

CHAPTER XXII

117.2200 WIND ENERGY SYSTEMS

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117.2201 Purpose

It is the intent of this section to accommodate the installation of Utility Grid and On Site Use Wind Energy Systems while protecting the public health, safety, and general welfare of the community. Regulations shall facilitate the installation of Wind Energy Systems in a manner that shall; 1) Minimize adverse visual and audio effects of structures through careful design and siting standards and, 2) Avoid the potential hazard to adjacent properties of Wind Energy System failure through structural standards and setback requirements.

117.2202 Definitions

- A. Ambient: Ambient is defined as the sound pressure level exceeded 90% of the time or L90.
- B. ANSI: American National Standards Institute.
- C. dB(A): The sound pressure level in decibels. Refers to the “a” weighted scale defined by ANSI. A method for weighting the frequency spectrum to mimic the human ear.
- D. Decibel: The unit of measure used to express the magnitude of sound pressure and sound intensity.
- E. IEC: International Electro technical Commission.
- F. ISO: International Organization for Standardization.
- G. On Site Use Wind Energy Systems (OSUWES): An On Site Use Wind Energy System is intended to primarily serve the needs of the consumer.
- H. Tower: An element of a wind energy system used to support the turbine and rotor.
- I. Rotor: An element of a wind energy system that acts as a multi-bladed airfoil assembly, thereby extracting through rotation, kinetic energy directly from the wind.
- J. SCADA Tower: A freestanding tower containing instrumentation such as anemometers or meteorological that is designed to provide present moment wind data for use by the supervisory control and data acquisition (SCADA) system.
- K. Shadow Flicker: Alternating changes in light intensity caused by the moving blade of a wind energy system casting shadows on the ground and stationary objects, such as a window at a dwelling.

- L. Sound Pressure: Average rate at which sound energy is transmitted through a unit area in a specified direction. The pressure of the sound measured at a receiver.
- M. Sound Pressure Level: The sound pressure mapped to a logarithmic scale and reported in decibels (dB).
- N. Utility Grid Wind Energy Systems (UGWES): A Utility Grid Wind Energy System is designed and built to provide electricity to the electric utility grid.
- O. Wind Energy System: A wind energy conversion system which converts wind energy into electricity through the use of a wind turbine generator and includes the turbine, rotor, and tower as well as related electrical equipment. This does not include wiring to connect the wind energy system to the grid.
- P. Wind Site Assessment: An assessment to determine the wind speeds at a specific site and the feasibility of using that site for construction of a wind energy system.

117.2203 On Site Use Wind Energy Systems (OSUWES)

An On Site Use Wind Energy System (OSUWES) requires a minimum lot size of two acres and is intended to primarily serve the needs of the owner. An OSUWES with a tower higher than 65 feet shall require a site plan review. OSUWES with no towers or towers 65 feet or less shall be a Permitted Use in all zoning classifications where structures of any sort are allowed subject to the following requirements.

Prior to the installation of a tower higher than 65 feet, an application shall be filed with the local government that will include:

- 1). Applicant identification.
- 2). A site plan.
- 3). Documentation that sound pressure level, construction code, tower, interconnection (if applicable), safety requirements have been met.
- 4). Proof of the applicant's public liability insurance.

- A. Property Set-back: The distance between an OSUWES tower and the owner's property lines shall be at least one and one half times the height of the wind energy system tower including the top of the rotor in its vertical position.
- B. Sound Pressure Level: OSUWES shall not exceed 55 dB(A) at the property line closest to the wind energy system. This sound pressure level may be exceeded during short-term events such as utility outages and/or severe wind storms. If the ambient sound pressure level exceeds 55 dB(A), the standard shall be ambient dB(A) plus 5 dB(A).
- C. Vibrations: Under no circumstances shall an OSUWES produce vibrations humanly perceptible beyond the site plan boundaries.
- D. Construction Codes, Towers, & Interconnection Standards: OSUWES including towers shall comply with all applicable State Of Michigan construction and electrical codes and local building permit requirements. OSUWES including towers shall comply with Federal Aviation Administration requirements, the Michigan Airport Zoning Act (Public Act 23 of 1950, MCL 259.431 et seq.), the Michigan Tall Structures Act (Public Act 259 of 1959, MCL 259.481 et seq.), and local jurisdiction airport overlay zone regulations. An interconnected

OSUWES shall comply with Michigan Public Service Commission and Federal Energy Regulatory Commission standards. Off-grid systems are exempt from this requirement.

