint exceeds any of the conditions listed in this section, the source WECU shall be shut down until the flicker or glint problem has been remedied.

L. Setbacks. Setbacks shall be measured from the outermost edge of the closest of the circular path of the wind turbine rotor blade. The Town board may increase the following minimum setbacks on a case-by-case basis, in order to protect public health and safety. Minimum setbacks shall be:

1. Property Line: 1.5 times its total height.

2. Public Roads and Highways: 1.5 times its total height.

3. Occupied Structures & Other Sensitive Receptors: 2640 feet (1/2 mile).

4. Wetlands and water bodies: 1320 feet from all sinkholes, wetlands, and navigable water ways.

5. Spacing and Density: Minimum setback distances between turbines shall be two (2) times the total height of each WECU.

M. Signage and Fencing. Licensee shall provide reasonable signage at the Facility, identifying the Premises as being part of the Facility and providing appropriate safety notices and warnings against trespassing. The no trespassing signs shall be posted around the entire premises at an appropriate distance for posting but no less than 2 conspicuous places for every 40 acre parcel within the Facility. Signs should be sized at a minimum to meet the provisions of Wis. Stat. 943.013(2).

1. No wind turbine, tower, building, or other structure associated with a wind energy system may be used to advertise or promote any product or service. No word or graphic representation, other than appropriate warning signs and owner or landowner identification, may be placed on a wind turbine, tower, building, or other structure associated with a wind energy system so as to be visible from any public road.

2. This prohibition shall include the attachment of any flag, decorative sign, streamers, pennants, ribbons, spinners or waving, fluttering or revolving devices, but not including weather devices.

N. Electrical Standards. All wiring between Wind turbines and the Wind Energy Facility substation shall be underground. All neutral grounding connectors from commercial Wind Turbines shall be insulated from the earth and shall be sized to accommodate at least twice the peak load of the highest phase conductor, to absolutely prevent transient ground currents, in order to comply with the National Electric Safety Code and the IEEE Standard 519-1992, approved by the American National Standards Institute, as follows:

1. Grounding of both the electrical transmission lines and the supply lines to the internal electrical systems of the turbines themselves, shall comply with Rule 92D, Current in Ground Conductors: "Ground connector shall be so arranged that under normal circumstances, there will be no objectionable flow of current over the grounding conductor."

2. Rule 215B: [It is not permissible] "to use the earth as a part of a supply circuit."

3. Under no circumstances shall any wind Turbine be connected directly to the grid; connection must be made through a substation or transformer properly grounded and filtered to keep harmonic distortion within recommended limits.

4. Bare, concentric neutrals are specifically prohibited in buried lines between turbines and in underground transmission lines to substations.

5. Electrical controls and control wiring and power-lines shall be wireless or not above ground except where wind farm collector wiring is brought together for connection to the transmission or distribution network, adjacent to that network.

O. Stray Voltage. The Licensee shall respond within (3) three calendar days to any request for a stray voltage investigation by any property owner within the project boundary or a one-mile radius beyond the project boundary. The tests shall be performed by mutually acceptable Wisconsin certified stray voltage investigator. The tests shall be performed according to PSCW Phase II Stray voltage Testing Protocol. Testing shall commence within (10) ten working days of the request. If testing cannot be initiated within (10) ten days, The Wind Turbine(s) in question shall be shut down until the testing can be started. The investigation shall be provided to the property owner at no cost up to a maximum of two investigations within a 12-month period. At no time shall the operation of a WECS increase the measured cow contact voltage (Vcc) or primary neutral to remote voltage (Vpn) on a livestock facility and an occupied structure within the project boundary and a one-mile radius beyond the project boundary, above the maximum pre-construction levels. The owner/operator agrees to abide by all rules, procedures, standards, and reporting established by the PSCW for stray voltage and related electrical phenomena. Owner/operator is responsible for mitigating within five working days from determination any net increase in cow contact voltages (Vee) or primary neutral to remote voltages (Vpn) attributed to the operation of the WECS. If corrections cannot be initiated within (3) three calendar days, the Wind Turbine(s) in question shall be shut down until the voltages in question are mitigated. A copy of the test results shall be sent to the property owner, PSCW Rural Electric Power Services staff, and the Town board within (30) days of test completion.

P. Emergency Shutdown. The Licensee shall be required to immediately cease operations for the duration of any emergency. Emergency shall mean a proven condition or situation caused by the Facility or by other conditions that present an imminent physical threat of danger to life or significant threat to property. A WECS that is found to present an imminent physical threat of danger to life or significant threat of damage to

property shall be immediately shut down and repaired or otherwise made safe and certified so by a Wisconsin professional engineer prior to resumption of operation. The Town shall have the right to access all WECUs to verify conditions and/or repair progress with reasonable notice to the WECS owner/operator. Within 24 hours of an occurrence of a tower collapse, turbine failure, property damage or contamination, fires, thrown blade or hub, collector or feeder line failure, injured WECS worker or private person, the owner/operator shall notify the Town of the occurrence and proposed remedial action.

Q. Decommissioning and Site Restoration Plan and Requirements. An application for a WECS License shall include a decommissioning and site restoration plan containing the information and meeting the requirements in this section.

1. The plan shall provide for the removal from the Project Parcels, and lawful disposal or disposition of all Wind Turbines and other structures, hazardous materials, electrical facilities, and all foundations. To protect the environment, removal shall be done by mechanical means. Blasting is not an approved means for removal. The plan shall provide for the removal of all access roads that the owner of the Project Parcels wants removed. The plan shall provide for the restoration of the Project Parcels to farmland of similar condition to that which existed before construction of the WECS.

