PUC Docket No. IP6646/WS-07-839

Site Permit Application for
Large Wind Energy Conversion System

Wapsipinicon Wind Project
Mower County, Minnesota

enXco Development Corporation

June 25, 2007

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Project Location	T104N, R15W	Sections 19-21, 28-33 (Pleasant Valley)
	T104N, R16W	Sections 24, 25, 36 (Sargeant)
	T103N, R15W	Sections 5-9, 17-21, 28-33 (Grand Meadow)
	T103N, R16W	Sections 1-5, 8-17, 20-29, 34-36 (Dexter)
	T102N, R15W	Sections 4-9, 16-18 (Marshall)
	T102N, R16W	Sections 1-5, 8-17 (Clayton)

A. Introduction

1. Overview

enXco Development Corporation("eDC"; "enXco") submits this site permit application for the Wapsipinicon Wind Farm project in Mower County, MN. The project involves constructing up to 205.5MW of nameplate capacity. Currently, enXco anticipates using up to 137 General Electric 1.5 MW turbines.

enXco began development of this site in 2001 and has acquired sufficient land to site up to 205.5MW. enXco has been continuously collecting wind data in the area since 2001 and is now securing the rights to interconnect up to 200MWh through the MISO study process.

enXco will site the equipment and facilities within the 80 square mile permit area shown in **Figure 1.** enXco has designated 80 square miles as the permit area to provide some siting flexibility and to allow sufficient room for buffer with I-90, various microwave beam paths which have been identified and existing wind projects. The study area is shown in **Figure 1**.

enXco will construct approximately six miles of a 161kV transmission line to bring power from the project substation to the point of interconnection, which is the Pleasant Valley Substation. enXco plans to apply for a permit for the transmission line and project substation through Mower County, which has previous experience with the permitting process for transmission lines associated with wind projects.

enXco anticipates that the project will be constructed for at least three distinct customers subject to the terms and conditions of separate project agreements. enXco plans to sell 100.5MW of capacity to Northern States Power Company, a Minnesota Corporation and wholly owned subsidiary of Xcel Energy ("Xcel Energy") as a complete "turnkey" project. This portion of the project will require a Certificate of Need ("CN"). enXco and Xcel Energy have coordinated the CN and Site Permit Applications as appropriate and enXco anticipates the CN application will be submitted at or near the same time as the submission of this Site Permit Application.

At this time enXco plans to construct the other 2 portions of the project such that pursuant to Section 216B.243 Subd. 8 of the Minnesota Statutes, no CN would be required. enXco will provide a complete description of the project structure and the reasons for its exemption from the CN requirement prior beginning construction on any other portions of the project.

2. Proposed Project Location

The Wapsipinicon Wind Farm will be located central Mower County in Clayton, Marshall, Dexter, Grand Meadow, Pleasant Valley, and Sargeant Townships about 20 miles east of Austin, MN (see **Figure 2 and 3)**. The cities of Elkton and Dexter are also within the study boundary. enXco has designated approximately 80 square miles as the permit area to provide some siting flexibility and to allow sufficient room for buffer with I-90, various microwave beam paths which have

been identified and existing wind projects. The town of Grand Meadow is adjacent to the project site to the east. Interstate 90 bisects the project area.

The site is located immediately north of the proposed High Prairie II Wind Farm and northwest of the existing High Prairie I Wind Farm.

Electricity generated from the turbines will be routed to a proposed substation within the study area. The exact location of this substation has not yet been determined, but is tentatively planned to be located adjacent to I-90 as shown on **Figure 3**. From there, power will be routed to the existing Pleasant Valley Substation located within the northern portion of the project area. The Pleasant Valley Substation is shown on **Figure 3.** enXco plans to permit the project substation and transmission through Mower County, which has previous experience with the process.

The turbines will be sited on agricultural land and located to maximize the capture of the wind resources while minimizing impacts to the surrounding area. The turbines will be on 80 meter (262.5 feet) towers with 77 meter (252.6 feet) rotors for a maximum height of 118.5 meters (388.8 feet). Each rotor will have a swept area of 4,654 square meters (50,095 square feet). A final siting plan layout will be developed and appropriate approvals/permits obtained prior to construction.

B. Applicant Information

1. Project Ownership

The project is being developed by enXco Development Corp which is currently negotiating the terms of the sale of 100.5MW of the project's capacity t to Xcel Energy. enXco intends to construct all or a portion of the remaining capacity concurrently with the first 100.5 MW pursuant to the terms and conditions of agreements yet to be finalized.

2. Construction, Operation and Maintenance

eDC will oversee the engineering, procurement and construction of the project and will perform the various aspects of the work itself or through the use of highly qualified contractors.

enXco will be directly responsible, through its Asset Management and Service companies respectively, for the Operation and Maintenance of that portion of the project in which enXco maintains an ownership position. enXco hopes to provide Operations and Maintenance Service to the entire project but acknowledges that Xcel Energy may select another qualified operator and service provider.

enXco Inc, the asset management company, provides operation services to enXco owned projects across the country as well as projects owned by third parties. enXco Service Corp, the service and maintenance company, not only maintains the turbines owned by enXco, but is also recognized as a premier third party service provider to the industry. enXco Service Corp currently maintains well over 3,000 turbines of all makes and models across the United States and is

a licensed service and warranty provider for the GE 1.5MW turbine to be used at the Project.

3. enXco interest in other LWECS project in Minnesota

enXco has developed and retained an ownership position in two LWEC systems in the State of Minnesota. These are the 85.5MW Chanarambie Wind Project and the 205.5MW Fenton Wind Project. In both cases, enXco performed complete greenfield development and financing of the projects. enXco also completed the engineering, procurement and construction of the Chanarambie project and is in the process of completing the engineering, procurement and construction of the Fenton project.

enXco operates and maintains the Chanarambie Project and will do the same for the Fenton Wind Project.

enXco has a long history of project development in Minnesota. enXco was involved in the development and construction of three 1.98MW projects which came online in 1999 and 2001. enXco was also involved in the financing and construction of the 12MW Viking project which came online in 2003. enXco provides operations and maintenance services to all four of these projects.

C. Compliance with Wind Siting Act and Minnesota Rules 4401

1. Certificate of Need

enXco is currently negotiating the sale of 100.5MW of the project to Xcel Energy. Under this structure a Certificate of Need will be needed for that portion of the project. enXco has coordinated the creation of the Site Permit Application with the Certificate of Need filing and will work with Xcel Energy through the regulatory process as appropriate. enXco anticipates that the Certificate of Need filing will be made at or near the same time as the filing of this LWECS Site Permit Application.

enXco currently plans to construct up to 105MW of the project such that pursuant to Section 216B.243 Subd. 8 of the Minnesota Statutes, no CN would be required. Further details will be provided as the structure of the projects is finalized. enXco will provide a complete description of the projects and the reasons for their exemption from the CN requirement prior to beginning construction on any other portions of the project.

enXco anticipates constructing the entire project concurrently to take advantage of economies of scale. This results in reduced capital costs which benefit the Utility Customers and their ratepayers. It also results in a more efficient construction schedule which helps to minimize the normal but sometimes inconvenient impacts of construction work on the host community.

2. State policy

enXco will site the project in a manner as to maximize capture of the wind resources while minimizing impact to area. The purpose of this site permit application is to provide information about the wind and environmental resources within the project area to aid in siting the project in an orderly manner that is

compatible with environmental preservation, sustainable development, and efficient use of resources.

D. Proposed Site

1. Wind Rights

enXco identified the Wapsipinicon project site in 2001. enXco has secured wind rights with private property owners within the project area sufficient to site 205.5MW of wind turbines. The agreements allow for approximately 30 years of project operation. Wind rights are currently being acquired from additional property owners in the area in order to optimize the turbine and electrical system layout.

2. Wind Characteristics

a. Interannual variation – The average annual wind speeds measured at the long term reference station at Rochester, MN varied by approximately 5% during calendar years 1997 through 2006.

b. Seasonal variation – Generally, the average wind speeds are highest during the winter and lowest during the summer. Average wind speed generally increases through the fall and decreases through the spring.

c. Diurnal conditions - The highest average wind speed observed at site occurs during the afternoon and late night. The lowest wind speeds are in mid morning and early evening.

d. Atmospheric stability – The studies engaged to determine wind speed and energy production for LWEC systems do not include this information.

e. Turbulence – The turbulence intensity at hub height was calculated at 0.098 which is consistent with expectations for the relatively uncomplicated terrain of the site area.

f. Extreme conditions – Extreme wind conditions while possible, are rare in southeastern Minnesota. Wind conditions monitored at the site were well within the design parameters of commercial wind turbines.

g. Speed frequency distribution – Wind speed frequency distribution is shown on **Figure 4.**

h. Variation with height – Wind speed variation with height, or wind shear was calculated using the power law. The resulting wind shear exponent, 0.209, is consistent with the relatively flat terrain of the project area.

i. Spatial variation – Due to the relatively uncomplicated terrain of the project area significant variation in wind speed is not anticipated within the project area.

j. Wind rose – Please see **Figure 4**.

3. Other Meteorological Conditions

Rainfall, snowfall, and temperature information were obtained from the State Climatology Office as outlined below.

Table 3-1. Climatological Information

Month	Mean Daily Maximum (°F)	Mean Extreme Maximum (°F)	Mean Daily Minimum (°F)	Mean Extreme Minimum (°F)	Normal Precipitation (inches)	Max Precip (inches)	Min Precip (inches)	Normal Snowfall (inches)	Normal wind speeds (mph)
January	21.2	40.2	3.7	-20.1	0.94	2.53	0.07	11.9	13.0
February	27.0	44.2	9.5	-14.4	0.75	2.21	0.04	7.8	12.6
March	37.8	60.6	20.7	-1.9	1.88	3.58	0.32	9.0	13.2
April	55.3	78.2	34.5	18.5	3.01	7.30	0.94	4.3	13.7
May	68.1	85.7	46.0	30.8	3.53	8.41	1.17	0	12.4
June	77.5	90.9	55.8	42.0	4.00	12.51	0.94	0	11.4
July	81.3	92.1	60.0	48.4	4.61	12.33	1.02	0	10.0
August	79.0	90.4	57.8	45.4	4.33	9.52	0.34	0	9.8
September	70.7	86.4	48.7	32.6	3.12	10.50	0.38	0	10.9
October	58.8	78.8	37.9	21.8	2.20	6.08	0.27	1.0	12.0
November	40.8	62.1	24.4	4.3	2.01	5.90	0.06	7.1	13.0
December	26.5	45.4	11.0	-13.3	1.02	2.83	0.22	11.6	12.8
Year	53.7	71.2	34.2	16.2	31.40				12.1

Source: Normals, means, and extremes from Rochester Airport (1971-2000), State Climatology Office.

