

SECTION 2. DEFINITIONS	Section 2 [Definitions] is not in conflict with Commission LWECS Site Permit requirements. Several of the 38 definitions are included in this section to provide a framework for subsequent discussions. OES EFP staff believes that several of the 38 definitions, as defined in Section 2 may affect discussion of the setback requirements in Section 4. They are as follows:
Subd. 5. Commercial WECS: A WECS of 1 megawatt to 5 megawatts in total name plate generating capacity.	
Subd. 9. 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.	
Subd. 13. Large wind energy conversion system or LWECS. "Large wind energy conversion system" or "LWECS" means any combination of WECS with a combined nameplate capacity of 5,000 kilowatts or more.	
Subd. 17. Non-Commercial WECS: A WECS of less than 1 megawatt in total name plate generating Capacity and 225 feet in total height or less.	
Subd. 22. Project: A WECS or combination of WECS.	Subd. 5 [Commercial WECS] It is not clear whether this means one turbine or multiple turbines between one and five megawatts in size. It also appears Subd. 5 and Subd.30 both define projects below 5 MW.
Subd. 26. Qualified Independent Acoustical Consultant: A person with Full Membership in the Institute of Noise Control Engineers/INCE, or other demonstrated acoustical engineering certification. The Independent Qualified Acoustical Consultant can have no financial or other connection to a WECS developer or related company.	OES EFP staff is not clear as to what the difference is or how the definitions are applied to WECS porojects.
Subd. 29. Rotor diameter (RD): The diameter of the circle described by the moving rotor blades.	The Commission rules (7854.0100 Definitions) do not define Commercial WECS. Also, Part 7854.0100 Subp 12 defines
Subd. 30. Small wind energy conversion system or SWECS: "Small wind energy conversion system" or "SWECS" means any combination of WECS with a combined nameplate capacity of less than 5,000 kilowatts.	"SWECS" which means a combination of wind energy conversion systems with a combined nameplate capacity of less than 5,000 kilowatts; while
Subd. 33. Total Name Plate Capacity: The total of the maximum rated output of the electrical power production equipment for a WECS project	Subp. 7 [LWECS] means a combination of wind energy conversion systems with a

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	<p>combined nameplate capacity of 5,000 kilovolts or more.</p> <p>Subd. 9. [Fall Zone] is not a term used in the Minnesota Rules, part 7854.0100. This does not address free standing structures.</p> <p>Subd 26 [Qualified Independent Acoustical Consultant]. The definition may preclude qualified consultants if they have worked for a wind developer. OES EFP staff believes this definition needs more clarity to interpret how it will be implemented.</p>
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SECTION 4. DISTRICT REGULATIONS *

Setbacks – Wind Turbines and Meteorological Towers

	WIND TURBINE – NON-COMMERICAL MICRO WECS	WIND TURBINE – NON-COMMERICAL WECS	WIND TURBINE – COMMERCIAL WECS	METEOROLOGICAL TOWERS
Property lines	1.1 times the total height or in A-1 and A-2 Districts only the distance of the fall zone as certified by a professional engineer plus 10 feet.	1.1 times the total height or in A-1 and A-2 Districts only the distance of the fall zone as certified by a professional engineer plus 10 feet.	3 RD Non-prevailing and 5 RD Prevailing***	The fall zone, as certified by a professional engineer plus 10 feet or 1.1 times the total height.

LWECS are not addressed in the table of Section 4.

Property Lines
 Commission issued site permits use 3 RD by 5 RD setbacks in two ways. First the Commission uses a 3 by 5 RD setback for the wind access buffer. Wind turbines may not be located with 3 RD of the perimeter of the site boundary on the non-prevailing wind axis and 5 RD on the prevailing wind axis. Within the site boundaries turbines must also be setback (3 by 5 RD) from the properties on non-participating landowners. Assuming all landowners within the