2. The plan shall provide for the decommissioning of the site upon the expiration or revocation of the WECS License, or upon the abandonment of the WECS. The WECS and WECU shall be deemed abandoned if its operation is ceased for 6 consecutive months.

3. The plan shall include provisions for financial security to secure completion of decommission and site restoration, in form and amount satisfactory to the Town. Cash on deposit with the Town, or cash held in escrow pursuant to an agreement acceptable to the Town, shall be acceptable security. The amount of the financial security shall be equal to the estimated cost of completing the decommissioning and site restoration in accordance with the approved plan, as approved by the Town.

4. The plan shall include written authorization from the WECS Licensee and all owners of all Project Parcels for the Town to access the Project Parcels and implement the decommissioning and site restoration plan, in the event the WECS Licensee fails to implement the plan. The written authorization shall be in a form approved by the Town.

R. Reporting Procedure/Requirements. Licensee shall report to the Town as follows:

1. Quarterly Power Production Reports: The Licensee shall submit a quarterly power production report to the Town which shall cover the proceeding calendar quarter and include actual net power production in kilowatt-hours for each commercial wind energy facility in the Town. This will be accomplished by providing a consumption meter and an output meter.

2. Annual Monitoring Reports. The Licensee shall submit an annual monitoring report to the Town, containing data on the operations and environmental impacts of the WECS site. Such reports shall describe all safety inspections of the WECS.

3. Extraordinary Events. Within 24 hours of any extraordinary event, Licensee shall notify the Town. "Extraordinary events" shall include but not be limited to tower collapse, catastrophic turbine failure, fires, leakage of hazardous materials, unauthorized entry to the tower base, thrown blade or hub , any injury to a Facility worker or other person that requires emergency medical treatment, or other event that impacts the public health and safety of the Town.

VIII. COMPLAINTS AND MODIFICATION, SUSPENSION OR REVOCATION OF LICENSE

A. Complaints and Modification, Revocation or Suspension. The Town board shall retain continuing jurisdiction to modify, suspend or revoke all WECS Licenses in accordance with this section. Such authority shall be in addition to the Town's authority to prosecute violations and take other enforcement action.

1. In this section, "violation" means a violation of the Ordinance, or a violation of a WECS License issued under the Ordinance, or a violation of a WECS License Agreement entered into under the Ordinance.

2. Any resident of the Town or Town official may file a written complaint with the Town clerk alleging that a WECS Licensee has committed or is committing a violation. Such complaints shall be forwarded to the Town Board.

3. The Town Board shall preliminarily review the complaint. In connection with its preliminary review, the Town Board may require the Town building inspector, engineer, attorney or other person or persons to conduct such investigations and make such reports as the Town Board may direct. The Town Board may request information from the holder of a WECS License, the complainant, and any other person or entity to assist with its preliminary review.

4. Following its preliminary review, the Town Board may:

a. Dismiss the complaint;

b. Refer the complaint to the Town attorney for prosecution; or

c. Conduct a hearing to determine whether the alleged violation(s) have occurred, and what remedial action should be taken. Prior to such hearing, notice of the hearing shall be given to the holder of the WECS License and the complainant, and in accordance with the Open Meeting Law. The holder of the WECS License and the complainant, and any other person, may appear at the hearing and may offer testimony and other relevant

evidence, and may be represented by an attorney. If the Town Board concludes that Violations have occurred, the Town Board may:

(1) Impose conditions on the WECS License to the extent reasonably necessary to discontinue the violation(s) or avoid any recurrence thereof; or

(2) Suspend the WECS License until such time as the WECS License holder presents a plan, satisfactory to the Town Board that will discontinue the violation(s) or prevent any recurrence thereof, and on such further conditions as the Town Board deems appropriate to discontinue and prevent further violations; or

(3) Revoke the WECS License and direct decommissioning of the WECS if the Town Board concludes that no reasonable modification can be made to the WECS to discontinue or prevent violations; or

(4) Refer the matter to the Town attorney for prosecution, subject to Town Board approval; or

(5) Take no action, if the Town board concludes that no further action is needed to discontinue or prevent violations, and that prosecution is unwarranted.

5. Following any such hearing, the Town Board's written decision shall be furnished to the WECS License holder and to the complainant.

IX. PROCEDURES FOR REVOCATON OF LICENSE

A. Revocation of License. An unsafe WECS and WECU and an inoperable WECS and WECU is hereby declared an unsafe public nuisance, which shall be subject to abatement by repair, rehabilitation, demolition, or removal by the Town Board. An inoperable WECS and WECU shall not be considered a public nuisance provided the owner can demonstrate that modernization, rebuilding or repairs are in progress or planned and will be completed within a reasonable time as approved by the Town Board, provided periodic reports on the status of the repairs are provided to the Town Board as requested of the licensee.

