

BERKSHIRE REGIONAL  
PLANNING COMMISSION

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MODEL LARGE SCALE  
WIND ENERGY FACILITY  
ZONING BYLAW

## INTRODUCTION

The Berkshire Regional Planning Commission takes the issue of wind turbine siting very seriously. The decision to allow or prohibit large scale wind energy facilities is a decision to be made by each community after an open and inclusive public process. This model bylaw is intended to assist communities that have made a community decision to allow large scale wind energy facilities within its boundaries. The Berkshire Regional Planning Commission has not adopted a formal position on the siting of large scale wind energy facilities in Berkshire County and the publication of this model bylaw should not be taken as such an endorsement.

## BACKGROUND

The majority of Berkshire communities possess wind resources sufficient to support large scale wind energy facilities. The great majority of viable locations in Berkshire County are located on hilltops and ridgelines. These hilltops and ridgelines are part of the iconic Berkshire landscape and many of them have significant environmental value. However, concerns over climate change and the instability in the global energy market has created a demand for the clean domestic renewable energy produced by wind turbines and other renewable sources such as solar photovoltaic and hydroelectric.

## MODEL BYLAW

This model bylaw is not intended to be adopted verbatim, but to serve as the foundation on which a community might develop its own bylaw tailored to the needs and desires of that community. The objective of this model bylaw is to assist communities with the permitting of large scale wind energy facilities in a responsible manner. To meet this objective the model bylaw recommends that:

- All large scale wind energy facilities may be allowed only after the issuance of a special permit.
- A local bylaw include design standards that define the size and scope of permissible projects.
- Applicants be required to conduct and submit a number of site assessments to inform the community as to whether the proposed location is appropriate for the proposed project.
- Applicants be required to post a financial surety to protect the community's financial interest.

This bylaw is not intended to regulate small wind energy facilities or meteorological towers.

This bylaw differentiates between large and small wind energy facilities based upon height. According to the American Wind Energy Association, small wind energy facilities range from 30' to 140' in height. Herein, a large wind energy facility is defined as being greater than 140' in height. An alternative means of differentiating between small and large wind energy facilities is based on the rated nameplate capacity of the wind turbine. (e.g. a wind energy facility greater than 60 kW is a large wind energy facility).

Berkshire Regional Planning Commission staff can provide limited technical assistance if communities have questions about the content of this model bylaw.

**MODEL LARGE WIND ENERGY FACILITY BYLAW**

**1.1 Purpose.**

The purpose of this bylaw is to encourage the responsible development of the town’s wind energy resources by providing standards for the design, placement, construction, monitoring, modification and removal of large wind energy facilities that address public health and safety, minimize impacts on scenic, natural and historic resources of the town and provide adequate financial assurances for decommissioning.

Communities may wish to include language about global warming, air pollution or acknowledge the benefits of clean renewable energy, such as no greenhouse gas emissions, in addition to the protective language mentioned above.

**1.2 Applicability.**

This bylaw applies to all large wind energy facilities to be constructed after the effective date of this bylaw. This bylaw also applies to physical modifications to any existing large wind energy facility that materially alter its type, number, location, height or configuration.

**1.3 Definitions.**

**Height** – the distance between the natural grade of the land measured vertically to the tip of the wind turbine blade at its highest point.

**Large Wind Energy Facility** – A wind energy facility with a height greater than one-hundred forty-feet (140’).

**Small Wind Energy Facility** – A wind energy facility with a height of one-hundred forty (140’) feet or less. Small wind energy facilities are regulated by § \_\_\_\_\_.

**Wind Energy Facility** – All equipment, machinery and structures utilized in connection with the conversion of wind to electricity. This includes but is not limited to, transmission, storage, collection and supply equipment, substations, transformers, towers, wind turbines, foundations, stormwater control measures, service roads and other appurtenant structures, facilities and equipment.

**Wind Turbine** – A device that converts kinetic wind energy into rotational energy that drives an electrical generator. A wind turbine typically consists of a nacelle body and a rotor with two or more blades.

