

REDWOOD COUNTY ZONING ORDINANCE  
SECTION 19  
WIND POWER MANAGEMENT

TABLE OF CONTENTS

		<u>PAGE</u>
SUBDIVISION 1.	PURPOSE	2
SUBDIVISION 2.	DEFINITIONS	2
SUBDIVISION 3.	PERMITTED/NON-PERMITTED USES	4
SUBDIVISION 4.	PERMIT APPLICATION	5
SUBDIVISION 5.	COMPLIANCE WITH CODES AND STANDARDS	7
SUBDIVISION 6.	OVERSPEED CONTROLS	8
SUBDIVISION 7.	SETBACK, HEIGHT, AND OTHER REQUIREMENTS	8
SUBDIVISION 8.	NOISE STANDARDS	9
SUBDIVISION 9.	SAFETY DESIGN STANDARDS	9
SUBDIVISION 10.	DECOMMISSIONING AGREEMENT	9
SUBDIVISION 11.	WASTE MANAGEMENT	10
SUBDIVISION 12.	TOWER TYPE	10
SUBDIVISION 13.	AESTHETICS	11
SUBDIVISION 14.	INTERFERENCES	11
SUBDIVISION 15.	ORDERLY AND EFFICIENT USE OF THE RESOURCE	11
SUBDIVISION 16.	AVOIDANCE AND MITIGATION OF DAMAGE TO ROADS	12
SUBDIVISION 17.	PRE-CONSTRUCTION MEETING	12
SUBDIVISION 18.	EFFECTIVE DATE	12

## **SECTION 19. WIND POWER MANAGEMENT**

### **SUBDIVISION 1. PURPOSE**

Purpose: This ordinance is established to regulate the installation and operation of Wind Energy Conversion Systems (WECS) within Redwood County not otherwise subject to siting and oversight by the State of Minnesota under the Minnesota Power Plant Siting Act, Minnesota Statutes § 216F, as the same may from time to time be amended. Nothing in this ordinance is intended to contravene, limit, or otherwise modify any wind power management or siting requirements of the State of Minnesota. If applicable, applicants will need to comply with any and all permitting and siting requirements of the State of Minnesota.

### **SUBDIVISION 2. DEFINITIONS**

In addition to terms defined elsewhere in the Redwood County Zoning Ordinance, the following definitions shall apply to this section:

1. Aggregated Projects: Aggregated projects are those which are developed and operated in a coordinated fashion, but which have multiple entities separately owning one or more of the individual WECS within the larger project. Associated infrastructure such as power lines and transformers that service the facility may be owned by a separate entity but are also included as part of the aggregated project. The planned kW generating capacity of the entire aggregated project will be used to determine whether an aggregated project is a Commercial WECS or Non-Commercial WECS.
2. Commercial WECS: A WECS of equal to or greater than 100 kW in total generating capacity. If more than one WECS is proposed, the total generating capacity of one (1) WECS shall be combined with the total generating capacity of any other WECS: (1) located within five miles of the WECS; (2) constructed within the same 12-month period as the WECS; and (3) which exhibits characteristics of being a single development, including but not limited to ownership structure, an umbrella sales arrangement, shared interconnection, revenue sharing arrangements, and common debt or equity financing.
3. C-BED Projects: A C-BED Project is a Community Based Energy Development Project that must have local owners, no single owner may be allowed to own more than 15 percent of a project, must have a local resolution of support, and the Power Purchase Agreement must ensure levelized cash flow to the project owners. Based on their total name plate generating capacity, C-BED projects are considered Micro-WECS, Non-Commercial WECS or Commercial WECS as defined in this section.
4. Fall Zone: The area, defined as the furthest distance from the tower base in which a guyed tower will collapse in the event of a structural failure. This area is less than the total height of the structure.

