Application Guidance for Site Permitting of Large Wind Energy Conversion Systems in Minnesota

Minnesota Department of Commerce
Office of Energy Security-Energy Facilities Permitting

August 2010

This page left intentionally blank

Part I: Introduction and Overview of the Permitting Process

Introduction
As interest in renewable energy production has grown with the public and policy makers, site permit applications for Large Wind Energy Conversion Systems (LWECS) have increased significantly. The resulting growth in the wind industry has led to increasingly complex permitting issues. The site permit application is not only the first step in the permitting process, but also serves as the primary document for environmental review. Because the application will serve as the basis for site permit decisions are made, preparing a complete and organized application benefits applicants, agency staff, and the public.

Statutory Authority
Large Wind Energy Conversion Systems (defined as 5,000 kilowatts or greater) are governed by Minnesota Statutes Chapter 216 F and Minnesota Rules Chapter 7854.

Role of the Minnesota Public Utilities Commission and the Office of Energy Security-Energy Facility Permitting
The Minnesota Public Utilities Commission regulates electricity, natural gas and telephone service industries in Minnesota. The Commission is responsible for reviewing and issuing a Certificate of Need (CN) for a project and issues site and route permits for energy facilities (large wind projects, transmission lines, power plants, and pipelines).

The Office of Energy Security-Energy Facility Permitting is responsible for environmental review procedures. The role of EFP staff is to assist the Commission by administering the review and analysis of siting and routing applications and making recommendations for decisions.

Overview of the LWECS Permitting Process
The permitting process begins when an application is formally submitted the Minnesota Public Utilities Commission (Commission). The Commission must make a final decision on a site permit within 180 days of application acceptance if a Certificate of Need is not required. The table below provides an overview of the major steps in the permitting process.

Table 1: Overview of the Permitting Process for a Large Wind Energy Conversion System

Permitting Milestones	Pre-Application	Draft Application	Application Submittal	Application Acceptance	Public Comment Period	Draft Site Permit	Public Comment Period*	Site Permit
Process	Data Assessment and Analysis, Consult with OES-EFP staff	OES-EFP staff review for completeness; applicant provides additional information if needed	E-file application	Commission accepts/rejects Application and reviews for completeness	OES-EFP staff accept public comments on the proposed project	Commission issues/denies draft site permit	OES-EFP staff accept comments on the Draft Site Permit	Commission issues/denies site permit
Length of Time	Varies			Within 30 days of submittal	14 days (Approx.)	Within 45 days after application acceptance	Minimum of 30 days after public notice in EQB Monitor	Within 180 days of application acceptance**

* A contested case hearing may be requested during the comment period for the Draft Site Permit and are referred to an administrative law judge (ALJ).
** This time frame applies only to projects without a Certificate of Need.

How to Use this Document

This document is intended to provide applicants and preparers of LWECS applications with information on how to prepare a complete site permit application. This document includes information on the permitting process, pre-application consultation, and how to submit an application. Additionally, this guidance material identifies the required elements of a site application and provides a list of maps and mapping guidelines. The application portion of this document also serves as the framework for organizing the application.

This document is organized into four parts:

1. Introduction and Overview of the Permitting Process
2. Pre-Application Consultation and How to File
3. LWECS Application and Guidelines
4. Mapping Guidelines

Part II: Pre-Application Consultation and How to File

Pre-Application and EFP Consultation

Preparing a complete project application is an important step in the permitting process. Preliminary assessments and analysis often make an application more robust. These guidelines will assist applicants in determining the information needed for a complete application and common resources used for data collection. The resources provided are by no means exhaustive and applicants should be prepared to gather the relevant information required to submit an application that can be accepted by the Commission.

Applicants are strongly encouraged to contact the Office of Energy Security–Energy Facility Permitting Staff (EFP) prior to application submission. EFP staff advise on application requirements and explain important elements of the state's review process. Pre-application consultation can also help identify missing elements within the application or elements requiring additional information for completeness.

The following list of documents and maps is needed for a pre-application consultation with EFP staff.