**1.4 Wind Energy Overlay District.**

The Wind Energy Overlay District is herein established as an overlay district. This overlay district is intended to modify and where there is inconsistency, supersede the regulations of the underlying district. Except as so explicitly modified or superseded, the regulations of the underlying district remain in effect.

The Wind Energy Overlay District includes all areas designated as such on the \_\_\_\_\_ Map, which is hereby incorporated by reference into this bylaw and is on file in the Office of the \_\_\_\_\_ Town Clerk.

The creation of an overlay district allows for the construction and operation of large wind energy facilities in designated locations. The use of an overlay district allows a community to proactively prevent projects from being constructed in areas thought to be inappropriate by the community. Please note that the boundaries of any overlay district cannot be arbitrarily chosen.

### 1.5 Use Regulations.

No large wind energy facility shall be erected, constructed, or installed without first obtaining a special permit from the Special Permit Granting Authority (“SPGA”). Physical modifications to an existing large wind energy facility that materially alter its type, number, location, height or configuration shall also require a special permit from the SPGA.

### 1.6 General Requirements.

- a. **Compliance.** The construction, operation, modification and removal of all large wind energy facilities shall comply with all local, state and federal laws.
- b. **Site Control.** The applicant shall demonstrate actual control over and legal access to the proposed site sufficient to allow for the construction and operation of a large wind energy facility.
- c. **Utility Notification.** The applicant shall demonstrate that ISO New England or the utility company that controls the electric grid in the area of the proposed site has been informed of the applicant’s intent to install an interconnected large wind energy facility. Off-grid large wind energy facilities shall be exempt from this requirement.
- d. **Operation & Maintenance.** The operator of a large wind energy facility shall maintain the large wind energy facility, access road(s) and stormwater control measures in good condition. The applicant shall submit an operation and maintenance plan for the life of the expected large wind energy facility, showing how the operator will maintain the large wind energy facility, access road(s) and stormwater control measures in good condition.
- e. **Contingency Plan.** The applicant shall submit a contingency plan that outlines the protocols to be followed to mitigate unacceptable adverse impacts to the town, its residents and the environment. At a minimum, the plan shall include mitigation steps to address the possibility of excessive noise, excessive shadow & flicker and excessive wildlife injuries or mortalities as determined by the state or federal agency with jurisdiction over the impacted species.
- f. **Liability Insurance.** The operator of the large wind energy facility shall obtain and keep current an insurance policy, against loss or damage to persons or property, including personal injury or death resulting from the large wind energy facility. The SPGA shall determine the minimum amount of liability insurance required. The operator of the large wind energy facility shall provide the SPGA with proof of liability insurance, in the amount determined by the SPGA, prior to the issuance of a building permit.
- g. **Removal Plan & Cost Estimate.** The applicant shall submit a detailed plan for the removal of the large wind energy facility and restoration of the site to its pre-existing condition upon abandonment or decommissioning. The removal plan shall be prepared by a qualified professional and include a detailed estimate of the anticipated removal and site restoration costs that includes a mechanism to account for inflation.
- h. **Financial Surety.** The operator of the large wind energy facility shall provide the SPGA with the following prior to the issuance of a building permit:

- i) Surety to ensure that the proposed large wind energy facility project site is properly stabilized to protect downslope properties and public ways. The amount and form of surety shall be determined by the SPGA.
- ii) Surety to cover possible damage to public ways and public lands damaged during the transportation of the large wind energy facility components. The amount and form of surety shall be determined by the SPGA.
- iii) Surety to cover the cost of removal of the large wind energy facility and the restoration of the site in the event the town must remove the large wind energy facility and restore the site. The amount and form of surety shall be determined by the SPGA, but in no event shall the amount exceed one-hundred twenty-five (125%) percent of the total estimated cost of removal. No less than ninety (90) days prior to the expiration of any financial surety required by this bylaw, the current operator of the large wind energy facility shall provide the SPGA with renewed, extended or replacement financial surety in an amount and form determined by the SPGA in accordance with this bylaw.