1. Each of the following occurrences shall constitute a violation of the terms and conditions of this License (a "Violation") and any such Violation shall be grounds for revocation of this License (whatever the reason for such an event of default and whether it shall be voluntary or involuntary or be effected by operation of law or pursuant to any judgment, order or regulation) after the expiration of the notice and cure period and revocation hearing as set forth below:

a. The Licensee abandons the wind turbine generators located on the premises for a period of six months or more.

b. The Licensee fails to observe or perform any material condition or provision of this License for a period of 30 days after it has received written notice of such failure from the Town; provided, however, that a Violation shall not occur if Licensee commenced performance of such obligation within such 30 day period and is diligently proceeding to complete such performance.

c. There is a material failure by Licensee to comply with any statute, regulation, rule, or license administered by any federal, state or county department, agency, or commission directly related to the operation of the wind turbine generator, and if Licensee fails to cure the material failure to comply for a period of 30 days after the date Licensee receives written notice of such failure from the town of the federal, state or local governmental body or agency with jurisdiction, provided, however, that a Violation shall not occur if Licensee commences performance of such obligation within such 30 day period and is diligently proceeding to complete such performance.

2. Each Wind Turbine and all related improvements shall be removed in accordance with the Decommissioning and Site Restoration Plan submitted by the applicant and approved by the Town through the licensing process.

3. The owner of a WECS and the underlying property owners shall be jointly liable for the removal of all equipment associated with the Wind Energy Facility at the end of the license period, the useful life of the facility, or when the facility is abandoned or otherwise out of operation for more than six months, at their expense. Upon removal of a Wind Energy Conversion System Facility, the owner of the facility and the underlying property owners shall be jointly liable for restoration of the site to its original condition at their expense. To protect the environment, removal shall be done by mechanical means. Blasting is not an approved means for removal. The restoration shall include removal of all materials above and below ground; public road repair, if any; and all re-grading and re-vegetation necessary to return the subject property to the condition existing prior to establishment of the WECS facilities. All hazardous materials shall be removed from the site and disposed of in accordance with state and federal laws. Should the owner of a WECS fail to remove equipment and restore the site, the underlying property owners shall be held responsible for said removal and restoration.

B. Hearing. The Town shall not revoke any License without first providing the Licensee a hearing and the right to respond, including the right to present evidence regarding any defenses or extenuating circumstances regarding the alleged violations or public or private nuisance.

X. LICENSE EXPIRATION

Expiration. Unless the Town board authorizes a different term based upon analysis of the useful life of the WECS, every license issued pursuant to this ordinance shall terminate upon the expiration of twenty-five years from the date of issuance if construction is commenced within one year of issuance. If construction is not commenced within one

year of issuance, the license shall expire one year after the date of issuance and the applicant will be required to reapply if it still intends to develop a WECS project.

XI. INSURANCE AND INDEMNIFICATION

A. Insurance. All Licensees shall maintain the following insurance coverage commencing upon construction of the facility:

1. The owner/operator shall, at its expense, maintain a broad form comprehensive coverage policy of public liability insurance insuring Applicant and Participating Landowners against loss or liability caused by Applicant's occupation and use of the Property under the Lease, in an amount not less than five million dollars ($5,000,000) of combined single limit liability coverage per occurrence, accident or incident, which has a commercially reasonable deductible. The Town shall be named as an additional insured on the policy.

2. Worker's compensation coverage in an amount required by Wisconsin law. Applicant shall require subcontractors and others not protected under its insurance to obtain and maintain worker's compensation and employers' liability insurance.

3. Certificates of insurance evidencing compliance with these requirements shall be provided to the Town. The insurer will provide notice to the Town in the event there is a lapse in coverage exceeding thirty (30) days. All policies other than worker's compensation shall be written on an occurrence and not on a claim-made basis.

B. Defense of Land Use Decision and Indemnity. In addition to the indemnification described below, Licensee shall reimburse the Town its reasonable attorneys' fees incurred in defending any legal actions brought by third parties challenging the legality or enforceability of the ordinance or any portion thereof, or the issuance of a License by the Town pursuant to the ordinance.

1. If the Town seeks reimbursement, it shall notify Licensee in writing promptly upon discovering any claim entitling it to a land use defense reimbursement, but in no event later than 120 days after receiving written notice of any action, lawsuit, proceeding, investigation or other claim against it which may give rise to a claim for a land use defense reimbursement.

2. Licensee shall not be obligated to reimburse the Town with respect to any such liability, action or claim if the Town fails to notify Licensee thereof in accordance with the provisions of this section in sufficient time including, without limitation, any responsive motion or answer to a complaint, petition, notice, or other legal, equitable action or claim, but only insofar as such knowing failure to notify Licensee has actually resulted in prejudice or damage to Licensee.

3. With respect to any third party action, lawsuit, proceeding, investigation or other claim which is subject to reimbursement under this section, Licensee shall be entitled to

assume and control (with counsel of its choice) the defense of such action, lawsuit, proceeding, investigation or other claim at Licensee's expense, provided, however, that the Town shall be entitled to participate in the defense of such claim and to employ counsel of its choice for such purpose (the fees and expenses of such separate counsel to be borne by the Town) and to assert against any third party any and all cross claims and counterclaims the Town may have, subject to Licensee's consent, which consent shall not be unreasonably withheld. If Licensee elects to assume the defense of any such claim, it may settle such claim in its sole discretion so long as either (1) such settlement provides an unconditional release of the Town, or (2) Licensee shall obtain the prior written consent of the Town (which consent shall not be unreasonably withheld). If Licensee elects to assume the defense of any claim, the Town shall fully cooperate with Licensee and its counsel in such defense.

4. Licensee shall defend, indemnify and hold harmless the Town and its officials, employees and agents from and against any and all claims, demands, losses, suits, causes of action, damages, injuries, costs, expenses and liabilities whatsoever, including reasonable attorneys' fees (such liabilities together known as "Liability") arising out of Licensee's selection, construction, operation and removal of the Wind turbines and affiliated equipment including, without limitation, Liability for property or personal injury (including death), whether said Liability is premised on contract or on tort (including without limitation strict liability or negligence). This general indemnification shall not be construed as limiting or qualifying the Town's other indemnification rights available under law.

