Wisconsin Power and Light Co.
An Alliant Energy Company

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April 3, 2025

Mr. Will Seuffert, Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101-2147

RE: Wisconsin Power & Light Company
MPUC Docket No. IP7145/WS-24-349
Site Permit Application for Bent Tree North Wind Farm

Dear Mr. Seuffert,

Wisconsin Power & Light Company (WPL or Applicant) respectfully submits to the Minnesota Public Utilities Commission (Commission) the enclosed Application for a Large Wind Energy Conversion System Site Permit for the proposed Bent Tree North Wind Farm located in Freeborn County, Minnesota (Application).

The Bent Tree North Wind Farm is currently designed to be 153 MW in size, consisting of 34 wind turbine generators on 38 possible locations, and associated infrastructure and facilities including a substation, electrical collection lines, access roads, crane paths, a laydown yard, Aircraft Detection Lighting System (ADLS), and meteorological towers. Construction of the Project is anticipated to start in the third quarter of 2027 with a commercial operations date in the fourth quarter of 2028.

The Application has also been electronically filed today through www.edockets.state.mn.us. The Application filing fee is being sent under separate cover. WPL will also provide, under separate cover, copies of the Application as directed by staff as follows: one copy to the Minnesota Department of Commerce, Energy Environmental Review and Analysis staff, and three copies and electronic version to the Commission staff via Sharepoint link. A copy of this filing is also being served upon the persons as designated on the Official Service List of record and the general service lists, as applicable. WPL requests that the following individuals be placed on the Commission's official service list for this matter, and they consent to electronic service:

Service List:

WISCONSIN POWER AND LIGHT COMPANY
Ben Tanko
4902 North Biltmore Lane
Madison, WI 53718
Telephone: (608) 290-5442
Email: BenjaminTanko@alliantenergy.com

WISCONSIN POWER AND LIGHT COMPANY
Zach Ramirez
4902 North Biltmore Lane
Madison, WI 53718
Telephone: (608) 458-3073
Email: ZachRamirez@alliantenergy.com

Portions of Appendix F of the Application is marked as "Trade Secret." Certain data contained therein is considered to be not-public data pursuant to Minn. Stat. 13.02, subd. 9, and is Trade Secret information pursuant to Minn. Stat. 13.37, subd. 1(b). This appendix contains maps that show the specific locations of sensitive archaeological and historic sites that are not to be publicly disclosed.

WPL appreciates the Commission's time in considering this Application. Should you have any questions concerning this Application, please contact me directly at (608) 458-3132.

Sincerely,

/s/ Zach Ramirez
Zach Ramirez
Senior Counsel
Telephone: (608) 458-3073
zachramirez@alliantenergy.com

cc:

STATE OF MINNESOTA

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

Katie Sieben	**Chair**
Joseph K. Sullivan	**Vice-Chair**
Audrey Partridge	**Commissioner**
Hwikwon Ham	**Commissioner**
John Tuma	**Commissioner**

IN THE MATTER OF THE APPLICATION OF ALLIANT ENERGY FOR THE BENT TREE NORTH WIND FARM PROJECT LOCATED IN FREEBORN COUNTY, MINNESOTA	**DOCKET NO. IP7145/WS-24-349**

AFFIDAVIT OF SERVICE

STATE OF IOWA)
) ss.
COUNTY OF LINN)

Tonya A. Bender, being first duly sworn on oath, deposes and states:

That on the 3rd day of April 2025, copies of the foregoing Affidavit of Service, together with Wisconsin Power and Light Company's Site Permit Application for Bent Tree North Wind Farm, was served upon the parties on the attached service list, by e-filing, electronic mail, and/or first-class mail, proper postage prepaid from Cedar Rapids, Iowa.

/s/ Tonya A. Bender
Tonya A. Bender

Subscribed and Sworn to Before Me
This 3rd day of April 2025.

/s/ Dezirae Fisher
Notary Public, State of Iowa
My Commission expires March 13, 2026

#	First Name	Last Name	Email	Organization	Agency	Address	Delivery Method	Alternate Delivery Method	View Trade Secret	Service List Name
1	Lisa	Barton	lbarton@alliantenergy.com	Alliant Energy		200 First Street SE Cedar Rapids IA, 52401 United States	Electronic Service		No	24-349WS-24-349
2	Generic	Commerce Attorneys	commerce.attorneys@ag.state.mn.us		Office of the Attorney General - Department of Commerce	445 Minnesota Street Suite 1400 St. Paul MN, 55101 United States	Electronic Service		Yes	24-349WS-24-349
3	Sharon	Ferguson	sharon.ferguson@state.mn.us		Department of Commerce	85 7th Place E Ste 280 Saint Paul MN, 55101-2198 United States	Electronic Service		No	24-349WS-24-349
4	Generic Notice	Residential Utilities Division	residential.utilities@ag.state.mn.us		Office of the Attorney General - Residential Utilities Division	1400 BRM Tower 445 Minnesota St St. Paul MN, 55101-2131 United States	Electronic Service		Yes	24-349WS-24-349
5	Will	Seuffert	will.seuffert@state.mn.us		Public Utilities Commission	121 7th Pl E Ste 350 Saint Paul MN, 55101 United States	Electronic Service		Yes	24-349WS-24-349

Minnesota Public Utilities Commission

Application for a Large Wind Energy Conversion System Site Permit

MPUC Docket Number: IP7145/WS-24-349

Bent Tree North Wind Farm

Freeborn, Waseca, and Steele Counties, Minnesota

Wisconsin Power & Light Company
4902 North Biltmore Lane
Madison, WI 53718

April 3, 2025

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Acronym	Definition
1W1P	One Watershed, One Plan
AADT	Annual Average Daily Traffic
ACS	American Community Survey
ADLS	aircraft detection lighting system
AGL	above ground level
AMA	Aquatic Management Area
ANSI	American National Standards Institute
Applicant or WPL	Wisconsin Power & Light Company
AQI	Air Quality Index
ASTM	American Society for Testing and Materials
BBCS	Bird and Bat Conservation Strategy
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
BOP	Balance of Plant
BBS	Breeding Bird Survey
BWSR	Board of Water and Soil Resources
CA	Certificate of Authority
CIA	critical issues analysis
CN	Certificate of Need
COD	commercial operation date
Commission or MPUC	Minnesota Public Utilities Commission
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
CSAH	County State Aid Highway
CSW	construction stormwater
CWA	Clean Water Act
dB	decibels
dBA	A-weighted decibels
DOC EERA	Minnesota Department of Commerce, Energy Environmental Review and Analysis
DWSMA	Drinking Water Supply Management Area
EJ	environmental justice
EMF	electric and magnetic fields
EQB	Environmental Quality Board
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
GIS	geographic information system
HCP	Habitat Conservation Plan
Hz	hertz
IBA	Important Bird Area

Acronym	Definition
IEC	International Electrotechnical Commission
IFR	instrument flight rules
INBA	Indiana bat
IPaC	Information for Planning and Consultation
IPP	Independent Power Producer
IRAC	Interdepartmental Radio Advisor Committee
ITP	incidental take permit
km	kilometer
kV	kilovolt
kW	kilowatt
LGU	local governmental unit
LOS	line-of-sight
LWECS	Large Wind Energy Conversion System
m/s	meters per second
MBS	Minnesota Biological Survey
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
mG	milligauss
MNDNR	Minnesota Department of Natural Resources
MnDOT	Minnesota Department of Transportation
MGS	Minnesota Geological Survey
MPCA	Minnesota Pollution Control Agency
mph	miles per hour
MPUC or Commission	Minnesota Public Utilities Commission
MW	megawatt
MWFRA	Migratory Waterfowl Feeding and Resting Area
MWI	Minnesota Wetland Inventory
NAC	noise area classification
NESC	National Electrical Safety Code
NHIS	Natural Heritage Information System
NIOSH	National Institute for Occupational Safety and Health
NLCD	National Land Cover Database
NLEB	northern long-eared bat
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES/SDS	National Pollutant Discharge Elimination System/State Disposal System
NRCS	Natural Resources Conservation Service
NREL	National Renewable Energy Laboratory
NRHP	National Register of Historic Places
NTIA	National Telecommunications and Information Administration
NWI	National Wetlands Inventory

Acronym	Definition
O&M	operation and maintenance
OSA	Office of the State Archaeologist
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbons
Phase I ESA	phase I environmental site assessment
POI	Point of Interconnection
PPA	power purchase agreement
PRISM	Parameter-elevation Regression on Independent Slopes Model
PSC	Public Service Commission of Wisconsin
Project	The 153 MW Bent Tree North Wind Farm
Project Area	Approximate 26,046-acre area where WPL proposes to build the Bent Tree North Wind Farm Project facilities
PWI	Public Waters Inventory
PWP	Permanent Wetland Preserve
RD	rotor diameter
RECs	recognized environmental conditions
RIM	Reinvest in Minnesota
RPS	Renewable Portfolio Standards
SOBS	sites of biodiversity significance
SCADA	Supervisory Control and Data Acquisition
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Office
SNA	Scientific and Natural Area
SPCC	Spill Prevention, Control, and Countermeasure Plan
SSA	sole source aquifer
SWCD	soil water conservation district
SWPPP	Stormwater Pollution Prevention Plan
TCB or TRBA	tricolored bat
THPO	Tribal Historic Preservation Officer
TI	turbulence intensity
UDC	Unified Development Code
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VFR	visual flight rules
WECS	wind energy conversion system
WEG	Wind Energy Guidelines
WEST	Western EcoSystems Technology, Inc.
Westwood	Westwood Professional Services, Inc.

Acronym	Definition
WHPA	Wellhead Protection Area
WMA	Wildlife Management Area
WOTUS	Waters of the U.S.
WPA	Waterfowl Production Area
WPL or Applicant	Wisconsin Power & Light Company
WRP	Wetlands Reserve Program
WTG	wind turbine generator
WQC	Water Quality Certification

1.0 APPLICANT INFORMATION

Wisconsin Power & Light Company (WPL or Applicant) respectfully submits this Application to the Minnesota Public Utilities Commission (Commission or MPUC) for a Site Permit to construct and operate the proposed Bent Tree North Wind Farm Project (Project) located in Freeborn County, Minnesota (**Map 1 – Project Location**). The Project is a Large Wind Energy Conversion System (LWECS), as defined in the Wind Siting Act, Minnesota Statutes (Minn. Stat.) Section (§) 216F.01, subd 2. A LWECS is any combination of wind turbine generators (WTG) and associated facilities with the capacity to generate 5 megawatts (MW) or more of electricity. The Project is currently designed to be 153 MW in size, consisting of 34 WTGs on 38 possible locations, and associated infrastructure and facilities including a Project Substation, electrical collection lines, access roads, crane paths, a laydown yard, Aircraft Detection Lighting System (ADLS), and meteorological towers. Portions of the wind turbine setback buffers extend into Waseca and Steele counties in Minnesota; however, no Project infrastructure or construction is proposed in these counties. Construction of the Project is anticipated to start in the third quarter of 2027 with a commercial operations date (COD) in the fourth quarter of 2028.

The Applicant will design, construct, finance, operate, maintain, and own the Project. WPL serves 491,000 electric and 198,000 natural gas retail customers in Wisconsin. While the Project is in Minnesota and will receive all approvals applicable in Minnesota, WPL, as a public utility under Wisconsin Statutes (Wis. Stat.), must obtain construction authority for the Project under Wis. Stat. § 196.49 and Wisconsin Administrative Code PSC 112. As a result, WPL must obtain authorization to construct the Project from the Public Service Commission of Wisconsin (PSC), as the cost of the Project exceeds the construction cost filing threshold listed in Wis. Stat. § 196.49(5g), as updated by the PSC in Docket No. 5-GF-154.

WPL will file a Certificate of Authority (CA) application with the PSC. Energy generated from the Project will be used to meet WPL's Renewable Portfolio Standards (RPS) requirements pursuant to Wisconsin statute and to meet the energy demand of WPL's retail and wholesale customers in Wisconsin.

WPL is committed to optimizing the wind resource for the Project. All decisions with respect to equipment selection and availability, site layout, and spacing are designed to make the most efficient use of land and wind resources, while complying with all applicable rules and regulations.

1.1 Letter of Transmittal

Letter of transmittal signed by an authorized representative or agent of the applicant.

Letter of transmittal signed by an authorized representative is provided as a cover letter to this application submission.

1.2 Applicant Name and Contact Information

Complete name, address, and telephone number of the applicant and any authorized representative.

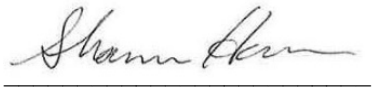
The authorized representatives for the Applicant are:

Applicant:	Wisconsin Power & Light Company
Authorized Representative:	Zach Ramirez, Senior Counsel
Address:	4902 North Biltmore Lane Madison, WI 53718
Telephone:	(608) 290-5442
Email:	zachramirez@alliantenergy.com

1.3 Signature of Application Preparer

Signature of the preparer of the application if prepared by an agent or consultant of the applicant.

Westwood Professional Services, Inc. is the lead consultant responsible for preparing this permit application.

Preparer of Application:	Shannon Hansen, Senior Environmental Permitting Specialist Westwood Professional Services, Inc.
Address:	12701 Whitewater Drive, Suite 300 Minnetonka, MN 55343
Telephone:	(952) 937-5150
Signature:	

1.4 Role of Applicant

Role of the applicant in the construction and operation of the LWECS.

WPL will permit, design, construct, finance, operate, and maintain the Project.

1.5 Ownership Statement

Statement of Ownership and list of any other LWECS or other energy facilities located in Minnesota in which the applicant, or a principal of the applicant, has an ownership or other financial interest.

WPL will own the Bent Tree North Wind Farm Project. WPL has ownership and financial interests in the Bent Tree Wind Farm, which received its Site Permit on October 20, 2009.[1] The Bent Tree Wind Farm is located adjacent to the southern boundary of the Project Area and began operation in February 2011. The Bent Tree Wind Farm includes 122 turbines with a nameplate capacity of 201 MW (**Map 2 – Existing Wind Turbines in the Project Vicinity**). WPL will be responsible for the operation and maintenance of the Project for its life, which will be a minimum of 30 years.

[1] *In the Matter of the Application of Wisconsin Power and Light Company for a Site Permit for up to 400 MW of Wind Generation in Freeborn County*, Docket No. ET6657/WS-08-573, ORDER (Oct. 20, 2009).

1.6 Operator of the LWECS

Operator of the LWECS if different from the applicant.

WPL will operate the Bent Tree North Wind Farm Project.

1.7 Name of Permittees

Name of the person or persons to be the permittees, should a site permit be issued.

The permit should be issued to Wisconsin Power & Light Company.

2.0 CERTIFICATE OF NEED (CN)

Discuss whether or not a CN for the project is required. This can be determined by reviewing Minnesota Statute Section 216B.243. If required, provide the expected schedule for obtaining the CN. A site permit cannot be issued for a project requiring a CN until the CN has been issued. However, the application process can proceed while the CN request is pending. If an exemption to a CN has been requested, provide a discussion of what the applicant intends to do with the power that is generated. Discuss any power purchase agreement or other agreement related to the sale of power generated by the project.

The Project does not require a Certificate of Need (CN) from the Commission. The facility qualifies for an exemption from the CN requirements under Minn. Stat. § 216B.243, subd. 8(7), because this site permit application is being submitted by an independent power producer (IPP) as WPL does not have any retail or wholesale customers in the state of Minnesota. WPL plans to use the power generated from the Project to meet the electricity needs of its retail and wholesale customers in the state of Wisconsin.

3.0 STATE POLICY

Describe how the proposed project furthers state policy to site projects in an orderly manner compatible with environmental preservation, sustainable development, and the efficient use of resources.

Pursuant to Minn. Stat. § 216F.03, the Project is designed to further the state policy of siting a project in an orderly manner compatible with environmental preservation, sustainable development, and the efficient use of resources. In alignment with this policy, the Project is designed to maximize wind resource development while minimizing impact on land resources and the environment. Also, as required, this Application addresses the Site Permit criteria set forth in Minn. Stat. Chapter 216F, portions of Chapter 216E, and Minn. R. Chapter 7854. Therefore, project design, wind resource, and technical information are provided in accordance with applicable laws and regulations to support a thorough evaluation of the reasonableness of the proposed Project and its site.

To facilitate the review of this Application, it has been organized and prepared following the *Application Guidance for Site Permitting of Large Wind Energy Conversion Systems in Minnesota* (DOC EERA, 2022); **Table 3-1** provides a completeness checklist for the Application, identifying the rules (Minn. R. 7854.0500) for a LWECS site permit application contents and where each element of those rules is addressed in the Application.

Table 3-1: Completeness Checklist

Minnesota Rule	Required Information	Application Section(s)
7854.0500	**SITE PERMIT APPLICATION CONTENTS**	
Subpart 1	**Applicant**. An applicant for a site permit must provide the following background information regarding the applicant:	1.0
(A)	A letter of transmittal signed by an authorized representative or agent of the applicant;	1.1
(B)	The complete name, address, and telephone number of the applicant and any authorized representative;	1.2
(C)	The signature of the preparer of the application if prepared by an agent or consultant of the applicant;	1.3
(D)	The role of the permit applicant in the construction and operation of the LWECS;	1.4
(E)	The identity of any other LWECS located in Minnesota in which the applicant, or a principal of the applicant, has an ownership or other financial interest;	1.5
(F)	The operator of the LWECS if different from the applicant; and	1.6
(G)	The name of the person or persons to be the permittees if a site permit is issued.	1.7
Subpart 2	**Certificate of Need or Other Commitment.**	2.0
(A)	The applicant shall state in the application whether a certificate of need for the system is required from the commission and, if so, the anticipated schedule for obtaining the certificate of need. The commission shall not issue a site permit for an LWECS for which a certificate of need is required until the applicant obtains the certificate, although the commission may process the application while the certificate of need request is pending before the commission.	2.0
(B)	The commission may determine if a certificate of need is required for a particular LWECS for which the commission has received a site permit application.	2.0
(C)	If a certificate of need is not required from the commission, the applicant shall include with the application a discussion of what the applicant intends to do with the power that is generated. If the applicant has a power purchase agreement or some other enforceable mechanism for sale of the power to be generated by the LWECS, the applicant shall, upon the request of the commission, provide the commission with a copy of the document.	2.0
Subpart 3	**State Policy**. The applicant shall describe in the application how the proposed LWECS project furthers state policy to site such projects in an orderly manner compatible with environmental preservation, sustainable development, and the efficient use of resources.	3.0
Subpart 4	**Proposed Site**. The applicant shall include the following information about the site proposed for the LWECS and any associated facilities:	4.0
(A)	The boundaries of the site proposed for the LWECS, which must be delineated on a United States Geological Survey Map or other map as appropriate;	4.1 – 4.2 Map 1 – Project Location
(B)	The following characteristics of the wind at the proposed site: (1) interannual variation; (2) seasonal variation; (3) diurnal conditions; (4) atmospheric stability, to the extent available; (5) turbulence, to the extent available; (6) extreme conditions;	9.1

Minnesota Rule	Required Information	Application Section(s)
	(7) speed frequency distribution; (8) variation with height; (9) spatial variations; and (10) wind rose, in eight or more directions.	
(C)	Other meteorological conditions at the proposed site, including the temperature, rainfall, snowfall, and extreme weather conditions; and	9.1.11
(D)	The location of other wind turbines in the general area of the proposed LWECS.	9.2 Map 2 – Existing Wind Turbines in the Project Vicinity
Subpart 5	**Wind Rights.** The applicant shall include in the application information describing the applicant's wind rights within the boundaries of the proposed site.	4.6 and 7.0
Subpart 6	**Design of Project.** The applicant shall provide the following information regarding the design of the proposed project:	5.0
(A)	A project layout, including a map showing a proposed array spacing of the turbines;	5.1 Maps 3a and 3b – Preliminary Site Layouts
(B)	A description of the turbines and towers and other equipment to be used in the project, including the name of the manufacturers of the equipment;	5.2
(C)	A description of the LWECS electrical system, including transformers at both low voltage and medium voltage; and	5.3
(D)	A description and location of associated facilities.	6.0
Subpart 7	**Environmental Impacts.** An applicant for a site permit shall include with the application an analysis of the potential impacts of the project, proposed mitigative measures, and any adverse environmental effects that cannot be avoided, in the following areas:	8.0
(A)	Demographics, including people, homes, and businesses.	8.1
(B)	Noise;	8.4
(C)	Visual impacts;	8.5
(D)	Public services and infrastructure;	8.6
(E)	Cultural and archaeological impacts;	8.7
(F)	Recreational resources;	8.8
(G)	Public health and safety, including air traffic, electromagnetic fields, and security and traffic;	8.6, 8.9
(H)	Hazardous materials;	8.10
(I)	Land-based economics, including agriculture, forestry, and mining;	8.11
(J)	Tourism and community benefits;	8.12 and 8.13
(K)	Topography;	8.14
(L)	Soils;	8.15
(M)	Geologic and groundwater resources;	8.16
(N)	Surface water and floodplain resources;	8.17
(O)	Wetlands;	8.18
(P)	Vegetation;	8.19
(Q)	Wildlife; and	8.20
(R)	Rare and unique natural resources.	8.21
Subpart 8	**Construction of Project.** The applicant shall describe the manner in which the project, including associated facilities, will be constructed.	10.0 -10.5

Minnesota Rule	Required Information	Application Section(s)
Subpart 9	**Operation of Project.** The applicant shall describe how the project will be operated and maintained after construction, including a maintenance schedule.	10.6
Subpart 10	**Costs.** The applicant shall describe the estimated costs of design and construction of the project and the expected operating costs.	10.7
Subpart 11	**Schedule**. The applicant shall include an anticipated schedule for completion of the project, including the time periods for land acquisition, obtaining a site permit, obtaining financing, procuring equipment, and completing construction. The applicant shall identify the expected date of commercial operation.	10.8
Subpart 12	**Energy Projections**. The applicant shall identify the energy expected to be generated by the project.	10.9
Subpart 13	**Decommissioning and Restoration**. The applicant shall include the following information regarding decommissioning of the project and restoring the site:	11.0
(A)	The anticipated life of the project;	11.1
(B)	The estimated decommissioning costs in dollars;	11.2
(C)	The method and schedule for updating the costs of decommissioning and restoration;	11.3
(D)	The method of ensuring that funds will be available for decommissioning and restoration; and	11.4
(E)	The anticipated manner in which the project will be decommissioned and the site restored.	11.5
Subpart 14	**Identification of Other Permits.** The applicant shall include in the application a list of all known federal, state, and local agencies or authorities, and titles of the permits they issue that are required for the proposed LWECS.	12.0

4.0 PROJECT DESCRIPTION AND OVERVIEW

4.1 Project Location

Project location (counties and townships of the project area).

WPL proposes to construct the Project in Freeborn County located in south central Minnesota, generally north of Albert Lea and south of New Richland, just west of U.S. Interstate 35 with State Highway 13 traveling north-south through the western portion of the Project Area (see **Map 1 – Project Location**).

Portions of the Project within Waseca and Steele counties are required to satisfy wind turbine setback buffers (see **Table 5-1** and **Table 5-2** for minimum setback requirements). No Project infrastructure is proposed within Waseca or Steele counties. All Project infrastructure will be located within Freeborn County. WPL has secured agreements with the landowners, where wind turbine setbacks extend beyond Freeborn County, and within Freeborn County where Project infrastructure is proposed (see **Section 7.0** for more information on the status of wind rights). All Project infrastructure will be located within the proposed Project Area consistent with Minnesota Rules regarding turbine placement. **Table 4-1** provides the Project Area location by county and township.

Table 4-1: Project Area Location

County	Township Name/City	Township	Range	Section(s)
Freeborn	Freeborn Twp.	T104N	R23W	1, 12, 13, 24
	Hartland Twp.	T104N	R22W	1-23
	Bath Twp.	T104N	R21W	3-9, 16-18
Waseca	Byron Twp.	105N	R23W	36
	New Richland Twp.	105N	R22W	31-36
Steele	Berlin Twp.	105N	R21W	31-34

WPL selected the Project location for wind-farm development based on the area's wind resources, geographic characteristics, environmental resources, transmission availability, willing landowners, and proximity to the Bent Tree Wind Farm project. WPL further refined target areas within the counties through discussions with landowners and the local governments.

4.2 Size of Project Area in Acres

Size of the project area in acres.

The Project Area is approximately 26,046 acres of mostly agricultural land. Of this, approximately 22,592 acres are in Freeborn County, approximately 2,312 acres are in Waseca County, and approximately 1,142 acres are in Steele County. As previously mentioned, the portions of the Project Area within Waseca and Steele counties are required to satisfy wind access buffers - no Project infrastructure or construction is proposed within these counties. All Project facilities including the turbines, Project Substation, electrical collection lines, access roads, crane paths, the laydown yard, ADLS tower, and meteorological towers will be located within the Project Area. The Project's aboveground facilities will occupy less than one percent of the Project Area.

4.3 Rated Capacity

Size (rated capacity), in megawatts, of the proposed project. If turbine model has not been selected, provide information on turbines being considered (up to three), representing the maximum and minimum megawatt size under consideration.

The Project is currently designed at a rated capacity of 153 MWs at the point of interconnection (POI), using Vestas V136 turbine models with rated nameplate capacity of 4.5 MWs. Hub heights being considered range from 112 meters to 120 meters. The Applicant intends to request competitive bids for turbine procurement.

4.4 Number of Turbines

Number of turbines and alternate turbine locations considered for the project.

Currently, the Project's total capacity of 153 MW will be generated using 34 WTGs, preliminarily designed with Vestas V136 turbines. Of the 38 WTG locations, 34 are primary and four are alternate. The wind turbine array based on the 112-meter hub height and the 120-meter hub height are shown on **Map 3a** and **Map 3b (Preliminary Site Layouts).**

4.5 Meteorological Towers

List the number of meteorological towers for the project. These shall be placed no closer than 250 ft. from the edge of the road rights-of-way and from the boundaries of the developer's site control (wind and land rights). Please note if meteorological towers will be temporary or permanent.

WPL will install up to two permanent free-standing (non-guyed) meteorological towers for the Project with an estimated height of approximately 350 feet. The location and design details of these towers will be determined later in the Project design process and will be located no closer than 250 feet from the edge of road rights-of-way. The meteorological towers will be designed for power performance testing of the Project wind turbine model. All applicable siting rules will be followed for these towers.

Additional information on the permanent meteorological towers is provided in **Section 6.3.4**. Preliminary meteorological tower locations are shown on **Map 3a** and **Map 3b (Preliminary Site Layouts)**.

4.6 Percent of Wind Rights Secured

Percent of wind rights secured, if any (see section 7.0 for more information regarding wind rights).

WPL has 100 percent land control for areas where the turbines and associated facilities will be located. WPL has revised the initial footprint of the Project Area numerous times, considering landowner involvement, agency and public comments, efficient and effective use of wind energy, minimization of environmental impacts, and applicable setback requirements. Of the 26,046 acres within the Project Area, 19,314.1 acres are currently under lease with 73 landowners (see **Section 7.0** for additional wind rights information).

5.0 PROJECT DESIGN

For every turbine layout that is submitted, the applicant must provide all of the following information (sections 5 through 11) for each turbine model and layout. For example, each layout will have to provide impacts to the environment per section 8 below and include accompanying maps.

Section 5.0 and its subsections provide a summary description of the Project, which includes a description of the Project turbine layout, electrical system, and associated facilities. Additional information is provided on construction, schedule, operation, and decommissioning of the Project in **Section 10.0** and **Section 11.0**, respectively. The final turbine micro-siting process, for the range of hub heights being considered, incorporated landowner input as to land use practices, nuances to each individual land parcel, and physical site visits.

5.1 Description of Project Layout

Provide a description of the project layout with the proposed spacing of turbines, residential roads, necessary setbacks, and site control.

The Project layouts currently show 38 WTG locations, of which 34 are primary and 4 are alternate. The Project is currently designed to be 153 MW in size, consisting of 34 WTGs and associated infrastructure and facilities including a Project Substation, electrical collection lines, access roads, crane paths, a laydown yard, ADLS, and meteorological towers. A transmission line will be constructed, owned, and operated by ITC Midwest to interconnect the Project to the transmission system. The Project optimizes the available wind resource while minimizing impacts to existing land use and the environment. Analysis of wind

direction data suggests that the optimal turbine string alignments are from west-southwest to east-northeast. Turbine placement for each layout was designed to provide a minimum of 3 Rotor Diameter (RD) crosswind spacing and 5 RD downwind spacing between turbines for up to 80 percent of the turbines. The spacing is dependent upon the selected equipment and the topography of the site. Design of the turbine array and collector system will minimize energy loss from wake and electrical line losses. The preliminary site layouts for the 112-meter hub height and the 120-meter hub height are shown on **Map 3a** and **Map 3b** (**Preliminary Site Layouts)**, respectively.

The preliminary Project layouts are based on the Vestas V136 4.5 MW turbine model and optimizes the wind resource and construction costs within the Project Area. This optimization takes into consideration elevation, adequate turbine spacing to minimize wake effects among turbines, underground collection lines and cables and access road lengths, as well as required setbacks from roads, buildings, homes, and other existing infrastructure. WPL wishes to preserve the right to evaluate and select turbine equipment of varying sizes and outputs.

5.1.1 General Setback Considerations

The Project layouts adhere to the wind energy conversion facility siting criteria outlined in the Commission's *Order Establishing General Wind Permit Standards*, Docket No. E,G-999/M-07-1102 (MPUC, 2008) and WPL's guidelines and best practices. WPL also generally incorporated the siting criteria contained in Freeborn County's Renewable Energy Systems ordinance (Freeborn County, 2017). Where setbacks differ for the same feature, WPL used the most stringent setback distance. **Table 5-1** and **Map 4a** and **Map 4b (Wind Access Buffer Setbacks and Land Ownership)** illustrate the range of wind turbine setbacks.

Table 5-1: Wind Turbine Setback Requirements

Turbine Setback Requirement	Setback Distances and Conditions	Authority
Wind Access Buffer – Prevailing Wind Directions	5 x rotor diameter from all boundaries of non-participating properties.	MPUC General Wind Permit Standards[1] Freeborn County Ordinance § 26-51 Steele County Ordinance § 1527.04
Wind Access Buffer – Non-Prevailing Wind Directions	3 x rotor diameter from all boundaries of non-participating properties.	MPUC General Wind Permit Standards Freeborn County Ordinance § 26-51
Internal Turbine Spacing	3 x rotor diameter non-prevailing wind direction and 5 x rotor diameter prevailing wind direction.	MPUC General Wind Permit Standards Freeborn County Ordinance § 26-51 Steele County Ordinance § 1527.04
	Of the 38 turbine locations proposed, up to 20 percent of them may be sited closer if required during final micro-siting to account for topographic conditions.	MPUC General Wind Permit Standards
Noise Requirements[2]	Distance must meet the state noise standard (Minn. R. 7030) of 50 dB(A) during overnight hours.	MPUC General Wind Permit Standards Freeborn County Ordinance § 26-51 Steele County Ordinance § 1527.04
Occupied Residences	1,000 feet from homes on adjacent parcels in the A zoning district.	Freeborn County Ordinance § 26-51
	750 feet from neighboring dwellings.	Steele County Ordinance § 1527.04
	500 feet, or the minimum distance required to meet the state noise standard (Minn. R. 7030) of 50 dB(A), whichever is greater.	MPUC General Wind Permit Standards[3]
Meteorological Towers	Permanent towers for meteorological	MPUC General Wind Permit Standards

Turbine Setback Requirement	Setback Distances and Conditions	Authority
	equipment shall be free standing. Permanent meteorological towers shall not be placed less than 250 feet from the edge of the road ROWs or from the boundaries of the developer's site control.	
	1.1 times the total turbine height from project boundary/parcel lines, road ROWs, railroad ROWs, power lines, trails, etc. 600 feet from public lands and USFWS wetland types 3, 4, and 5. 50 feet from public ditches. 30 feet from public drain tile, 500 feet from residences in A zoning district. 500 feet from municipalities, residential zones, campgrounds, churches, and health care facilities.	Freeborn County Ordinance § 26-51
	Total height of the meteorological tower must be setback from project boundary lines equal to total turbine height.	Steele County Ordinance § 1527.04
Public Roads and Recreational Trails	Minimum 250 feet from edge of road rights-of-way. Setbacks from state trails and other recreational trails determined on a case-by-case basis.	MPUC General Permit Standards
	1.1 times the total turbine height	Freeborn County Ordinance § 26-51
	Minimum setback of the total height of the turbine from the base to the road right-of-way.	Steele County Ordinance § 1527.04
Railroads	1.1 times the total turbine height	Freeborn County Ordinance § 26-51
Public Lands	Same as Wind Access Buffer setbacks for prevailing and non-prevailing wind directions.	MPUC General Permit Standards
	3 times rotor diameter.	Freeborn County Ordinance § 26-51
Public Drainage Ditch	50 feet	Freeborn County Ordinance § 26-51
	16.5 feet	MN Buffer Law (Minn. Stat. § 103F.48) Steele County Buffer Ordinance
Public Drain Tile	30 feet	Freeborn County Ordinance § 26-51
Municipality, residential zone, campgrounds, churches, and health care facilities	2,640 feet	Freeborn County Ordinance § 26-51
Sand and Gravel Operations	Turbines and associated facilities shall not be placed in active sand and gravel operations, unless negotiated with the owner.	MPUC General Permit Standards;
	Prohibited.	Freeborn County Ordinance § 26-51
Aviation	Turbines and associated facilities shall not be located so as to create an obstruction to navigable airspace of public and private airports.	MPUC General Permit Standards Minn. R. 8800.1900, subp. 5. Freeborn County Ordinance § 26-51
Power lines	1.1 times the total turbine height	Freeborn County Ordinance § 26-51
	90 feet or greater from road centerline when located adjacent to road ROW.	Steele County Ordinance § 1527.06

Turbine Setback Requirement	Setback Distances and Conditions	Authority
Shadow Flicker Requirements[4]	Shadow Flicker should not exceed 30 hours per year at residences within one mile of each turbine within a project.	Freeborn County Ordinance § 26-51
Public Waters[5] and NWI Wetland Types III, IV, and V (3, 4, and 5)	Wind turbines and associated facilities shall not be placed in public waters wetlands, except that electric collector or feeder lines may cross or be placed in public waters or public waters wetlands subject to permits and approvals by the MNDNR, USACE, and local units of government as implementers of the Minnesota Wetland Conservation Act.	MPUC General Permit Standards
	50 feet along public water wetlands, lakes, rivers, and streams.	MN Buffer Law (Minn. Stat. § 103F.48) Steele County Buffer Ordinance
	3 x rotor diameter	Freeborn County Ordinance § 26-51
Public Conservation Lands	3 x rotor diameter	Freeborn County Ordinance § 26-51
Native Prairie[6]	Turbines and associated facilities shall not be placed in native prairies and construction activities shall not be placed in native prairie unless addressed in a native prairie protection plan.	MPUC General Permit Standards; Freeborn County Ordinance § 26-51
Substations, accessory facilities, and power lines associated with the WECS	If the WECS facilities and infrastructure are not located within a public right-of-way or any utility easement required by the zoning ordinance, they shall be setback from the edge of the right-of-way as regulated in Chapter 42.	Freeborn County Ordinance § 26-52
	Substations shall meet structural setbacks from roads and property lines of non-participating landowners.	Steele County Ordinance § 1527.04
Ground clearance	Rotor blades must maintain at least 30 feet between their lowest point and the ground.	Freeborn County Ordinance § 26-53 Steele County Ordinance § 1257.06

[1] Setbacks do not apply to property lines where two or more participating landowners are involved.
[2] Noise standards are regulated by the MPCA under Minn. R. Chapter 7030. These rules establish the maximum night and daytime noise levels that effectively limit wind turbine noise to 50 dB(A). The MPCA standards require A-weighting measurements of noise; background noise must be at least 10 dB lower than the noise source being measured.
[3] MPUC General Permit Standards identify the minimum setback from residences as 500 ft, or the minimum distance required to meet the state noise standard of 50 dB(A), whichever is greater. Recent site permits have required a minimum of a 1,000-foot setback from residences, or the minimum distances required to meet the state noise standard of 50 dB(A), whichever is greater.
[4] For detailed discussion regarding shadow flicker setbacks refer to Section 8.5.6.
[5] Public Water Wetlands as defined in Minn. Stat. § 103G.005, subd. 15a. Excludes WCA exempt and farmed wetlands.
[6] Native prairie as defined in Minn. Stat. § 84.02, subd. 5 or lands enrolled in the Native Prairie Bank Program as provided for in Minn. Stat. § 84.96, unless addressed in a prairie protection and management plan. See Section 8.21.3.

5.1.2 Wind Access Buffer Setback

Implementation of a Wind Access Buffer setback is intended to reduce disruption of the normal wind flow and protect the wind rights of non-participating landowners. It requires turbines to be setback from the property line of a nonparticipating landowner at least 5 RD in the prevailing wind directions and 3 RD in the non-prevailing wind directions. Similarly, the MPUC General Permit Standards require internal turbine spacing setbacks of at least 5 RD in the prevailing wind directions and 3 RD in the non-prevailing wind directions.

All turbines will be located a minimum of 5 RD from non-leased properties in the prevailing wind directions and 3 RD in the non-prevailing wind directions to accommodate disruption of normal wind flow and protect the wind rights of non-participating landowners. Similarly, internal turbine spacing will be at least 5 RD in the prevailing wind direction and 3 RD in the non-prevailing wind direction, with no more than 20 percent of the Project's turbines closer than the prescribed internal setbacks. Minimum turbine setbacks are shown in **Table 5-2**.

Table 5-2: Minimum Turbine Setbacks

Turbine Model [1]	Turbine Model RD (m/ft)	5 RD (m/ft)	3 RD (m/ft)	Total Height w/Blades (m/ft)
Vestas V136 - 112	136 m / 446 ft	680 m / 2,231 ft	408 m / 1,138 ft	180 m / 591 ft
Vestas V136 - 120	136 m / 446 ft	680 m / 2,231 ft	408 m / 1,138 ft	188 m / 617 ft
[1] Turbine hub heights will range from 112 m to 120 m (368 ft to 394 ft).				

5.2 Description of Turbines and Towers

A description of the turbines and towers and other equipment to be used in the project, including the name of equipment manufacturer(s).

The turbine blades convert the energy of wind into rotational energy. Anemometers located on the turbine nacelle continuously sense wind speed and wind direction. The hub and nacelle are constantly being rotated to match wind speed and direction. Yaw motors rotate the blades to optimize blade angles in relation to wind speed and direction. Blades are continuously yawed into the wind by motors contained within the hub to optimize energy production. The hub contains a large bull ring gear to transfer mechanical force from the blades to the shaft connecting the hub to the gear box located within the nacelle. The mechanical braking system, located within the hub, locks the blade rotor to prevent the blades from spinning during maintenance periods or other times when the turbine needs to be out of service. The gear box adjusts shaft speeds to match the required generator speed. Electricity is produced by the generator that is connected to the grid through a full-scale converter system which controls both the generator and the power quality delivered to the grid. The following sections provide detailed turbine information.

5.2.1 Project Wind Turbines

The turbines under consideration for the Project will be designed and equipped to operate effectively in the climate experienced at the Project. WPL intends to use wind turbines with the latest efficiency ratings and control technologies. WPL will select turbine technology that maximizes turbine efficiency from an energy production and wind-plant economics standpoint. The latest turbine models have a variety of design configurations that allow the purchaser to determine the turbine best suited for the site.

WPL is proposing to use the Vestas V136 turbine model with a 136-meter rotor diameter with hub heights ranging from 112 meters to 120 meters (368 feet to 394 feet), and total heights between 180 meters and 188 meters (591 feet and 617 feet). **Table 5-3** reflects the differing characteristics based on the range of hub heights being considered. WPL wishes to preserve the right to evaluate and select turbine equipment of varying sizes and outputs.

Table 5-3: Wind Turbine Characteristics

Characteristic	Vesta V136 - 112	Vesta V136 - 120
Nameplate Capacity (megawatts)	4.5 MW	4.5 MW
Hub Height[1]	112 m (368 ft)	120 m (394 ft)
Blade Length (m)	66.7 m (219 ft)	66.7 m (219 ft)
Total Height[2]	180 m (591 ft)	188 m (617 ft)
Rotor Diameter (m)	136 m (446 ft)	136 m (446 ft)
Cut-in wind speed[3] meters per second (m/s)	3 m/s	3 m/s
Cut-out wind speed[4] (m/s)	32 m/s	32 m/s
Rated Capacity wind speed [5] (m/s)	14.5 m/s	14.5 m/s
Wind Swept Area (square meters)	14,527 m^2	14,527 m^2
Rotor Speed (revolutions per minute)	Variable (5.6-14.0 RPM)	Variable (5.6-14.0 RPM)
Wind Class[6] (m/s)	8.5 m/s	8.5 m/s
Standard Operating Temperature [7]	-30°C to 45°C -22°F to 113°F	-30°C to 45°C -22°F to 113°F

1 Hub height = the turbine height from the ground to the middle of the hub.
2 Total height = the total turbine height from the ground to the tip of the blade in an upright position.
3 Cut-in wind speed = wind speed at which turbine begins operation.
4 Cut-out wind speed = wind speed above which turbine shuts down operation.
5 Rated capacity wind speed = wind speed at which turbine reaches its rated capacity based on average site air density.
6 Based on the International Electrotechnical Commission (IEC) Class II (Medium Wind) annual average wind speed (maximum).
7 WPL proposes using the Low Temperature Turbine Package.

5.2.2 Wind Turbine Design and Operation

Each turbine consists of the foundation, tower, rotor (hub and blades), and nacelle (**Figure 1**). Sections below provide additional information on each turbine component.

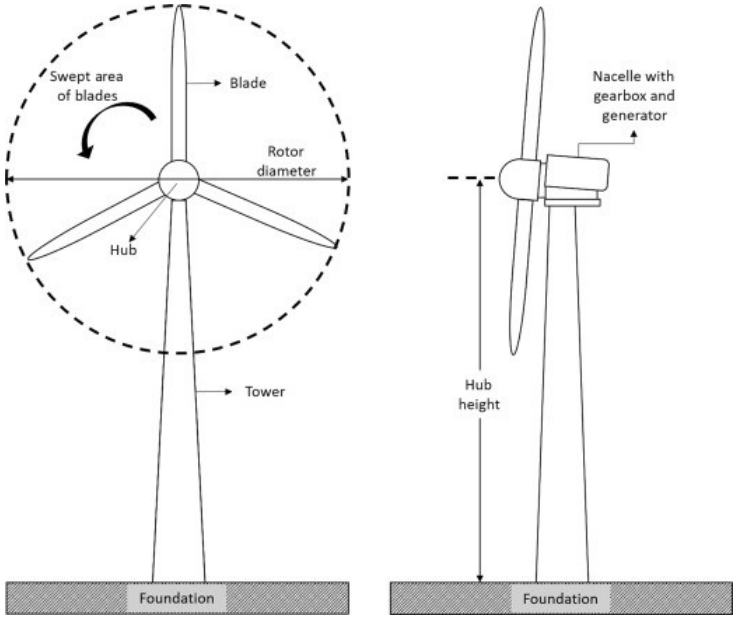


Figure 1: Typical Commercial Wind Turbine

5.2.2.1 Turbine Foundation

A spread-type foundation is expected to be used to support the turbines. The spread-type foundation is an octagon shaped foundation with a pedestal up to 16 feet in diameter located at the center of the foundation. This pedestal supports the turbine tower and extends about one to three feet above ground, allowing it to be bolted to the foundation. The foundation base will be up to 80 feet in diameter and 5 to 15 feet thick.

A geotechnical investigation will be completed at each proposed turbine location to clearly understand foundation requirements and to facilitate foundation engineering and design. Foundation engineering and design will be completed and certified by outside registered engineering consultants with extensive experience in wind turbine foundation design.

Rebar and rebar cages are installed throughout the foundation. Anchor bolts are tied to the rebar and extend up through the foundation pedestal. The turbine tower is bolted to these anchor bolts. Approximately 700 to 900 cubic yards of concrete will be used for each foundation.

Foundation installation includes removal of native soil and prep of the foundation area, installation of reinforcing bar, pouring of the foundation concrete, and installation of the turbine ground grid which encircles the foundation. Topsoil removed near the foundation is stockpiled and used to reclaim areas around it. Subsoil, rock, and other debris removed will be profiled and disposed of at an approved site.

5.2.2.2 Turbine Tower

The tower supports the nacelle, hub, and blades. The tower is a tubular steel structure tower with currently planned hub heights between 112 meters (368 feet) and 120 meters (394 feet). The tower consists of several sections manufactured from steel plates rolled and welded to form a tubular structure. All welds are made in automatically controlled power welding machines and are ultrasonically inspected during manufacturing per American National Standards Institute (ANSI) specifications.

Tower surfaces are sandblasted, coated for protection against corrosion, and painted with non-glare white or light grey paint. Individual tower sections are delivered to the site and bolted together during the tower erection phase. Access to the turbine is through a secured steel door at the tower base. A service platform at the top of each section allows for access to the tower's connecting bolts for routine inspection. An internal ladder runs to the top platform of the tower just below the nacelle. A nacelle ladder extends from the machine bed to the tower top platform allowing nacelle access independent of its orientation. Towers may include lifts for use by Project personnel. The tower is equipped with interior lighting and a safety guide cable alongside the ladder.

The tower also houses electrical, control, and communication cables and a control system at the bottom. Towers may include lifts for use by Project personnel. Electrical equipment at the base of the tower conditions the generated electricity to match electric grid requirements.

5.2.2.3 Rotor (hub and blades)

The wind turbine is equipped with a rotor consisting of three blades and a hub. The blades are controlled by the pitch control system. Based on the prevailing wind conditions, the blades are continuously positioned to optimize the pitch angle. The blades are made of carbon and fiberglass and consist of two airfoil shells.

The hub supports the three blades and transfers the reaction loads to the main bearing and the torque to the gearbox. The hub structure also supports blade bearings and pitch cylinders. Blade bearings allow the blades

to operate at varying pitch angles. The turbine is equipped with a pitch system for each blade and a distributor block, all located in the hub. Each pitch system is connected to the distributor block with flexible hoses. The distributor block is connected to the pipes of the hydraulic rotating transfer unit in the hub by three hoses (pressure line, return line and drain line). Each pitch system consists of a hydraulic cylinder mounted to the hub and a piston rod mounted to the blade bearing via a torque arm shaft. Valves facilitating pitch cylinder operation are installed on a pitch block bolted directly onto the cylinder.

5.2.2.4 Nacelle

The nacelle houses the main bearing, gearbox, generator, generator cooling, and other miscellaneous equipment. The nacelle may include a step-up transformer. The nacelle supports the anemometers and Federal Aviation Administration (FAA) required lighting.

5.2.2.5 Lightning Protection

Each turbine is protected from lightning through a grounding and shielding system. A grounding system is installed during foundation installation work and is designed to be effective in local soil conditions. A low resistance path to ground is established with the grounding system that provides a safe path to earth for lightning strikes. Each of the turbine blade contains a solid metal tip and copper wire that extends from the blade tips through the rotor and nacelle and down the tower to the buried ground grid. Lightning rods are attached to the anemometer and wind vane to offer additional protection to the turbine nacelle.

5.2.2.6 SCADA

All supervisory control and data acquisition (SCADA) communication cables will be installed underground and connect the wind turbines to the Project Substation to provide communications between the wind turbines, Project Substation, operation and maintenance (O&M) building, and electrical grid. The SCADA system monitors a vast range of turbine components and gathers information to operate them, including generator output, bearing temperatures, FAA lighting, and coolant temperatures. The SCADA system will be located within the Project Substation. Personal computers located within the existing O&M building and at WPL's off-site generation control center will allow remote, 24-hour monitoring of the Project and each turbine on an individual basis.

5.2.3 Turbine Safety

The turbine vendor will maintain the turbines under a services agreement for a minimum of two (2) years, which coincides with the warranty period. The Project will be monitored remotely through WPL's energy management system. This will provide 24-hour control and observation of the Project.

Each wind turbine in the Project will communicate directly with the SCADA system for performance monitoring, predictive maintenance, and energy reporting. The SCADA system also provides for overall control of the wind farm. WPL will require its contractors to provide a one-year warranty on their work. Turbine suppliers are providing extended warranties, which WPL will take advantage of to the extent it is prudent to do so. WPL will request the turbine supplier to provide a guarantee on wind turbine performance, output, and availability.

A summary of key safety features for the Project is as follows:

- Interlocks: Turbines contain an interlock system that prevents ascent with the turbine in-service.
- Brakes: Three independent braking systems are utilized on turbines. Aerodynamic brakes utilize backup battery power or nitrogen accumulators that yaw the turbine blades out of the wind, bringing the rotor to a stop. The mechanical braking system uses disc brakes activated hydraulically upon loss of electric power. The mechanical braking system brings the wind turbine to a stop quickly. Finally, the wind turbine utilizes a parking brake that is applied automatically when O&M personnel ascend the turbine.
- Tower Climbing: Safety interlocks prevent tower climbing unless proper safety gear is employed, the wind turbine is shut down, and the wind turbine parking brake is engaged. Safety climbing gear and harnesses are required to climb the tower ladders.
- Tower Lifts: Safety interlocks prevent lifts from operating unless locks are engaged. Overspeed and overload detectors stop movement of the lift if speed or weight is in excess of ratings.
- Electrical Equipment: The Project Substation is enclosed by a chain link fence meeting State and Federal regulations with all gates padlocked. Other outdoor electrical equipment is padlocked with doors requiring a special tool to open when padlocks are removed. Internal energized equipment is shielded by panels to avoid inadvertent contact with energized components of the electrical equipment.
- Access Roads: Access roads may be gated and padlocked if circumstances dictate a need to do so.