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<p>Neighboring Dwellings*</p>	<p>750 feet This setback requirement may be reduced by the Zoning Administrator subject to maintaining adequate health and safety requirements.</p>	<p>750 feet</p>	<p>750 feet from participating neighboring dwellings; non-participating dwelling setbacks are 10 RD; Setbacks can be less if an owner agrees to a reduced setback, but no less than 750 feet.</p>	<p>The fall zone, as certified by a professional engineer plus 10 feet or 1.1 times the total height.</p>	<p>site permit boundaries are participants, there is no setback from property lines for participating landowners, which would make the Goodhue County ordinance more restrictive. Property lines are not defined in this Article.</p>
<p>ROAD RIGHTS-OF-WAY**</p>	<p>The Distance Of The Fall Zone, As Certified By A Professional Engineer Plus 10 Feet Or 1.1 Times The Total Height</p>	<p>The Distance Of The Fall Zone, As Certified By A Professional Engineer Plus 10 Feet Or 1.1 Times The Total Height</p>	<p>1.1 Times The Height May Be Reduced For Minimum Maintenance Roads Or A Road With An Average Daily Traffic Count Of Less Than 10.</p>	<p>The Fall Zone, As Certified By A Professional Engineer Plus 10 Feet Or 1.1 Times The Total Height.</p>	<p><u>Neighboring Dwellings</u> Turbines must be setback far enough from all homes to allow for compliance with the Pollution Control Agency Noise Standards. See Site Permit at 4.3. The site permit also provided for a 1,000 setback from the homes of all project participants and a minimum of 1,500 feet from the homes of all non-participants. See site permit at Section 4.2.</p>
<p>OTHER RIGHTS-OF-WAY (RAILROADS, POWER LINES, ETC.)</p>	<p>THE LESSER OF 1.1 TIMES THE TOTAL HEIGHT OR THE DISTANCE OF THE FALL ZONE, AS CERTIFIED BY A PROFESSIONAL ENGINEER PLUS 10 FEET.</p>	<p>The fall zone, as certified by a professional engineer plus 10 feet or 1.1 times the total height.</p>	<p>THE LESSER OF 1.1 TIMES THE TOTAL HEIGHT OR THE DISTANCE OF THE FALL ZONE, AS CERTIFIED BY A PROFESSIONAL ENGINEER PLUS 10 FEET.</p>	<p>THE FALL ZONE, AS CERTIFIED BY A PROFESSIONAL ENGINEER PLUS 10 FEET OR 1.1 TIMES THE TOTAL HEIGHT.</p>	<p>The 10 RD setback requirement of Goodhue County from neighboring dwellings is significantly more restrictive than what has been required in Commission issued LWECs site permits.</p> <p>If the intent of County Zoning is to provide health and safety standards, Goodhue County has established a dual standard by having a setback of 750 feet for turbines up to nearly 1-MW in size and 10 rotor diameters for turbines larger than 1 MW in size.</p>

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	WIND TURBINE -- NON-COMMERCIAL MICRO WECS	WIND TURBINE -- NON-COMMERCIAL WECS	WIND TURBINE -- COMMERCIAL WECS	METEOROLOGICAL TOWERS
Public conservation lands	1.1 TIMES THE TOTAL HEIGHT	The fall zone, as certified by a professional engineer plus 10 feet or 1.1 times the total height.	3 RD Non-Prevailing and 5 RD Prevailing***	600 feet
Wetlands	1.1 TIMES THE TOTAL HEIGHT	The fall zone, as certified by a professional engineer plus 10 feet or 1.1 times the total height.	1,000 FEET OR 3 RD NON-PREVAILING AND 5 RD PREVAILING***	600 feet
Other Structures	The fall zone, as certified by a professional engineer plus 10 feet or 1.1 times the total height.	3 RD Non-Prevailing and 5 RD Prevailing***	The fall zone, as certified by a professional engineer plus 10 feet or 1.1 times the total height.	The fall zone, as certified by a professional engineer plus 10 feet or 1 times the total height.
Other Existing WECS and Internal Turbine Spacing	NA	750 FEET FROM TOP OF BLUFF (MISSISSIPPI RIVER AND CANNON RIVER), 500 FEET FROM TOP OF BLUFF FROM OTHER BLUFFS IN SHORELAND	3 RD Non-Prevailing and 5 RD Prevailing	The fall zone, as certified by a professional engineer plus 10 feet or 1 times the total height. -Extent of wake interference impacts on existing WECS shall be considered

Road Rights-of-Way
 Commission Site Permits have a minimum setback of 250 feet from the edge of the nearest public road right-of-way.
 See Section 4.4 of the Site Permit. This setback does not factor in traffic counts, or road classification.
 Goodhue's road setback would be more restrictive.

Other Rights-Of-Way (Railroads, Power Lines, etc.)
 Commission setbacks from other rights of way have not been addressed as defined setbacks in LWECS site permits. Setbacks from other rights-of-way have been negotiated by the Permittee and the entities controlling other rights-of-way within the site permit boundaries.

Wetlands
 The proposed site permit at Section 4.6 requires that "Wind turbines and associated facilities including foundations, access roads, underground cable and transformers, shall not be placed in public waters wetland, as defined in Minnesota Statutes section 103G.005, subpart 15a.
 The Goodhue ordinance which