4. Other wind turbines in the area

Two LWECS Site Permits have been approved in the immediate area. The High Prairie Project is currently in operation and the High Prairie II Project is beginning constructed at the time of this application. The Wapsipinicon Wind Farm site is located immediately north of the High Prairie II site.

E. Design of Project

1. Project layout, setbacks

enXco is in the process of acquiring wind rights over additional properties in order to optimize the site layout. In addition, a thorough review of wetland areas and an assessment of microwave beam pathways are being conducted. Completion of all these activities is planned for Mid-July of 2007.

enXco will update this Site Permit with a project layout following these activities, so that an accurate representation of the turbine locations, project substation and interconnecting transmission lines are depicted.

The final layout will incorporate setbacks from occupied residences, road rights of way and land over which the wind rights are not controlled. enXco generally maintains a minimum setback of 1,000 feet from occupied residences, 250 feet from road rights of way and 2-5 Rotor diameters from property over which the wind rights are not controlled.

2. Description of turbines, towers, foundations, and other equipment

The 1.5 Series turbine, rated 1.5 MW, assembled by GE Wind Energy, is a three bladed, upwind, active yaw, and active aerodynamic control regulated wind turbine generator with power/torque control capabilities. The rotor utilizes blade pitch

regulation and variable speed operation to achieve optimum power output at all wind speeds. The variable speed operation minimizes power and torque spikes delivered from the rotor to the drivetrain resulting in improved long-term reliability.

a. Rotor

The 1.5 MW turbine Series rotor utilizes an active-pitch controller to provide continuous fine adjustment of the blade angle. This “fine tuning” optimizes wind energy capture at all operating wind speeds. The turbine’s active-pitch controller also enables the wind turbine to dramatically reduce the damaging peak loads associated with large stall-regulated rotors. The turbine can be delivered with 1 of 3 blade diameters: 65 meters for high wind speed applications, 70.5 meters for medium wind speed applications, and with a 77 meters rotor diameter for low wind speed applications.

Under partial load, the pitch angle is held constant, and the rotor speed is varied to maximize energy capture. If the rated wind speed is exceeded, the turbine power output is kept constant by varying the pitch angle, independent of air temperature and air density.

A major attribute of the turbines variable speed technology is its ability to minimize torque spikes. By allowing the rotor to increase in speed during sudden gusts, high torque transients in the drivetrain are eliminated.

b. Hub Assembly

The hub is manufactured from cast ductile iron and undergoes stringent X-ray quality control procedures. It is mounted directly on the rotor shaft. There is access to the inside of the hub for inspection and service of the electric pitch system and the blade mounting bolts.

c. Blades

The rotor blades use airfoils that are specifically designed for the 1.5 MW turbine. These turbine airfoils have reduced sensitivity to blade-surface roughness and provide a smooth blending along the blade. The superior aerodynamic characteristics of the turbine airfoils were verified in wind-tunnel tests, and result in one of the highest performance rotors in the industry.

The white blades are manufactured from fiberglass with a smooth layer of gel coat that provides UV protection. Field tests have proven that the proposed blades perform efficiently and at low noise levels.

d. Gearbox

The gearbox is a high efficiency, 3-stage planetary/spur gear design with a ratio of 1:72. The entire gearbox is supported by elastomeric bushings, providing noise reduction. The gearbox housing is cast to give a ductile and sturdy construction. The housing is designed to transmit all static and dynamic forces via the yaw system directly into the tower structure. The parking brake is mounted on the high-speed shaft of the gearbox.

The bearings on the main shaft inside the gearbox are of the spherical and cylindrical roller type. These bearings guarantee that parallelism of the shafts is maintained during operation.

All gears and bearings inside the gearbox are continuously force-lubricated through injection of 100% synthetic oil.

The bearings are force-lubricated by crossflow from individual nozzles. Before the oil is forced through the oil pipes, it passes through a filter and a pressure reduction valve ensuring the delivery of clean oil at the correct pressure to the bearings. This system effectively and continuously cleans and cools the bearings under all operating conditions.

e. Generators

The generator is a doubly fed, asynchronous design with a wound rotor and slip rings. A frequency converter tied into the rotor circuit varies the rotor field frequency, allowing the generator speed to be adjusted in a range of +/- 30% around the synchronous speed.

The generator meets protection class requirements of the International Standard IP 54 with all electrical and moving parts totally enclosed for safety and protection from the elements. The generator housing is grounded and an air-to-air cooler ensures proper cooling of the windings. The generator is fastened to the bedplate with elastomeric elements to reduce noise and vibration.

f. Full Span Control System

The 1.5 MW Series wind turbine is equipped with variable pitch control system for each blade, providing safe, sure operation and through the triple redundancy of individual blade aerodynamic braking capability, the need for high torque mechanical breaking is eliminated. Individual blade pitch angles are controlled by individual electric motor drives located inside the rotor hub. A fail-safe battery back up assures continuous, reliable operation.

g. Brake System (Aerodynamic Brake)

The electrically actuated individual blade pitch systems act as the main braking system for the wind turbine. Normal braking is accomplished by feathering the blades out of the wind. Any single feathered rotor blade can stop the wind turbine, and each rotor blade has its own battery bank and failsafe controls to ensure safe and reliable emergency feather action after a grid loss.

The turbine is also equipped with a brake located at the output (high-speed) shaft of the gearbox. This emergency brake is only applied on manual emergency-stops (E-stops). Under grid loss conditions, the machine first feathers the blades to slow the rotor, then after a time delay, the mechanical brake system actuates to ensure a safe and controlled shut-down.

h. Yaw Drive System

A roller bearing attached between the nacelle and tower facilitates yaw motion. Three yaw planetary drives (with electrical failsafe brakes) mesh with the outside gear of the yaw bearing and ensure proper yaw motion. Pre-loaded friction pads produce sufficient friction to prevent un-commanded yawing under normal operational conditions. Extreme yaw moments act in response to the yaw drive brakes. The yaw brakes are actuated when the turbine has reached the end position of a yawing maneuver.

The wind direction sensor on top of the nacelle communicates with a computer, which evaluates the measured wind parameters, and within a specified time interval, activates the yaw drives to align the nacelle to the changing wind directions. The yaw control action is continuously active, even below the cut in speed of the rotor to keep the turbine safely oriented into the wind. On the underside of the yaw deck a cable twist sensor is mounted to provide an accurate measurement of nacelle rotation. After the sensor detects 900-degree rotation in one direction (net), the controller automatically brings the rotor to a complete stop, untwists the cable by counter yawing and re-starts the wind turbine.

i. Turbine Control Unit

The machine can be controlled from the control panel inside the nacelle or from the bottom of the tower. It can also be remotely controlled through the SCADA system, with local lockout capability provided at the turbine controller. Using the tower top control panel, the machine can be stopped, started, and turned out of the wind. Service switches at the tower top prevent service personnel at the bottom of the tower from operating certain systems of the turbine while service personnel are in the nacelle. To override any machine operation, E-stop buttons located in the tower base can be triggered to quickly and safely stop the turbine.

j. Nacelle

The nacelle is a fiberglass shell enclosure with sound-insulating foam applied to the inside. Access from the tower into the nacelle is through a manhole in the bedplate. The nacelle functions as a housing to protect the mechanical and electrical equipment from the outside environment. It allows sufficient standing room and working space around the drivetrain for service and maintenance work. The housing is ventilated and well illuminated with a skylight hatch, enabling work to be carried out safely and when convenient. Most service and maintenance work can be carried out from inside the nacelle. A hatch at the front end of the nacelle gives easy and safe access to the blades and the hub. When the rotor is stopped and secured in the right position, there is access through a top hatch in the nose cone to the inside of the hub for maintenance functions. The sound insulating foam inside the nacelle enclosure and the elastomeric mounts of the main machine components reduce the acoustic emissions.

k. Sensors

To monitor the generator temperature, PT100 temperature sensors are built into the windings. The sensors provide a direct read-out of temperature on the controller display and a signal for an automatic shutdown of the turbine when a certain, user-defined temperature limit is exceeded.

l. Towers

The 1.5 MW Series turbine is available with a 65, 80, or a 100 meter hub height. The tubular tower offers protection to maintenance workers servicing the turbine in adverse weather conditions. The tubular tower is tapered in shape and is manufactured in three sections from certified steel plates. All welds are made in automatically controlled power welding machines and ultrasonically inspected during manufacturing. All surfaces are sandblasted and multi-layer coated for protection against corrosion. Access to the turbine is through a lockable steel door at the base of the tower. Three platforms are connected with a ladder and a fall arresting safety system for access to the nacelle. Interior lights are installed. An optional man-lift is offered for all tower heights to expedite easy access to the nacelle. This tower configuration is designed in accordance with the Uniform Building Code, the International Electrotechnical Committee's 1400-1 Standard, and Germanischer Lloyd's Rules and Regulations for Wind Turbine design.

m. Torque Limiting Coupling

To protect the gear drive line from excessive torque loads, a torque-limiting coupling is provided to connect the generator and gearbox output shaft.

n. Lightning Protection

The rotor blades are equipped with a lightning protection system. The entire turbine is grounded and shielded to protect against lightning, and the foundation has a crow's foot grounding arrangement to facilitate lightning flow into the ground. The lightning protection system has successfully protected the turbine in tests and actual operation. However, lightning is an unpredictable force of nature, and it is possible that a lightning strike could damage various components notwithstanding the lightning protection deployed in the machine.