*Consider requiring applicants to submit surety (cash, irrevocable letter of credit, bond) to protect the interest of the municipality and the public. Please note that many forms of surety expire after a definite period of time and the surety amount may need to be amended over time as inflation occurs. The applicant/owner should be required to provide a new or renewed form of surety prior to the expiration of the old one. The issue of financial surety is complex and beyond the scope of this note. Communities are encouraged to meet with town counsel or a financial professional if they are unfamiliar with the surety process.*

- i. **NHESP Letter.** The applicant shall petition the Massachusetts Natural Heritage & Endangered Species Program (“NHESP”) for a letter of determination as to the possible existence of rare or endangered species and species of special concern at the proposed site.

## 1.7 Design Standards.

- a. **Height.** No large wind energy facility shall exceed \*\* feet in height.

*Each community should determine whether a height limit is appropriate. In the alternative, a community may wish to let the developer construct a wind energy facility at the most ideal height for electric power production. As wind turbine and tower technology have advanced so have the height of towers. At this time, the technology is available to construct wind turbines in excess of 500’ from the ground to the tip of the blade at its highest point. However, more typical commercial scale wind turbines are between 400’ and 450’ from the ground to blade tip at its highest point. For example, the five proposed 2.5 MW wind turbines on West Hill in Savoy are 420’ tall each. Appropriate height limitations may be in the range of 400’ to 500’.*

- b. **Appearance.** All large wind energy facilities shall be finished a neutral (white or gray) non-reflective color in order to be less visually obtrusive.
- c. **Signage.** Signs listing the 24-hour contact information of the large wind energy facility operator shall be installed in easily accessible and noticeable locations at the large wind energy facility site. All signs shall comply with the Town of \*\*\* sign bylaw.
- d. **Lighting.** Large wind energy facilities shall contain a beacon light only if required by the Federal Aviation Administration. A large wind energy facility may include lights necessary for the safe operation of the large wind energy facility. All operational lighting shall be directed downwards and

screened from roadways and abutting properties with native vegetation. Evidence of the FAA requirement for the facility shall be submitted with the application.

- e. **Shadow & Flicker.** All large wind energy facilities shall be located in areas that do not result in significant shadowing or flickering on off-site inhabited buildings. The applicant has the burden of proving that any shadowing or flickering on off-site inhabited buildings is not significant.

*Shadow/Flicker occurs when rotating wind turbine blades pass between a receptor (i.e. person) and the sun. This creates a repeating cycle of varying light intensities that is perceived as the lights flickering. Shadow/flicker will generally be the greatest during the early morning or late evening. The State of New Hampshire defines significant shadow/flicker as more than 30 hours per year on abutting occupied buildings. (NH Office of Energy Planning-Small Wind Energy Systems 2008). The shadow flicker effect on a particular area of land can be inexpensively modeled with great accuracy. A shadow flicker analysis is required later in this bylaw.*

- f. **Appurtenant Structures & Equipment.** All appurtenant structures and equipment shall comply with the dimensional requirements of the underlying zoning district, including but not limited to setbacks and height.
- g. **Noise Regulations.** All large wind energy facilities and appurtenant equipment shall comply with the provisions of the Massachusetts Department of Environmental Protection’s, Division of Air Quality Noise Regulations (310 CMR 7.10).

*See “310 CMR 7.10”*

- h. **Setbacks.**

- i) No large wind energy facility shall be located within one-half (1/2) mile of the nearest off-site inhabited building in existence on the date the application to construct a large wind energy facility is received by the SPGA.

