WILSON TOWNSHIP ZONING ORDINANCE AMENDMENT: WIND ENERGY

(ADD TO ARTICLE 2) WIND ENERGY DEFINITIONS:

Ambient: Ambient is defined as the sound pressure level exceeded ninety (90) percent of the time.

Anemometer: A device used to measure wind speed.

dB(A): The sound pressure levels in decibels. Refers to the "a" weighted scale defined by ANSI. A method for weighting the frequency spectrum to mimic the human ear.

Decibel: The unit of measure used to express the magnitude of sound pressure and sound intensity.

Hub Height: The distance measured from the ground level to the center of the turbine hub.

Small On-Site Wind Energy Systems: A wind energy conversion system consisting of a wind turbine (horizontal or vertical axis), a tower, and associated control or conversion electronics which has a rated capacity of not more than one hundred (100) kW and which is intended to primarily reduce on-site consumption of utility power.

Shadow Flicker: Alternating changes in light intensity caused by the moving blade of a wind turbine casting shadows on the ground and stationary objects, such as window of a dwelling.

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.

Sound Pressure Level: The sound pressure mapped to a logarithmic scale and reported in decibels (dB).

Wind Energy Facility: A power generating facility consisting of one or more wind turbines under common ownership or operation control, and includes substations, MET towers, cables/wires, and other buildings accessory to such facility, whose main purpose is to supply electricity to off-site customers.

Wind Turbine Generator: A wind energy conversion system which converts wind energy into power. Includes a tower, pylon, or other structure, including all accessory facilities, upon which any, all, or some combination of the following are mounted:

1. A wind vane, blade, or series of wind vanes or blades, or other devices mounted on a rotor for the purpose of converting wind into electrical or mechanical energy.

2. A shaft, gear, belt, or coupling device used to connect the rotor to a generator, alternator, or other electrical or mechanical energy-producing device.

3. A generator, alternator, or other device used to convert the energy created by the rotation of the rotor into electrical or mechanical energy.

Wind Turbine Generator Total Height:

Horizontal Axis Wind Turbine Rotors: The distance between the ground and the highest point of the wind turbine generator, plus the length by which the rotor wind vanes or blades mounted on a horizontal axis wind turbine rotor exceeds the height of the wind turbine generator.

Vertical Axis Wind Turbine: The distance between the ground and the highest point of the wind turbine generator including the top of the blade in its vertical position.

(NEW SECTION IN ARTICLE 16: GENERAL PROVISIONS)

SECTION 1629: SMALL ON-SITE WIND ENERGY SYSTEMS

1. **Small On-Site Wind Energy Systems:** A wind energy conversion system which is intended to primarily serve the needs of the property upon which it is located shall be considered an accessory structure.

2. **Small On-Site Wind Energy Systems up to one hundred (100) feet in height** shall be permitted by right in the following districts: **R2, R3, RR, CR, FF, B1, B2, B3, and I**.

3. **Small On-Site Wind Energy Systems over one hundred (100) feet in height** shall be considered a Special Land Use in all districts.

4. All small On-Site Wind Energy Systems shall be permitted as a **Special Land Use** in the **R1 District**.

5. The following site development standards shall apply to all small on-site wind energy systems in the Township:

    a. **Blade Clearance**: There shall be a minimum vertical blade tip clearance from the ground of twenty (20) feet.

    b. **Guy Wires**: If the small wind energy system is supported by guy wires, such wires shall be covered with a high visibility material so as to make it visible to a height of at least six (6) feet above the ground.

    c. **Setbacks**: Each small wind energy system shall be set back from an adjoining lot line or a public or private road right-of-way a distance equal to the total height of the wind turbine generator. The Planning Commission may reduce the setback if the neighboring property is under the same ownership or based on other factors such as topography specific to the site. No part of the wind turbine generator, including guy wire anchors, may extend closer to the property line or waterfront than the required setback for the district in which the unit is located.

    d. **Noise**: Small wind energy systems shall not cause a sound pressure level in excess of fifty-five (55) dB(A) or in excess of five (5) dBA above the background noise, whichever is greater, as measured at the nearest property line. This level may be exceeded during short-term events such as utility outages and severe wind storms.