o. Power Conditioning

The 1.5 MW Series turbine variable speed system uses a proprietary doubly fed generator (DFG) and power converter system to ensure the delivery of constant frequency power to the grid. The turbines are also able to provide Voltage Amp Reactive (VAR) support. The turbines variable speed technology provides maximal energy capture, torque control, elimination of voltage flicker and power pulsation, as well as power factor control. A major attribute of the turbines variable speed technology is its ability to mitigate torque spikes. Torque transients, which cause voltage flicker and damage to drivetrain components, are attenuated by allowing an increase in rotor speed, thereby "storing" the additional energy of a wind gust in the rotational inertia of the rotor blades. This energy can be

extracted and fed into the grid by reducing the rotor speed as the wind gust dies or it can be "dumped" by pitching the blades out of the wind. Thus, variable speed operation can dramatically reduce torque transients, which translates to lower costs and longer life of the wind turbine drivetrain. Additional power conditioning equipment may be necessary and if so will be specified in the Interconnection Agreement (IA) and installed at or near the point of interconnection.

p. Foundations

The free standing, tubular towers will sit atop a robust foundation designed for the specific soil conditions at the individual turbine site. Due to the wide array spacing of the turbines, a thorough investigation of the soil strengths and characteristics will be performed at each turbine site for optimization of the foundation designs for the Project.

q. Service Roads

Each turbine will be accessible by a low profile, all weather gravel road extending from the turbine base to a public road. The roads will have a finished width of approximately 16 feet although the width during the construction period may be greater.

r. Permanent Meteorological Towers

The Project may also include up to 5 permanent meteorological towers which will be used to provide redundancy to the sensors located on the turbines as well as an independent source of wind speed and other information. The permanent met towers are typically located upwind of turbines on leading edges of the project and monitor the wind speed at hub height, 80 meters or 262.5 feet in this case.

3. Description of LWECS electrical system, transformers

enXco will contract to have the electrical system designed by a professional, experienced and qualified electrical system design firm and reviewed by the purchasing utility. The design work includes a load flow analysis for the Project to ensure the Facility will meet the power factor and voltage control specifications set forth as well as a coordination study which will determine the appropriate protective relay settings for optimum protection and selectivity for the Project's electrical system as well as the purchasing utilities system.

Power from each turbine will be fed down the tower from the generator through the power conditioning equipment and breaker panel out to a pad mount transformer. The pad mount transformer steps the voltage up to an internal collector system voltage of 34.5kV.

The pad mount transformers will meet all state code requirements as well as industry standards and will be configured in a loop fed, dead front arrangement. All transformers will be equipped with locking doors to prevent unauthorized entry and bollards to protect against accidental impacts from service equipment or farm machinery.

Direct burial collector cables will run from the turbine strings to a centrally located substation and will be plowed under the ground to a nominal depth of 48 inches. A non-degradable warning tape will be installed 12 inches above the collector cables. All collector cables are currently planned to be installed underground, however should conditions arise that would require the use of overhead lines, such lines will be sited so as to minimize the impact to the landowner.

The project will require the installation of a 161/34.5kV project substation which will consist generally of 2 161/34.5kV transformers, and associated switching and protection equipment as well as metering equipment and a small control house. Power from the turbines will be collected at this substation and transmitted to the Pleasant Valley Substation via approximately 6 miles of overhead 161kV transmission line. MISO is currently completing the System Impact Study for the project's 200MW Interconnection request. enXco anticipates beginning the negotiation of the appendices to the Large Generator Interconnection Agreement("LGIA") late in the second quarter of 2007 and executing the LGIA in the third quarter of 2007. enXco will permit the project substation and associated transmission line to the point of interconnection through the Mower County transmission permitting process.

4. Description and location of associated facilities

An operations and maintenance facility will be associated with the project. A final location for this facility has not yet been selected.

The Service facility will consist of approximately 4000 square feet of space divided roughly in half between staffing space adequate for 8 – 12 full time employees and work space suitable for maintaining turbine components and storage of equipment and supplies.

F. Environmental Analysis

In conformance with Minnesota Rules 4401, an environmental analysis associated with the Wapsipinicon Project has been completed. As part of this analysis, background information was obtained and reviewed including:

- Soils map
- National Wetland Inventory map
- Department of Natural Resources Public Waters Map
- United States Geologic Survey map
- Parks mapping
- Public Recreation Information Map
- Natural Heritage Database information
- Topography
- Land use and land cover
- Avian nesting areas and migration routes
- Prime farmland data
- Mower County Comprehensive Plan
- Federal Emergency Management Agency Floodplain Maps
- State Historical Preservation Office information

Additionally, information request letters were sent to determine if various agencies had additional information or knowledge of the site that would assist in determining potential environmental impacts for this project. These letters were sent to the Department of Agriculture, US Fish and Wildlife Service, Department of Natural Resources, Mower County Soil and Water Conservation District, US Corps of Engineers, and Mower County Planning and Zoning. Follow up phone calls with some of these agencies were also made to obtain information. The letters and responses that were received are included in **Appendix B.**

In conformance with Minnesota Rules 4401.0450, potential environmental impacts associated with the Wapsipinicon Wind Farm are discussed below.

1. Demographics Analysis

a. Description

The proposed project site will be a 40 square mile area located in rural Mower County in Clayton, Marshall, Dexter, Grand Meadows, Pleasant Valley, and Sargeant Townships about 20 miles east of Austin, MN (see **Figure 2 and 3)**. The cities of Elkton and Dexter are also within the study boundary. The town of Grand Meadow is adjacent to east of the project site. Interstate 90 bisects the project area. While the proposed project will be within 40 square miles, enXco has designated a permit area of approximately 80 square miles to provide some siting flexibility and to allow sufficient room for buffer with I-90, various microwave beam paths which have been identified and existing wind projects, and avoidance of recreation areas.

The area is a sparsely populated agricultural area. Based on the County's Comprehensive Plan and US Census Bureau information, Mower County was at the height of its population prior to 1960 when there were 48,498 residents. Since that time, the County has experienced a general population decline of 23% from 1960 to 1990. Since 1990, there has been a 3% increase in population in the County.

With respect to the townships in the County specifically, the population steadily declined from 1960 to 1990. In the 1990's, population began to stabilize and slightly increase, but has overall lost 36% of their population since 1960. The townships represent 24.8% of the County's population.

Information from the US Census Bureau from 2000 indicates that the number of households in the County increased by over 500 between 1990 and 2000. The average household size in the County is 2.42; the total population is 38,603 and there are 15,582 households. Based on data from 2004, the population of the surrounding towns of Elkton, Dexter, and Grand Meadow are 149, 333, and 945, respectively.

The primary employment opportunities in the County revolve around agriculture in addition to the George A. Hormel meat packing plant in Austin, MN. The median household income in 1999 was $36,654.

b. Impacts

This project is expected to bring between eight and twelve full time jobs to the host community and is anticipated to have a negligible impact on the demographics of the area.

c. Mitigation

The project is anticipated to have a negligible impact to the demographics of the area. Beyond the eight to twelve full time jobs which will be created. The project is anticipated to temporarily bring additional employment and business to the area during construction. Post construction, payment to the landowners for easements and leases are expected to be beneficial to the community. No specific mitigation action is needed.

2. Noise

a. Description

The rural setting of the project site typically has background noise levels in the 25-35 decibel range with higher levels near roads. Background noise in the area is a result of wind, farming equipment/operations, and vehicles. A comparison of typical noise generators is outlined below.

Common Outdoor Noise Levels	Noise Level (dBA)	Common Indoor Noise Levels
	110	Rock Band
Jet Flyer at 100 ft.		
	100	
Gas Lawn Mower at 3 ft.		Inside Subway Train (New York)
	90	
Diesel Truck at 50 ft.		Food Blender at 3 ft.
	80	
Noisy Urban Daytime		Garbage Disposal at 3 ft.
		Shouting at 3 ft.
	70	
Gas Lawn Mower at 100 ft.		Vacuum Cleaner at 10 ft.
Commercial Area		Normal Speech at 3 ft.
	60	
Heavy Traffic at 300 ft.		Large Business Office
	50	
Quiet Urban Daytime		Dishwasher Next Room
	40	
Quiet Urban Nighttime		Small Theatre Large
Quiet Suburban Nighttime		Conference Room (Background)
	30	
		Library
Quiet Rural Nighttime		Bedroom at Night
		Concert Hall (Background
	20	
		Broadcast and Recording Studio
	10	
		Threshold of Hearing
	0	

Source: Noise Control-New Standards; W.R. Green; California Department of Transportation;

Paper presented at AASHO Annual Meeting; November 14, 1973.

b. Impact

The wind turbines to be used within the project site are warranted to generate a maximum apparent sound power level no greater than 106 decibels immediately adjacent to the turbine. The decibels decrease as the receptor moves further away from the turbine. The turbines are expected to generate less than 50 decibels at approximately 1,000 feet. The sound a turbine makes can be described as a "whoosh" sound when the rotors are moving. On a windy day, the sound of the turbines is generally masked by the sound of the wind. The Minnesota Pollution Control Agency has noise level standards for residential and industrial uses between 50-65 decibels.

c. Mitigation

The turbines will be sited to comply with the Minnesota Pollution Control Agency's noise standards. In addition, the Public Utilities Commission has previously required a 500 foot minimum setback from an occupied residence. enXco's policy is to site the turbines so as to comply with the MPCA standards and to observe 250 foot setbacks from roads.

3. Visual Impacts

a. Description

The existing project site is a rural agricultural area. Crops of primarily corn and some soybeans dominate the area with some livestock grazing areas. The topography of the area is generally flat with some gently rolling areas that are punctuated by drainageways and scattered wetlands. Homesteads are also scattered throughout the study area along with grain storage silos from various farming operations. The Pleasant Valley Substation is located in the northern portion of the site and is visible within a few miles. The High Prairie I wind farm is visible from the southeastern portion of the site. The viewshed is open expanses of agricultural uses and rural residential.

b. Impact

It is anticipated that up to 137 turbines would be placed within the project area. These turbines will be on 80 meter towers with 77 meter rotors for a maximum height of 118.5 meters (388 feet).

The High Prairie I wind farm is located approximately 1.5 miles southeast of the proposed Wapsipinicon wind farm site. The High Prairie I turbines are visible from a distance from the southeast corner of the Wapsipinicon site. The proposed High Prairie II wind farm is located immediately south of the project area and once constructed, would be visible from the southern portion of the site. From a distance, the turbines blend into the surrounding area. While these turbines will have a visual impact on the area, it is a matter of perception of whether this is a negative or positive impact.