*The setbacks suggested in this bylaw are intended to proactively mitigate against possible adverse effects of large wind energy facilities on the public. According to the National Academy of Sciences “noise produced by wind turbines is not a major concern for humans beyond a half mile.” (National Academy of Sciences, 2007)<sup>i</sup> However, this same report states that “low-frequency vibration and its effects on humans are not well understood. (National Academy of Sciences, 2007)<sup>ii</sup> The intent of the ½ mile setback is to reduce the likelihood that neighbors living in proximity to the large wind energy facility will be adversely affected by noise produced by large wind energy facilities. State noise regulations (310 CMR 7.10) still apply. Please note that the ½ mile setback suggested in this bylaw is the recommended minimum setback distance from the large wind energy facility to off-site inhabited buildings. A community may wish to require larger setbacks or smaller setbacks (not recommended).*

*An additional reason to impose a ½ mile setback from off-site inhabited buildings is to mitigate the potential shadow flicker effects on off-site inhabited buildings. According to the National Academy of Sciences, “shadow flicker is not important at distant sites (for example greater than 1,000 ft from a turbine) except during the morning and evening hours when shadows are long.” (National Academy of Sciences, 2007)<sup>iii</sup> According to the Minnesota Department of Health Environmental Health Division, flicker should not be an issue at distances over 10 rotational diameters. (Minnesota Department of Health, 2009)<sup>iv</sup> Thus, a setback of a ½ mile should ensure that all off-site inhabited buildings are outside the area susceptible to the greatest amount of shadow flicker.*

- ii) All large wind energy facilities shall be setback a distance equal to one and one-half (1.5) times the height of the large wind energy facility from property lines, on-site inhabited buildings, public rights of way and recreational trails. The SPGA may reduce the setback requirement from property lines, if written permission is granted by all individuals or entities with control over the affected real property.

*A smaller setback distance is recommended from the large wind energy facility to property lines, on-site inhabited buildings, public ways and recreational trails to minimize the risk of harm to the public. Blade failure, tower failure and ice throw are concerns addressed by this setback. “The 74 known European turbine blade failures since 2000 have thrown whole blades up to 150 meters (492’) and blade pieces up to 500 meters (1640’). (Chief Medical Officer of Health (Ontario), 2010)<sup>v</sup>”. According to the same report, ice thrown from wind turbines is usually found within 100 meters (328’) of the turbine. (Chief Medical Officer of Health (Ontario), 2010)<sup>vi</sup> According to this bylaw a typical large wind energy facility of 400’ must be setback 600’ from property lines, on-site inhabited buildings, public ways and recreational trails, placing these areas outside of the known range of whole turbine blades, but not of blade fragments. Thus, the frequency of blade failure becomes important in order to calculate the risk of possible harm. Unfortunately, data about turbine blade failure is scarce. Researchers analyzing two databases of wind turbine blade failures from Germany and Denmark recommend assigning a risk value that approximately 1 in 4,000 wind turbines per year experience partial blade failure. (Garrad Hassan Canada (Canadian Wind Energy Association), 2007)<sup>vii</sup> Although, the exact risk calculation may be debatable in general terms blade failure does not occur very frequently. A community will need to assess the likelihood and associated risk that a blade failure or ice throw will occur striking a person, vehicle or building when determining the appropriate setback distance from property lines, on-site inhabited buildings, public ways and recreational trails.*

*As discussed above shadow flicker is greatest within 1000’ of the wind turbine. Thus, property lines, on-site inhabited buildings, public ways and recreation trails may be in an area that experiences higher amounts of shadow flicker with the proposed 1.5 times the height setback suggested by the bylaw. As mentioned above, each community should calculate the risks and benefits of the setback distance and come to their own conclusion about what is appropriate.*

- i. **Unauthorized Access.** All large wind energy facilities shall be constructed to prevent unauthorized persons from gaining access to the large wind energy facility.
- j. **Emergency Response Access.** The large wind energy facility and access roads shall be constructed and maintained to allow for safe access by local emergency vehicles. Local public safety officials shall be provided with the ability to access the facility as needed to respond to emergencies.
- k. **Habitat Fragmentation.** To the extent possible, large wind energy facilities, associated roadways and transmission lines shall be located in or adjacent to areas where land is already cleared to avoid habitat fragmentation.
- l. **Vegetation Clearing.** The clearing of natural vegetation shall be limited to that which is necessary for the construction, operation, and maintenance of the large wind energy facility, associated roadways and transmission lines and is otherwise prescribed by applicable laws. Revegetation plans shall be provided for restoration areas required for construction but not necessary for ongoing maintenance and operations. Only native species typically found in the facility’s environment may be used for restoration.
- m. **Wetlands.** All large wind energy facilities, associated roadways and transmission lines shall be constructed in compliance with all applicable local, state and federal laws pertaining to wetlands.
- n. **Wildlife.** All large wind energy facilities, associated roadways and transmission lines shall be constructed to avoid or minimize impacts to wildlife, with particular attention paid to avian and bat species, as well as rare species, endangered species and species of special concern.
- o. **Stormwater Management.** All stormwater controls installed at the large wind energy facility site and on associated roadways shall be constructed and managed according to the Massachusetts Stormwater Policy.