The entire Project will be designed to meet or exceed all federal, state, local, Occupational Safety and Health Administration (OSHA) requirements, and other pertinent regulations.

The safety and security of the public can be compromised if the turbine tips or blows over, if ice throw occurs, or if a blade falls off. A turbine may blow over due to a local earthquake or an extremely high wind event. The Project is located in an area with extremely low earthquake potential (USGS, 2024). The turbines will pose minimal physical threat to the security and safety of the public, as they will be located greater than 678 feet from local road rights-of-way and a minimum of 1,200 feet from residences.

5.3 Description of LWECS Electrical System

A description of the LWECS electrical system, including collection lines, feeder lines, transmission lines, transformers, and interconnection voltage, and substations.

A description of the LWECS electrical system, including the electrical collection system, transmission lines, transformers, and interconnection voltage, and substations are provided in the following sections.

5.3.1 Electrical Collection System

A three-phase dry-type transformer located in the nacelle will step up the voltage to 34.5 kilovolts (kV), necessary to minimize electrical losses as the electric power is transported to the Project Substation. Medium voltage (34.5 kV) cables will extend from the nacelle to the base of the tower and connect to a medium voltage (34.5 kV) switchgear unit to connect to the collector cable system. WPL expects to utilize underground electric power cables to transmit all power from the turbines to the Project Substation. The Project is expected to have approximately 34 miles of underground electric circuits. The underground cables will be installed in a trench that is at least 48 inches in depth. Most of the underground electric circuits will parallel turbine access roads or public rights-of-way. However, some of these underground circuits will

traverse private rights-of-way. The collector system underground cable layout will be designed in a manner that meets affected landowner requirements, minimizes impact to the environment, and achieves required economics.

The underground electric cable trench will be backfilled with native soil that is clean of rocks or other materials that may damage the cable. In certain cases, a clean backfill material such as lime screenings will be used as the first six to twelve inches of backfill material to achieve required backfill thermal conductivity or cable protection. In all cases, backfill material will be installed in a manner that mitigates trench backfill settling and potential washouts. The underground cable trench route will be restored to its prior use with areas being seeded and protected from erosion as necessary.

Above ground cable vaults measuring approximately 48 inches by 60 inches will be installed where underground cable circuits intersect and will be located at various locations within the Project Area allowing termination and splicing of the electric and communication cables. These vaults will be installed in a manner to minimize visual impact, avoid interference with intended land use, and ensure the public is protected. Where appropriate, bollards will be installed adjacent to these cable vaults to minimize damage by farm equipment or vehicles.

All underground cable circuits will terminate at the Project Substation. Cable circuits will be installed underneath public rights-of-way in compliance with road permits received from appropriate public authorities.

5.3.2 Transformers

A wind turbine generates electricity at a low voltage (1,000 volts or less), which must be stepped up to a higher voltage to avoid excessive electrical losses on the collector system before being sent to the Project Substation. This voltage is stepped up to 34.5 kV by a transformer located outside and adjacent to the turbine tower or in the wind turbine nacelle. The collector system gathers the electricity from each of the turbines and transmits this electricity to the Project Substation. WPL expects the collector system to be entirely underground. Placing the collector system underground improves reliability and is non-intrusive to local land use. Each collector system circuit is limited to a loading of 25 MW or less.

5.3.3 Project Substation

The basic elements of the Project Substation are a control house, transformer, circuit breakers, relaying equipment, high-voltage bus work, steel support structures, and overhead lightning suppression conductors. The substation equipment will be installed on concrete foundations.

The Project Substation transformer will step-up the voltage from 34.5 kV to 161 kV so that the electricity can be reliably interconnected to the power grid. Underground cable and communication circuits composing the collector circuit will terminate within the substation.

5.3.4 Interconnection

A new transmission line will be required to interconnect the Project Substation to ITC Midwest's transmission system. ITC Midwest will separately apply for any required permits and approvals for the transmission line.

The new 161 kV transmission line will be constructed from the Project Substation to the POI at ITC Midwest's existing Freeborn Switching Station. ITC Midwest will construct, own, and operate this

transmission line. The transmission line is expected to follow existing transmission line rights-of-way to the greatest extent possible, with the intent to minimize impacts to landowners and the surrounding environment. The transmission line will be permitted by ITC Midwest in compliance with all regulatory requirements. Depending on the final design, the transmission line would either be permitted through the state or county.

6.0 DESCRIPTION AND LOCATION OF ASSOCIATED FACILITIES

Describe the facilities, equipment, machinery, and other devices necessary for the operation and maintenance of a large wind energy conversion system, including collector and feeder lines, and substations.

6.1 Transmission and Project Substation

Describe the facilities necessary for the project to interconnect to the transmission grid. This includes any project transmission lines, project substations, and how they connect to existing substation(s) used at the point of interconnection. Show the location of all power lines entering and leaving the substation. If an existing substation is being modified, show the location of all new potential power lines and reconfigured lines and new or altered access roads. If the project is in the MISO queue, identify and describe the phase in the process at the time of application.

6.1.1 Transmission Grid Interconnection

The Project will connect to the transmission grid by connecting to ITC Midwest's existing Freeborn Switching Station located on ITC Midwest's existing Hayward-Huntley 161 kV transmission line. From the Freeborn Switching Station, a 161 kV line will be constructed to connect to the Project Substation. This approximate six mile route will utilize an existing ITC Midwest 69 kV transmission right-of-way. It is expected the existing 69 kV will be underbuilt on the new 161 kV structures needed for the Project. ITC Midwest will design, permit, construct, own, and operate this line.

WPL currently has two MISO queue positions which may be utilized for the project: J2054 – 67 MW in the DPP-2021-West cycle and J3029 – 200 MW in the DPP-2022-West cycle. Portions of either or both queue positions will be utilized based on timing and cost of the results. DPP-2021-West is currently finalizing DPP2 results. DPP-2022-West is in the DPP1 phase.

6.1.2 Project Substation

A new Project Substation (aka collector substation) is proposed within the Project Area and will be accessed from a newly constructed driveway off 730th Avenue (see **Map 3a** and **Map 3b – Preliminary Site Layouts**). The substation footprint will be approximately 275 feet by 250 feet. Substation equipment will be installed on concrete foundations, and the surrounding surfaces within the footprint will be graveled. The entire substation footprint will be enclosed with a chain link fence and accessed through two padlocked gates. A stormwater basin may be constructed to manage surface water flow from the substation footprint. The substation will be designed and constructed according to utility standards for Minnesota.

6.2 Collector and Feeder Lines

Provide the total number of miles of collector and feeder lines required, separated by type (overhead vs. underground). Specify the collector line voltage to be used and transformer type, location, and size of transformer pad at each turbine site.

The collector system gathers electricity from each turbine and will transmit it through about 34 miles cumulatively of underground 34.5 kV collector lines to the Project Substation. WPL expects the collector system to be entirely underground. Placing the collector system underground improves reliability and is non-intrusive to local land use. If the transformers are located at ground level, a typical transformer pad may be up to 10 feet by 12 feet in size. Final size will be determined at a later date.

6.3 Associated Facilities

Describe any planned operation and maintenance buildings, other associated facilities, or met towers for the project. This includes operations and maintenance facilities, temporary access roads, and meteorological towers. Describe and list how associated facilities will be permitted (through the LWECS site permit, local permits, or through a separate routing permit from the Commission).

6.3.1 O&M Facility

The Project will utilize the existing Bent Tree Wind Farm operations building located east of Hartland and State Highway 13 at 31072 State Hwy 13 in Hartland, Minnesota (see **Map 2 - Existing Wind Turbines in the Project Vicinity**). The existing O&M Facility includes a main building, a parts storage building, parking areas, and outdoor storage areas. An additional storage building is likely to be constructed on the property adjacent to the existing parts storage building. The additional storage building will be a heated structure with dimensions of approximately 80 feet by 100 feet. Racking will be installed inside the building for storage of turbine parts. A local building permit will be obtained for this additional storage building.

6.3.2 Access Roads

For general access, the existing public highways and roads will effectively meet the needs of the Project. However, new private roads will be required to allow access to the turbines located in the Project Area. WPL will provide for the construction of access roads from the public road to the turbines, with several turbines served from a single access road when possible. WPL will carefully design the Project to keep required access roads to a minimum, thereby minimizing cost and land impacts. Access roads will be built to mitigate washouts and contamination of the surrounding agricultural land with gravel. Access roads will be constructed to match the existing adjacent grade and may incorporate geotechnical fabric or cement stabilization measures beneath the aggregate roadway cap if necessary. WPL will retain a qualified contractor to maintain the access roads in a manner consistent with their intended use.

Access roads during construction will be installed to approximately 16 feet wide. Where access roads need to be widened for crane paths and equipment deliveries a compacted soil shoulder will be installed up to an additional 24 feet wide. This area will be reclaimed upon completion of construction. Where temporary installations are removed, areas will be graded to natural contours, soil de-compaction and re-seeding will occur as described further in **Section 10.5**.

The proposed access roads to the primary turbine locations and the access roads to the four alternate turbine locations are listed in **Table 8-13** and shown on **Map 3a** and **Map 3b (Preliminary Site Layouts)**. Access road locations may change due to engineering and other constraints that might be identified as Project plans mature. Any design changes will also comply with any driveway ordinance requirements.

Access roads may be gated or fenced, or have other site access control, depending on existing land use and in coordination with landowners. However, views from the existing roads will not be obstructed and existing viewsheds in each direction of public highways or local roads will be maintained.

6.3.3 Crane Paths and Pads

Construction cranes will move from turbine to turbine along identified crane paths. These temporary crane paths will be approximately 40 to 60 feet wide depending on the size of the crane being used. It is generally not necessary to place base material to a specific depth, however timber crane mats will often be used to provide additional support as the cranes walk from site to site. Surface grading may be necessary to create a level path or for crossing upland drainage ditches or swales. Geotextile fabric, culverts, riprap, and timber mats may be used where necessary to facilitate these types of crossings.

In addition, crane pads will be constructed at each final turbine location. These pads will be approximately 60 feet by 80 feet in size, depending on the crane size to be used. Crane pads are used to stabilize the crane during turbine construction and are expected to remain for future turbine maintenance and repair work. However, some crane pads may be fully removed or removed and reconstructed within access roads.

All disturbed areas will be restored to pre-construction conditions following crane movements by removing construction materials, decompacting the soil, shaping the ground surface to preconstruction elevations, seeding disturbed slopes, installing erosion control blankets on disturbed slopes greater than 3:1, and removing erosion control measures once final stabilization has occurred.

The final location of crane paths and pads will be determined based on civil, structural, environmental, and operational factors, as well as considering the input of landowners and the county. The proposed crane paths to the primary turbine locations and the crane paths to the four alternate turbine locations are listed in **Table 8-13** and shown on **Map 3a** and **Map 3b (Preliminary Site Layouts)**.

6.3.4 Meteorological Towers

WPL will install up to two permanent meteorological towers for the Project for power curve testing and site monitoring purposes. The meteorological towers will have an estimated height of approximately 350 feet and provide wind and weather measurement at several elevations (see **Section 9.0**). The towers will be designed in accordance with the applicable sections of the most current accepted standards for power curve testing, as specified by the IEC 61400-12-1, MEASNET, and applicable technical documentation from the turbine supplier. The towers will be a free-standing (non-guyed) galvanized steel lattice structure designed for maximum wind and ice loading and shall be certified for the site conditions. The towers shall be designed and fabricated to the latest EIA/TIA-222-H structural Standards for Steel Antenna Towers and Antenna Supporting Structures. They will incorporate a safety climb cable and FAA obstruction lighting.

As mentioned in **Section 4.5**, the final location and design details of the tower locations will be determined later in the Project design process and will adhere to applicable setback requirements. All necessary local, state, and federal permitting for the towers will be completed once final locations have been determined.

6.3.5 Laydown Areas

WPL proposes to use one primary laydown area. The laydown area will be approximately 15 acres in size, and will provide for temporary storage of construction equipment, turbine components, and electrical equipment, and will serve as the location for construction trailers and offices. The location of the laydown

yard has yet to be determined but will be located in cropland to avoid natural features such as wetlands and trees.

6.3.6 Temporary Batch Plant

One temporary batch plant may be needed to supply concrete for construction of the Project. A source for concrete for Project construction is yet to be determined. The batch plant may be able to use rural water service but is more likely to require well water. The water source will be determined prior to construction when a contractor is selected to construct the Project. The potential location of this temporary facility will be determined and permitted locally by the construction contractor. WPL will obtain all required permits for establishment of batch plants, as needed.

6.4 Permitting for Associated Facilities

WPL will obtain any other federal, state, or local permits or authorizations required to construct and operate the Project following issuance of the Site Permit. **Table 12-1** in **Section 12** of this Application provides a summary of the permits and approvals that may be required.

WPL will comply with all permits or licenses issued by the counties, cities, and townships affected by the Project that do not conflict with or are not preempted by federal or state permits and regulations.

7.0 WIND RIGHTS

Describe wind rights secured; the applicant should distinguish between option agreements and easement or lease agreements. An option agreement provides the applicant the exclusive right to enter into an easement or lease agreement. An easement or lease agreement, which may contain a development period, provides the applicant with the ability to construct and operate the proposed project. Include the number of acres secured for construction and operation of the project and compare that to the total number of acres of the project boundary.

WPL has utilized wind easements for this Project, consisting of a 7-year development period, 25-year initial operations term, and two optional 10-year extensions. Additionally, WPL has also utilized wind buffer easements that grant wind rights only. As of the date of filing, WPL has secured site control agreements with landowners for 19,314.1 acres of land. This represents 74.2 percent of the total Project Area which is comprised of 26,046 acres. The secured agreements will ensure access for construction and operation of the Project and will identify the obligations and responsibilities of WPL and the landowners. Current participating and non-participating parcels and landowners are shown on **Maps 4a** and **4b (Wind Access Buffer Setbacks and Land Ownership).**

8.0 ENVIRONMENTAL IMPACTS

Provide an analysis of the potential impacts of the project, mitigative measures, and any adverse environmental effects that cannot be avoided, for each of the required elements listed below (sections 8.1-8.20). In accordance with Minnesota Statutes Chapter 116D (Minnesota Rules 4410.3600), the analysis of environmental impacts in this section satisfies environmental review requirements and an Environmental Assessment or Environmental Impact Statement is not required.

In accordance with Minn. R. 7854.0500, subpart 7, **Section 8.0** provides an analysis of the potential impacts of the Project, proposed mitigation measures, and any adverse environmental effects that cannot be avoided. Consistent with Commission procedures on siting LWECS and with applicable portions of the Power Plant

Siting Act, various exclusion and avoidance criteria were considered in selecting the Project Area. Additionally, this section provides an objective evaluation of the anticipated positive and negative impacts of the proposed Project actions on the physical, biological, and socio-economic environment. Potential impacts to these resources from the construction and operation of the Project are described and quantified, and potential mitigations for these impacts are discussed.

Table 8-1 summarizes the temporary and permanent impacts for each Project component based on the preliminary site layout for the 120-meter hub height turbine and WPL's development experience. The 120-meter hub height turbine provides the maximum acreage impacted from the Project. Temporary impacts are short-term impacts and include the construction footprint for the turbines, access roads, crane paths, collection lines, meteorological towers, laydown yard, ADLS tower, and Project Substation. Permanent impacts are for the life of the Project and include the footprint after construction has been completed and includes the turbine pads, crane pads, access roads, meteorological tower pads, ADLS tower, and Project Substation. WPL has co-located access roads, collection lines, and crane paths to the extent practicable to minimize the Project's footprint.

Table 8-1: Temporary and Permanent Impacts from Project Facilities

Project Facility	Approximate Footprint Dimensions[1]	Temporary Impact (acres)	Permanent Impact (acres)
Turbines	200-foot radius for construction workspace	77.3	--
	80-foot diameter for turbine pad	--	17.5
Project Substation	275-foot by 250-foot	--	1.6
Access Roads[2]	100-foot-wide corridor for construction workspace	156.4	--
	16-foot-wide gravel road	--	39.8
Crane Paths	100-foot-wide corridor for construction workspace	60.4	--
Crane Pads[3]	60-foot by 80-foot-wide pad	--	4.2
Collection Lines	50-foot-wide corridor	156.3	--
Meteorological Towers[4]	75-foot by 75-foot construction workspace	0.8	--
	40-foot by 40-foot tower pad	--	0.2
ADLS[5]	75-foot by 75-foot construction workspace	0.5	--
	13-foot by 13-foot tower pad	--	<0.1
	Total	**451.7**	**63.3**

[1] Footprint dimensions are approximate. Impact acreages were calculated using GIS analysis and are based on the preliminary site layout for the 120-meter hub height turbine and WPLs experience with similar projects.

[2] Access road impacts include the 25-foot access road around each turbine. A 100-foot-wide corridor for construction workspace is the industry standard for construction to allow for equipment passage, sheep's foot, and other construction traffic on each side of an access road for grading.

[3] A crane pad will be constructed next to each turbine, for a total of 34 crane pads. Crane pads will be constructed in cropland to avoid natural features such as wetlands and trees.

[4] WPL anticipates constructing two free-standing meteorological towers each with an approximate construction workspace of 75 feet by 75 feet and an installed 40-foot by 40-foot tower pad.

[5] WPL will construct one ADLS tower. One model under consideration includes a 13-foot by 13-foot graveled area and a 13-foot by 11-foot concrete slab for the generator immediately adjacent to the ADLS tower. Temporary impacts have been conservatively estimated at 0.5 acre. Permanent impacts will be approximately 169 square feet (0.004 acre) for the gravel pad and the fenced area will be approximately 35 feet by 25 feet. The location will be determined based on coordination with the manufacturer.

Analysis of the area as a potentially suitable site for a wind project began in 2008. Since then, WPL has

continued to study and refine the Project Area to minimize the Project's potential impact on the environment. WPL has used the results of previously conducted and ongoing studies as well as agency and tribal input to inform the appropriate siting of Project infrastructure. A list of agency and tribal correspondence is summarized in **Section 13** and provided in **Appendix A (Agency and Tribal Correspondence)**.

8.1 Demographics

Describe the population; per capita incomes, number of homes, type and quantity of businesses in and near the project area. This should include population density within five miles from the project boundary.

Demographic information was obtained from the 2020 Decennial Census Redistricting Data (U.S. Census, 2020a) where applicable. When Redistricting data were not available, the 2022 American Community Survey (ACS) 5-Year Estimates were used. Data is provided at the township and county levels to characterize the demographics in the Project Area for the purpose of comparison.

8.1.1 Population Density

Provide the number of people per square mile with information on population densities in the project area or counties in which the project is located.

Population densities within five miles of the Project Area are listed in **Table 8-2**. Of the three counties within five miles of the Project Area, Steele County has the largest total population at 37,406 people, followed by Freeborn County at 30,895. Waseca County has the smallest total population at 18,968.

Cities within five miles of the Project Area have the highest population densities ranging from 520 to 2,048 people per square mile. Township population densities range from six to 24 people per square mile. County population densities range from about 43 to 87 people per square mile, with Steele County having the highest population density. The county seat of Freeborn County is Albert Lea, about 11 miles southeast of the Project Area. The county seat of Steele County is Owatonna, about 17 miles northeast of the Project Area. The county seat of Waseca County is Waseca, about 15 miles north of the Project Area.

Table 8-2: Population Density within Five Miles of the Project Area

Category	Total Population[1]	Area (square miles)[2]	People per Square Mile
Minnesota	5,706,494	86,943	65.6
Freeborn County	30,895	721.0	42.9
Freeborn Township	233	36	6.5
Hartland Township	253	35.8	7.1
Bath Township	401	35.7	11.2
Geneva Township	437	35.5	12.3
Carlston Township	302	35.9	8.4
Manchester Township	423	35.9	11.8
Bancroft Township	792	33.2	23.9
City of Hartland	321	0.3	1,070
City of Geneva	508	0.5	1,016
City of Clarks Grove	694	0.6	1,156
City of Manchester	52	0.1	520

Category	Total Population[1]	Area (square miles)[2]	People per Square Mile
City of Freeborn	264	0.2	1,320
Steele County	37,406	431.5	86.7
Berlin Township	506	35.3	14.3
Summit Township	433	36	12
City of Ellendale	676	0.8	845
Waseca County	18,968	432.1	43.9
Byron Township	216	36	6
New Richland Township	426	35.5	12
City of New Richland	1,229	0.6	2,048.3

[1] Total Population taken from 2020 Decennial Census, Redistricting Data (PL 94-171), Table P1 Race.
[2] Minnesota Legislative Coordinating Commission – Geographic Information Services (LCC-GIS, 2020). Redistricting Data, Minnesota, 2020. https://gisdata.mn.gov/dataset/society-redistricting-2020

8.1.2 Environmental Justice Analysis

Provide an Environmental Justice Analysis for the project area. Include a table that provides population, housing, minority population, per-capita income, and the percent of persons living below the poverty level in relation to county and township population. If environmental justice populations are found within or adjacent to the project boundary, include a discussion of mitigation measures and any impacts that cannot be avoided.

Environmental Justice (EJ) means the right of communities of color, Indigenous communities, and low-income communities, to the enjoyment of a healthy environment and to the fair treatment with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies (MPCA, 2022a). In general, EJ is intended to ensure all people benefit from equal levels of environmental protection and have the same opportunities to participate in decisions that may affect their environment or health (USEPA, 2021b).

WPL evaluated the "Map of Environmental Justice Areas" interactive map created by the Minnesota Pollution Control Agency (MPCA, n.d.-a) which identifies areas of EJ concern in Minnesota. The data are from the U.S. Census Bureau's five-year 2018-2022 American Community Survey using census tract boundaries. A census tract is an area of concern if it includes any one of the following four criteria: 1) at least 40 percent of the population is people of color, 2) at least 35 percent of economically disadvantaged community members have income at or below 200 percent of the federal poverty level, 2) at least 40 percent or more of the population has limited proficiency in English, and 4) are located within Indian County, which is defined as federally recognized reservations and other Indigenous lands. The MPCA refers to the federal government poverty thresholds to identify an income threshold at two times the federal poverty threshold. In 2022, the MPCA considered an individual with an income of $27,180 and a family of four with an income of $55,500 to be in poverty (MPCA, 2024a). Based on the MPCA EJ criteria, the Project Area is not in an area of concern for EJ.

The following sections and tables provide information on population, minority populations, housing, per capita income, and the percent of persons living below the poverty level in relation to county and township populations.

8.1.2.1 Population Characteristics

The Project is in a lightly populated rural area in south-central Minnesota. Populations in Freeborn, Waseca, and Steele counties are projected to generally decline over the next few decades. From 2020-2060, the population in Freeborn County is projected to decrease by 17.2 percent, Waseca is projected to decrease by 15.9 percent, and Steele is projected to decrease by 0.1 percent (Minnesota Compass, 2024). According to the MN Demographic Center (2024), the five counties with the largest estimated declines in population by 2075 are Ramsey (-128,966), Hennepin (-64,509), Saint Louis (-26,036), Stearns (-23,084), and Polk (-10,316).

In Minnesota, non-Hispanic white Minnesotans represent 78 percent of the statewide population, and minority populations (those who identify as Asian, American Indian, Black, Hispanic, and two or more races) make up the remaining 22 percent of the total population (Minnesota Compass, 2024). In Freeborn, Steele, and Waseca counties, White people comprise between 84 percent to 90 percent of the population, and minority populations comprise the remaining 10 to 16 percent of the population. Most notably, Black or African Americans comprise the largest percentage of the minority population in the three counties. Based on these statistics and the MPCA areas of EJ concern, there is no indication that minority populations are concentrated within the Project area, or that the Project is located in an area occupied by a minority population. The Population characteristics from the 2020 Census are detailed in **Table 8-3**.

Table 8-3: Population Characteristics

County	Population Groups[1]						Total Pop.
	White	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Other Race Alone or Two or More Races[2]	
Freeborn County	25,988	486	136	1,148	5	3,132	30,895
Steele County	32,151	1,373	120	342	22	3,398	37,406
Waseca County	17,040	359	149	111	14	1,295	18,968

[1] Population Group data were retrieved from the 2020 Decennial Census, Table P8, Race.
[2] Other Race Alone or Two or More Races includes individuals who identify outside of the Census Bureau categories of White, Black or African American, American Indian or Alaska Native, Asian, and Native Hawaiian or Other Pacific Islander, or identify with two or more races.

8.1.2.2 Housing Characteristics

Freeborn, Steele, and Waseca counties had an estimated 14,114; 15,691; and 7,895 total households in 2022, respectively. Steele County had the most estimated total households, and Waseca County had the least. Out of the townships, New Richland Township had the most estimated total households, while Hartland Township had the least (U.S. Census Bureau, 2020a). Housing characteristics within the Project Area are detailed in **Table 8-4**.

Table 8-4: Housing Characteristics within the Project Area

County/Township	Total Housing Units[1]	Occupied Housing Units[1]	Vacant Housing Units[1]	Average Household Size[2]
Freeborn County	14,114	13,076	1,038	2.35
Freeborn Township	117	107	10	2.63
Hartland Township	100	94	6	2.86
Bath Township	176	169	7	2.03
Steele County	15,691	14,823	868	2.45
Berlin Township	267	201	66	2.41
Waseca County	7,895	7,387	508	2.41
Byron Township	95	91	4	2.56
New Richland Township	198	176	22	2.48

[1] Data retrieved from the 2020 DEC Redistricting Data (PL 94-171), Table H1, Occupancy Status.
[2] Data retrieved from the 2022 ACS 5-Year Estimates Subject Tables, Table S1101, Households and Families.

A total of 250 residences are located within 2 kilometers (1.2 miles) of the currently proposed turbine locations (see **Maps 4a** and **4b - Wind Access Buffer Setbacks and Land Ownership**). A review of the demographic characteristics of the Project Area do not indicate that minority or low-income residents are concentrated in any portion of the Project. The construction and operation of the Project is not anticipated to displace any current residences or alter the demographic character of the Project Area.

8.1.2.3 Income and Poverty

Per capita income within the townships ranges from $32,821 to $60,216, and ranges from $35,814 to $40,146 in the counties. Median household income is higher in the townships and ranges from $83,333 to $104,306, and ranges from $65,679 to $79,722 in the counties. In Freeborn County, Hartland Township has the highest median household income and one of the lowest percentage of individuals below the poverty level. Bath Township has the highest per capita income, the second highest median household income, and the lowest percentage of individuals living below the poverty level. Freeborn and Steele counties have the highest percentage of individuals living below the poverty level. Per capita income, median household income, and individuals below poverty level were retrieved from 2022 ACS 5-Year Estimates as shown in **Table 8-5**.

Table 8-5: Income and Poverty

County/Township	Per Capita Income	Median Household Income	Individuals Below Poverty Level (percent)
Freeborn County	$36,751	$65,679	9.6%
Freeborn Township	$46,348	$83,333	7.3%
Hartland Township	$37,628	$104,306	2.8%
Bath Township	$60,216	$99,286	0.8%
Steele County	$40,146	$79,722	8.5%
Berlin Township	$43,575	$93,333	4.2%
Waseca County	$35,814	$71,856	6.6%
Byron Township	$32,821	$88,750	7.7%
New Richland Township	$34,605	$82,500	4.0%

8.1.3 Business and Industry

According to the Minnesota Department of Employment and Economic Development (DEED), Freeborn and Steele counties are part of the Southeast planning region, which is projected to see a 5.1 percent increase in employment levels over the next decade (DEED, 2024a). Waseca County is a part of the Southwest planning region, which is projected to see a 3.9 percent increase in employment levels over the next decade (DEED, 2024b). In addition to new jobs created, there will be a much larger number of vacancies in all three counties. **Table 8-6** provides the economic characteristics of the three counties.

Table 8-6: Economic Characteristics

County/Township	# of Business Establishments	# of Jobs	Top Three Industries
Freeborn County	832	11,663	1. Health Care & Social Assistance 2. Manufacturing 3. Retail Trade
Steele County	1,102	18,961	1. Health Care & Social Assistance 2. Manufacturing 3. Retail Trade
Waseca County	559	5,597	1. Manufacturing 2. Health Care & Social Assistance 3. Retail Trade

8.1.4 Potential Impacts

Short-term impacts to socioeconomic resources will be relatively minor. Approximately 62 acres of agricultural land will be removed from production for the life of the Project. Landowners having turbines or other Project facilities on their land will receive an annual easement payment for the life of the Project.

8.1.4.1 Employment Impacts

During construction, the Project is expected to support 100 to 150 temporary jobs. Over the duration of construction (approximately eight to nine months), these personnel will live in or around Freeborn County and surrounding communities. If no local contractors are available, the influx of up to 150 construction workers in any of the three counties would equate to a total population increase of approximately 0.5 percent in Freeborn County, 0.4 percent in Steele County, and 0.8 percent in Waseca County. This would represent a minimal temporary increase in the total population of the counties within the Project Area. These temporary construction jobs will generate indirect economic benefits as employees spend their income on local goods and services and pay county and local sales tax.

During the operations, which is expected to be 30 years, approximately 2 to 3 permanent O&M staff, who will largely be wind technicians, will support the Project locally. Due to the temporary nature of the temporary construction workers, and the limited number of permanent O&M staff, the Project is not anticipated to significantly change the demographics of the Project area.

General skilled labor is expected to be available in Freeborn, Steele, and Waseca counties or Minnesota to serve the Project's basic infrastructure and site development needs. Specialized labor will be required for certain aspects of the Project. It may be necessary to import specialized labor from other areas of Minnesota or neighboring states. The relatively short construction duration often precludes special training of local or regional labor. WPL will issue a Request for Proposals to Balance of Plant (BOP) contractors to construct the Project. WPL will include preferences for contractor bids that utilize local, union construction craft

employees to the greatest extent feasible in accordance with the Project's budget, timeline, industry standards and requirements, and corporate safety policies. The BOP contractor selected will be required to work with labor unions, local subcontractors, and other vendors to implement a Project construction staffing model that maximizes local hiring and local economic benefits for the Project, while ensuring the Project is safely built on time and on budget.

Construction of the Project would provide temporary increases to the revenue of the area through increased demand for lodging, food services, fuel, transportation, and general supplies. The Project will also create new local job opportunities for various trade professionals that live and work in the area, and it is typical to advertise locally to fill required construction positions. Opportunity exists for sub-contracting to local contractors for gravel, fill, and civil work. Additional personal income will also be generated by circulation and recirculation of dollars paid out by the Project as business expenditures and state and local taxes.

8.1.4.2 Housing Impacts

Effects on temporary or permanent housing are anticipated to be negligible. The Applicant anticipates that sufficient temporary lodging and permanent housing will be available in the form of motels and hotels in municipalities near the Project Area such as Mankato, Waseca, Albert Lea, and Owatonna, which are within 20 miles of the Project Area. There are two hotels in Waseca, 11 hotels in Albert Lea, and eight hotels in Owatonna (Hotels.com, 2024). In addition, as shown in **Table 8-4**, 1,038 vacant housing units are available in Freeborn County, 868 vacant housing units in Steele County are available, and 508 vacant housing units are available in Waseca County. Overall, the demand for temporary housing for construction personnel would represent a minimal, temporary impact on the availability of temporary housing.

8.1.4.3 Overall Socioeconomic Impacts

Adverse impact to socioeconomics will be limited to the temporary loss of the agricultural production on the land currently farmed. However, the areas surrounding each turbine may still be farmed, and the temporary losses of agricultural land will be negated by the payments to the landowners from the Project. Overall, the Project will have a positive impact on the economy of the region by creating temporary and permanent jobs, increasing local tax bases due to production taxes, and providing lease payments to participating landowners.

8.1.5 Mitigation Measures

No measures to mitigate socioeconomic impacts are proposed because the Project is anticipated to achieve a positive socioeconomic benefit. Landowners participating in the Project will benefit from annual lease payments that will offset potential financial losses associated with removing a small portion (1 to 2 acres) of their land from agricultural production.

8.2 Land Use

Describe land use in the project area and in the greater project area. This discussion should include a description of applicable zoning and comprehensive planning at the local or county level.

8.2.1 Comprehensive Plans and Local Zoning

Provide a discussion of comprehensive plans and local zoning reviewed for the proposed project. Provide an analysis and discussion of potential impacts of the project, proposed mitigative measures, and any adverse environmental effects that cannot be avoided. Information on urban growth boundaries and zoning can generally be found on local or county websites.

The Applicant reviewed available local comprehensive plans and zoning within and adjacent to the Project Area, including Freeborn County, Waseca County, Steele County, the City of Hartland, and the six townships (Bath, Berlin, Byron, Freeborn, Hartland, and New Richland). Freeborn, Waseca, and Steele counties have comprehensive plans and zoning ordinances. The City of Hartland's zoning regulations extends into a portion of the Project Area, and although the city has zoning regulations, it does not have a comprehensive plan (Hartland, 2014). None of the townships within the Project Area have their own zoning regulations or comprehensive plans.

8.2.1.1 Comprehensive Plans

A comprehensive plan is a guide for future development in the applicable local government's jurisdiction and generally includes policies, goals, and plans for private and public land and water use, transportation, and community facilities. The local government may then adopt zoning regulations that further the goals of the comprehensive plan and provide for orderly development, including governing the size, placement, density, and height of structures, as well as where certain uses can occur.

The Project Area is primarily zoned for agricultural land uses within all three counties. The discussion below focuses on land use policies that guide development in agricultural areas. **Table 8-7** lists the respective comprehensive plans of the governing bodies within and adjacent to the Project Area.

Table 8-7: Comprehensive Plans Governing Bodies

Governing Body[1]	Plan Name	Year Adopted/Updated	Associated Regulations
Freeborn County	Comprehensive Land Use Policy Plan	2017	Freeborn County Code (Ordinance No. 2016-01)
	Comprehensive Water Plan 2016-2021	2016	Amendment to Implementation (2016-2021)
Waseca County[2]	Waseca County Comprehensive Plan	2005	The Waseca County Unified Development Code (UDC) (Ordinance 97)
	Le Sueur River Comprehensive Watershed Management Plan (1W1P)	2023	Minn. Stat. Chapter 103B
Steele County	Comprehensive Land Use Plan	2007	Steele County Zoning Ordinance (Section 502.02)

[1] Based on publicly available information online, Comprehensive Plans for the City of Hartland and the townships of Bath, Berlin, Byron, Freeborn, Hartland, and New Richland were not identified. Freeborn, Waseca, and Steele counties have jurisdiction over all areas within the county outside of incorporated municipalities.

[2] The 1W1P is a partnership that includes Blue Earth, Waseca, Faribault, and Freeborn counties and their soil water conservation districts (SWCDs). Waseca County SWCD is the fiscal agent and day-to-day administrator.

8.2.1.2 Freeborn County Comprehensive Land Use Policy Plan

Freeborn County's Comprehensive Land Use Policy Plan (Freeborn County Comprehensive Plan) provides a set of policies applied to specific areas or land uses that are designed to guide the land use decisions for those areas and uses (Freeborn County, 2017). The Freeborn County Comprehensive Plan states that areas identified as agricultural land should be managed in a way to preserve that use and prevent a decline of agricultural uses. The intent of the Agricultural District is to protect agricultural and open land uses from the intrusion and premature development of uses not performing a function necessary to the agricultural use of the land or meeting the social, cultural or economic growth needs of the county. The Freeborn County Comprehensive Plan further specifies that lands within the Agricultural Districts are generally for agriculture use and farm dwellings, although certain uses related to the needs of the people of the county may be developed if they are compatible with open land.

8.2.1.3 Freeborn County Comprehensive Water Plan

Freeborn County's 2016-2021 Comprehensive Water Plan (Comprehensive Water Plan) establishes priorities in actions related to water quality, water quantity, and special land uses and conditions that influence land and water resources (Freeborn County, 2016). Resources and concerns include aquifers, surface waters (lakes, shoreland, aquatic invasive species, and wetlands), soil and erosion, waste disposal and management (subsurface sewage treatment systems, feedlots, and solid waste), drainage, and municipal wastewater and stormwater. The Comprehensive Water Plan focuses on agricultural land uses since approximately 81 percent of productive land in Freeborn County is farmed or used for rotational animal pastures. The Comprehensive Water Plan (Ordinance Sec. 26-51) requires a 3 RD setback from wetland types 3, 4, and 5. These setbacks have been included in **Table 5-1**.

8.2.1.4 Waseca County Comprehensive Land Use Plan

Waseca County's 2005 Comprehensive Land Use Plan (Waseca County Comprehensive Plan) focuses on growth and development issues for the next 20 years, or until approximately the year 2025 (Waseca County, 2005). The Waseca County Comprehensive Plan relies on information from land use studies to analyze the current pattern of development (existing land use) and serves as the framework for formulating policies, plans, and programs for future land use. Waseca County currently separates land uses by nine zoning districts. The Agricultural District is intended to provide a district that will retain suitable agricultural areas within the county; control scattered non-farm development, and secure economy in governmental expenditures for public services, utilities, and schools. Additionally, portions of the Agricultural District have been designated as exclusive agricultural use zones (known as Agricultural Covenant Parcels) by the Waseca County Farmland Preservation Plan, which is a part of the Minnesota Agricultural Land Preservation Program (Minn. Stat. Chapter 40A, 2023). Agricultural Covenant Parcels must be at least 35 acres and qualify as prime or exclusive agricultural lands to be preserved and protected. Although the County does enroll and protect land under agricultural covenants, and multiple Parcels reside within the Project Area in Waseca County (Waseca County, 2018), the Project would not prevent landowners from continuing to farm their land.

8.2.1.5 Steele County Comprehensive Land Use Plan

The primary goals of the Steele County Comprehensive Land Use Plan include the protection of agricultural areas from encroachment of incompatible uses, protection of the agricultural economy and community, promoting orderly development in a manner that does not degrade the natural environment, providing a decision-making guide for managing growth that will serve the best interest of current and future citizens, and making the most efficient and economical use of public funds and investments (Steele County, 2007).

The Steele County Comprehensive Land Use Plan emphasizes the importance of promoting orderly development within or near population centers while preserving and protecting the county's farmland and natural resources.

According to the Steele County Tax Parcel Viewer, the wind buffer setback parcels in Steele County are within the Agricultural (A-1) District (Steele County, 2022).

8.2.1.6 Le Sueur River Comprehensive Watershed Management Plan

The Project Area is located primarily within the Le Sueur River Watershed, with smaller portions within the Cannon River and Cedar River Watersheds along the eastern boundary (MNDNR, 2023a). The Le Sueur River Watershed was selected for a One Watershed, One Plan (1W1P) planning grant in 2020. The purpose of a 1W1P program is to develop comprehensive watershed management plans. The goal of 1W1P is to align local water planning on major watershed boundaries with state strategies towards prioritized, targeted and measurable implementation plans. The Le Sueur Comprehensive Watershed Management Plan (Plan) was approved by the Minnesota Board of Water and Soil Resources (BWSR) on August 24, 2023 (BWSR, 2023). The Plan focuses on restoring impaired waters and habitats, protecting high quality lakes, reducing peak flows through water storage, and protecting groundwater quality through resource management. The Le Sueur River Watershed is divided into three main tributaries or drainage areas including Cobb River, Le Sueur River, and Maple River. The Le Sueur River bisects the eastern half of the Project Area; the Cobb and Maple rivers are west of, and outside of the Project Area. The top five high priority issues identified in the 1W1P include water quality in rivers and streams due to high sediment and nutrient loading; water quality in lakes due to excess nutrients; erosion of agricultural lands and bluff areas; water quantity and flooding due to increased precipitation; and loss of wetlands from ditching, drainage, and land use changes.

8.2.2 Local Ordinances

The Project is subject to Minnesota's Wind Siting Act, Minn. Stat. Chapter 216F, for siting of wind energy conversion systems, and portions of the Power Plant Siting Act (Minn. Stat. Chapter 216E). As such, and pursuant to Minn. Stat. § 216F.07, a site permit for a LWECS issued by the Commission, "supersedes and preempts all zoning, building or land use rules, regulations or ordinances adopted by regional, county, local and special purpose governments." Therefore, WPL is not required to apply to county zoning authorities for additional permits or approvals for the Project. However, pursuant to Minn. Stat. § 216F.081, "[t]he commission, in considering a permit application for LWECS in a county that has adopted more stringent standards, shall consider and apply those more stringent standards, unless the commission finds good cause not to apply the standards." To assist the Commission in its review of the Project, WPL reviewed and incorporated pertinent county zoning requirements for wind energy development in this Application. The results of WPL's review are presented in the subsections that follow.

8.2.2.1 Freeborn County Renewable Energy Systems

Freeborn County's Renewable Energy Systems Ordinance (RES Ordinance), Chapter 26, regulates the installation and operation of renewable energy systems (Freeborn County, 2017). Renewable energy means energy from sources that are not easily depleted such as wind energy. Under this RES Ordinance, the Project is considered a Commercial wind energy conversion system (WECS) because the turbines have a hub height greater than 200 feet. Commercial WECS and meteorological towers are conditionally permitted in the Agricultural district. By its terms, the RES Ordinance applies only to systems that are not otherwise subject to siting and oversight by the MPUC (see Sec. 26-20); thus, it does not apply to the Project. The RES Ordinance provides a summary of general standards regarding setbacks in Sec. 24-51, which applies to meteorological towers and commercial WECS. These setbacks have been included in **Table 5-1**.

The RES Ordinance contains additional provisions regarding safety design standards, tower configuration standards, abandonment and decommissioning, flicker analysis, additional standards for commercial WECS projects (preliminary acoustic studies, local emergency services notification, and pre-construction meeting), other applicable standards (other signage, power lines, waste disposal, orderly development, noise, electrical code and standards, and the FAA), avoidance and mitigation of damages to public infrastructure (roads and drainage system), and interference with electromagnetic communications. The Project has been designed to generally comply with this Ordinance.

8.2.2.2 Waseca County Zoning Ordinance

Waseca County's Unified Development Code (UDC) Zoning Ordinance identifies wind farms as conditionally permitted in the Agriculture (A-1) district (Section 6.02). The ordinance includes regulations relating to height limitations, proximity to airports, and setback requirements. A summary of commercial wind turbines and associated meteorological towers setback requirements have been included in **Table 5-1**. No Project facilities will be located within Waseca County. The Project has been designed to generally comply with this Ordinance.

8.2.2.3 Steele County Zoning Ordinance

Steele County's Zoning Ordinance identifies commercial WECS as conditionally permitted use and temporary meteorological towers as interim use in the Agricultural, Interim Agricultural, Residential, General Business, and Industrial districts (Steele County, 2020). Construction or operation of WECS Operation and Maintenance Facilities and WECS Project Temporary Construction Yards will also be classified as conditional use in all Districts (see Sec. 1527.03). A summary of WECS setback requirements is provided in Steele County Zoning Ordinance Sec. 1527.04 and are included in **Table 5-1**. No Project facilities will be located within Steele County. The Project has been designed to generally comply with this Ordinance.

8.2.2.4 City of Hartland and Nearby Municipal Ordinances

The City of Hartland's Basic Code of Ordinances regulates the installation and operation of wind energy conversion systems (WECS). The Ordinance includes regulations relating to, among other things, noise, turbine setbacks, compliance requirements, certification requirements, and dismantling conditions. Part of the Project Area resides within the City of Hartland's municipal boundaries, where it has jurisdiction. Construction or operation of WECS or windmills are permitted in the Industrial (I), Rural Residential, and Agriculture Districts as conditional use (Hartland, 2014). No Project facilities will be located within the City of Hartland.

The nearby municipalities of Freeborn, New Richland, Ellendale, Geneva, and Clarks Grove, all have established local zoning and/or comprehensive plans. However, no Project infrastructure will be located within these neighboring jurisdictions.

8.2.3 Current and Future Zoning

Identify and map current and future zoning, including urban growth boundaries within and adjacent to the project area.

In determining the current and future zoning classifications for the proposed Project, the Applicant reviewed the zoning ordinances, and comprehensive plans listed in **Table 8-7,** and sources of zoning information for Freeborn, Steele, and Waseca counties. Current and future zoning for the Project Area is shown on **Map 7 - Current and Future Zoning**.

8.2.3.1 Freeborn County Current and Future Zoning

The Project Area is in an area of the county that is mostly zoned for agricultural uses. While the Online Property Search viewer does not provide a zoning layer for areas outside of municipalities (Freeborn County, n.d.), Section 42-57 of the Freeborn County Code of Ordinances states that any land detached from an incorporated municipality will be placed under the "A" Agricultural District unless placed in another district by the board of county commissioners (Freeborn County, 2017). There are no floodplains within the Project Area, and several Public Waters Inventory (PWI) waterways include a shoreland overlay district (Freeborn County, n.d.). Information on surface waters and floodplain resources can be found in **Section 8.17**.

8.2.3.2 Steele County Current and Future Zoning

In Steele County, the wind access buffers are on parcels designated as Agriculture. There are no mapped floodplains or shoreland overlay districts within the Steele County portion of the Project Area (FEMA n.d.; Steele County, 2022). All language set forth in the Ordinance in terms of zoning is intended for both current and future interpretation. Information on surface waters and floodplain resources can be found in **Section 8.17**.

8.2.3.3 Waseca County Current and Future Zoning

In Waseca County, the Project Area is in an area of the county that is mostly zoned for agricultural uses (Waseca County, 2017). As outlined in Section 6.08 in the UDC, Agricultural Protection District Standards aim to maintain the county's rural agricultural character, maintain active agricultural uses as an integral part of the county's economy, encourage development and retention of agriculturally related businesses, and prevent development from infringing on high-quality farmland soils or agricultural operations. To maintain these Standards, the county has enrolled parcels of land and protected them under agricultural covenants, which prevents non-agricultural development within those parcels (Waseca County, 2023). Several of these parcels are enrolled as of 2018 (Waseca County, 2018), but the Project will not prevent landowners from continuing to farm their land as no infrastructure is planned within Waseca County.

Some portions of the Project Area are in a stream overlay district. Information on surface waters and floodplain resources can be found in **Section 8.17**.

8.2.3.4 City of Hartland Current and Future Zoning

Current zoning information for the City of Hartland is in **Section 8.2.3.4** and shown on **Map 7 – Current and Future Zoning**.

8.2.4 Potential Impacts

The Project is generally consistent with county zoning requirements and comprehensive plans regarding siting of LWECS projects. The Project Area occurs primarily within county-zoned agricultural districts. All three counties allow commercial wind energy systems and meteorological towers as a conditional use within agricultural districts. WPL believes the Project will be compatible with the rural and agricultural character of all three counties.

The Project is not likely to impact future zoning and expansion of incorporated areas nearby. WPL has sited all Project infrastructure approximately two miles or more from incorporated areas to minimize potential impacts on future urban growth. No infrastructure is proposed within regulated floodplain or shoreland overlay district. Development of the Project will allow continued agricultural use within the Project Site.

Temporary and permanent impacts to current land use are anticipated to occur from the construction of the Project. Land use is primarily agricultural with 94 percent being used for row crops and pasture. Temporary and permanent impacts to agricultural activities will include the removal of land from row crop production and pasture during the construction and operation of the Project. Additionally, temporary and permanent impacts to pastureland are expected to be minimal and restricted to removing small amounts of land from agricultural use.

8.2.5 Mitigation Measures

Since the proposed Project is consistent with the zoning requirements and comprehensive plans for Freeborn, Steele, and Waseca counties and meets all setback requirements, it is unlikely to impact current or future zoning or expansion. Therefore, no mitigation is proposed to achieve consistency with local zoning and comprehensive plans.

Overall, the Project is not expected to affect the future land use planning goals of the counties in the Project Area.

8.3 Conservation Easements

Conservation easements are sold or donated by a landowner to state, federal, or non-governmental organizations in perpetuity to meet conservation objectives. Conservation easements may or may not require public access as part of the easement agreement. Describe the conservation easements on lands within and adjacent to the project boundary, particularly Reinvest in Minnesota (RIM) lands. Conservation easements owned by non-governmental organizations, such as land trusts, are registered with the county.

Conservation easements are voluntary legal agreements between a landowner and a state, federal or non-governmental organization (such as a land trust) that places restrictions on the use of the property, to protect the natural values of the land. Conservation easements are sold or donated by a landowner to state, federal, or non-governmental organizations in perpetuity to meet conservation objectives. Conservation easements may or may not require public access as part of the easement agreement. The easements are flexible and tailored to meet a landowner's needs and vision for the land. The landowner retains ownership of the property and all rights and privileges for its use, except for the uses restricted under the easement agreement. Conservation easements within the Project Area identified from publicly available data are listed in **Table 8-8**.

The BWSR administers and partners with several conservation easement programs including the Reinvest in Minnesota (RIM) Reserve Program, RIM Wetland Reserve Program (RIM//WRP), Conservation

Reserve Enhancement Program (CREP), Permanent Wetland Preserve (PWP) Program, and the Wetland Reserve Program (WRP). These programs have varying requirements including the length of time parcels are protected, annual lease rates, and type of land use/habitat protected.

WPL reviewed BWSRs conservation easement interactive map and identified two easements totaling approximately 98 acres within the Project Area (see **Map 5 - Public Land Ownership and Recreation**). The land is currently enrolled in the CREP and RIM easement programs. The easements are located in the eastern portion of the Project Area and listed in **Table 8-8**. Both easements are on private land and closed to the public.