    e. **Vibration**: Small wind energy systems shall not cause vibrations through the ground which are perceptible beyond the property line of the parcel on which it is located.

    f. **Reception Interference**: Small wind energy systems shall not cause interference with television, microwave, navigational or radio reception to neighboring areas.

g. **Shadow Flicker**: Small wind energy systems shall not cause shadow flicker upon any structure on a neighboring property.

h. **Potential Ice Throw**: The potential ice throw or ice shedding for the wind turbine generator shall not cross the property lines of the site nor impinge on any right-of-way or overhead utility line.

i. **Safety**: A small on-site wind energy system shall have an automatic system to prevent uncontrolled rotation.

j. **Other Regulations**: On-site use wind energy systems shall comply with all applicable State construction and electrical codes, Federal Aviation Administration requirements, Michigan Aeronautics Commission requirements, the Michigan Tall Structures Act (P.A. 259 of 1959, as amended), and the Michigan Public Service Commission and Federal Energy Regulatory Commission standards.

ARTICLE 5: R-2 AGRICULTURAL DISTRICT
SECTION 501
(ADD) 9. Wind Energy Facilities subject to the provisions of Section 1605 (10).

ARTICLE 9: FF FARM AND FOREST DISTRICT
SECTION 901
(ADD) 12. Wind Energy Facilities subject to the provisions of Section 1605 (10).

ADD TO SECTION 1605 (SUPPLEMENTAL SITE DEVELOPMENT REQUIREMENTS FOR CONDITIONAL USES AUTHORIZED BY SPECIAL USE PERMIT)

10. **Wind Energy Facilities and Anemometer Towers:** Anemometer Towers and wind energy facilities consisting of one (1) or more wind turbines whose main purpose is to supply electricity to off-site customers shall be allowed as a Special Use and shall adhere to the following requirements in addition to the requirements contained in **Sections 1604 and 1606** of this Ordinance.

a. <u>Principal or Accessory Use</u>

A wind energy facility or anemometer tower may be considered either a principal or an accessory use. A different existing use or an existing structure on the same parcel shall not preclude the installation of a wind energy facility or a part of such facility on such parcel. Wind energy facilities that are constructed and installed in accordance with the provisions of this Article shall not be deemed to constitute the expansion of a nonconforming use or structure.

b. <u>State or Federal Requirements.</u>

Any proposed wind turbine generator anemometer tower shall meet or exceed any standards and regulations of the Federal Aviation Administration (FAA), Michigan Aeronautics Commission (MAC), the Michigan Public Service Commission, National

Electric Safety Code, Federal Energy Regulatory Commission, and any other agency of the state or federal government with the authority to regulate wind turbine generators or other tall structures in effect at the time the Special Land Use approval is approved.

c. Sufficient Wind Resources

The proposed site shall have documented annual wind resources sufficient for the operation of the proposed wind turbine generator; provided, however, this standard shall not apply to an anemometer tower. No wind turbine generator shall be approved without submission of a wind resource study documenting wind resources on the site Said study shall indicate the long term commercial economic viability of the project. The Township may retain the services of an independent, recognized expert to review the results of the wind resource study prior to acting on the application for special approval.

d. Minimum Site Area

The minimum site area for a wind turbine generator or an anemometer tower erected prior to a wind turbine generator shall be as necessary to meet required wind energy setbacks and any other standards of this Article.

e. Setbacks

Each proposed wind turbine generator or anemometer tower shall meet the following applicable setback requirements:

(1) **Setback from Property Line:** Each wind turbine generator shall be set back from any adjoining lot line a distance equal to the total height of the wind turbine generator including the top of the blade in its vertical position. The Planning Commission may reduce this setback to no less than one hundred (100) feet; provided the adjoining property is owned or leased by the applicant or an easement is obtained. If the adjoining property that owned or leased by the applicant includes more than one (1) parcel, the properties may be considered in combination in determining setback relief. The amount of setback relief approved by the Planning Commission will be based on data provided by the applicant and prepared by a qualified professional. Such data shall satisfy the Planning Commission that any potential blade and ice throw will not cross the property line and that sound levels will not exceed fifty (55) decibels on the dB (A) scale at the property line from the proposed setback. Data provided shall be specific to the proposed tower in the proposed location taking into consideration prevailing winds, topography, existing vegetation, and other relevant factors.