1. Project description and overview including :
   A. Project location showing counties, townships, cities, and major roads in or near the project area.
   B. Estimated size of the project area in acres and project boundary delineation
   C. Anticipated interconnect location(s) and associated facilities
   D. List of other permits needed for this project (Federal, State, or Local)
   E. Size (rated capacity), in megawatts, of the proposed project. If a turbine model is not yet certain, provide information on turbines being considered, representing the maximum and minimum megawatt size under consideration
   F. Preliminary turbine layout

2. MN DNR Natural Heritage Inventory System (NHIS) Reports and map(s). The NHIS provides important information on Minnesota's rare plants, animals, and native plant communities. The NHIS response typically consists of a Natural Heritage letter, Index Report, Detailed Report, and Map(s). The Detailed Report and map(s) contain specific location information that is considered nonpublic data (Minnesota Statutes, section 84.0872, subd. 2.) and should be provided to EFP separately. Public data, including the Index Report and letter (s) should be included in the application. This information should be requested early in the planning process.

   For more information or to request a NHIS report, go to:
   http://www.dnr.state.mn.us/eco/nhnrp/nhis.html

3. Report on archaeological or historic sites within and near the project area from the MN State Historical Preservation Office (SHPO).

For more information on MN SHPO or to request a report, go to http://www.mnhs.org/shpo/

4. Analysis of Tier One (Preliminary Site Screening) and Tier Two (Site Characterization Study) of the *Draft Wind Turbine Guidelines* (U.S. Fish and Wildlife Service, 2010). The primary purpose of the *Wind Turbine Guidelines* is to describe information typically needed to identify, assess, and monitor the potential adverse impacts of wind energy projects on wildlife and their habitat, especially migratory birds and bats.

5. Analysis of any site studies to date (avian, bat, wildlife, or other biological surveys completed or anticipated prior to site construction).

6. Certificate of Need statement and schedule for obtaining certificate, if needed.

7. Project correspondence (if any) with federal, state, and county agencies; local units of government and tribal governments to date.

Maps for Pre-Application Consultation

1. Map 1: Project location and boundaries, county boundaries, nearest communities, cities, and major roads. Include an inset map showing where the project is located in the state.

2. Map 2: Preliminary turbine layout and alternate turbine locations

3. Map 3: NHI map showing the general location of threatened, endangered, and special concern species and/or their habitat occurring within 5 miles of the proposed project. Map to be labeled *Not for Public Distribution*.

4. Map 4: Ownership map showing all public lands, conservation easements (public and private), and public recreation information (PRIM) within 5 miles of the project boundary. PRIM maps can be downloaded from the MN DNR at http://www.dnr.state.mn.us/maps/prim.html. Additional data layers can be obtained from the MN DNR data deli. Information on conservation easements can be obtained from the county.

5. Map 5: Local zoning and landuse map(s) showing current and future land use in the project area and surrounding areas, including urban growth boundaries.

Determining Application Completeness

Applications often require modifications before they can be considered complete. Consulting with EFP staff prior to formally submitting an application to the Commission can help identify missing elements, address concerns, and provide additional guidance on submitting a complete application. A thorough, accurate, and well organized application is needed for the Commission to accept an application, to facilitate public review and comment, and for the Commission to issue a site permit.

Applicants should be aware that applications rarely answer all the questions that state agencies must address. Applicants will be asked to provide additional information and data throughout

the permitting process. Applicants must respond to all EFP and Commission inquiries and requests in a timely and thorough manner.

How to File

LWECS applications are formally submitted electronically on e-dockets. Hard copies of the application and electronic copies are needed by Commission staff and EFP staff for review and posting on the website.

> For more information on e-dockets and how to establish an account, go to: https://www.edockets.state.mn.us/EFiling/security/login.do?method=showLogin

1. E-Filing
   Applicants are responsible for establishing and maintaining an eDocket account and registry. Applications must be submitted to E-dockets for consideration. The 180 day permitting process begins when an application has been accepted by the Commission.

2. Electronic copy
   An electronic version of the application must be submitted to the Commission and suitable for posting on the Commission's web page. Chapters, appendices, and maps should be individual PDF files and labeled as they appear in the table of contents and include the file size. The table of contents should also be a separate PDF. File sizes should be limited to 5MB to the extent possible.

3. Paper copies
   Seven paper copies of the application must be submitted: 3 to the Commission and 4 with EFP.

4. Map Data
   Provide the data used (preferably shapefiles) for all maps submitted with the application to EFP. Files should be labeled and arranged to correspond with each map.