XII. STANDARDS

A. Construction Standards. All WECS shall be constructed in compliance with Good Utility Practice for Wind Turbines. In the event after inspection by a qualified expert in Good Utility Practice, the Town concludes that any of the Wind Turbines were not constructed in compliance with Good Utility Practice or constitutes a danger to persons or property, then upon notice being provided, Licensee shall have 90 days to bring the non-compliant Wind turbine(s) into compliance with such standards. If 90 days is insufficient time to cure the non-compliance, Licensee shall present a plan to the Town describing the reason for the delay and the time frame for the cure to be put in place. Failure to bring such non-compliant Wind Turbine(s) into compliance or failure to provide a plan for compliance within 90 days shall constitute grounds for the Town Board to order immediate removal of said Wind Turbine(s) at Licensee's expense.

B. Performance Standards. All WECS shall be operated and maintained consistent with Good Utility Practice for comparable facilities.

C. State and Federal Standards. Construction of WECS and Wind Turbines shall meet or exceed current standards and regulations, if any, of any other agency of the state or federal government with the authority to regulate wind powered generators. If such standards and regulations are changed and retroactive application is required for the change, then Licensee shall bring the Wind Turbine(s) into compliance with such

applicable revised standards and regulations within 6 months of the effective date of such standards and regulations, unless a different compliance schedule is permitted by the controlling state or federal agency or approved by the Town. A Determination of No Hazard for each Wind Turbine must be obtained from the FAA for each Wind Turbine as a condition precedent to the receipt of a license under the ordinance.

D. Wind Turbine Safety Standards. Licensee shall comply with the following safety standards:

1. All wiring between the Wind turbines and substations shall be installed at least four (4) feet underground.

2. The outside of Wind Turbines shall not be climbable.

3. All access doors to the towers and electrical equipment shall be locked.

4. Appropriate warning signage shall be placed on each tower, all electrical equipment, and all entrances.

E. Repair & Replacement. Licensee shall be authorized to repair and replace the wind turbine generator and associated equipment consistent with Good Utility Practice during the Term of the License as needed to keep the Facility in good repair and operating condition. However, no such repair or replacement shall entitle Licensee to any extension of the Term of this License, even if it extends the useful life of the Facility. If Licensee desires to extend the term of the License in the future, Licensee shall be required to apply for such extension or amendment of the License in accordance with the terms of the ordinance.

XIII. FEES AND EXPENSES

A. Tax Hold Harmless. In the event that the shared revenue payments to the Town are eliminated by the Legislature, Licensee shall be required to pay the Town an amount not less than $1,667 per megawatt per year for Wind Turbines actually installed and operating within the Town. Such payments shall be on an annual basis and payable on the 180th day after notice from the Town of Licensee's obligation to pay under this paragraph. Licensee's obligation to make such payments shall cease if the State adopts or implements a new mechanism to replace the shared revenue payments, to the extent that the new payment mechanism produces revenue not less than the revenue payable under the predecessor program. The shared revenue payments referenced above are paid to the Town directly by the Sate of Wisconsin, not Licensee. Regardless, Licensee shall be required to supplement the Town's annual shared revenue payments actually received, by an amount equal to the annual percentage change of the Consumer Price Index as of January 1st of each calendar year beginning on the first January following the date the Town receives its first payment. For purposes of this escalator clause, the Consumer Price Index means the U.S. Department of Labor, Bureau Statistics, Consumer Price Index for the United States, All Urban Consumers, all items, unadjusted tax index.

B. Property Taxes. If the property tax exemption for WECS under current state law is revised or revoked by future Legislatures, Licensee will be responsible for all related assessments and taxes associated with the license and WECS site. Failure to pay such tax obligation shall be considered a non-compliance with the ordinance.

C. Reimbursement of Fees and Costs. Licensee shall reimburse the Town for its actual reasonable fees and costs incurred in the application, negotiation, administration and enforcement of the ordinance, including, without limitation, the Town's attorney fees, engineering and consultant fees, Town Board meeting and hearing fees, and the costs of public notices relative to the review and consideration of each application filed by an applicant under the ordinance. The preceding fees are payable within 30 days of invoice. Unpaid invoices shall bear interest at the rate of 1.0% per month until paid. The Town may recover all reasonable costs of collection, including attorney fees.

D. Government services/costs. The Town Board may require the WECS Licensee to pay the cost of Town governmental services reasonably related to the WECS and not otherwise paid by the WECS Licensee.

XIV. ADMINISTRATION, INSPECTIONS, ENFORCEMENT AND PENALTIES

A. Administration. The ordinance shall be administered by the Town Board or its designee.

B. Inspections. The Town Board or its designee may enter upon any property for which a licensing permit has been issued under the ordinance to conduct inspections to determine whether the conditions stated in the permit and other standards and requirements of the ordinance are being complied with.

C. Enforcement. The Town Board or its designee may issue orders to abate any violation of the ordinance or any condition attached to a licensing permit approved by the Town Board. The Town Board or its designee may issue a citation for any violation of the ordinance. The Town Board may refer any violation of the ordinance to the Town's legal counsel for enforcement through litigation. Nothing in the ordinance shall be construed to prevent or limit the Town from using any other lawful means of enforcing the ordinance.