There are no significant scenic overlooks or viewsheds in the project area. The view has been altered from pre-settlement time from a tall grass prairie and oak savanna to farmsteads altered by humans. These turbines are anticipated to be seen from a distance since they will be the tallest structure in the area. However, the gray/white color of the turbines is such that they will blend in with the surrounding area. Additionally, the area will retain its rural nature rather than being converted to a higher density residential or commercial use.

c. Mitigation

The following measures will be used to minimize the visual impact of the turbines in the area:

- The gray/white color of the turbines is designed to blend into the skyline.
- The turbines will not be placed in park areas or sensitive habitat areas.
- Turbines will not be lit unless required by the FAA.
- Collector lines and transmission lines will be buried underground to the greatest extent feasible.
- Areas not used for crop production that are temporarily disturbed to create the turbine sites and access roads will be re-seeded with the same surrounding vegetation.
- Turbines will be placed up to 1,000 feet away from primary residences.

4. Public Services and Infrastructure

a. Description

The project site is located in southeastern Minnesota in a lightly populated, rural area. Existing infrastructure in the area includes paved and gravel roads and utility services. Rural township and county roads as well as I-90 and TH16 bisects the study area. Two old rail lines cross the southern half of the study area.

- **Electrical Service:** Electrical service for the area is provided by Alliant Energy, Freeborn Mower Cooperative Services, and People's Cooperative Services. There is a 345kV transmission line that traverses the study area from south to north to Great River Energy's Pleasant Valley Substation.

- **Traffic Routing**: A number of township and county roads cross the area. Interstate-90 bisects the study area. Information from Mn/DOT for 2004 indicates that the ADT for I-90 within the study area is between 11,300-11,500 vehicles. The ADT for TH16 between Dexter and Grand Meadow is 1,750-2,150 vehicles. The local roads in the area consist of two-lane paved and gravel roads.

- **Railroad:** The United States Geologic Survey maps indicate that the Chicago Great Western rail line used to cross the southwest corner of the study area and passes through the town of Elkton.

The Chicago, Milwaukee, St. Paul, and Pacific rail lines used to cross the central portion of the study area and goes through Dexter and Grand Meadow. These lines have been abandoned.

- **Water Supply**: On-site wells provide water to the farmsteads in the area. Municipal water via water towers are available within the city limits in the study area.

- **Sanitary Sewer**: The farmsteads within the study area are served by on-site septic systems.

- **Telephone:** Phone service is provided by Frontier Communications of Minnesota to serve the homes and businesses in the area.

- **Radio Towers:** Mower County has implemented a communication system for emergency personnel within the County. As part of this system, microwave paths have been established (see **Figure 5)**. enXco will comply with county setback regulations from these paths and will also conduct an independent study so as to avoid interference with other beam paths that may pass through the area

- **Radar:** The main public use airports with radar in the region are the Rochester International Airport, Austin Airport, and the Fillmore County Airport. These airports are approximately 15 - 30 miles from the project site.

b. Impact

The proposed project is not anticipated to have a significant impact on existing public infrastructure and services. A summary of possible impacts is outlined below:

- **Electrical Service:** Construction of the Wapsipinicon Wind Farm is anticipated to add up to 137 1.5MW wind turbines and associated power collection systems within the 80 square mile permit area. The project will generate a maximum of 205.5 MW of energy per hour. The turbines will be connected by underground transmission lines. The goal is for the collector system to be underground to the maximum extent possible. It is anticipated that approximately six miles of 161 kv lines will be needed above ground to connect the Wapsipinicon substation to the Pleasant Valley substation.

- **Transportation and Roads:** Construction of the turbines will require some access roads to be constructed on private property to accommodate construction and maintenance activities. These roads will be constructed so as to minimize disturbance to agricultural fields and to maximize efficiency of gaining access to the turbines. The access roads will be constructed as gravel roads that area approximately 16 feet in width. Impact to wetlands

and wildlife features will be avoided and minimized. If wetland impact is anticipated, appropriate permits and mitigation will be obtained. These access roads will be maintained during construction by enXco Development Corporation and after construction by the project operator. During construction, a temporary increase in traffic is expected in the area. However, due to the minimal traffic in the area and temporary nature of the traffic increase, no significant impacts are anticipated.

- **Water Supply:** Construction and operation of the turbines will not require connection to a water supply, abandonment of wells, or construction dewatering.

- **Sanitary Sewer:** Construction and operation of the turbines will not require connection to sewer or septic systems and will not impact existing septic systems.

- **Telephone:** Construction and operation of the turbines will not impact telephone service to the area.

- **Radio Towers**: The County has developed a communication for local safety officers and personal. This communication system is linked by microwave and the signals are sent from various towers in the County. Wind turbines will not be placed within the microwave paths established by the County. **Figure 5** shows the general location of the beam paths.

- **Radar:** enXco has retained Aviation Systems, a reputable third party consultant and initiated a review process with the FAA to ensure that the final turbine siting does not adversely impact radar installations in the area.

c. Mitigation

Construction, operation, and maintenance of the turbine sites will be in conformance with local, State, and Federal requirements. No significant infrastructure impacts are anticipated by this project and as such, no major mitigation is required. Some roads will need to be upgraded and some access roads constructed.

5. Cultural and Archeological Impacts

a. Description of Resources

Four recorded archaeological sites were identified within the Development site and one was identified adjacent of the Development site. Thirty-one historical structures are recorded within the Development site; these properties are detailed below in **Table 5-1**.

Table 5-1. Previously Identified Archaeological Sites and Historic Properties within the Development Site and Within One Mile of the Development Site

Inventory Number	Site Name	Legal Location	Site Type	Survey Report Reference
Archaeological Sites Within the Development Site				
21MWw	Sutton	T103N, R16W, Sec. 26	Historic Documentation	N/A
21OL0034	N/A	T104N, R15W, Sec. 6	Lithic Scatter	Lyon et al. 2003
21MWy	Root River	T104N, R15W, Sec. 16	Historic Documentation	N/A
21MW0013	Greenland	T104N, R15W, Sec. 26	Artifact Scatter	N/A
Historic Properties Within the Development Site				
MW-ELK-001	Elkton Post Office	T102N, R16W, Sec. 1	Historic Property	N/A
MW-ELK-002	Commercial block	T102N, R16W, Sec. 1	Historic Property	N/A
MW-GRA-015	Bridge No. 1942	T103N, R15W, Sec. 15	Historic Property	N/A
MW-GRA-011	House	T103N, R15W, Sec. 19	Historic Property	N/A
MW-GRA-012	House	T103N, R15W, Sec. 19	Historic Property	N/A
MW-GRA-004	Railroad car/house	T103N, R15W, Sec. 19	Historic Property	N/A
MW-GRA-001	Commercial building	T103N, R15W, Sec. 24	Historic Property	N/A
MW-GRA-002	Exchange State Bank	T103N, R15W, Sec. 24	Historic Property	N/A
MW-GRA-003	National Café	T103N, R15W, Sec. 24	Historic Property	N/A
MW-GRA-005	Booth Post No. 130 – Grand Army of the Republic Hall	T103N, R15W, Sec. 24	Historic Property	N/A
MW-GRA-006	Grand Meadow Post Office	T103N, R15W, Sec. 24	Historic Property	N/A
MW-GRA-007	Masonic Hall (Old Town Hall)	T103N, R15W, Sec. 24	Historic Property	N/A
MW-GRA-008	Grand Meadow City Hall	T103N, R15W, Sec. 24	Historic Property	N/A
MW-GRA-009	House	T103N, R15W, Sec. 24	Historic Property	N/A
MW-GRA-010	House	T103N, R15W, Sec. 24	Historic Property	N/A
MW-GRA-013	House	T103N, R15W, Sec. 24	Historic Property	N/A
MW-GRA-014	House	T103N, R15W, Sec. 24	Historic Property	N/A
MW-DEX-001	First State Bank of Dexter	T103N, R16W, Sec. 13	Historic Property	N/A
MW-DEX-	Dexter	T103N, R16W,	Historic	N/A

002	Elevators	Sec. 13	Property	
MW-DEX-003	Standard Station	T103N, R16W, Sec. 13	Historic Property	N/A
MW-DEX-005	House	T103N, R16W, Sec. 13	Historic Property	N/A
MW-DEX-004	Dexter Public School	T103N, R16W, Sec. 24	Historic Property	N/A
OL-HFT-003	Bridge No. L6150	T104N, R15W, Sec. 5	Historic Property	N/A
MW-PLE-001	Pleasant Valley Town Hall	T104N, R15W, Sec. 22	Historic Property	N/A
MW-PLE-004	Bridge No. 89234	T104N, R15W, Sec. 23	Historic Property	N/A
MW-PLE-003	Austin & LaCrosse Road Section	T104N, R15W, Sec. 30	Historic Property	N/A
MW-SNT-003	Zion Lutheran Church	T104N, R16W, Sec. 23	Historic Property	N/A
MW-SNT-005	Austin & LaCrosse Road Section	T104N, R16W, Sec. 25	Historic Property	N/A
MW-SNT-006	Bridge No. 2493	T104N, R16W, Sec. 25	Historic Property	N/A
MW-SNT-004	School District No. 111	T104N, R16W, Sec. 26	Historic Property	N/A
Archaeological Sites Within One Mile of the Development Site				
21MWI	N/A	T103N, R15W, Sec. 2	Artifact Scatter	N/A

b. Impacts

The proposed construction activities have the potential to impact archaeological sites and to add to the visual impacts in the region of the site.

c. Mitigative Measures

A Phase I Archaeology Survey is recommended for all the proposed wind turbine locations, access roads, junction boxes, and areas of construction impact for the proposed transmission line to document previously unrecorded archaeological sites within the Development site. A Phase I Archaeology Survey consists of the following tasks: consultation, documentation, and identification.

If archaeological sites are found during the Phase I survey or during construction, their integrity and significance should be addressed in terms of the site's potential eligibility to the National Register of Historic Places (NRHP). If such sites are found to be eligible for the NRHP, appropriate mitigative measures will need to be developed in consultation with Minnesota SHPO, the State Archaeologist, and consulting American Indian communities.