5. Trade Secret or Privileged Data
   Applicants may request certain information be considered trade secret and/or privileged data not available to the public. According to the Minnesota Government Data Practices Act (and other applicable law), the Commission has the authority to determine if the trade secret request satisfies the requirements for the protected classification and will notify the applicant of the determination before releasing such data or information. However, the application serves as the environmental analysis and is the basis for public comment and is generally regarded as public information. An applicant may withdraw its application if the information is not entitled to protection.

Part III: Application Guidelines

Tips on Preparing an Application

Data Analysis

Provide an analysis or interpretation of the data used and presented for each required element identified below. For example, if it has been determined that population density is low; provide an interpretation of the significance of low population densities in relation to the project.

Citations and References

Preparing an application will require the use of many data sources. Provide citations and sources of information, as they are used, including websites. If projection models are used, specify which model/and or program was used, and the assumptions, variables, or inputs used in modeling. Data sources used for mapping should also be cited.

Writing Environmental Impacts and Mitigation of the Proposed Actions

Determining the impacts and appropriate mitigation measure of the proposed project can be challenging. The environmental analysis portion of the application should be an objective evaluation of the anticipated positive and negative impacts of the proposed project actions on the physical, biological, and socio-economic environment. The following may be helpful in considering impacts and mitigation:

1. The characterization of impacts should include descriptions of duration, intensity (or magnitude), and context (site specific, local, regional, etc).
2. Provide supporting analysis or rationale for the impact and its intensity. The analysis should be value-neutral rather than a justification for the action.
3. Mitigation measures should provide decision-makers with a list or range of options to reduce impacts and not simply reduce impacts to permit levels.

Best Management Practices

Identify the use of best management practices (BMPs) to be employed during construction and post-construction of the project as applicable. In some instances, BMPs can provide mitigation measures.

Application

The information required in the application is consistent with Minnesota Rules 7854.0500.

1. **Applicant Information**
   - 1.1. Letter of transmittal signed by an authorized representative or agent of the applicant.
   - 1.2. Complete name, address, and telephone number of the applicant and any authorized representative.
   - 1.3. Signature of the preparer of the application if prepared by an agent or consultant of the applicant.
   - 1.4. Role of the permit applicant in the construction and operation of the LWECS.
   - 1.5. Operator of the LWECS if different from the applicant.
   - 1.6. Name of the person or persons to be the permittees (if a site permit is issued).

2. **Certificate of Need (CN)**
   Discuss whether or not a CN for the LWECS system 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 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.

3. **State Policy**
   Describe 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.

4. **Project Description and Overview**
   - 4.1. Project location (counties and townships of the project area)
   - 4.2. Size of the project area in acres.
   - 4.3. 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.
   - 4.4. Number of turbine sites and alternative turbine sites identified for the project
   - 4.5. 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.
   - 4.6. Percent of wind rights secured, if any (see section 7 for more information regarding wind rights).
   - 4.7. Ownership statement (identify any other LWECS located in Minnesota in which the applicant, or a principal of the applicant, has an ownership or other financial interest).

5. **Project Design**
   - 5.1. Provide a description of the project layout with the proposed spacing of turbines, residential roads, necessary setbacks, and site control.
   - 5.2. A description of the turbines and towers and other equipment to be used in the project, including the name of equipment manufacturer(s).
   - 5.3. A description of the LWECS electrical system, including collection lines, feeder lines, transmission lines, transformers, and interconnection voltage, and substations.

6. **Description and Location of Associated Facilities**
   Describe the facilities, equipment, machinery, and other devices necessary to the operation and maintenance of a large wind energy conversion system, including collector and feeder lines, and substations.

   6.1. Transmission and Project Substations
   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.

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

6.3. Associated Facilities
Describe any planned operation and maintenance buildings, other associated facilities, or met towers for the project.

6.4. 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)

7. **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 LWECS. The applicant should provide 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.

8. **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 chapter 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.

8.1. **Demographics**
Describe the population, number of homes, type and quantity of businesses in and near the project area. This should include population density within 5 miles from the project boundary. Provide the number of people per square mile with information on population densities in the project area. Turbine distance from receivers (homes) must meet the state noise standard (see section 8.3 for more information on noise standards). Provide an analysis and discussion of potential impacts of the project, proposed mitigative measures, and any adverse effects that cannot be avoided.