D. Penalties. Any person, applicant, or licensee who fails to comply with any provision of the ordinance or of any license issued pursuant to the ordinance shall, upon conviction thereof, forfeit at least five-hundred dollars ($500.00) but not more than one-thousand dollars ($1,000.00) for each offense. A separate offense shall be deemed committed on each day during which a violation occurs or continues. Any person, applicant or licensee who is in default of payment of forfeiture or costs may be imprisoned in the county jail until the forfeiture or costs are paid, except that the period of imprisonment may not exceed thirty (30) days.

E. Severability. The sections, paragraphs, sentences, clauses, articles and phrases of this ordinance are severable; if any provision is found to be unconstitutional, invalid or unenforceable, such finding shall not affect the remaining portions of this ordinance.

These Standards, Guidelines and Rules for Ordinance Number _____ were passed and adopted by the Town Board of Holland on this _____ day of _____, 2010.

TOWN OF HOLLAND

_____ _____
Town Chairman Town Supervisor

_____ _____
Attest: Town Clerk Town Supervisor

Published and posted this _____ day of _____, 2010

APPENDIX TO WIND ENERGY SYSTEMS LICENSING ORDINANCE

(a) Introduction

The potential impact of sound and sound induced building vibration associated with the operation of wind powered electric generators is often a primary concern for citizens living near proposed wind energy systems (WES(s)). This is especially true of projects located near homes, residential neighborhoods, businesses, schools, and hospitals in quiet residential and rural communities. Determining the likely sound and vibration impacts is a highly technical undertaking and requires a serious effort in order to collect reliable and meaningful data for both the public and decision makers.

This protocol is based in part on criteria published in American National Standards S12.9 - Quantities and Procedures for Description and Measurement of Environmental Sound, and S12.18 and for the measurement of sound pressure level outdoors.

The purpose is to first, establish a consistent and scientifically sound procedure for evaluating existing background levels of audible and low frequency sound in a WES project area, and second to use the information provided by the Applicant in its Application showing the predicted over-all sound levels in terms of dBA and dBC[1] as part of the required information submitted with the application.

These values shall be presented as overlays to the applicant's iso-level plot plan graphics (dBA and dBC) and in tabular form with location information sufficient to permit comparison of the baseline results to the predicted levels. This comparison will use the level limits of the ordinance to determine the likely impact operation of a new wind energy system project will have on the existing community soundscape. If the comparison demonstrates that the WES project will not exceed any of the level limits the project will be considered to be within allowable limits for safety and health. If the Applicant submits only partial information required for this comparison the application cannot be approved. In all cases the burden to establish the operation as meeting safety and health limits will be on the Applicant.

Next it addresses requirements for the sound propagation model to be supplied with the application.

[1] Calculated from one-third octave band sound power levels (LW per IEC 61400-11) provided by the wind turbine manufacturer covering the frequency range from 6.3 Hz to 10,000 HZ or higher.

Finally, if the project is approved, this Appendix covers the study needed to compare the post-build sound levels to the predictions and the baseline study. The level limits in the ordinance apply to the post-build study. In addition, if there have been any complaints about WES sound or low frequency noise emissions by any resident of an occupied dwelling that property will be included in the post-build study for evaluation against the rules for sound level limits and compliance.

The characteristics of the proposed WES project and the features of the surrounding environment will influence the design of the sound and vibration study. Site layout, types of WES(s) selected and the existence of other significant local audible and low frequency sound sources and sensitive receptors should be taken into consideration when designing a sound and vibration study. The work will be performed by an independent qualified acoustical consultant for both the pre-construction background and post-construction sound studies as described in the body of the ordinance.

(b) Instrumentation

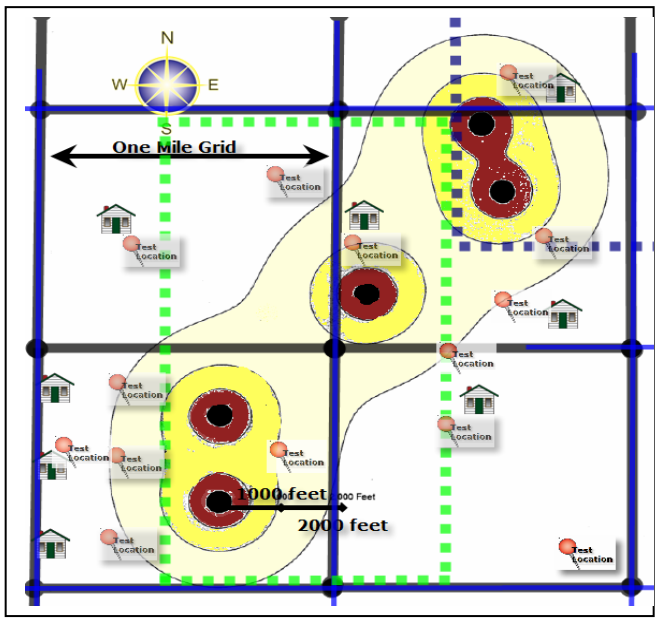
All instruments and other tools used to measure audible, inaudible and low frequency sound shall meet the requirements for ANSI or IEC Type 1 Integrating Averaging Sound Level Meter with one-third octave band analyzer with frequency range from 6.3 Hz to 20k Hz and capability to simultaneously measure dBA LN and dBC LN. The instrument must also be capable of measuring low level background sounds down to 20 dBA. Measurements shall only be made with the instrument manufacturer's approved wind screen. A compatible acoustic field calibrator is required with certified ± 0.2 dB accuracy. Portable meteorological measurement requirements are outlined in ANSI S12.9 Part 3 and are required to be located within 5m of the sound measuring microphone. The microphone shall be located at a height of 1.2 to 1.5 meters for all tests unless circumstances require a different measurement position. In that case, the reasons shall be documented and include any adjustments needed to make the results correspond to the preferred measurement location.