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	BLUFFS	750 FEET FROM TOP OF BLUFF (MISSISSIPPI RIVER AND CANNON RIVER), 500 FEET FROM TOP OF BLUFF FROM OTHER BLUFFS IN SHORELAND AREAS OR FOR NON-SHORELAND BLUFFS.	AREAS OR FOR NON-SHORELAND BLUFFS.		<p>requires turbines to be setback 1,000 feet from wetlands is more restrictive than Commission requirements.</p> <p>The Goodhue ordinance Article 18 does not define wetland. Therefore it is not known how this would be applied and to what wetlands.</p> <p><u>Other Structures</u> OES EFP staff does not know what is meant by other structures, nor is "other structures" defined in the ordinance. Other than dwellings, there is no obvious reason for a setback. Therefore this requirement is considered more stringent than Commission LWECs site permit requirements.</p> <p><u>Other Existing WECS and Internal Turbine Spacing</u> This requirement is similar to the Condition contained in LWECs site permit. See Section 4.10 in proposed AWA Goodhue site permit. The LWECs site permit also states "if required during final micro siting of the turbine towers to account for topographical conditions, up to 20 percent of the towers may be sited closer than the above spacing but the Permittee shall minimize the need to site the turbine towers closer."</p>
	1350 FEET FROM TOP OF BLUFF (MISSISSIPPI RIVER AND CANNON RIVER), 500 FEET FROM OTHER BLUFFS IN SHORELAND AREAS OR FOR NON-SHORELAND BLUFFS.	1350 FEET FROM TOP OF BLUFF (MISSISSIPPI RIVER AND CANNON RIVER), 500 FEET FROM OTHER BLUFFS IN SHORELAND AREAS OR FOR NON-SHORELAND BLUFFS.			
<p>* The setback for dwellings, schools, churches, health care facilities, campgrounds shall be reciprocal unless the owner or authorized agent signs a letter of understanding waiving this setback, but no less than a 750 foot setback.</p> <p>** The setback shall be measured from future rights-of-way if a planned changed or expanded right-of-way is known.</p> <p>***Prevailing and Non Prevailing Rotor Diameter setbacks shall be measured horizontally from the tower base.</p> <ul style="list-style-type: none"> • Prevailing Wind –Azimuth between 290 degrees to 30 degrees and between 130 degrees and 230 degrees. 					

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- Non-Prevailing Wind – Azimuth between 30 degrees and 130 degrees and between 230 degrees and 290 degrees.

Setbacks – Substations and Accessory Facilities:

Minimum setback standards for substations and feeder lines shall be consistent with the standards for essential services established in Article 15 (Essential Services) of the Goodhue County Zoning Ordinance.

Substation setbacks

- 0 feet / structure setback from road ROW – located wholly outside the ROW.
- Property lines 0 feet / structure setback from property lines/side yard.

Given the fact that the Goodhue ordinance does not allow for this, it would be stricter than Commission LWECS site permit requirements.

Bluffs

Commission issued site permits have not addressed setbacks from bluffs. Bluffs have not been a factor in previous LWECS site permit dockets. OES EFP staff believes setbacks from bluffs should be considered in the micro-siting of wind turbines. However, there is no standard as to what that number should be and whether it should be a uniform standard or based on information in the docket record.

Therefore the Goodhue ordinance is more stringent.

SECTION 6. STRAY VOLTAGE TESTING FOR COMMERCIAL WECS PROJECTS

- Subd. 1 Pre-construction Stray Voltage Test. The applicant shall offer to perform at least two pre-construction stray voltage tests at all registered feedlots within the proposed project boundary and within a one-mile radius beyond the proposed project boundary. The applicant shall pay for these associated costs.
- Subd. 2. A copy of the test results shall be sent to each of the following: property owners, Minnesota Public Utilities Commission, local utilities, and the County. The applicant shall obtain written permission from property owners prior to stray voltage testing. If permission is denied, all responsibility for stray voltage problems shall be with the property owner.

Stray Voltage

This requirement has not been included in Commission issued LWECS site permits; therefore OES EFP staff would consider it to be more restrictive.

It has not been included as a requirement because scientific evidence indicates that stray voltage is not caused by wind energy conversion systems.

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<p>Subd. 3 If a registered feedlot owner within the project boundary has a stray voltage test performed for their facility, and it is found that the cause of the stray voltage is attributed to the Commercial WECS project, the project owners shall pay for all costs associated with the testing and correcting of the problem.</p>	<p>See October 21, 2010, OES EFP staff comments (page 16), OES EFP staff proposed Findings 74 through 81, and OES EFP staff Supplemental Comments and Recommendations (pages 2 and 3).</p>
<p><u>SECTION 9. OTHER APPLICABLE STANDARDS</u></p> <p>Subd. 1. Noise – All WECS shall comply with State of Minnesota Noise Standards.</p> <p>Subd. 2. Electrical codes and standards – All WECS and accessory equipment and facilities shall comply with the National Electrical Code and other applicable standards.</p> <p>Subd. 3. Owner/Operator contact information shall be provided to the County on a yearly basis.</p> <p>Subd. 4. Minnesota State Building Code – All WECS shall comply with the Minnesota State Building Code.</p> <p>Subd. 5. Interference – The applicant shall minimize or mitigate interference with electromagnetic communications, such as radio, telephone, microwaves, or television signals cause by any WECS. The applicant shall notify all communication tower operators within two miles of the proposed WECS location upon application to the county for permits. No WECS shall be constructed so as to interfere with County or Minnesota Department of Transportation microwave transmissions.</p>	<p><u>Interference</u> The Commission site permit for interference is more restrictive than the Goodhue County ordinance.</p>