- p. **Invasive Species Management.** The applicant and subsequent large wind energy facility operator shall utilize best management practices during construction and post-construction to control the introduction of invasive species at the large wind energy facility site and along the associated roadways and transmission lines.

### 1.8 Large Wind Energy Facility Site Studies.

- a. **Balloon/Crane Test.** Within twenty (21) days after the filing of an application to construct a large wind energy facility the applicant shall arrange for a balloon or crane test at the proposed site to illustrate the height of the proposed large wind energy facility . The balloon or crane shall remain raised in place for a period of eight (8) consecutive daylight hours between sunrise and sunset. The date, time and location of such test shall be advertised in a newspaper of general circulation in the town at least seven (7) days prior to the date of the test. If visibility and weather conditions are inadequate for observers the SPGA may require additional tests.
- b. **Sight Line Simulations.** The SPGA shall select up to five (5) locations from which the applicant shall conduct and submit sight line simulations from the chosen location to the proposed large wind energy facility site. All simulations shall be in color and provide an accurate representation of the height, width and breadth of the proposed large wind energy facilities.
- c. **Project Viewshed Map.** The applicant shall submit a viewshed map showing all areas within five (5) miles of the proposed large wind energy facility site that will be able to view the large wind energy facility. The viewshed map shall identify streets, historical resources, cultural facilities, recreational resources, publicly owned land, and other local landmarks.
- d. **Noise Analysis.** The applicant shall submit the results of a noise analysis to the SPGA. The noise analysis shall be conducted in accordance with industry standards and certified by a qualified independent acoustical engineer. The noise analysis shall contain sufficient information for the SPGA to determine whether the operation of the proposed large wind energy facility will comply with Massachusetts Department of Environmental Protection's, Division of Air Quality Noise Regulations (310 CMR 7.10). In completing the noise analysis, the acoustical engineer shall consider the unique topography of the surrounding area, prevailing wind direction and atmospheric conditions, such as high wind shear or thermal inversion, that may affect the propagation of sound emitted from the large wind energy facility. The noise analysis shall also include an analysis and discussion of the anticipated impacts of low frequency noise emitted from the large wind energy facility.

*Wind turbine noise is one of the most controversial aspects of wind turbine siting and operation. Over the past decade manufacturers have worked to develop quieter wind turbines. However, wind turbines still produce both audible and low frequency noise whose propagation varies depending on a myriad of factors, such as topography, atmospheric conditions, tree cover and wind direction. Credible experts disagree over the health impacts caused by noise emitted by wind turbines. At this time, bona fide health concerns exist over wind turbine noise. Until the health impacts of wind turbine noise are more fully understood, this bylaw takes a precautionary approach by requiring large setbacks to the nearest off-site inhabited building.*

- e. **Shadow & Flicker Analysis.** The applicant shall conduct a shadow and flicker analysis and submit its findings to the SPGA. The shadow and flicker analysis shall include a list of all off-site inhabited buildings estimated to receive thirty (30) or more shadow/flicker hours per year.

- f. **Avian & Bat Species Analysis.** The applicant shall submit the results of an avian and bat species analysis to the SPGA. The avian and bat species analysis shall be conducted and certified by a qualified independent wildlife biologist. The avian and bat species analysis shall contain sufficient information to fully characterize and determine the risk posed by the proposed large wind energy facility to avian and bat species. Applicants are strongly encouraged to comply with the most recent US Fish & Wildlife Service Wind Turbine Guidelines Advisory Committee Recommended Guidelines: Recommendations on developing effective measures to mitigate impacts to wildlife and their habitats related to land-based wind energy facilities, when planning and conducting studies to meet the requirements of this section. The SPGA may require the large wind energy facility operator to conduct one year of post construction monitoring to document avian and bat species injuries and mortalities.