(c) Measurement of Pre-Construction Sound Environment (Base-lines)

An assessment of the proposed WES project areas existing sound environment is necessary in order to predict the likely impact resulting from a proposed project. The following guidelines must be used in developing a reasonable estimate of an area's existing background sound environment. All testing is to be performed by an independent qualified acoustical consultant approved by the Town. The WES applicant may file objections detailing any concerns it may have with the Town’s selection. These concerns will be addressed in the study. Objections must be filed prior to the start of the noise study. All measurements are to be conducted with ANSI or IEC Type 1 certified and calibrated test equipment per reference specification at the end of this Appendix. Test results will be reported to the Town or its appointed representative.

1. **Sites with No Existing Wind Energy Systems (Base-line Sound Study)**

Sound level measurements shall be taken as follows:



The results of the model showing the predicted worst case dBA and dBC sound emissions of the proposed WES project will be overlaid on a map (or separate dBA and dBC maps) of the project area. An example (right) shows an approximately two (2) mile square section with iso-level contour lines prepared by the applicant, sensitive receptors (homes) and locations selected for the baseline dBA and dBC sound tests whichever are the controlling metric. The test points shall be located at the property line bounding the property of the turbine's host closest to the wind turbine. Additional sites may be added if appropriate. A grid comprised of one (1) mile boundaries (each grid cell is one (1) square mile) should be used to assist in identifying between two (2) to ten (10) measurement points per cell. The grid shall extend to a minimum of one (1) mile beyond the perimeter of the project boundary. This may be extended to more than one mile at the discretion of the Town. The measurement points shall be selected to represent the noise sensitive receptor sites based on the anticipated sound propagation from the combined WTi in the project. Usually, this will be the closest WTi. If there is more than one WTi near-by then more than one test site may be required.

The intent is to anticipate the locations along the bounding property line that will receive the highest sound emissions. The site that will be most likely negatively affected by the WES project's sound emissions should be given first priority in testing. These sites may include sites adjacent to occupied dwellings or other noise sensitive receptor sites. Sites shall be selected to represent the locations where the background soundscapes reflect the quietest locations of the sensitive receptor sites. Background sound levels (and one-third octave band sound pressure levels for the sound measuring consultants file) shall be obtained according to the definitions and procedures provided in the ordinance and recognized acoustical testing practice and standards.

All properties within the proposed WES project boundaries will be considered for this study.

One test shall be conducted during the period defined by the months of April through November with the preferred time being the months of June through August. These months are normally associated with more contact with the outdoors and when homes may have open windows during the evening and night. Unless directed otherwise by the Town the season chosen for testing will represent the background soundscape for other seasons. At the discretion of the Town, tests may be scheduled for other seasons.

All measurement points (MPs) shall be located with assistance from with the Town staff and property owner(s) and positioned such that no significant obstruction (building, trees, etc.) blocks sound and vibration from the nearest proposed WES site. Duration of measurements shall be a minimum of ten continuous minutes for each criterion at each location. The duration must include at least 6 minutes that are not affected by transient sounds from near-by and non-nature sources. Multiple 10 minute samples over longer periods such as 30 minutes or one (1) hour may be used to improve the reliability of the L90 values. The ten minute sample with the lowest valid L90 values will be used to define the background sound.

The tests at each site selected for this study shall be taken during the expected 'quietest period of the day or night' as appropriate for the site. For the purpose of determining background sound characteristics the preferred testing time is from 10 pm until 4 am. If circumstances indicated that a different time of the day should be sampled the test may be conducted at the alternate time if approved by the Town.

Sound level measurements must be made on a weekday of a non-holiday week. Weekend measurements may be taken at selected sites where there are weekend activities that may be affected by WTi sound.

Measurements must be taken at 1.2 to 1.5 meters above the ground and at least 15 feet from any reflective surface following ANSI 12.9 Part 3 protocol including selected options and other requirements outlined later in this Section.

a. *Reporting*

(1) For each Measurement Point and for each measurement period, provide each of the following measurements:

(a) LAeq, L10, and L90, in dBA
(b) LCeq , L10, and L90, in dBC

(2) A narrative description of any intermittent sounds registered during each measurement. This may be augmented with video and audio recordings.

(3) A narrative description of the steady sounds that form the background soundscape. This may be augmented with video and audio recordings.

b. Wind speed and direction at the Measurement Point, humidity and temperature at time of measurement will be included in the documentation. Corresponding information from the nearest 10 meter weather reporting station shall also be obtained.

Measurements taken when wind speeds exceed 2m/s (4.5 mph) at the microphone location will not be considered valid for this study. A windscreen of the type recommended by the monitoring instrument's manufacturer must be used for all data collection.

(1) Provide a map and/or diagram clearly showing (using plot plan provided by Town or Applicant):

- The layout of the project area, including topography, the project boundary lines, and property lines.
- The locations of the Measurement Points.
- The minimum and maximum distance between any Measurement Points.
- The location of significant local non-WES sound and vibration sources.
- The distance between all MPs and significant local sound sources. And,
- The location of all sensitive receptors including but not limited to: schools, day-care centers, hospitals, residences, residential neighborhoods, places of worship, and elderly care facilities.