Table 8-8: Conservation Easements within the Project Area

Conservation Program	Acreage	Location	Expiration Year
RIM	72.0	93°20'5"W 43°50'5"N West of 770th Ave and northeast of Bath.	N/A- Perpetual or Permanent
CREP	26.1	93°21'54"W 43°48'16"N West of County Road 24, north of 310th Street in the southeast corner of the Project Area.	N/A- Perpetual or Permanent

Freeborn County SWCD maintains a list of perpetual easements within the county. In the 2023 Annual Report, Freeborn County had 195 easements totaling 11,360 acres. Easement types include lands enrolled in RIM, RIM/WRP, PWP, CREP, WRP, and EWP easements (Freeborn SWCD, 2023).

There are no federal easements in the Project Area. The nearest federal easement is a U.S. Fish and Wildlife Service (USFWS) easement located 3.3 miles southwest of the Project Area and is associated with an unnamed WPA (USFWS, 2024a). Similarly, there are no state wetland bank easements in the Project Area (BWSR, 2018).

8.3.1 Potential Impacts

WPL continues to review land title records of participating parcels to identify any conservation easements that are not recorded in public databases on any properties within the Project Area. No other easements have been identified at this time. If additional conservation easements are identified, WPL will coordinate with landowner and the agency that administers the conservation easement to address any potential impacts.

8.3.2 Mitigation Measures

No mitigation measures are proposed for conservation easements because impacts to lands subject to conservation easements are not anticipated.

8.4 Noise

Noise is measured in the unit of decibels (dB) on a logarithmic scale to match human perception of noise. Additionally, human hearing is not equally sensitive to all frequencies of sound from low to high. To account for this, A-weighting (dBA) is used to reflect the typical sensitivity of human hearing. Common sound sources in an agricultural or rural environment include but are not limited to; sound from farm equipment, traffic noise from nearby roads and highways, various noise from wildlife, and wind rustling through vegetation. A graphic showing common noise levels is provided in **Figure 2** below.

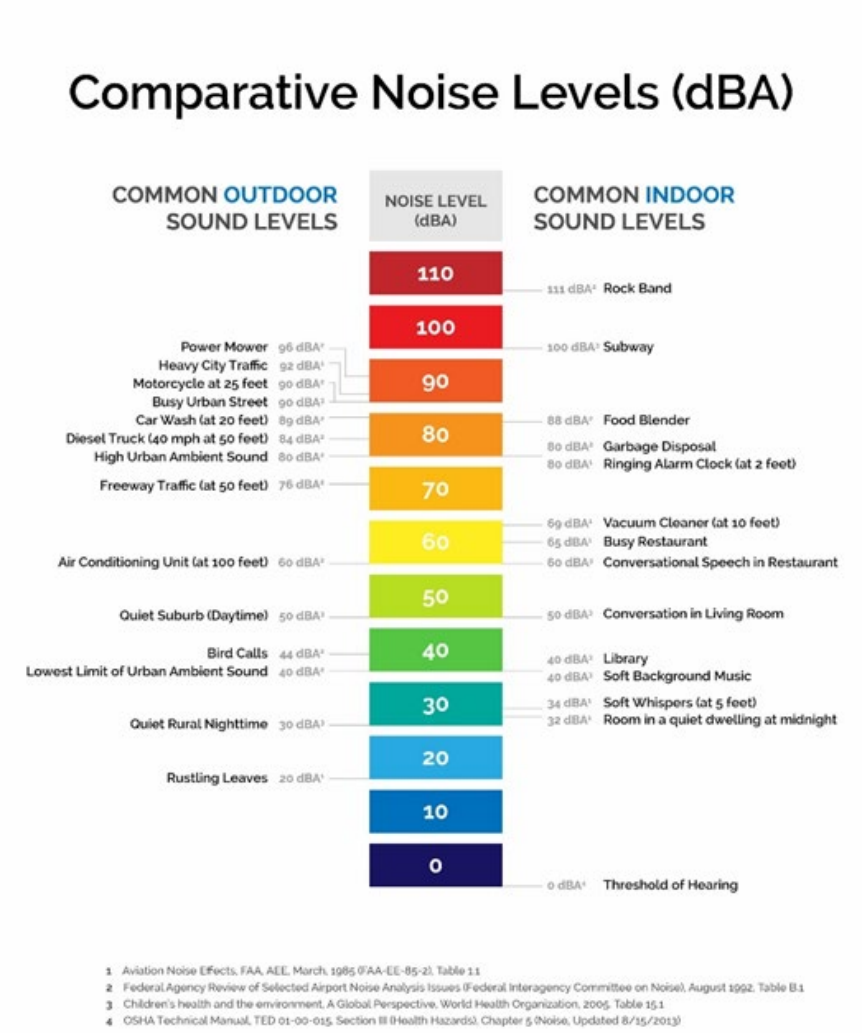


Figure 2: Common Indoor and Outdoor Noise Levels

8.4.1 Ambient Sound Levels

Provide existing ambient sound levels and projected post-project sound levels including total sound and turbine only noise. Provide the method or type of model used to determine noise levels.

The *Application Guidance for Site Permitting of Large Wind Energy Conversion Systems in Minnesota* (DOC EERA, 2022) requires a description of ambient noise levels in the Project Area, as well as post-project sound levels including total sound and turbine only noise.

Ambient noise levels were measured in the Project Area in the spring of 2024 to characterize the existing acoustic environment relating to wind turbine operations. The measurement methodology was developed in accordance with the National Association of Regulatory Utility Commissioners (NARUC, 2011) guidance document prepared for the MPUC, *Assessing Sound Emissions from Proposed Wind Farms & Measuring the Performance of Completed Projects* and the *Guidance for Large Wind Energy Conversion System Noise Study Protocol and Report* (DOC EERA, 2019).

The survey included unattended measurements taken at five locations throughout the Project Area. Data collected during periods of precipitation or when wind speeds exceeded 5.5 meters per second (m/s) or 12

miles per hour (mph) were excluded from the analysis. Daytime and nighttime averages at each measurement location are shown in **Table 8-9** below.

Table 8-9: Measured Background Noise Level Averages

Measurement Location	Average Leq-1 hour (dBA)	
	Daytime (7 am – 10 pm)	Nighttime (10 pm – 7 am)
MP-1	54.8	54.7
MP-2	53.5	52.7
MP-3	53.8	49.6
MP-4	51.9	50.7
MP-5	54.3	54.7

According to the American National Standards Institute/Acoustical Society of America S12.9-2013/Part 3, rural residential areas have a typical daytime noise level of 40 dBA and a typical nighttime level of 34 dBA. Project Area ambient noise level measurements recorded daytime average levels between 52 and 55 dBA and nighttime average levels between 50 and 55 dBA. An audio review of measurement periods above 50 dBA was conducted and found no periods attributable to existing wind turbines. Background noise levels in the vicinity of the Project were identified as farming equipment/operations, crop dusting planes, wind, vehicle traffic, and birdsong. Noise levels varied over the course of the measurement period. The pre-construction Ambient Noise Assessment is in **Appendix B**.

8.4.2 Projected Operational Sound Levels

Projected post-project total sound levels must meet MN standards (Minnesota Rules Chapter 7030) at all residential receptors (homes). If background sound levels are less than the applicable standard at nearby receptors, the modeled turbine-only noise levels should not cause an exceedance of the applicable state standard at nearby receptors, inclusive of the measured background sound level. "Cause" means that the project turbine-only contribution is in excess of the applicable state standard. If background sound levels are equal to or greater than the applicable state standard at the nearby receptors, the windfarm should not contribute more than 47 dB(A) to total sound levels at the nearby receptors. Therefore, for example, when nighttime background sound levels are at 50 dB(A), a maximum turbine-only contribution of 47 dB(A) would result in a non-significant increase in total sound of 2 dB(A). Typically, 750-1500 ft is required to meet noise standards depending on turbine model, number of turbines, layout, and site specific conditions.

An operational noise impact evaluation of the Project was conducted, and a noise propagation model was run for the proposed Project layouts. The noise impact assessment report is in **Appendix C**. Project noise contributions were calculated at all noise sensitive receptors in the Project vicinity. The primary noise sources from the Project are expected to be the wind turbines, the Project Substation, and Project Substation transformer. Non-Project noise sources in the Project vicinity include U.S. Interstate 35, local road traffic, and agricultural activity.

As required under the Power Plant Siting Act (Minn. Stat. Chapter 216E) and by the MPUC, a state-level review was conducted. The relevant regulation, Minn. R. Chapter 7030, sets forth noise limits according to land use and time of day. Noise sensitive areas in the Project Area consist of residential homes. Households are classified as Noise Area Classification 1 (NAC 1) per Minn. R. 7030.0050, subp. 2. NAC 1 has the lowest noise limits of the three classifications, and while conservation areas are not classified, for

conservatism they were also held to NAC 1 limits. These limits are listed in **Table 8-10**. Daytime is defined as 7 a.m. to 10 p.m. and nighttime is defined as 10 p.m. to 7 a.m.

Table 8-10: Minnesota Rule 7030.0040 NAC 1 Noise Level Limits

Metric	Daytime Limit	Nighttime Limit
L_{50}	60 dB(A)	50 dB(A)
L_{10}	65 dB(A)	55 dB(A)

These limits are expressed in the L_{50} and L_{10} metrics, which are statistical noise level metrics representing the noise level that is exceeded 50 percent and 10 percent of the measurement period, respectively. However, noise modeling most accurately predicts L_{eq} levels, which is the continuous noise level or the overall logarithmic average of a measurement period. L_{10} levels are on average 3 dBA above Leq, while L_{50} values are lower than L_{eq}. Thus, modeled L_{eq} can be used as a conservative metric for ensuring compliance with the L_{50} limits specified in Minn. R. 7030.0040, subp. 1. Therefore, if L_{eq} limits are assumed to be the same as the L_{50} limits, any modeled noise level below the L_{eq} limits would be below the L_{50} limits prescribed by Minn. R. 7030.0040. **Figure 3** provides a visual comparison of the L_{eq}, L_{10}, and L_{50} metrics (FHWA, 2017).

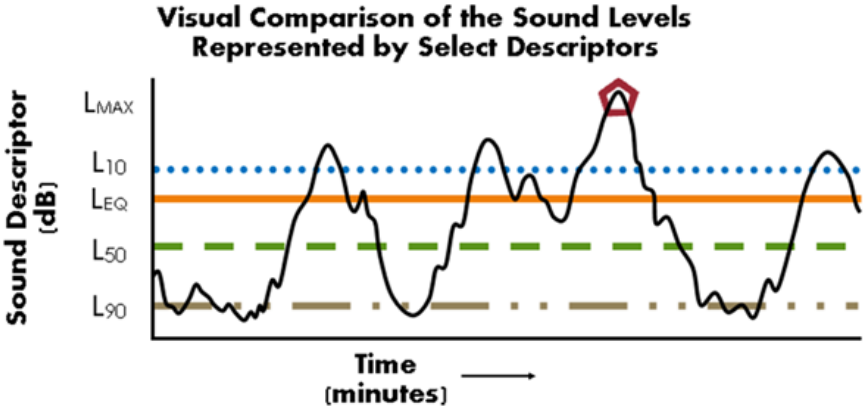


Figure 3: Comparison of Sound Level Metrics

Noise propagation for each turbine was modeled using manufacturer noise data. The noise propagation model was then used to predict levels at all noise sensitive receptors within two kilometers (1.2 miles) of proposed Project infrastructure. A hypothetical scenario was modeled that included the 34 primary and 4 alternate turbine locations. In reality, if an alternate location is used, a corresponding primary location would be removed from the array, so the 38-turbine scenario is conservative.

Results show a maximum Project generated noise level of 45.5 dBA for the Vesta V136 112-meter hub height turbine, and 45.4 dBA for the Vesta V136 120-meter hub height turbine. As predicted, Project noise levels for the hypothetical 38-turbine layout (including 4 alternates) do not exceed the maximum turbine-only noise level contribution of 47 dBA; a final layout including any combination of alternates and primary turbine locations is expected to have similar or lower turbine-only noise level contributions.

Predicted maximum Project noise levels do not exceed the limit of 47 dBA at any noise sensitive receptor as provided for in the 2022 *Application Guidance for Site Permitting of Large Wind Energy Conversion Systems in Minnesota*. This ensures that Project (turbine-only) noise does not cause or significantly

contribute to an exceedance. As nighttime ambient levels of 50 dBA and above were measured in the Project vicinity, a maximum-turbine only contribution of 47 dBA is the applicable Project noise level limit to show compliance with Minn. R. 7030. Accordingly, minimal noise impacts, within regulatory limits, are expected from Project operation.

8.4.3 Turbine and Facility Lighting

Describe the turbine lighting system and any light-mitigating technology or comparable solution to ADLS or LIDS capable of reducing the impact of nighttime lighting while maintaining night conspicuity sufficient to assist aircraft in identifying and avoiding collision with the facilities. Describe all other lighting at the facility, potential impacts to residents and the surrounding area, and associated mitigation.

The FAA requires obstruction lighting or marking of structures over 200 feet above ground surface because they are considered obstructions to air navigation. On June 21, 2024, WPL submitted Notices of Proposed Construction or Alteration (Form 7460-1) for the primary and alternate turbine locations to the FAA based on the Vestas V136 112-meter hub height turbine. On September 30, 2024, the FAA responded with determinations of no hazard to air navigation provided the turbines adhere to marking and lighting requirements listed in the FAA Advisory circular 70/7460-1 M, Obstruction Marking and Lighting, white paint/synchronized red lights-Chapters 4, 13 (Turbines), and 15. On April 1st, 2025, WPL submitted new Notices of Proposed Construction or Alteration (Form 7460-1) for each turbine location based on the Vestas V136 120-meter hub height turbine. It is anticipated that the taller turbines will result in similar determinations of no hazard. WPL will work with the FAA if any concerns are identified. See **Table 13-1** for a summary of FAA coordination.

8.4.3.1 Aircraft Detection Lighting System (ADLS)

The FAA has approved commercial operation of ADLS for use at wind farms. An ADLS is a sensor-based system that monitors the airspace around a wind facility. When aircraft are detected nearby, the lights on the turbines become activated. An ADLS must be continuously monitored in accordance with the current version of AC 70/7460-1, Obstruction Marking and Lighting.

WPL plans to install one ADLS radar tower. The location of the tower is tentatively planned to be located within the existing O&M Facility. The final location will be determined based on participating landowners, environmental conditions, an analysis of radar coverage from an ADLS approved technology vendor, and ultimately review and approval by the FAA and Federal Communications Commission (FCC). The ADLS tower will be free-standing and likely between 50 feet and 100 feet tall, depending on topography and whether there are any obstructions in the area. The tower is anticipated to have an approximate 169-square-foot graveled area surrounding its foundation. A typical generator skid will be located adjacent to the tower on a typical concrete slab of approximately 143 square feet, and will consist of a generator, propane canister, transformer, main disconnect, battery, automatic transfer switch, and a generator controller. Security fencing will be installed around the ADLS radar tower unit with an approximate dimension of 35 feet by 25 feet. Underground cabling will be installed between the tower and Project Substation to connect the system electrically. If an approaching airplane is detected, its distance, speed, and heading will be tracked, and the system will determine whether to activate the aviation lights. WPL will coordinate with the FAA for certification and implementation of the ADLS. The timing of the ADLS system installation will depend on duration of FAA review and approval, availability of vendors, and the manufacturing, delivery, installation, and testing of the system.

8.4.4 Potential Impacts

Provide an analysis and discussion of potential impacts of the project, options to mitigate impacts, and any adverse environmental effects that cannot be avoided.

When in motion, the turbines emit a perceptible sound. The level of this noise varies with the speed of the turbine and the distance of the listener to the turbine. On relatively windy days, the turbines create more noise. However, the ambient or natural noise level from the wind tends to override the turbine noise as distance from the turbines increases.

WPL proposes siting turbines at least 1,250 feet from occupied homes plus the distance required to comply with the Project noise limit of a 47 dB(A). The closest turbine to a non-participating residence is 1,599.6 feet, and the closest turbine to a participating residence is 1,327.6 feet.

8.4.5 Mitigation Measures

Provide an analysis and discussion of potential impacts of the project, options to mitigate impacts, and any adverse environmental effects that cannot be avoided.

Predicted Project noise levels for receptors in the Project Area were at or below the nighttime Project noise limit of 47 dB(A). Modeling results indicated the highest predicted Project noise contribution is 45.5 dBA for Vesta V136 112-meter hub height turbine, and 45.4 dBA for the Vesta V136 120-meter hub height turbine. As such, no mitigation measures are planned at this time. WPL will develop a post-construction noise study methodology that incorporates the *Guidance for Large Wind Energy Conversion System Noise Study Protocol and Report* (DOC EERA, 2019). Results of the post-construction noise study will be provided to the Commission after commencing commercial operation.

8.5 Visual Resources

Describe the visual impacts of the project on the surrounding area. Provide an analysis and discussion of potential impacts of the project, proposed mitigative measures, and any adverse environmental effects that cannot be avoided.

The Project will introduce wind turbines and associated facilities to the landscape and can alter the existing visual resources where they are most perceptible. Additionally, during construction, visual resources may be interrupted by construction equipment and increased vehicle traffic. WPL analyzed potential impacts to existing visual resources, including on public resources and private land, and shadow flicker.

8.5.1 Existing Visual Resources

The topography of the Project Area is relatively flat with gently rolling hills with elevations that range from approximately 1,176 to 1,350 feet above sea level. Elevations generally increase from west to east with the highest elevations in the southeast portion of the Project Area. In general, the Project Area is relatively flat with slopes of less than three percent though there are locations where the slopes reach roughly five percent. The landscape can be classified as rural open space. **Maps 8a** and **8b (Topographic Map with Project Facilities)** shows the general topography within the Project Area.

Vegetation within the Project Area is predominantly agricultural crops and pasture, with isolated woodlands that surround residences and riparian areas. This type of largely rural landscape dominated by agricultural and pasture lands is typical of south-central Minnesota. The main agricultural crops grown in Freeborn County include corn and soybeans.

Viewsheds in the area are generally broad and uninterrupted, with only small, scattered areas where they are interrupted by trees or topography. The settlements in the vicinity are residences and farm buildings (inhabited and uninhabited farmsteads) scattered along rural county roads. The Project Area is also shaped by a built environment, including cemeteries and a community solar garden. Horizontal elements, such as highways, county roads, and a railroad, are consistent with the long and open viewsheds in the area. Vertical elements such as existing wind turbines, overhead transmission lines, and communication towers are visible from considerable distances and are the tallest and often the most dominant visual feature on the landscape. Additionally, numerous electrical distribution lines parallel some roads that contribute to the existing visual elements.

There are two commercial wind farms within 10 miles of the Project Area (see **Map 2 - Existing Wind Turbines in the Project Vicinity**). The Bent Tree Wind Farm is immediately south of the Project Area and consists of 122 Vestas V82 turbines with a RD of 82 meters (269 feet) that generate 1.65 MW each. The Oak Glen Wind Project is about 9.5 miles northeast of the Project Area and contains 24 Vestas V90 turbines with a RD of 90 meters (295.3 feet) that generate 1.8 MW each. Both wind projects began operating in 2011. Meteorological towers associated with these wind facilities may also be visible on the landscape. Generally, the Bent Tree Wind Farm and Oak Glen Wind Project contain similar turbine models with total heights ranging from approximately 330 feet (101 meters) to approximately 492 feet (150 meters). As described in **Section 5.2.1** and shown in **Table 5-3**, the proposed Project turbines will range in size from approximately 591 feet (180 meters) to 617 feet (188 meters) in height with a rotor diameter of 136 meters (446 feet). While the proposed Project turbines will be larger, each turbine will have greater power output (4.5 MW) than those used at Bent Tree Wind Farm and Oak Glen Wind Project, thus fewer turbines will be used to generate the 153 MW of nameplate capacity.

One existing 69 kV transmission line traverses the Project Area for about 3.6 miles and parallels 730th Avenue (County Road 116) in a north-south direction through the eastern portion of the Project Area (**Map 3a** and **Map 3b – Preliminary Site Layouts**). There are no other overhead transmission lines within two miles of the Project Area. Additionally, numerous electrical distribution lines parallel roads that contribute to the existing visual elements.

The FCC Antenna Structure Registration database identifies two antenna structures within the Project Area; both towers are located along CSAH 35. Three antenna structures are located just over two miles from the Project, resulting in additional existing visual impacts within the vicinity of the Project Area (FCC, 2018).

Visual impacts on public resources and private lands are described in the sections below, followed by overall potential visual impacts and mitigation measures.

8.5.2 Visual Impacts on Public Resources

Discuss the visual impacts of the project on public resources, such as public lands, waters or other areas of scenic value.

The Project may be located within the viewshed of Minnesota Department of Natural Resources (MNDNR) managed Wildlife Management Areas (WMAs), USFWS Waterfowl Production Areas (WPAs), and other local natural resource areas. There are 15 WMAs and seven WPAs within 10 miles of the Project Area. None of these public lands are within the Project Area.

Segments of two county snowmobile trails extend through the Project Area. Additional information

regarding this resource is in **Section 8.8.7**. **Map 5 - Public Land Ownership and Recreation** identifies the various natural, recreational, and wildlife areas within and proximal to the Project. As stated previously, the severity of the visual effect will be dependent upon the perspective of the individual observer.

Visual impacts on public resources during construction will be dependent on the construction activity and proximity to the public resource. For example, site clearing, and grading would be visible from public resources adjacent to the Project Area boundary or within one to two miles of the Project's footprint. Other activities, such as turbine erection, would be visible from longer distances due to the height of the crane and towers.

During operation, the wind turbines will impact the visual surroundings of the Project Area and vicinity, but the degree of the visual and unavoidable impact on public resources will vary based upon the distance from the Project, obstructions such as trees between the public resource and Project, a viewer's orientation to the Project (i.e., facing towards or away), and the viewer's personal preferences. For example, a person utilizing Chapa-kak-say-za WMA approximately 1.5 miles north of the Project Area may see the wind turbines from the open areas of the WMA, but not in areas with trees immediately adjacent to the person or when the person is oriented south. To the extent public resources are utilized at night, turbine lighting may be visible when the ADLS system detects aircraft in the vicinity (see **Section 8.4.3.1**).

8.5.3 Visual Impacts on Private Lands and Homes

Discuss the visual impacts of the project on private lands and homes within and near the project area.

The impact of the Project's aesthetics is based on subjective human responses. For some viewers, the Project could be perceived as a visual intrusion; for other viewers, the Project may have positive aesthetic qualities. While people living in or traveling through the area are accustomed to viewing wind turbines associated with the existing wind farms south and east of the Project Area, the Project will add to the cumulative visual impacts by adding a projected 34 new turbines in the area. This is particularly true for residences in the eastern and southern portions of the Project Area where the existing wind turbines are more visible than to residences in the western and northern portions of the Project Area. Depending on a residence's location and orientation, residences in the southern and eastern portion of the Project Area may have turbines in multiple viewing angles (i.e., not only south and/or east, but also west and/or north).

The placement of turbines in the landscape will have an impact on the existing visual experience of the Project Area for residents and persons traveling along highways in the Project Area and vicinity. Residences with turbines and associated infrastructure closest to their homes are those that are participating in the Project by signing easements. The closest turbine to a non-participant residence is 1,599.6 feet, and the closest turbine to a participating residence is 1,327.6 feet. Visual impacts to those traveling on highways in the vicinity will be most evident to people traveling along County Roads 10 and 13 on western side of the Project Area, roads around Hartland, along County Road 20 in the eastern side of the Project Area, and U.S. Interstate 35 about two miles east of the Project Area. These roads carry more vehicles daily than many of the internal county and township roads. See **Table 8-13** for a list of Annual Average Daily Traffic (AADT) counts within the Project Area.

The Project Substation may be visible to those residents that live within one mile of this facility. The Project Substation will be lower profile than the wind turbines.

Turbine access roads have been designed to provide direct access from public roads to the turbine location to minimize impacts on the agricultural fields. Where possible, the access roads follow field edges. To the

extent possible, WPL has co-located linear facilities (access roads, crane paths, and collection lines) to minimize visual impacts. Post-construction, WPL anticipates minimal visual impacts from temporary facilities (crane paths, collection lines, and workspace associated with wider access roads and turbines) because all temporary impacts will be restored to pre-construction conditions. Additionally, areas surrounding the turbines and most associated facilities will continue to be farmed during operation (see **Section 11** and **Appendix H**).

8.5.4 Overall Potential Visual Impacts

Project infrastructure, including turbines, the Project Substation, permanent meteorological towers, and ADLS tower will create new human-made features visible throughout the landscape. As mentioned in **Section 6.3.1**, WPL will not construct a new O&M Facility. Instead, the existing O&M Facility for the Bent Tree Wind Farm will be used, and an approximate 80- by 100-foot storage building will be constructed adjacent to the existing parts storage building. The new storage building will not create new visual impacts as the existing O&M Facility is in Hartland, immediately east of State Highway 13. The primary visual impact associated with wind farms are the turbine structures and associated nighttime lighting required by FAA, as they can typically be seen from a greater distance than other Project infrastructure.

The turbines will alter the visual character of the landscape near the Project Area. The new turbines will likely be viewed as a visual disruption; as generally compatible with the rural agricultural heritage of the area, which includes wind turbines, silos, and grain elevators; or as adding a positive aesthetic quality to the landscape. The installation of wind turbines will not significantly alter the character of the regional landscape given the presence of existing wind farms in the vicinity; however, the degree of visual impact will vary based on the type of observer and individual preference.

The topography in the vicinity is generally flat and the vegetation cover is uniformly low, making the ridgelines of the landform in the vicinity highly vulnerable to visual disruptions. The Project will alter the landscape in the area from agricultural to wind farm/agricultural.

Temporary visual impacts will occur during construction, including the presence of equipment staging at the laydown area, cranes and crane paths, and the installation of underground collection lines. Visual impacts as well as temporary alteration of the land within the construction areas would be short-term and only for the duration of construction.

8.5.5 Mitigation Measures

WPL will implement the following mitigation measures for visual resources:

- Wind turbines will exhibit visual uniformity in the shape, color, and size of rotor blades, nacelles, and towers.
- Collection cables or lines on the site will be buried in a manner that minimizes additional surface disturbance (e.g., collocating them with access roads, where feasible).
- For ancillary buildings and other structures, low-profile structures will be chosen whenever possible to reduce their visibility.
- Turbine foundations and roads have been designed to minimize and balance cuts and fills.
- Facilities, structures, and roads will be located in stable fertile soils to reduce visual contrasts from erosion and to better support rapid and complete regrowth of vegetation.

- Lighting for facilities will not exceed the minimum required for safety and security, and full-cutoff designs that minimize upward light pollution will be selected. The installed ADLS will include lights that are off until aircraft approach.

The turbines will be uniform in color and painted non-glare white or light grey paint color designed to minimize visual impacts. As described in **Section 8.4.3**, WPL will follow the FAA lighting and marking requirements and coordinate with the FAA on implementation of the ADLS radar system. With this radar system, turbine lighting (synchronized flashing red lights) is off until the radar detects an aircraft within a prescribed distance to the Project, at which time, the blinking red lights turn on. After the aircraft is safely beyond the Project, the blinking lights are again turned off.

8.5.6 Shadow Flicker

Provide an analysis and discussion of shadow flicker based on the preliminary turbine layout. Include isopleths for 100, 50, and 25 hours / year of potential shadow flicker. List the assumptions and methodology used in the analysis. Provide a figure illustrating likely hours of shadow flicker/year at 1,000 feet and a table showing potential shadow durations/ day at 1,000 feet based.

Shadow flicker can be defined as an intermittent change in the intensity of light in an area resulting from the operation of a wind turbine due to its interaction with the sun. While indoors, an observer experiences repeated changes in the brightness of the room as shadows cast from the wind turbine blades briefly pass by windows as the blades rotate. For this to occur, the wind turbine must be operating, the sun must be shining, and the window must be within the shadow region of the wind turbine; otherwise, there is no shadow flicker. Shadow intensity, or how "light" or "dark" a shadow appears at a specific receptor, will vary with distance from the turbine. The closer a receptor is to a turbine, the more turbine blades block out the sun's rays, and shadows will be wider and darker. Receptors located farther away from a turbine experience thinner and less distinct shadows since the blades block out less sunlight. A stationary wind turbine generates only a stationary shadow like any other structure. Currently, shadow flicker impacts are not regulated by state or federal law; however, the Minnesota Site Permit acknowledges the significance of 30 hours of shadow flicker in a year.

8.5.6.1 Potential Impacts

On behalf of WPL, Westwood completed a shadow flicker impact assessment for the range of hub heights being considered. Both layouts included the 38 Vestas V136 4.5MW wind turbines; one with a hub height of 112 meters (368 feet) and the other with a hub height of 120 meters (394 feet) above ground level. To meet setbacks, some turbine coordinates differ between layouts. The shadow flicker impact assessment report is in **Appendix D.**

Under the Vestas V136 112-meter hub height turbine layout, 146 shadow receptors are not expected to experience shadow flicker and 96 shadow receptors are expected to experience no more than 30 hours of shadow flicker per year. Of the remaining eight shadow receptors registering above 30 hours per year, the maximum expected impact is 48 hours and 38 minutes.

Under the Vestas V136 120-meter hub height turbine layout, 147 shadow receptors are not expected to experience shadow flicker and 95 shadow receptors are expected to experience no more than 30 hours of shadow flicker per year. Of the remaining eight shadow receptors registering above 30 hours per year, the maximum expected impact is 49 hours and 0 minutes.

Table 8-11 depicts the distribution of shadow flicker hours modeled for the receptors. Shadow flicker frequency calculations were modeled for 250 residential structures (receptors) within two kilometers (1.2 miles) of the Project Area boundary using windPRO modeling (see **Maps 4a** and **4b - Wind Access Buffer Setbacks and Land Ownership**).

Table 8-11: Realistic Shadow Flicker Distribution on Receptors

Realistic Shadow Flicker (hours/year)	Number of Receptors	
	Vestas V136 112	Vestas V136 120
0	146	147
0 to 5	47	45
5 to 10	18	17
10 to 15	9	10
15 to 20	6	8
20 to 25	8	6
25 to 30	8	9
30+	8	8

For both layouts, the eight receptors that are modeled to receive greater than 30 hours of shadow flicker a year are from alternate turbine locations. No exceedance is expected at receptors when only primary turbines are included in the modeling. Reductions due to turbine operational time, direction, and sunshine probabilities were included in the analysis. Blocking effects of trees or other structures were not factored into the assessment.

8.5.6.2 Mitigation Measures

Based on the shadow flicker analysis, eight residential structures will receive more than 30 hours of shadow flicker per year from the alternate turbine locations under each layout. If any utilized turbine locations lead to more than 30 hours of shadow flicker per year on a residence, WPL will prepare shadow flicker management plan in coordination with impacted residents.

8.6 Public Services and Infrastructure

Describe the public services and infrastructure within the project boundary and 5 miles outside the project boundary and list associated setbacks. Describe potential impacts and mitigation measures.

The Project is in a low-populated, predominantly rural and agricultural area in south-central Minnesota. Public services supporting rural residences and farmsteads within the Project Area include transportation/roadways, electric and telephone/telecommunications. The City of Hartland is within the Project Area near the southwestern boundary.

The largest city in the Project vicinity is New Richland, which is located approximately 2.5 miles north of the northern border of the Project. The City of New Richland has its own police and fire departments. Four incorporated cities (Clarks Grove, Freeborn, Geneva, and Ellendale) and two unincorporated villages (Manchester and Matawan) are located within five miles of the Project Area. All the communities, except for Ellendale, receive public services from Freeborn County. Ellendale receives most public services from Steele County but has its own fire department.

The Project is expected to have minimal effect on the existing services and infrastructure. Construction and operation of the Project will be in accordance with associated federal, state, and local permits and laws, as well as industry construction, operation standards and best practices. The Project is designed to have temporary effects on the existing infrastructure during Project construction and operation. Because only minor impacts are expected, extensive mitigation measures are not anticipated. The following sections describe specific impacts that may occur to public services and infrastructure and how they will be mitigated.

8.6.1 Roads and Traffic

List all roads, road miles, and their classification (Federal, state, county, township, or private) within the project area. Turbines shall not be placed closer than 250 feet from the edge of public road rights-of-way.

Existing roadway infrastructure in the Project Area consists of one state highway, and several county highways, county roads, and township roads. State Highway 13 provides a main arterial roadway running north-south of the Project Area. Several other County State Aid Highways (CSAHs) connect various parts of the Project to cities and other townships. In addition, local county and township roads provided paved or gravel roadways along the agricultural areas of the Project. There are a small number of private driveways and private roads throughout the proposed Project Area that typically connect homes, farms, and other rural areas to public infrastructure.

Table 8-12 provides a list of existing roads and crane paths that will be used to access the proposed turbines and the jurisdiction of each road. Access road and crane path locations may change due to engineering and other constraints that might be identified as Project plans mature. Any design changes will also comply with any driveway ordinance requirements.

Table 8-12: Access Road and Crane Path Entrance Locations

Number	Turbine ID	Access Road Entrance	Crane Path Entrance	Road Jurisdiction
1	T-01P	CSAH 33/310th Street		County
2	T-02P	T200		Township
3	T-03P	T200		Township
4	T-04	CSAH 33/310th Street	CSAH 33/310th Street	County
5	T-05P	CSAH 33/310th Street		County
6	T-06	318th Street		Township
7	T-07	318th Street		Township
8	T-08 Alt	T200		Township
9	T-09	CSAH 33/310th Street	CSAH 33/310th Street	County
10	T-10 Alt	CSAH 33/310th Street		County
11	T-11P	670th Avenue		County
12	T-12	County Road 67/680th Avenue		County
13	T-13	County Road 67/680th Avenue		County
14	T-14	County Road 67/680th Avenue	County Road 67/680th Avenue	County
15	T-16	County Road 70		County
16	T-17P	County Road 70		County
17	T-18	315th Street/T232		Township

Number	Turbine ID	Access Road Entrance	Crane Path Entrance	Road Jurisdiction
18	T-19	315th Street/T232		Township
19	T-20	315th Street/T232	315th Street/T232	Township
20	T-21	710th Street/T88		Township
21	T-22	710th Street/T88		Township
22	T-23	CSAH 35/325th Street		County
23	T-24	CSAH 35/325th Street		County
24	T-25	315th Street/T232		Township
25	T-26	315th Street/T232		Township
26	T-27	CSAH 20/740th Avenue		County
27	T-28P	715th Avenue		Township
28	T-29P	715th Avenue		Township
29	T-30	T320		Township
30	T-31	715th Avenue		Township
31	T-32	T320		Township
32	T-33	340th Street/SW 168th Street	T320	Township
33	T-34P	T320		Township
34	T-35	335th Street	335th Street	Township
35	T-36 PAlt	335th Street		Township
36	T-37 Alt	CSAH 20/SW 168th Street	335th Street	County/Township
37	T-38	CSAH 20/SW 168th Street		County
38	T-39	CSAH 20/SW 168th Street	335th Street	County/Township

Existing daily traffic levels were determined for roads within or adjacent to the Project Area using MnDOT's Traffic Mapping Application (MnDOT, 2023). According to MnDOT, State Highway 13 had the highest AADT count at 2,765 vehicles per day based on the draft 2023 data. Other roads within the vicinity of the Project have an AADT ranging from 34 to 1,050 cars per day. **Table 8-13** provides available AADT for roads within and adjacent to the Project Area. All 2023 dates are draft AADT counts and are subject to change.

Table 8-13: Existing Average Daily Traffic Levels

Road Segment Description	Total Miles within Project Area	AADT (vehicles per day)	Year Data Collected[1]
County Road 63 | 170th Street	0.5	34	2023
County Road 67 | 685th Street	3.0	77	2023
County Road 70 | 335th Street	2.5	32	2023
County Road 77 | 200th Avenue	1.3	51	2021
CSAH 1 | 110th Street	0.5	172	2021
CSAH 10 | 660th Avenue *Between CSAH 1 and CSAH 33*	3.3	195	2023
CSAH 10 | 660th Avenue *South of CSAH 33*	0.5	327	2023
CSAH 14 | SW 168th Street *Between SW 172nd Avenue and 780th Ave*	0.9	195	2019

Road Segment Description	Total Miles within Project Area	AADT (vehicles per day)	Year Data Collected[1]
CSAH 20 | 740th Avenue *Between intersection of CSAH24/CSAH 14 and CSAH 35*	3.7	210	2017
CSAH 20 | 740th Avenue *Between CSAH 35 and 310th Street*	1.5	290	2017
CSAH 24 | 760th Avenue *Between intersection of CSAH 20/CSAH 14 and CSAH 35*	1.6	62	2023
CSAH 24 | 760th Avenue *Between CSAH 35 and 310th Street*	0.8	61	2023
CSAH 33 *Between County Road 67 and CSAH 10*	2.6	379	2023
CSAH 33 | Johnson Street *Between Broadway Street and State Highway 13*	0.3	1,050	2017
CSAH 33 | Johnson Street County Road 67 and Broadway Street	0.6	556	2023
CSAH 35 | 325th Street	6.6	328	2023
CSAH 44 | Broadway Street *Between Johnson Street and Lincoln Street*	0.1	382	2023
CSAH 44 | Broadway Street *Between Lincoln Street and Morin Street*	< 0.1	378	2023
CSAH 44 | Broadway Street *Between Main Street and Johnson Street*	0.2	144	2023
State Highway 13	4.2	2,765	2023
[1] 2023 AADT data has not been finalized. All other years are the official AADT.			

Haul roads associated with the Project will utilize major travel routes to deliver turbine equipment and supplies. Primary routes for hauling necessary materials may include State Highway 13, CSAHs 10, 14, 33, and 35, and County Roads 67 and 77. Should these routes require road improvements or traffic control measures during the construction period, WPL and their contractors will implement appropriate safety measures.

8.6.1.1 Potential Impacts

During Project construction, there will be temporary impacts on public roads within the Project Area. Roads will be affected by the normal use of vehicles employed to deliver Project components, construction materials and equipment to and from Project locations. Specific routes may also be impacted by the temporary expansion of road widths and/or intersections to facilitate the safe and efficient delivery of Project facility components and associated construction equipment.

During construction, local roads may experience an increase in daily traffic of between 100 and 150 trips per day. These trips may include between 30 and 35 semi-trucks per day during some phases of construction. A majority of the area roadways within or proximal to the Project have AADTs currently well below capacity, the additional 100 to 150 vehicle trips during construction would be perceptible, but comparable to traffic loads experienced during peak planting and harvest periods.

Transportation of equipment and materials associated with the construction of wind projects usually involves oversized and/or overweight loads. All oversized equipment will be delivered using standard heavy haul practice where applicable. Shipment trailers will be selected to maintain compliance with state and local requirements for maximum axle weights. Permits will be obtained for oversized truck movements

where applicable.

Following construction, maintenance crews will drive through the Project Area to monitor and maintain the wind facility. It is not anticipated that operation, maintenance, and repair activities will adversely impact normal traffic in the Project Area. Traffic control measures and coordination with local authorities will be implemented to ensure public health and safety is protected with respect to the Project.

8.6.1.2 Mitigation Measures

Turbines will be set back from the edge of public road rights-of-ways (ROWs) based on the standards set by the MPUC and county governments. Prior to construction, WPL will coordinate with the applicable local and state road jurisdictional authorities to ensure that the increased traffic and additional weights being applied to area roads are acceptable, and to obtain all relevant permits for access and utility installation. WPL will also work closely with the landowners in the placement of access roads to minimize land use disruptions during construction and operation of the Project to the extent possible.

Designated haul-roads will be reviewed with the local authority having jurisdiction. WPL will negotiate in good faith to execute a comprehensive road use agreement that will be used to identify suitable travel routes, traffic control measures, methods for evaluating, monitoring, and restoring roads, and mitigation measures to ensure roads used for oversize/overweight loads are properly identified, monitored, and stabilized. WPL will ensure that the general contractor communicates with the relevant road authorities throughout the construction process. Construction-related impacts are further described in **Section 10**.

8.6.2 Communication Systems

Describe and list all communication systems in and adjacent to the project boundary. This may include, but is not limited to, microwave, cell phone, radio, and internet.

WPL contracted Comsearch to assess potential interference with microwave paths and Fresnel zones, AM/FM radio broadcasts, land mobile and emergency services, and off-air television, and Doppler and NEXRAD systems. While the initial reports were based on a turbine hub height of 112 meters, Comsearch confirmed the 120-meter hub height turbine would not change the results presented in the reports. Correspondence with Comsearch and the communication system reports are in **Appendix E**.

WPL also contacted the National Telecommunications and Information Administration (NTIA) requesting Project review. On June 21, 2024 WPL submitted Project information (based on the 112-meter hub height turbine) to the NTIA and the NTIA provided Project information to the Interdepartmental Radio Advisor Committee (IRAC) on July 2, 2024. The review process provides a 45-day period for agencies within IRAC to comment on the proposed Project in regard to potential impacts the Project may have on various radio communications. Members of IRAC include the Air Force, Army, FAA, Department of Homeland Security, National Aeronautics and Space Administration, Department of State, and Department of Transportation, among others. On August 20, 2024, the NTIA responded that after a 45+ day review period, no reviewing agencies had concerning issues with the turbine placement. On March 6, 2025, WPL submitted Project information (based on the 120-meter hub height turbine) to the NTIA. It is anticipated that the taller turbines will result in similar findings of no concern. WPL will work with the NTIA if any concerns are identified by the IRAC agencies. See **Table 13-1** for additional information on the NTIA review. NTIA correspondence is in **Appendix A**.

8.6.2.1 Microwave Beam Paths

Microwave bands that may be affected by the installation of wind turbine facilities operate over a wide frequency range (900 MHz – 23 GHz). A microwave study was conducted to determine the potential impact of wind turbines on licensed, proposed and applied non-federal government microwave systems. The microwave study identified two licensed microwave paths that are in the Project vicinity. Both microwave paths are licensed by Union Pacific Railroad Company and are located immediately east of the Project Area.

The Fresnel Zones and Consultation Zones for these microwave paths were calculated and mapped (see **Map 14 – Microwave Beam Path**). A total of 38 turbine locations were considered in the analysis, each with a blade diameter of 136 meters (446 feet) and a hub height of 112 meters (368 feet). Of those turbines, none were found to have potential obstruction with the microwave systems in the area. The Microwave Study is in **Appendix E**.

Potential Impacts

Potential impacts to microwave beam paths are associated with the physical placement of the turbines in relation to the microwave beam paths. Turbine placement in the line of sight of a microwave beam path may distort or completely interrupt the transmission of the signal.

Mitigation Measures

Based on results of the microwave study, no turbines have the potential to obstruct the microwave systems in the Project vicinity, therefore, no mitigation measures are proposed.

8.6.2.2 AM/FM Radio

AM and FM radio broadcast stations whose service could potentially be affected by the Project were analyzed. Database records for six licensed AM stations were identified within approximately 18.6 miles (30 kilometers) of the Project Area with the closest (KATE) being located about 12.7 miles (20.46 kilometers) south of the Project in Albert Lea. Since there were no AM stations found within 1.9 miles (3 kilometers) of the Project, which is the maximum possible exclusion distance based on a directional AM antenna broadcasting at 1000 KHz or less, the Project is not anticipated to impact the coverage of local AM stations.

Database records for 15 FM stations were identified within approximately 18.6 miles (30 kilometers) of the Project Area with the closest (K280EB) being located 11.6 miles (18.74 kilometers) south of the Project in Albert Lea. The coverage of FM stations is generally not sensitive to interference due to wind turbines, especially when large objects (e.g., wind turbines) are located in the far field region of the radiating antenna to avoid the risk of distorting its radiation pattern. The AM and FM Radio Report is in **Appendix E**.

Potential Impacts

Some AM/FM signal loss may occur in close proximity to individual turbines, but most AM/FM radio receptors near residences should have sufficient setback to minimize signal interruptions. Interference to AM towers would be limited to a distance equal to one wavelength from non-directional antennas and 10 wavelengths, or 3 kilometers (1.9 miles), from directional antennas. The closest AM tower, KATE, is located 12.7 miles (20.46 kilometers) with a required separation distances of 0.13 mile (0.21 kilometer). The closest FM tower, K280EB, is located 11.6 miles (18.74 kilometers) from the Project Area. At these

distances there should be adequate separation to avoid radiation pattern distortion.

Mitigation Measures

No impacts to AM/FM radio are anticipated due to the distance between existing AM/FM radio towers and the Project, therefore, no mitigation measures are proposed at this time. WPL will address any reception impacts which may arise following construction of the Project on a case-by-case basis. If impacts do occur, additions or changes to transmitters, receivers, or amplifiers can also be made to communication systems to minimize impacts.

8.6.2.3 Land Mobile and Emergency Services

The registered communication system frequencies for the following types of first responders were identified to determine any potential impact from the proposed turbines on these entities: police, fire, emergency medical services, emergency management, hospitals, public works, transportation and other state, county, and municipal agencies. All industrial and business land mobile radio systems and commercial E911 operators within the proposed Project Area were also identified. The Land Mobile & Emergency Services Report is in **Appendix E.**

Potential Impacts

The first responder, industrial/business land mobile sites, area-wide public safety, and commercial E911 communications are typically unaffected by the presence of wind turbines, and WPL does not anticipate any significant harmful effect to these services in the Project Area. Although each of these services operates in different frequency ranges and provides different types of service including voice, video and data applications, there is commonality among these different networks with regard to the impact of wind turbines on their service. Each of these networks is designed to operate reliably in a non-line-of-sight environment. Many land mobile systems are designed with multiple base transmitter stations covering a large geographic area with overlap between adjacent transmitter sites in order to provide handoff between cells. Therefore, any signal blockage caused by the wind turbines does not materially degrade the reception because the end user is likely receiving signals from multiple transmitter locations. Additionally, the frequencies of operation for these services have characteristics that allow the signal to propagate through wind turbines. As a result, very little, if any, change in their coverage should occur when the wind turbines are installed.

Mitigation Measures

In the event that a public safety entity believes its coverage has been compromised by the presence of the wind energy facility, WPL will work with the affected public safety entity to identify potential mitigation measures.

8.6.2.4 Television Interference

Provide an analysis of the potential for television interference.

Off-air television stations whose service could potentially be affected by the Project were analyzed within 93.2 miles (150 kilometers) of the Project Area. TV stations at this distance or less are the most likely to provide off-air coverage to the Project Area and neighboring communities. TV station coverage was examined to determine if communities in the Project vicinity could potentially have degraded television reception due to the location of the proposed turbines.

A total of 124 database records were identified for stations within approximately 93.2 miles (150 kilometers) of the proposed turbines. Of these stations, 109 stations are currently licensed and operating, 90 of which are low-power stations or translators. Translator stations are low-power stations that receive signals from distant broadcasters and retransmit the signal to a local audience. These stations serve local audiences and have limited range, which is a function of their transmit power and the height of their transmit antenna. The Over-the-Air TV Analysis is in **Appendix E**.

Potential Impacts

Based on a contour analysis of the 109 licensed stations within 93.2 miles (150 kilometers) of the Project, it was determined that seven (7) of the full-power digital stations and thirteen (13) low-power digital stations, may have their reception disrupted in and around the Project. The areas primarily affected would include TV service locations within 6.2 miles (10 kilometers) of the turbines that have clear line-of-sight (LOS) to a proposed wind turbine but not to the respective station. After the wind turbines are installed, communities and homes in these locations may have degraded reception of these stations. This is due to multipath interference caused by signal scattering as TV signals are reflected by the rotating wind turbine blades and mast.

Mitigation Measures

While TV signals are reflected by wind turbines, which can cause multipath interference to the TV receiver, modern digital TV receivers have undergone significant improvements to mitigate the effects of signal scattering. When used in combination with a directional antenna, it becomes even less likely that signal scattering from wind farms will cause interference to digital TV reception. Signal scattering could still impact certain areas currently served by these 20 TV stations, especially those that would have line-of-sight to at least one wind turbine but not to the station antenna. In the unlikely event that interference is observed in any of the TV service areas, WPL will recommend a high-gain directional antenna be used, preferably outdoors, and oriented towards the signal origin to mitigate the interference. Cable service and direct broadcast satellite service will not be affected by the presence of the turbines and may be an option for those homes that experience disruption to their off-air TV reception. WPL will be responsible for implementing the agreed upon mitigation measures after confirming TV signal impacts are a result of the Project.

8.6.2.5 Doppler and NEXRAD

Doppler Weather Radar Systems[2] and NEXRAD radars[3] were analyzed to assess the potential of the turbines to block radar coverage and produce false targets if the turbines are in the LOS of the radar systems' transmitted signals.

The search radius for radar systems was established at 155 miles (250 kilometers) from the center of the Project Area. No commercial Doppler radar systems and three NEXRAD radar systems were identified within 155 miles of the Project center. The three NEXRAD radar systems identified are associated with KMPX out of Minneapolis/St. Paul, MN; KARX out of LaCrosse, WI; and KDMX out of Des Moines, IA. The nearest NEXRAD radar system is KMPX at 69 miles from the center of the Project Area.

To verify the presence or absence of LOS conditions between the Project and the three NEXRAD radar systems, LOS coverage plots were generated for each radar system by taking into account the height of the

[2] Doppler Radar Weather Systems owned and operated by television stations and commercial interests.

