

**TOWN OF BOURNE  
BOARD OF HEALTH  
BOURNE, MASSACHUSETTS**

**WIND ENERGY CONVERSION SYSTEM REGULATIONS**

The Bourne Board of Health held multiple public hearings during the winter, spring and summer of 2011 on the subject of possible adverse health effects caused by wind turbines. After receiving a substantial amount of testimony and documentation from interested members of the public, the Board determined that there can be adverse health risks associated with wind turbines including, but not limited to, noise and shadow flicker. In addition, the Board determined that the fluids and substances used in wind turbines/wind energy conversion systems can present a threat to public health and safety if not properly regulated. Further, the catastrophic failure or abandonment of wind turbines may present adverse effects to public health and safety.

Wherefore, acting pursuant to Massachusetts General Laws Chapter 111, Sections 31 and 122 the Board determined that reasonable regulations should be adopted for the protection of the public health and safety of the residents of Bourne and, on August 10, 2011, voted to adopt these regulations regarding wind energy conversion systems (WECS). On March 14, 2012, the Board further voted to amend the Wind Energy Conversion Systems (WECS) regulations so that they provide as follows:

**1. Purpose**

The purpose of these Regulations is to protect the public from adverse health effects and nuisances that can be associated with WECS. Chronic or repeated exposure to excessive noise is recognized by public health experts as a hazard to both physical and mental health. In addition to being an annoyance, it may cause a number of ailments including emotional stress, fatigue, high blood pressure and, at high levels, hearing loss. The Bourne Board of Health declares excessive noise and flicker a nuisance.

Recognizing that people have a right to and should be ensured an environment free from excessive sound, vibration, shadow flicker and catastrophic failures of these systems capable of jeopardizing their health, safety or welfare or of degrading their quality of life, this regulation is enacted to protect, preserve and promote the health, safety, welfare and quality of life for the citizens of Bourne. Present state and local regulations are in the opinion of the Board inadequate to protect the residents of Bourne from the unique health risks associated with WECS. The Board therefore, after numerous public hearings and due consideration, hereby adopts the following regulations.

**2. Applicability**

No person shall construct or install a WECS in the Town of Bourne unless in compliance with these Regulations.

### **3. Definitions**

**Abandonment:** A WECS shall be considered abandoned if not operated for 365 consecutive days.

**Adverse Health Effects:** Any change in body function or the structure of cells that can lead to disease or health problems. Adverse Health Effects include, but are not limited to, sleep disturbance, temporary or permanent hearing loss, dizziness, and anxiety.

**Aerodynamic Amplitude Modulation (AAM):** As related to wind turbines is the sound pressure from aerodynamic action of the turbine blades. This sound is sometimes distinguished as a swishing noise or thumping. AAM noise is characterized by the fluctuation in sound amplitude (rotational speed of the hub multiplied by the number of blades).

**Cap Value:** The value, measured in decibels, of the total amount of ambient noise plus the noise generated by a WECS.

**Daytime:** The period between the hours of 7:00 a.m. and 7:00 p.m., Monday through Friday, except holidays observed by the Town of Bourne.

**Height:** The highest point reached at any time by any part of the WECS.

**Infrasound:** infrasound is sound that is lower in frequency than 20 Hz (Hertz) or cycles per second, the “normal” limit of human hearing.

**Nighttime:** The hours between 7:00 p.m. and 7:00 a.m. on weekdays, together with all hours on Saturday, Sunday, and holidays observed by the Town of Bourne.

**Noise:** Unwanted or disturbing sound, or infrasound, that either interferes with normal activities such as sleeping and conversation, or disrupts or diminishes one’s quality of life.

**Wind Energy Conversion System (“WECS”):** All equipment, machinery and structures utilized in connection with the conversion of wind to other forms of energy.

**Shadow Flicker:** The effect of the sun being blocked by an object that is in motion, casting a shadow that is intermittent.