2. **Sites with Existing Wind Energy Systems**

Two complete sets of sound level measurements must be taken as defined below:

a. One set of measurements with the wind generator(s) off unless the Town elects to substitute the sound data collected for the background sound study collected as part of an earlier baseline study. Wind speeds must be suitable for background testing.

b. One set of measurements with the wind generator(s) running with wind speed at hub height sufficient to meet nominal power output or higher and at 2 m/s or below at the microphone location. Conditions should reflect the worst case sound emissions from the WES project. This will normally involve tests taken during the evening or night when winds are calm (2m/sec or less) at the ground surface yet, at hub height, sufficient to operate the turbines.

Sound level measurements and meteorological conditions at the microphone shall be taken and documented as discussed above.

3. **Sound Level Estimate for Proposed Wind Energy Systems (when adding more WTi to existing project)**

In order to estimate the sound impact of the proposed WES project on the existing environment an estimate of the sound produced by the proposed WES(s) under worst-case conditions for producing sound emissions must be provided. This study may be conducted by a firm chosen by the WES operator with oversight provided by the Town.

The qualifications of the firm should be presented along with details of the procedure that will be used, software applications, and any limitations to the software or prediction methods.

Provide the manufacturer's sound power level (Lw) characteristics for the proposed WES(s) operating at full load utilizing the methodology in IEC 61400-11 Wind Turbine Noise Standard. Provide one-third octave band Lw sound power level information from 6.3 Hz to 10k Hz. Furnish the data with and without A-weighting. Provide sound pressure levels predicted for the WES(s) in combination and at full operation and at maximum sound power output for all areas where the predictions indicate dBA levels of 30 dBA and above. The same area shall be used for reporting the predicted dBC levels. Contour lines shall be in increments of 5 dB.

Present tables with the predicted sound levels for the proposed WES(s) in dBA, dBC and at all octave band centers (8 Hz to 10k Hz) for distances of 500, 1000, 1500, 2000, 2500 and 5000 feet from the center of the area with the highest density of WES(s). For projects with multiple WES(s), the combined sound level impact for all WES(s) operating at full load must be estimated.

The above tables must include the impact (increased dBA and dBC above baseline L90 Background sound levels) of the WES operations on all residential and other noise sensitive receiving locations within the project boundary. To the extent possible, the tables should include the sites tested in the background study.

Provide a contour map of the expected sound level from the new WES(s), using 5 dBA and 5 dBC increments created by the proposed WES(s) extending out to a distance of at least 2500 feet from the project boundary or the 35 dBA or 50 dBC boundary whichever is greater.

Provide a description of the impact of the proposed sound from the WES project on the existing environment. The results should anticipate the receptor sites that will be most negatively impacted by the WES project and to the extent possible provide data for each MP that are likely to be selected in the background sound study (note the sensitive receptor MPs):

a. Report expected changes to existing sound levels for LAeq, L10 and L90, in dBA

b. Report expected changes to existing sound levels for LCeq, L10 and L90, in dBC

c. Report the predicted sound pressure levels for each of the 1/1 octave bands as un-weighted dB in tabular form from 8 Hz to 10k Hz.

d. Report all assumptions made in arriving at the estimate of impact, any limitations that might cause the sound levels to exceed the values of the estimate, and any conclusions reached regarding the potential effects on people living near the project area. If the effects of coherence, worst case weather, or operating conditions are not reflected in the model a discussion of how these factors could increase the predicted values is required.

e. Include an estimate of the number of hours of operation expected from the proposed WES(s) and under what conditions the WES(s) would be expected to run. Any differences from the information filed with the Application should be addressed.

4. **Post-Construction Measurements**

Post Construction Measurements should be conducted by a qualified noise consultant selected by and under the direction of the Town. The requirements of this Appendix for Sites with Existing Wind Energy Systems shall apply

(1) Within twelve months of the date when the project is fully operational, and within two weeks of the anniversary date of the Pre-construction ambient noise measurements, repeat the existing sound environment measurements taken before the project approval. Post-construction sound level measurements shall be taken both with all WES(s) running and with all WES(s) off except as provided the ordinance.

(2) Report post-construction measurements to the Town using the same format as used for the background sound study.

(3) Project Boundary: A continuous line encompassing all WES(s) and related equipment associated with the WES project.

REFERENCES

ANSI/ASA S12.9-1993/Part 3 (R2008) - American National Standard Quantities and Procedures for Description and Measurement of Environmental Sound, Part 3: Short-Term Measurements with an Observer Present.

This standard is the second in a series of parts concerning description and measurement of outdoor environmental sound. The standard describes recommended procedures for measurement of short-term, time-average environmental sound outdoors at one or more locations in a community for environmental assessment or planning for compatible land uses and for other purposes such as demonstrating compliance with a regulation. These measurements are distinguished by the requirement to have an observer present. Sound may be produced by one or more separate, distributed sources of sound such as a highway, factory, or airport. Methods are given to correct the measured levels for the influence of background sound. For the purposes of this ordinance the options that are provided in ANSI S12.9-Part 3 (2008) shall be applied with the additional following requirements:

Wind Turbine Siting Acoustical Measurements
ANSI S12.9 Part 3 Selection of options and other requirements