[3] NEXRAD radars jointly operated by the National Weather Service, the Federal Aviation Administration, and the U.S. Air Force.

radar antenna, the maximum height of the wind turbine blades, the curvature of the earth, and potential refractivity in the atmosphere. The analysis revealed that no NEXRAD radar systems were in the LOS of the turbines.

Potential Impacts

WPL does not anticipate impacts to the NEXRAD radars because the turbines are not located within any of the radar LOS coverage plots. The effective terrain elevations would block LOS between the antennas of all three radars and the turbines. Therefore, LOS conditions would not exist between the radars and the wind turbines. The Doppler and NEXRAD Weather Radar Study is provided in **Appendix E**.

Mitigation Measures

Because no impacts on Doppler and NEXRAD radar systems are anticipated, no mitigation measures are proposed.

8.6.3 Other Local Infrastructure

Twelve pipelines were identified within the Project Area including nine gas pipelines and three hazardous liquid pipelines (PHMSA, 2024).

One abandoned railroad runs through the Project Area. The Dakota, Minnesota & Eastern Railroad, operated north-south through the City of Hartland and generally paralleled State Highway 13. The parent company for the railroad is Canadian Pacific Railway. Approximately 4.1 miles of abandoned track are located within the Project Area (MnDOT, 2024a). As described in **Section 8.7**, this railroad has been identified as a historic railway.

One existing 69 kV transmission line is located within the Project Area and is owned by ITC Midwest (see **Section 6.1.1** for additional information on this transmission line). Nine other transmission lines are located within five miles of the Project Area (ESRI, 2022). Clark's Grove Substation is located within the Project Area, and two substations are located within five miles of the Project Area.

8.6.3.1 Potential Impacts

Potential impacts to pipelines and other underground utilities and transmission and distribution lines consist entirely of incidental physical damage from construction equipment during the construction of the Project. No other potential impacts are anticipated.

8.6.3.2 Mitigation Measures

In order to avoid potential physical impacts to pipelines and other underground utilities, all underground lines will be located using a utility locator service prior to breaking ground during construction. Additionally, warning signs and/or flagging will be installed to mark the locations of overhead distribution lines to aid in the avoidance of these features. In the unlikely event that impacts to other local services occur due to the Project, WPL will address these issues on a case-by-case basis.

8.6.4 Local Emergency Services

Use of heavy equipment during construction presents the potential for injuries such as falls, equipment-use related injuries, or electrocution. Operation of an LWECS project presents a potential risk to public safety if the wind turbines or Project Substation are damaged by inclement weather or not operated in compliance with safety standards. Injuries as a result of construction or operation of an LWECS project would require

use of local emergency services such as police, fire, ambulance, or hospitals and could affect the availability of these services for the local population.

The Project Area is covered by three Ambulance Service Districts in Freeborn County: Freeborn, New Richland, and Albert Lea. The Public Safety Answering Point for Freeborn County is staffed 24 hours a day / 365 days a year by 10 Public Safety Telecommunicators who process all emergency and non-emergency calls that include services for Freeborn County Sheriff's Office, Albert Lea Police Department, Albert Lea Fire Department, There are 14 County Fire Departments, two Ambulance Services, a Medical Helicopter, Minnesota State Patrol and other related state, county and city agencies and services.

8.6.4.1 Potential Impacts

WPL will coordinate with emergency services providers to determine appropriate safety precautions and standards and develop measures to address these precautions and standards. If emergency services are required during construction or operation of the Project, the numerous law enforcement, fire departments, ambulance services, and hospitals near the Project Area would be adequate to address Project-related emergency service needs without negatively impacting the availability of these services for the local populace.

8.6.4.2 Mitigation Measures

Because no significant impacts on emergency services are anticipated, no mitigation measures are proposed. WPL will continue to coordinate with local emergency services throughout construction of the Project and as it enters operation.

8.7 Cultural and Archaeological Resources

Consult with the Minnesota State Historic Preservation Office (SHPO) to determine the extent and type of archaeological and cultural resources in and near the project area (within 0.5 miles of the project boundary). Provide an interpretation of the results obtained from SHPO. A qualified archaeologist may be needed to interpret results and to identify mitigation techniques. If surveys are required or recommended, list the type and phase as described in the SHPO Manual for Archaeological Projects in Minnesota (2005).

8.7.1 Sites Potentially Affected

Provide a list of all historic and archeological sites potentially affected by the proposed project.

The Project Area is located in Minnesota Archaeological Region 2e – Prairie Lake East. Sites of earlier prehistoric periods in this region are generally located on islands and peninsulas of lakes, with some villages near major rivers. Winter villages would be located in the wooded areas of large river valleys. Temporary campsites could be found on rivers and around lakes. Late prehistoric large village sites may be found on the terraces of the Minnesota and Blue Earth rivers, with some campsites on islands and peninsulas of lakes (Gibbon et al., 2002).

On behalf of WPL, Westwood conducted a Phase Ia Cultural Resources Literature Review of records at the Minnesota State Historic Preservation Office (SHPO) and Office of the State Archaeologist (OSA) within a one-mile buffer surrounding the Project Area. Review of information from these offices included an examination of site maps, archaeological site forms, burial files, historic structure inventories, and survey reports. The purpose of this review is to create an inventory of previously recorded cultural resources, including archaeological sites and historic architecture resources that are within a one-mile buffer

surrounding the Project Area. The Phase Ia Cultural Resources Literature Review is provided in **Appendix F-1**.

The literature review revealed that a Phase IA Archaeological Reconnaissance Survey was completed for the eastern two-thirds of the Project as part of an earlier project area by Rolling Hills Consulting Services, LLC in July 2008. Most of the Project Area at the time was found to be of low potential for unrecorded archaeological resources. Areas of high potential in the southern and eastern portion of the Project Area were included in the pedestrian survey. Other cultural resources investigations have also been conducted within the Project vicinity and include historic resources (farmsteads, churches, bridges, culverts, and the Minneapolis and St. Louis Railway corridor) in the town of Hartland and surrounding unincorporated areas of the Project Area and surrounding one-mile buffer. These investigations and accompanying reports provide limited insights into the development and historic context(s) applicable to the Project Area and surrounding one-mile buffer.

8.7.1.1 Previously Recorded Archaeological Sites

A total of six previously reported archaeological sites are located within one mile of the Project Area. They all have a Native American cultural association and have not been evaluated for listing in the National Register of Historic Places (NRHP). One site is located within the Project Area. **Table 8-14** documents the six reported archaeological sites within one mile of the Project Area.

Table 8-14: Archaeological Resources within 1-Mile of Project Area

SHPO ID	Site Type	Cultural Affiliation	NRHP Eligibility	Location within 1-Mile of Project Area
21FE0009	Earthwork	Prehistoric	Unevaluated	Buffer
21FE0059	Lithic Scatter	Prehistoric	Unevaluated	Buffer
21FE0061	Artifact Scatter	Prehistoric	Unevaluated	Buffer
21FE0062	Lithic Scatter	Prehistoric	Unevaluated	Buffer
21FE0063	Single Artifact	Prehistoric	Unevaluated	Project Area
21FEac	Lithic Scatter	Prehistoric	Unevaluated	Buffer

8.7.1.2 Previously Recorded Historic/Architectural Resources

Twenty-three historic/architectural resources have been previously inventoried within the Project Area and surrounding one-mile buffer. Eighteen resources are in the Project Area and five of these resources are located outside the Project Area and surrounding one-mile buffer. Of the resources in the buffer, four bridges were recommended Not Eligible for the NRHP in 2023, and one church has been "moved to [an] unknown location."

Of the 18 resources located in the Project Area, two are parallel linear resources: State Highway 13 and the Minneapolis and St. Louis Railway Company/Chicago and North Western Railway Company, which bisect the Project Area on a north-south route. Since 2021, both have been recommended Not Eligible for the NRHP. In the town of Hartland, eight residential, commercial, and industrial resources were inventoried in 1984 and have not been evaluated for the NRHP. In the unincorporated areas of the Project, there are two farmsteads, one creamery, one church, and one railroad-related structure that were each inventoried more than 20 years ago and are considered Unevaluated for the NRHP. One bridge and two culverts were recommended Not Eligible in 2023.

8.7.2 Potential Impacts

*Describe how the proposed project would affect any identified historic and archeological resources and how the project could be modified to reduce or eliminate potential affects. Modifications could include site changes in siting and/or micrositing, route changes for connecting facilities, and construction practices. For more information, see MN State Historical Socie*ty http://www.mnhs.org/shpo/.

A review of the existing cultural resource data indicates that there is one previously documented archaeological site and 18 inventoried historic/architectural resources within the proposed Project Area. Additionally, five archaeological sites and five historic/architectural resources have been inventoried in the one-mile buffer surrounding the Project Area. No previously inventoried historic resources within one mile of the Project Area are Listed or Eligible for listing in the NRHP.

Information regarding the location of previously documented cultural resource sites was taken into consideration during initial Project design. WPL has designed the Project to avoid any impacts to previously documented archaeological or historic architectural resources either by Project alteration or structure placement. As such, no impacts to previously documented archaeological or historic architectural resources would occur as a result of the Project.

While the Applicant will avoid documented archeological and historic architectural sites, the Project may have the potential to add to the visual impacts on cultural resources in the region of the Project Area. In the event an undocumented archaeological or historic architectural resource is impacted by construction of the Project, the Applicant will determine the nature of the impact and consult with the SHPO on whether or not the resource is eligible for listing in the NRHP.

On February 9, 2024, Westwood, on behalf of WPL, sent the Minnesota SHPO a letter informing them of the Project and requesting comments. On April 2, 2024, SHPO commented with a letter that recommended a Phase Ia literature review and assessment followed by a Phase I archaeological survey if recommended by the Phase Ia assessment. Consistent with the SHPO comments, a Phase Ia literature review was completed in March 2024 and updated in August 2024 (**Appendix F-1**). In June and November 2024, Westwood completed an archaeological pedestrian survey to identify previously unrecorded archaeological resources. One archaeological site consisting of a sparse lithic scatter was identified. Westwood recommends avoidance of the landform on which the site is situated or additional testing. The Phase I Archaeological Survey report is provided in **Appendix F-2** and will be submitted to the SHPO.

8.7.3 Mitigation Measures

The Project is of varying potential for unrecorded archaeological resources. WPL understands that additional previously undocumented cultural resources could be present within the Project Area. If archaeological or historic resources are found during construction, the integrity and significance of such resources will be addressed in terms of the site's potential eligibility to the NRHP. In addition, an assessment of the Project's potential impacts upon the resource will be undertaken. If such resources are found to be eligible for the NRHP, adverse effects to the resource will be avoided by adjustment of the Project layout when possible. If avoidance is not possible, appropriate mitigative measures will need to be developed in consultation with Minnesota SHPO, the State Archaeologist, and consulting applicable tribal communities, if any. While avoidance would be a preferred action, mitigation for Project-related impacts on NRHP-eligible archaeological and historic resources may include additional documentation through data recovery.

Should previously unknown cultural resources be encountered during Project construction and/or operation, work will stop, and the discovery will be examined by an archaeologist. If the discovery is determined to be a significant cultural resource, SHPO and OSA will be notified. Should human remains be inadvertently discovered, Minn. Stat. § 307.08 will be followed, all work will cease, law enforcement will be immediately contacted, and the OSA will be notified.

8.8 Recreation Resources

Provide a summary of recreational resources within the project boundary and 10 miles from the project boundary. This should include summaries of public and private recreational lands, and any unique recreational opportunities or features in the area such as wildlife refuges, scenic riverways or byways, designated trails (motorized and non-motorized), and Scientific Natural Areas (SNAs). Public lands are subject to the five rotor diameter setback for turbines along the prevailing wind direction and three rotor diameter setback on the non-prevailing wind direction. Turbine setbacks from recreational trails will be considered on a case-by-case basis. Provide an analysis and discussion of potential impacts of the project, proposed mitigative measures, and any adverse environmental effects that cannot be avoided.

Publicly available information was reviewed for Freeborn, Waseca, Steele, and Faribault counties to identify recreational resources within 10 miles of the Project Area. Recreation opportunities include hiking, biking, boating, fishing, camping, swimming, cross country skiing, snowmobiling, hunting, golfing, and nature viewing. **Map 5 - Public Land Ownership and Recreation** shows the locations of state parks, Aquatic Management Areas (AMAs), Scientific and Natural Areas (SNAs), WMAs, state game refuges, snowmobile trails, state trails, WPAs, within 10 miles of the Project Area boundary.

8.8.1 Wildlife Management Areas

WMAs are owned by the state of Minnesota and were established to protect and manage lands and waters for wildlife production, public hunting, trapping, fishing, or other recreational activities. Minnesota has approximately 1,500 WMAs, consisting of over 1.3 million acres of public land (MNDNR, 2008a). There are no WMAs located within the Project Area. Ten WMAs are within 10 miles of the Project Area boundary (MNDNR, 2024a). **Table 8-15** describes the WMAs within 10 miles of the Project Area boundary.

Table 8-15: Wildlife Management Areas within 10 Miles of the Project Area Boundary

County	WMA Name	WMA Area (acres)	Distance from Project Area Boundary (miles)	Location Relative to Project Area
Steele	Chapa-kak-say-za WMA	20.6	1.5	North
Freeborn	Manchester WMA	112.6	2.3	South
Waseca	Teal Marsh WMA	74.0	2.3	North
Freeborn	Geneva WMA	85.7	2.8	Southeast
Faribault	Dean Christensen Memorial WMA	79.6	6.0	West
Waseca	Young Bull WMA	40.6	6.0	West
Freeborn	Halls Lake WMA	151.9	6.6	South
Faribault	Wells WMA	27.0	8.3	Southwest
Steele	Pogones Marsh WMA	112.5	9.3	Northeast
Waseca	Mueller WMA	120.7	9.6	Northwest

8.8.2 Scientific and Natural Areas

Minnesota's state SNAs are lands that are set aside for scientific study and to promote public understanding. They may consist of native plant and animal communities, rare species, and areas of significant biodiversity. SNAs are public lands open to recreational activities such as birdwatching, nature photography, and hiking. SNAs are established for their outstanding ecological features and public enjoyment (MNDNR, 2024b). There are no SNAs within 10 miles of the Project Area boundary (MNDNR, 2024a).

8.8.3 Aquatic Management Areas

The Aquatic Management Area (AMA) program administers more than 700 AMAs and 770 shore land miles in 73 counties. AMAs provide angler and management access, protect critical shore land habitat, and provide areas for education and research (MNDNR, 2024c). There are no AMAs in the Project Area or within 10 miles of the Project Area boundary (MNDNR, 2024a).

8.8.4 National Wildlife Refuges

The USFWS manages the National Wildlife Refuge (NWR) system to protect wildlife and provide wildlife viewing opportunities (USFWS, n.d.-a). There are no NWRs within or near the Project Area. The nearest NWR is about 46 miles southwest of the Project Area boundary in Iowa (USFWS, 2022a).

8.8.5 Waterfowl Production Areas

Waterfowl Production Areas (WPAs) are public lands managed by USFWS that are meant to preserve habitat for waterfowl and other wildlife. These areas are typically wetlands or grasslands that provide roosting and nesting habitat for waterfowl. Most of these federally managed wetlands and surrounding uplands are open to hunting (USFWS, n.d.-b). There are no WPAs located within the Project Area. There are eight WPAs located within 10 miles of the Project Area (USFWS, 2024a). **Table 8-16** lists the eight WPAs with the closest being the Unnamed WPA approximately 3.0 miles south of the Project Area boundary.

Table 8-16: Waterfowl Production Areas within 10 Miles of the Project Area Boundary

County	WPA Name	WPA Area (acres)	Distance from Project Area (miles)	Location Relative to Project Area
Freeborn	Unnamed WPA[1]	168.9	3.0	South
Freeborn	Halls Lake WPA	409.4	5.8	South
Steele	Straight River Marsh WPA2	16.9	6.1	Northeast
Freeborn	Two Island WPA	268.4	6.2	South
Steele	Straight River Marsh WPA	166.5	6.3	Northeast
Steele	Straight Creek WPA	345.4	8.3	Northeast
Freeborn	Foster Creek WPA	239.4	8.5	Southwest
Freeborn	Iowa, Chicago & Eastern WPA	169.1	8.5	South
Freeborn	Goose Lake WPA[2]	167.1	9.1	South

[1] The Unnamed WPA consists of two adjacent easements.

[2] Approximately 148.0 acres are located within 10 miles of the Project Area boundary.

8.8.6 Scenic Rivers and Byways

There are no national Scenic Rivers within 10 miles of the Project Area (Interagency Wild & Scenic Rivers

Council, n.d.). There are no State Wild, Scenic, and Recreational Rivers located within 10 miles of the Project Area (MNDNR, 2008b). There are no national or state scenic byways located within 10 miles of the Project Area (FHWA, n.d.; MnDOT, n.d.).

8.8.7 Recreational and Water Trails

8.8.7.1 Snowmobile Trails

There are approximately 12 miles of snowmobiles trails in the Project Area (**Map 5 - Public Land Ownership and Recreation**). Snowmobile Trail 133 is a Freeborn County Trail that runs east/west through the Project Area and north/south around the City of Hartland to 200th Avenue. At 200th Avenue, Snowmobile Trail 133 becomes Snowmobile Trail 215, a Waseca County Trail that continues north. Several other county snowmobile trails connect to and branch out from the two snowmobile trails within 10 miles of the Project Area (MNDNR, n.d.-a). All turbines will be setback a minimum of 250 feet from the snowmobile trails.

8.8.7.2 Recreational Trails

No state recreational trails are within the Project Area. One state recreational trail is within 10 miles of the Project Area. The Blazing Star State Trail runs from Albert Lea Lake in Albert Lea through Myre-Big Island State Park. Currently, six miles are constructed between the City of Albert Lea and Myre-Big Island State Park. This trail also connects to Albert Lea's city trail system. Another 1.5 miles of trail are built between the city of Hayward and Township Road 290. Once the trail reaches Austin, it will connect to Austin's city trail system, as well as the Shooting Star State Trail. When completed, the Blazing Star State Trail will connect Albert Lea and Austin via Myre-Big Island State Park and Hayward (MNDNR, 2024d).

8.8.7.3 Water Trails

State water trails are river routes that were developed for recreational activities and are designated by legislation and managed by the MNDNR and local partners. State water trails provide recreation opportunities on rivers that have historic, recreational, and scenic values. No state water trails are located within the Project Area. The nearest water trail is the Shell Rock River State Water Trail located approximately nine miles south of the Project Area (**Map 5 - Public Land Ownership and Recreation**) near Albert Lea (MNDNR, 2022).

8.8.8 Parks and Golf Clubs

There are no federal or state parks located within Project Area. Myre-Big Island State Park is located approximately 11.8 miles southeast of the Project area boundary. The park contains wet lowlands, oak savanna, grasslands, and a maple/basswood forest. Recreational opportunities include hiking, camping, canoeing, and bird watching. There are four county parks and 17 city parks within 10 miles of the Project Area boundary as listed in **Table 8-17** and shown on **Map 5 - Public Lands and Recreation**.

Table 8-17: Local Parks within 10 Miles of the Project Area

Location	Park Name	Agency	Distance from Project Area (miles)	Location Relative to Project Area
Freeborn County	Arrowhead Point County Park	Freeborn County	3.6	South
Steele County	Beaver Lake County Park	Steele County Parks & Recreations Department	2.3	North
Steele County	Hope School County Park	Steele County Parks & Recreations Department	7.6	North
Waseca	Eustice Park	Waseca County	10.0	Northwest
City of Albert Lea	Snyder Fields	City of Albert Lea	8.5	South/Southeast
City of Albert Lea	Bancroft Bay	City of Albert Lea	8.8	South/Southeast
City of Albert Lea	Edgewater Park	City of Albert Lea	8.8	South/Southeast
City of Albert Lea	Troy Hammer Park	City of Albert Lea	9.0	South/Southeast
City of Albert Lea	Tiger Hills Park	City of Albert Lea	9.2	South/Southeast
City of Albert Lea	Shorewood Hills Park	City of Albert Lea	9.3	South/Southeast
City of Albert Lea	Brookside Park	City of Albert Lea	9.5	South/Southeast
City of Albert Lea	Eastgate Park	City of Albert Lea	9.5	South/Southeast
City of Albert Lea	Lakeview Park	City of Albert Lea	9.5	South/Southeast
City of Albert Lea	Oakwood Park	City of Albert Lea	9.7	South/Southeast
City of Albert Lea	Shoreland Park	City of Albert Lea	9.7	South/Southeast
City of Albert Lea	Lee Park	City of Albert Lea	10.0	South/Southeast
City of Alden	North Park	City of Alden	7.9	South
City of Ellendale	Ellendale Ball Field	City of Ellendale	2.2	Northeast
City of Hartland	Unnamed Park	City of Hartland	0.0	West
City of New Richland	St. Olaf Lake Park	New Richland Parks & Recreation Department	3.4	North
City of Wells	Thompson Park	City of Wells Parks & Recreation Department	9.5	Southwest
City of Wells	Half Moon Park	City of Wells Parks & Recreation Department	9.9	Southwest

There are four golf courses within 10 miles of the Project Area boundary. Riverview Golf Course is located 3.3 miles to the north; Oakview Gold Course is located 5.0 miles to the south; Green Lea Golf Course is located 9.0 miles to the southeast; and Wells Golf Course is located 9.5 miles southwest of the Project Area boundary.

8.8.9 Potential Impacts

The Project has been designed to avoid direct impacts to recreational resources and public lands. No turbines have been sited within public lands or designated recreational resources, such as county or city parks. However, turbines located within the viewshed of land managed by the MNDNR and local parks may affect the aesthetic quality of those areas if other structures or features, such as trees or buildings, do not obstruct the turbines. To the extent public resources are used at night, turbine lighting may be visible whether traditional flashing lighting or only when the ADLS system detects aircraft in the vicinity.

Depending upon the timing of construction activities, noise from construction activities could diminish the users experience of the snowmobile trails. Construction of the Project may also require the temporary

closing or relocating of part of the snowmobile trails to maintain the safety of construction personnel and recreationalists. These impacts will be temporary as they will only occur during the construction of the Project.

8.8.10 Mitigation Measures

Project turbines and facilities will not be located within public recreational resources. Turbines will be set back to the appropriate distance defined by the MPUC and county setback requirements. WPL will coordinate with the snowmobile trail managers and groups to confirm mapped trail locations and determine if any re-routes will be required. If re-routes are required, and should construction occur during winter months, signage will be installed to redirect trail users to the new route.

8.9 Public Health and Safety

8.9.1 EMF

Provide an estimate of the magnetic field profile created by collector lines. Profiles should include buried collector lines, bundled configurations, and overhead collector lines, at 0', 25', 50', and 100'. Provide an analysis and discussion of potential impacts of the project, proposed mitigative measures, and any adverse environmental effects that cannot be avoided.

Electric and magnetic fields (EMF) are invisible lines of force that are present around electrical devices. Electric fields arise from the voltage or electrical charges, and magnetic fields arise from the flow of electricity or current that travels along transmission lines, power collection lines, substation transformers, house wiring, and electrical appliances. The intensity of the electric field is related to the voltage of the line and the intensity of the magnetic field is related to the current flow through the conductors (wire). EMF can occur indoors and outdoors. Electric field strength is measured in kilovolts per meter (kV/m). Magnetic field strength is typically measured in milliGauss (mG). EMF from electrical collection lines, regardless of whether they are below-ground or above-ground, transmission lines, or transformers, dissipates rapidly with distance from the source (NIEHS, 2002).

Sources of EMF from the Project include the underground power cable and electrical collection system, wind turbine transformers, and the Project Substation transformer. EMF from the future interconnection with the ITC Midwest 161 kV transmission line is also discussed in this section. The 34.5 kV underground power cable to be used in the proposed Project collection system is shielded, meaning the energized conductor is located at the center of the cable and is surrounded by a grounded metallic shield. This construction confines the electric field to the interior of the cable. The 34.5 kV collector line network will be installed underground and buried approximately 48 inches below grade. Wind turbine transformers may be located in the nacelle (see **Section 5.2.2.4** and **Figure 1**) or at the base of the turbine tower on a transformer pad (see **Section 5.2.2**). The Project Substation transformer will step-up the voltage from 34.5 kV to 161 kV so that the electricity can be reliably interconnected to the power grid (see **Section 5.3.3**).

The magnetic field strength of the proposed 34 kV underground collector lines as measured from 0 feet, 25 feet, 50 feet, and 100 feet from the centerline are shown in **Table 8-18**. The proposed underground 34.5 kV collection circuits are broken up into six unique right-of-way sections (UG1 – UG6).

Table 8-18: Magnetic Field Strength (mG) of Underground Collector Lines

Distance from Centerline (Ft)	UG1	UG2	UG3	UG4	UG5	UG6
100	0.193	0.339	0.608	0.992	1.108	0.988
50	0.714	1.139	2.489	5.308	5.538	3.632
25	2.294	3.245	8.144	7.142	6.833	8.542
0	8.496	9.026	8.331	7.436	6.236	7.956

The magnetic field profile data shows that magnetic field levels decrease rapidly as the distance from the centerline increases.

8.9.1.1 Potential Impacts

There is no federal standard for transmission line electric fields. The Commission, however, has imposed a maximum electric field limit of 8 kV per meter (kV/m) measured at one meter (3.28 feet) above the ground.[4] There are presently no Minnesota regulations pertaining to magnetic field exposure.

Levels of EMF from the Project will be considerably below accepted guidelines. Extensive research has been conducted regarding EMFs. A Canadian study of collection lines at a wind facility measured EMF (magnetic fields) of that facility's 27.5 kV collection lines, slightly lower voltage than the electrical collection lines proposed for the Bent Tree North Wind Farm. This study found magnetic fields associated with buried electrical collection lines to be within background levels at one meter above ground (McCallum et al., 2014).

EMFs from underground electrical collection and feeder lines dissipate quickly and relatively close to the source because they are buried underground, heavily insulated, and shielded. Research has shown that electric fields surrounding buried lines are negligible, and magnetic fields often dissipate significantly within approximately three feet (approximately 0.9 meter) of stronger EMF sources, such as transmission lines and transformers (NIOSH, 1996). As shown in **Table 8-18**, the magnetic strength is between 0.193 mG and 1.108 mG at 100 feet from the centerline. The nearest residence is 216.7 feet from a collection line.

For aboveground collection lines and substation transformers, the same principles of magnetic field dissipation apply. The 2002 National Institute of Environmental Health Sciences (NIEHS) reports a study of 321 power lines yielded mean results of the lowest voltage transmission lines (115kV) to be 29.7 mG underneath the transmission line and 6.5 mG 50 feet away from the transmission line measured from one meter (3.28 feet) above the ground. The strongest EMF around the outside of a substation comes from the power lines entering and leaving the substation. Beyond the substation fence or wall, the EMF produced by the substation equipment is typically indistinguishable from background levels (NIEHS, 2002). The nearest residence is 490.8 feet from the Project Substation.

In addition to these studies, the Commission has repeatedly found there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects. In the Huntley-Wilmarth 345 kV Transmission Line Project, for example, the Commission concluded that "No adverse health impacts from electronic and magnetic fields are anticipated for persons living or working

[4] *In the Matter of the Route Permit Application for a 345 kV Transmission Line from Brookings County, S.D. to Hampton, Minn*., Docket No. ET2/TL-08-1474, ORDER GRANTING ROUTE PERMIT (Sept. 14, 2010) (adopting the Administrative Law Judge's Findings of Fact, Conclusions, and Recommendation at Finding 194).

near the Project."[5] To date, there is no conclusive research evidence that EMFs stemming from power lines pose significant impacts to health (Boorman et al., 1999).

8.9.1.2 Mitigation Measures

Based upon current research regarding EMFs, and the separation distances being maintained between wind turbines, and electrical collection system and public access and occupied homes (see **Section 5.1.1** and **Section 5.3.3**), EMFs associated with the Project are not expected to have an impact on public health and safety. Electrical equipment will be grounded per ANSI and National Electrical Safety Code (NESC) guidelines to maintain safety and reliability.

8.9.2 Stray Voltage

Stray voltage generally refers to the voltage between the grounded neutral of a distribution system and the earth. According to the U.S. Department of Agriculture (USDA, 1991), stray voltage is a small voltage (less than 10 volts) that can be measured between two possible contact points. If these two points are contacted by a person or animal, a current will flow. People and animals respond to the resulting current flow and not to the applied voltage. Stray voltage is not related to electrical faults and is generally not considered hazardous.

Stray voltage poses a concern in agricultural areas, particularly dairy farms, as it involves the unintentional transfer of electricity between two grounded objects. This issue is typically caused by improperly grounded electrical equipment in farm buildings or a faulty utility connection.

8.9.2.1 Potential Impacts

Most instances of stray voltage can be traced to unbalanced currents in distribution circuits when the currents in the three phase conductors are not all equal. WPL's collector circuits are inherently balanced, so no appreciable neutral-to-earth voltage is expected. There will be no connection between WPL's collection system and the local distribution system. Furthermore, while some circuits may be parallel, no interaction or stray voltage from the Project electrical system is anticipated to impact existing distribution facilities or the proposed transmission line.

Electrical systems, including farm systems and utility collection and distribution systems, must be adequately grounded to provide reliability and to minimize stray voltage. Potential effects from stray voltage can result from a person or animal encountering neutral-to-earth voltage. Stray voltage does not cause electrocution and is not related to ground current, EMF, or earth currents. Stray voltage is typically not associated with underground electric collection lines, which connect to the Project Substation and are not tapped or diverted for other uses. Therefore, stray voltage is not expected to have an impact on public health and safety.

Additionally, all electrical components in the Project will be grounded in accordance with state and national electrical codes. Following the adopted electric codes and guidelines will ensure the system is designed

[5] *In the Matter of the Application of Xcel Energy and ITC Midwest for a Certificate of Need for the Huntley-Wilmarth 345-kV Transmission Line Project*; *In the Matter of the Application of Xcel Energy and ITC Midwest for a Route Permit for the Huntley-Wilmarth 345-kV Transmission Line Project*, Order Finding Environmental Impact Statement Adequate, Granting Certificate of Need, Issuing Route Permit, and Requiring Additional Analysis (Aug. 5, 2019) at ALJ Report, Route Permit Finding No. 346. See also, *In the Matter of the Application for a HVTL Route Permit for the Tower Transmission Line Project*, Docket No. ET-2, E015/TL-06-1624, Findings of Fact, Conclusions of Law and Order Issuing a Route Permit to Minnesota Power and GRE for the Tower Transmission Line Project and Associated Facilities at p. 23 (Aug. 1, 2007).

correctly and potential issues of induced voltage are mitigated in accordance with applicable law. In addition, soil resistivity measurements will be taken on site as part of the Project's geotechnical analysis, and that data will be used to help design grounding systems. For these reasons, the potential for stray voltage as a result of the Project will be negligible.

8.9.2.2 Mitigation Measures

No impacts due to stray voltage are anticipated and no mitigation is proposed. Mitigation of potential stray voltage impacts include meeting safety requirements during the construction and operation of the Project and choosing proper wiring materials for wet and corrosive conditions, which can improve grounding and reduce the potential for stray voltage (see **Section 8.9.2.1**).

8.9.3 Aviation

Identify all public and private licensed airports within the project boundary and within 10 miles of the project boundary. This includes the location and orientation of all public and private runways and landing strips. Identify all commercial services operating within the project boundary such as aerial applications for agricultural purposes, including flight paths, and any state or local programs for the control of diseases and pests (i.e., spongy moth control). Provide an analysis and discussion of potential impacts of the project, proposed mitigative measures, and any adverse effects that cannot be avoided. Airport setbacks must be in accordance with MN Department of Transportation Department of Aviation and Federal Aviation Administration requirements.

No public or private airports are located within the Project Area. One active public airport and one private heliport are within 10 miles of the Project Area boundary (MnDOT, 2024b) as shown in **Table 8-19**.

Table 8-19: Licensed Public/Private Airports within 10 miles of the Project Area Boundary

Airport Name	City	County	Distance/Direction[1]	Runway Information[2]
Albert Lea Municipal Airport	Albert Lea	Freeborn	8.5 miles/south	Two asphalt runways, northwest/southeast and northeast/southwest
Riverwood Health Care Center Helipad	Albert Lea	Freeborn	9.4 miles/south	One concrete pad

[1] Distance in miles from the nearest portion of the Bent Tree North Wind Project boundary.
[2] Runway surface type and general orientation.

There are no known commercial air services operating within the Project Area. There are no commercial operators with an aerial spraying or dusting license with an associated city within the Project Area. (MnDOT, 2024c). No gypsy moth or spongy moth infestation treatment in the Project Area and surrounding region has occurred recently or is currently planned (MDA, 2024).

Apart from the air traffic associated with the public and private airports/heliports, the Project Area may experience additional aerial activity related to crop dusting in agricultural fields, as identified during the ambient noise study described in **Section 8.4.1**. Crop dusting operations, usually conducted during daylight hours, involve highly maneuverable airplanes or helicopters. Military airspace and training routes do not overlie the Project Area.

8.9.3.1 Potential Impacts

The closest public airport to the proposed Project is the Albert Lea Municipal Airport, located

approximately 8.5 miles south of the Project Area. The area influenced by airport rules and regulations can extend several miles from the airport boundary (MnDOT, 2016). The area of influence at the Albert Lea Airport ranges from about 2.0-2.3 miles from the middle of the runways (MnDOT, 2024b). The Project Area does not fall within the Albert Lea Airport area of influence.

Under 14 Code of Federal Regulations Part 77.9, all structures exceeding 200 feet (61 meters) above ground level (AGL) must be submitted to the FAA for an aeronautical study. The purpose of the study is to identify obstacle clearance surfaces that could limit the placement of wind turbines. The result of the aeronautical study is the issuance of a Determination of Hazard or No Hazard. See **Table 13-1** for a summary of FAA correspondence.

Additionally, a Tall Towers Permit will be required by MnDOT prior to developing the Project to maintain the safety of airspace within Minnesota. A permit from MnDOT is required for any of the following (MnDOT, 2024c):

- Structure is greater than 500 feet (152 meters) AGL;
- Structure is more than 200 feet (61 meters) AGL within three nautical miles of an airport and increasing by 100 feet (31 meters) for each additional mile out to six miles or 500 feet (152 meters);
- Structure would increase an instrument approach minimum flight altitude or increase its flight visibility minimums;
- Structure would increase the minimum obstruction clearance altitude of a federal airway; or
- Structure penetrates any of the following imaginary surfaces: primary, horizontal, conical, approach, or transitional surfaces.

To determine potential impacts to aviation associated with the development of the Project, WPL contracted with Capitol Airspace Group to conduct an obstruction evaluation for the Project Area. The purpose for the evaluation was to identify obstacle clearance surfaces established by the FAA that could limit the placement of 591-foot AGL wind turbines. The analysis assessed height constraints overlying an approximately 50-square-mile study area to aid in identifying optimal wind turbine locations. Capitol Airspace Group assessed the proposed Project using a geographic information system (GIS) to determine proximity to airports, published instrument procedures, enroute airways, FAA minimum vectoring altitude and minimum instrument flight rules (IFR) altitude charts, and military airspace and training routes.

Capitol Airspace evaluated all 14 CFR Part 77 imaginary surfaces, published instrument approach and departure procedures, visual flight rules (VFR) operations, FAA minimum vectoring altitudes, minimum IFR altitudes, and enroute operations. At 591 feet AGL, proposed wind turbines will not exceed 77.17(a)(2) or 77.17(a)(5) obstruction standards. However, wind turbines should remain below FAA obstacle clearance surfaces in order to avoid the possibility of determinations of hazard. At 591 feet AGL, proposed wind turbines will exceed 14 CFR Part 77.17(a)(1) and will be identified as obstructions regardless of their location. However, exceeding this standard does not automatically result in the issuance of a determination of hazard from the FAA. Proposed structures must be determined to have airspace impacts that constitute a substantial adverse effect in order to warrant the issuance of determinations of hazard.

8.9.3.2 Mitigation Measures

WPL, utilizing the FAA's established 7460-1 Notice of Proposed Construction review process, will work with potentially impacted entities, which could include the City of Albert Lea, Albert Lea Municipal

Airport, MnDOT Aeronautics and Aviation, NTIA, DoD, and the FAA to identify and address any identified potential impacts by the Project on safety corridors and low altitude airways. Adjustments in the Project Area plans could avoid conflicts between proposed wind turbine locations and air traffic, with the intent to ensure the issuance of determinations of no hazard by the FAA for this Project and associated wind turbines. WPL will notify local airports about the Project and new turbines in the area to reduce the risk to crop dusters. See **Table 13-1** for a summary of FAA coordination.

8.10 Hazardous Materials

If hazardous materials are known to exist in the project area, list and describe the type of contaminant, where the contaminant is located on site, media in which the contaminant is embedded (soil, water, tank, etc.), estimated concentration of the contaminant, and estimated volumes of the contaminant. Provide an analysis and discussion of potential impacts of the project, proposed mitigative measures, and any adverse environmental effects that cannot be avoided.

The land within the Project Area is primarily rural and used for agriculture. Potential hazardous materials within the Project Area would be associated with agricultural activities, and include petroleum products (fuel and lubricants), pesticides, and herbicides. Older farmsteads may also have lead-based paint, asbestos shingles, and polychlorinated biphenyls in small transformers that are associated with overhead electrical distribution lines. Trash and farm equipment dumps are common in rural settings.

During construction of the Project, some solid and fluid materials will be generated from construction activities. These materials will be properly contained and disposed of following applicable state and local requirements. WPL will also take measures to pursue recycling opportunities for these materials when available.

During operation of the Project, turbine hydraulic oils and lubricants will be contained within the wind turbine nacelle and within service vehicles. If located within the nacelle the transformers will be the dry type. The Project will monitor fluids during maintenance at each turbine and transformer. A small volume of hydraulic oil, lube oil, grease, and cleaning solvent will be stored in the O&M Facility. When fluids are replaced, the used products will be handled according to applicable regulations and disposed of or recycled to the extent possible through approved materials handling companies.

8.10.1 Federal and State Listed Hazardous Materials

8.10.1.1 EPA Sites

The Applicant conducted a preliminary review of the EPA "MyEnvironment" database and map to identify federally listed sites that may have environmental impacts. A review of this information indicates the following designated sites are located within the Project Area:

- 3 Air Pollution sites (ICIS-AIR);
- 3 Hazardous Waste (RCRA) sites; and
- 4 Water Discharger (NPDES) sites.

8.10.1.2 MPCA Sites

The Applicant conducted a preliminary review of the MPCA "What's in My Neighborhood?" database to identify state listed sites that may have environmental impacts. Review of this information indicates the

following 53 designated sites are located within the Project Area:

- 1 Air quality site;
- 1 Aboveground tank;
- 11 Construction stormwater sites;
- 2 Environmental review sites;
- 3 Hazardous waste sites;
- 2 Hazardous waste, very small generator sites;
- 1 Industrial stormwater site;
- 1 Petroleum brownfield site;
- 3 Petroleum remediation sites;
- 1 Site assessment site;
- 2 Subsurface Sewage Treatment System (SSTS) licensed organizations;
- 3 Underground tanks; and
- 1 Wastewater, Municipal NPDES/SDS Permit site.

Four sites with known hazardous materials were identified within the Project Area during the review of the MPCA website.

1. The AT&T Radio Tower located along County Road 35 was identified to have previously had a leak. The leak occurred in December 1992 and consisted of an unknown amount of Fuel Oil #1 and Fuel Oil #2. All impacted soils were excavated and removed from the site and the site was closed by the MPCA in February 1993.
2. The CP Railway Right-of-Way located within the town of Hartland was identified as having a Site Assessment completed from 2012 to 2014. The site assessment was conducted to identify any potential hazardous materials left in place from the historic CP Railway. No hazardous materials were identified, and the site was closed in 2014.
3. Tweentens Conoco located along Johnson Street in the town of Hartland was identified as being a petroleum remediation leak site. Records indicate that a leak was discovered in July 1993 of an unknown amount of gasoline. Groundwater was confirmed to not have been contaminated and only soil was impacted. Roughly 500-cubic yard of contaminated soil were removed from the site in April 1994 and the site was given MPCA closure in November 1994.
4. Hi Yield Products, located at 300 Railroad Street was identified to be a brownfield and petroleum remediation site. Records indicate that an unknown amount of an unknown product was released into the soil in August 2011. The brownfield at the site was considered closed by the MPCA in November 2011, however the leak site remains open. No treatment or cleanup actions are listed as taking place. Based on the lack of evidence of treatment of cleanup, it is assumed that contaminated soil still exists at this site.

The above-listed sites will be avoided. Operation of the Project turbines will include use of petroleum products including gear box oil (either mineral based or synthetic based upon manufacturer and

application), coolants, hydraulic fluid, and gear grease. The turbines will be regularly serviced and any waste fluids that are generated with this service will be managed and disposed of (if needed) or recycled in compliance with applicable waste disposal laws and regulations.

In addition to the research described above, an American Society for Testing and Materials (ASTM) conforming Phase I Environmental Site Assessment (Phase I ESA) E2247-23 will be conducted on participating parcels within the Project Area. The Phase I ESA will identify known Recognized Environmental Conditions, Controlled Recognized Environmental Conditions, or Historical Recognized Environmental conditions that may require additional action prior to or during construction.

8.10.2 Potential Impacts

Prior to the pre-construction meeting and as noted above, WPL will conduct a Phase I ESA conforming to ASTM standards to identify and avoid existing recognized environmental conditions (RECs) on participating parcels within the Project Area. Facilities identified by the MPCA database will be a particular focus of this assessment.

Hazardous materials used and stored within the Project facilities during construction may include fuel, lubricating oil, hydraulic oil, propylene glycol, and other materials. Additionally, during operation of the Project, hazardous materials, such as hydraulic oil, lube oil, coolants, grease, and cleaning solvents will be used and stored on site as they are necessary to maintain wind turbines and other equipment. Grounding transformers located at the Project Substation are required for the operation of the Project and contain large quantities of cooling fluids, typically mineral oil. The main power transformer at the Project Substation will also contain oil.

Due to the presence of hazardous materials during project construction and operations, there is the potential for project spills and/or leaks to occur. The primary concerns associated with these potential spills and/or leaks are the potential impacts to surface water and groundwater resources and soil contamination.

8.10.3 Mitigation Measures

Information from the Phase I ESA will be used to identify and avoid, if necessary, any identified RECs. If RECs cannot be avoided, appropriate remediation, if required, will be conducted to avoid potential concerns associated with RECs. Any wastes generated during any phase of the Project will be handled and disposed of in accordance with Minn. R. Chapter 7045 and local rules and regulations.

Spill-related impacts from construction are primarily associated with fuel storage, equipment refueling, and equipment maintenance. To avoid spill-related impacts during construction, WPL will develop a project specific Spill Prevention, Control, and Countermeasure (SPCC) plan that will outline measures to be implemented to prevent accidental releases of fuels and other hazardous substances and describe the required response, containment, and cleanup procedures to be used in the event of a spill. The SPCC plan, because of its specificity, will be written by the contractor prior to construction.

A facility specific SPCC Operations Plan will also be developed and will be managed and maintained at the Project's O&M facility.

To avoid potential impacts to water and soil resources, hazardous materials will generally be stored indoors. In cases where materials need to be stored outdoors, the materials will be stored within secondary containment. Secondary containment will prevent impacts and will contain leaks if they occur. If any

wastes, fluids, or pollutants are generated during any phase of construction or operation of the Project, they will be handled, processed, treated, stored, and disposed of in accordance with Minn. R. Chapter 7045.

8.11 Land-based Economies

Describe impacts to land-based economies, including agriculture, forestry, and mining. This should include a description of the land-based economy and a general discussion of potential revenues lost as a result of the project (acres removed from production). Provide discussion of the potential environmental impacts of the project, proposed mitigative measures, and any adverse effects that cannot be avoided.

Existing land-based economies is centralized around agriculture with small areas containing pasture lands for animal husbandry (Dewitz and USGS, 2021). Freeborn County lists most property owners involved in agriculture having parcels ranging from 40 to 180 acres each. Property owners may themselves farm the land or have lease/rental agreements with others for utilizing the land for crop production or other agricultural activities. Other land-based activities used for revenue or income will not be affected by the proposed Project.

Environmental impacts of the Project will be minimal. The small areas of land used for the Project infrastructure leaves little, if any, potential for negative environmental impacts. The Applicant has taken steps to address potential issues during pre-construction, construction, operation, and decommissioning of the Project. As a part of agreements with landowners, WPL has designed the Project to comply with all standards and will remediate environmental impacts directly caused by the Project.

8.11.1 Agriculture/Farming

According to the USDA's 2022 Census of Agriculture, approximately 351,174 acres of land in Freeborn County is in farms, including 332,702 acres of cropland (94.7 percent), 15,718 acres of woodland and other (4.5 percent) land uses, and 2,754 acres of pastureland (0.8 percent). A total of 908 individual farms are located in Freeborn County, with the average farm size at 387 acres.

In 2022, the top three crops (in acres) in Freeborn County included corn for grain, soybeans for beans, and vegetables. Hogs and pigs topped the list of livestock inventory, followed by turkeys, and cattle and calves. The total market value of agricultural products sold in Freeborn County was approximately $476 million including $320 million for crops and $156 million for livestock, poultry, and products (USDA, 2022).

Most of the Project Area is agricultural cropland (see **Map 6 – Land Cover**). Cultivated land comprises approximately 24,420 acres (94 percent) of the Project Area.

Converting cropland to the Conservation Reserve Program (CRP) and the RIM program is another source of farm income. CRP and RIM lands are cropland planted to conserve grasses and legumes to protect and improve the soil with limited harvesting or pasturing allowed on CRP land. CRP land is enrolled for 10- to 15-year periods, whereas RIM conservation easements are permanent. Approximately 85 percent of the soil within the Project Area is prime farmland. The Natural Resource Conservation Service (NRCS) identifies prime farmland as land that has the best combination of both physical and chemical characteristics for the production of food, livestock feed and forage, fiber, and oilseed crops and is available for these agricultural uses. Important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance (Soil Survey Staff, 2024).

The use of feedlots is a common practice in raising livestock in the state of Minnesota. The MPCA

administers rules regulating livestock feedlots in Minnesota. According to Freeborn County, there were 225 total registered feedlots in 2023 (Freeborn County, 2023). Approximately 24 registered feedlots are in the Project Area in Freeborn County based on the most recent feedlot data from the MPCA (MPCA, 2024b).

8.11.1.1 Potential Impacts

The construction and operation of the Project will not significantly impact the current agricultural land use or character of the area.

Small portions of land will be removed from agricultural production at turbine locations and along proposed access roads (generally less than 1 to 2 acres per turbine). Individual landowners will be able to continue to plant crops and graze livestock up to the turbine pads. Agricultural practices may be impacted by creating altered maneuvering areas for agricultural equipment around turbine structures and access roads, but access roads have been designed with landowner input for minimal agricultural impact.

If construction activities are executed outside of winter months, temporary impacts to agriculture fields may occur. These temporary impacts may include limited planting opportunity, crop damage, drain tile damage, and soil compaction.

About 85 percent of the soil within the Project Area is considered prime farmland. The loss of agricultural land to the construction of the wind farm will reduce the amount of land that can be cultivated. Approximately 0.2 percent of the Project Area will be converted to non-agricultural land use. Similarly, approximately 57.5 acres (0.2 percent) will be converted out of prime farmland. This will not significantly alter crop production in the Project Area or surrounding area.

As discussed in **Section 8.9.1.3**, stray voltage poses a concern in agricultural areas, particularly dairy farms, as it involves the unintentional transfer of electricity between two grounded objects. Stray voltage does not cause electrocution and is not related to ground currents, EMF, or earth currents. Stray voltage is not a particular concern for dairy farms near the Project Area because WPL's collector circuits are inherently balanced, and no appreciable neutral-to-earth voltage is expected. In addition, there will be no connection between WPL's collection system and the local distribution system. WPL is committed to siting turbines and power lines to avoid conflicts with dairy farms in the Project Area.

8.11.1.2 Mitigation Measures

Only areas occupied by turbines, Project Substation, meteorological towers, ADLS tower, access roads, and potentially crane pads, will be removed from crop production for the life of the Project. All land surrounding the constructed facilities can still be farmed once construction of Project infrastructure is complete. The permanent loss of approximately 62 acres of agricultural land will not result in the loss of any agriculture-related jobs or any net loss of income. Revenue lost from the removal of land from agricultural production will be more than offset by lease payments to landowners hosting the Project facilities. As a result of land payments to landowners hosting facilities and landowners without facilities but with wind rights agreements, significant new agricultural income will enter the county from the Project.

Negotiations with property owners have produced land agreements mutually agreeable to both parties that address agricultural impacts such as crop damage, soil compaction, and drain tile repairs. Drain tile will be repaired according to the agreement between the Applicant and the owner of any damaged tile. WPL will strive to avoid impacts to CRP land and RIM lands.

WPL will coordinate with property owners to identify features on their property, including drain tile, which can be avoided. WPL recognizes that the excavation and heavy equipment associated with construction may cause damage to known or unknown drain tiles. In the event that there is damage to drain tile as a result of construction activities or operation of the Project, WPL will work with affected property owners to repair the damaged drain tile in accordance with the easement agreements between WPL and the landowners and in accordance with the site permit conditions.