Links*:* Minnesota State Demographer
http://www.demography.state.mn.us/

US Census Bureau
http://factfinder.census.gov

Minnesota Department of Employment and Economic Development
http://www.positivelyminnesota.com/apps/lmi/rws/

8.2. **Land Use**

8.2.1. **Local Zoning and Comprehensive Plans**

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.

8.2.1.1. Provide a table of adopted comprehensive plans within and adjacent to the proposed project area and the year they were adopted. List the governing body (county, town, or city) responsible for the plan, the name of the plan, and any other associated development plans such as land and water management plan and farmland preservation plan.

8.2.1.2. Identify any county or local ordinances pertaining to wind energy conversion standards.

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

Information on urban growth boundaries and zoning can generally be found on local or county websites.

8.2.2. **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.

Reinvest in Minnesota (RIM)
http://www.bwsr.state.mn.us/easements/index.html

RIM shape files are available from the MN DNR Data Deli
http://deli.dnr.state.mn.us/data_catalog.html

8.3. **Noise**

Provide existing and projected ambient noise levels. The project must meet MN noise standards (Minnesota Rules Chapter 7030) at all residential receivers (homes). Typically 750-1500 ft is required to meet noise standards depending on turbine model, number of turbines, layout, and site specific conditions. Provide an analysis and discussion of potential impacts of the project, proposed mitigative measures, and any adverse environmental effects that cannot be avoided.

8.3.1. Provide wind turbine noise estimates and isopleths for all preliminary turbine layouts at 40 and 50 dB.

8.3.2. Describe the noise impacts from a single turbine and from multiple turbines in relation to the noise standard.

8.3.3. Provide the method or type of model used to determine noise levels.

8.4. **Visual Impacts**

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.

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

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

8.4.3. 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.

8.5. **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.

8.5.1. Roads

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.

8.5.2. Telecommunications

Describe and list all communication systems.

8.5.3. 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.

8.5.4. Television

Provide an analysis of the potential for television interference.

8.6. **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).

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

8.6.2. 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 Society
http://www.mnhs.org/shpo/

8.7. **Recreation**

8.7.1. 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.

For more information on recreational resources, go to:
MN Public Recreation Information Map (MN PRIM)
http://www.dnr.state.mn.us/maps/prim.html

MN DNR Division of Parks and Recreation
http://www.dnr.state.mn.us/parks_recreation/index.html

MN DNR Division of Trail and Waterways
http://www.dnr.state.mn.us/trails_waterways/index.html

MN DNR Wildlife Management Areas
http://www.dnr.state.mn.us/nature_viewing/index.html

MN DNR scientific and Natural Areas
http://www.dnr.state.mn.us/snas/index.html

National Wildlife Refuges
http://www.fws.gov/refuges/profiles/ByState.cfm?state=MN

8.8. **Public Health and Safety**

8.8.1. 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.

8.8.2. Aviation

Identify all public and private registered 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,. gypsy 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. For more information go to:

MN Department of Transportation
http://www.dot.state.mn.us/aero/

MN Department of Transportation (Tall Structures)
http://www.dot.state.mn.us/aero/avoffice/talltowers.html

8.9. **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.

8.10. **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.

8.11. **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.

More information on regional and local tourism can be found at
MN Tourism: Explore Minnesota
http://industry.exploreminnesota.com/side2/research-reports/economic-impact/

8.12. **Local Economies**

8.12.1. Describe the economic impacts of the project to local communities, 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.

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

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

8.13. **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.

8.14. **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.

For more information, go to:

MN Geospatial Office (MNGEO)
http://www.mngeo.state.mn.us/chouse/soil.html

MN Natural Resource Conservation Service
http://www.mn.nrcs.usda.gov/

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

For more information go to:

Minnesota State Geological Survey
http://www.geo.umn.edu/mgs/

US Geological Survey
http://www.usgs.gov/

8.16. **Surface Water and Floodplain Resources**

8.16.1. 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.

8.16.2. MN DNR has designated Wildlife Lakes that restrict the use of motorized boats to reduce disturbance to waterfowl. Describe any designated Wildlife Lakes in and adjacent to the project boundary.