5.2 background sound: Use definition (1) 'long-term
5.3 long-term background sound: The L90 excludes short term background sounds
5.4 basic measurement period: Ten (10) minutes L90(10 min)
5.6 Sound Measuring Instrument: Type 1 integrating meeting ANSI S1.43
6.5 Windscreen: Required
7.1 Long-term background sound
7.2 Data collection Methods: Second method Observed samples to avoid contamination by short term sounds (purpose: to avoid loss of statistical data)
8 Source(s) Data Collection: All requirements in ANSI S12.18 Method #2 precision to the extent possible while still permitting testing of the conditions that lead to complaints.
8.3(a) All meteorological observations required at both (not either) microphone and nearest 10m weather reporting station.
8.3(b) For a 10 minute sound measurement to be valid the wind velocity shall not exceed 2m/s (4.5 mph) measured less than 5m from the microphone. Compliance sound measurements shall not be taken when winds exceed 4m/s.
8.3(c) In addition to the required acoustic calibration checks the sound measuring instrument internal noise floor must also be checked at the end of each series of ten minute measurements and no less frequently than once per day. Insert the microphone into the acoustic calibrator with the calibrator signal off. Record the observed dBA and dBC reading from the sound level meter or other recording instrument to determine an approximation of the instrument self noise. This calibrator covered microphone must demonstrate that the results of this test are at least 5 dB below the immediately previous ten minute acoustic test results for the acoustic data to be valid. This test is necessary to detect undesired increase in the microphone and sound level meter internal self noise. As a precaution sound measuring instrumentation should be removed from any air conditioned space at least an hour before use. Nighttime measurements are often performed very near the dew point. Minor moisture condensation inside a microphone or sound level meter can increase the instrument self noise and void the data.
8.4 to the end: The remaining sections of ANSI S12.9 Part 3 Standard do not apply.

ANSI S12.18-1994 (R2004) American National Standard Procedures for Outdoor Measurement of Sound Pressure Level

This American National Standard describes procedures for the measurement of sound pressure levels in the outdoor environment, considering the effects of the ground, the effects of refraction due to wind and temperature gradients, and the effects due to turbulence. This standard is focused on measurement of sound pressure levels produced by specific sources outdoors. The measured sound pressure levels can be used to calculate sound pressure levels at other distances from the source or to extrapolate to

other environmental conditions or to assess compliance with regulation. This standard describes two methods to measure sound pressure levels outdoors. METHOD No. 1: general method; outlines conditions for routine measurements. METHOD No. 2: precision method; describes strict conditions for more accurate measurements. This standard assumes the measurement of A-weighted sound pressure level or time-averaged sound pressure level or octave, 1/3-octave or narrow-band sound pressure level, but does not preclude determination of other sound descriptors.

ANSI S1.43-1997(R2007) American National Standard Specifications for Integrating Averaging Sound Level Meters

This Standard describes instruments for the measurement of frequency-weighted and time-average sound pressure levels. Optionally, sound exposure levels may be measured. This standard is consistent with the relevant requirements of ANSI S1.4-1983(R 1997) American National Standard Specification for Sound Level Meters, but specifies additional characteristics that are necessary to measure the time-average sound pressure level of steady, intermittent, fluctuating, and impulsive sounds.

ANSI S1.11-2004 American National Standard 'Specification for Octave-Band and Fractional-Octave-Band Analog and Digital Filters'

This standard provides performance requirements for analog, sampled-data, and digital implementations of bandpass filters that comprise a filter set or spectrum analyzer for acoustical measurements. It super-cedes ANSI S1.11-1986 (R1998) American National Standard Specification for Octave-Band and Fractional-Octave-Band Analog and Digital Filters, and is a counterpart to International Standard IEC 61260:1995 Electroacoustics - Octave-Band and Fractional-Octave-Band Filters. Significant changes from ANSI S1.11-1986 have been adopted in order to conform to most of the specifications of IEC 61260:1995. This standard differs from IEC 61260:1995 in three ways: (1) the test methods of IEC 61260 clauses 5 is moved to an informative annex, (2) the term 'band number,' not present in IEC 61260, is used as in ANSI S1.11-1986, (3) references to American National Standards are incorporated, and (4) minor editorial and style differences are incorporated.

ANSI S1.400-2006 American National Standard Specifications and Verification Procedures for Sound Calibrators

IEC 61400-11
Second edition 2002-12, Amendment 1 2006-05

IEC 61400-11
Second edition 2002-12, Amendment 1 2006-0

Wind turbine generator systems –Part 11: Acoustic noise measurement techniques

The purpose of this part of IEC 61400 is to provide a uniform methodology that will ensure consistency and accuracy in the measurement and analysis of acoustical emissions by wind turbine generator systems. The standard has been prepared with the anticipation that it would be applied by:

- the wind turbine manufacturer striving to meet well defined acoustic emission performance requirements and/or a possible declaration system;
- the wind turbine purchaser in specifying such performance requirements;
- the wind turbine operator who may be required to verify that stated, or required, acoustic performance specifications are met for new or refurbished units;
- the wind turbine planner or regulator who must be able to accurately and fairly define acoustical emission characteristics of a wind turbine in response to environmental regulations or permit requirements for new or modified installations.

This standard provides guidance in the measurement, analysis and reporting of complex acoustic emissions from wind turbine generator systems. The standard will benefit those parties involved in the manufacture, installation, planning and permitting, operation, utilization, and regulation of wind turbines. The measurement and analysis techniques recommended in this document should be applied by all parties to insure that continuing development and operation of wind turbines is carried out in an atmosphere of consistent and accurate communication relative to environmental concerns. This standard presents measurement and reporting procedures expected to provide accurate results that can be replicated by others.