5. Feed Line: Any power line that carries electrical power from one or more WECS, or individual transformers associated with individual WECS, to the point of interconnection with the electric power grid. In the case of interconnection with the high voltage transmission systems, the point of interconnection shall be the substation serving the WECS.
6. Interconnect: Large wind developments need to interconnect to transmission lines through a substation, and residential WECS simply connect to the electrical panel serving the residence. Community wind projects, which vary in size from slightly less than 1 MW to less than 5 MW, can interconnect at the distribution, subtransmission, or transmission level depending on a number of factors such as the size of the project and the capacity of the grid at the project site.
7. Kilovolt-ampere (KVA): KVA is the unit of apparent power. KVA is used for measuring the power consumption of non-resistive equipments such as motors, computers, and most non-incandescent lighting.
8. Kilowatt: A unit of power equal to 1000 watts.
9. Megawatt: A unit of power equal to one million watts.
10. Meteorological Tower: For the purposes of this ordinance, meteorological towers are those towers which are erected primarily to measure wind speed and directions plus other data relevant to the placement of WECS. Meteorological towers do not include towers and equipment used by airports, the Minnesota Department of Transportation, or other similar applications to monitor weather conditions.
11. Micro-WECS: Micro-WECS are WECS less than 10 kW in total generating capacity. If more than one WECS is proposed, the total generating capacity of one (1) WECS shall be combined with the total generating capacity of any other WECS: (1) located within five miles of the WECS; (2) constructed within the same 12-month period as the WECS; and (3) which exhibits characteristics of being a single development, including but not limited to ownership structure, an umbrella sales arrangement, shared interconnection, revenue sharing arrangements, and common debt or equity financing.
12. Non-Commercial WECS: A WECS equal to or greater than 10 kW in total generating capacity and less than 100 kW in total generating capacity. If more than one WECS is proposed, the total generating capacity of one (1) WECS shall be combined with the total generating capacity of any other WECS: (1) located within five miles of the WECS; (2) constructed within the same 12-month period as the WECS; and (3) which exhibits characteristics of being a single development, including but not limited to ownership structure, an umbrella sales arrangement, shared interconnection, revenue sharing arrangements, and common debt or equity financing.
13. Power Purchase Agreement: A legally enforceable agreement between two or more persons where one or more of the signatories agrees to provide electrical power and one or more of the signatories agrees to purchase the power.

14. Project Boundary/Property Line: The boundary line of the area over which the entity applying for a WECS permit has legal control for the purpose of installation of a WECS. This control may be attained through fee title ownership, easement, or other appropriate contractual relationship between the project developer and landowner.
15. Residence: Any structure or dwelling suited and intended for human habitation. Residence shall not include any dwelling unfit for human habitation or any dwelling that has remained vacant for more than three years.
16. Rotor Diameter: The diameter of the circle described by the moving rotor blades.
17. Substations: Any electrical facility designed to convert electricity produced by WECS to a voltage greater than 35 KV for interconnection with high voltage transmission lines. The substations shall be located outside of the road right of way.
18. Total Generating Capacity: The maximum rated output designated by the manufacturer or the maximum possible output if operated without limitation or restriction by any means, whichever is greater.
19. Total height: The highest point, above ground level, reached by a rotor tip or any other part of the WECS.
20. Tower: All vertical structures including those that support the electrical generator, rotor blades, and/or meteorological equipment.
21. Tower height: The total height, above ground level, of the WECS exclusive of the rotor blades.
22. Transformer: An electrical device by which alternating current of one voltage is changed to another voltage.
23. Transformer pole: A single structure made of metal or wood to which the transformer is attached.
24. Watt (W): The basic unit of electric, mechanical, or thermal power. For electric power it is equal to one volt-ampere.
25. Wind Energy Conversion System (WECS): Any device, including but not limited to a wind charger, windmill, or wind turbine, and associated facilities that converts wind energy to electrical energy. The energy may be used on-site or distributed into the electrical grid.
26. Wind Turbine: Any piece of electrical generating equipment that converts the kinetic energy of wind into electrical energy through the use of airfoils or similar devices to capture the wind.

### **SUBDIVISION 3. PERMITTED/NON-PERMITTED USES**

WECS shall be permitted, conditionally permitted, or not permitted based on the table below:

<b>District</b>	<b>Micro-WECS</b>	<b>Non-Commercial WECS</b>	<b>Commercial WECS</b>	<b>Meteorological Tower</b>
Agriculture (A)	Permitted	Conditional Use Permit	Conditional Use Permit	Permitted
Flood Plain (FP)	Conditional Use Permit	Conditional Use Permit	Conditional Use Permit	Conditional Use Permit
Highway Service Business (B-1)	Conditional Use Permit	Conditional Use Permit	Not Permitted	Conditional Use Permit
Industrial (I)	Conditional Use Permit	Conditional Use Permit	Conditional Use Permit	Conditional Use Permit
Project Riverbend	Not Permitted	Not Permitted	Not Permitted	Not Permitted
Rural Residential (R1)	Conditional Use Permit	Conditional Use Permit	Not Permitted	Not Permitted
Scenic River (S)	Conditional Use Permit	Not Permitted	Not Permitted	Not Permitted
Shoreland	Conditional Use Permit	Conditional Use Permit	Not Permitted	Not Permitted
Urban Expansion (UE)	Conditional Use Permit	Conditional Use Permit	Not Permitted	Conditional Use Permit
Wild and Scenic River District	Not Permitted	Not Permitted	Not Permitted	Not Permitted

#### **SUBDIVISION 4. PERMIT APPLICATION**

1. Land Use/Zoning Permit. All permitted WECS and WECS which require a Conditional Use Permit shall apply for a Land Use/Zoning Permit. A Land Use/Zoning Permit is required to be approved by the Redwood County Environmental Office prior to the commencement of construction. The applicant shall complete and submit to the Redwood County Environmental Office a Land Use/Zoning Permit Application provided by the Redwood County Environmental Office and the following:
  - A. The name(s) and address(es) of the WECS owner(s).
  - B. A written description of the WECS, including but not limited to: total number of WECS, total generating capacity of each WECS, total height of each WECS, length of the rotor blades for each WECS, rotor diameter of each WECS, color of each WECS, and rotor direction of each WECS.
  - C. A site plan indicating the location of the following: parcel boundaries, each WECS, roads, county tile lines, meters, transformers, power cables, structures, wells, septic systems, and trees.
  - D. Signed copy of a Power Purchase Agreement if any power is sold off site or documentation that all power will be utilized on-site.

- E. A written description of the location of all scenic areas and natural features including bluffs within 1,320 feet of each WECS.
  - F. Copies of all permits that indicate compliance with all other applicable State and Federal Regulatory Standards, including but not limited to any and all required FAA permits or approvals.
  - G. A written description of potential impacts on nearby WECS and wind resources on adjacent properties. A Wake Loss Study may be required if the county determines the proposed projects may have a significant impact on nearby WECS.
  - H. A Decommissioning Agreement which satisfies the requirements set forth in Subdivision 11 below.
2. Conditional Use Permit. If a conditional use permit is required, the applicant for the proposed WECS must fill out a conditional use permit application provided by the Redwood County Environmental Office. Aggregated projects may jointly submit a single application and be reviewed under joint proceedings including notices, hearings, reviews, and as appropriate, approvals. Permits will be issued and recorded separately. Joint applications will be assessed fees as one project. The following shall be submitted with each application:
- A. The name(s) and address(es) of project owner(s). For C-Bed projects, must provide percent of ownership for each of the project owners.
  - B. Letter from the State Agency responsible for size determination of a project, pursuant to Minnesota Statutes, Chapter 216F.011, as amended from time to time.
  - C. A written description of the project, including but not limited to: total number of WECS, total generating capacity of each WECS, total generating capacity of the project, total height of each WECS, length of rotor blades for each WECS, rotor diameter of each WECS, color of each WECS, and rotor direction.
  - D. A site plan detailing the location of the following: project area boundaries, WECS, roads, county tile lines, transformers, power lines, communication lines, interconnection point with transmission lines or meter(s), and other ancillary facilities or structures.
  - E. Signed copy of a Power Purchase Agreement if any power is sold off site or documentation that all power will be utilized on-site.
  - F. A written description of the location of all scenic areas and natural features including bluffs within 1,320 feet of each proposed WECS.
  - G. Copies of all permits or documentation that indicates compliance with all other applicable State and Federal Regulatory Standards including but not limited to any and all required FAA permits or approvals.
  - H. A written description of potential impacts on nearby WECS and wind resources on adjacent properties. A Wake Loss Study may be required if the county determines the proposed projects may have a significant impact on nearby WECS