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

8.16.3. Describe 100-year Federal Emergency Management Agency (FEMA) floodplains within the project area.

For more information on Wildlife Lakes, go to:
http://www.dnr.state.mn.us/wildlife/shallowlakes/designation.html

For information on other surface waters and meandering water bodies, go to:

MN Pollution Control Agency (PCA)
http://www.pca.state.mn.us/water/

MN DNR
http://www.dnr.state.mn.us/waters/index.html
http://www.dnr.state.mn.us/watershed_tool/index.html

8.17. **Wetlands**

Describe wetlands within and near the project area. Turbines, towers, or associated facilities shall not be located in public waters or wetlands. Electric collector and feeder lines may cross or be placed in public water wetlands subject to DNR, US Fish and Wildlife Service, and the US Army Corp of Engineers' approval. Permits may be 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.

MN Board of Water and Soil Resources
http://www.bwsr.state.mn.us/index.html

8.18. **Vegetation**

Describe the dominant vegetation and cover types for the following: agricultural lands (row crops, hay /pasture, other), non-agricultural upland (prairie, grasslands, 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.

MN DNR-Ecological Resources
http://www.dnr.state.mn.us/eco/index.html

8.19. **Wildlife**

8.19.1. 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.

8.19.2. 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.

8.19.3. 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.

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

For more information on waterfowl feeding and resting areas, go to:
http://www.dnr.state.mn.us/wildlife/shallowlakes/mwfra.html

For other information regarding wildlife and wildlife habitat, go to:
MN DNR-Wildlife Action Plan
http://www.dnr.state.mn.us/cwcs/index.html

USFWS Wind Turbine Guidelines
Draft Wind Turbine Guidelines

For information on Important Bird Areas, go to:
http://www.dnr.state.mn.us/iba/index.html

8.20. **Rare and Unique Natural Resources**

8.20.1. Describe any rare and unique natural resources, including habitat and community types, threatened, endangered, species of special concern as determined by the NHI 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.

8.20.2. 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 likely 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.

MN DNR Natural Heritage Inventory
http://www.dnr.state.mn.us/eco/nhnrp/nhis.html

For information on land in the Prairie Bank Easement Program, go to:
http://www.dnr.state.mn.us/prairierestoration/prairiebank.html

For information on Minnesota's Species of Greatest Conservation Need, go to:
http://www.dnr.state.mn.us/cwcs/index.html

9. **Site Characterization**
   - 9.1. Describe the site characteristics for the following:
     - 9.1.1. Interannual variation
     - 9.1.2. Seasonal variation
     - 9.1.3. Diurnal conditions
     - 9.1.4. Atmospheric stability, to the extent available
     - 9.1.5. Turbulence, to the extent available
     - 9.1.6. Extreme conditions
     - 9.1.7. Speed frequency distribution
     - 9.1.8. Variation with height
     - 9.1.9. Spatial variations
     - 9.1.10. Wind rose, in eight or more directions, including a diagram or illustrating wind rose.
     - 9.1.11. Other meteorological conditions at the proposed site, including the temperature, rainfall, snowfall, and extreme weather conditions
   - 9.2. Location of other wind turbines within 10 miles from the project boundary.

10. **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:

10.1. **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.

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 road bed depth and road width. Describe any associated site access control required for the project (fences or gates).

10.3. **Associated Facilities**

Describe any operation and maintenance buildings, other associated facilities, or met towers for the project.

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.

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.

10.6. **Operation of Project**
Describe how the project will be operated and maintained after construction, including a maintenance schedule.

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.

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.

10.9. **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.

10.10. **Decommissioning and Restoration**
Include the following information regarding decommissioning of the project and restoring the site:

- 10.10.1. the anticipated life of the project
- 10.10.2. the estimated decommissioning costs in current dollars
- 10.10.3. the method and schedule for updating the costs of decommissioning and restoration
- 10.10.4. the method of ensuring that funds will be available for decommissioning and restoration
- 10.10.5. the anticipated manner in which the project will be decommissioned and the site restored

11. **Identification of other permits**
Provide a table of permits for all known or potentially required permits for the proposed LWECS. Include federal, state, and local agencies or authorities and the permits they issue.

Part IV: Maps

Map Scale and Data Layers

Aerial photos are generally used as a base layer for most maps and should be provided at a scale of at least 1:4800. The extent of the aerial photography must be inclusive enough to show the landscape context within which the proposed facilities would be placed and will require the map extent to go beyond the project boundary. Rectified orthophotos using GIS are preferred (reduced size aerial photos are not adequate). The standard GIS platform is ESRI ArcGIS v. 9. All data (shapefiles are preferred) used to create the following maps must be submitted to EFP.