*Some communities may believe that the regulation/protection of wildlife in relation to large wind energy facility siting is the responsibility of the Commonwealth. If so, the above section (f) Avian & Bat Species Analysis can be omitted from the bylaw. However, please keep in mind that the Commonwealth has not yet adopted standards to assess bird and bat impacts at wind energy facility sites.*

*Avian and bat species can be particularly affected by the operation of a wind energy facility. This bylaw requires the applicant to develop and conduct studies in order to fully characterize the risk to avian and bat species if the wind energy facility were constructed. The SPGA is strongly encouraged to hire its own wildlife expert (paid for by the applicant) to review the avian and bat analysis. BRPC can provide limited technical assistance to communities who wish to develop more stringent criteria related to bird and bat analyses.*

*US Fish & Wildlife has convened a group of scientists and wind industry experts with the purpose of creating protocols for wind energy developers to follow when selecting wind energy facility sites. The protocols are intended to assist wind developers in assessing the risk posed to avian and bat species at a particular site. At this time, the protocol are still in draft form, but are nonetheless useful for communities and the SPGA to understand what types of studies should be completed.*

**1.9 Pre-application Conference**

Prior to the submission of an application for the construction or modification of a large wind energy facility, applicants are strongly encouraged to meet with the SPGA at a public meeting to discuss the proposed large wind energy facility project and to clarify the filing requirements and permitting process.

**1.10 Procedures**

Upon receipt of a complete application for a large wind energy facility , the SPGA shall review and take action upon the application in accordance with the special permit procedures set forth in § \*\* and this section.

**1.11 Reasonable Conditions & Mitigation**

The SPGA may impose reasonable conditions, safeguards and limitations on time and use and may require the applicant to implement all reasonable measures to mitigate unforeseen adverse impacts of the large wind energy facility should they occur.

**1.12 Application Requirements**

The applicant shall submit the following required information as part of the application for a large wind energy facility special permit. All site plans shall be signed and sealed by a registered professional engineer or licensed surveyor.

- a. **Contact Information.** Name, address, phone number, e-mail and signature of the applicant, as well as all co-applicants or property owners, if any and the name contact information and the signature of any agents representing the applicant.
- b. **Site Identification.** Identify the location of the proposed large wind energy facility. Provide the street address, if any, and the tax map and parcel number(s).
- c. **Location Map.** A relevant portion of the most recent USGS Quadrangle Map at a scale of 1" = 25,000' or similar scale showing the proposed large wind energy facility site, associated roadways, transmission lines and the area within at least a two mile radius of the proposed site.
- d. **Vicinity Map.** A map of the proposed large wind energy facility site at a scale of 1" = 300' or similar scale, with existing contour intervals no greater than ten (10') feet showing the entire area within a three thousand (3000') foot radius of the proposed large wind energy facility and shall include:
  - i) Existing topography, public and private roads, recreation trails, property lines of all abutters within one thousand (1000') feet, structures including their use, historic sites, cultural sites, wetlands, known bat hibernacula, known critical habitat areas, other environmentally sensitive areas, location of existing and proposed electric distribution lines, transformers, substations, and access easements.
- e. **Site Plan.** A site plan with a scale of 1" = 40', unless otherwise noted with contour intervals no greater than two (2') feet showing the following:
  - i) Property lines of the proposed large wind energy facility site and adjacent parcels within two (2) times the height of the large wind energy facility. Use scale of 1" = 100'
  - ii) Outline of all existing structures, including their uses, located within two (2) times the height of the large wind energy facility with exact distances to the large wind energy facility listed. Use scale of 1" = 100'
  - iii) Existing and proposed public and private roads, driveways, and recreational trails within two (2) times the height of the large wind energy facility. Use scale of 1" = 100'
  - iv) Representations, dimensioned and to scale, of the proposed large wind energy facility including, but not limited to, tower foundations, guy anchors, cable locations, associated equipment and structures, fencing, electric distribution infrastructure, parking and access roads.
  - v) All proposed changes to the existing site, associated roadways and transmission lines, including but not limited to areas of temporary clearing, areas of permanent clearing, areas of grading, and areas of cut and fill.
  - vi) Delineation of all wetland resource areas and buffers on the proposed large wind energy facility site, associated roadways and transmission lines.
  - vii) Location of known habitat areas for rare species, endangered species and species of special concern
  - viii) A cross section of the proposed access road indicating its width, crown, depth of gravel, drainage, and paving or other surface material.
- f. **Elevations.** Siting elevations or views at grade from north, south, west and east for a distance equal to 1.5 times the height of the large wind energy facility around the proposed large wind energy