- I. A map reflecting the locations of all temporary, non-residential construction sites and staging areas.
- J. Additional Information stated in Minnesota Rules, Part 7854.0500 (subpart 1) as amended from time to time.
- K. A topographic map of the project site and surrounding areas.
- L. A written description of the current land use on the site and surrounding areas and the location of all existing WECS, meteorological towers, and telecommunication towers within 2 miles of the site.
- M. A map indicating the location of and distance to neighboring properties.
- N. A Decommissioning Agreement which satisfies the requirements set forth in Subdivision 11 below.
- O. In regards to each WECS, a written and notarized statement from a licensed professional engineer certifying:
  - 1) The foundation, tower, hub/rotor, blades, and other components each individually satisfy generally accepted professional engineering standards;
  - 2) The foundation, tower, hub/rotor, blades, and other components are all compatible;
  - 3) The final constructed WECS will be structurally sound and will satisfy generally accepted professional engineering standards; and
  - 4) Soil borings have been conducted and the specific soils upon which the WECS will be constructed are suitable to and will support the final constructed WECS.
- P. Written evidence that all necessary wind easements have been acquired.
- Q. Proof that all notifications required pursuant to Subdivision 15, Subpart 2 were mailed to all required telecommunication companies and the meeting minutes if a meeting was required to be held.

#### **SUBDIVISION 5. COMPLIANCE WITH CODES AND STANDARDS**

- 1. All WECS shall comply with all applicable state and federal laws, rules, and regulations including, without limitation:
  - A. Uniform Building Code, as amended from time to time.
  - B. The National Electrical Code, as amended from time to time.
  - C. Federal Aviation Administration (FAA) rules and regulations, as amended from time to time.
  - D. Minnesota Pollution Control Agency (MPCA)/Environmental Protection Agency (EPA) rules and regulations, as amended from time to time.
  - E. Rules and regulations, as amended from time to time, regarding the Allied Radio Matrix for Emergency Response (ARMER) Communication System.

2. All equipment shall conform to applicable industry standards including the American Wind Energy Association standards for WECS design and related standards adopted by the American National Standards Institute (ANSI).
3. Special attention will be paid to all WECS that are experimental, used, or prototype devices. Maintenance records, inspection by a qualified wind energy professional or licensed professional engineer, or some other documentation of unit's safety and integrity may be required.

#### **SUBDIVISION 6. OVERSPEED CONTROLS**

All Commercial WECS shall be equipped with redundant braking systems, including both aerodynamic (including variable pitch) overspeed controls and mechanical brakes. Mechanical brakes shall be operated in a fail-safe mode, whereby they are engaged in the case of loss of load on the generator. Stall regulation shall not be considered a sufficient braking system for overspeed protection.

#### **SUBDIVISION 7. SETBACK, HEIGHT, AND OTHER REQUIREMENTS**

1. Commercial WECS/ Meteorological Tower:
  - A. Structures/Residences:
    - 1) Commercial WECS: 1000 feet from the nearest residence.
    - 2) Meteorological Towers: 750 feet from the nearest residence.
  - B. Other Commercial WECS: no closer than five (5) rotor diameters (RD)
  - C. Rights of Way: no closer than 1.1 times the height of the tower and blades
  - D. Property Lines: no closer than 1.1 times the height of the tower and blades
  - E. Minnesota River Bluff line: 1,320 feet from the bluff break
2. Non-Commercial WECS/ Meteorological Tower:
  - A. Structures/Residences: 500 feet from the nearest residence. The applicant's residence and/or other on-site structures are not subject to this restriction.
  - B. Rights of Way: no closer than 1.1 times the height of the tower and blades
  - C. Property Lines: no closer than 1.1 times the height of the tower and blades
3. Micro-WECS:
  - A. Structures/Residences: 200 feet from the nearest residence. The applicant's residence and/or other on-site structures are not subject to this restriction.
  - B. Rights of Way: no closer than 1.1 times the height of the tower and blades
  - C. Property Lines: no closer than 10 feet from any neighboring property
4. Other Requirements for all WECS:
  - A. The setback requirements shall be reciprocal.
  - B. All power line(s) under 34.5 KV shall be buried.
  - C. All Substations will have the same setbacks as any other structure.
  - D. Any/all transformers must be located within the road right of way.

## **SUBDIVISION 8. NOISE STANDARDS**

Noise is regulated and the regulations are enforced by the Minnesota Pollution Control Agency under Chapter 7030. These rules establish the maximum nighttime and daytime noise levels.