In some cases, providing all of the layers requested on a single map may not be practical. Applicants should submit maps that provide cartographic clarity as well as providing the necessary geographic information below.

Obtaining Data Layers

Data layers and shapefiles for use with ArcGIS can be obtained from several sources, including but not limited to:

Minnesota Geospatial Information Office
Provides and maintains certain statewide geographic data, including aerial photographs.
http://www.mngeo.state.mn.us/

Minnesota Department of Natural Resources Data Deli
This site contains GIS shapefiles for MN County Biological Survey (MCBS) Sites of Biodiversity Significance and MCBS Native Plant communities as well as recreational and public land data.
http://deli.dnr.state.mn.us/

Natural Resource Conservation Service (NRCS)
http://www.mn.nrcs.usda.gov/technical/soils/digi.html

Minnesota State Geological Survey
http://www.geo.umn.edu/mgs/

US Geological Survey
http://www.usgs.gov/

List of Required Maps

1. Project Location
   Include county and municipal boundaries, cities, villages, lakes and rivers, and all major roads and highways delineated on a United States Geological Survey map, with a state locator map. Extent should be at least 10 miles from the project boundary.

2. Project Area and Facilities
   Provide a project area map with a recent (within the last 3 years) aerial photograph as a base. Include:

- Boundaries of the project area,
- Location of all proposed turbine sites
- Location of any new substation facilities or existing substation expansion
- Location of collector circuits, access roads, and crane paths.
- The extent of this map should not extend more than 2 miles beyond the project area boundary. Maps should include local infrastructure including roads, existing utility facilities (electric transmission and distribution, pipelines etc.), and the location of sensitive sites including but not limited to all residences, airports and private air strips, municipalities, recreational lands, major rivers and lakes. If new residences, subdivisions, commercial or industrial facilities have been built since the date of the aerial photo base map, note those features accurately on the project area map.

3. Public Land Ownership and Recreation
   Map of all publicly owned lands inside the project boundary and within 5 miles of the project area (parks, trails national/county/state forests, etc).

4. Turbine Layout and Constraints
   Provide layout and constraint maps for each turbine type under consideration. Include setbacks from participating and non-participating landowners, and any other proposed setbacks.

5. Existing Wind turbine locations in the project area.

6. Land Cover
   Provide land cover in the project area and surrounding areas.

7. Zoning Map
   Include local zoning in the project area and adjacent to the project boundary, including urban growth boundaries.

8. Topographic Maps
   Provide topographic maps showing all turbine sites, substation facilities, collector circuits, and access roads. The topographic extent should extend no less than 2 miles out from the project boundary.

9. FEMA Floodplain

10. Wetlands Inventory Map
    A. Wetland Maps
       MN Wetland Inventory (MNWI) Maps up to 5 miles from the project boundary).
       Provide maps showing WI wetlands within and around the project area boundary. Maps should show each turbine site and all connecting facilities (roads, collector circuits etc.) without obscuring map details.
    B. Delineated Wetlands Maps (within the project boundary)
    C. Flood Insurance Rate Maps

11. Surface Waters
    Map all surface waters within the project area and ½ mile from the project boundary

12. Unique Natural Features
    Include MCBS site classification, rare plant communities, and cultural or archaeological sites of significance within and adjacent to the project boundary. Include turbine layout, collector circuits, and access roads.

13. Soils
    Provide soils within the project area grouped by soil association. Include turbine layout, collector circuits, and access roads.

14. Site Geology and Depth to Bedrock
    Map depth to bedrock in the project area. Include turbine layout, collector circuits, and access roads.

15. Land Ownership
    A. Land Ownership Maps ½ mile outside the project boundary showing ownership, roads, and municipal boundaries.
    B. Parcel boundary maps showing the project boundary with the location of all turbine sites, access roads, collector circuits, and crane paths. Parcel maps should be based on the most recent data available and include corrections to reflect accurate ownership.

16. Microwave Beam Path
    Include microwave beam paths and telecommunication systems within and adjacent to the project boundary.

17. Sound/Noise
    Map noise modeling data for each turbine type under consideration. Include all homes within the project area.