facility. Elevations shall be at one quarter inch equals one foot or similar scale and show the following:

- i) The proposed large wind energy facility, associated equipment, existing and proposed structures, and security barriers with total elevation dimensions.
  - ii) Existing and proposed trees and shrubs at the time of application with approximate elevations dimensioned.
- g. **Technical Information.**
- i) Documentation of the large wind energy facility's nameplate capacity, manufacturer, model number, tower height, rotor diameter, braking mechanisms, other safety mechanisms, tower type, color, foundation type and foundation dimensions.
- h. **Stormwater Control Plans.** Engineering plans showing the drainage of surface water and detailed plans to control erosion and sedimentation, during construction and as a permanent measure, which show conformance to the Massachusetts Stormwater Policy.
- i. **Transportation Plan.** A written transportation plan discussing the anticipated transportation issues created by the transportation of the large wind energy facility components, which shall include the following:
- i) A map showing the anticipated transportation route commencing at the Massachusetts state line.
  - ii) All locations in the Town of \_\_\_\_\_ where land alterations and clearing of vegetation will be required, regardless of ownership, including the approximate square footage of each land alteration.
  - iii) A detailed list of all bridges and culverts to be crossed in the Town of \_\_\_\_\_ during the transportation of the large wind energy facility components that include the applicable width and weight restrictions of each bridge and culvert.
  - iv) Detailed site plans for all anticipated road, bridge, or culvert alterations in the Town of \_\_\_\_\_ along the anticipated transportation route, regardless of ownership.
  - v) A list of the anticipated combined weight of the delivery vehicles and cargo.
  - vi) A list of the turning radii of the delivery vehicles with cargo.
  - vii) All anticipated road closures and traffic disruptions that may affect emergency response vehicles and plans to manage these road closures and traffic disruptions in cooperation with local emergency officials.
- j. **Other Information.**
- i) Documents establishing legal access to and control of the proposed large wind energy facility site as required by § 1.6 (b).
  - ii) Documents demonstrating that the applicant has notified ISO-New England or the local electric supplier as required by § 1.6 (c).
  - iii) Operation and maintenance plan as required by § 1.6 (e).
  - iv) Plans and costs estimates for the removal of the large wind energy facility as required by § 1.6 (i).
  - v) Studies and materials required by § 1.8.
  - vi) Contingency plan as required by § 1.6 (f).
  - vii) Certification of height approval from the FAA, including required lighting.
  - viii) NHESP letter as required by § 1.6 (j).

- ix) Revegetation plan as required by § 1.7 (l).

*A community may already have site plan and/or special permit filing requirements. The section above lists specific provisions that communities should consider in addition to its existing filing requirements, to ensure that the SPGA is given all the information necessary to make an informed decision.*

**1.13 Waiver**

Upon written request of the applicant, the SPGA may waive any of the application requirements contained in § 1.12, as the SPGA, in its discretion, deems appropriate.

*A community may discover that due to the location, type or size of the project some of the filing requirements are unnecessary and can be waived to avoid imposing an unnecessary expense on the applicant.*

**1.14 Damage to Public Ways & Public Lands**

The applicant shall be responsible for the cost of repairing any damage to public ways and public lands in the Town of \_\_\_\_\_ caused by the use of the public ways or public lands in connection with the transportation, construction, operation, maintenance and decommissioning of the large wind energy facility.