6. Recreational Resources

a. Description

Recreational opportunities within the County include hunting, snowmobiling, camping, hiking, and fishing. Information from the Department of Natural Resources and Mower County was reviewed to determine recreational resources within the Wapsipinicon Wind Farm study area. Based on this information, there are a few public recreation facilities within the study area. These areas are shown on **Figure 6** and include the following:

- Schwerin Creek Wildlife Management Area (WMA) is a 37 acre site located within the southwestern portion of the study area. Schwerin Creek flows through the WMA and hunting is allowed.

- Wild Indigo Scientific and Natural Area (SNA) is a 150 acres area located west of the study area and contains one of the best examples of mesic tallgrass prairie left in Southeastern Minnesota. It stretches for 12 miles between Dexter, Brownsdale, and Ramsey. While there is no formal trail, the SNA is open to hiking and wildlife viewing. The site contains rare plants as wild quinine, compass plant, white wild indigo, and plains wild indigo.

The following WMA's are located outside of the study area:

- Carey Creek WMA is located about five miles east of the northeastern corner of the study area and hunting is allowed.

- Deer Creek WMA located about six miles east of the study area.

b. Impacts

The Wild Indigo SNA and Schwerin Creek WMA are located within the study area. Turbines will not be located within these sites. Any impact on these recreational facilities would be visual in nature since some of the turbines may be viewed from the SNA and WMA areas.

c. Mitigation

Wind turbines will not be sited within or immediately adjacent to a public park, Wildlife Management Area, or Scientific and Natural Area. Therefore, no mitigation is required.

7. Public Health and Safety (Air Traffic, Electromagnetic Fields, Security and Traffic

a. Description

Air Traffic: The main public use airports in the region are the Rochester International Airport, Austin Airport, and the Fillmore County Airport. These airports are approximately 15 - 30 miles from the project site. The

Flying A's is a private use airport near Stewartville and is over 15 miles away from the site.

Electromagnetic Fields: Electromagnetic fields (EMF) can be man-made or natural. Natural EMF's can be created by lightning and static electricity. Man-made EMF's are created wherever people use electricity and an electric current is flowing through a conductor, such as in household appliances or electric transmission lines. Electric fields are produced by voltage and these fields are easily shielded by objects (e.g., trees, buildings, and skin). In contrast, magnetic fields are produced by current and these fields pass through most materials. Both electric and magnetic fields weaken with increasing distance from the source.

There has been concern about EMF's and potential health risks since the 1970's. A number of epidemiological studies have been conducted in an attempt to determine if EMF's pose a health risk. While some of these studies have found a weak association between leukemia and exposure to EMF, other studies have found no connection. Laboratory studies have also been conducted but have not been able to substantiate a direct relationship between increased EMF and increased cancer risks.

Information from the Minnesota Department of Health (MDH) indicates that the results of these studies are insufficient to determine if there is a cause and effect relationship between EMF and health issues. The MDH continues to monitor EMF research and supports avoidance measures. Exposure to EMF can be reduced by increasing the distance between the EMF source and the recipient.

Security: The project is proposed in a lightly populated area. Construction, operation, and maintenance are anticipated to have minimal impacts on residents in the area.

Traffic: The project site is within a rural area with low population density. Existing traffic levels on the surrounding roads is low. Traffic information is included in Item 4.

b. Impacts

Air Traffic: enXco will coordinate the siting of wind turbines with the FAA. The turbines will be lit to comply with any FAA regulations and will be visible in the area.

Electromagnetic Fields: There will be Electromagnetic Fields ("EMFs") associated with the collector cables and any equipment through which electricity is flowing. There is not conclusive evidence from research that EMFs pose a significant impact.

Security: There is no impact on security associated with this project for the area.

Traffic: See Item 4.

c. Mitigation

Air Traffic: The turbines will be lit to comply in any FAA regulations and will be visible in the area. Each turbine will receive a Determination of No Hazard to Air Navigation from the FAA and the associated Mn/DOT Aeronautics Office concurrence will be obtained prior to construction.

Electromagnetic Fields: While there is no conclusive evidence of harmful effects of EMF, increasing the distance between the source and receptors decreases the EMF. The project electrical collector system lines will be buried to a nominal depth of four feet underground. Approximately six miles of transmission line is anticipated to be above ground to meet the point of interconnection at the Pleasant Valley substation. The addition of these transmission facilities, turbines, and substation is not anticipated to significantly increase the EMF's in the area. No mitigation is necessary.

Security: No mitigation is necessary.

Traffic: See Item 4.

8. Hazardous Materials

a. Description

A FirstSearch™ database review of known potential contamination sites was completed. Information from State and Federal databases indicates the following known active sites are within the study area:

Dexter Dump – Unpermitted: This dump is located in Section 26, R16W, T103N just south of I-90.

Various active spill sites at Harvest States Coop in Elkton

There are a few other spill sites or leaking underground storage tanks within the study area, but according to the databases, those sites have been cleaned up. The active and closed sites are not anticipated to have an impact on the project.

b. Impacts

During construction and operation of the turbines, vehicles involved in the construction and maintenance of the turbines will contain gasoline and other petroleum products. The turbines themselves will contain relatively small amounts of petroleum products such as oil, hydraulic fluid and gear grease. enXco has not found any record of hazardous material disposal or dumping in this area and as such does not anticipate encountering any hazardous wastes at the turbine sites.

c. Mitigation

The materials within the turbines are not anticipated to create a hazardous condition. If any wastes are generated or identified during this

project, it will be addressed in conformance with local, State, and Federal requirements.

9. Land-based Economics

a. Description

The main industry in the study area is agricultural. The area has been farmed with corn, soybeans, and other crops for many years. Drain tile has been used in many areas to further increase the production capabilities of the land for agricultural use.

There are no significant forestry resources within the study area. There is some mining within the County. Mining is only present in the County where limestone is accessible through a quarry. These areas are primarily located on the eastern and western borders of the County.

b. Impacts

The turbines will be sited on existing agricultural land. A small area of approximately 1 acre or less will be out of production for the construction and operation of each turbine. To provide a high estimate of the footprint of the impact of the turbines, the following assumptions were made:

- Each turbine would have a 0.04 acre footprint. This includes a 45' diameter circle under each turbine that included a 15 foot diameter foundation and a 12' diameter gravel skirt.

- An average of 0.5 miles of 16' wide road would be associated with each turbine. This equates to a total of 42,240 square feet (0.97 acres) per turbine. Preliminary road layouts indicate that the majority of the access roads will be less than 0.5 miles long.

With up to 137 turbines being sited, this results in approximately 137 acres of land conversion within the 51,200 acre (80 square mile) project area. This represents a 0.3% change in land cover for the project area. Agricultural activity is anticipated to continue between the turbine sites, thereby reducing impacts associated with the creation and operation of the wind energy facility.

c. Mitigation

The turbines will be sited so as to maintain the agricultural use for the landowners to the greatest extent feasible while still allowing access to the turbines. Agricultural activities will still be allowed between the turbine sites.

10. Tourism and Community Benefits

a. Description

There are no significant tourist destinations in or near the project area. Areas within the County that could attract tourism are Lake Louise State Park located in southern Mower County, the City of Austin, which boasts the SPAM Museum, and some streams along the eastern border of Mower County and into Fillmore County which support trout and trout fishing. However, there are no trout streams within or immediately adjacent to the study area.

b. Impacts

No impacts on tourism are anticipated by this project.

c. Mitigation

No mitigation is necessary.

11. Topography

a. Description

Information from the USGS Topographic Quadrangle indicates that this area ranges in elevation from 1300 feet above mean sea level (AMSL) in the northwest near the North Branch of the Root River to 1430 feet AMSL in the central portion (see **Figure 2 and 7)**. The study area is relatively flat with gently rolling hills. There are a number of intermittent streams and creeks that cross the area directly to the north and east of the study area.

b. Impacts

Siting and construction of the turbines and access roads will require some grading of the area. However, this grading is not anticipated to be significant and will be completed in such a manner as to tie into existing contours to the greatest extent feasible.

c. Mitigation

Since significant grading is not anticipated, no mitigation measures are needed.

12. Soils

a. Description

Information from the Soil Survey for Mower County was reviewed. The primary soil association within the study area is the Tripoli-Oran-Readlyn association. These soils are described as nearly level and gently sloping silty soils on till plains. They can also be described as poorly drained to somewhat poorly drained.

The Marshan-Waukee-Hayfield and Clyde-Floyd-Racine are two other minor soil associations within the study area. These are located near the

major drainageways including the North Branch of the Root River, Schwerin Creek, and Deer Creek. The soils in this area can be considered prime farmland soils.

Figure 8 shows the general soil associations in the area and **Figure 9** shows the more detailed soil information.

b. Impacts

As with any soil disturbance, construction of the turbines and access roads can increase the potential for erosion and sedimentation. Construction of the turbine sites and access roads will involve temporarily disturbing at the most approximately 5-10 acres of land per turbine. This equates to 670 – 1,340 acres of temporary disturbance. Erosion control methods such as silt fence and temporary mulch will be used during construction. The topsoil is generally salvaged and stockpiled where the roads and turbines are constructed and then spread back over the disturbed areas. Upon completion of the project, approximately 137 acres of land will be converted to turbines and associated infrastructure.