- E. Safety: An OSUWES shall have automatic braking, governing, or a feathering system to prevent uncontrolled rotation or over speeding. Written shut down procedures for emergency personnel must be submitted to the Milton Township Fire Department. All wind towers shall have lightning protection. The minimum vertical rotor tip clearance from grade shall be 20 feet for a wind energy system employing a horizontal axis rotor. The tower shall be freestanding.

117.2204 Wind Site Assessment for Utility Grid Wind Energy Systems

Installation of SKADA towers shall be considered a Special Land Use. Prior to the installation of the tower, an application for a Special Land Use permit shall be filed with the local government that will include 1) applicant identification, 2) a site plan, 3) a copy of that portion of the applicant's lease with the land owner granting authority to install the Met tower and requiring the applicant to remove all equipment and restore the site after completion of the wind site assessment, and 4) proof of the applicant's public liability insurance. The distance from the center of a Met tower and the property lines between the leased property and the non-leased property shall be at least one and one half times the height of the Met tower. Leased property can include more than one piece of property and the requirement shall apply to the combined properties.

117.2205 Utility Grid Wind Energy Systems (UGWES)

- A. A Utility Grid Wind Energy System (UGWES) is designed and built to provide electricity to the electric utility grid. UGWES shall be considered a Special Land Use allowed only in Section 23 T30NR.9W and Section 36 T30NR.9W of Milton Township, Antrim County, Michigan. The high elevation, most favorable wind conditions, and large parcels of agricultural land make these Sections most appropriate for a UGWES and to meet the Purpose Statement of this ordinance. Prior to the installation of a UGWES, an application for a Special Land Use permit shall be filed with the local government and shall also include the following:
 - 1. Sound Pressure Level: Copy of the modeling and analysis report.
 - 2. Visual Impact: Visual simulations of how the completed project will look from four viewable angles.
 - 3. Environmental Impact: Copy of the Environmental Impact analysis.
 - 4. Avian and Wildlife Impact: Copy of the Avian and Wildlife Impact analysis.
 - 5. Shadow Flicker: Copy of the Shadow Flicker analysis.
 - 6. Manufacturers' Material Safety Data Sheet(s): Documentation shall include the type and quantity of all materials used in the operation of all equipment including, but not limited to, all lubricants and coolants.
 - 7. Decommissioning: Copy of the decommissioning plan.