(2) **Setback from Road**: In addition to the above, a wind turbine generator shall, in all cases, be set back from a public or private road right-of-way a minimum distance equal to the height of the wind turbine generator total height as defined in the Ordinance.

(3) **Setback from Structures**: Each wind turbine generator shall be setback from the nearest inhabited structure a distance not less than one and one-half (1 ½) times the total height of the wind turbine generator.

(4) **Setback from Communication and Power Lines**: Each wind turbine shall be set back from the nearest above-ground public electric power line or telephone line a distance of no less than four hundred (400) feet or one and one-half (1 ½) times the total tower height, whichever is greater, determined from the existing power or communications lines.

(5) **Building Setbacks**: Setbacks for buildings accessory to a wind turbine generator shall conform to the setbacks of the district.

f. Height

Regarding wind turbine height, the applicant shall demonstrate compliance with the Michigan Tall Structures Act (P.A. 259 of 1959, as amended), FAA guidelines, and Michigan Aeronautics Commission guidelines as part of the approval process.

g. Tower Separation

Wind turbine separation distance shall be based on 1) industry standards, 2) manufacturer recommendation, and 3) the characteristics (prevailing wind, topography, etc.) of the particular site location. At a minimum, there shall be a separation between the towers of not less than three (3) times the turbine rotor diameter. Documents shall be submitted by the developer/manufacturer confirming specifications tower separation.

h. Minimum Ground Clearance

The lowest point of the arc created by rotating wind vanes or blades on a wind turbine generator shall be no less than twenty (20) feet.

i. Maximum Noise Levels

The sound pressure level generated by the wind energy system shall not exceed fifty-five (55) dB(A) measured at neighboring property lines. If the ambient sound pressure level exceeds fifty-five (55) dB(A), the standard shall be ambient plus five (5) dB(A).

j. Maximum Vibrations

Any proposed wind turbine generator shall not produce vibrations through the ground humanly perceptible beyond the parcel on which it is located.

k. Potential Ice Throw

The potential ice throw or ice shedding for the wind turbine generator shall not cross the property lines of the site nor impinge on any right-of-way or overhead utility line.

l. Signal Interference

No wind turbine generator shall be installed in any location where its proximity with existing fixed broadcast, retransmission, or reception antennas for radio, television,

navigation, wireless phone or other personal communication systems would produce electromagnetic interference with signal transmission or reception. No wind turbine generator shall be installed in any location along the major axis of an existing microwave communications link where its operation is likely to produce electromagnetic interference with the link's operation.

m. <u>Visual Impact, Lighting, Power Lines:</u>

(1) Wind turbines shall be mounted on tubular towers, painted a non-reflective, non-obtrusive neutral color. The appearance of turbines, towers, and buildings shall be maintained throughout the life of the wind energy facility pursuant to industry standards (i.e. condition of exterior paint, signs, landscaping). A certified registered engineer and authorized factory representative shall certify that the construction and installation of the wind energy facility meets or exceeds the manufacturer's construction and installation standards.

(2) The design of the wind energy facility's buildings and related structures shall, to the extent reasonably possible, use materials, colors, textures, screening, and landscaping that will blend facility components with the natural setting and the environment existing at the time of installation.

(3) Wind turbine generators shall not be artificially lighted, except to the extent required by the FAA or the MAC or other applicable authority, or otherwise necessary for the reasonable safety and security thereof. If lighting is required, the lighting alternatives and design chosen:

(a) Shall be the intensity required under State or federal regulations.

(b) Shall not be strobe lighting or other intermittent white lighting fixtures, unless expressly required by State or federal regulations. Such intermittent lighting shall be alternated with steady red lights at night if acceptable to State or federal regulations.

(c) May be a red top light that does not pulsate or blink.

(d) All tower lighting required by State or federal regulations shall be shielded to the extent possible to reduce glare and visibility from the ground.

(4) Wind turbines shall not be used to display any advertising except the reasonable identification of the manufacturer or operator of the wind energy facility.