- a. In furtherance of this section, a qualified independent engineer, paid for by the applicant and selected by the town , shall document the condition of all public ways and public lands along the anticipated transportation route prior to the transportation of any large wind energy facility component.
- b. Within thirty (30) days after all large wind energy facility components have been transported, the qualified independent engineer, paid for by the applicant and selected by the town , shall re-document the condition of all public ways and public lands along the actual transportation route to determine whether the public ways and public lands have been damaged by the applicant and if so, the total cost to repair such damage.

*The transportation of wind turbine components involves the movement of extremely heavy loads over the public ways and bridges. Communities are encouraged to adopt some mechanism to assess and calculate the damage to public ways and public lands caused by the transportation of wind turbine components and to shift the cost of repair to the applicant. A community should require the applicant to post financial surety to cover possible damage to the public ways/lands.*

**1.15 Abandonment & Removal of Large Wind Energy Facilities**

- a. The most recent operator shall remove the large wind energy facility, at the end of its useful life or when it is abandoned, and restore the site in accordance with its removal plan. The most recent operator shall notify the Building Inspector by certified mail of the proposed date of discontinuance. Absent notice of a proposed date of discontinuance, the large wind energy facility shall be considered abandoned if it is not operated for a period of six (6) months.
- b. The most recent operator shall physically remove the large wind energy facility and restore the site within one-hundred eighty days (180) days from the date of discontinuance or abandonment. If the most recent operator fails to remove the large wind energy facility within the one-hundred eighty (180) day period, the town shall have the right to enter onto the site and physically remove the large wind energy facility and restore the site at the sole expense of the most recent operator.

### 1.16 Technical Review

Upon submission of an application for a large wind energy facility special permit, the SPGA will be authorized to hire independent consultants at the applicant's expense, pursuant to M.G.L. Chapter 44 § 53G, to assist the SPGA with the technical review of application materials and to monitor the construction project to ensure that all work is conducted in accordance with approved plans and conditions.

### 1.17 Lapse of Approval

Any special permit approved to construct, operate or modify a large wind energy facility pursuant to this bylaw shall automatically expire if:

- a. The large wind energy facility is not installed and operating within two (2) years from the date of approval; or
- b. the large wind energy facility becomes abandoned or discontinued.

### 1.18 Violations

It is unlawful for any person or entity to construct, install, modify or operate a large wind energy facility that is not in compliance with this bylaw or with any condition contained in a special permit, issued pursuant to this section.

### 1.19 Penalties

Any person or entity that fails to comply with any provision of this bylaw or any condition contained in a special permit, issued pursuant to this section shall be subject to enforcement and penalties as allowed by applicable law.

### 1.20 Severability

The provisions of this bylaw are severable, and the invalidity of any section, subdivision, subsection, paragraph or other part of this bylaw shall not affect the validity or effectiveness of the remainder of this bylaw.

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<sup>i</sup> *Impacts of Wind-Energy Development on Humans*, National Academy of Sciences, 2007, page 109.

<sup>ii</sup> *Impacts of Wind-Energy Development on Humans*, National Academy of Sciences, 2007, page 109.

<sup>iii</sup> *Impacts of Wind-Energy Development on Humans*, National Academy of Sciences, 2007, page 110.

<sup>iv</sup> *Public Health Impacts of Wind Turbines*, Minnesota Department of Health Environmental Health Division, 2009, pg.14

<sup>v</sup> *The Potential Health Impacts of Wind Turbines*, Chief Medical Officer of Health (Ontario), 2010, pg. 7

<sup>vi</sup> *The Potential Health Impacts of Wind Turbines*, Chief Medical Officer of Health (Ontario), 2010, pg. 7

<sup>vii</sup> *Recommendations for Risk Assessments of Ice Throw and Blade Failure in Ontario*, Garrad Hassan Canada (Canadian Wind Energy Association), 2007, pg. 11