- B. The Utility Grid wind energy system project shall meet the following standards and requirements:
1. **Property Set-Back:** The distance between a Utility Grid wind energy system and the property lines of adjacent non-leased properties including public rights of way shall be at least one and one half times the height of the wind energy system tower including the top of the rotor in its vertical position. Where property is leased on both sides of a public right of way, a wind energy system may be placed no closer than one and one half times the height of the tower from the closest edge of the right of way. Leased property can include more than one piece of property and the requirement shall apply to the combined properties. The rotor shall be located such that the minimum blade clearance above ground shall be twenty feet.
 2. **SCADA (supervisory control and data acquisition) or meteorological (Met) towers** shall also comply with the property set-back requirement. The set-back shall be at least one and one half times the height of the SCADA or Met tower. An Operations and Maintenance Office building, a sub-station, or ancillary equipment shall comply with any property set-back requirement that may be applicable to that type of building or equipment. Overhead transmission lines and power poles shall comply with the set-back requirements applicable to public utilities.
 3. **Sound Pressure Level:** The sound pressure level generated by a Utility Grid wind energy system shall not exceed 55 dB(A) measured at the property lines between leased and non-leased property. This sound pressure level shall not be exceeded for more than 3 minutes in any hour of the day. If the ambient sound pressure level exceeds 55 dB(A), the standard shall be ambient dB(A) plus 5 dB(A). As part of the application and prior to installation, the applicant shall provide modeling and analysis that will confirm that the Utility Grid wind energy system will not exceed the maximum permitted sound pressure levels. Modeling and analysis shall conform to IEC 61400 and ISO 9613. After installation of the Utility Grid wind energy system, sound pressure level measurements shall be done by a third party, qualified professional according to the procedures in the most current version of ANSI S12.18. All sound pressure levels shall be measured with a sound meter that meets or exceeds the most current version of ANSI S1.4 specifications for a Type II sound meter. Documentation of the sound pressure level measurements shall be provided to the local government within 60 days of the commercial operation of the project.
 4. **Construction Codes, Towers, and Interconnection Standards:** Utility Grid wind energy systems including towers shall comply with all applicable State of Michigan construction and electrical codes and local building permit requirements. Utility Grid wind energy systems including towers shall comply with Federal Aviation Administration requirements, the Michigan Airport Zoning Act (Public Act 23 of 1950, MCL 259.431 et seq.), the Michigan Tall Structures Act (Public Act 259 of 1959, MCL 259.481 et seq.), and local jurisdiction airport overlay zone regulations. The minimum FAA lighting standards shall not be exceeded. All tower lighting required by the FAA shall be shielded to the extent possible to reduce glare and visibility from the ground. The tower shaft shall not be illuminated unless required by the FAA. Utility Grid wind energy systems shall comply with applicable utility, Michigan Public Service Commission, and Federal Energy Regulatory Commission interconnection standards. The height of the tower shall not exceed 199 feet measured from the average grade level to the top of the pod/tower not including the rotor.

5. **Safety:** All Utility Grid wind energy systems shall be designed to prevent unauthorized access to electrical and mechanical components and shall have access doors that are kept securely locked at all times when service personnel are not present. All spent lubricants and cooling fluids shall be properly and safely removed in a timely manner from the site of the wind energy system. Each UGWES or SCADA tower shall have one sign, not to exceed four (4) square feet in an area posted at the base of the tower. There shall be no display of advertising of any kind placed on the UGWES, SCADA tower or site plan property. The minimum vertical rotor tip clearance from grade shall be 20 feet for a wind energy system employing a horizontal axis rotor. Each UGWES tower shall be equipped with both a manual and automatic braking device capable of stopping the UGWES operation in high winds (40 miles per hour or greater).
6. **Hazard Prevention Plan:** An application for a UGWES shall be accompanied by a hazard prevention plan. Such plan shall address the following at a minimum:
 - a. Certification that the electrical wiring between turbines and between turbines and the utility right-of-way does not pose a fire hazard.
 - b. The landscape plan accompanying the application shall be designed to avoid spread of fire from any source on the turbine; such preventative measures may address the types and locations of vegetation below the turbine and on the site.
 - c. The following shall be submitted with the application for a special use permit for a wind turbine generator:
 - i. A listing of any hazardous fluids that may be used on site shall be provided.
 - ii. Certification that the turbine has been designed to contain any hazardous fluids shall be provided.
 - iii. A statement certifying that the turbine shall be routinely inspected to ensure that no fluids are released from the turbine.
 - iv. A Hazardous Materials Waste Plan shall be provided.
7. **Visual Impact:** Utility Grid wind energy system projects shall use tubular towers and all Utility Grid wind energy systems in a project shall be finished in a single, non-reflective matte finished color. A project shall be constructed using wind energy systems of similar design, size, operation, and appearance throughout the project. No lettering, company insignia, advertising, or graphics shall be on any part of the tower, hub, or rotor. Nacelles may have lettering that exhibits the manufacturer's and/or owner's identification. The applicant shall avoid state or federal scenic areas and significant visual resources listed in the local unit of government's comprehensive plan.
8. **Wind Access Buffer:** For any newly proposed UGWES or SCADA tower, a 'wind access buffer' equal to a minimum of five (5) rotor diameters shall be observed from any existing off site UGWES or SCADA tower, based on the average rotor diameter between the existing and proposed UGWES or SCADA tower.
9. **Environmental Impact Analysis:** The applicant shall have a third party, qualified professional conduct an analysis to identify and assess any potential impacts on the natural environment including, but not limited to wetlands and other fragile ecosystems, historical and cultural sites, and antiquities. The applicant shall take appropriate measures to minimize, eliminate or mitigate adverse impacts identified in the analysis. The applicant shall identify and evaluate the significance of any net effects or concerns that will remain after mitigation efforts.