8.11.2 Forestry

According to the MNDNR Division of Forestry (MNDNR, 2024e) commercial or industrial forestry resources are not located within the Project Area. Approximately 189 acres (0.7 percent) of forested and wooded areas are within the Project Area. Local forested land within the Project Area is generally associated with farmsteads as shelterbelts or woodlots and forests along the watercourses. These, however, are not harvested and considered economically significant forest resources.

No federal or state forests are within the Project Area (USFS, n.d.; MNDNR, 2024a).

8.11.2.1 Potential Impacts

Shelterbelts and woodlots associated with farmsteads and forested areas along watercourses will not be impacted during construction or operation of the Project. No commercial or industrial quality forestry resources are located within the Project Area.

8.11.2.2 Mitigation Measures

No forestry resource mitigation efforts will be required as no impacts to forestry resources are anticipated.

8.11.3 Mining/Resource Extraction

Sand and gravel resources are regularly exploited in areas dominated by glacial till and outwash deposits. Many of the pits are inactive, abandoned, or their use is limited to the landowner. Based on MnDOT County Pit Maps and topographic maps, there are no active gravel pits located within the Project Area (MnDOT, 2003).

8.11.3.1 Potential Impacts

Negative impacts to mining or resource extraction are not anticipated.

8.11.3.2 Mitigation Measures

No impacts to mining or resource extraction are anticipated. No mitigation is therefore necessary.

8.12 Tourism

Describe any tourism and associated community benefits derived from natural resources, recreational, and/or historical or cultural opportunities in the area. Provide an estimate of annual tourism revenues. Provide an analysis and discussion of potential impacts of the project, proposed mitigative measures, and any adverse environmental effects that cannot be avoided.

The Project Area and surrounding area have little tourism and associated industries with most attractions located in the city of Albert Lea approximately 10.5 miles away. Based on the DEED, Freeborn County employment statistics show only nine percent of the population work in Accommodation & Food Services

and less than one percent in Arts, Entertainment, & Recreation (DEED, 2024a). Similar numbers can be found for Steele and Waseca counties.

In 2019, Freeborn County generated $46,865,875 in tourism revenue based on data compiled from the Minnesota Department of Revenue and U.S. Bureau of Labor Statistics (Explore MN, 2021). Tourism likely associated with the Project Area and surrounding area relate to natural resources and outdoor recreation. Several federal and state lands including parks, WMAs, WPAs, snowmobile trails, and regional lakes are primary attractions for visitors (see **Map 5 - Public Lands and Recreation**).

8.12.1.1 Potential Impacts

No expected impacts are likely to occur with to the Project Area or surrounding area with the development of wind turbines. The Project is sited on private lands currently being used for agriculture making it unlikely for adverse impacts to arise on public or private tourist attractions. Any potential impacts resulting from the Project will be reduced through appropriate setbacks from occupied structures and recreational spots to ensure safety.

8.12.1.2 Mitigation Measures

No impacts to tourism are anticipated. No mitigation is therefore necessary.

8.13 Local Economies and Community Benefits

8.13.1 Workforce

Describe the economic impacts and community benefits of the project, such as the number of people to be employed as a result of construction and operation of the LWECS. Estimate how much of the workforce will come from local sources; number of jobs created during construction and number of jobs created for maintenance and operation of the facility. Include number of temporary and permanent jobs expected from the project.

According to the U.S. Census Bureau (U.S. Census, 2020b), the largest industries employing residents of Freeborn County are:

- Education, health care and social assistance services (22.1 percent),
- Manufacturing (24.1 percent), and
- Retail trade (11.9 percent).

The 2022 per capita income for Freeborn County was $36,751 (DEED, 2024a). Hartland Township has a per capita income level higher than that of the county at $37,628 and Bath Township exhibits a further elevated per capita level of $60,216. Other surrounding townships have a per capita income ranging from $32,821 to $46,348.

The per capita income level appears to generally correlate with relative poverty levels for the county and townships. Freeborn county has a 9.6 percent poverty rate. Hartland, Bath, and Freeborn Townships all have poverty rates lower than the county (2.8 percent, 0.8 percent, and 7.3 percent respectively). Steele and Waseca counties have a poverty rate at 8.5 percent and 6.6 percent respectively.

Constructing the Project will provide the citizens of the three counties with opportunities for economic

growth and development across several industries. Hiring local skilled labor from Freeborn County to fulfill the 100 to 150 construction workers needed is one example of direct impacts on the local economic benefits. Additionally, it is anticipated that 2 to 3 full time wind technician positions will be created for long term operations and maintenance of the Project.

8.13.2 Tax Payments and Annual Revenue Estimates

Discuss tax payments made to counties, including annual tax revenue estimates.

Long-term beneficial impacts to the county's tax base as a result of construction and operation of the Project will contribute to improving the local economy. The development of wind energy in south central Minnesota is a good example of how the economic base has been diversified and strengthened.

In addition to the creation of jobs and personal income, the Project will pay a Wind Energy Production Tax to the local units of government of $0.0012 per kilowatt-hour ($1.20 per MWh) of electricity produced, resulting in an annual tax payment of approximately $19,000 per turbine per year, or up to $650,000 per year if all 34 turbines are constructed. These revenues are based on a 41 percent capacity factor and are split 80 percent to Freeborn County and 20 percent to the townships. Production estimates are based on an expected generator interconnection agreement from MISO that has no limitations on injection capacity. MISO DPP 2021 and 2022 studies are currently ongoing. The actual production will determine the final Wind Energy Production Tax in a given year.

Local townships benefit from this new tax revenue to fund their services, particularly road maintenance. The Hartland Township Supervisor has reported the township generates almost half of its annual income from wind energy and uses that revenue to fund road maintenance, among other things, resulting in benefits for all township residents.

8.13.3 Potential Impacts and Mitigation Measures

Provide an analysis and discussion of potential impacts of the project, proposed mitigative measures, and any adverse effects that cannot be avoided.

It is anticipated that local contractors and suppliers will be engaged during construction. Wages and salaries paid in Freeborn, Steele, and Waseca counties will contribute to personal income of the region. Additional household income will be generated for residents in the county and state by corollary payments made by the Applicant during development, construction, and operation of the proposed facility as well as state and local taxes throughout the life of the Project. Purchase of equipment, fuel, supplies, and other services and materials will benefit local economies. Local wind energy production tax payments are split 80 percent to Freeborn County and 20 percent to the host townships. Local townships benefit from this new tax revenue to fund their services, particularly road maintenance. The Hartland Township Supervisor has reported the township generates almost half of its annual income from wind energy and uses that revenue to fund road maintenance, among other things, resulting in benefits for all township residents.

Socioeconomic impacts associated with the Project will be positive. The construction and operation of the Project will provide an increase in wages and purchases made at local businesses and an increase in the counties' tax base.

8.14 Topography

Describe the topography within the project area. Describe any changes to site topography due to grading

activities. Provide an analysis and discussion of potential impacts of the project, proposed mitigative measures, and any adverse environmental effects that cannot be avoided.

The overall topography of the Project Area showcases rolling hills, with elevations spanning from approximately 1,176 to 1,350 feet above mean sea level. The landscape is characterized by scattered small wetlands and creeks, with the Le Sueur River being the primary watercourse.

8.14.1 Impacts and Mitigation Measures

It is expected that general topographical features within the Project Area will not be significantly impacted. Although the installation of turbines and access roads will require some soil excavation and fill activities, these impacts will be localized and will not alter the general landscape features as they exist today. No permanent impacts to drainage patterns or overall topography are expected and therefore no mitigation measures are proposed. However, as a general practice, WPL will return disturbed areas to a condition that matches pre-construction drainage patterns and surrounding grades. Procedures outlined in the Project's Stormwater Pollution Prevention Plan (SWPPP) will be followed to minimize soil erosion and sedimentation impacts.

8.15 Soils

Describe the soils within and adjacent to the project area. Provide an analysis and discussion of potential impacts of the project, proposed mitigative measures, and any adverse environmental effects that cannot be avoided.

The Project Area is comprised of four soil associations: Webster-Nicollet-Clarion-Canisteo (s1750), Nicollet-Clarion-Canisteo (s1751), Delft-Clarion (s3558), and Lester-Hamel (s3504) associations. These soil associations are generally deep, poorly drained to well drained, and are formed from loess and glacial till (Soil Survey Staff, 2024). Soil associations and their coverage of the Project Area are listed in **Table 8-20** below and shown on **Map 12 – Soil Associations**.

Table 8-20: Soil Associations in the Project Area

Soil Association	Acres	Percent of Project Area
Webster-Nicollet-Clarion-Canisteo (s1750)	21,596.6	82.9
Nicollet-Clarion-Canisteo (s1751)	1,850.4	7.1
Delft-Clarion (s3558)	708.8	2.7
Lester-Hamel (s3504)	1,890.2	7.3
Total	**26,045.9**	**100.0**

In addition to the soil associations, the NRCS identifies certain areas as important to agricultural use and classifies these areas as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. These are lands that are deemed to have the best physical and chemical properties for production of crops and that are available for crop production (Soil Survey Staff, 2024). The majority of the Project Area is classified as prime farmland as shown in **Table 8-21** and on **Map 12 – Soil Associations**.

Table 8-21: Prime Farmland Classifications in the Project Area

Prime Farmland Classification	Acres	Percent of Project Area
Prime Farmland[1]	22,137.4	85.0
Farmland of Statewide Importance	3,565.2	13.7
Not Prime Farmland	343.2	1.3
Total	**26,045.9**	**100.0**

[1] This includes soils classified as "all areas prime farmland," "prime farmland if drained," and "prime farmland if protected from flooding or not frequently flooded during the growing season."

8.15.1 Potential Impacts

Construction activities such as clearing, grading, foundation excavation, and backfilling, as well as the movement of construction equipment within the construction workspace, may result in impacts to soil resources. Potential impacts to soil resources include soil erosion, soil compaction, reduction of soil fertility, and changes to other soil characteristics. Clearing vegetation removes protective cover and root structure and exposes soil to the effects of wind and precipitation, which may increase the potential for soil erosion and movement of sediments into sensitive environmental areas such as wetlands. Grading and equipment traffic may compact soil, reducing porosity and percolation rates, which could result in increased runoff potential. These impacts will be temporary and localized to the footprint of facilities. During construction, there is also the potential for localized soil erosion and sedimentation. These activities are described further in **Section 10**.

Construction of the Project facilities is estimated to temporarily impact 451.7 acres (see **Table 8-1**). Of this, approximately 408 acres of Webster-Nicollet-Clarion-Canisteo soils, 30.4 acres Delft-Clarion soils, and 13.3 acres of Nicollet-Clarion-Canisteo soils will be impacted during construction. Once constructed, it is estimated that 55.9 acres of Webster-Nicollet-Clarion-Canisteo soils, 4.2 acres of Delft-Clarion soils, and 3.1 acres of Nicollet-Clarion-Canisteo soils will be impacted for the life of the Project (**Table 8-22**).

Table 8-22: Summary of Impacts by Soil Association

Map Unit Symbol	Soil Association	Temporary Impacts (acres)	Permanent Impacts (acres)
s1750	Webster-Nicollet-Clarion-Canisteo	408.0	55.9
s3558	Delft-Clarion	30.4	4.2
s1751	Nicollet-Clarion-Canisteo	13.3	3.1
s3504	Lester-Hamel	0.0	0.0
	Total	**451.7**	**63.3**

Note: addends may not sum due to rounding.

Construction of the Project facilities is estimated to temporarily impact 402.2 acres of prime farmland and permanently impact 57.5 acres of prime farmland (**Table 8-23**) for the life of the Project.

Table 8-23: Summary of Impacts by Prime Farmland Classification

Prime Farmland Classification	Temporary Impacts (acres)	Permanent Impacts (acres)
Prime Farmland	402.2	57.5
Farmland of Statewide Importance	47.9	5.6
Not Prime Farmland	1.5	0.2
Total	**451.7**	**63.3**
Note: addends may not sum due to rounding.		

8.15.2 Mitigation Measures

WPL will obtain coverage under the MPCAs NPDES/SDS Construction Stormwater (CSW) General Permit, which allows discharge of stormwater from construction activities. To comply with the NPDES/SDS CSW General Permit, best management practices (BMPs) will be implemented during construction of the Project to conserve topsoil, minimize soil erosion, and protect adjacent resources from sedimentation. Proposed BMPs may include installation of temporary sediment controls such as silt fence, sediment logs, and rock outlets, implementation of erosion controls such as vegetation, mulch, and erosion control blanket, when disturbance has temporarily or permanently ceased. Prior to submittal of a Notice of Intent (NOI) to obtain coverage under the NPDES/SDS CSW General Permit, a Project SWPPP will be developed. The SWPPP will include a narrative component, erosion and sediment control plans, and details for BMP installation. Because the Project will impact more than 50 acres, and is located within one mile of impaired waters, WPL will submit the SWPPP to the MPCA with the NOI at least 30 days prior to the start of construction.

Access roads will be placed away from steep slopes to the degree possible to minimize the amount of grading and soil disturbance. Additionally, access roads, collection lines, and crane paths are co-located to the extent practicable to minimize the footprint of facilities and reduce soil disturbance. Geotechnical soil borings will be conducted at wind turbine foundation locations prior to construction to determine the soil suitability to support turbine foundations; this information will help dictate final design parameters of the turbine and structure foundations.

Following the completion of construction, temporarily disturbed soils will be restored to pre-construction conditions in accordance with landowner lease agreements. Excess soil may be used as backfill, spread out around the construction areas, graded in some locations to drain away from turbines, or topped with gravel or topsoil as appropriate. As part of the post-construction reclamation efforts, soils that have been compacted in areas where project infrastructure is not located will be de-compacted, spread with topsoil stockpiled during construction, and revegetated by seeding, as needed. Depending upon the timing of reclamation activity and future use of the area, these areas will be reseeded with temporary cover crops and perennial vegetation or planted with row crops.

At the end of the Project's life, Project facilities will be decommissioned, and areas will be returned back to agricultural use. The Decommissioning Plan is in **Appendix H**.

8.16 Geologic and Groundwater Resources

Describe the geology and groundwater resources of the project area. This should include a discussion of

surface geology, bedrock, and wells. Be sure to specify what type of well(s) will be constructed for the project and expected capacity. Provide an analysis and discussion of potential impacts of the project, proposed mitigative measures, and any adverse environmental effects that cannot be avoided.

8.16.1 Surficial Geology

Surficial geology of the Project Area in Freeborn County consists of materials that are the result of the action of glacial ice and flowing water. The surficial materials are mainly glacial deposits (drift). This glacial drift is composed of glacial till that is characterized by a matrix of sand, silt, and clay with scattered pebbles, cobbles, and some boulders. The drift material over the bedrock surface ranges from less than 50 feet to over 200 feet (Mankato State University, 1991).

Byron Township in Waseca County has level topography consisting of till-plain deposits similar to stagnant-ice deposits (Waseca County, 2005). The land surface in Steele County is primarily composed of Pleistocene glacial drift, which is a mixture of glacial till (clay, silt, sand, and boulders with low to moderate water-bearing potential) and glacial outwash (sand, gravel, and lesser amounts of silt or clay, which serves as a primary source of water throughout the state) (Steele County, 2007).

8.16.2 Bedrock Geology

Bedrock within the region of the Project is comprised of Upper Cretaceous, Middle Devonian, Upper Ordovician, and Middle Ordovician rocks (Lusardi et al., 2019). Depth to bedrock is shown on **Map 13 – Site Geology and Depth to Bedrock**. Most of the Project Area is in the northern region of Freeborn County, which is primarily underlined by the Maquoketa and Galena bedrock. The Maquoketa bedrock is comprised of carbonate rock, fine-grained limestone, shaly-limestone, and shale, with a gradational base. The Galena bedrock is comprised of carbonate rock, fine-grained white, yellow, and yellow-gray limestone, dolomitic limestone, and sandy, shaly, and silty beds. The northern portion of the Project Area is underlined by Dubuque, Windrow, Spillville, Glenwood, and Platteville bedrock, and are composed of a mixture of fossiliferous limestone, shale, and clay (Mankato State University, 1991). Minnesota Geological Survey (MGS) data indicate that depths to bedrock range from about 80 to 294 feet with depths increasing towards the eastern and southeastern portions of the Project Area (MGS, 2023).

In Steele County, the bedrock is primarily Precambrian rocks, which consists of weathering residuum and the Keweenawan System. Weathering residuum forms a cap on top of the Precambrian rocks, has low water-bearing potential, and is composed of white and green clay. Sandstone in the Keweenawan System is situated under volcanic basalt flows and thin brown sedimentary rocks and has high to moderate water-bearing potential in the upper sandstones and interflow sedimentary rocks, respectively (Steele County, 2007).

8.16.3 Aquifers and Wells

Minnesota is divided into six groundwater provinces based on bedrock and glacial geology. The aquifers within these provinces occur in two general geologic settings: unconsolidated sediments (e.g. gravel, sand, clay) deposited by glaciers, streams, and lakes; and bedrock. Aquifers within the Project Area are Stewartville-Cummingsville (OGSC), Galena-Stewartville Mbr (OGSV), Stewartville-Decorah (OGSD), and Dubuque-Galena (ODGL) (MDH, n.d.). The Project is within the South-Central Province, which is characterized by thick loam and clay loam glacial sediment overlying sandstone and carbonate Paleozoic aquifers (MNDNR, 2021). These Paleozoic aquifers have high water-bearing potential due to the sandstone and fractured limestone beds, which make them a valuable water resource in southeastern Minnesota (Steele County, 2007). In this province, regionally extensive sedimentary bedrock is usually buried beneath clayey,

unconsolidated sediments with limited extent surficial and buried sand aquifers (MNDNR, 2021).

WPL reviewed the Project Area for EPA designated sole source aquifers (SSA), wells listed on the Minnesota Well Index, and the University of Minnesota Duluth's Natural Resources Research Institute Wellhead Protection Areas (WHPAs) Map. The EPA defines a SSA as one that supplies at least 50 percent of the drinking water for its service area, where contamination of the aquifer could create a significant hazard to public health, and where there are no alternative water sources that could reasonably be expected to replace the water supplied by the aquifer (EPA, 2023). There are no SSAs in the Project Area (EPA, 2024).

Homes and farms in the Project Area typically use private wells and septic systems for their household needs. According to the MDH's Minnesota Well Index online database, there are 88 domestic wells, one sealed well, and 12 unverified "Other" well locations within the Project Area. The wells were drilled to depths ranging from about 114 to 614 feet with depths generally increasing east of State Highway 13, and static water levels between 20 and 180 feet deep (MDH, n.d.). The MNDNR depth to water table map indicates most of the Project Area has a depth to water table of zero to 10 feet with isolated areas of 10 to 20 feet (MNDNR, 2016a).

Public and non-public community water supply source-water protection in Minnesota is administered by the MDH through the Wellhead Protection program. The purpose of the Wellhead Protection Program is to prevent contamination of public drinking water supplies by identifying water supply recharge areas and implementing management practices for potential pollution sources found within those areas (MDH, 2022). There are no Wellhead Protection Areas (WHPAs) or Drinking Water Supply Management Areas (DWSMAs) within the Project Area (MDH, n.d.). The nearest WHPAs and DWSMAs are in New Richland and Clarks Grove.

8.16.4 Potential Impacts

WPL does not anticipate any impacts to bedrock during construction or operation. Depth to bedrock across the Project Area ranges from about 80 to 294 feet. Construction activities will occur to depths of approximately 10 to 30 feet for turbine foundations and 5 to 10 feet for the Project Substation foundations. Geotechnical testing will occur at turbine locations and the substation prior to construction to determine soil stability and depth to bedrock. Groundwater may be encountered within 10 to 20 feet of the ground surface but will be further determined through geotechnical testing.

Project activities are not expected to impact groundwater resources or wells due to adherence to state and county setbacks from water wells and the minimal water-related needs of the Project. Water may be used during construction to control dust and mix with concrete. A temporary batch plant may be needed to supply concrete for construction of the Project. The batch plant may be able to use rural water service but is more likely to require well water. The water source will be determined prior to construction when a contractor is selected to construct the Project.

Use of water for operations will be negligible. Temporary dewatering may be required during construction for specific turbine foundations and/or electrical trenches.

8.16.5 Mitigation Measures

Because impacts are not expected to geologic resources during the Project construction and operation, mitigation measures are not anticipated. If a batch plant is required, the batch plant operator will obtain the

local permits and access to water supply and will address supply and drawdown issues in those permits. WPL does not anticipate that more than 10,000 gallons of water per day or one million gallons per year would be withdrawn during construction. If amounts exceed these thresholds, WPL will obtain the required water appropriation/dewatering permits from the MNDNR.

If identified wells require abandonment, they will be sealed in accordance with Minnesota Department of Health (MDH) regulations.

8.17 Surface Water and Floodplain Resources

Describe surface water and floodplains in the project area, including but not limited to lakes, rivers, and streams. All outstanding resource value waters should be identified. Meandered waterbodies should also be identified, especially if the state owns any part of the sub-surface. List the shoreland management classifications associated with lakes and rivers.

The Project Area is primarily within the Le Sueur River Watershed, with smaller portions within the Cedar River Watershed and Cannon River Watershed along the eastern boundary (MNDNR, 2023a). Land use in these watersheds is predominately agricultural and is planted with crops such as corn and soybeans or used for livestock production. It is also extensively drained through a vast network of ditches and tile. When considering the hydrology, geomorphology, biology, connectivity, and water quality of the watersheds in the Project Area, they are all considered moderately healthy (MNDNR, n.d.-b).

8.17.1 Lakes, Rivers, and Streams

There are no named lakes within the Project Area. The Le Sueur River and Boot Creek are the only named rivers and streams within the Project Area. A small portion of the Le Sueur River in the northeast portion of the Project Area is natural, but the remainder has been heavily altered (USGS, 2023). The river bisects the Project Area east of Hartland and flows north and west to its confluence with the Blue Earth River south of Mankato (MPCA, n.d.-b). Boot Creek is located in the northwest section of the Project Area, and splits into Judicial Ditch 6 and an unnamed ditch (USGS, 2023). There are two drained surface water features within the Project Area that are mapped as Mule Lake (a drained lakebed) and an unnamed drained wetland (MNDNR, 2012). Lakes, rivers, streams, and the drained lake and wetland are shown on **Map 10 – Surface Waters**.

8.17.1.1 Outstanding Waters and Trout Streams

No waterbodies within the Project Area are identified as Outstanding Resource Value Waters under Minn. R. 7050.0335, subpart 3 (MPCA, 2022b).

There are no designated trout streams within the Project Area (MNDNR, n.d.-c; MNDNR, 2023b). The closest designated trout streams are Woodson Creek and Wolf Creek, which are located approximately 21 miles southeast of the Project Area.

8.17.1.2 Ditches

Judicial Ditch 6, Judicial Ditch 8, County Ditch 28, and County Ditch 46 are county and jurisdictional ditches within the Project Area. County Ditch 46 is an impaired water by the MPCA (MPCA, 2024c).

8.17.1.3 Minnesota Public Waters Inventory

Public waters are all waters of the state that meet the criteria set forth in Minn. Stat. § 103G.005, subd. 15,

and consist of certain wetlands, water basins, and natural and altered watercourses. The MNDNR maintains a PWI map of each county that shows these waters of the state. PWI wetlands include all type 3, 4, and 5 wetlands (as defined in USFWS Circular No. 39, 1971 edition) that are 10 acres or more in size in unincorporated areas or 2.5 acres or more in size in incorporated areas. PWI water basins and watercourses generally include waters managed or owned by a state or federal agency including lakes and rivers managed for a specific purpose, such as game or trout, waters with publicly available access, and waters assigned a shoreland management classification.

There are three PWI natural watercourses and four altered watercourses within the Project Area; there are no PWI basins or PWI wetlands within the Project Area. Some portions along two of these PWI watercourses in the Project Area have 50-foot protection buffer requirements, according to the Minnesota Buffer Law (MNDNR, 2019). These buffered watercourses include the mainstem of the Le Sueur River and portions of Boot Creek. An additional four designated watercourses scattered throughout the Project Area have 16.5-foot protection buffer requirements.

All or part of a watercourse may be designated as a public water. The PWI watercourses in the Project Area are listed in **Table 8-24** and shown on **Map 10 – Surface Waters**.

Table 8-24: Public Waters Inventory within 1 Mile of Project Area

PWI Type	PWI Feature Name/ID	Protection Buffer (feet)	Name
Natural/Altered Watercourse	Unnamed Stream (M-055-076-001-002-007)	50/16.5	Le Sueur River
Public Water Watercourse	Unnamed Stream (M-055-076-001-046)	50/16.5	Boot Creek
Public Water Watercourse	Unnamed Stream (M-055-076-001-046-001)	16.5	Unnamed Stream
Public Ditch/Altered Watercourse	Unnamed Stream (M-055-076-001-046)	16.5	County Ditch 46
Public Ditch/Altered Watercourse	Unknown Stream	--	County Ditch 28
Public Ditch/Altered Watercourse	Unnamed Stream (M-055-076-001-046)	16.5	Judicial Ditch 8
Public Ditch/Altered Watercourse	Unknown Stream	16.5	Judicial Ditch 8

8.17.1.4 Designated Wildlife Lakes

For lakes designated for wildlife management, the MNDNR is allowed to temporarily lower lake levels to improve wildlife habitat and restrict the use of motorized boats to reduce disturbance to waterfowl. There are no designated wildlife lakes in the Project Area.

8.17.2 Impaired Waters

Section 303(d) of the Clean Water Act (CWA) requires each state to review, establish, and revise water quality standards for all surface waters within the state. Waters that do not meet their designated beneficial uses because of water quality standard violations are considered impaired. According to the most recent EPA approved 2024 Impaired Waters List, there are three 303(d) impaired watercourses within the Project Area. There are no listed impaired lakes or wetlands within the Project Area (MPCA, 2024c). The impaired waters are shown on **Map 10 – Surface Waters** and summarized in **Table 8-25**.

Table 8-25: 2024 Impaired Waters within Project Area

Water Type	Feature Name	AUID[1]	Affected Use	Pollutant or Stressor (Impairment)
Watercourse	Boot Creek	07020011-621	Aquatic Life	Fish bioassessments
	Le Sueur River	07020011-664	Aquatic Consumption	Mercury in fish tissue
	County Ditch 46	07020011-618	Aquatic Life	Benthic macroinvertebrates bioassessments

[1] AUID = Assessment Unit Identifier.

8.17.3 FEMA Floodplains

The Project Area is within four Federal Emergency Management Agency (FEMA) map panels that cover Freeborn County (27047C0050C and 27047C0075C, effective November 19, 2014), Waseca County (27161C0400C, effective March 27, 2023), and Steele County (27147C0325C, effective December 2, 2011). Digital FEMA floodplain data is available for Waseca and Steele counties.

The FEMA maps and digital data indicate that the Project Area is largely outside of the 100-year floodplain in Freeborn and Steele counties. A portion of the Le Sueur River in Waseca County is mapped as Zone A 100-year floodplain (FEMA, n.d.) as shown on **Map 9 – FEMA Floodplains**.

8.17.4 Potential Impacts

There are no designated wildlife lakes, listed impaired lakes or wetlands, designated trout streams, or Outstanding Resource Value Waters within the Project Area. All other surface waters located within the Project Area will not experience significant changes because of the Project. The SWPPP and other BMPs for soil erosion and pollution prevention will minimize any potential impacts associated with the Project.

The Project Area is largely outside of the 100-year floodplain. Based on the preliminary site plan layouts, the small portion of Zone A 100-year floodplain associated with the Le Sueur River in Waseca County will not be impacted.

8.17.5 Mitigation Measures

Because there will be no impacts to surface waters and no mapped floodplains will be impacted within the Project Area, no mitigation measures are proposed.

8.18 Wetlands

Describe wetlands within and near the project area. Turbines, towers, and associated facilities shall not be located in public waters or wetlands. Unavoidable wetland impacts from collector and feeder lines may be subject to MDNR, US Fish and Wildlife Service, the US Army Corps of Engineers, and local government permitting requirements as applicable. Permits are required to cross MN DNR administered lands and/or from other agencies. Provide an analysis and discussion of potential impacts of the project, proposed mitigative measures, and any adverse environmental effects that cannot be avoided.

Wetlands are areas with hydric (wet) soils, hydrophilic (water-loving) vegetation, and wetland hydrology (inundated or saturated much of the year). Wetlands are part of the foundation of water resources and are vital to the health of waterways and communities that are downstream. Wetlands detain floodwaters, recharge groundwater supplies, remove pollution, and provide fish and wildlife habitat. Wetlands are also economic drivers because of their key role in fishing, hunting, agriculture, and recreation. Wetland types

include temporarily flooded basins, marshes, swamps, bogs, and fens. Wetlands vary widely due to differences in soils, topography, climate, hydrology, water chemistry, vegetation, and other factors.

8.18.1 Desktop Identified Wetlands

Wetlands within the Project Area were identified via desktop review using Minnesota's 2022 update to the National Wetlands Inventory (NWI), referred to as the Minnesota Wetland Inventory (MWI). MWI is a publicly available GIS database that provides information on the location and characteristics of wetlands in Minnesota. It is based on the framework for the NWI. The wetland inventory has been remapped using the GIS technology, including lidar and high-resolution aerial imagery, making it the most comprehensive, current, and accurate wetland inventory in the country (MNDNR, n.d.-g). Utilizing this tool rather than relying on NLCD data, which can inaccurately classify and depict wetlands, allows for more precise measurements and understanding of wetlands and potential impacts.

A total of 320 potential wetlands, totaling 477.4 acres, were identified within the Project Area. Of these, 176 were categorized as freshwater emergent wetlands (349.2 acres), 55 were riverine (60.1 acres), 74 were freshwater forested/shrub (50.6 acres) and 15 were freshwater ponds (17.5 acres). There are three PWI streams located within the Project Area, these overlap mapped NWI riverine wetlands and are associated with the Le Sueur River and two other unnamed streams. The majority of wetlands are isolated basins.

The number of NWI wetlands, along with their type (based on the Cowardin Classification System) and their acreage within the Project Area are presented in **Table 8-26**. The Cowardin system is a classification system used by the USFWS to identify and classify wetlands and deep-water habitats. The system was developed in 1979 by Lewis M. Cowardin and others for the USFWS's NWI, which was established in 1974 to inventory wetlands across the United States. The Cowardin system is now the official USFWS wetland classification system and the federal standard for wetland classification.

Table 8-26: NWI Type and Acreage within the Project Area

NWI Type	Acres[1]	Percent of Site
Freshwater emergent wetlands (PEM)	349.2	1.4
Riverine	60.1	0.2
Freshwater forested/shrub (PFO)	50.6	0.2
Freshwater ponds	17.5	0.1
Total	**477.4**	**1.9**

[1] Wetland acreage based on Minnesota's 2022 Update to NWI data.

There are no calcareous fens identified within or adjacent to the Project Area. Calcareous fens are rare and distinctive wetlands characterized by non-acidic peat with a constant supply of calcium and magnesium bicarbonate rich groundwater. This specialized environment is dominated by a calcium-loving plant community. The closest mapped calcareous fen is located approximately 10 miles northeast of the Project Area in Steele County. Due to the specialized nature of fens, it is unlikely to find associated habitat within the Project Area (MNDNR, 2016b).

8.18.2 Field Delineation

A partial field delineation of the wetlands and waterways was conducted in July 2024 using the level two

routine determination methods set forth in the USACE Wetlands Delineation Manual (USACE, 1987) and the supplemental methods set forth in the regional supplement to the USACE Wetland Delineation Manual: Midwest Region (USACE, 2010). The delineation included areas within a 500-foot radius of proposed and alternate turbine locations, within a 150-foot-wide corridor along proposed and alternate access roads and temporary crane paths, and the Project Substation. Thirty-three wetlands totaling 12.2 acres and two waterways totaling 2.7 acres (6,124 linear feet) were delineated within these areas. All delineated wetlands were classified as seasonally flooded basins (PEM1A). Mapped watercourse WC-01 was classified as intermittent while WC-02 was classified as perennial based on field observations. Additional field delineations are tentatively scheduled in Spring 2025 to delineate the remaining areas of planned Project infrastructure. A wetland delineation report will be prepared and will be circulated to wetland agencies for review and approval prior to construction.

8.18.3 Wetland Impacts

Turbines and meteorological towers will be sited in upland areas to maximize the wind resource and as such, are likely to avoid most wetlands and other water resources, which are typically at lower elevations. Access roads and Project infrastructure will be designed and sited to avoid or minimize permanent impacts to wetlands to the greatest extent feasible. Temporary wetland impacts may occur based on construction corridors. WPL will review site design after the remaining areas are delineated. The final design will avoid surface water resources to the extent practicable. Also, per the Freeborn County Zoning Ordinance (2017), all turbines have been sited at least 50 feet from the top edge of an open public ditch and 3 RD from Circular 39 wetland types 3, 4 and 5 (Shaw and Fredine, 1971).

All remaining areas where Project infrastructure is proposed will be field delineated and final impact calculations will be based on the final site design and delineations. Additionally, after the field verification of wetlands, Project facilities may undergo minor shifts to avoid wetland features whenever possible. Temporary impacts associated with crane paths and crane pads will be minimized and construction matting will be used where avoidance is not possible. Installation of underground electric cables is expected to avoid impacts by directional boring as necessary. Wherever practical, WPL will also parallel collection lines with access roads to minimize temporary impacts to wetlands.

8.18.4 Wetland Mitigation Measures

The layouts have been designed and sited to avoid or minimize permanent wetland impacts to the greatest extent feasible. Additional field delineations are anticipated to be conducted in Spring 2025. The remaining desktop identified wetlands will be field verified during the wetland delineation. Wetlands will be avoided to the extent possible during the construction and operations phases of the Project. If wetland impacts cannot be avoided, WPL will submit a permit application to the USACE for dredge and fill within Waters of the United States under Section 404 of the CWA, to the local governmental unit (LGU) for Minnesota WCA coverage and the MPCA for Water Quality Certification (WQC) under Section 401 of the CWA prior to construction.

WPL will mitigate direct or indirect wetland impacts during construction and operation by protecting topsoil, minimizing soil erosion, and protecting adjacent wetland resources. Other practices may include containing excavated material, protecting exposed soils, using silt fences, stabilizing restored material, and revegetating disturbed areas with non-invasive species. As noted above, turbines have been sited at least 50 feet from the top edge of any open public ditches.

8.19 Vegetation

Describe the dominant vegetation and cover types for the following: agricultural lands (row crops, hay /pasture, other), non-agricultural upland (prairie, other grasslands, brushlands, and upland woods) and wetlands (wooded, marshes, bogs, fens). Provide a table with the estimated number of acres of each land cover type and the number of acres to be impacted by the project, including permanent and temporary impacts. Provide a discussion of mitigation measures.

The western portion of the Project Area is located in the Minnesota River Prairie Subsection (251Ba). Vegetation at the time of the public land survey (1847 to 1907) in this subsection consisted primarily of tallgrass prairie and wetlands. The eastern portion of the Project Area is located in the Oak Savanna Subsection (222Me). Vegetation at the time of the public land survey in this subsection consisted primarily of bur oak savanna. Maple-basswood forests were also common. Today these subsections consist primarily of farmed agricultural land (MNDNR, n.d.-d).

Table 8-27 summarizes the land cover types within the Project Area. Based on the 2021 National Land Cover Database (NLCD), the Project Area is primarily cultivated crops.

Table 8-27: Land Cover in Project Area

Land Cover Type	Acres	Percent of Project Area
Agricultural		
Cultivated Crops	24,420.0	93.8
Hay/Pasture	66.6	0.3
Developed		
Developed, Open Space	735.2	2.8
Developed, Low Intensity	125.7	0.5
Developed, Medium Intensity	267.8	1.0
Developed, High Intensity	23.5	0.1
Forest		
Deciduous Forest	163.6	0.6
Evergreen Forest	5.3	<0.1
Mixed Forest	20.0	0.1
Wetland/Open Water		
Open Water	14.4	0.1
Woody Wetlands	23.6	0.1
Emergent Herbaceous Wetlands[1]	95.1	0.4
Herbaceous	84.3	0.3
Barren Land	0.9	<0.1
Total	**26,045.9**	**100.0**

[1] The NLCD Wetlands cover type consists of areas where perennial herbaceous vegetation accounts for greater than 80% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

Forested areas in the Project Area are primarily present surrounding residences as windbreaks and as gallery forests along the watercourses. Hay/Pasture and herbaceous lands are present primarily in areas near farmsteads and the margin of some waterbodies in the Project Area. Wetlands are generally associated with streams, and there are a numerous ponds present in the Project Area. The hay/pasture and herbaceous areas

may contain potential remnant native prairie areas. Native prairie is discussed in **Section 8.21.3** and may be present within the Project Area.

8.19.1 Potential Impacts

The primary impact from construction of the Project would be the cutting, clearing, and removal of existing vegetation within the construction workspace. The degree of impact would depend on the type and amount of vegetation affected, the rate at which the vegetation would regenerate after construction, and whether periodic vegetation maintenance would be conducted during operation. Secondary effects from disturbances to vegetation could include increased soil erosion, increased potential for the introduction and establishment of invasive and noxious weed species, habitat fragmentation and edge effects, and a local reduction in available wildlife habitat.

Cultivated cropland comprises approximately 97 percent of the permanent and temporary impacts. A summary of vegetation impacts is provided in **Table 8-28**. Cropland and vegetation will be permanently removed and replaced with turbine and crane pads, access roads, and a Project Substation. Temporary vegetation impacts will occur during construction of the access roads, crane paths, turning radii, laydown area, the installation of underground collection lines, workspace around turbines and crane pads, and/or intersection improvements. The turbines and access roads are sited to avoid forested areas to maximize turbine output and avoid tree removal. Limited tree clearing may be required for the construction of permanent infrastructure (e.g. access roads) or temporary construction activities (e.g., collection line ROW or crane paths). Trees along equipment delivery routes may require trimming or full removal. Tree clearing for safety reasons will be conducted outside of the bat active season, between November 1 and April 14, outside of the spring staging season, pup season, and fall swarming season for NLEB in Minnesota. Impacts on surface waters and wetlands are discussed in **Section 8.17** and **Section 8.18**, respectively. Less than one percent of the Project Area will be permanently converted to sites for wind turbines, access roads, and facilities.

Table 8-28: Summary of Land Cover Impacts

Land Cover Type	Temporary Impacts (acres)	Permanent Impacts (acres)
Agricultural		
Cultivated Crops	436.3	62.3
Hay/Pasture	0.1	<0.1
Developed		
Developed, Open Space	11.6	0.5
Developed, Low Intensity	2.3	0.3
Developed, Medium Intensity	0.4	<0.1
Developed, High Intensity	0.2	<0.1
Forest		
Deciduous Forest	0.5	0.1
Wetland[1]		
Emergent Herbaceous Wetlands	0.3	--
Total	**451.7**	**63.3**

Land Cover Type	Temporary Impacts (acres)	Permanent Impacts (acres)
1 The NLCD database is based off aerial photography and likely underestimates the wetlands in the Project Area. The water resource-specific datasets described in Sections 8.17 and 8.18 are more accurate. Note: addends may not sum due to rounding.		

As ground will be disturbed by equipment deliveries from different geographic areas, introduction of noxious weeds may occur, though WPL will work collaboratively with all Project construction parties to minimize and prevent the introduction of invasive species (as designated by the Minnesota Department of Agriculture (MDA) through the implementation of BMPs.

8.19.2 Mitigation Measures

WPL will follow the SWPPP and associated permitting requirements during construction and will restore disturbed soils and vegetation as soon as possible after construction activities are complete. In cropped areas, a temporary cover crop may be planted to stabilize soils depending on the timing of construction completion and the next growing season.

The following measures will be used to avoid and minimize impacts on existing vegetation in the Project Area during siting, construction, and operation to the extent practicable:

- Prioritize turbine, access road, and Project Substation siting on cultivated cropland.
- Avoid disturbance of wetlands during construction and operation of the Project. If jurisdictional wetland impacts are proposed, WPL will obtain the applicable wetland permits (see **Section 8.18**).
- Design the Project to minimize the need to clear existing trees and shrubs.
- Prepare a construction SWPPP and obtain a NPDES/SDS CSW General Permit.
- Use BMPs during construction and operation of the Project to protect topsoil and adjacent resources and to minimize soil erosion. Practices may include, but not limited to containing excavated material, protecting exposed soil, stabilizing restored material, revegetating non-cropland with non-invasive species, and (wherever feasible) using a seed mix that matches the surrounding impacted areas (i.e., roadside mix, grazing mix, etc.) in cooperation with landowners.
- Use BMPs to limit the transfer of invasive species during construction such as washing construction vehicles.

8.20 Wildlife

Describe existing wildlife resources and expected impacts to habitats, species, and populations, including a discussion of the results obtained from the USFWS Wind Turbine Guidelines Tier One and Tier Two screening process. Provide documentation and/or studies used in Tier One and Tier Two process. If the results from Tier One and Tier Two screening indicate the need for Tier Three field studies, provide the questions or data gaps to be answered by the field studies and a schedule for completing the work. Include whether or not the impacts will be temporary or permanent. Additional studies may be needed (Tiers Four and Five) based on the results of Tier Three.

8.20.1 Existing Wildlife Resources

The Project Area consists of mostly agricultural land, with inclusions of grassland/hay/pasture, forest, and

wetlands and waterways that provide suitable habitat for a variety of common wildlife species. Information from the Minnesota Biological Survey (MBS), the Breeding Bird Survey (BBS), and field surveys were used to identify wildlife species typical of the Project Area and within the county.

8.20.1.1 Birds

Given the agricultural landscape, avian species most likely to use the Project Area include those most commonly found in cultivated fields, pasturelands, and disturbed lands. Various migratory and resident bird species may use the Project Area as part of their life cycle. Migratory birds may use the Project Area for resting, foraging, or breeding activities for only part of the year. Resident bird species occupy the Project throughout the year.

The Minnesota Breeding Bird Map List includes 246 species found by the MBS during the breeding season. In Freeborn County, 118 species were recorded with counts ranging from one to 38. Birds with the most counts included red-winged blackbird (*Agelaius phoeniceus*), common yellowthroat (*Geothlypis trichas*), house wren (*Troglodytes aedon*), song sparrow (*Melospiza melodia*), American robin (*Turdus migratorius*), common grackle (*Quiscalus quiscula*), mallard (*Anas platyrhynchos*), yellow warbler (*Setophaga petechia*), sedge wren (*Cistothorus platensis*), and American goldfinch *(Spinus tristis)* (MNDNR, 2014a).

BBS data from the Hartland BBS Route 50003, which runs east-west from east of Geneva to just west of Hartland, and bisects the southern portion of the Project Area, had a total of 116 breeding and nonbreeding bird species with the most common species being common grackle, American robin, red-winged blackbird, and Canada goose (Sauer et al. 2020).

During the avian surveys (see **Section 8.20.4**), the most abundant large bird species recorded were Canada goose (*Branta canadensis)* and snow goose (*Anser caerulescens*), and more than half the small bird observations were attributed to four species: red-winged blackbird (*Agelaius phoeniceus*), cliff swallow (*Petrochelidon pyrrhonota*), song sparrow (*Melospiza melodia*), and common grackle (*Quiscalus quiscula*). During the songbird migration surveys, four species accounted for more than 70 percent of observations: red-winged blackbird, common grackle, song sparrow, and cliff swallow.

Thirty-five bald eagle observations were recorded during avian surveys conducted in 2017-2018. Thirty-four bald eagle observations were made during 2022-2023 surveys, and 12 additional observations were documented incidentally. Eagle use was highest during spring, followed by fall, winter, and summer. Flight paths and perch locations of bald eagles showed activity in spring generally spread throughout the Project area, with several flights observed along the Le Sueur River in the north-central Project area. Minnesota is outside of the breeding range of the Golden Eagle, but a small number of individuals are found in the state during migration and over winter (Katzner et al., 2020, NatureServe Explorer, 2022). The majority of the Golden Eagle's found in MN occur within the southeastern portion of the state (Goetzman, 2014), but there is a potential for them to migrate through the Project Area. No golden eagles were observed during surveys or incidentally.

Section 8.20.4 provides additional information on the birds observed during the avian surveys. Results of the surveys are provided in the Project's specific Bird and Bat Conservation Strategy (BBCS) in **Appendix G**.

8.20.1.2 Mammals

Many different species of mammal may occur in the Project Area and use the food and cover available from agricultural fields, pasture, woodland/forest, and wetland areas. As detailed in **Section 8.19**, the Project Area is dominated by cultivated crops (94 percent), including corn and soybean fields. Corn and soybeans are annual cover types that are typically used by a few common wildlife species on a limited seasonal basis. Species that may use agricultural land include white-tailed deer (*Odocoileus virginianus*), small mammals such as mouse [Family Muridae] and vole [Family Cricetidae] species, raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), coyote (*Canis latrans*), and groundhog (*Marmota monax*).

Grassland and wooded areas may be used by white-tailed deer, cottontail rabbit (*Sylvilagus floridanus*), squirrels [Family Sciuridae], and red fox (V*ulpes vulpes*). Wetland habitat within the Project Area may be used by mammalian species such as American beaver (*Castor canadensis*), mink (*Neogale vison*) and muskrat (*Ondatra zibethicus*).

Bats are discussed in **Section 8.20.4** and **Section 8.21**.

8.20.1.3 Reptiles and Amphibians

Reptile species known to use agriculture habitats include the common garter snake (*Thamnophis sirtalis*) and eastern fox snake (*Pantherophis vulpinus*). Though open water is limited in the Project Area, species may inhabit the wetland and open water areas in the Project Area, including the painted turtle (*Chrysemys picta*), and common snapping turtle (*Chelydra serpentina*).

Most amphibian species that may occur are likely limited to non-agricultural areas, wetlands, and riparian habitats within the Project Area. Amphibian species known to occur in Freeborn County and that may occur within the Project Area include the American toad (*Anaxyrus americanus*), gray treefrog (*Hyla versicolor*), green frog (*Lithobates clamitans*), northern leopard frog (*Lithobates pipiens*), and tiger salamander (*Ambystoma tigrinum*). The northern leopard frog and American toad are also known to use agricultural habitats.

8.20.1.4 Insects

There are many species of insects and pollinators that may utilize the Project Area. Typically, these species inhabit native prairie. The potential native prairie identified and further discussed in **Section 8.21.3** will be field verified during the wetland delineation, which is anticipated to be completed in the spring of 2025. The Project is not anticipated to negatively impact insect species.

8.20.1.5 Fish

Fish may be present in the streams that traverse the Project Area or in ponds. Fish species typical of streams in the southern portion of the state include the black bullhead catfish (*Ameiurus melas*) bluegill (*Lepomis macrochirus*), common shiner (*Luxilus cornutus*), and yellow perch (*Perca flavescens*). WPL will bore collection lines underneath all waterways within the Project Area. Soil erosion and other potential pollutants will be controlled by the Project's SWPPP and other BMPs (e.g. dust control and dewatering) implemented to prevent impacts. Other Project infrastructure has been designed to avoid impacts to mapped and field verified streams, and therefore, the Project has no impact on fish species.

8.20.2 Waterfowl Feeding and Resting Areas

MN DNR has established waterfowl feeding and resting areas on selected lakes to protect waterfowl from disturbance. List any waterfowl feeding and resting areas in and adjacent to the project boundary.

Migratory Waterfowl Feeding and Resting Areas (MWFRA) are managed by the MNDNR to protect waterfowl from disturbance on selected waters of the state (MNDNR, 2024f). There are no MWFRAs within or adjacent to the Project Area. The nearest MWFRA is Upper Twin Lake, located approximately 13 miles south of the Project Area (MNDNR, 2016c).

8.20.3 Important Bird Areas

Identify Important Bird Areas (IBA) within and adjacent to the project boundary. IBAs provide essential habitat for one or more breeding, wintering, and migrating species of bird.

Important Bird Areas (IBAs) are voluntary and non-regulatory, and part of an international conservation effort. The program relies on participation of private landowners, public land managers, and community members: to identify the most essential habitats for birds and designates IBAs in Minnesota; monitor these areas for changes to birds and their habitats; and conserve these areas for long-term protection of birds (MNDNR, 2024g). There are no state or global IBAs within or near the Project Area. The closest IBA is Elk Creek Marsh, located approximately 26 miles south of the Project boundary in Iowa (Audubon Minnesota, 2022).

8.20.4 Bird and Bat Surveys

Western EcoSystems Technology, Inc. (WEST) conducted avian use surveys; raptor and eagle nest surveys; bat habitat assessments; activity surveys; and presence/probable absence acoustic surveys for the Project and surrounding area. Results of these surveys are summarized below and detailed in the Project's BBCS. The BBCS summarizes the voluntarily implemented studies/results assessing the potential environmental impacts that may result from construction and operation of the Project. The BBCS is a draft document that will be updated throughout the permitting process as revisions or approval of the Incidental Take Permit (ITP) occurs. The BBCS referenced throughout this Application and included in **Appendix G** was updated on November 7, 2024 to include results of the 2024 bat studies and to update the status of the Habitat Conservation Plan (HCP).

8.20.4.1 USFWS Land-Based Wind Energy Guidelines

The USFWS released the Land-Based Wind Energy Guidelines (WEG) on March 23, 2012 to provide a structured and scientific approach to wildlife concerns throughout the various stages of land-based wind energy development. The WEGs also encourage effective communication between wind energy developers and federal, state, and local conservation agencies and tribes.