c. Mitigation

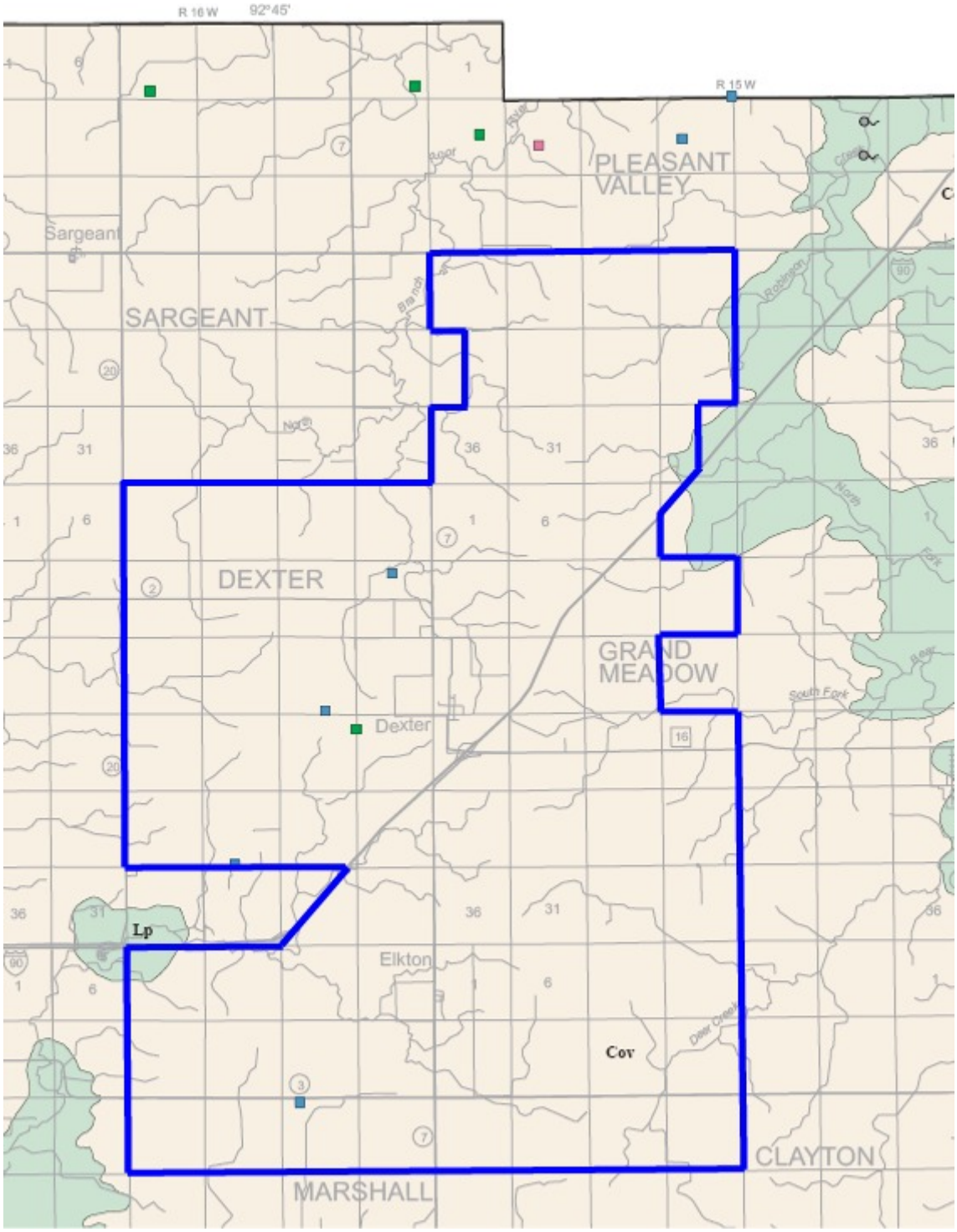
Wind turbine and road access will be sited to take into account the contours of the land and prime farmland locations to minimize impact. An erosion and sediment control plan and Storm Water Pollution Prevention Plan (SWPPP) will be prepared for the construction project and the disturbed areas will be seeded after construction to stabilize the area. The project will also be subject to the requirements of the NPDES Construction permit.

13. Geologic and Groundwater Resources

a. Description

Mower County is located in a karst area where bedrock that is susceptible to solution that can cause sinkholes, springs, and caves. These features generally form where water can move rapidly. Fast- flowing streams, both above- and below- ground tend to form the most caves since the dissolved minerals are removed, exposing more soluble rock to unsaturated water. Surface water is most effective for dissolving rock in Minnesota. Carbonic acid, nitrates, sulfates, sulfides, and bacteria all contribute to cave forming and are linked to the atmosphere, which can be effectively brought underground through movement of surface water through the ground.

While the bedrock in the project area is susceptible to sinkhole formation, a thick blanket of relatively water-resistant glacial sediment impedes both streams and ground water from interacting with the bedrock. The depth to solid bedrock is greater than 50-75 feet in the study area. While sinkholes are possible in the project area, they are highly unlikely. The highest probability of sinkhole formation in the project is shaded green on the figure below:



MGS-DNR Atlas C-11, Part B, Plate 10

Information from the County Well Index indicates that there are no drift wells in use in the project area. All drinking water is derived from bedrock aquifers. The static water level as noted in the County Well Index is greater than 70 feet below the wellhead in the study area west of the Range 15-16 boundary and 2 miles east of this line as well. East of this area, the static water level is greater than 40 feet below wellhead. In all

cases, the actual static water level is up to 50 feet above the top of the bedrock, indicating the aquifers are confined. The most significant confining layer is the loamy glacial drift separating the bedrock from the surface. This inhibits fluid flow between the bedrock aquifers and the surface, pressurizing the aquifer to some degree.

b. Impacts

The project is not anticipated to have any impacts on groundwater or geologic resources. Water supply needs will be minimal and can be accommodated by local supplies.

c. Mitigation

Turbines will not be located in areas where surficial karst conditions are present. Soil borings at the turbine sites will be obtained for structural design purposes, and special attention paid to sealing the borings in areas where the bedrock is most soluble to ensure that water does not flow down the borehole and form sinkholes near that location in the future.

14. Surface Water and Floodplain Resources

a. Description

Storm water runoff is directed overland and via drain tile over agricultural areas to ditches, intermittent streams, and eventually into the various tributary creeks. The main water bodies within and adjacent to the study area are shown on **Figure 7** as follows:

North Branch Root River
Robinson Creek
North Fork Bear Creek
South Form Bear Creek
Deer Creek
Schwerin Creek
Rose Creek
Dobbins Creek
Little Cedar River

The DNR has jurisdiction over the DNR Public streams as shown on **Figure 7.** There are also a number of public ditches and intermittent streams within the study area. These areas generally meet jurisdictional wetland criteria as shown on **Figure 7** and **10**. There are no lakes in the project area.

Based on the FEMA Flood Insurance Maps, there is designated floodplain in the area located southeast of the study area associated with Deer Creek as shown on **Figure 11.** While there is no FEMA designated floodplain in the area, the creeks in the area do carry water and are subject to localized flooding during snow melt or heavy rain conditions.

There are two impaired waters in the area. Robinson Creek is located within the northern portion of the study area. Rose Creek is located

outside of the study area immediately to the west (see **Figure 12).** Both of these streams are impaired for fecal coliform.

b. Impacts

Construction of the turbines and associated roads will result in disturbing up to 5-10 acres of land per turbine over the 40 square mile site. This equates to 670 – 1,340 acres of temporary disturbance. Upon completion of the project, approximately 137 acres of land will be converted to turbines and associated infrastructure. The siting of the turbines will avoid low points in the landscape, thus preventing impact on wetlands or floodplains. Access roads will be located to avoid floodplains and wetlands to the greatest extent feasible.

The project will not result in additional fecal coliform directed to Robinson Creek or Rose Creek.

c. Mitigation

The additional impervious surface created by the project is anticipated to be up to 1 acre per turbine, including the turbine foundation, gravel skirt, and access roads. For the total project, this equates to 137 acres over the 40 square mile site. These areas will be disconnected and separated by vegetation so as to reduce impact of a small amount of increased storm water volume.

Turbines and access roads will be sited to avoid the low areas of the area. However, If access roads need to be constructed in drainageways, culverts to allow cross drainage and to prevent impounding water will be created. An NPDES Construction permit will be obtained and the project will adhere to the requirements of this permit.

15. Wetlands

a. Description

The National Wetland Inventory (NWI) map and aerial photo was reviewed for the study area. A site inspection of the wetlands in the study area was completed on April 21, 2007. An additional review of the western portion of the study area will be completed by mid-July. There are few wetlands in the study area as a result of the existing topography as well as impacts from agricultural activities. The wetlands that are present have been impacted by agricultural activities through drain tile, tilling, or sedimentation from runoff. Many of the wetlands and drainage swales are dominated by reed canary grass. Where shrubs are present, there is primarily dogwood and willow.

The 80 square mile study area contains approximately 645 acres of wetland based on the NWI and land cover mapping as shown on **Figure 10 and 13.** There are a number of intermittent streams and the wetlands generally correspond to these stream locations. The DNR has jurisdiction over some of the water courses as noted in Item 14. There are a few larger wetland complexes that are fed by a number of drainage swales. These areas are Type 2, 3 and 6 wetlands with reed canary grass,

dogwood, and willow. These areas have been impacted by the surrounding agricultural uses.

Table 15-1 summarizes the wetlands that are present within the site based on wetland type according to the NWI map and land cover map.

Table 15-1. Summary of Wetland Types within the Study Area*

Circular 39 Type	Cowardin Type	Acres within Study Area
Type 1 – Seasonally flooded basin or floodplain	PEMA	170
Type 2 – Wet meadow	PEMB	135
Type 3 – Shallow marsh	PEMC, PEMF	220
Type 4 – Deep marsh	PEMF, PEMG, PABF, PUBG	15
Type 5 – Shallow open water	PABF, PUBG	0
Type 6 – Shrub swamp	PSSB, PSSB	55
Type 7 – Forested swamp	PFOA, PFOC, PFOD	50
	TOTAL:	**645**

*Data based on NWI Map and land cover map.

b. Impacts

The wind turbines will be sited to avoid the low points within the study area, thus eliminating the possible impact to wetlands. Access roads may need to be located through or near wetlands. However, efforts will be made to avoid and minimize wetland impact associated with road access.

c. Mitigation

Access roads and turbine locations will be designed around the wetlands to avoid impacts as much as possible. If wetlands will be impacted by the access roads, the wetland edge will be delineated, mitigation will be provided, and a permit will be obtained from the regulatory agencies. The strategy will be to avoid the wetlands within the project.

16. Vegetation

a. Description

Based on aerial photos, the USGS map, and a field review, the vegetation within the site consists mainly of agricultural, cropped areas. Few wooded areas are present on the site. The wooded areas that do exist are associated with farmsteads or along drainageways. The northwest corner of the site does contain a larger wooded tract adjacent to the North Branch of the Root River. **Table 16-1** summarizes the land cover present at the site in its current condition. **Figure 13** shows the land use.