(5) The electrical collection system shall be placed underground within the interior of each parcel at a depth designed to accommodate the existing agricultural land to the maximum extent practicable. The collection system may be placed overhead adjacent to State and County roadways, near substations or points of interconnection to the electric grid or in other areas as necessary.

n. <u>Shadow Flicker:</u>

(1) The wind turbine generator shall be designed in such a manner as to minimize shadow flicker on a roadway. The wind turbine generator shall be designed in such a manner as to prevent shadow flicker on any existing structures located off the property on which the wind turbine generator is located. If necessary to prevent shadow flicker from crossing occupied structures, the wind turbine generator may be programmed to stop rotating during times when the wind turbine generator shadow crosses these structures. The wind turbine generator operator may obtain written agreements which allow shadow flicker to cross an occupied structure.

(2) The Planning Commission may require the applicant to conduct an analysis of potential shadow flicker at occupied structures if it deems such an analysis necessary. 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 sunrise to sunset 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.

o. <u>Safety:</u>

(1) All collection system wiring shall comply with all applicable safety and stray voltage standards.

(2) Wind turbine towers shall not be climbable on the exterior.

(3) All access doors to wind turbine towers and electrical equipment shall be lockable.

(4) Appropriate warning signs shall be placed on wind turbine towers, electrical equipment, and facility entrances.

(5) All wind turbine generators shall be equipped with controls to control the rotational speed of the blades within design limits for the specific wind turbine generator.

p. <u>Hazard Planning.</u>

An application for a wind turbine generator shall be accompanied by a hazard prevention plan. Such plan shall contain:

(1) Certification that the electrical wiring between turbines and between turbines and the utility right-of-way does not pose a fire hazard.

(2) Location of landscaping to 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.

(3) A listing of any hazardous fluids that may be used on site shall be provided, including Material Data Safety Sheets (MDSS).

(4) Certification that the turbine has been designed to contain any hazardous fluids shall be provided.

(5) A statement certifying that the turbine shall be routinely inspected to ensure that no fluids are released from the turbine.

q. Approvals

All required approvals from other local, regional, state or federal agencies must be obtained prior to approval of a site plan. In the case where site plan approval is a requirement for other local, regional, state, or federal agency approval, evidence of such shall be submitted with the site plan.

r. Removal of Wind Turbine Generators

(1) The applicant shall submit a decommissioning plan. The plan shall include:

(a) The anticipated life of the project.

(b) The estimated decommissioning costs in current dollars. Such costs shall not include credit for salvageable value of any materials.

(c) The method of ensuring that funds will be available for decommissioning and restoration.

(d) The anticipated manner in which the project will be decommissioned and the site restored.

(2) Any wind turbine generator or anemometer tower that is not operational for a continuous period of twelve (12) months shall be considered abandoned, and the owner of such wind turbine generator or anemometer tower shall remove the same within one hundred eighty (180) days of abandonment. Failure to remove an abandoned wind turbine generator or anemometer tower within the one hundred eighty (180) day period provided in this subsection shall be grounds for the Township to remove the wind turbine generator or anemometer tower at the owner's expense.

(3) In addition to removing the wind turbine generator, or anemometer tower, the owner shall restore the site of the wind turbine generator or anemometer tower to its original condition prior to location of the wind turbine generator or anemometer tower, subject to reasonable wear and tear. Any foundation associated with a wind generator or anemometer tower shall be removed to a minimum depth of five (5) feet below the final grade and site vegetation shall be restored.

(4) The Planning Commission shall require the owner of the wind turbine generator to deposit a performance guarantee in an amount equal to the estimated costs associated with the removal of the wind turbine generator or anemometer tower and all associated equipment and accessory structures and restoration of the site to a reusable condition which shall include the removal of all underground

structures to a depth of five (5) feet below the natural ground level at that location. The amount of the performance guarantee shall be reviewed every five (5) years. The amount of the performance guarantee shall be increased based on an inflation rate equal to the average of the previous ten (10) years Consumer Price Index. The performance guarantee shall be in the form of a cash deposit, certified check, irrevocable bank letter of credit, or surety bond acceptable to the Township.

s. <u>Equipment Replacement</u>

Major components of the wind turbine generator may be replaced without a modification of the Special Use permit provided all regulations contained herein are adhered to.