The WEGs introduce a tiered approach for assessing potential impacts on wildlife and their habitats. This approach involves a decision-making process that collects information in increasing detail, quantifies the potential risks of proposed wind energy projects to wildlife and habitats, and evaluates those risks to inform siting, construction, and operation decisions. Each tier builds upon the previous one, refining and expanding on the issues raised and efforts undertaken.

At each tier, developers are provided with a set of questions to identify potential problems associated with each phase of the project and guide the decision-making process. The tiered approach is designed to assess the risks of project development by formulating questions that relate to site-specific conditions regarding

potential species and habitat impacts.

The tiers are outlined as follows:

1. Tier 1: Preliminary evaluation or screening of sites, which involves a landscape-level screening of possible project sites based on readily available public information.
2. Tier 2: Site characterization, which includes a comprehensive characterization of one or more potential project sites through consultation with appropriate agencies/authorities and one or more reconnaissance level site visits by a wildlife biologist.
3. Tier 3: Field studies to document site wildlife conditions and predict project impacts, which entails site-specific assessments at the proposed project site using quantitative and scientifically rigorous studies such as acoustical monitoring, avian surveys, and nest surveys.
4. Tier 4: Post-construction mortality studies, which evaluate direct fatality impacts.
5. Tier 5: Other post-construction studies, which assess direct and indirect effects of adverse habitat impacts and how they can be addressed. These studies are not typically conducted for most projects and may include displacement and/or use studies and curtailment effectiveness studies.

The tiered approach allows developers to determine if they have sufficient information to proceed with project development or if additional information gathered at a subsequent tier is necessary to make informed decisions. The WEGs recognize that wind energy developers who voluntarily adhere to these guidelines undertake a robust level of wildlife impact analysis and share the responsibility with the USFWS to uphold the scientific standards of the guidelines for wise development decisions.

It is important to note that not all five tiers are recommended or necessary for every project.

8.20.4.2 Results of Tier 1 and Tier 2 Analysis

Results of the Tier 1 and Tier 2 site evaluation and characterization are incorporated into the Project's BBCS (**Appendix G)**. Tier 1 studies provide a preliminary evaluation or screening of public data from federal, state, and tribal entities and offer early guidance to project proponents about sensitive wildlife resources found within the site. Tier 2 studies provide an evaluation of effects of the proposed Project on any federal or state listed species and other sensitive species. Based on the results of the Tier 2 analysis and agency coordination, Tier 3 wildlife studies were completed for the Project.

8.20.4.3 Results of the Tier 3 Process

Tier 3 wildlife surveys were conducted to further evaluate wildlife usage throughout the Project Area. These studies followed the Tier 3 approach outlined in the WEGs and the *Avian and Bat Survey Protocols for Large Wind Energy Conversion Systems in Minnesota*, as established by the MNDNR and DOC. Eagle surveys followed the recommendations from the WEGs, the USFWS 2013 Eagle Conservation Plan Guidance, and the USFWS 2020 Updated Eagle Nest Survey Protocol. Their purpose was to evaluate the potential risks associated with the Project. The specific studies and when they were conducted are listed in **Table 8-29** and detailed in the BBCS (**Appendix G**).

Table 8-29: Tier 3 Wildlife Studies

Survey Type	Study Period
Avian Use Surveys	October 2017 to September 2018 June 2022 to May 2023
Raptor Nest Survey	May 2018 and March 2022
Bald Eagle Nest Monitoring	June 2022
Eagle Nest Survey	March 2024
NLEB Habitat Assessment	2018
NLEB Presence/Probable Absence Acoustic Surveys	June 2018
General Bat Activity Surveys	March to October 2018
NLEB and TCB Bat Survey and Monitoring Work Effort	Summer 2024
Post-construction Facility Monitoring at the Bent Tree Wind Farm	July to October 2020
Post-Construction Facility Monitoring at the Bent Tree North Wind Farm	To be completed post-construction

Avian Use Surveys (2017 - 2018)

Avian use surveys were conducted for large birds/eagles, small birds, and songbird migration from October 2017 to September 2018. No federal or state threatened or endangered bird species were observed. A total of 13 *Species of Greatest Conservation Need (SGCN) were observed.*

One hundred and twenty (120) large bird use surveys were conducted over 12 visits. A total of 1,302 large individual birds representing 18 identifiable species were observed during the surveys. Thirty-five bald eagle o*bservations were recorded during th*e surveys. No golden eagles were observed during surveys or incidentally. Three SGCN were recorded in the fall including: northern harrier *(Circus hudsonius),* American kestrel *(Falco sparverius),* and Franklin's gull *(Leucophaeus pipixcan).*

A total of 1,228 individual small birds representing 40 identifiable species were observed during the surveys. Six SGCN were recorded, including sedge wren, bobolink *(Dolichonyx oryzivorus),* dickcissel *(Spiza americana)*, field sparrow *(Spizella pusilla)*, red-headed woodpecker *(Melanerpes erythrocephalus),* and eastern meadowlark *(Sturnella magna).*

A total of 1,156 observations representing 36 small bird species were documented over the course of 72 fixed-point songbird migration surveys. Four SGCN were recorded including grasshopper sparrow (*Ammodramus savannarum*), red-headed woodpecker, eastern meadowlark, and brown thrasher (*Toxostoma rufum*).

Avian Use Surveys (2022 - 2023)

Avian use surveys were conducted for large birds/eagles and small birds from June 22, 2022 to May 26, 2023. No federal or state threatened or endangered bird species were observed. A total of 12 *Species of Greatest Conservation Need (SGCN) were observed.*

A total of 3,192 individual large birds representing 28 identifiable species were observed during 215 large

bird surveys. Two species designated as both MNDNR SPC and Minnesota SGCN were observed: Franklin's gull, and trumpeter swan (*Cygnus buccinator*). Two additional species designated as Minnesota SGCN were observed: American kestrel and northern harrier. The trumpeter swan was not observed during the 2017-2018 surveys.

Thirty-four bald eagle observations were made during surveys, and 12 additional observations were documented incidentally. No golden eagles were observed during surveys or incidentally.

A total of 2,044 individual small birds representing 48 identifiable species were observed during 215 small bird surveys. Eight species designated as Minnesota SGCN were observed, including common nighthawk (*Chordeiles minor*), yellow-headed blackbird (*Xanthocephalus xanthocephalus*), dickcissel, black-billed cuckoo (*Coccyzus erythropthalmus*), bobolink, red-headed woodpecker, grasshopper sparrow, and upland sandpiper (*Bartramia longicauda*). The grasshopper sparrow and red-headed woodpecker were also observed during the 2017-2018 surveys.

Raptor Nest Surveys (2018)

Raptor nest surveys were conducted from March 22 to March 23, 2018 to record bald eagle and other raptor nests present within and near the Project Area. Eighteen nests were observed and included six active bald eagle nests within 10 miles of the Project area; seven raptor nests within one mile of the Project Area; and five additional large raptor nests outside the one-mile buffer (these were consistent with bald eagle nests). The nearest active bald eagle nest was located five miles east of the Project Area, along Geneva Lake. The nearest large raptor nest that was consistent in size and shape with a bald eagle nest was located 0.9 mile northwest of the Project Area. Because no active bald eagle nests were documented within two miles of the Project Area, no follow up ground-based nest-monitoring was conducted at the Project in 2018.

Raptor Nest Surveys (2022)

Raptor nest surveys were conducted within the Project Area and a one-mile buffer from May 2 to May 5, 2022 to determine if eagle or other raptor nests were present within and near the Project. A bald eagle nest was identified on May 4, 2022, within the Project Area. Two surveys were conducted on June 2 and 7, 2022, to determine whether the nest was an active bald eagle nest and would warrant monitoring throughout the breeding season. The nest was confirmed to be an inactive bald eagle nest during these checks.

Four other raptor nests (presumed red-tailed hawk) were observed outside of the Project area but inside the one-mile buffer. Additionally, two bald eagles, unassociated with a nest, were incidentally observed within the Project and one-mile buffer. Ten red-tailed hawks and eight American kestrels were also observed in or adjacent to the Project and one-mile buffer over four days of surveys.

Bald Eagle Nest Monitoring (2022)

Bald eagle nest monitoring surveys were conducted at a bald eagle nest that was first documented on May 4, 2022 (Westwood, 2022). Two surveys were conducted on June 2 and 7, 2022, to determine whether the nest was an active bald eagle nest and would warrant monitoring throughout the breeding season (Tuma and Voth 2022). The nest was confirmed to be an inactive bald eagle nest during these checks. The nest was in good condition, but no greenery or wash was observed to indicate recent tending, and no bald eagles were observed during either status check.

Eagle Nest Survey (2024)

An eagle nest survey was conducted within the Project Area and surrounding two-mile buffer from March

1 to March 2, 2024 to identify and record the location and status of all nests consistent in size and structure with bald eagle nests within the Survey Area. Collectively the Project Area and buffer are referred to as the Survey Area. Three eagle nests were observed within the Survey Area, including two nests (one active and one inactive) that were located within the Project Area and an additional active nest was within the two-mile buffer.

Bat Surveys

Eight bat species are present in Minnesota including the big brown bat (*Eptesicus fuscus*; most common), silver-haired bat (*Lasionycteris noctivagans*), eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), little brown bat (*Myotis lucifugus;* LBBA), NLEB, TCB, and evening bat (*Nycticeius humeralis*). All of Minnesota's bat species occur throughout the state, with the exception of evening bat which is known from a single location. The NLEB is federally listed endangered, and state listed as special concern, and the TCB is proposed to be listed as an endangered species. The big brown bat, LBBA, and TCB are also listed as special concern.

2018 Northern Long-eared Bat Habitat Assessment

The Project is within the range of the NLEB. In 2018, an NLEB desktop habitat assessment was conducted to better understand potential use of the Project Area by the NLEB and evaluate the availability of suitable habitat within and near the Project Area. The NLEB, which was federally listed as a threatened species at the time of the assessment is now federally listed as an endangered species. The largest expanse of potentially suitable summer NLEB habitat occurs in the south portion of the Project area. If NLEBs occur in the Project area during summer, they would most likely be found in forested habitat within the connected habitat buffer.

2018 Northern Long-eared Bat Presence/Probable Absence Acoustic Surveys

Acoustic surveys were conducted to assess potential impacts of the Project on the NLEB. Acoustic surveys were conducted from June 9 to June 12, 2018 at two sites within the Project area with two detector locations (stations). Detectors were placed in suitable habitat for NLEB, including forest edges, small clearings, and forest-canopy openings, near water sources and/or forested riparian edges.

A total of 2,318 bat call sequences were recorded. The average number of bat calls per detector night was 290. However, due to the nature and quality of the calls, biologists concluded that the six potential NLEB calls did not have characteristics indicative of NLEB; five of the potential NLEB calls were re-labeled as unidentified high-frequency calls and one was labeled as a probable LBBA call.

2018 General Bat Activity Report

General bat activity surveys were conducted from March 28 to October 31, 2018, to document bat activity patterns at a ‘ground station’ in cultivated cropland and a ‘raised station’ placed near forested habitat. The survey resulted in 622 detector-nights. Hoary bats and silver-haired bats were more frequently detected at the raised station, while big brown bats were more frequently detected at the ground station. Calls identified as potential TCB were only detected on 8.2 percent of detector-nights, and NLEB was the least-detected species (3.4 percent of detector-nights). A qualified bat biologist reviewed all calls classified as NLEB and did not identify any high-quality calls that could be confirmed as NLEB.

2024 Northern Long-eared Bat and Tricolored Bat Habitat Assessment

In 2024, an NLEB and TCB desktop habitat assessment was conducted as an update to the 2018 habitat

assessment. The assessment was completed in accordance with Phase I of the USFWS 2024 *Range-Wide Indiana Bat and Northern Long-eared Bat Survey Guidelines* (USFWS 2024b), which was approved for temporary use for TCB surveys until formal guidance is released for this species. Because the Project location is well north of the known range of the Indiana Bat (INBA), the assessment only focused on the NLEB and TCB.

The assessment area contained approximately 827 acres of potentially suitable TCB habitat, of which approximately 659 acres occurs within the Project area, and approximately 274 acres of potentially suitable NLEB habitat, of which approximately 194 acres occurs within the Project Area. A majority of the forested areas within the Project are small, fragmented patches associated with homesteads or shelterbelts, but there are some larger forested patches (greater than 10 acres) scattered throughout the Project Area that connect to forested areas within the assessment area (see Figure 6-10 in the BBCS in **Appendix G**). One forested patch (9.9 acres) within the Project Area was conservatively included as potentially suitable NLEB habitat in order to account for potential discrepancies in digitizing and/or aerials.

2024 Northern Long-eared Bat and Tricolored Bat Presence/Probable Absence Acoustic Surveys

Summer presence/probable absence acoustic surveys were conducted from the nights of June 7 to June 24 and July 26 to July 29, 2024, for a total of 168 detector nights recorded. The acoustic surveys followed the USFWS 2024 *Range-Wide Indiana Bat & Northern Long Eared Bat Survey Guidelines* (USFWS, 2024b) for non-linear projects. A total of 14 detector locations across nine sites were placed in suitable habitat for NLEB and TCB, including forest edges, small clearings, and forest-canopy openings, near water sources, and along forested riparian edges.

A total of 30,204 call files were identified to species by the automated classification software (Kaleidoscope). Kaleidoscope identified 62 potential NLEB calls and 196 potential TCB calls. Qualified acoustic analysts reviewed all files flagged as potential NLEB and TCB and recorded any other bat species observed during this process. All calls identified by Kaleidoscope as potential NLEB and TCB calls were reclassified as noise, unidentified high-frequency calls, or another species. During call labeling, qualified acoustic analysts confirmed the presence of big brown bat, hoary bat, silver-haired bat, eastern red bat, and LBBA. These results indicate probable summer absence of NLEB and TCB within the Project.

The BBCS has been updated to include results of the 2024 summer presence/absence surveys.

8.20.4.4 Planned Tier 4 Studies

WPL is planning to conduct post-construction monitoring surveys for potential direct impacts to birds and bats. This survey will be conducted in accordance with the Tier 4 guidelines from the USFWS and will adhere to the standards set by the MNDNR and DOC (MNDNR, 2014b). Surveys will be completed for mortalities per turbine with estimation of facility-wide fatality and will compare the existing public data of bird and bat mortality at projects with similar habitat types and study methodology. Survey results will be provided to the USFWS, DOC, and MNDNR no later than March 15 of the year following the surveys.

8.20.5 Potential Impacts

Provide an analysis and discussion of potential impacts of the project, proposed mitigative measures, and any adverse environmental effects that cannot be avoided.

Historically, the Project Area and surrounding region contained a variety of natural communities and habitat that supported diverse species of wildlife. As noted in **Section 8.19**, the Project is an area that historically

consisted primarily of tallgrass prairie and wetlands, and bur oak savanna. Maple-basswood forests were also common. As the historic vegetation has been converted to agricultural use, the wildlife species that occupy the landscape reflect the changes in habitat type and availability.

The Project Area is dominated by agricultural uses (cultivated cropland). The potential for habitat fragmentation impacts is low because the Project is sited on a previously disturbed landscape, particularly where turbines and facilities will be located. Based on studies of existing wind energy projects in the United States and Europe, the impact to wildlife would primarily occur to avian and bat populations (National Wind Coordinating Committee, 2010). The Project is likely to result in similar impacts to bird and bat species that have been documented at Bent Tree Wind Farm and other wind farms on agricultural land within southern Minnesota as described below.

WPL finalized a Bat HCP that was issued on October 25, 2024 and an ITP for 11 operational or proposed wind farms on lands owned or leased by WPL's and Interstate Power and Light (IPL) utilities. The HCP and ITP includes the Bent Tree North Wind Farm for coverage of incidental take of NLEB, TCB, INBA, and LBBA by operation of wind turbines. WPL will be submitting in 2025 an HCP implementation plan to the USFWS for Bent Tree North that will include a description of the development timeline process for the Project, the anticipated life of the Project, an evaluation of potential impacts to the covered species that could arise from construction and operation of the Project, the proposed minimization regime to be implemented at the Project, and an associated take assessment for the covered species. The HCP includes minimization and avoidance measures to protect these bat species. Minimization measures involve implementing avoidance strategies during project design, planning, and construction, as well as curtailment measures during operation. Additionally, the plan includes monitoring, mitigation, and adaptive management measures to reduce the impact on bat populations, including conducting compliance monitoring, implementing mitigation actions through a conservation bank, and setting up triggers for adaptive management based on monitoring data. WPL will follow the identified Project curtailment measures in accordance with the HCP.

8.20.5.1 Birds

Given the agricultural landscape, avian species most likely to use the Project Area include those most commonly found in cultivated fields, pasturelands, and disturbed lands. Many of the most-observed bird species within the Project Area were common, disturbance-tolerant species, similar to the results of surveys at other wind energy facilities in the region.

Shorebirds and waterfowl using saturated depressions within croplands in the Project Area as stopover habitat during spring migration may be more sensitive to displacement by Project turbines. European studies have shown that some waterfowl, shorebirds, and grassland songbird species can be displaced by turbines. For example, migrant shorebirds were displaced by 820 to 1,640 feet (250-500 meters) (Winkelman, 1990a and 1990b). In Denmark, some migrant shorebirds were displaced by up to 2,625 feet (800 meters) by the presence of wind turbines (Pedersen and Poulsen, 1991). However, shorebirds and waterfowl are likely to prefer habitat along the unaltered portions of Le Sueur River, Cobb River, and on Freeborn Lake, limiting displacement effects. Given that most lands within the Project Area are already disturbed and subject to human activity related to farming, and because most of the birds observed were common, disturbance-tolerant species, displacement effects are expected to be minimal.

Migratory birds and passerines accounted for the majority of avian mortalities at the Lakefield Wind Project located in Jackson County, MN, which is consistent with Strickland and colleagues (2011) who suggest that passerines are the most common mortality reported at wind energy facilities. Additionally, Westwood

(2015) showed that migratory songbirds accounted for the majority of avian mortalities at Lakefield.

During Project pre-construction surveys, bald eagles were observed throughout all seasons during both nest surveys. Their use of the Project Area was concentrated generally in the southern portion of the Project Area due to the presence of a nesting pair of bald eagles and a bald eagle nest within the Project Area. The majority of the bald eagle sightings occurred during the spring season and are attributed to the presence of the bald eagle nest instead of being attributed to large congregations of bald eagles within the Project Area. No golden eagles were identified within the Project Area during the avian use survey.

Additionally, eagle post-construction fatality monitoring (PCM) surveys were conducted at the existing Bent Tree Wind Farm, located south of the proposed Project, from February 8 to May 15, 2020. No eagle fatalities were observed during this PCM survey or incidentally by O&M staff.

WEST conducted one year of PCM studies at the existing Bent Tree Wind Farm from July 1 to October 16, 2020 to inform the risk management approach at the Project as part of WPL's multi-site, multi-bat species HCP. Fifteen bird carcasses were found at Bent Tree Wind Farm, comprising nine identifiable species: three unidentified large birds, two unidentified sparrows, two killdeer (*Charadrius vociferus*), and one each of downy woodpecker (*Dryobates pubescens*), magnolia warbler (*Setophaga magnolia*), mourning dove, ring-necked pheasant (*Phasianus colchicus*), rock pigeon, American white pelican (*Pelecanus erythrorhynchos*), Canada goose, and red-tailed hawk were found during carcass searches or incidentally on site. The American white pelican is listed as species of special concern in Minnesota. No federal or state-listed threatened and endangered bird species were documented during the surveys.

Based on the results of post-construction monitoring at the Bent Tree Wind Farm, estimated avian fatality rates at Bent Tree North Wind Farm would be expected to be around 0.35 (small birds) and 0.40 (large birds)/MW/year. **Table 8-30** summarizes avian fatality rates at southern Minnesota wind farms.

Table 8-30: Avian Fatality Rates at Southern Minnesota Wind Farms

Project	County, State	Adjusted Fatality Rates (birds/MW/year)	Year of Study	Study Citation
Bent Tree Wind Farm	Freeborn, MN	0.35 – 0.40	2020	Pickle and O'Neil, 2021
Pleasant Valley Wind Farm	Mower, MN	0.68	2016-2017	Tetra Tech, 2017
Grand Meadow Wind Project	Mower, MN	0.53-0.80	2013	Chodachek et al., 2014
Prairie Rose Wind Energy Facility	Rock, MN	0.44	2014	Chodachek et. al, 2015
Lakefield Wind[1]	Jackson, MN	2.75	2012	Westwood, 2013
		1.07	2014	Westwood, 2015
Elm Creek Wind I	Jackson, MN	1.55	2009–2010	Derby et al., 2010
Elm Creek Wind II	Jackson, MN	3.64	2011–2012	Derby et al., 2012
Odell	Cottonwood, Jackson, Martin, and Watonwan, MN	4.69	2016–2017	Chodachek and Gustafson, 2018

[1] Adjusted fatality rates for 2012 and 2014 are based on Huso et. al. 2012 methods.

Overall, adjusted fatality rates for all bird species vary between 0.35 (lowest) to 4.69 (highest)

birds/MW/year for the existing wind farms in southern Minnesota. Differences in study design, statistical modeling, and site-specific characteristics can make direct comparisons between wind projects difficult; however, it is likely that bird mortality rates at the Project will be comparable to those observed at Bent Tree Wind Farm due to similarities in avian species composition, land cover, land use, and location within the region. As such, bird mortality rates are not likely to significantly affect populations of most species, including species of conservation concern. Fatality estimates are relatively constant across the country except for in the Great Plains, where there appears to be lower avian fatality rates, and the Pacific region, where there may be slightly higher fatality rates. Most avian fatalities due to wind turbines are small passerines, about 60 percent of avian fatalities in publicly available reports in the United States. Fatality rates of migratory passerines increase in the spring and fall during migration (AWWI, 2017). The majority of avian species have a low risk of impacts at the population level (Allison et al., 2019). Based on the post-construction fatality studies outlined above, national averages for post-construction fatalities, and AWWI's conclusions about geographic trends, WPL anticipates that unavoidable avian fatalities due to collision will be at or below the national average and may result in limited localized impacts to some groups of birds, such as small passerines.

Eagle Take Coverage

Pre-construction surveys conducted for the Project determined there is risk for bald eagles at the Project. WPL is currently assessing options for eagle permits to ensure compliance with Bald and Golden Eagle Protection Act (BGEPA), including the potential option of pursuing an Eagle Incidental Take – Wind (Utility) General Permit (GP) for the Project, given that the Project will meet the GP eligibility criteria. To be eligible for a general eagle take permit under the USFWS 2024 eagle rule, a wind facility must 1) be in an area with relative abundance below the seasonal thresholds identified by the USFWS for both eagle species, and 2) not have a golden eagle nest within two miles or a bald eagle nest within 660 feet of turbine blades or other turbine infrastructure. The Project meets both of these criteria based on the proposed turbine locations and the 2024 eagle nest surveys (see **Section 8.20.4.3**).

8.20.5.2 Bats

Potential unavoidable impacts from the Project on bats are expected to be similar to the post-construction fatality rates at the above wind facilities, based on the similar land uses within the Project Area, geographic proximity of the projects, and similarities in species composition. Migratory tree-roosting bats (e.g., hoary bat, silver-haired bat, and eastern red bat), which were detected during the Project's pre-construction studies, may have the highest risk of collision based on previous bat fatality studies (AWWI, 2017). Unlike birds, wind facilities may present a risk to populations of migratory tree-roosting bats; in addition, although impacts from wind facilities on cave-roosting bats are typically low, even a small impact can be a risk to populations already impacted by white-nose syndrome (Allison et al., 2019). Overall, risk of mortality to bats in the Project Area is likely to be greatest on nights during fall migration, when the number of bats moving through the area are the highest. During the fall migration, weather conditions that are most conducive to higher mortality rates occur with warm temperatures (greater than 50 degrees Fahrenheit) and low wind speeds (less than 6.5 m/s or 14 miles per hour) (Baerwald and Barclay, 2009; Arnett et al., 2010; Good et al., 2011; Cryan and Brown, 2007). In addition, risk may be higher on the first night following the passage of a low-pressure system when the prevailing wind shifts from a southerly to a northerly direction (Cryan and Brown, 2007; Good et al., 2011).

Based on the results of post-construction monitoring at Bent Tree Wind Farm, estimated bat fatality rates at Bent Tree North Wind Farm would be expected to be around 9.92 bats/MW/year. **Table 8-31** summarizes bat fatality rates at southern Minnesota wind farms.

Table 8-31: Bat Fatality Rates at Southern Minnesota Wind Farms

Project	County, State	Adjusted Fatality Rates (bats/MW/year)	Year of Study	Study Citation
Bent Tree Wind Farm	Freeborn, MN	9.92	2020	Pickle and O'Neil 2021
Pleasant Valley Wind Farm	Mower, MN	1.80	2016-2017	Tetra Tech, 2017
Grand Meadow Wind Project	Mower, MN	3.11	2013	Chodachek et al., 2014
		1.05	2014	
Prairie Rose Wind Energy Facility	Rock, MN	0.41	2014	Chodachek et. al, 2015
Lakefield Wind[1]	Jackson, MN	19.87	2012	Westwood, 2013
		20.19	2014	Westwood, 2015
Elm Creek Wind I	Jackson, MN	1.49	2009-2010	Derby et al., 2010
Elm Creek Wind II	Jackson, MN	2.81	2011-2012	Derby et al., 2012
Odell	Cottonwood, Jackson, Martin, and Watonwan counties	6.74 (2.45-12.47)	2016-2017	Chodachek and Gustafson, 2018

[1] Adjusted fatality rates for 2012 and 2014 are based on Huso et. al., 2012 methods.

WPL determined there is potential risk (associated primarily with migration) at the Project to the following federally listed (or soon to be listed) bat species: NLEB, LBBA, and TCB. Since these species of concern have potential to occur within WPL's Iowa and southern Minnesota wind energy facilities, WPL has elected to take a programmatic approach to address potential risk to these species. The proposed effort, which is an agreement with the USFWS, will initially include nine Alliant Energy wind facilities. As described in **Section 8.20.5**, the HCP is a multi-site, multi-bat species HCP that includes avoidance, minimization, and mitigation actions taken for the benefit of the included species. The Bent Tree North Wind Farm will be included in this HCP once it becomes operational and will follow all conditions addressed in the HCP.

8.20.6 Mitigation Measures

WPL will implement the following measures to the extent practicable to minimize and/or avoid potential impacts to wildlife in the Project Area during Project design, construction, and operation:

- Prioritize turbine siting in cultivated cropland.
- Avoid siting turbines in mapped native prairie, native plant communities (NPCs), and SOBS (all ranks).
- Maintain, at a minimum, the three by five times the RD setback from adjacent WMAs to reduce risk to waterfowl/waterbirds and grassland-associated birds when siting turbines in the Project Area.
- Turbines will be sited more than 1,000 feet from suitable summer habitat for NLEB and (as assessed during the 2024 habitat assessment) and as much as possible from the smaller patches of potential TCB habitat to minimize risk to roosting bats.
- Per the multi-bat species HCP for the Project, feather turbine blades during low wind speeds to

minimize risk to bats and follow curtailment schedules.

- Avoid or minimize disturbance to individual wetlands or drainage systems during Project construction. Field delineations will be conducted prior to construction to identify the limits of wetland and other WOTUS boundaries in the vicinity of Project activities.
- Conduct a minimum of two years of post-construction Project monitoring to assess operational impacts to birds and bats depending on the Project's determined risk level (USFWS, 2012; MNDNR, 2014b).
- Protect existing trees and shrubs by avoiding tree removal for turbines, access roads, and underground collector lines. These will be identified based on aerial photos and during field surveys.
- Maintain sound water and soil conservation practices during construction and operation of the Project to protect topsoil and adjacent resources and to minimize soil erosion. To minimize erosion during and after construction, BMPs for erosion and sediment control will be used. These practices can include silt fencing, temporary seeding, permanent seeding, mulching, filter strips, erosion blankets, grassed waterways, and sod stabilization.
- Turbines will be sited more than 660 feet from known bald eagle nests and will minimize the number of turbines sited within one mile of bald eagle nests to the extent feasible. Furthermore, the construction footprint will be designed so that no construction activity will occur within 660 ft of documented bald eagle nests.
- To reduce avian collisions, low and medium voltage connecting power lines associated with the wind energy development Project will be placed underground.
- In general, the length and number of access roads will be minimized to the extent possible in the Project design, and existing roads will be used, where feasible.
- Light turbines according to FAA requirements, which will include ADLS radar.
- The use of high-intensity lighting, steady burning, or bright lights, such as sodium vapor, quartz, halogen, or other bright spotlights, will be minimized.
- All internal turbine nacelle and tower lighting will be extinguished when unoccupied to avoid attracting prey for nocturnal birds or bats.
- Inspect and control noxious weeds in areas disturbed by the construction and operation of the Project.
- Meteorological towers will be free standing; 2 towers will be permanent.
- Continue to update and implement the Project's BBCS during construction and operation of the Project. The BBCS is attached to this Application in **Appendix G**. This BBCS consists of WPL's corporate standards for minimizing impacts to avian and bat species during construction and operation of wind energy projects. The BBCS has been developed in a manner that is consistent with the guidelines and recommendations of the USFWS WEG (USFWS, 2012). It includes WPL's commitments to wind project siting suitability assessments, construction practices and design standards, operational practices, permit compliance, and construction and operation worker training. The BBCS also includes additional BMPs during siting/operation that will help minimize risk to eagles. It also includes additional avoidance and minimization measures that may be implemented in consultation with the USFWS and MNDNR if avian and bat mortalities exceed an acceptable level.

WPL is committed to minimizing wildlife impacts within the Project Area. WPL has designed the layout to minimize avian impacts by siting all turbines in cultivated crops and avoiding high use wildlife habitat

(woodlands adjacent to farmsteads), using tubular towers to minimize perching, placing electrical collection lines underground as practicable, and minimizing infrastructure. WPL will continue to consult with USFWS, and MNDNR regarding appropriate mitigation measures for wildlife impacts.

8.21 Rare and Unique Natural Resources

Describe any rare and unique natural resources, including habitat and community types, threatened, endangered, species of special concern as determined by the NHIS database. Detailed locations of these species should not be included in the application. Describe any surveys or known studies conducted for rare and unique resources and provide any avoidance and mitigation plans.

8.21.1 Federal and State Listed Species

A request for information and environmental review was submitted to the MNDNR and USFWS in February 2024. WPL received an official species list for the Project from the USFWS Minnesota-Wisconsin Ecological Services Field Office on March 19, 2024 (USFWS, 2024c). WPL received Natural Heritage Information System (NHIS) data for the Project from the MNDNR on April 10, 2024 (MNDNR, 2024h) and an update to the NHIS review for the Project was provided on April 12, 2024 (MNDNR, 2024i). The USFWS response identified six federally protected species and the MNDNR NHIS response identified 19 federal and/or state-listed threatened, endangered, special concern species as potentially occurring within the Project Area and surrounding region. The listed species and their potential occurrence within the Project Area are provided in **Table 8-32**. Copies of the requests and responses are in **Appendix A**.

Table 8-32: Federal and State Protected Species with Potential to Occur in Project Area

Species	Minnesota Status	Federal Status	Potential Occurrence within Project Area[1]
Plants/Trees			
Butternut	Endangered	–	Unlikely
Davis' sedge	Threatened	–	Unlikely
Edible valerian	Threatened	–	Occurs[3]
Hooded arrowhead	Threatened	–	Unlikely
James' sedge	Threatened	–	Unlikely
Minnesota fawnlily	Endangered	Endangered	Unlikely
Sullivant's milkweed	Threatened	–	Occurs[3]
Tuberous Indian plantain	Threatened	–	Occurs[3]
Western prairie fringed orchid	Endangered	Threatened	Unlikely
Wild quinine	Threatened	–	Unlikely
Animals			
Bald eagle[2]	–	BGEPA	Occurs[4]
Blanding's turtle	Threatened	–	Unlikely
Ellipse mussel	Threatened	–	Unlikely
Fluted-shell mussel	Threatened	–	Unlikely
Golden eagle	–	BGEPA	Possible
Henslow's sparrow	Endangered	–	Possible
Loggerhead shrike	Endangered	–	Unlikely
Monarch butterfly[2]	–	Candidate	Possible[7]

Species	Minnesota Status	Federal Status	Potential Occurrence within Project Area[1]
Mucket mussel	Threatened	–	Unlikely
Northern long-eared bat[2]	–	Endangered	Possible[5]
Pugnose shiner fish	Threatened	–	Unlikely
Rusty patched bumble bee	–	Endangered	Possible
Spike mussel	Threatened	–	Unlikely
Tricolored bat[2]	–	Proposed Endangered	Likely[6, 7]
Trumpeter Swan	Special Concern	–	Occurs[4]
Whooping crane[2]	–	Experimental population, non-essential	Possible
Wood Turtle	Threatened	–	Unlikely

[1] Unlikely – The Project is outside the species' known range or suitable habitat appears absent in the Project area. The species may have restricted mobility and population size; however, the species may occur in the Project during migration or other times of the year.
Possible – The Project is within the species' known range, but the Project contains limited suitable habitat; and/or the species is highly mobile and may occur year-round.
Likely – The Project is within the species' known range and contains suitable habitat.
Occurs – Records exist of the species' occurrence in the Project based on the sources described above or other survey data.

[2] Identified in the Critical Issues Analysis (CIA) as having potential to occur within the Project through a previous IPaC request (Westwood, 2024).

[3] These species are known to occur within the Project Area based on a Natural Heritage Information System query (MNDNR, 2024h and 2024i).

[4] Known to occur within the Project area based on pre-construction avian use surveys (McDonald and Pickle 2018; Pickle et al. 2023).

[5] A presence/absence survey in 2018 indicated probable absence of this species in the summer (Hyzy and McDonald 2019). However, it could migrate through the area in the spring or fall.

[6] Calls that Kaleidoscope software identified as potential tricolored bat calls were recorded during the 2018 pre-construction general bat acoustic surveys, but these calls were not qualitatively reviewed to confirm presence (Hyzy and McDonald 2019). It is possible that the species occurs in the Project area during the spring, summer, and/or fall.

[7] Species probability of occurrence within the Project was not reviewed in the CIA (Westwood, 2024).

8.21.2 Sites of Biodiversity Significance

Describe Minnesota County Biological Survey sites of biodiversity significance and native plant communities rated Moderate, High, or Outstanding within and adjacent to the project boundary.

Sites of Biodiversity Significance (SOBS) in Minnesota have been systematically mapped and ranked by the MNDNR as part of the MBS. The survey has led to the development of geospatial databases that illustrate the highest quality NPCs remaining in surveyed counties as well as SOBS within Minnesota that can help with decision-making when planning development and conservation efforts. Biodiversity significance ranks include outstanding, high, moderate, and below. Sites with a rank of "outstanding" contain the rarest species and examples of the rarest NPCs and/or the largest, most ecologically intact or functional landscapes. Sites with a rank of "high" contain very good quality occurrences of the rarest species, high-quality NPCs or important functional landscapes. Sites with a rank of "moderate" contain occurrences of rare species, moderately disturbed NPCs, and/or landscapes that have strong potential for recovery of NPCs and characteristic ecological processes. Sites ranked "below" lack occurrences of rare species or do not meet MBS standards for other rankings.

Five SOBS units are mapped within the Project Area as shown on **Map 11 – Unique Natural Features** (MNDNR, 2024j). Three SOBS units are classified as having "moderate" levels of biodiversity are located

along the abandoned railroad tracks running parallel to State Highway 13 (except through the City of Hartland) and include the areas designated as a Mesic Prairie NPCs. Two SOBS units are classified as having "below" levels of biodiversity. One of the "below" level SOBS units coincides with a freshwater emergent wetland located in the northeast portion of the Project Area and the other units coincides with a stand of deciduous forest in the south-central portion of the Project). No areas classified as "high" or "outstanding" occur within the Project Area.

8.21.3 Native Prairie and Native Prairie Bank Program

Identify any native prairie within or adjacent the project boundary. Identify lands enrolled in the Native Prairie Bank Program (number of acres) and any associated Prairie Protection Plan. Turbines are generally not permitted in native prairie. Any direct impacts to native prairie will require a biological survey, and/or a native prairie protection plan, prior to construction. Recommendations for setbacks from native prairie will be limited to site-specific conditions that warrant additional protection, such as prairie chicken habitat, associated wetland complexes, public waters, or other important wildlife uses.

MNDNR maps native prairie, NPCs, and railroad ROW prairie. While MNDNR digital data and maps are useful as an initial screening to identify known location of native prairie, the information is not based on comprehensive surveys. Therefore, there is potential for native prairie to exist in the Project Area that is not included in these data. The MNDNR's 2011 guidance recommends that all grasslands, including hayfields, pastures, and fallow lands be evaluated as potentially harboring native prairie (MNDNR, 2011).

Six NPCs were identified within the Project Area (**Map 11 – Unique Natural Features).** All six NPCs are mostly linear features located along the abandoned railroad tracks and consist of Mesic Prairie ranging from 0.4 acre to 8.5 acres within the Project Area. Two NPCs are located adjacent to the southern Project boundary and include a Mesic Prairie and Southern Mesic Oak-Basswood Forest. Native prairies are a subset of the NPC dataset. (MNDNR, 2024k).

Two linear MBS railroad rights-of-way prairies are mapped along the abandoned railroad generally north of 327th Street (see **Map 11 – Unique Natural Features)** and overlap with three of the NPCs. The sites are classified as Mesic and given a quality rank of Fair based on the low percentage of native prairie plant species observed during the survey (MNDNR, 2017).

WPL conducted a desktop native prairie evaluation in February 2024 and identified 11 areas of potential native prairie in addition to the mapped native prairie, NPCs, and railroad ROW prairie areas (see **Map 11 – Unique Natural Features)**. The desktop evaluation involved utilizing historical aerial imagery, geospatial information on native prairies and plant communities, USDA CRP information, and USFWS NWI. Areas that were excluded from consideration included: row crops or tilled fields, bare or develop ground, forests, wet meadows with clear signature of reed canary grass, and open water or inundated wetlands. Based on the preliminary site layout, no Project facilities will impact the potential native prairies identified in the Project Area. All infrastructure is setback the appropriate distance to mitigate adverse impacts. WPL will field verify the presence or absence of native prairies during the wetland delineations.

A Native Prairie Bank easement is a voluntary agreement between a landowner and the MNDNR. The landowner agrees to manage the land under an easement in ways that protect the native prairie. Each easement is tailored to the unique character of the land and desires of the landowner, with common protection features such as no plowing or building on the native prairie. The Project Area does not include a Native Prairie Bank/Prairie Corridor (MNDNR, n.d.-e).

8.21.4 Potential Impacts

Project infrastructure will be sited to avoid MNDNR SOBS and NPCs. Potential impacts to rare and unique natural features are discussed in **Section 8.20.5**.

8.21.5 Mitigation Measures

No impacts to MNDNR SOBS or NPCs are anticipated, therefore no mitigation measures are proposed. Mitigation measures for wildlife are discussed in **Section 8.20.6**.

8.22 Climate Change

Minnesota has been taking more action against climate change. Executive Order 19-37 (Climate Change Executive Order), signed in December 2019, created the Governor's Advisory Council and the Climate Change Subcabinet to coordinate climate change mitigation and resilience strategies in the State of Minnesota. The subcabinet's 2020 Annual Report to the Governor describes climate change as an existential threat that impacts all Minnesotans and our ability to thrive. It also encourages State leaders and policy makers to consider equity in our state's response to climate change (MPCA, 2020).

The Next Generation Energy Act set statutory goals to reduce GHG emissions in the State by 80 percent between 2005 and 2050, while supporting clean energy, energy efficiency, and supplementing other renewable energy standards in Minnesota. Interim goals were also set: a 15 percent reduction by 2015, and a 30 percent reduction by 2025. Minnesota's GHG emissions declined 23 percent between 2005 and 2020. If current trends continue, the State is on track to meet the goal of reducing emissions 30 percent by 2025. Since 2005, emissions from the electricity generation sector have declined by 54 percent, mainly because of producing energy from renewable sources like wind and solar instead of coal (DOC and MPCA, 2023).

In 2022, the Governor and Lt. Governor introduced Minnesota's Climate Action Framework that updates Minnesota's climate goals to reduce emissions 50 percent by 2030 and achieve net-zero emissions by 2050.

According to the MPCA, electricity generation has historically been a major source of air pollution in Minnesota and is the second largest source of greenhouse gas emissions (and is also the sector in which the greatest reductions in emissions have occurred) (MPCA, 2024d). Based on the most recent emissions data from 2022, there is one source of emissions within the Project Area. Northern Natural Gas – Albert Lea natural gas compressor station is located in the northeastern section of the Project Area, and releases ammonia, carbon monoxide, CO_2, nitrogen oxides, sulfur dioxide, volatile organic compounds, PM Primary, PM 2.5 Primary, and PM 10 Primary. There are two sources of emissions immediately north and northeast of the Project Area boundary, but within five miles of the Project Area. Cargill Animal Nutrition releases ammonia, polycyclic aromatic hydrocarbons (PAH), benzene, and formaldehyde, and Lee J Sackett Inc. releases ammonia, PAHs, benzene, and acetamide (MPCA, n.d.-c). The nearest active air monitoring station, which is approximately 50 miles east of the Project Area in Rochester, Minnesota, identified 87 percent of the Air Quality Index (AQI) days as having "good" air quality, with the remainder classified as "moderate" (MPCA, 2024e).

The Applicant prepared a CO_2 emissions estimate for the Project during construction and operations (**Appendix I**). This estimate is based on the number and type of equipment, the days and duration, and the estimated fuel consumption to determine the total amount of gas and diesel fuel used during construction and operation of the Project. The calculations also include the annual CO_2 emissions of the Project during operations, onsite vehicle traffic, and Project staff commuter traffic to and from the Project Area.

Based on these calculations, the Project is estimated to generate approximately 8,144 short tons of CO_2 during the Project construction phase, and 28 short tons of CO_2 annually during the operational life of the Project.[6] The Project is expected to offset approximately 433,018 short tons of CO_2 equivalent annually. The total CO_2 emissions estimated to be produced by the construction and operation of the Project will be minimal when compared to the reduction in CO_2 emissions the Project will result in long term.

8.22.1 Impacts and Mitigation Measures

Per Minnesota Statute § 216B.1691 Renewable Energy Objectives, which became effective in 2023, all electric utilities are required to generate or procure 100 percent of electricity sold to Minnesota customers from carbon-free sources by 2040, with an interim goal of 80 percent carbon-free electricity by 2030. Carbon-free sources are those that generate electricity without emitting CO_2. Electric utilities are also required to generate or procure 55 percent of electricity sold to Minnesota customers from an eligible energy technology by 2035. Eligible energy technology includes technology that generates electricity from solar, wind, and certain hydroelectric, hydrogen, and biomass sources. The Project will further Minnesota's Renewable Energy Objectives by providing a renewable source of energy that will help offset CO_2 and other GHG emissions, primarily from coal and natural gas.

The Project has been designed with resiliency in mind as climate continues to change in Minnesota. Project equipment has been carefully engineered and selected to withstand the potential for an increase in the frequency of severe weather events. As an example, the turbines being considered for the Project have an operating temperature of -30°C to 45°C (-22°F to 113°F) and will include the manufacturers Low Temperature Turbine Package.

The Project will ultimately be a large contributor to CO_2 emissions reduction due to the Project's ultimate energy generation from renewable sources and, therefore, would assist in achieving the CO_2 emissions reduction and carbon-free electricity goals outlined by the State of Minnesota.

9.0 SITE CHARACTERIZATION OF WIND RESOURCES

The United States Department of Energy and the Minnesota Department of Commerce (DOC) have conducted wind resource assessment studies in Minnesota since 1982. In 2021, the National Renewable Energy Laboratory (NREL) for the U.S Department of Energy released maps for Land-Based Wind Speed: Multiyear Average at 100 meters Above Surface Level. Near the Project Area, the mean annual wind speed at 100 meters is expected to be 8.0 to 8.25 meters/second (m/s).

A 60-meter meteorological tower was installed for the project in November 2007. This tower was in operation until April 2019 when it was destroyed in an ice storm. A new tower was installed in the same location in August 2019 and remains in-service. Also, in order to obtain higher elevation wind speed, a Triton ground-based sodar unit was placed in service in August 2015 in the eastern portion of the project and was in-service until April 2022 when it was moved to the meteorological tower location. A Windcube ground based lidar unit was also installed near the meteorological tower in April 2024 for calibration purposes. After the calibration period, it is planned to locate the Windcube in the western portion of the project.

The meteorological tower is collecting wind speeds at 32 meters, 45 meters, and 58 meters, and wind

[6] This is an initial estimate based on the current energy mix in the U.S. Moving forward, with new regulations, increased renewables and use of electric vehicles, this estimate can reasonably be expected to decrease drastically and trend towards zero over the operational life of the Project.

direction at 44 meters and 57 meters. The ground based lidar and sodar unit collect data from 40 meters up to 200 meters. WPL reviewed and analyzed the meteorological information collected to design the project.

9.1 Site Wind Characteristics

9.1.1 Interannual Variation

Long term wind speed analysis found the mean annual wind speed is predicted to be 8.45 m/s, with a range of 8.03 m/s to 9.01 m/s. This range translates to an approximate variation of plus or minus 12 percent from the mean.

9.1.2 Seasonal Variation

Table 9-1 shows the expected wind speeds in the Project Area at the 120-meter level based on the wind resource analysis. The strongest winds are during the winter months with other strong winds in the late fall and early spring. The summer months of July and August have the lowest average wind speeds of 6.88 m/s and 6.89 m/s, respectively.

Table 9-1: Average Wind Speeds at 120 Meters

Month	Wind Speed (m/s)
	120 meters
January	9.12
February	9.1
March	9.02
April	8.98
May	8.47
June	7.69
July	6.88
August	6.89
September	8.42
October	8.8
November	9.12
December	8.95
Annual Mean	**8.45**

9.1.3 Diurnal Conditions

Figure 4 shows the expected diurnal variations of 120-meter wind speeds. Wind speeds are generally greatest in the night and early morning hours and decline at midday.

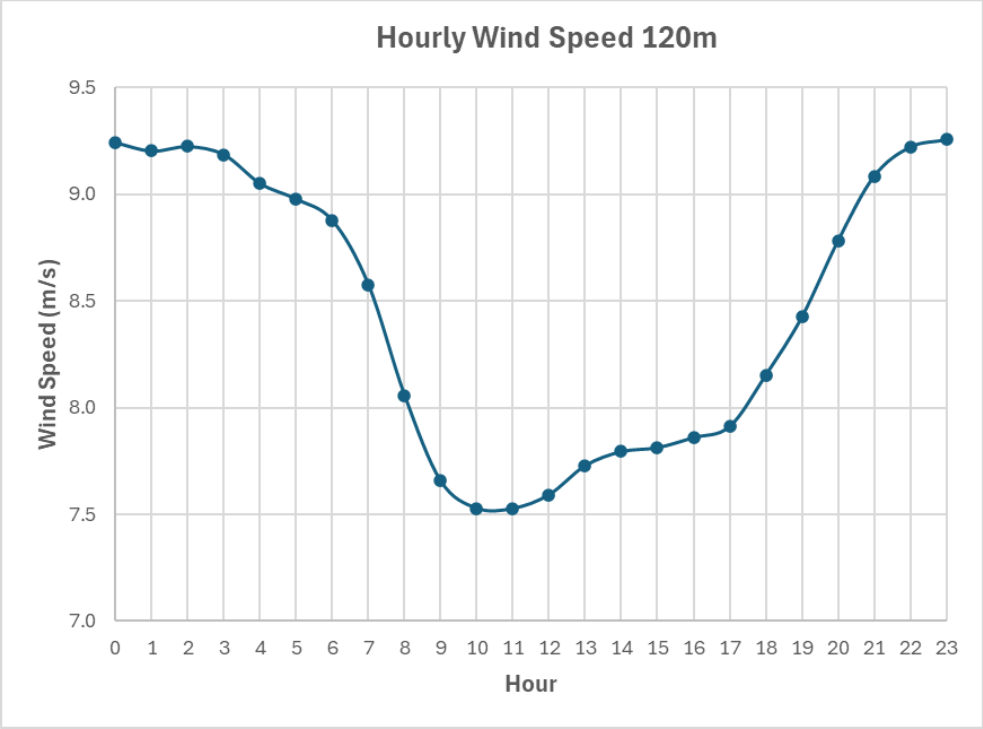


Figure 4: Average Hourly Variation of 120-Meter Wind Speeds

9.1.4 Atmospheric Stability

Project specific atmospheric stability has not been calculated. Based on other regional atmospheric stability data, WPL expects the approximate atmospheric stability profile to be as follows: (a) Neutral – 24 percent; (b) Stable – 47 percent ; and (c) Unstable – 29 percent.

9.1.5 Hub Height Turbulence

The Turbulence Intensity (TI) is defined as the measured standard deviation of wind speed over an hour, divided by the mean for the same time period. **Table 9-2** shows expected TIs for wind speeds ranging from 5 m/s to 30 m/s. TI values of less than 16 percent are generally acceptable to most major turbine manufacturers.