Table 16-1: Existing Land Cover

Land Cover	Acres	Percent of Project Area
Row crops/Agricultural	48,150	95%
Wooded	510	1%
Wetland	645	1.3%
Commercial/Industrial	140	0.3%
Farmstead/Rural Residential	900	1.8%
Single Family Residential	145	0.3%

b. Impacts

Of the study area, approximately 137 acres will be used for the turbines and access roads. The vegetation that will be disturbed will primarily be agricultural in nature. With the annual planting of row crops, the vegetation in the area is routinely disturbed. Turbines will not be constructed in wooded areas or in wetland areas since the turbines need to be sited to maximize the capture of the wind. The operation and maintenance of the turbines will not impact vegetation in the area.

c. Mitigation

The vegetation at the turbine locations and access roads will be disturbed and removed. Topsoil will be removed and stockpiled in the disturbed areas. Once construction is complete, the topsoil will be used to cover and revegetate the disturbed areas.

17. Wildlife

a. Description

The wildlife on this site is a result of the plant communities/land cover present. The land cover present consists of significant tracts of agricultural field punctuated by drainage ways and a few wetlands. Wooded areas are mainly associated with farmsteads. There is a wooded area in the northwestern corner associated with the North Branch of the Root River. The area has been in agricultural production since at least the late 1930's based on the historic photos. Wildlife typical of this area would be those accustomed to disturbance and human presence.

Wildlife observed during the April site visit included species adapted to an agricultural environment. These included red-winged black birds, sparrows, crows, mallards. A few red-tailed hawks were observed near the wetland areas hunting for rodents and snakes. Based on a site visit and review of the historic photos, the majority of this site does not provide significant wildlife habitat. Habitat is provided along the North Branch of the Root River as it provides a wooded corridor for wildlife. Areas where disturbance has not occurred or has been minimized include the Schwerin Creek WMA and Wild Indigo SNA. These areas provide important habitat for wildlife within an area that is mostly impacted by agriculture. A map showing the general land cover is shown on **Figure 13**.

Avian and Bat Species

With wind farm sites, resident and migratory birds as well as bats are wildlife of particular interest. There have been a number of studies throughout the United States, including Minnesota and Iowa that show varying degrees of impact on bird and bat species. The common result of these studies is that the degree of impact on these species is related to the habitat within or near the study area.

In Minnesota, there are a variety of resident as well as migratory bird species as well as a number of bat species. **Appendix C** contains listings of typical species that could be found in Mower County. Again, the presence of birds or bats would be dependent on the habitat present. Due to the lack of significant woodland cover, greenway corridors, and waterfowl habitat, the study area does not provide suitable sites for significant wildlife habitat.

Mammals

Agricultural fields provide some cover in later summer months as well as a food source for some species. While sparse, the larger wetland complexes also provide cover and food sources for some species. Typical species in these areas would include mice, rabbits, and other rodents. Larger mammals such as fox, raccoon, and coyotes would also be anticipated in the area. White-tailed deer would also likely be present, feeding off the corn in the fall.

Reptiles and Amphibians

A number of reptile and amphibian species are expected to use the area. Frogs are anticipated to breed in the wet, unplowed areas. Snakes would forage for food in the grassy areas within the site.

b. Impacts

General Wildlife Impacts

The general disturbance that occurs with agricultural activities is expected to be the main impact on wildlife in the area. The temporary disturbance associated with construction of the turbines is anticipated to have a minimal affect on wildlife.

Turbines will be located to avoid low areas and wooded areas. By avoiding low areas and wooded areas the project is not expected to have an impact of wildlife.

Avian and Bat Impacts

There have been a number of studies done throughout the Country on the impact of turbines on bird and bat species. Three regional studies that have been conducted include:

- *Avian mortality associated with the Top of Iowa Wind Farm*
- *Avian monitoring studies at the Buffalo Ridge, Minnesota Wind Resource Area: Results of a 4-Year Study.*
- *Avian issues in Development of Wind Energy in Western Minnesota*

More recently, information was presented in November 2006 to the National Wind Coordinating Collaborative. Additionally, the United States Fish and Wildlife Service has developed guidelines to avoid and minimize impacts from wind turbines on birds and bats.

The results of these studies indicate that while there are fatalities to birds and bats associated with the turbines, these fatalities can be minimized by siting turbines away from significant habitat. Further, these fatalities are localized in nature and do not have a significant impact on the overall population of these species.

c. Mitigation

The site area was chosen due to its wind resource and due to the land cover present. The lack of significant habitat within or near the study area reduces the chance for impacts to wildlife in the area. Further, turbines and access roads will be sited to avoid the wetlands and wooded areas. This will further limit the impacts on wildlife. Based on these mitigation measures as well as erosion control measures discussed in this document, the project is not anticipated to have a significant impact on wildlife in the area.

18. Rare and Unique Natural Resources

a. Description

The DNR Natural Heritage Database has been contacted for information about rare and unique natural resources. Information has been obtained for half of the 80 square mile study area (**Appendix B**). When the remaining information for the western portion of the study area is obtained, it will be included with this application.

Information from the Natural Heritage Database includes the presence of Wild Quinine (*Parthenium integrifolium*) located along the railroad right of way just east of Dexter. This plant is on the Minnesota Endangered Species List and is associated with mesic prairie habitats in southeastern Minnesota.

Of other concern are potential remnants of prairie in the area that have not been impacted by agriculture. While the DNR's County Biological Survey has not yet been completed for Mower County, there is likely remnant prairie in the County. The Wild Indigo SNA (see **Figure 6)** is a representative of that type of prairie. These areas would be associated with railroad rights of way, or areas that were not plowed by agricultural activities. The DNR has indicated that portions of Sections 17 and 20 within T103N and R15W within the study area could contain prairie remnants. Based on a field review in April 2007, these sections contain large wetland complexes that may contain remnant prairie or mesic to wet prairie.

b. Impacts

It is anticipated any remnant prairie areas would be associated with railroad right-of-way and lower, wetland areas that were not impacted by agriculture. The turbine and access roads will be sited to avoid the wetlands, wooded areas, and areas with native remnant prairie.

c. Mitigation

DNR recommends including setback buffers around native prairie tracts. A more detailed wetland review of the areas within the permit area will be completed by mid-July. enXco will share these results with the DNR and use this information for turbine siting to avoid remnant prairie or endangered species. If additional botanical surveys are needed by the DNR at that time, this will be completed to assist in siting the turbines to avoid impact to rare and endangered species.

G. Construction of the Project

1. Construction Management

enXco will perform the construction management services. enXco is a leading energy contractor that provides engineering, procurement and construction services for wind power plants in North America, Europe, and Asia. enXco maintains a high level of expertise in construction methods, budgets and schedules, a knowledge of project design standards and engineering practices, and a knowledge of owner, operator and lender requirements. enXco also maintains ongoing relationships with qualified contractors having experience in the engineering procurement and construction of wind energy facilities.

Generally, enXco, by itself or in coordination with qualified contractors, will undertake the following activities:

- Securing building, electrical, and grading permits
- Performing detailed civil, structural, and electrical engineering
- Scheduling execution of construction activities
- Completing surveying and geotechnical investigations
- Forecasting project labor requirements and budgeting

enXco oversees all aspects of the construction process including the installation of communication and power collection lines, the substation, the installation of access roads, concrete foundations, towers, and the erection of the wind turbines.

The proposed Development will be constructed under the direct supervision of enXco's on-site construction manager and will employ qualified contractors. The construction consists of the following tasks:

- Site development, including access roads
- Foundation excavation

- Concrete foundations
- All electrical and communications installation
- Tower assembly and machine erection
- System testing

Throughout the construction phase, ongoing coordination occurs between the project development and the construction teams. The on-site project manager helps to coordinate all aspects of the Project, including ongoing communication with local officials, citizens groups and landowners. Even before the Project becomes fully operational, the O & M staff is integrated into the construction phase of the Project. The enXco construction manager and O & M staff manager work together continuously to ensure a smooth transition from construction through wind power plant commissioning and, finally, operations.

2. Civil Works

Completion of the development will require various types of civil works and physical improvements to the land. These civil works primarily include the following:

- Improvements of existing roads to the development site.
- The construction of access roads adjacent to the wind turbine strings to allow construction and continued servicing of the wind turbines.
- Clearing and grading for wind turbine tower foundation installations.
- Plowing underground cabling for connecting the individual wind turbines.
- Installation of an on-site transmission line for connecting wind turbine strings for delivery to the electricity collection/metering location.
- Clearing and grading for pad-mounted transformers and other installations.
- Installation of any site fencing and security.

Any improvements to existing roads will primarily consist of re-grading and filling of the gravel Access roads will be constructed along each turbine string, approximately parallel to the wind turbines. Siting roads in areas with unstable soil will be avoided wherever possible. All access roads will include appropriate drainage and culverts while still allowing for the crossing of farm equipment. The access roads will be approximately 16 feet wide and will be covered with road base designed to allow passage under inclement weather conditions.

Electrical and communications wires and cables will plowed into the ground to a nominal depth of 48 inches. Plowing in the cables minimizes the surface disturbance and the amount of time spent with equipment in the landowners' fields. Adequate spacing between the communication and electrical wires will ensure no interference between the two. This plowing technique has been applied widely in other wind plants and is believed to be the safest and most cost-effective alternative available. In the unlikely event that repairs must be made to a cable,

care is taken to ensure that other cables in the trench or an adjacent trench are not damaged.

3. Commissioning

The Development will be commissioned after completion of the construction phase. Acceptance of the five major subsystems that comprise a wind power plant and the wind power plant as a whole is achieved through detailed inspection and testing procedures. The manufacturer's inspection criteria applicable to wind power plant components augment this process as wind power plant acceptance is dependent upon the cooperation of each component within the major wind power plant subsystems (e.g., turbines, communication system, meteorological system, high voltage collection and distribution system, and wind power plant SCADA System.).