## **SUBDIVISION 9. SAFETY DESIGN STANDARDS**

1. Clearance: For all WECS Rotor blades and/or airfoils must maintain at least 30 feet of clearance between their lowest point and the ground.
2. Warnings:
  - A. For all Commercial WECS, a sign or signs shall be posted on the tower, transformer, and substation warning of high voltage. Signs with emergency contact information shall also be posted on the WECS or at another suitable point.
  - B. For all guyed towers, visible and reflective objects, such as plastic sleeves, reflectors or tape, shall be placed on the guy wire anchor points and along the outer and innermost guy wires up to a height of 8 feet above the ground. Visible fencing shall be installed around anchor points of guy wires.
  - C. Meteorological towers measuring 200 feet or less in total height not otherwise subject to state and federal laws, rules, and regulations, including FAA rules and regulations, shall be painted in alternating bands of white and orange. In regards to the bands:
    - 1) The bands shall be equal in width;
    - 2) The bands shall be perpendicular to the vertical axis;
    - 3) The total number of bands shall be an odd number;
    - 4) Each band shall be approximately one-seventh of the total height of the structure; and
    - 5) The bands located at the top and bottom ends of the meteorological tower shall be painted orange.

## **SUBDIVISION 10. DECOMMISSIONING AGREEMENT**

1. For all WECS, a Decommissioning Agreement shall be signed by the landowner and project owner, if different from the landowner, and submitted to the Redwood County Environmental Office. The Decommission Agreement shall include, at a minimum, the following:
  - A. A statement indicating the WECS project shall be decommissioned at the end of its useful life or if it has not been used or has not produced energy for a period of twelve (12) months or more, unless an applicant submits a written description of a viable alternative use for each WECS and the viable alternative use is approved by the Redwood County Environmental Office in writing prior to the commencement of the alternative use.
  - B. A statement indicating all structures and debris shall be removed to a depth of four (4) feet.
  - C. A statement indicating the soil shall be restored to pre-construction condition.

- D. A statement indicating all vegetation shall be restored to pre-construction condition and shall be consistent and compatible with the surrounding vegetation.
  - E. A statement of the total estimated cost of decommissioning the WECS project.
  - F. A statement indicating the landowner and project owner, if different from the landowner, are responsible for all costs associated with decommissioning the WECS project, and further, indicating the source of the funds which will be used to decommission the WECS project.
2. The Redwood County Board of Commissioners may require the establishment of an escrow account or other security to ensure funding is available to decommission the WECS project.
  3. Any WECS that has not been used or has not produced energy for a period of twelve months or more shall be decommissioned, unless an applicant submits a written description of a viable alternative use for each WECS and the viable alternative use is approved by the Redwood County Environmental Office in writing prior to the commencement of the alternative use. If a WECS is to be decommissioned, the applicant must follow all the guidelines that were set forth in the approved Decommissioning Agreement.

#### **SUBDIVISION 11. WASTE MANAGEMENT**

1. Solid Waste: Construction of WECS, as with other facilities, will lead to the generation of various types of waste: packaging, equipment parts, litter, and debris generated by clearing. Removal of such material shall be accomplished in a timely manner. Similarly, ongoing operation and maintenance of these machines results in the generation of various waste products which may include worn parts and packaging for new parts. All such materials shall be removed from the site immediately and managed in a manner consistent with all appropriate local, state, and federal laws, rules, and regulations.
2. Hazardous Waste: Operation and maintenance of WECS may result in the generation of some hazardous materials. This will primarily be used lubricating materials. All such material shall be removed from the site immediately and managed in a manner consistent with all appropriate federal, state, and local rules and regulations.

#### **SUBDIVISION 12. TOWER TYPE**

All Commercial WECS must utilize self-supporting tubular towers. Micro-WECS and Non-Commercial WECS may use tubular or lattice construction towers. Meteorological towers may be guyed. Tubular towers provide several benefits:

1. Improved aesthetics, including intra and inter visual consistency
2. Minimized impact on farming activities
3. Reduced potential for unauthorized climbing
4. Improved maintenance access increasing the total WECS operating availability
5. Reduced need for ancillary structures to house control equipment

### **SUBDIVISION 13. AESTHETICS**

The following items are required standards to mitigate visual impacts of WECS:

1. Coatings and Coloring: All WECS shall be finished in a non-reflective unobtrusive color. Black blades are acceptable for mitigation of icing.
2. Signage: Any printed or visual markings on the tower or nacelle shall be consistent with the Redwood County Ordinance pertaining to signage.
3. WECS Consistency: To the extent feasible, the project shall consist of WECS of similar design and size, including tower height. Further, all WECS shall rotate in the same direction. WECS shall also be consistent in design, color, and rotational direction with nearby facilities.
4. Lighting: Lighting, including light intensity and frequency of strobe, shall adhere to the requirements established by Federal Aviation Administration. Red strobe lights are preferred for night time illumination to reduce impacts on migrating birds and red pulsating incandescent lights should be avoided. The Zoning Administrator may impose additional requirements for metrological towers where concerns exist regarding aerial spray applicators. Permits may allow for infrared lights or heat lamps to prevent icing of sensors.
5. Intra-project Power and Communication Lines for Commercial WECS: All power lines used to collect power from a Commercial WECS and all communication lines shall be buried underground. Allowances shall be provided where shallow bedrock interferes with the ability to bury underground lines.

### **SUBDIVISION 14. INTERFERENCES**

1. No WECS shall cause any interference with commercial or private use and enjoyment of other legally operating telecommunication devices including but not limited to radios, televisions, telephones, personal communication devices, and other electronic equipment and devices.
2. All applicants that propose to construct, maintain, or operate a Non-Commercial WECS or Commercial WECS shall notify in writing any and all telecommunication companies, including wireless telecommunication companies, that have facilities located within one mile of the proposed site of the intent to construct and the proposed location of the WECS project. It is the applicant's responsibility to hold a meeting if any of the telecommunication companies respond to the applicant's notification within ten (10) days of the date the notice was mailed. This meeting must be held before an application to construct a WECS will be considered by the Redwood County Planning Commission.

### **SUBDIVISION 15. ORDERLY AND EFFICIENT USE OF THE RESOURCE**

The Redwood County Zoning Ordinance calls for the orderly and efficient use of wind resource(s). Applications shall be reviewed to ensure the project area does not adversely impact wind development potential on adjacent lands.

**SUBDIVISION 16. AVOIDANCE AND MITIGATION OF DAMAGE TO ROADS**

For Non-Commercial WECS and Commercial WECS, an applicant shall:

1. Identify in writing all public roads to be used for the purpose of transporting each WECS, substation parts, materials, and/or equipment for construction, operation, maintenance, and/or decommissioning of the WECS project.
2. Provide written documentation that all haul roads have been approved by each of the relevant road authorities.
3. Obtain and provide a copy of any and all required permits from the relevant road authorities prior to construction, including but not limited to moving permits, weight and size permits, access/driveway permits, tile outlet permits, and standard utility permits.
4. Contact the road authority for road closures, road signage removals, road signage re-locating, road signage restoring, culverts, widening road intersections, and any other road activities.
5. Contact the Redwood County Dispatch prior to any road closures for the re-routing of emergency vehicles during the closure.
6. Contact the road authority to conduct an inspection of the road conditions of the haul routes prior to and after construction.

**SUBDIVISION 17. PRE-CONSTRUCTION MEETING**

For all Non-Commercial WECS and Commercial WECS, an applicant shall conduct a Pre-Construction meeting prior to construction commencement with a written notice sent to the following individuals a minimum of one week prior to said meeting:

1. Township Chairman
2. Redwood County Highway Engineer
3. Redwood County Sheriff
4. Redwood County Zoning Administrator
5. Area Hydrologist, Minnesota Department of Natural Resources
6. Minnesota Pollution Control Agency
7. United States Farm Service Agency
8. Redwood County Soil & Water Conservation District
9. US Fish & Wildlife Service
10. Minnesota State Historical Society
11. Two Planning Commission Members: Chair and County Board Representative
12. Minnesota Department of Roads

**SUBDIVISION 18. EFFECTIVE DATE**

This amended and restated ordinance shall be in full force and effect upon adoption and publication pursuant to law. Passed and adopted by the Redwood County Board of Commissioners on this \_\_\_\_ day of September, 2011.

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Lon Walling, Chairman  
Redwood County Board of Commissioners

\_\_\_\_\_  
Vicki Knobloch  
Redwood County Administrator