### **4. Notice to Board of Health**

Any person who intends to construct or install a WECS must first provide written notice to the Board of Health. The notice must be accompanied by adequate information

for the Board to review the potential that the WECS has for causing adverse health effects and shall include, at a minimum, the following:

- Basic information about the applicant, including the history/experience of applicant in relation to wind turbines;
- An existing conditions plan;
- Land uses of properties abutting the site of the proposed WECS;
- Manufacturer's specifications;
- Manufacturer's operation and safety manuals;
- Abandonment plan/Decommissioning plan;
- Security plan;
- Emergency contact plan;
- Ambient Noise Study – to be performed by a qualified engineer that is in the business of sound engineering and containing a certification that the study was performed utilizing applicable industry standards and procedures. No ambient noise study is required for WECS with the capacity of less than 10 KW or less than 75 feet in height, whether commercial or private use WECS. A copy of a concurrent application to another regulatory board or authority may be submitted in order to decrease duplicity of requirements.

## **5. Performance Standards**

A WECS shall comply with the following performance standards.

### **A. Noise.**

Daytime: The noise generated by a WECS shall not exceed 6 dB(A) above ambient or and with a cap value of 65 dB(A) at the closest property line. The Board may allow a greater dB(A) where the applicant has demonstrated proven at a public meeting no inhabitants will be adversely affected.

Nighttime: The noise generated by a WECS shall not exceed 6 dB(A) above ambient and with a cap value of 40 dB(A) at the closest property line. The Board may allow a greater cap value of 65 dB(A) where the applicant has proven at a public meeting no inhabitants will be adversely affected.

### **B. Modulation.**

The amplitude modulated noise measurable in overall A-weighted sound pressure level shall not exceed 4 dB peak to trough at the closest property line. A higher AAM may occur only if the applicant has demonstrated to the Board of Health that no inhabitants will be adversely affected.

### **C. Shadow Flicker**

Shadow flicker shall not extend beyond the lot lines of the property upon which the WECS is located. A variance may be obtained to allow shadow flicker to extend beyond the lot lines as provided for in the section on Variances. A shadow flicker of 3 to 60 hertz shall never be allowed. Shadow flicker shall not create a nuisance.

### **D. Abandonment**

Whenever a WECS is abandoned as defined by these Regulations, all fluids and hazardous materials shall be removed within 30 days. An owner of a WECS that is shut down for maintenance or mechanical failure for more than 30 days must notify the Board and may be required to appear before the Board of Health to provide information regarding the reasons for the prolonged shutdown.

### **E. Emergency Access**

The Board shall have a Knox box available, model to be determined at a public meeting, at the gate with an emergency shutdown switch to deactivate the WECS in the case of an emergency. This device shall also be available for other safety personnel as required. Training manuals and sessions are to be provided prior to activation for emergency personnel, Board of Health Agent, Fire and Police.

All turbines located in the Town of Bourne must have a ten (10) foot chain link fence with barbed wire around the base of turbine or provide the Board with sufficient facts that the WECS cannot be accessed by personnel not authorized.

### **F. Security**

The Board may require the posting of security in the form of a proper bond, deposit of monies or other security sufficient in the opinion of the Board to secure decommissioning or to remediate health concerns. Security that is required by another Town Board or authority may be utilized to satisfy this requirement if the Board of Health has direct, unencumbered access to the security and the amount is deemed adequate by the Board.

## **6. Variances**

Any applicant may request a variance from these Regulations. Such a request must be in writing. The Board may grant a variance from the provisions of these Regulations if the applicant demonstrates to the Board's reasonable satisfaction that there will be no nuisance created that will affect any property within three times (3X) the radius of the height of the WECS.

A variance request must be in writing and include sufficient information for the Board to determine that no nuisance will be created as described above.

## **7. Enforcement**

The Board of Health or its agent shall enforce these Regulations. The Board may issue enforcement orders requiring compliance with these Regulations. In the event of noncompliance with an enforcement order, the Board may seek and obtain injunctive orders in Superior Court restraining violations of these Regulations. The Board may levy fines upon any individual who violates the provisions of these Regulations.

Whoever violates any provision of these Regulations may be penalized by the non-criminal method of disposition as provided in Massachusetts General Laws, Chapter 40, Section 21D, and pursuant to the Board of Health Fine Regulation.. Alternatively, the Board may levy fines and collect same by filing a criminal complaint in District Court.

Any fines imposed under the provisions of this bylaw shall inure to the Town of Bourne for such use as the Town may direct.

## **8. Severability**

If any provision of these regulations is deemed invalid, the remaining provisions shall remain in effect.