H. Operation of the Project

1. Operations and Maintenance

While enXco develops all project sites with the intention of performing the operations and maintenance work itself throughout the life of the installation, enXco periodically enters into agreements to develop and sell complete projects to third parties. In the case of the Wapsipinicon project 100.5 MW of the total project capacity will be sold to Xcel Energy. Xcel Energy may choose to engage enXco or another reputable operator and service provider. In either case the operator and maintenance team will be responsible for daily operations, scheduled and unscheduled maintenance as required by the equipment manufacturers, and in accordance with good utility practice. For purposes of this application we will refer to the facility operator and service provider as enXco.

The Development will be staffed with six to eight full time site technicians, a Wind Power Plant Supervisor and additional support staff as appropriate. The site technicians will be responsible for performing daily plant checks and resets as well as scheduled and non-scheduled maintenance.

Generally, the project will be manned five days per week. At all other times, operations and maintenance personnel will be on-call, and equipped with remote monitoring and control capabilities as described below.

2. Site Control and Data Acquisition (SCADA) System

The wind turbines, as well as certain circuit breakers, metering and meteorological equipment are monitored by a centralized SCADA system. The SCADA system is designed to monitor the condition of the wind plant equipment, alert service technicians to any fault or alarm conditions and also record and sort data relating to availability, kWh production and turbine performance.

If a turbine faults off line or if a collection system circuit breaker trips, an error code is enunciated on the SCADA system, which then pages the on-call technicians who responds by physically going to the equipment to investigate or, if the fault occurs when no technician are on site, he can call up the SCADA from a portable laptop or other remote PC. Once connected to the SCADA System the technician can see more specifically what equipment has been faulted and the exact nature of

the fault. The technician can also view current wind speed and production data to determine if an emergency visit to the wind power plant is warranted. Remote access to the SCADA system can be made available to the Facility Owner and the turbine manufacturers as required or deemed appropriate.

3. Maintenance Schedule

The Project will require scheduled maintenance of the individual wind turbines, the transmission facilities, and the site improvements (roads, gates, fences, etc.). Estimates of the duration and scheduling of the maintenance activities are based on enXco's experience in operating and maintaining similar projects, as well as those recommended by the equipment manufacturer. Scheduled maintenance of the wind turbines and transmission facilities will be completed whenever possible, at times when the wind speed at the site is insufficient for the Project to produce power.

4. General Maintenance Duties

Each wind turbine requires periodic scheduled maintenance in accordance with schedules and procedures required by the turbine manufactures. Generally, scheduled maintenance is conducted in two separate inspections at approximately six-month intervals. On average the turbines will require 40 to 50 person hours of scheduled mechanical and electrical maintenance per year. Usually, no more than two turbines are being serviced at any one time.

In addition to the turbine manufacturer supplied O & M Manuals, enXco has developed extensive tracking and documentation procedures and systems which enhance its ability to optimize scheduling, track labor and parts usage and analyze parts failure and trending.

In connection with its many O & M contracts, enXco also maintains multiple high voltage substations and associated collection systems totaling more than 500 MW of capacity. enXco employs a staff of highly experienced personnel who are well versed in maintenance and repair procedures of the type electrical equipment anticipated for the Development, with a particular emphasis on preventative and predictive maintenance testing and procedures.

enXco will coordinate the timing cycle for service of high voltage and low voltage collection system equipment with any scheduled outages planned whenever possible. If coordination of these service activities in conjunction with the purchasing utility is deemed impractical, enXco will attempt to schedule these service outages during low wind periods. enXco will provide data that may be required by the purchasing utility to respond to information requests from the following: MAPP, NERC, ISO, and RTO guidelines.

The protective relays will be calibrated and operationally tested annually by qualified subcontractors and a written report verifying calibration will be submitted to the Facility Owner.

The Preventative Maintenance Schedule includes, but is not limited to, inspection of the following:

- Switch cupboards (door and floor plate and cable clamps) on an annual basis.
- Control box/top cabinets (sensors, emergency stop switch) on a semi-annual basis and the safety chain with centrifugal switch on an annual basis.
- Low Tension Main Distribution (power switch) on a semi-annual basis.
- Converter Cabinets (low tension part, power switch, network contact) on an annual basis
- Tower components including climb protection and resting platforms on an annual basis.
- Wind direction tracking (gliding areas, yaw drive, yaw position sensor, cable torsion safety switch, slide bearing, wind flag, anemometer) on a semi-annual basis.
- Rotor blades, external on a semi-annual basis and blade fastenings on an annual basis.
- Rotor hub (rotor shaft fastening, pitch bearing fastening - outer ring, pitch bearing fastening - inside ring) on an annual basis.
- Machine strap on an annual basis.
- Pitch motors on an annual basis.
- Pitch adjustment (pitch gearing, position switch) on an annual basis and switch cupboards on a semi-annual basis.
- Nose cone (general, entry to the hub) on an annual basis.
- Drive land (pillow block. Shaft, gear box, oil cooler, decoupling for structure-borne noise, coupling, decoupling for the generator) on an annual or semi-annual basis depending on the component.
- Generator on a semi-annual basis.
- Braking hydraulics unit (brake disc, coatings, calipers) on an annual or semi-annual basis depending on the component.
- Hydraulics (valves, hydraulics tubes, control block, pipe work, hydraulic oil) on a semi-annual basis.
- Cable in the machine head and in the tower on an annual basis.

I. Costs

1. Capital Costs

The cost for the Project will be approximately $2,000 per installed kW of nameplate capacity. This includes development costs, engineering, procurement and construction costs.

2. Operating Costs

enXco anticipates Operating costs for the full 200MW project to total approximately $6,000,000 per year. Of this approximately one half will be costs associated with the operation and maintenance of the project with the balance being made up of taxes and fees including the Minnesota production tax and landowner payments.

J. Schedule

enXco plans to have the Wapsipinicon Wind Project in service and in Commercial Operation on or before December 31, 2008. To achieve this enXco has set the following Milestones:

Milestone Description	Target Start Date	Deadline
Land Acquisition	In Process	July 15, 2007
Site Permit	June 1, 2007	December 15, 2007
Preconstruction Studies	In Process	August 15, 2007
Equipment Procurement	In Process	Various
Construction	April 2008	December 31, 2008

enXco does not anticipate a need for third party financing. However, enXco maintains a presence in the financing markets. Should third party financing be required enXco will procure it in the normal course of business.

K. Energy Projections

enXco has retained a reputable independent third party meteorologist to estimate the energy production from the site based on measurements taken from equipment on the site and correlated to long term references. The net annual energy production from the project, assuming various losses aggregating to roughly 13%, is estimated at approximately 700GWh (gigawatt hours).

L. Decomissioning and Restoration

1. Estimated Life of the Project

enXco has extensive experience operating and maintaining wind turbines of all vintages. Based on this experience it is anticipated that the project can be operated for approximately 30 years.

2. Estimated Decommissioning Costs

Approximately $1 million is budgeted for the decommissioning of the project

3. List of Decommissioning Activities

Decommissioning activities include the removal of wind turbine nacelles, blades, towers, foundations, cables, roads, and other facilities to a depth of 36 inches below grade.

4. Method for Ensuring that Funds are Available for Decommissioning

Decommissioning funds will be set aside as a specific budget item. A set-aside guarantee will be executed on behalf of the Project with an independent administrator of such funds. During year 20 of operation of the wind power plant, approximately $5,000 per turbine will be set aside for decommissioning.

5. Method for Updating that Funds are Available and Updating Decommissioning Costs

The independent administrator will report annually to the Project on the status of decommissioning funds. The Project will report every eight years to the independent administrator with an updated budget for the cost of decommissioning the plant in current-year and decommissioning-year dollars.

M. Identification of Required Permits/Approvals

There are a number of permits or approvals that are or may be required prior to construction of the Wapsipinicon Wind Farm. These permits/approvals are outlined in the table below.

Agency	Permit/Approval	Authority	Description
FAA	Notice of Proposed Construction or Alteration	14 CFR Chap 1 Subchapter E Part 77	Determination of No Hazard to Air navigation
USFWS	Consultation and review of the proposed project regarding federally threatened and endangered species	Endangered Species Act of 1973	The Act requires all projects that are in areas designated to be habitat for endangered species to be reviewed by FWS
MN PUC	LEGF Certificate of Need	MN Rules 7849	For wind turbines and transmission interconnections and associated facilities
MN PUC	Site Permit	MN Rules 4401	For wind turbines – meet threshold for LWECS requiring permit.
MN State Historical Preservation Office	Cultural and Historical Resources Review	National Historic Preservation Act; Historical Sites Act (Minn. Stat. 138.661-138.669); Field Archaeology Act (Minn. Stat. 138.31-138.42); Private Cemeteries Act (Minn. Stat. 307)	Cultural Resources Review and State and National Register of Historic Sites Review.
MPCA	NPDES Stormwater Permit for Construction and Storm Water Pollution Plan (SWPPP)	Clean Water Act	Program designed to reduce the amount of sediment and pollution entering surface and groundwater during and after construction projects.

MPCA	Small Quantity Generator	MN Rules 7045	Hazardous Waste rules regarding storage and disposal of turbine lubricating oil.
MN DNR	Woks in Public Waters	Minn. Stat. §103G.005	Applies to activities conducted below the Ordinary High Water Level of public waters and public waters wetlands.
MN DNR	License to Cross Public Lands and Waters	Minn. Stat. §84.415	Required for utilities passing over, under, or across state lands and public waters.
MDH	Plumbing Plan Review	MN Rules 4715.3130	Ensures healthy and safe plumbing installation.
Mower County SWCD	Wetland Conservation Act Approval	Minn. Stat. §103G.222-103G.2373; MN Rules 8420	Requires proposed impacts to wetlands be avoided and minimized
Mower County	Building Permits	County Ordinance	
Mower County	Conditional Use Permit	County Ordinance	Approves the siting and construction of the substation and Transmission Line.
Mower County	Individual Septic Tank Systems (ISTS) Permit	County Ordinance	
Mower County	Driveway Permits		If Turbine road will connect to a county road
Mower County	Utility Permits	County Right of Way	
Mower County	Moving Permits		Need to permit oversized loads on county roads.
Mn/DOT	Driveway Permits		If access road will connect a state road.
Mn/DOT	Utility Accommodation Permit		
Mn/DOT	Work within Right of Way Permit		
Mn/DOT	Haulage Permits		
Mn/DOT	Aviation clearance from Office of Aeronautics		Review and approval of FAA 7460 permits