Table 9-2: Turbulence Intensities

Wind Speed Range (m/s)	Average TI (%)
5-10	7.7
10-15	7.0
15-20	7.8
20-25	8.8
25-30	10.9

9.1.6 Extreme Conditions

Extreme winds were calculated at the site using a Periodic Maxima method using a simple Gumbel-fit of the observed annual maximum wind speeds. Using these methods, the maximum 50-year 10-minute mean wind speed and 3-second gust for the Project are expected to be 34.4 m/s and 45.1 m/s, respectively. These values are calculated from data collected from the meteorological tower in the Project Area spanning about 2.7 years of measurements.

9.1.7 Wind Speed Frequency Distribution

Figure 5 presents a wind speed frequency distribution for the Project based on the wind resource analysis. 120-meter wind speeds range between 4 m/s and 13 m/s approximately 80 percent of the time, and between the cut in speed of 3 m/s and 25 m/s approximately 95 percent of the time.

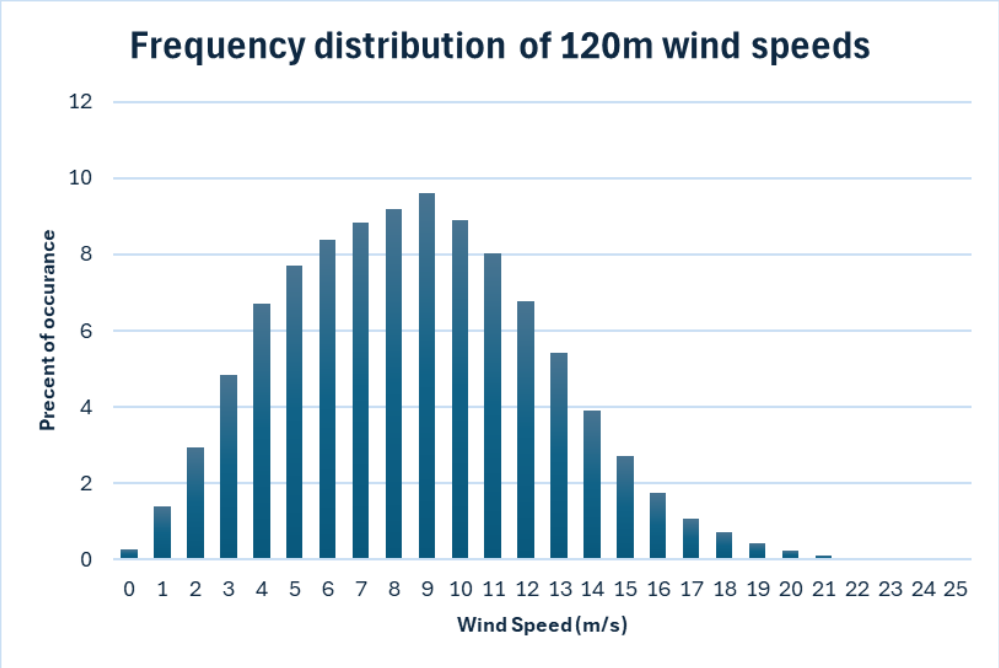


Figure 5: Frequency Distribution of Hourly 120-Meter Wind Speeds

9.1.8 Wind Variation with Height

Wind shear is the relative change in wind speed as a function of height. Wind shear is calculated using a power function based upon the relative distance from the ground. The general equation used for calculating wind shear is $S/S0 = (H/H0)\alpha$, where S0 and H0 are the speed and height of the lower level and α is the power coefficient. The power coefficient can vary greatly due to the terrain roughness and atmospheric stability. The power coefficient will also change slightly with variation in height. The vertical variation with height or shear alpha coefficient is 0.18 based on the 32- to 58-meter level at the meteorological tower.

9.1.9 Spatial Variations

The topography of the Project Area is relatively flat with gently rolling hills with elevations that range from approximately 1,176 to 1,350 feet above sea level. WPL expects locations with similar elevations to have similar wind speeds throughout the Project Area. No extreme slopes exist to drastically change the wind speed from one point to another. The meteorological tower is centrally located and well represented for the site conditions.

9.1.10 Wind Rose

In eight or more directions, including a diagram or illustrating wind rose.

A wind rose is a graphical presentation that shows the various compass points and specifies the frequency that the wind is observed to blow from a given compass point. Small-scale variations are expected in the Project Area depending on individual turbine height and exposure. The prevailing energy wind direction is S-SSE, with significant energy from the WNW-NNW sectors. **Figure 6** shows the expected wind rose for the Project Area from the wind resource analysis.

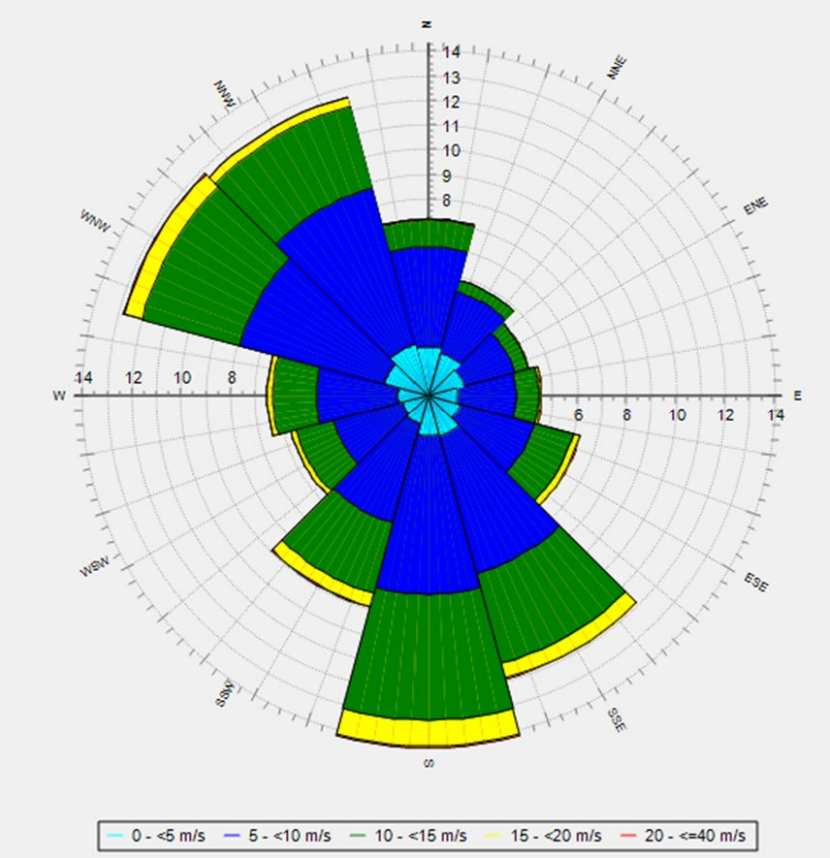


Figure 6: Wind Rose from Meteorological Tower

9.1.11 Other meteorological Conditions

Other meteorological conditions at the proposed site, including the temperature, rainfall, snowfall, and extreme weather conditions.

The Project Area has a climate that is characterized by cold winters and hot summers. Summers provide long periods of sunshine, and southerly winds bring warm, moist air from the south. In winter, the climate cools rapidly because solar insolation is reduced and northerly winds bring in cold, dry air from the north and west. The climate of the Project Area is quite uniform because there are no large bodies of water or sharply marked differences in topography within the area.

Information on other meteorological conditions including the temperature, precipitation, and extreme weather conditions is provided below.

9.1.11.1 Climate Conditions

The MNDNR Climate Explorer tool was used to provide a summary of historical climate data for Freeborn County (MNDNR, n.d.-f). The climate data that is presented in this tool was collected from nationally available sources, the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information, and the Parameter-elevation Regression on Independent Slopes Model (PRISM) Climate Group.

Climate variables reviewed include temperature and precipitation using available data from the past 129 years (1895-2023) for Freeborn County. As shown in **Figures 7 and 8**, average temperatures and precipitation have generally increased.

Temperature

The mean temperature in the county between 1895-2023 was 44.11°F, with the lowest average temperature in 1917 (39.5°F) and the highest average temperature in 1931 (49.66°F) as shown in **Figure 7**.

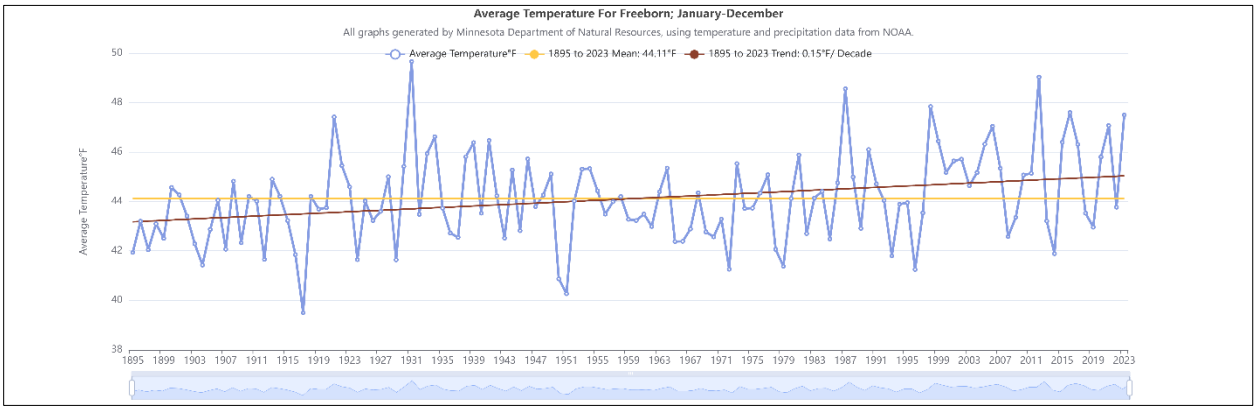


Figure 7: Average Annual Temperature for Freeborn County 1895-2023

Precipitation

The mean precipitation over this same 129-year period was 31.5 inches, with the lowest average precipitation in 1910 (16.07 inches) and the highest average precipitation in 1993 (47.81 inches) as shown in **Figure 8**.

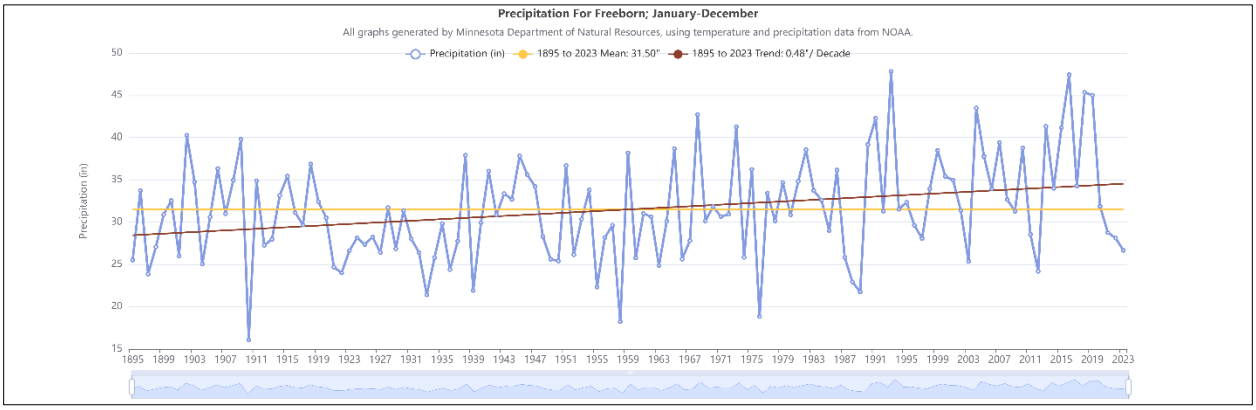


Figure 8: Average Annual Precipitation for Freeborn County 1895-2023

Extreme Weather

Extreme weather events for the Project Area include hail, thunderstorms, blizzards, tornadoes, extreme cold/wind chill, flash floods/floods, heavy snow, excessive heat, ice storms, and droughts. The most frequent events are hail, thunderstorms, and blizzards. Extreme weather events that occurred over the past 20 years (January 1, 2003, to December 31, 2023) in Freeborn County are summarized in **Table 9-3** (NOAA, 2024).

Table 9-3: Freeborn County Extreme Weather Events from 2003 to 2023

Weather Event	Number of Days with Event
Hail	50
Thunderstorm Wind	48
Blizzard	15
Tornado	12
Extreme Cold/Wind Chill	13
Flash Flood	12
Heavy Snow	8
Flood Event	7
Heavy Rain	5
Excessive Heat	4
Ice Storm	1
Drought	0
Highest Temperature (°F) in 2013	101
Lowest Temperature (°F) in 2019	-29

The most frequent events (hail, thunderstorms, and blizzards) are usually of short duration and localized, leading to damage in small geographic areas. Of the 12 tornados recorded in Freeborn County, most were between 40-135 mph, but two were between 136-165 mph, and one was between 166-200 mph. In high winds, the turbine blades "feather" into the prevailing wind direction to increase aerodynamics and reduce wind resistance, and the turbines shut down above the cut-out wind speed (32 m/s or 72 miles per hour). Wind turbines are not designed to survive tornado-force winds of 89+ m/s (200+ miles per hour).

According to data from the Albert Lea Reporting Station 210075, the lowest temperature recorded in the past 20 years (2003-2023) was -29°F in 2019 and the highest temperature recorded was 101°F in 2013 (HPRCC, 2024). The wind turbines being considered for the Project operate at temperatures between -22°F to 113°F and will be designed to automatically shut down when temperatures are outside the operating temperature range.

In the winter, icing events are variable in frequency. It is expected that the average annual energy loss will be approximately 1.7 percent or less due to icing. In icy weather, the turbines stop turning due to loss of aerodynamics, as well as imbalance resulting from unequal ice loads.

According to MNDNR (2024l), Minnesota will continue to see increased temperatures and larger, more frequent extreme precipitation events. Turbines proposed for this Project are capable of withstanding most

of the extreme weather conditions that occur in the area and will include accessory equipment for operation in cold weather and lightning protection systems.

9.2 Location of Other Wind Turbines

There are two commercial wind farms within 10 miles of the Project Area (**Map 2 - Existing Wind Turbines in the Project Vicinity**). The Bent Tree Wind Farm is immediately south of the Project Area and contains 122 Vestas V82 turbines that generate 1.65 MW each. The Oak Glen Wind Project is about 9.5 miles northeast of the Project Area and contains 24 Vestas V90 turbines that generate 1.8 MW each. Both of these wind projects began operating in 2011.

10.0 PROJECT CONSTRUCTION

Describe the manner in which the project will be constructed, including impacts, mitigation, and any best management practices to be used during construction for each of the following:

Project construction consists of site work (e.g. vegetation clearing, grading), construction of access roads, crane pads upon which the erection cranes will rest, laydown area(s) for large turbine components, temporary turning radii on existing public roads, removal of excess access road width upon completion of turbine erection, and development of temporary crane paths from time to time.

Construction also includes reclamation of the laydown area(s) and temporary turning radii to the original land use, or in accordance with local governing bodies. Upon completion of construction, laydown area(s), temporary roads, and temporary crane paths will be reclaimed to their original use.

A summary of construction activities expected for the Project are as follows:

- Final turbine micro-siting.
- Final survey for access roads and collector system.
- Construction of laydown area for equipment and material storage and work trailer location.
- Construction of access roads.
- Improvements to local roads.
- Installation of collector system including electrical and communication cables.
- Installation of Project Substation.
- Installation of tower foundations.
- Wind turbine tower erection.
- Setting of nacelle, rotor, and blades on the tower.
- Checkout, testing, and commissioning of Project.
- Restoration of site including removal of crane pads, excess access road width, and restoration of laydown areas.

10.1 Local Roads and Infrastructure

Estimate the potential impacts of construction vehicles on the local roads, including potential locations where local roads would need to be modified, expanded, or reinforced in order to accommodate delivery of turbines.

WPL anticipates that improvements to local roads will be necessary for equipment deliveries. The specific locations where road improvements will be necessary will be dependent on the final Project layout and corresponding haul routes.

Transportation of equipment and materials associated with the construction of wind farms involves oversized and/or overweight loads and road use that is not consistent with normal traffic in the Project Area. Designated haul roads will be reviewed with the local authority having jurisdiction over the haul roads and road use agreements will be executed where required. Road use agreements will be used to identify suitable travel routes; traffic control measures; methods for evaluating, monitoring, and restoring roads; and mitigation measures to ensure roads used for oversize/overweight loads are properly identified, monitored and stabilized.

Haul roads associated with the Project will utilize major travel routes to deliver turbine equipment and supplies. Primary routes for hauling necessary materials may include State Highway 13, CSAHs 10, 14, 33, and 35, and County Roads 67 and 77. Should these routes require road improvements or traffic control measures during the construction period, WPL and their contractors will implement appropriate safety measures.

Prior to construction, WPL will coordinate with the applicable local and state entities to ensure that the weights being introduced to area roads are acceptable. WPL will work with the City of Hartland; Freeborn, Steele, and Waseca counties if applicable, and MnDOT, as necessary, regarding roadway concerns, ROW work (if any), and setbacks during construction of the Project. WPL will also work closely with the landowners for the placement of access roads to minimize land use disruptions during construction and operation of the Project to the extent possible.

On February 9, 2024, the Applicant sent letters to MnDOT, the Freeborn, Steele, and Waseca counties, and the various Townships for comments on the Project. WPL met with MnDOT and county and township staff to introduce the Project and discuss the potential need for road use agreements. See **Section 13.0** for agency responses and information on county and township outreach and coordination. Based on Project design and research on local and state roadways and ROWs, the Project would require permits for installations or modification of road approaches, overweight and over-dimension loads to transport equipment and materials over local and state roads. In addition, roadway maintenance and repair, county ditch repair and movement of cranes over highways would also be involved.

MPUC general permitting standards places a 250-foot setback from the edge of a public ROW. WPL has designed the Project to adhere to the MPUC setback requirements for ROWs. Additionally, work in a ROW would require a permit from MnDOT. It is expected that additional coordination with Freeborn County and MnDOT will be required. Authorities having jurisdiction over any work performed within a public ROW may require permitting for temporary or permanent access including, but not limited to, placement or modification of utilities, temporary widening of field entrances, and location and construction of new access driveways.

10.2 Access Roads

Provide the total number of miles required for turbine access roads. Describe the materials to be used and construction of access roads, including roadbed depth and road width. Describe any associated site access control required for the project (fences or gates).

Access roads are necessary to connect the public roadway network to each turbine location. A total of approximately 12 miles of permanent access roads will be necessary, and permanent roadways will be gravel and approximately 16 feet wide. Actual final lengths of access roads will be determined by final turbine road layout, environmental constraints, landowner preferences and other factors. After construction is complete, a gravel roadway will be installed around the entire base of each turbine so as to facilitate driving around turbine bases. This gravel roadway around each turbine base will be approximately 25 feet wide.

The typical cross section of access roads will be dependent on terrain, grade, and drainage considerations. Access roads may incorporate geotechnical fabric and cement stabilization measures beneath the aggregate roadway cap. Also, if necessary, a final aggregate dressing may be placed on some of the turbine access roads.

Although not anticipated, the installation of access roads may require changes to gates, fences, or other existing landscape modifications. Modifications will be discussed with the landowners and gates and fences will be replaced or reconfigured in coordination with the landowner. Any damages to gates or fences resulting from construction or operation of the Project will promptly be repaired. WPL will work with landowners to ensure the location of access roads minimizes adjacent land use disruptions to the extent practicable. Access roads will be designed and constructed to include appropriate drainage and culverts as necessary and permits for drainage and culvert installation will be obtained as required.

To facilitate crane movement and equipment delivery during construction, crane pathway locations will be finalized based upon final turbine and road layout; landowner requests; avoidance of environmental constraints, such as wetlands, sites of biological significance, prairies, sensitive habitat; and other factors.

Access roads during construction will be installed to approximately 16 feet wide. Where access roads need to be widened for crane paths and equipment deliveries a compacted soil shoulder will be installed up to an additional 24 feet wide. This area will be reclaimed upon completion of construction. Where temporary installations are removed, areas will be graded to natural contours and soil de-compaction and re-seeding will occur as described further in **Section 10.5**.

The Project will include permanent gravel roads that provide access to the wind turbines. The primary function of the roads is to provide accessibility to the turbines for turbine maintenance crews. The roads will be low-profile to allow farm equipment to cross. Access road approaches and turning radii may be up to 200 feet wide during construction.

WPL designed the access road network to efficiently serve the Project, minimize environmental impacts, and reduce overall length as practicable. WPL also considered landowner input on road locations.

10.3 Other Associated Facilities

Describe any operation and maintenance buildings, other associated facilities, or met towers for the project. Include the number of road miles, number of acres required to accommodate the facility, size of facilities, and any other information needed to characterize the extent and impact of the associated facility.

The Project will include the installation two permanent meteorological towers, an electrical collection system, and the Project Substation. Meteorological towers are described in **Section 6.3.4**. The electrical collection system is described in **Section 5.3.1** and **Section 6.2**. The Project Substation is described in **Section 5.3.3** and **Section 6.1.2**.

As described in **Section 6.3.1**, WPL plans to use the existing Bent Tree Wind Farm O&M Facility.

The Project will also require grading of a main temporary laydown area, preferably centrally located, of approximately 15 acres to serve as: (1) a parking area for construction personnel; (2) a location for construction offices; and (3) staging area for turbine components, cable, pad mount transformers, junction boxes, and other material during construction. Other temporary staging areas may be needed for parking and unloading of large equipment deliveries. All laydown yards and staging areas will be located in upland agricultural land to avoid impacts to natural features such as wetlands and trees. All temporary staging areas will be sited in a location agreed upon by the Applicant and willing landowners. All affected areas will be restored in conjunction with the post-construction clean-up.

10.4 Turbine Site Location

Describe the type of foundation(s) to be used. Include the following: dimensions, surface area, and depth required, amount of soil excavated, materials used for the foundation and reinforcement, and a description of the tower mounting system.

See description of turbine foundations in **Section 5.2.2.1**.

10.5 Post-Construction Cleanup and Site Restoration

Describe the timeframe and methods for post-construction clean-up and site restoration. Include information on erosion control methods and materials, decommissioning of temporary roads, and site restoration plans.

Following the installation of turbines and the turbine being mechanically complete (fully erected), gravel driveways will be placed around the turbine and left in place throughout the Project's life. All temporary road radius improvements and temporary culverts will be removed and restored as turbines reach mechanical completion. For any section of state, county, or township road used as a haul route, the roadway will be restored to its pre-construction state, or better, as negotiated in road use agreements with the responsible road authority.

Areas temporarily disturbed by construction activities will be re-graded to original contours. Excavated soil will be used as backfill and to support the construction of access roads, and the remaining soil will be spread over temporary construction areas. Where excavated soil is spread and grading occurs, topsoil will be placed atop the excavated soils and the areas will be revegetated, if required. In areas where soil compaction occurred from construction activities, areas will be de-compacted, covered with topsoil, and revegetated as required.

Restored temporary construction areas will be reseeded unless the area is in a tillable agricultural field. In coordination with the landowner, areas within tillable agricultural fields where the landowner wants the land to be used again for agricultural purposes will be restored by the Applicant and then returned to agricultural use by the landowner. Reseeded areas (i.e., in areas outside of tillable agricultural fields) will be monitored to confirm that the seeding resulted in revegetation. Additional seed will be applied as

necessary. Storm water BMPs, such as silt fence and straw wattle, will not be removed until 70 percent revegetation/regrowth has occurred, unless the area is in a tillable agricultural field. If the area is in tillable agricultural field, a cover crop will be planted to minimize soil loss.

10.6 Operation of Project

Describe how the project will be operated and maintained after construction, including a maintenance schedule.

Once the turbines are erected and after completion of electrical infrastructure work, electric wiring is installed and checked, then the turbines are pre-commissioned and prepared for final testing, checkout, and commissioning. The Project will go through a test and calibration phase with test energy being exported to the electrical system. At the end of the test phase, the Project is ready for commercial operation.

The Project will be consistent with North American Electric Reliability Corporation (NERC) Reliability Standards. WPL affiliates will conduct operational monitoring of the Project through SCADA on a continual basis, 24 hours per day, seven days a week. Once the Project shifts into operations, the local O&M crew will be comprised of approximately 2 to 3 primary staff, who largely will be wind technicians, to carry out the maintenance on the turbines along with a site supervisor. These workers will work out of the existing Bent Tree Wind Farm O&M building.

10.7 Costs

Describe the estimated costs of design and construction of the project and expected operating costs. This can be described as approximate capital development costs and the general costs associated with project operation and maintenance.

WPL will file a CA application with the PSC that includes an expected installed cost of approximately $453 million (including allowance for funds used during construction) for the Project. Costs to interconnect to the transmission system are not included as MISO studies remain ongoing. The largest component of the total cost of the Project will be the turbine equipment. However, infrastructure costs for access road construction and electrical collection systems are also factors.

10.8 Schedule

Provide an anticipated schedule for completion of the project, including the time periods for land acquisition, obtaining a site permit, obtaining financing, procuring equipment, and completing construction. Provide the expected date of commercial operation.

10.8.1 Land Acquisition

WPL is responsible for all land acquisition and will obtain the necessary land use rights from landowners. The Project Area will be located on land currently utilized for agricultural purposes such as cropping or pasture. WPL is currently undertaking and completing extensive analyses regarding land use, including but not limited to environmental factors, landowner acceptance, and constructability. WPL will evaluate land use and will contact local governments to involve them in the process. All regulations and requirements applicable to the selected site will be satisfied. WPL currently has first right to construct turbines and other infrastructure on specific properties within the Project Area.

WPL will select the wind turbine, plan necessary access roads, and determine appropriate collection system cabling routes. WPL will offer long term easement agreements to designated landowners. Annual acreage

payments will be paid for properties that are participating in the project but don't have a turbine sited. WPL will also make annual turbine payments on a per MW of nameplate capacity basis to those properties where a turbine is sited. Transmission easements, if needed, will be separate from the easement agreements. WPL plans to acquire outright any properties upon which it plans to locate the Project Substation. The substation footprint will be approximately 275 feet by 250 feet. Typically, the total purchased acreage of the Project Substation property is about 5 to 10 acres. See **Section 6.1.2** for additional information on the Project Substation and **Section 13.1** for additional information on community outreach and goodwill gestures.

10.8.2 Permits

WPL will be responsible for undertaking all required environmental review and will obtain all permits and licenses that are required following issuance of the LWECS site permit. All regulations and requirements applicable to the selected site will be evaluated and understood to ensure the wind generating plant will conform. **Section 6.4** and **Section 12** identify potential permits for construction and operation of the Project.

10.8.3 Equipment Procurement

The majority of the global wind turbine manufacturing capacity is booked in the near-term. Therefore, wind turbine suppliers are reticent to accept "spot market" purchase agreements, opting instead for longer-term supply agreements. Subsequently, WPL is negotiating long-term turbine supply agreements that will reduce price volatility, provide certainty in delivery, and reserve production capacity sufficient to meet our strategic planning needs for wind construction.

10.8.4 Construction Financing

WPL will be responsible for financing all pre-development, development, and construction activities. WPL expects financing through internal funds.

10.8.5 Construction Completion

WPL personnel will manage prime construction contractors regarding roads, turbine assembly, electrical, and communications. The construction will take approximately eight to nine months to complete.

The following schedule shown in **Table 10-1** sets forth the milestones needed to meet the agreed on COD in the fourth calendar quarter of 2028.

Table 10-1: Project Schedule Estimated Completion

Project Milestones	Estimated Timeframe
Land Acquisition Completion	Q3 2024
Site Permit Approval Order	Q2 2026
WI Regulatory Approval Order	Q2 2026
Construction Contracting	Q3 2025
Turbine Supply Agreement	Q1 2025 – Q1 2026
Major Equipment Procurement	Q1 2025 – Q4 2026
Environmental Permits Received	Q1 2026 – Q4 2026
Start of Construction	Q3 2027

Project Milestones	Estimated Timeframe
Civil Construction	Q3 2027
Turbine Erection	Q2 2028
Project Substation Construction	Q2 2028 – Q3 2028
Commercial Operations Date	Q4 2028

10.8.6 Permanent Financing

Permanent financing will be provided with WPL's internal funds. WPL will retain the ownership interest in this Project.

10.8.7 Expected Commercial Operation Date

WPL expects the Project will begin commercial operation in the fourth quarter of 2028. The commercial operation date is dependent on the completion of the interconnection, permitting, and other development activities.

10.9 Energy Projections

Identify the energy expected to be generated by the project. This can be described as a range of the net capacity factor and the average annual output for that range in megawatt hours.

The Project will have a nameplate capacity of up to 153 MW. Assuming a net capacity factor of 41 percent, the projected average annual output will be approximately 549,514 MWh. Output will be dependent on final design, site-specific features, and selected turbine equipment.

11.0 DECOMMISSIONING AND RESTORATION

The Site Permit application should include a draft Decommissioning Plan. The draft plan should include a detailed task list and cost estimate prepared by an engineer. Decommissioning Plans should contain:

The Decommissioning Plan is in accordance with the requirements of Minn. R. 7836.0500, subp. 13 and the Freeborn County Zoning Ordinance, Article 14, Section 11. The Decommissioning Plan is in **Appendix H**.

WPL's decommissioning objective will be to restore the site to a condition that will facilitate its pre-construction use at the end of operation. Wind facilities are expected to have a useful commercial lifespan of approximately thirty (30) years. The system must be decommissioned if: a) it reaches the end of system's serviceable life; or b) the system becomes a discontinued use, or c) upon facility abandonment. Facility abandonment is defined by the Freeborn County Ordinance as a 12-month period in which the Owner fails to pay property taxes or generate electricity.

After the Site Permit term expires, the Project operation may be extended (upon Commission review and approval) or the Project ceases to operate. The Project Owner will be responsible for removal of all above ground equipment and underground equipment within the Project Area. The Owner will restore and reclaim the site to pre-construction topography and topsoil quality to the extent practical and assumes that most of the site will be returned to farmland and/or pasture after decommissioning.

Decommissioning includes removing the wind turbines, underground cables, ancillary equipment, and substation. All underground components, including equipment foundations and underground cables, will be removed to a depth of four feet below ground. Underground utility lines, if deeper than four feet below ground surface elevation, may be left in place to minimize land disturbance and associated impacts to future land use. Civil facilities, including substation security fencing and access roads, are also included in decommissioning. Standard decommissioning practices will be utilized, including dismantling and repurposing, salvaging/recycling, or disposing of the wind energy improvements.

After all equipment is removed, any holes or voids created by turbine pedestals, concrete pads and other equipment will be filled in with native soil to the surrounding grade, and the Project Area will be restored to pre-construction conditions, to the extent feasible. All access roads and other areas compacted by equipment will be de-compacted to a depth necessary to ensure adequate soil drainage and root penetration, then will be fine graded and tilled to a farmable condition.

In accordance with the Site Permit requirements, the Project will have been maintained with vegetation, which is expected to survive decommissioning activities. Consequently, efforts to restore the site, if the land is not returned to row crop agriculture, is expected to be limited to over-seeding. Over-seeding would be completed by a qualified native seeding contractor. Restoration efforts may also include temporary seeding as farmland or re-development of the land for other beneficial uses, based on consultation with the landowner(s). See Section 5.3 in the Decommissioning Plan for details on reclamation activities.

11.1 Anticipated Life of the Project

WPL expects that the life of the Project will be no less than 30 years after issuance of the Site Permit. At the end of the anticipated operation, the Project Owner will be responsible for removing the wind facilities as described in this Plan; however, the Project Owner reserves the right to continue to operate the Project, instead of decommissioning, by applying for an extension of required and applicable permits.

After the Project has reached the end of its useful life, and at least ninety (90) days prior to the start of decommissioning activities, the Project Owner will notify the Commission, participating landowners, landowners with lease agreements, counties, and other local units of government in writing, of the intended decommissioning activities and schedule. Applicable permits and approvals will be obtained prior to the start of decommissioning work. These parties will again be notified once decommissioning activities have been completed.

11.2 Estimated Cost of Decommissioning

The total estimated cost of decommissioning the Project is approximately $7,580,516 ($222,956 per turbine). Estimated salvage/scrap value of the turbines, cables, and other materials is approximately $4,277,388.

The net decommissioning costs after accounting for resale and salvage values is approximately $3,303,128, or $97,151 per turbine.

11.3 Future Updates to Decommissioning Plan and Costs

According to EERA recommendations, a revised decommissioning estimate shall be submitted prior to construction and every five years following the beginning of commercial operation or any time there is a change in ownership or permit amendment. Each revised plan will reflect advancements in construction techniques, reclamation equipment, and decommissioning standards. The decommissioning cost estimate

will also be reassessed and revised to reflect any identified changes in the costs, including current salvage values of materials and equipment. The amount of the Financial Assurance will be adjusted accordingly to offset any increases or decreases in decommissioning costs and salvage values determined during each plan reassessment.

11.4 Assurance of Funds for Decommissioning

The Project Owner will be responsible for all costs to decommission the Project and associated facilities. A Financial Assurance in the form of an escrow account, surety bond, or parent guarantee equal to the net decommissioning costs to ensure proper decommissioning will be provided, with Freeborn County listed as the beneficiary.

11.5 List of Decommissioning Activities and Restoration

A summary of decommissioning activities and tasks is as follows:

- **Public Road Improvement and Access Road Modifications and Removal –** as the cost estimate is based on scrapping and recycling turbine components where possible, sections of public roads that have insufficient strength to accommodate the construction traffic necessary for decommissioning may need to be improved prior to the start of hauling operations. Intersection turning radius modifications are not anticipated since turbine components will be cut to fit on standard semitrailer trucks. The roads subjected to decommissioning traffic will be restored to a condition equal to or better than the condition of the road prior to decommissioning activities. Aggregate removed from the Project access roads is a potential source for the public road restoration material. A pre-decommissioning road survey, similar to a pre-construction survey, may be prepared so that road conditions pre- and post-decommissioning can be accurately assessed.
- **Wind Turbine Felling –** during felling, a long cable is attached to the nacelle and a bulldozer. A notch is the cut near the base of the turbine tower, allowing the turbine to fall in a desired direction when pulled by the cable. Once on the ground, the turbines will be disassembled and processed for recycling. Felling turbines eliminates the need for crane paths and pads, minimizing time for turbine removal and disturbing less surface area than turbine dismantling.
- **Wind Turbine Removal –** the modular components can be disassembled and then processed into pieces small enough (less than 40 feet by eight feet and less than 20 tons) to be loaded onto standard semitrailer trucks and transported off site. The components of the wind turbines that are not designated for resale will be cut into pieces sized to meet recycling requirements so the scrap value may be maximized. The components will then be loaded on tractor-trailers and transported to a licensed recycling facility. The blades will be hauled to the REGENFiber Facility, which is owned by an Alliant Energy subsidiary and located in Fairfax, Iowa. There, the blades will be processed and ground into reinforcement fibers that can be reused in the construction industry.
- **Turbine Foundation Removal and Restoration –** turbine foundations are constructed from concrete and rebar. The foundation will be exposed using backhoes or other earth moving equipment. The pedestal (upper part of the turbine foundation) will then be removed to a depth of at least four feet below grade using hydraulic vibratory hammers to break up the concrete. The rebar can be cut with torches or cutoff saws. The concrete will be broken into pieces sized for transport. The foundation debris will be hauled off site to be recycled or disposed of, depending on market prices for aggregate at the time of decommissioning. The rebar will be recycled. Following

removal of the turbine foundation, the resulting void will be backfilled with native subsoils and compacted to at least 90 percent of the fill material's standard Proctor density. Topsoil will be reapplied to the site and graded to match surrounding grade to preserve existing drainage patterns. The topsoil and subsoil will be de-compacted to a minimum depth of 18 inches and revegetated to match pre-construction conditions.

- **Crane Path and Crane Pad Preparation and Removal –** the turbine felling technique eliminates the need for large industrial cranes and the associated crane paths and crane pads.
- **MET and ADLS Towers –** following disconnection of electrical components, towers will be gradually lowered to the ground for disassembly. The steel structures will be cut into pieces sized to meet recycling requirements so the scrap value may be maximized. The components will then be loaded on tractor-trailers and transported to a metal recycling facility. The concrete pads, along with any anchoring components, will be excavated to a depth of four feet, or as otherwise set out in the easement agreements. Concrete will be broken into transportable pieces and hauled off site. Following removal of the foundations, subsoil will be de-compacted to a minimum depth of 18 inches. Topsoil will be reapplied to match the surrounding grade.
- **Access Roads –** the roads that local landowners desire to be left as-is will be titled to such landowners. All other roads will be removed, with the road areas restored in a manner consistent with current uses. Disturbed areas will be leveled, de-compacted, and seeded.
- **Underground Electrical Collection Lines –** the electrical cables and fiber optic conduits contain no material known to be harmful to the environment and will be left in place, non-functional. Any cables at a depth of less than four feet, such as cables entering and exiting the turbine foundations, junction boxes, or substation components, will be removed. Following any necessary removal, the area affected will be restored by reapplication of topsoil to match the surrounding grade and preserve existing drainage patterns. The topsoil and subsoil will be de-compacted to a minimum depth of 18 inches and tilled to farmable conditions.
- **Project Substation –** all steel, conductors, switches, transformers, and other components of the substation will be disassembled and taken off site to be recycled or reused. Foundations and underground components will be removed to a depth of four feet. Additionally, any permanent stormwater treatment facilities (e.g., infiltration ponds and engineered drainage swales) will be removed. Topsoil will be reapplied to match surrounding grade to preserve existing drainage patterns. Topsoil and subsoil will be de-compacted to a minimum depth of 18 inches and the site will be revegetated to match pre-construction conditions.

12.0 IDENTIFICATION OF OTHER PERMITS

Provide a table of permits for all known or potentially required permits for the proposed project. Include federal, state, and local agencies or authorities and the permits they issue.

Pursuant to Minn. Stat. § 216F.07, the site permit is the sole site approval required for the location, construction, and operation of this Project and the site permit supersedes and preempts all zoning, building, and land use rules, regulations, and ordinances adopted by regional, county, local, and special purpose governments.

WPL will obtain all approvals, permits, and licenses that are required following issuance of the LWECS

Site Permit. The federal, state and local permits or approvals that have been identified as potentially being required for the construction and operation of the Project are provided in **Table 12-1**. Permits dependent on the final site layout will be applied for after receiving Commission approval, but prior to construction.

Table 12-1: Potential Permits and Approvals

Administering Agency	Permit/Approval
Federal	
Federal Aviation Administration	• Form 7460-1 Notice of Proposed Construction or Alteration (Determination of No Hazard)
	• Form 7460-2 Notice of Actual Construction or Alteration
U.S. Army Corps of Engineers	• Federal Clean Water Act Section 404 Nationwide Permit • Wetland Delineation Approvals • Jurisdictional Determinations
U.S. Environmental Protection Agency	• Spill Prevention Control and Countermeasure Plan (SPCC)
U.S. Fish and Wildlife Service	• Review for Threatened and Endangered Species under Section 7 of the Endangered Species Act • Incidental Take Permit (ITP) under Section 10 of the Endangered Species Act • General Eagle Incidental Take – Wind (Utility) Energy under Bald and Golden Eagle Protection Act
State	
Minnesota Public Utilities Commission	• Large Wind Energy Conversion System (LWECS) Site Permit
Minnesota State Historic Preservation Office	• Cultural and historic resources review • State and National Register of Historic Places review
Minnesota Department of Natural Resources	• License to Cross Public Lands and Waters, if needed • Public Waters Work Permit, if needed • Endangered species coordination • Water Use Permit, if needed
Minnesota Pollution Control Agency	• NPDES/SDS Permit for Construction Activities and Storm Water Pollution Prevention Plan • License for Very Small-Quantity Generator of Hazardous Waste; • Section 401 Water Quality Certification, or waiver
Minnesota Department of Transportation	• Air Obstruction Notification for Meteorological Towers (50 to 200 feet) • Tall Towers Permit • Utility Accommodation on Highway ROW Permit • Oversize/Overweight Permit • Access/Driveway Permit
Local Governments	

Freeborn County	• Roadway Access Permit • Building Permit for O&M Facility Expansion • Working in the Right-of Way Permit • Annual Oversize/Over-Weight Permit • Drainage Permit
Freeborn County Soil Water Conservation District (SWCD)	• Wetland Conservation Act Approvals
Townships	• Right-of-way permits • Crossing permits • Road access permits • Driveway permits for access roads
Other	
Midcontinent Independent System Operator	Generator Interconnection Agreement

13.0 AGENCY AND TRIBAL CORRESPONDENCE

This section describes outreach efforts conducted by WPL and discusses pre-Application involvement by federal, state, and local regulatory stakeholders. **Section 13.1** includes information on community outreach efforts.

As part of pre-Application efforts, WPL reached out to federal, state, and local regulatory stakeholders with jurisdiction or interest in the Project Area to introduce the Project and request comments. Additionally, 11 recognized Minnesota Tribal governments were also contacted for comments. Project introduction letters were emailed and mailed between February 7 to 12, 2024. Representative Project introduction letters sent to agencies and Tribal governments are in **Appendix A-1** and **Appendix A-2**, respectively. Separate letters were sent to the USFWS, MNDNR, and the Freeborn County Supervisor, which are included in **Appendix A-3**. Agency and Tribal government responses received as of the date of this application are included in **Appendix A – 4**.The Applicant will continue to work with local, state, and federal agencies, and Minnesota Tribal governments as the Project advances. Agency and tribal correspondence is summarized in **Table 13-1**.

Table 13-1: Agency and Tribal Correspondence

Agency	Correspondence Date and Summary
Federal	
United States Army Corps of Engineers (USACE), St. Paul District	2/13/2024 (Initial Agency Response) - Acknowledged receipt and provided general regulatory information. Also advised that a pre-application meeting can be requested. 02/15/2024 – Westwood responded that impacts to jurisdictional waters are not known at this time but would be permitted.
United States Fish and Wildlife Service (USFWS)	2/9/2024 (Initial Agency Response) – Acknowledged receipt. 3/14/2023 – WPL met with USFWS staff to introduce the Project and provided an overview and summary of wildlife survey results. 3/19/2024 – Westwood received IPaC report.

Agency	Correspondence Date and Summary
Federal Aviation Administration (FAA) - Dakota-Minnesota Airports Division and District Offices	2/12/2024 (Initial Agency Response) – Provided general information on filing FAA notices. 2/12/2024 – Westwood responded that notices will be filed as turbine locations are determined. 6/21/24 – WPL submitted Form 7460-1, Notice of Proposed Construction or Alteration, for each turbine location based on the Vestas V136 112-meter hub height turbine. 8/15/24 – FAA responded with a notice of preliminary findings and indicated that further study would be necessary. The FAA provided a 60 day timeframe to request further study. 8/22/2024 – WPL requested further study and the FAA published the notice for public comment. The purpose of the notice is to solicit aeronautical comments from the public concerning the physical effect of the proposed wind turbines on the safe and efficient use of airspace by aircraft. 9/30/2024 – FAA responded with a determination of no hazard to air navigation provided the turbines adhere to marking and lighting requirements listed in the FAA Advisory circular 70/7460-1 M, Obstruction Marking and Lighting, white paint/synchronized red lights-Chapters 4, 13 (Turbines), and 15. This FAA determination becomes final on November 9, 2024 unless a petition was filed with the FAA by October 30, 2024. 11/9/2024 – No petitions were filed by the October 30, 2024 deadline; therefore, the FAA determinations of no hazard are final for the 112-meter hub height turbine. The determinations expire on March 30, 2026. 4/1/25 – WPL submitted Form 7460-1, Notice of Proposed Construction or Alteration, for each turbine location based on the Vestas V136 120-meter hub height turbine.
United States Department of Commerce, National Telecommunications and Information Administration (NTIA)	6/7/24 – WPL submitted Project information, based on the Vestas V136 112-meter hub height turbine, to the NTIA and requested a review of the Project from interested federal agencies. 6/18/24 – NTIA requested the Project information be resubmitted using an updated template. 6/21/24 – WPL resubmitted Project information to the NTIA. 7/2/2024 – NTIA sent request for comments to members of IRAC with a deadline of August 15, 2023. 8/20/24 – NTIA responded that after a 45 day review period, no reviewing agencies had concerning issues with the 112-meter hub height turbine placement. They also noted the Project Area is over 111 kilometers (69 miles) south of the Minneapolis/St. Paul

Agency	Correspondence Date and Summary
	NEXRAD, and that based on the distance and terrain, the Project appeared to be radar neutral. 3/6/25 – WPL submitted Project information, based on the Vestas V136 120-meter hub height turbine, to the NTIA and requested a review of the Project from interested federal agencies.
State	
BSWR (Board of Water and Soil Resources)	No response to date.
DEED (Minnesota Department of Employment & Economic Development)	2/9/2024 (Initial Agency Response) – Responded to contact Lisa Hughes, Economic Development Program Specialist. 2/9/2024 – Westwood forwarded email with Project introduction letter and map to L. Hughes. No further response to date.
MDA (Minnesota Department of Agriculture)	No response to date.
MNDNR (Minnesota Department of Natural Resources)	2/9/2024 (Initial Agency Response) – Acknowledged receipt. Indicated Haley Brown will be primary contact during early coordination. After SPA is submitted, Cynthia Warzecha will be primary contact. Requested to be copied on communications. 2/9/2024 – Westwood responded with acknowledgement of initial response. 3/18/2024 – WPL and Westwood met with MNDNR to introduce the Project and gain feedback. 4/10/2024 – WPL received Natural Heritage Review letter from MNDNR in response to request for agency feedback on project development. 4/12/2024 – WPL received updated Natural Heritage Review letter from MNDNR in response to request for agency feedback on Project development. 8/7/2024 – WPL received an early coordination response from the MNDNR that provided recommendations on areas to avoid, potential DNR permits that would be needed, and BMPs. 10/21/2024 - WPL responded to the MNDNR early coordination recommendations and addressed avoidance of critical bat habitat, obtaining MNDNR permits, and provided responses to recommended BMPs.
DOC (Minnesota Department of Commerce)	02/05/2024 – WPL met with DOC staff to introduce the project, describe studies that have been completed or are in process, and to discuss general schedule and process for the application. 07/23/24 – Draft SPA sent to DOC staff for review.

Agency	Correspondence Date and Summary
	09/06/24 – DOC staff provided comments on the draft SPA.
MnDOT, District 6 (Minnesota Department of Transportation)	No response to date.
MnDOT, Office of Aeronautics - Aviation Planning Section	04/11/2024 – WPL met with Minnesota Department of Transportation Office of Aeronautics staff to introduce the project and understand their process and timing to process the Tall Towers Permit.
MnDOT, Utility Routing & Siting Coordinator	2/9/2024 (Initial Agency Response) – Requested additional design information and offered to schedule a Project introduction meeting. Provided general Project review information and guidance. 2/26/24 – Westwood responded that design information is not yet available and that WPL is interested in meeting. 2/27/24 – MnDOT requested date the SPA will be submitted to MPUC and said to hold off meeting until a site plan is done. 2/27/24 – Westwood responded with an SPA submittal date of May and offered to provide a preliminary layout when it becomes available to share. 2/4/2025 – Westwood followed up with an SPA submittal date of February and provided maps showing the preliminary layouts. 2/4/25 – MnDOT responded with a request for additional details on the collection line crossing of Trunk Highway 13 and shapefiles of the Project layout, with specific interest in access roads, the collection line system, and the Project boundary. MnDOT also provided a copy of the Trunk Highway right-of-way (Map 32-23) that will be required when applying for a utility permit. 2/5/25 – Westwood provided confirmation that 3 collection lines are proposed to cross beneath Trunk Highway 13 at the location MnDOT identified. Westwood also provided GIS shapefiles of the 112-meter hub height turbine layout, the 120-meter hub height turbine layout, and the project boundary.
MDH (Minnesota Department of Health)	2/9/2024 (Initial Agency Response) – Acknowledged receipt and forwarded to appropriate staff. No further response to date.
MPCA (Minnesota Pollution Control Agency)	2/12/2024 (Initial Agency Response) – Responded that they typically do not conduct reviews on projects without ER documents. Recommended contacting department again when the EAW or other ER documentation is ready for review.
SHPO (Minnesota State Historic Preservation Office)	3/11/2024 (Initial Agency Response) – Acknowledged receipt and provided general review information. 4/2/24 – The SHPO sent letter recommending a Phase Ia Literature Review be completed to assess the potential for archaeological resources, and if recommended, a Phase I Archaeological Survey

Agency	Correspondence Date and Summary
	should be conducted. See Appendix F for a copy of the Phase Ia Literature Review and Phase I Archaeological Survey report.
Tribal Governments	
Bois Forte Band of Chippewa – Tribal Historic Preservation Officer (THPO)	No response to date.
Fond Du Lac Band of Lake Superior Chippewa – THPO	No response to date.
Grand Portage Band of Lake Superior Ojibwe – THPO	No response to date.
Leech Lake Band of Ojibwe (LLBO) - THPO	2/16/2024 (Initial Agency Response) – Anita Cloud responded to inform Alliant that Amy Burnette is no longer with LLBO and attached an introduction letter from the new THPO, Gina Lemon. G. Lemon sent a letter (No. 24-065-NCRI) stating she had reviewed the documentation provided by Alliant and had determined that the LLBO does not have any known recorded sites of religious or culturally identified resources in the Project area. She stated that if any human remains or LLBO-affiliated objects are encountered during Project development, to contact the appropriate county, state, and tribal authorities. She also noted that this letter does not exempt the Project from potential Section 106 review. 2/20/24 – Westwood acknowledged the staff change and stated their letter would be documented and included in the SPA.
Lower Sioux Indian Community - THPO	No response to date.
Mille Lacs Band of Ojibwe - THPO	No response to date.
Prairie Island Indian Community - THPO	No response to date.
Red Lake Nation Band of Ojibwe - THPO	No response to date.
Shakopee Mdewakanton Sioux Community - Director of Cultural Resources	2/9/2024 (Initial Agency Response) – Leonard Wabasha requested a desktop survey of previously recorded archaeological and architectural sites in or near the Project Area. 2/12/2024 – Westwood responded that the literature review is currently in progress and the Westwood cultural team is coordinating with the OSA and SHPO. 10/14/24 – Westwood emailed the Phase Ia Literature Review report to L. Wabasha.
Upper Sioux Indian Community - THPO	2/9/2024 (Initial Agency Response) – Samantha Odegard, THPO, responded with interest in further consultation on the Project with emphasis on cultural resources and tribal participation, and requested information about the Project timeline. 6/17/24 – Westwood sent results of the Phase Ia Literature Review

Agency	Correspondence Date and Summary
	report and mentioned field surveys were underway. See Appendix F for a copy of the Phase Ia Literature Review report. 6/17/24 - S. Odegard, THPO, responded with request for tribal participation during field surveys and noted there are areas of the Project with high potential for unrecorded cultural sites and burials. 7/3/24 - Westwood responded with additional information on the status of the field investigations and offered to have a tribal representative visit the site during the remaining field investigations this fall. 7/3/24 – S. Odegard, THPO, responded with a request to meet in order to discuss involvement in the survey work. 8/12/24 – WPL responded with potential virtual meeting dates. 9/24/24 – WPL and Westwood cultural resources staff met with S. Odegard and Drew Brockman of the Upper Sioux Indian Community to discuss the status and findings of the partial field survey conducted on June 10-14, 2024. S. Odegard and D. Brockman requested digital files of the Project layout in order to determine if they would accompany Westwood cultural resources staff during the remaining field surveys. 9/25/24 – Westwood sent digital files (GIS shapefiles and KMZ) of the Project layout, along with a copy of the PowerPoint presentation, to D. Brockman. D. Brockman confirmed receipt of meeting materials and indicated they would review the materials and respond as soon as possible. 10/9/24 – D. Brockman responded "Thank you for the time to review the Bent Tree North Project. Our office has no further comments or concerns on the proposed activities. Unfortunately, due to scheduling conflicts our office will likely not be able to participate in upcoming field work. Please keep our office updated on project progress and any pertinent project-related meetings that we can participate in." 2/4/25 – Westwood provided an update on the pedestrian survey that was completed in November 2024 and stated that no additional archaeological resources were identified.
White Earth Nation - THPO	No response to date.
Minnesota Indian Affairs Council (MIAC) - Cultural Resources Manager	No response to date.
Local	
Freeborn County Soil and Water Conservation District (SWCD)	No response to date.
Freeborn County, District 1 Commissioner	2/19/24 – WPL followed up on the Project Introduction Letter with a phone call and sent an email on 2/20/24.