10. Avian and Wildlife Impact: The applicant shall have a third party, qualified professional conduct an analysis to identify and assess any potential impacts on wildlife and endangered species. The applicant shall take appropriate measures to minimize, eliminate or mitigate adverse impacts identified in the analysis. The applicant shall identify and evaluate the significance of any net effects or concerns that will remain after mitigation efforts.

Sites requiring special scrutiny include wildlife refuges, other areas where birds are highly concentrated, bat hibernacula, wooded ridge tops that attract wildlife, sites that are frequented by federally and/or state listed endangered species of birds and bats, significant bird migration pathways, and areas that have landscape features known to attract large numbers of raptors.

At a minimum, the analysis shall include a thorough review of existing information regarding species and potential habitats in the vicinity of the project area.. Where appropriate, surveys for bats, raptors, and general avian use should be conducted. The analysis shall include the potential effects on species listed under the federal Endangered Species Act and Michigan's Endangered Species Protection Law.

The analysis shall indicate whether a post construction wildlife mortality study will be conducted and, if not, the reasons why such a study does not need to be conducted. Power lines should be placed underground, when feasible, to prevent avian collisions and electrocutions. All above-ground lines, transformers, or conductors should comply with the Avian Power Line Interaction Committee (APLIC, <http://www.aplic.org/>) published standards to prevent avian mortality.

11. Electromagnetic Interference: No Utility Grid wind energy system shall be installed in any location where its proximity to existing fixed broadcast, retransmission, or reception antennae for radio, television, or wireless phone or other personal communication systems would produce electromagnetic interference with signal transmission or reception unless the applicant provides a replacement signal to the affected party that will restore reception to at least the level present before operation of the wind energy system. No Utility Grid wind energy system shall be installed in any location within the line of sight of an existing microwave communications link where operation of the wind energy system is likely to produce electromagnetic interference in the link's operation unless the interference is insignificant.
12. Vibrations: Under no circumstances shall a UGWES or SCADA tower produce vibrations humanly perceptible beyond the site plan boundaries.
13. Shadow Flicker Analysis: The applicant shall conduct an analysis on potential shadow flicker at occupied structures. The analysis shall identify the locations of shadow flicker that may be caused by the project and the expected durations of the flicker at these locations from sun-rise to sun-set over the course of a year. The analysis shall identify problem areas where shadow flicker may affect the occupants of the structures and describe measures that shall be taken to eliminate or mitigate the problems.
14. Removal of Abandoned Utility Grade Wind Energy Systems: Any UGWES or SCADA tower that is not operated for a continuous period of twelve (12) months shall be considered abandoned, and the owner of such UGWES or SCADA tower shall remove the same within one hundred eighty (180) days of receipt of notice from the Township of such abandonment. In addition to removing the UGWES or SCADA tower, the owner

shall restore the site of the UGWES or SCADA tower to its original condition prior to location of the UGWES or SCADA tower, subject to reasonable wear and tear. Any foundation associated with UGWES or SCADA tower shall be removed to a minimum depth of five (5) feet below the final grade and site vegetation shall be restored. Failure to remove a UGWES or SCADA tower within the one hundred eighty (180) day period provided in this subsection shall be grounds for the Township to remove the UGWES or SCADA tower at owner's expense. The Planning Commission shall require the applicant to file a irrevocable bond equal to the reasonable cost (including adjustment for inflation) of removing the UGWES or SCADA tower and attendant accessory structures as a condition of a Special Land Use permit given pursuant to this section.