Agency	Correspondence Date and Summary
	No response to date.
Freeborn County, District 2 Commissioner	3/25/24 – GSC followed up on the Project Introduction Letter with an email to Dawn Kassa. No response to date.
Freeborn County, District 3 Commissioner	3/25/24 – GSC followed up on the Project Introduction Letter with an email to John Forman. 3/25/24 – J. Forman responded stating he had no questions at this time and will continue to follow the Project.
Freeborn County, District 4 Commissioner	3/25/24 – GSC followed up on the Project Introduction Letter with an email to Christopher Shoff. No response to date.
Freeborn County, District 5 Commissioner	3/25/24 – GSC followed up on the Project Introduction Letter with an email to Nicole Erickson. 3/27/24 – N. Erickson responded with request for an in-person meeting. 4/2/24 – WPL met with N. Erickson.
Freeborn County, County Attorney	No response to date.
Freeborn County, Administrator	2/20/24 – WPL followed up on the Project Introduction Letter with email to Ryan Rasmusson. 3/18/24 – GSC sent second follow up email to R. Rasmusson requesting an in-person meeting on 4/2/24. 4/2/24 – WPL met with R. Rasmusson.
Bath Township (Freeborn County), Supervisor	5/17/2024 (Initial Agency Response) – Jason Jacobusse, Bath Township Supervisor A, responded with concerns regarding turbine setback distances and requested more details on the turbine layout. 6/7/2024 – WPL responded that the turbine layout has not been finalized and will not be available for public comment until late summer.
Hartland Township (Freeborn County), Chair/Supervisor	No response to date.
City of Clarks Grove (Freeborn County), Mayor	No response to date.
City of Hartland (Freeborn County), Mayor	2/20/24 – WPL followed up on the Project Introduction Letter with a phone call and left a voice message, and sent an email, to Kelly Routh on 2/20/24. 2/20/24 – K. Routh responded with a phone call to WPL.

Agency	Correspondence Date and Summary
Steele County, District 1 Commissioner	No response to date.
Steele County, District 2 Commissioner	No response to date.
Steele County, District 3 Commissioner	No response to date.
Steele County, District 4 Commissioner	No response to date.
Steele County, District 5 Commissioner	No response to date.
Steel County, County Attorney	No response to date.
Steele County, Planning & Zoning Director	No response to date.
Steele County SWCD, District Manager	No response to date.
Berlin Township (Steel County), Chairman	2/19/24 – WPL followed up on the Project Introduction Letter with email to Richard Johnson. No response to date.
City of Ellendale (Steele County)	No response to date.
Waseca County, District 1 Commissioner	No response to date.
Waseca County, District 2 Commissioner	No response to date.
Waseca County, District 3 Commissioner	No response to date.
Waseca County, District 4 Commissioner	No response to date.
Waseca County, District 5 Commissioner	No response to date.
Waseca County, County Attorney	No response to date.
Waseca County, Senior Land Use Planner	No response to date.
Waseca County SWCD, District Manager	2/9/2024 (Initial Agency Response) – Responded that there is no proposed infrastructure within Waseca County and has no comments. 2/12/2024 – Acknowledged response.
Byron Township (Waseca County), Chairman	2/19/24 – WPL followed up on the Project Introduction Letter with a phone call and voice message to Robert Wenzel. No response to date.
Byron Township (Waseca County),	3/22/24 – GSC followed up on the Project Introduction Letter with

Agency	Correspondence Date and Summary
Supervisor	a phone call and voice message to confirm Curt Krause received the letter and asked if he had any questions. GSC also asked if C. Krause would be able to meet with WPL on 4/2/24. No response to date.
Byron Township (Waseca County), Supervisor	3/22/24 – GSC followed up on the Project Introduction Letter with a phone call and voice message to confirm Scott Routh received the letter and asked if he had any questions. GSC also asked if S. Routh would be able to meet with WPL on 4/2/24. No response to date.
New Richland Township (Waseca County), Chairman	2/19/24 – WPL followed up on the Project Introduction Letter with a phone call and voice message to Nicholas Budach. No response to date.

13.1 Community Outreach

Since 2021, WPL has partnered with Good Steward Consulting (GSC) to further community outreach efforts and serve as an educational resource to the local community. WPL and GSC have met with several community groups, held a public open house event, sent out newsletters, advertised Project information through multiple sources, sponsored and attended community events, and met with county, city, and township staff. In 2022, WPL opened a local Project office with public office hours, hired a Project Local Representative, and launched the "Bent Tree Wind Farm" public Facebook page, Project Website, Project email, and Project Local Representative phone number.

GSC formed the Friends of Bent Tree North Wind Farm group in 2021 as a private group comprised of people who support the Project. The participating landowners form the core of this group, and they are encouraged to invite other Project supporters to join. Participants of this group are provided with public Project information and industry facts regarding the positive impacts of the Project, which can then be shared in the community. The Friends of Bent Tree North Wind Farm group continues to host meetings every other month.

WPL and GSC have also maintained contact with landowners since 2021. One of several ways communication has been maintained is through hosting two annual landowner dinners in which Project updates are provided, questions are answered, and concerns are addressed. WPL has hosted several landowner dinners with the most recent one being on November 7, 2023. WPL plans to continue partnering with GSC to maintain contact with participating landowners, and the Friends of Bent Tree North Wind Farm group continues to host meetings every other month.

WPL and GSC met with stakeholders and hosted events in 2024 that included the following advertisements, meetings, and events:

- January 1, 2024, GSC advertised the Project in the Albert Lea Tribune Newspaper. The advertisement also included contact information for the local Project representative.
- January 11, 2024, GSC renewed the annual Project membership with the Albert Lea-Freeborn

County Chamber of Commerce.

- March 7, 2024, WPL virtually met with the Freeborn County Engineer, Phil Wacholz, to introduce the project.
- March 12, 2024, WPL sponsored the 19th Annual Freeborn County Ag Luncheon. GSC facilitated the event honoring local farm families and the local agricultural community.
- March 28, 2024, GSC advertised the Project in the NRHEG Star Eagle. The advertisement provided wind facts and included contact information for the local Project representative.
- April 2, 2024, WPL sent out Project introduction letters. WPL and GSC then met with several local stakeholders, including a Freeborn County Commissioner, Freeborn County Administrator, Albert Lea Economic Development Agency, Freeborn County Chamber of Commerce, and Freeborn County Planning and Zoning.
- April 3, 2024, GSC advertised the Project in the Albert Lea Tribune Newspaper. The advertisement provided information on spring planting and included contact information for the local Project representative.
- April 12, 2024, GSC advertised the Project in the NRHEG Star Eagle Newspaper. The advertisement provided information on spring planting and included contact information for the local Project representative.
- April 30, 2024, GSC sent out a Project newsletter to local stakeholders, landowners, and supporters of the Project. This newsletter contained Project information, economic benefits of wind, and a brief outline of the Project timeline. The newsletter also included contact information for the local Project representative.
- May 7, 2024, GSC sent out post card invites to all addresses within a quarter mile of the Project boundary. Invites were also sent to local stakeholders in Freeborn County, Steele County, Waseca County, Project landowners, and supporters. The postcard invitations also included the contact information for the local Project representative.
- May 9, 2024, GSC posted flyers in the Project area inviting the community to the May 16, 2024, open house event. The flyer also included contact information for the local Project representative.
- May 9, 2024, GSC ran a Project advertisement in the NRHEG Star Eagle Newspaper inviting the community to the May 16, 2024, open house event. The advertisement also included contact information for the local Project representative.
- May 11, 2024, GSC ran a Project advertisement in the Albert Lea Tribune Newspaper inviting the community to the May 16, 2024, open house event. The advertisement also included contact information for the local Project representative.
- May 13, 2024, GSC sent invitations for the May 16, 2024, open house event to the Minnesota Attorney General, Minnesota Environmental Quality Board (EQB), and the MPUC. The invitation also included contact information for the local Project representative.
- May 15, 2024, GSC ran a Project advertisement in the Albert Lea Tribune Newspaper inviting the community to the May 16, 2024, open house event. The advertisement also included contact information for the local Project representative.
- May 16, 2024, WPL and GSC hosted an open house event for the community at WPL's O&M Facility in Hartland.
- May 16, 2024, WPL conducted an interview with a reporter for a story that was published in the Albert Lea Tribune.

- June 6, 2024, WPL provided a sponsorship for the 2024 Freeborn County Corn & Soybean Growers Annual Golf Event with GSC's facilitation.
- June 22, 2024, GSC advertised the Project in the Albert Lea Tribune Newspaper. The advertisement provided wind facts and included contact information for the local Project representative.
- June 24, 2024, GSC hosted a Friends and Supporters of the Bent Tree North Wind Farm meeting.
- June 27, 2024, WPL provided a sponsorship to the Albert Lea-Freeborn County Chamber of Commerce Foundation for the 4th of July Fireworks event. GSC facilitated the event.
- July 1, 2024, WPL provided a sponsorship to the Freeborn County Fair for the Kiddie Farm Zone and the Thorni Ridge Exotics Mobile Petting Zoo. GSC facilitated the event.
- July 3, 2024, GSC advertised the Project in the NRHEG Star Eagle. The advertisement provided wind facts and included contact information for the local Project representative.
- July 7, 2024, WPL provided a sponsorship to the Freeborn County Chamber of Commerce for the 4th of July fireworks.
- July 11, 2024, GSC advertised the Project in the NRHEG Star Eagle. The advertisement provided general benefits of wind.
- August 1, 2024, WPL met with Phil Wacholz, Freeborn County Engineer, to further discuss a road use agreement and what the next steps would be.
- August 3, 2024, GSC advertised the Project in the Albert Lea Tribune Newspaper. The advertisement provided general benefits of wind.
- August 5, 2024, WPL provided a sponsorship to the Freeborn County Fair.
- August 6, 2024, WPL provided a sponsorship to the Freeborn Corn & Soybean Growers Golf Outing to support local scholarships for students.
- August 22, 2024, GSC advertised the Project in the NRHEG Star Eagle. The advertisement provided permitted megawatt wind facts.
- September 14, 2024, GSC advertised the Project in the Albert Lea Tribune Newspaper. The advertisement provided permitted megawatt wind facts.
- September 18, 2024, GSC advertised the Project in the Albert Lea Tribune Newspaper. The advertisement provided permitted megawatt wind facts.
- October 3, 2024, GSC advertised the Project in the NRHEG Star Eagle. The advertisement provided the 2024 harvest.
- October 5, 2024, GSC advertised the Project in the Albert Lea Tribune Newspaper. The advertisement provided the 2024 harvest.
- October 29, 2024, WPL provided a table sponsorship to the Freeborn County Chamber of Commerce for their annual meeting.
- September 4, 2024, GSC sent out a Project newsletter to local stakeholders, landowners, and supporters of the Project. This newsletter contained Project information, economic benefits of wind, and a brief outline of the Project timeline. The newsletter also included contact information for the local Project representative.
- November 7, 2024, GSC advertised the Project in the NRHEG Star Eagle. The advertisement will run on a weekly basis starting in November through the end of January 2025. The advertisement provided the project logo and included contact information for the local Project representative.

- November 7, 2024, GSC advertised the Project in the Albert Lea Tribune Newspaper. The advertisement will run on a weekly basis starting in November through the end of January 2025. The advertisement provided the project logo and included contact information for the local Project representative.
- December 19, 2024, GSC sent a holiday postcard to participating landowners and the private Project friends group.
- December 23, 2024, GSC advertised the Project in the NRHEG Star Eagle. The quarter-page holiday advertisement "Sending Warm Holiday Wishes & Season's Greetings!" also included the new Project logo.
- December 23, 2024, GSC advertised the Project in the Albert Lea Tribune Newspaper. The quarter-page holiday advertisement "Sending Warm Holiday Wishes & Season's Greetings!" also included the new Project logo.

WPL and GSC will continue coordinating with the local community and governmental agencies to increase public knowledge about the Project.

14.0 REFERENCES

Allison, T.D, Diffendorfer, J.E., E.F. Baerwald, J.A. Beston, D. Drake, A.M. Hale, C.D. Hein, M. M. Huso, S.R. Loss, J. E. Lovich, M.D. Strickland, K.A. Williams, and V.L. Winder. 2019. Impacts to wildlife of wind energy siting and operation in the United States. Issues in Ecology. https://pubs.usgs.gov/publication/70206033.

American Wind Wildlife Institute (AWWI). 2017. Wind Turbine Interactions with Wildlife and Their Habitats: A Summary of Research Results and Priority Questions. June 2017. 12 pp. https://awwi.org/wp-content/uploads/2017/07/AWWI-Wind-Wildlife-Interactions-Summary-June-2017.pdf.

Arnett, E.B., M.M. Huso, M.R. Schirmacher, and J.P. Hayes. 2010. Altering turbine speed reduces bat mortality at wind-energy facilities. Frontiers in Ecology and the Environment, 9: 209-214. https://doi.org/10.1890/100103

Audubon Minnesota. 2022. Minnesota IBAs Interactive Map. https://www.arcgis.com/home/webmap/viewer.html?webmap=3b3d225539f8449daf84be6aa89eab50

Baerwald, E.F. and R.M. Barclay. 2009. Geographic variation in activity and fatality of migratory bats at wind energy facilities. Journal of Mammalogy 90:1341-1349.

Boorman G., N. Bernheim, M. Galvin, S. Newton, F. Parham, C. Portier, and M. Wolfe. 1999. NIEHS Report on "Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields." NIEHS Report. 99(4493):1–67.

Board of Water and Soil Resources (BWSR). 2018. Wetland Banking Easements. Interactive Map. https://bwsr.state.mn.us/wetland-bank-mitigation-easements. Accessed March 2024.

BWSR. 2023. Le Sueur River Watershed, Comprehensive Watershed Management Plan. https://www.wasecacounty.gov/DocumentCenter/View/8759/2023_leSueurRiverWatershed_comprehensiveManagementPlan_ISG?bidId=. Accessed September 2024.

Chodachek, K., C. Derby, D. Bruns Stockrahm, P. Rabie, K. Adachi, and T. Thorn. 2014. Bat Fatality Rates and Effects of Changes in Operational Cut-in Speeds at Commercial Wind Farms in Southern Minnesota – Year 1. July 9 – October 31, 2013. Prepared for Minnesota Department of Commerce, St. Paul, Minnesota. Prepared by Western EcoSystems Technology, Inc. (WEST), Bismarck, North Dakota, and Minnesota State University Moorhead, Moorhead, Minnesota. May 23, 2014. https://apps.commerce.state.mn.us/eera/web/project-file?legacyPath=/opt/documents/MNDOC,%20Bat%20Fatality%20Study%20Year%201,%205.23.14.pdf

Chodachek, K., K. Adachi, and G. DiDonato. 2015. Post-Construction Fatality Surveys for the Prairie Rose Wind Energy Facility, Rock County, Minnesota. Final Report: April 15 to June 13, 2014 and August 15 to October 29, 2014. Prepared for Enel Green Power, North America, Andover, Massachusetts. Prepared by WEST, Bismarck, North Dakota. https://tethys.pnnl.gov/sites/default/files/publications/Chodachek-et-al-2015_Post-Construction-Fatalities-Prairie-Rose.pdf

Chodachek, K., and Z. Gustafson. 2018. Tier 4 Post-Construction Mortality Monitoring Study for the Odell

Wind Energy Project, Cottonwood and Jackson Counties, Minnesota. Final Fatality Report: December 2016 – December 2017. Prepared for Odell Wind Farm, LLC, Oakville, Ontario. Prepared by WEST, Bismarck, North Dakota. 34 pp. March 15, 2018. https://tethys.pnnl.gov/publications/tier-4-post-construction-mortality-monitoring-study-odell-wind-energy-project

Cryan, P.M. and A.C. Brown. 2007. Migration of bats past a remote island offers clues toward the problem of bat fatalities at wind turbines. *Biological Conservation* 139:1-11. https://doi.org/10.1016/j.biocon.2007.05.019.

Derby, C., K. Chodachek, K. Bay, and A. Merrill. 2010. Post-Construction Fatality Surveys for the Winnebago Wind Project: March 2009- February 2010. Prepared for Iberdrola Renewables, Inc. (IRI), Portland, Oregon. Prepared by Western EcoSystems Technology, Inc. (WEST), Bismarck, North Dakota.

Derby, C., K. Chodachek, and M. Sonnenberg. 2012. Post-Construction Fatality Surveys for the Elm Creek II Wind Project. Iberdrola Renewables: March 2011 - February 2012. Prepared for Iberdrola Renewables, LLC, Portland, Oregon. Prepared by Western EcoSystems Technology, Inc. (WEST), Bismarck, North Dakota. October 8, 2012.

Dewitz, J., and U.S. Geological Survey (USGS). 2021. *National Land Cover Database (NLCD) 2019 Products (ver. 3.0, February 2024)*: U.S. Geological Survey data release. https://doi.org/10.5066/P9KZCM54.

ESRI. 2022. U.S. Electric Power Transmission Lines. https://resilience.climate.gov/datasets/d4090758322c4d32a4cd002ffaa0aa12_0/about. Accessed April 2024.

Explore MN. 2021. Tourism's Economic Impact on Minnesota Counties: Fact Sheet 2021. https://mn.gov/tourism-industry/assets/FactSheet_2021_tcm1135-468754.pdf

Federal Communications Commission (FCC). 2018. Antenna Structure Registrations, Minnesota. July 13, 2018. https://wireless2.fcc.gov/UlsApp/AsrSearch/asrRegistrationSearch.jsp;JSESSIONID_ASRSEARCH=ACwHSvfwnqVfxXQ3FsQhHWkIF5_F2toS8opFoBtuf1oFmJ9gIKm1!28943649!-1573088852. Accessed April 2024.

Federal Emergency Management Agency (FEMA). n.d. Flood Map Service Center. https://msc.fema.gov/portal/home. Accessed April 2024.

Federal Highway Administration (FHWA). n.d. National Scenic Byways & All-American Roads. Minnesota. https://fhwaapps.fhwa.dot.gov/bywaysp/state/MN/map. Accessed April 2024.

FHWA. 2017. Sound Level Descriptors. https://www.fhwa.dot.gov/Environment/noise/resources/sound_descr.cfm. Accessed July 2024.

Freeborn County, Minnesota. n.d. Online Property Search. https://beacon.schneidercorp.com/Application.aspx?AppID=333&LayerID=3791&PageTypeID=1&PageID=2405. Accessed September 2024.

Freeborn County, Minnesota. 2016. Comprehensive Water Plan 2016-2021. https://www.co.freeborn.mn.us/DocumentCenter/View/2177/Freeborn-County-Comprehensive-

Water-Plan-2016-2021-PDF. Accessed February 2024.

Freeborn County, Minnesota. 2017. Code of Ordinances. https://library.municode.com/mn/freeborn_county/codes/code_of_ordinances. Accessed February 2024.

Freeborn County, Minnesota. 2023. County Feedlot Officer 2023 Annual Report. Revised November 21, 2023. https://www.co.freeborn.mn.us/DocumentCenter/View/8332/2023-County-Feedlot-CFO-Annual-Report.

Freeborn Soil and Water Conservation District (Freeborn SWCD). 2023. SWCD Annual Report. https://www.freebornswcd.org/about-us-annual-report-plan. Accessed September 2024.

Gibbon, G.E., Johnson, C.M., and E. Hobbs. 2002. Chapter 3: Minnesota's Environment and Native American Culture History. Mn/Model Final Report Phases 1-3, MnDOT. SHPO Reference #95-4098. https://www.dot.state.mn.us/mnmodel/P3FinalReport/chapter3.html.

Goetzman, K. 2014. Our Golden Eagles. The Secret Is Out: Each Winter Golden Eagles Take up Residence in Southeastern Minnesota. Minnesota Conservation Volunteer. January-February 2014: 8-21. https://www.dnr.state.mn.us/mcvmagazine/issues/2014/jan-feb/golden_eagles.html.

Good, R.E., Erickson, W., Merrill, A., Simon, S., Murray, K., Bay, K., and C. Fritchman. 2011. Bat monitoring studies at the Fowler Ridge Wind Energy Facility, Benton County, Indiana. Prepared by WEST, Cheyenne, Wyoming. https://tethys.pnnl.gov/sites/default/files/publications/Good-et-al-2011_Fowler-Ridge.pdf

Hartland, Minnesota. 2014. Minnesota Basic Code of Ordinances. American Legal Publishing Corporation. https://www.hartlandmn.com/_files/ugd/c81116_8cdc6465479f4763bb9e818d96ef24fe.pdf. Accessed September 2024.

High Plains Regional Climate Center (HPRCC). 2024. Station ALBM5 Data Explorer. Albert Lea 3se, MN. https://hprcc.unl.edu/stationtool/. Accessed May 2024.

Hotels.com. 2024. https://www.hotels.com/. Accessed February 2024.

Huso, M.M., N. Som, and L. Ladd. 2012. Fatality estimator user's guide (ver. 1.2, December 2018): U.S. Geological Survey Data Series 729, 22 p. https://doi.org/10.3133/ds729

Hyzy, B. and McDonald, R. 2019. Northern Long-Eared Bat Presence/Probable Absence Acoustic Surveys & General Bat Activity Surveys, Bent Tree 2 Wind Farm, Freeborn County, Minnesota. Draft Report. Prepared for Black & Veatch, Alliant Energy. Prepared by WEST, Golden Valley, Minnesota. January 11, 2019.

Interagency Wild & Scenic Rivers Council. n.d. Minnesota. https://www.rivers.gov/minnesota. Accessed March 2024.

Katzner, T. E., M. N. Kochert, K. Steenhof, C. L. McIntyre, E. H. Craig, and T. A. Miller. 2020. Golden Eagle (*Aquila chrysaetos*), Version 2.0. In: P. G. Rodewald and B. K. Keeney, eds. Birds of the World. Cornell Lab of Ornithology, Ithaca, New York. doi: 10.2173/bow.goleag.02.

http://birdsoftheworld.org/bow/species/goleag/cur/. Accessed May 2024.

Lusardi, Barbara A; Gowan, Angela S; McDonald, Jennifer M; Marshall, Katherine J; Meyer, Gary N; Wagner, Kaleb G. 2019. Minnesota Geological Survey. https://conservancy.umn.edu/handle/11299/208552. Accessed March 2024.

Mankato State University. 1991 Geologic Atlas of Freeborn County, MN. https://mrbdc.mnsu.edu/sites/mrbdc.mnsu.edu/files/public/gis/minnesota_geologic_atlas/freeborn_county_geologic_atlas.pdf. Accessed February 2024.

McCallum L.C., Whitfield Aslund M.L., Knopper L.D., Ferguson G.M., Ollson C.A. 2014. Measuring electromagnetic fields (EMF) around wind turbines in Canada: is there a human health concern? Environ Health. 2014 Feb 15;13(1):9. doi: 10.1186/1476-069X-13-9. PMID: 24529028; PMCID: PMC3943383. https://pubmed.ncbi.nlm.nih.gov/24529028/. Accessed June 2024.

McDonald, R. and J. Pickle. 2018. 2017–2018 Avian Use Studies, Bent Tree 2 Wind Farm, Freeborn County, Minnesota. October 2017 – September 2018. Draft Report. Prepared for Black & Veatch, Overland Park, Kansas. Prepared by WEST, Golden Valley, Minnesota. December 31, 2018.

Minnesota Compass. 2024. Project Population Change by County, 2020-2060. https://www.mncompass.org/topics/demographics?population#1-11449-g.

Minnesota Demographic Center. 2024. Long-Term Population Projections for Minnesota. https://mn.gov/admin/demography/data-by-topic/population-data/our-projections/.

Minnesota Department of Commerce (DOC), Energy Environmental Review and Analysis (EERA). 2019. *Guidance for Large Wind Energy Conversion System Noise Study Protocol and Report. Guidance for Developing and e-Filing the LWECS Noise Study Protocol and Report Submittals to the Minnesota Public Utilities Commission.* July 2019. https://apps.commerce.state.mn.us/eera/web/doc/13710.

DOC EERA. 2022. *Application Guidance for Site Permitting of Large Wind Energy Conversion Systems in Minnesota.* Revised June 2022 and corrected July 2024. https://eera.web.commerce.state.mn.us/eera/web/project-file/12221.

DOC and Minnesota Pollution Control Agency (MPCA). 2023. Greenhouse Gas Emissions in Minnesota 2005- 2020. Report to the Legislature. January 2023. https://www.pca.state.mn.us/sites/default/files/lraq-2sy23.pdf.

Minnesota Department of Employment and Economic Development (DEED). 2024a. Freeborn County Profile. Updated June 04, 2024. https://mn.gov/deed/data/data-tools/county-profiles/.

DEED. 2024b. Waseca County Profile. Updated June 04, 2024. https://mn.gov/deed/data/data-tools/county-profiles/. Accessed March 2024.

Minnesota Department of Health (MDH). n.d. Minnesota Well Index. https://mnwellindex.web.health.state.mn.us/ Accessed February 2024.

MDH. 2022. Wellhead Protection – About the rule. https://www.health.state.mn.us/communities/environment/water/rules/wellhead.html. Accessed February 2024.

Minnesota Department of Natural Resources (MNDNR). n.d.-a. Find Snowmobile Trails. Interactive Map. https://www.dnr.state.mn.us/snowmobiling/interactive_map/index.html. Accessed March 2024.

MNDNR. n.d.-b Watershed Health Assessment Framework Map. https://arcgis.dnr.state.mn.us/ewr/whaf2/. Accessed March 2024.

MNDNR. n.d.-c Trout fishing streams and lakes. https://www.dnr.state.mn.us/fishing/trout/map.html. Accessed March 2024.

MNDNR. n.d-d. Ecological Classification System. https://www.dnr.state.mn.us/ecs/index.html. Accessed March 2024.

MNDNR. n.d.-e. Minnesota Native Prairie Bank Map. https://www.dnr.state.mn.us/snap/prairiebank.html. Accessed March 2024.

MNDNR. n.d.-f. MNDNR Climate Explorer. https://arcgis.dnr.state.mn.us/climateexplorer/main/historical. Accessed March 2024.

MNDNR. n.d.-g. National Wetlands Inventory Update. https://www.dnr.state.mn.us/eco/wetlands/nwi_proj.html. Accessed March 2024.

MNDNR. 2008a. More About Wildlife Management Areas. https://www.dnr.state.mn.us/wmas/description.html#:~:text=Wildlifepercent 20managementpercent 20areaspercent 20(WMAs)percent 20are,andpercent 20otherpercent 20compatiblepercent 20recreationalpercent 20uses. Accessed January 2024.

MNDNR. 2008b. Minnesota's Wild, Scenic, and Recreational Rivers. https://www.dnr.state.mn.us/waters/watermgmt_section/wild_scenic/wsrivers/rivers.html.

MNDNR. 2011. Guidance for Commercial Wind Energy Projects. October 1, 2011. 20 pp. http://files.dnr.state.mn.us/publications/ewr/dnr_wind_energy_project_guidance_2011.pdf.

MNDNR. 2014a. Minnesota Breeding Bird Map List. List with Number of Records per Species per County. https://www.dnr.state.mn.us/eco/mbs/bird-map-list.html. Accessed May 2024.

MNDNR. 2014b. Avian and Bat Survey Protocols for Large Wind Energy Conversion Systems in Minnesota. https://files.dnr.state.mn.us/eco/ereview/avian-bat-protocols.pdf.

MNDNR. 2016a. Water-Table Elevation and Depth to Water Table, Minnesota Hydrogeology Atlas Series HG-03. https://gisdata.mn.gov/dataset/geos-hydrogeology-atlas-hg03.

MNDNR. 2016b. Identification of Known Calcareous Fens. https://files.dnr.state.mn.us/publications/waters/calcareous_fen_list_march_2016.pdf.

MNDNR. 2016c. Migratory Waterfowl Feeding and Resting Areas. [Shapefile]. December 30, 2016. https://gisdata.mn.gov/dataset/env-migratory-waterfowl-areas.

MNDNR. 2017. MCBS Railroad Rights-of-Way Prairies. [Shapefile]. July 27, 2017. https://gisdata.mn.gov/dataset/biota-mcbs-railroad-prairies.

MNDNR. 2019. Buffer Protection Map, Minnesota. Ecological and Water Resources Division. https://gisdata.mn.gov/dataset/env-buffer-protection-mn. Accessed March 2024.

MNDNR. 2021. Minnesota groundwater provinces 2021 (PDF). https://files.dnr.state.mn.us/waters/groundwater_section/mapping/provinces/2021-provinces.pdf. Accessed February 2024.

MNDNR. 2022. Map of Minnesota State Water Trails. https://www.dnr.state.mn.us/watertrails/location_map.html. Accessed January 2024.

MNDNR. 2023a. MNDNR Watershed Suite [Shapefile]. October 27, 2023. https://gisdata.mn.gov/dataset/geos-dnr-watersheds. Accessed September 2024.

MNDNR. 2023b. Streams – Trout Data Map. University of Minnesota Duluth, Natural Resources Research Institute. Minnesota Natural Resource Atlas. https://mnatlas.org/resources/streams-trout/. Accessed March 2024.

MNDNR. 2024a. Recreation Compass. https://www.dnr.state.mn.us/maps/compass.html. Accessed January 2024.

MNDNR. 2024b. Minnesota Scientific and Natural Areas: What are they? https://www.dnr.state.mn.us/snas/what_are.html. Accessed January 2024.

MNDNR. 2024c. Aquatic Management Areas. https://www.dnr.state.mn.us/amas/index.html. Accessed January 2024.

MNDNR. 2024d. Map of Blazing Star State Trail. https://files.dnr.state.mn.us/maps/state_trails/blazing_star.pdf. Accessed January 2024.

MNDNR. 2024e. Forest Inventory Viewer. https://maps2.dnr.state.mn.us/for/forestview/mapper.html?app=inventory. Accessed January 2024.

MNDNR. 2024f. Migratory Waterfowl Feeding and Resting Areas. https://www.dnr.state.mn.us/wildlife/shallowlakes/mwfra.html. Accessed January 2024.

MNDNR. 2024g. Important Bird Areas. https://www.dnr.state.mn.us/iba/index.html. Accessed May 2024.

MNDNR. 2024h. Re: Natural Heritage Review of the Proposed Bent Tree 2. From J. Drake, Natural Heritage Review Specialist, MNDNR, St. Paul, Minnesota to S. McCoshum, Westwood Professional Services, Inc. Correspondence # MCE 2023-00951. April 10, 2024. 5 pp.

MNDNR. 2024i. Re: Natural Heritage Review of the Proposed Bent Tree 2. From J. Drake, Natural Heritage Review Specialist, MNDNR, St. Paul, Minnesota. To S. McCoshum, Westwood Professional Services, Inc. Correspondence # MCE 2023-00951. April 12, 2024. 5 pp.

MNDNR. 2024j. MBS Sites of Biodiversity Significance. Updated May 9, 2024. https://gisdata.mn.gov/dataset/biota-mcbs-sites-of-biodiversity.

MNDNR. 2024k. Native Plant Communities GIS Data. Updated May 7, 2024. https://gisdata.mn.gov/dataset/biota-dnr-native-plant-comm.

MNDNR. 2024l. Climate Change and Minnesota. https://www.dnr.state.mn.us/climate/climate_change_info/index.html. Accessed June 2024.

MnDOT. n.d. Minnesota Scenic Byways. https://www.dot.state.mn.us/scenicbyways/

MnDOT. 2003. County Pit Maps. https://www.dot.state.mn.us/materials/aggcopitmaps.html.

MnDOT. 2016. Airport Influence Areas Viewer Application. http://www.dot.state.mn.us/aero/airportinfluencemaps.html; Accessed March 2024.

MnDOT. 2023. Traffic Mapping Application. https://www.dot.state.mn.us/traffic/data/tma.html. Accessed January 2024.

MnDOT. 2024a. Minnesota Railway Viewer Application. https://www.dot.state.mn.us/ofrw/freight/data.html. Accessed March 2024.

MnDOT. 2024b. Airports Information in Minnesota. https://gisdata.mn.gov/dataset/trans-airports

MnDOT. 2024c. Tall Towers - Minnesota Structure Height Regulations. Aviation: Minnesota Department of Transportation. http://www.dot.state.mn.us/aero/talltowers.html.

Minnesota Executive Order No. 19-37 (EO-19-37) (2019). Establishing the Climate Change Subcabinet and the Governor's Advisory Council on Climate Change to Promote Coordinated Climate Change Mitigation and Resilience Strategies in the State of Minnesota. https://mn.gov/governor/assets/2019_12_2_EO_19-37_Climate_tcm1055-412094.pdf. Accessed May 2024.

Minnesota Geological Survey. 2023. Depth to Bedrock – Minnesota 2023. https://hub.arcgis.com/content/7d6744ce505d45e781fd4a063baeba14/about

MPCA. n.d.-a. Understanding Environmental Justice in Minnesota, Environmental Justice – Overview of Areas of Concern, Interactive Map. https://experience.arcgis.com/experience/bff19459422443d0816b632be0c25228/. Accessed September 2024.

MPCA. n.d-b. Le Sueur River. https://www.pca.state.mn.us/watershed-information/le-sueur-river. Accessed March 2024.

MPCA. n.d.-c. Point Source Air Emissions Data. https://public.tableau.com/app/profile/mpca.data.services/viz/Pointsourceairemissionsdata_v10_5-11130/Byfacility. Accessed September 2024.

MPCA. 2020. Annual Report to the Governor on the Climate Change Executive Order. https://climate.state.mn.us/sites/climate-action/files/2021-01/ClimateChangeSubcabinetReport_2020_cc-mn3-01.pdf.

MPCA. 2022a. Environmental Justic Framework.https://www.pca.state.mn.us/sites/default/files/p-gen5-05.pdf. Accessed September 2024.

MPCA. 2022b. Outstanding Resource Value Waters. ArcGIS Hub.

https://hub.arcgis.com/maps/mpca::outstanding-resource-value-waters/about?layer=5. Accessed March 2024.

MPCA. 2024a. MPCA Environmental Justice. [Shapefile]. Metadata updated July, 12, 2024. https://gisdata.mn.gov/dataset/env-ej-mpca-census. Accessed September 2024.

MPCA. 2024b. Feedlots in Minnesota. Updated daily. https://gisdata.mn.gov/dataset/env-feedlots. Accessed April 2024.

MPCA. 2024c. Impaired Waters Viewer (IWAV). Impaired Waters: Final 2024. https://gisdata.mn.gov/dataset/impaired-waters-viewer. Accessed June 2024.

MPCA. 2024d. GHG emissions data. Tableau Public. https://public.tableau.com/app/profile/mpca.data.services/viz/GHGemissioninventory/GHGsummarystory. Accessed February 2024.

MPCA. 2024e. Minnesota Air Quality Index. Tableau Public.https://public.tableau.com/app/profile/mpca.data.services/viz/MinnesotaAirQualityIndex_0/AQIExternal. Accessed February 2024.

Minnesota Public Utilities Commission (MPUC). 2008. *Order Establishing General Wind Permit Standards.* January 11, 2008. https://www.edockets.state.mn.us/edockets/searchDocuments.do?method=showPoup&documentId={C2984532-74BE-4C6C-BB99-2CAC2B2C16E6}&documentTitle=4897855.

Minnesota Legislative Coordinating Commission – Geographic Information Services (LCC-GIS). 2020. Redistricting Data, Minnesota, 2020. https://gisdata.mn.gov/dataset/society-redistricting-2020.

Minnesota Statutes. 2023. Chapter 40A. Agricultural Land Preservation Program. https://www.revisor.mn.gov/statutes/cite/40A. Accessed February 2024.

National Association of Regulatory Utility Commissioners (NARUC). 2011. *Assessing Sound Emissions from Proposed Wind Farms & Measuring the Performance of Completed Projects*. NARUC Grants & Research. The National Association of Regulatory Utility Commissioners. A report for the Minnesota PUC, Funded by the U.S. Department of Energy.

National Institute for Occupational Safety and Health (NIOSH). 1996. NIOSH Fact Sheet: EMFs in the Workplace. Publication No. 96-129. https://www.cdc.gov/niosh/docs/96-129/. Accessed June 2024.

National Institute of Environmental Health Sciences (NIEHS) 2002. Electric and Magnetic Fields Associated with the Use of Electric Power. https://www.niehs.nih.gov/sites/default/files/health/materials/electric_and_magnetic_fields_associated_with_the_use_of_electric_power_questions_and_answers_english_508.pdf. Accessed March 2024.

National Wind Coordinating Committee. 2010. Wind Turbine Interactions with Birds, Bats, and their Habitats. https://www1.eere.energy.gov/wind/pdfs/birds_and_bats_fact_sheet.pdf. Accessed May 2024.

NatureServe Explorer. 2022. *Aquila chrysaetos* Golden Eagle. Last updated August 4, 2023.

https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.100925/Aquila_chrysaetos. Accessed May 2024.

NOAA. 2024. National Centers for Environmental Information. Storm Events Database. https://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=27percent 2CMINNESOTA#.

Pedersen, M.B., and E. Poulsen. 1991. Impact of a 90 m/2MW wind turbine on birds – avian responses to the implementation of the Tjaereborg wind turbine at the Danish Wadden Sea. Dansek Vildundersogelser, Haefte 47. Miljoministeriet & Danmarks Miljoundersogelser.

Pickle, J. and N. O'Neil. 2021. Post-Construction Bird and Bat Fatality Monitoring Study, Bent Tree Wind Energy Facility, Freeborn County, Minnesota: July – October 2020. Prepared for Wisconsin Power and Light Company, Madison, Wisconsin. Prepared by WEST, Golden Valley, Minnesota. February 24, 2021.

Pickle, J., V. Kaufman, and M. Tuma. 2023. *Avian Use Survey Report, Bent Tree 2 Wind Project, Freeborn County, Minnesota. June 2022 – May 2023*. Prepared for Alliant Energy Company, Cedar Rapids, Iowa. Prepared by Western EcoSystems Technology, Inc. (WEST), Golden Valley, Minnesota. September 1, 2023.

Pipeline and Hazardous Materials Safety Administration (PHMSA). 2024. National Pipeline Mapping System. Public Viewer. https://www.npms.phmsa.dot.gov/. Accessed March 2024.

Sauer, J.R., Link, W.A., and Hines, J.E. 2020. The North American Breeding Bird Survey, Analysis Results 1966 - 2019: U.S. Geological Survey data release. https://doi.org/10.5066/P96A7675. Accessed May 2024.

Shaw, S.P. and C.G. Fredine. 1971. Wetlands of the United States. U.S. Fish and Wildlife Circular 39. U.S. Department of the Interior, Washington, D.C. 67 p.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. 2024. Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/. Accessed February 2024.

Steele County, Minnesota. 2007. Steele County Comprehensive Land Use Plan. September 25, 2007. https://cms2.revize.com/revize/steelecountynew/comprehensivepercent 20landpercent 20usepercent 20plan.pdf. Accessed September 2024.

Steele County, Minnesota. 2020. Steele County Zoning Ordinance. Chapter 1527. Wind Energy Conversion Systems. https://cms2.revize.com/revize/steelecountynew/Zoningpercent 20Ordinancepercent 20withpercent 20Admendments.pdf. Accessed September 2024.

Steele County. 2022. Tax Parcel Viewer. County Zoning Districts. May 24, 2022. https://steele-county-hub-site-steelecomn.hub.arcgis.com/apps/d3aead984a994bce861ad812a4551e7f/explore. Accessed September 2024.

Strickland D, Arnett E, Erickson W, Johnson D, Johnson G, Morrison M, Shaffer J, Warren-Kicks W. 2011. Comprehensive guide to studying wind energy/wildlife interactions. National Wind Coordinating Collaborative. https://rewi.org/wp-content/uploads/2020/10/Comprehensive_Guide_to_Studying_Wind_Energy_Wildlife_Interactions_2011_Updated.pdf.

Tetra Tech. 2017. 2016-2017 Post-Construction Mortality Monitoring Annual Report. Pleasant Valley Wind Farm, Mower and Dodge Counties, Minnesota. Prepared for Northern States Power Company Minnesota. Prepared by Tetra Tech, Bloomington, Minnesota June 2017.

Tuma, M. and M. Voth. 2022. *Technical Memorandum: Bent Tree 2 Wind Project 2022 Bald Eagle Nest Monitoring*. Prepared for Alliant Energy Corporation. Prepared by Western EcoSystems Technology, Inc., Golden Valley, Minnesota. August 10, 2022.

U.S. Army Corps of Engineers (USACE). 1987. Wetlands Delineation Manual: Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS. Available online at: https://www.sac.usace.army.mil/Portals/43/docs/regulatory/1987_wetland_delineation_manual_reg.pdf

USACE. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region, ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-10-16. Vicksburg, MS: U.S. Army Engineer Research and Development Center. Available online at: https://usace.contentdm.oclc.org/utils/getfile/collection/p266001coll1/id/7630

U.S. Census Bureau. 2020a. 2020 Decennial Census Redistricting Data (PL 94-171) Summary Files. https://www.census.gov/programs-surveys/decennial-census/about/rdo/summary-files.html.

U.S. Census Bureau. 2020b. Explore Census Data. https://data.census.gov/.

U.S. Department of Agriculture (USDA). 1991. Effects of Electrical Voltage/Current on Farm Animals: How to Detect and Remedy Problems. USDA Agricultural Handbook No. 696, 142 pp.

USDA. 2022. 2022 State Agriculture Overview. https://www.nass.usda.gov/Quick_Stats/Ag_Overview/stateOverview.php?state=MINNESOTA.

U.S. Environmental Protection Agency (EPA). 2021b. Environmental Justice. https://www.epa.gov/environmentaljustice.

EPA. 2023. Overview of the Drinking Water Sole Source Aquifer Program. https://www.epa.gov/dwssa/overview-drinking-water-sole-source-aquifer-program#What_Is_SSA. Accessed February 2024.

EPA. 2024. Sole Source Aquifers Interactive Map. https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=9ebb047ba3ec41ada1877155fe31356b. Accessed February 2024.

U.S. Fish and Wildlife Service (USFWS). n.d.-a. National Wildlife Refuge System. https://www.fws.gov/program/national-wildlife-refuge-system/about-us#:~:text=Thepercent 20missionpercent 20ofpercent 20thepercent 20National,presentpercent 20andpercent 20futurepercent 20generationspercent 20of

USFWS. n.d.-b. Wetland Management Districts & Waterfowl Production Areas. https://www.fws.gov/story/waterfowl-production-areas#:~:text=Waterfowlpercent 20productionpercent 20areaspercent 20arepercent 20small,grasslandpercent 20birdspercent 20andpercent 20otherpercent 20wildlife.

USFWS. 2012. Land-Based Wind Energy Guidelines. March 23, 2012. 82 pp. https://www.fws.gov/media/land-based-wind-energy-guidelines.

USFWS. 2022a. National Wildlife Refuge System and Fish Hatcheries. Interactive Map. https://www.arcgis.com/apps/webappviewer/index.html?id=e379b7e1fff54f00b826ce18183458bd&extent=-18139024.5238percent 2C2047562.8107percent 2C-5615581.8096percent 2C8377771.7452percent 2C102100

USFWS. 2024a. Waterfowl Production Areas. [Shapefile]. Updated August 14, 2024. https://arc-gis-hub-home-arcgishub.hub.arcgis.com/datasets/14e9ffa1ee304c46b7d4fab018cfd39d_0/about. Accessed September 2024.

USFWS. 2024b. Range-Wide Indiana Bat & Northern Long-Eared Bat Survey Guidelines. USFWS, Department of the Interior. March 2024. 95 pp. https://www.fws.gov/sites/default/files/documents/2024-04/final_usfws_range-wide_ibat-nleb_survey_guidelines_508-compliant.pdf

USFWS. 2024c. Initial Project Scoping: IPaC - Information for Planning and Consultation. IPaC, Environmental Conservation Online System, USFWS, Washington, D.C. Accessed March 2024. https://ipac.ecosphere.fws.gov/

U.S. Forest Service (USFS). n.d. Interactive Visitor Map. https://www.fs.usda.gov/ivm/.

U.S. Geological Survey (USGS). 2023. National Hydrography Dataset. https://www.usgs.gov/national-hydrography/national-hydrography-dataset.

USGS. 2024. Earthquake Hazards Program. Interactive Map. Updated April 13, 2024. https://www.usgs.gov/programs/earthquake-hazards/earthquakes

Waseca County, Minnesota. 2005. Waseca County Comprehensive Plan. https://www.wasecacounty.gov/DocumentCenter/View/127/wasecacocomp091305?bidId=

Waseca County, Minnesota. 2017. Waseca County Zoning Map. https://www.wasecacounty.gov/DocumentCenter/View/44/full-map?bidId=. Accessed February 2024.

Waseca County. 2018. 2018 Ag Covenant Properties. https://www.wasecacounty.gov/DocumentCenter/View/4945/Ag-Covenant-Map?bidId=. Accessed February 2024.

Waseca County, Minnesota. 2023. Unified Development Code. https://codelibrary.amlegal.com/codes/wasecacounty/latest/overview. Accessed March 2024

Westwood Professional Services (Westwood). 2013. *2012 Avian and Bat Fatality Monitoring, Lakefield Wind Project Jackson County, MN.* https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={0975A27A-BF4E-4C0A-A687-13921C2B58EF}&documentTitle=20131-82775-01.

Westwood. 2015. *2014 Avian and Bat Fatality Monitoring, Lakefield Wind Project, Jackson County, Minnesota.*

https://www.edockets.state.mn.us/edockets/searchDocuments.do?method=showPoup&documentId={692D3147-C6D7-41DE-A8B3-EA7381C45948}&documentTitle=20154-109264-01.

Westwood. 2022. *Bent Tree 2 Nest Survey, Residences & Other Environmental Review Memo (File R0035761.00)*. Prepared for Alliant Energy Corporation. Prepared by Westwood, Minnetonka, Minnesota. May 12, 2022. 10 pp.

Westwood. 2024. *Critical Issues Analysis: Bent Tree II Wind Project, Waseca, Steele, and Freeborn Counties, Minnesota.* Prepared for Alliant Energy Corporation, Madison, Wisconsin. Prepared by Westwood, Minnetonka, Minnesota. January 10, 2024. 58 pp.

Winkelman, E. 1990a. Disturbance of birds by the experimental wind park near Oosterbierum (Fr.) during building and partly operative situations (1984-1989). RINreport 90/9, DLO Institute for Forestry and Nature Research, Arnhem.

Winkelman, E. 1990b. Impact of the Wind Park near Urk, Netherlands, on Birds: Bird Collision Victims and Disturbance of Wintering Fowl. International Ornithological Congress 20: 402-403.